www.IPRSMediquipe.com

THE IPRS Mediquipe + NEWSLETTER

ISSUE #1 MARCH 2024

Derby County FC

Find out how the League One outfit use their Biodex Isokinteic Sytem

Case study: Knee Replacement Rehabilitation

A look into Gaelic Football Injuries

CONTENTS

18

Editor's Note

Jude Potter

Magazine editor

I am delighted to see the launch of the first edition of our Newsletter. IPRS Mediquipe are proud to celebrate 27 years of our association with Biodex Medical Systems, Inc. providing Biodex rehabilitation equipment, aftercare and clinical education across the UK and Ireland.

Some of you will be aware of health challenges we have faced this year that have prevented us from hosting our annual Clinical Focus Day. As an alternative way of keeping in communication with you, it was suggested to us that a regular Newsletter may best serve our valued Biodex customers in sharing topical content, endeavouring to feature relatable articles to our broad spectrum of Biodex customers.

Research, assessment, recovery success? I very much welcome any contributors who feel they have a clinical article they would like to share in demonstrating how the Biodex equipment, when integrated with other treatment, can complement patient recovery. Plus, a great opportunity of promoting your organisation.

I welcome suggestions and requests for future editions, feel free to contact me.

Kind Regards.

Jude

Contributors

Thank you to all our contributors for our first IPRS Mediquipe newsletter, if you would like to contribute to our futures editions please get in touch with us!

Jane Campbell
UPMC Aut Even Hospital | Physiotherapist Manager

A Chartered Physiotherapist with over 22 years' experience and a Masters of Clinical Research, Jane has worked as a Senior Physiotherapist in the UK, New Zealand and Ireland and is the Vice President of the Irish Society of Chartered Physiotherapists (ISCP).

John Hartley
Derby County FC | Head Physiotherapist

John is a highly experienced sports physiotherapist with over 20 years in professional sport, and currently the Head Physiotherapist at Derby County Football Club.

Martin McIntyre
The Sports Injury Sports Medicine Clinic

Martin McIntyre is the founder of The Sports Injury Sports Medicine Clinic in Castlebar. An expert in the areas of performance evaluation, health and fitness, exercise physiology, sports biomechanics and injury prevention and treatment.

Dave Fevre
IPRS Mediquipe | Clinical Support Lead

Dave Fevre is a vastly experienced sports clinician and IPRS Mediquipe's Clinical Support Lead. Dave has consultancy roles with several European, Premiership, Championship and EFL football clubs and is on the teaching faculty for both the Football Association (FA) and Rugby Football League (RFL).

Case Study: Knee Replacement Rehabilitation Using Biodex System 4

WRITTEN BY JANE CAMPBELL, PHYSIOTHERAPY MANAGER FOR UPMC AUT EVEN HOSPITAL

The UPMC Aut Even hospital is a private hospital in Kilkenny, Ireland delivering specialist rehabilitation services. They make use of the Biodex Isokinetic System 4 which was a key factor on this case study.

PATIENT PROFILE

The patient involved in this case study is a 64 year old nurse who had undergone a knee replacement surgery.

Despite all her efforts and understanding of the importance of post-operative care, she unfortunately experienced significant challenges in achieving her range of motion (ROM) goals.

REHABILITATION PROCESS

The patient attended weekly rehabilitation sessions, which consisted of passive stretching, active range exercises, and strengthening work. Despite these efforts, her range of motion remained limited at 0-50 degrees after 4 weeks.

INTERVENTION

At the four-week mark, it was decided to manipulate the knee under anaesthetic (MUA).

The knee was manipulated with ease to 120 degrees, indicating that the problem was not due to arthrofibrosis.

Rehabilitation Program

To facilitate an increase in ROM and gain patient confiednce, the Biodex System 4 isokinetic machine was introduced into her rehabilitation program. Attendance at rehab was increased to twice a week. The biodex was used, in passive mode, to simulate a continuous passive motion (CPM) machine.

The range was set based on the patient's comfort response initially, with two-minute sets at low speeds (30 degrees/second). The range was increased as the patient's tolerance increased, and a pause was added/increased at the end of the range in flexion.
This was supplemented with a home exercise program to support her recovery and maintain the improvements gained during her sessions with the Biodex machine.

Progression

Co-contractions were introduced in passive mode, first eccentric and then concentric. Once the patient's range started to increase, active exercising was reintroduced.

Outcome

The combined approach of the Biodex System 4 and the home exercise program provided a comprehensive rehabilitation strategy for the patient. The patient's range on discharge at 14 weeks post-operation was 0-115 degrees, which surpassed her pre-opertaive range of 96 degrees.

Conclusion

The case demonstrates the potential benefits of using advanced rehabilitation equipment like the Biodex System 4 in conjunction with traditional rehabilitation programmes for TKR patients.

A case study with Derby County

The Biodex Isokinetic dynamometer allows clinicians to provide objective data on players to help assess players. This is particularly useful when signing players who have had recent injuries or a history of injury to a specific area of their body.

Protect & Recover

By John Hartley, Head Physiotherapist at Derby County FC

The introduction of the transfer window to elite football twenty years ago created an exciting and entertaining addition to the world of football. This is now one of the most important moments of the season for clubs and managers alike to sign players to strengthen the team for the coming season, or during the January window to push for promotion or survival.

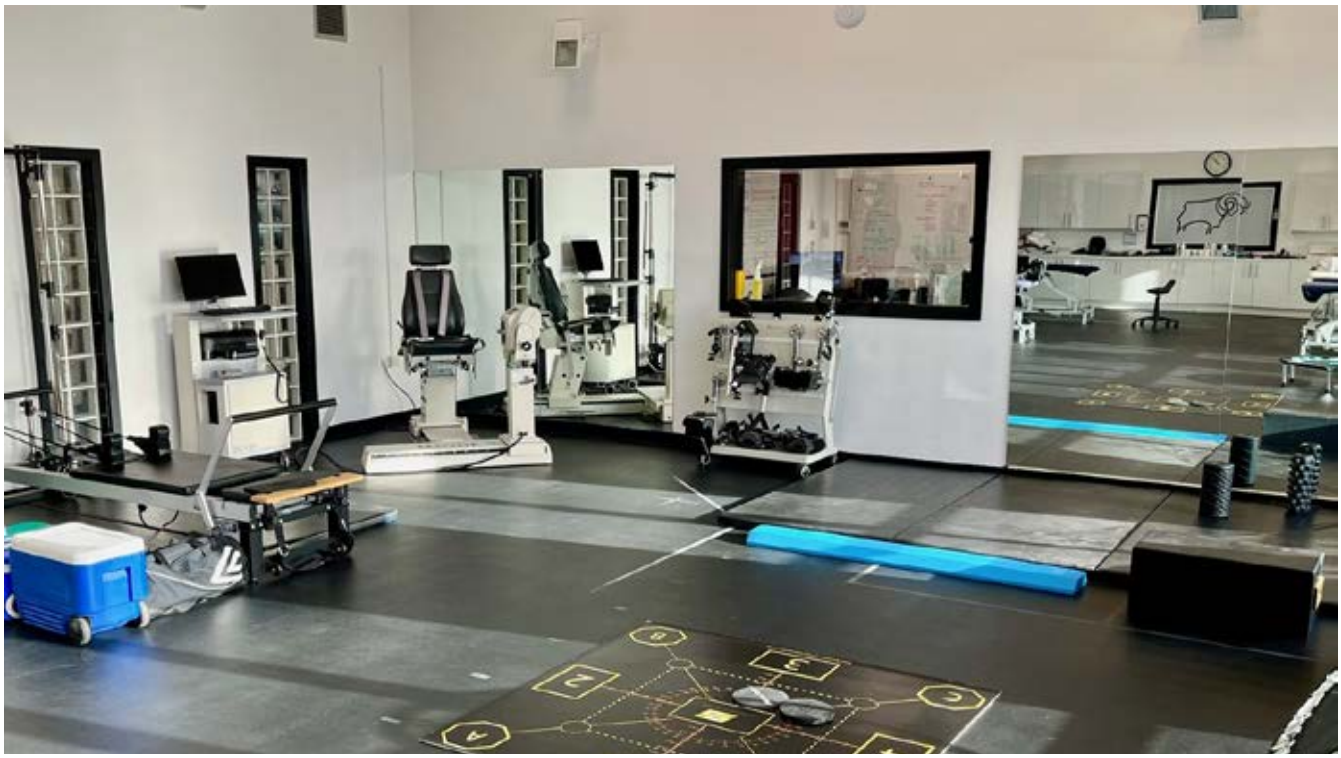
This opportunity comes with great success stories and failures for new signings or loan players. Given the nature of 'deadline day' huge amounts of pressure can be put on clubs and managers to sign a player, and not miss a great opportunity. This acts to create a greater need for medical departments to be thorough in their assessments on players to help inform decisions on whether transfers or loans will be completed. Often loan signings may have had less playing time due to competition for places or be on the way back from injury. Going out on loan acts to allow the player to gain further match minutes to help them develop as a player or recover from injury and regain form.

“During his medical, it was highlighted that the player had some underlying strength deficits of around 20% in both his right quad at 60 deg/sec and left hamstring at 300 deg/sec using baseline isokinetic testing.”

The Biodex Isokinetic dynamometer allows clinicians to provide objective data on players to help assess players. This is particularly useful when signing players who have had recent injuries or a history of injury to a specific area of their body. This case study describes the journey of one 22-year-old footballer signed on loan who completed his medical towards the end of the August transfer window, with a history of repeated previous injury to his right rectus femoris and his opposite hamstring.

The club’s policy when completing medicals is to conduct a thorough clinical examination and gather objective data on specific joints and muscles range of motion and strength. This is standard operating procedure for sports clubs and allows medical practitioners to evaluate the athlete as a whole and discuss previous medical/injury issues so the player is supported when integrating into a new team environment. This also allows the opportunity to highlight areas for physical development whilst on loan or areas for ongoing management. Various measurements are taken during the assessment, including an isokinetic test for areas that have suffered significant previous injury.

During his medical, it was highlighted that the player had some underlying strength deficits of around 20% in both his right quad at 60 deg/sec and left hamstring at 300 deg/sec using baseline isokinetic testing. Given the significant past medical history of the player and previous interrupted loan moves with thigh injuries, it was felt that we could utilise the Biodex isokinetic dynamometer to both monitor and strengthen the player to normalise asymmetries and hopefully reduce the risk of future injury. The player had completed a preseason training schedule prior to signing on loan and was therefore currently training as normal, despite the deficits in strength. To support his athletic development and aim to improve his robustness to the demands of repeated exposure to first team football, a strengthening programme was implemented to run alongside his on-field training to aim to reduce his deficits and imbalances for both his quads and his hamstrings. Unfortunately, the player became injured when striking the ball in training and injured his rectus femoris with a 2c BAMIC injury. The player completed 8 weeks of rehabilitation, 6 weeks of modified training with match involvement, prior to the removal of training and playing limitations. During this rehabilitation period, the Biodex Isokinetic Dynamometer was used to provide ongoing assessment of the quad in two test positions and across three settings. The long-



“...it was felt that we could utilise the Biodex isokinetic dynamometer to both monitor and strengthen the player to normalise asymmetries and hopefully reduce the risk of future injury.”

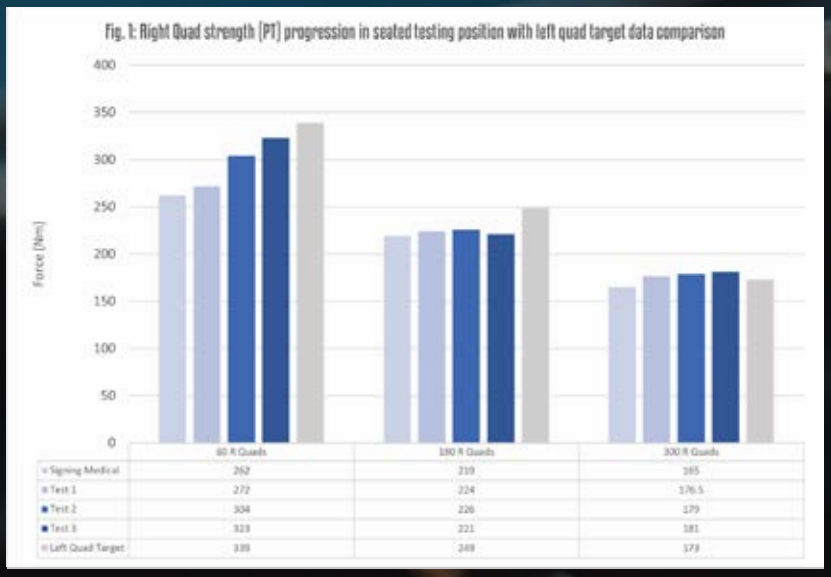
term aim was to develop and protect the athlete from future injury with a gradual integration into the demands of first team football. The Rectus Femoris is an extremely long bi-articular muscle located within the anterior aspect of the quadriceps muscle group workings to extend the knee, flex the hip, and stabilise the pelvis on the femur in weightbearing (Brukner and Connell, 2016; Mendiguchia et al., 2013).

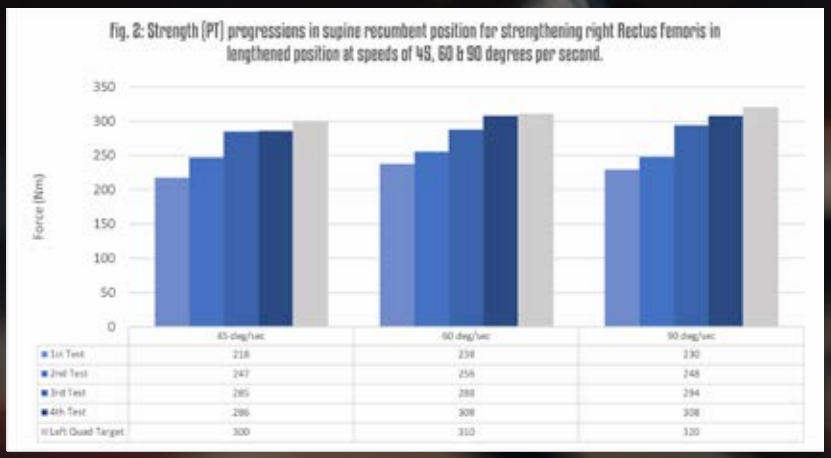
It is innervated by the Femoral nerve and has two proximal heads of origin, the direct head originates from the anterior inferior iliac spine and the indirect head from the superior acetabular ridge which converge to from the proximal aspect of the muscle (Balius et al., 2009). As a group, the quadriceps account for a significant portion of muscle injuries in elite men's and women's football, accounting for 7% and 11% of all injuries on average respectively (Ekstrand et al., 2011; Hallen et al., 2024) and are most commonly injured whilst accelerating, decelerating or kicking the ball (Morgan et al., 2018).

Three different settings in two different positions were used on the Biodex to gain a broad range of monitoring of the players progression over time. Seated concentric quads/hamstrings at 60/180/300 degrees per second was used as a baseline test when completing the players medical and was used as a constant throughout his rehabilitation and monitoring. Concentric knee extension in a supine recumbent position with the hip at neutral and the knee flexing through range off the end of the chair was the second position that allowed the player to produce force in the outer range of the Rectus Femoris muscle. Finally, having performed concentric contractions in two positions, eccentric quads was performed in sitting.

This work was performed as part of an ongoing rehabilitation programme including but not limited to squat, step-up and split-squat variations with focus on isometric, concentric and eccentric actions through range, before progression into plyometric work.

The player progressed well over time, as seen in Fig.1 Seated concentric baseline test, Fig.2 Supine recumbent lying concentric exercise and Fig. 3 Seated Eccentric exercise and used his uninjured leg as a target for rehabilitation (coloured silver on graphs).

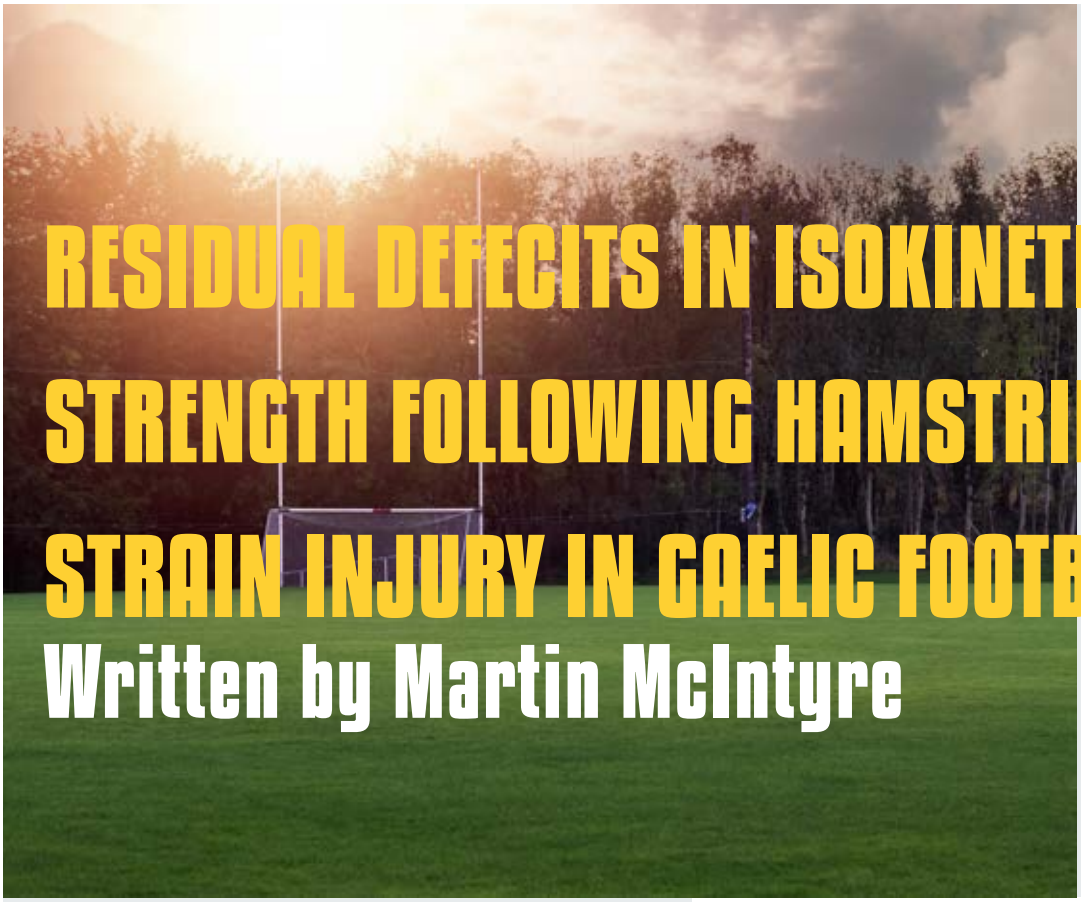




On return to training, the player had recorded the majority of his results to within 5% of his target with all within 10% limb symmetry index prior to returning to training and had a significant increase in confidence in his quad. His training load was monitored closely to plan his return to match exposure and in true fairytale fashion he managed to score with his first touch on his competitive return to the team.

The player now continues with self-management strategies for recovery and preparation for games along with ongoing support from the medical and sports science departments.

Written by John Hartley, Head Physiotherapist at Derby County Football Club



RESIDUAL DEFECITS IN ISOKINETICS STRENGTH FOLLOWING HAMSTRING STRAIN INJURY IN GAELIC FOOTBALL

Written by Martin McIntyre

Hamstring strain injuries (HSI) account for the largest proportion of injuries (21-29%) in Gaelic football (Murphy, O'Malley et al. 2012) and is typically higher than the 12-15% seen in Australian rules, soccer and rugby (Orchard, Seward et al. 2013, Ekstrand, Waldén et al. 2016, Roe, Blake et al. 2016). Strength been long considered a strong risk factor (Burkett 1970) and testing is widely used to determine the mechanical and performance capabilities of the hamstring muscles (Matinlauri et al., 2019). Isokinetics (IKD) is a tool also used for identifying HSI risk it has been reported weak eccentric hamstring strength is associated with the risk of hamstring muscle strain in soccer players (Fousekis et al., 2011) with moderate evidence for lower eccentric strength at 30 deg.s-1 and 120 deg.s-1 and hamstring to concentric quadriceps torque ratios (Maniar et al., 2016). The aim of this study was to investigate the concentric and eccentric strength with respect to retrospective HSI in Gaelic football.

A total of 49 amateur Gaelic Football players from 4 clubs (2 Senior, 2 Intermediate) from the Connacht region were recruited for this study.

Methods

Participants and study design

A total of 49 amateur Gaelic Football players from 4 clubs (2 Senior, 2 Intermediate) from the Connacht region were recruited for this study. All 49 players were tested in the preseason period.

The subject was sat upright in the seat of the dynamometer and it was adjusted to ensure that the upper back and the upper limb was fully supported via the seat slider and seat height and both measurements were recorded.

The subject was asked to hold a deep breath while fixing shoulders, pelvis, and thigh of tested leg using stabilisation straps (Bennell et al., 1998), with the seat belts located on either side of the subject. The back of the seat was adjusted so the subject's trunk angle was at 900, and the seat length adjusted to ensure the subject's thigh was fully supported with knee flexing freely. The limb lever was adjusted and recorded so the bottom of the lever was set just above the malleolus, and this position recorded.

The dynamometer's axis of rotation was lined up with the axis of rotation of the subject's tested knee. The limb was positioned in mid-range, palpatated at the medial and lateral joint line and this point aligned with the axis of rotation. The ankle strap was then applied to lock the participant in position.

Following this range of motion (ROM) was set for knee extension, the participant extended the knee to terminal end range and then hold pressed on the front panel. The participant was then instructed to pull back into flexion to end point and hold pressed on the dynamometer and then set as toward limit on the front panel.

The subjects details were entered manually in the software and the isokinetic protocol was selected from the dropdown menu and the side tested specified. The knee has held in full extension with the hold button and the anatomical position calibrated, also with the subject relaxed the limb was weighed. The test was initiated by engaging the computer control function and instructed to hold the handgrips located on either side of the seat at all times.

To familiarise themselves with the testing procedure each participant then performed 3 submaximal extension's and flexion's at 60 0/s, following this they were allowed 20-30s of passive movement and recovery where they then initiated the test by pulling and holding the lever in full flexion. Verbal cues such as 'Kick out as hard and as fast as possible' for concentric quadricep, and 'Pull back as hard and as fast as possible' for concentric hamstring were used and five maximal repetitions performed.

A rest period of 90secs was then undertaken and the same procedure was repeated for 180 0/s. On completion the other limb was setup and the dynamometer setup mirrored to repeat the process. Following completion of the concentric testing the dynamometer automatically changed over to passive mode prior to the eccentric testing of the quadriceps at 60 0/s.

There was a recovery period of 90secs, during this period the limb was positioned in mid-range and the subject instructed to kick out for 5 secs, to ensure on active quadriceps contraction the axes remained aligned. If this was not the case the seat was lowered and then the process repeated until the axes remained aligned during active contraction of the quadriceps in midrange. It was made clear that the machine moved alone for eccentric actions. Once the recovery period was elapsed and the knee joint aligned with a "active quadriceps contraction" the participant undertook 3 submaximal eccentric extensions at 60 0/s with passive knee flexion at 60 0/s. They were then counted down from 3-2-1 and the eccentric test begun from terminal extension into flexion. Subjects were encouraged to 'push as hard as possible' during eccentric knee extension and completed 5 maximal repetitions.

They were once again given 90 secs rest period prior to eccentric testing of the hamstrings at 60 0/s . During this period the limb was once again positioned in mid-range and the subject instructed to pull back for 5 secs, to ensure on active hamstrings contraction, the axes remained aligned. If this was not the case the seat height was increased and then the process repeated until the axes remained aligned during active contraction of the hamstrings. Once the recovery period was elapsed and the knee joint aligned with a "active hamstrings contraction" the participant undertook 3 submaximal eccentric flexions at 60 0/s with passive extension of the knee 60 0/s. They were then counted down from 3-2-1 and the eccentric test begun by pulling from flexion into terminal extension. Subjects were encouraged to 'pull as hard as possible' during eccentric knee flexion and completed 5 maximal repetitions.

This process was again repeated for 180 0/s. Once this testing sequence had been completed the opposite side was tested and the protocol repeated by firstly mirroring the seat up of the dynamometer as per the tested limb and the contralateral limb tested again at speeds of 60 0/s and 180 0/s.

The following calculations were then obtained from the results:

1) Peak torque (Nm), obtained at 600/s (PT60) and 1800/s (PT180) and peak torque normalised to body mass (Nm.kg-1) at 60 0/s (PT60%) and 180 0/s (PT180%) for both concentric (con) and eccentric (ecc) contractions.

2) Conventional ratio, concentric peak torque of hamstring muscles divided by peak torque of the quadriceps muscles at 60 0/s (Hcon : Qcon60) and 180 0/s (Hcon : Qcon180) (Yeung et al. 2009).

3) Hamstring to opposite hamstring ratio in concentric mode at 60 0/s (Hcon : Hcon60) and 180 0/s (Hcon : Hcon180).

4) Functional ratio, eccentric hamstring peak torque versus eccentric quadriceps peak torque at 60 0/s (fHe:Qc60) and 180 0/s (fHe:Qc180) (Yeung et al. 2009).

Results

Participant and injury details

A total of 49 participants (26.5+/-2.4yrs; 81.6+/-9.1 kgs) reported for screening 20 of whom sustained a previous hamstring strain in the past 12 months with mean time lost per HSI to training or matches 20.1±7.1 days. The major mechanism was high speed running and kicking, accounting for 89% and 11% of hamstring strains, respectively.

Previous HSI Isokinetic concentric and passive eccentric torques

When comparing the injured group involved side to the non-inured group there was a significant difference in PT60 in extension and flexion. When comparing the injured group involved side to the non-inured group there was a significant difference in extension PT180.

Table 1: Comparing concentric and eccentric hamstring variables from previously injured hamstring and the non injured group (Mean of L+R).

	60 °/s			180°/s		
	Injured	Non-injured	ES	Involved	Non-injured	ES
PT_{con} extension	190±48	204±28	0.36	182±51	152±21**	0.77
PT_{ecc} extension	164±44	253±57**	1.74	230±67	231±61	0.02
PT_{ecc} flexion	88±31	130±28**	1.42	126±23	127±27	0.04
$PT\%_{con}$ extension	2.32±0.58	2.54±0.36	0.46	2.23±0.61	1.88±0.19*	0.77
$PT\%_{con}$ flexion	1.11±0.27	1.24±0.22*	0.52	1.09±0.27	1.01±0.20	0.33
$PT\%_{ecc}$ extension	2.0±0.56	3.17±0.78**	1.8	2.82±0.83	2.89±0.82	0.08
$PT\%_{ecc}$ flexion	1.08±0.39	1.62±0.32**	1.51	1.54±0.30	1.60±0.35	0.18

Participant and injury details

A total of 49 participants (26.5+/-2.4yrs; 81.6+/-9.1 kgs) reported for screening 20 of whom sustained a previous hamstring strain in the past 12 months with mean time lost per HSI to training or matches 20.1±7.1 days. The major mechanism was high speed running and kicking, accounting for 89% and 11% of hamstring strains, respectively.

Previous HSI Isokinetic concentric and passive eccentric torques

When comparing the injured group involved side to the non-inured group there was a significant difference in PT60 in extension and flexion. When comparing the injured group involved side to the non-inured group there was a significant difference in extension PT180.

In the injured the opposite to opposite hamstring ratios were 0.92+/-0.14 and 0.94+/-10.15 for Hcon : Hcon60 and Hcon : Hcon180, respectively.

There was a significant difference in fHe:Qc60 and fH:Qc180 when comparing the involved limb to the non-dominant side in the un-injured group (Table 2).

The findings from our study indicate that players with previous HSI have weaker eccentric strength in comparison to un-injured peers.

Table 2: Comparison of functional ratios from previously injured hamstring and non-dominant side of non injured group.

$fHe:Qc_{60}$			$fHe:Qc_{180}$		
Involved	Non Dominant	ES	Involved	Non Dominant	ES
0.48±0.18	0.65±0.16**	1.0	0.74±0.25	0.85±0.20*	1.0

There was a significant difference in both fHe:Qc60and fHe:Qc180 and also in Hcon : Qcon180 when comparing the injured group to the dominant side of the non-injured group.

Table 3: Comparison of conventional and functional ratios from previously injured hamstring strain group versus non-previously injured group

	60 °/s			180 °/s		
	Involved	Dominant	ES	Involved	Dominant	ES
Hcon : Qcon	0.50±0.15	0.51±0.10	0.08	0.51±0.15	0.55±0.10*	0.31
fHe:Qc	0.48±0.18	0.65±0.16**	1.0	0.74±0.25	0.85±0.19*	0.5

Discussion

The purpose of our study was to determine whether there was a difference in concentric, eccentric strength in players who had a history of HSI and the risk associated with future HSI. The findings from our study indicate that players with previous HSI have weaker eccentric strength in comparison to un-injured peers.

Isokinetic data is considered controversial due to the inconsistencies of studies and the lack of corroboration within the literautre (Bennell et al., 1998; ZVjac et al., 2013; Van dyk et al., 2016). Variations in populations and cohorts (Australian, South American, European, Asian, South American, North American), football codes (Australian rules, AFL, Soccer, Gaelic football) age (20-29yrs) produce large inter study variations. More importantly methodological and experimental differences in studies ranging from 18-1252 subjects with injured groups between 6-167, the machine (Cybex, Biodex, Kin-Com, Contrex), practise trails (0-4), range (70-1100), speeds (30-3000/sec), reps (3-10reps), warm up (non-10mins), stretching, alignment of the centre of axis, analysis (means, t-test, injured un-injured, dominant v non-dominant, spearmans, logistic regressions, logit, ROC, AUC) and the number of testers (1-5) all differ within the literature and many studies that have looked into the reliability of standard isokinetic strength measurements, test-retest reliability and characterising the minimal differences required between tests (Feiring et al.,1990; Pincivero et al.,1997; McCleary et al.,1992). When calibration, gravity correction, and patient positioning are all standardised reliability increases (>0.8) (Feiring et al.,1990; Pinicivero et al.,1997; McCleary et al.,1992). As a result we have applied a methodology in which we address the center of axis and modes of testing and indicate a strong correlation in test-retest for peak torque pf the quadriceps and hamstrings in both eccentric and concentric modes. This is consistent with other studies in which values of 0.8-0.9 have been reported which indicate good reliability values consistent with isokinetic methodologies (Impellizzeri et al., 2008).

Relative to body weight we report significantly weaker concentric quadriceps at 1800/s and eccentric quadriceps at 60 0/s and 1800/s and weaker hamstrings concentrically and eccentrically at 60 0/s in previously injured players when comparing them to their non-injured cohort even though test speeds are not close to the physiological speeds of high running of 7300/s and 860-17200/s (Nagahara et al., 2014; Nunome et al., 2002). Nevertheless, lower levels of eccentric knee flexor strength elevate the risk of future HSI (Bourne et al., 2017) while lower hamstring strength at 30 0/s and 120 0/s is associated with increased HSI risk in soccer players (Fousekis et al., 2011). Furthermore during pre-season reduced hamstring eccentric peak torque's at 300/s <2.44 times body weight is associated with 5.6 fold increase in the risk of HSI in professional footballers (Lee et al., 2018). Given the debate surrounding the mechanism of injury and the various rehabilitation practices associated with isometric, and eccentric strength our study highlights the requirement to consider of three aspects of muscle contraction due to these residual deficits in players with previous HSI.

It is also worth considering isokinetic ratios as it is reported that between limb imbalances or hamstring-to-opposite hamstring in professional soccer players differs significantly in injured versus uninjured players for concentric Hopp60:Hopp60 (0.9+/-0.07 v 1.05+/-0.1) and eccentric strength (0.79+/-0.23 v 0.94 +/-0.15) with a cut off of 0.90 at 600/s recommended for HSI prevention (Orchard et al.,1997). We report a similar trend in which the injured group had lower hamstring-to-opposite hamstring at both 600/s (0.92±0.14) and 1800/s (0.94±0.15) also suggestive of a 0.9 cut off as proposed by Orchard et al (1997). Isokinetic eccentric knee flexor torque ≥0.85 increased the risk of hamstring injury fourfold (95% CI 1.13-13.23) among elite soccer players (Fousekis et al., 2011) and also shows significant deficits in eccentric knee flexor following injury (95% CI 0.04-0.37 Nm/kg-1) (Sugiura et al.,, 2008). Furthermore lower eccentric strength at 30o/s and 1200/s for previously injured athletes has moderate evidence whereas high velocity measures of 2400/s and 3000/s have very limited evidence (Maniar et al., 2016). Various methods of assessing HSI injury risk have been used with soccer players who have isokinetically derived strength imbalances and are fivefold more likely to sustain severe injuries (>30 days lost) compared to those without imbalances (Croisier et al., 2008). The correction of these isokinetic parameters through strength training reduces the risk of HSI to the same level as those players without imbalances (Croisier et al., 2008). Limb dominance is also preferred for voluntary motor acts in humans (Carpes et al.,2010), preference and task complexity (Carpes et al.,2010). Eccentric strength is significantly greater in the preferred kicking leg (Ruas et al., 2015) and this reliance on the dominant side may help explain the fact that in Australian rules football 38-71% of injuries have occurred on the dominant or kicking side (Bennell et al, 1998; Cameron et al., 2003; O Sullivan et al., 2008). Eccentric hamstring torque decreases during match-play as a function of time (Greig & Siegler, 2009) and coupled with the extra stress and fatigue with kicking in the dominant limb could quiet possibly make the kicking limb more susceptible to fatigue and increase HSI during match play and is a factor to consider given the kicking nature of the sport.

In the conventional ratio we report values of 0.5-0.51 for Hcon:Qcon60 for previously injured players with HSI while other studies have reported the conventional hamstring to quadriceps ratio can be utilized to discriminate risk in preseason, <0.50 increases the risk of hamstring injury 3 fold in professional soccer players and in Brazilian professional soccer players, outside of 0.55-0.65 by 8-45 fold (Lee et al., 2017; Liporaci et al., 2019). Previously injured club footballers here report significantly lower ratios with a small effect size for Hcon:Qcon180, when comparing to the un-injured group and lower than those values recommended for preventative purposes, as <0.6 significantly increased the risk of hamstring injury by 17 times (Yeung et al., 2014). We also report the injured group had significantly lower fHe:Qc60, fHe:Qc180 when comparing to the un- injured group and we report values somewhat lower in comparison to values of 0.79+/- 0.19 and 0.96 +/- 0.19 (Baroni et al., 2018). We concur with the findings in professional soccer players where the fHe:Qc60

is significantly different in injured (0.65+/-0.21) v non injured players (0.8+/-0.15) (Dauty et al., 2003). It is specific in determining the ability of the eccentrically acting hamstring to brake the action of the concentrically contracting quadriceps during the late swing phase of the gait cycle (Yeung et al., 2009). Lower ratios may represent the inability of the hamstrings to support joint movements performed by the quadriceps as the hamstrings become an antagonist (Aagaard et al., 1998), and one deduce that the hamstrings would be susceptible to injury as a result.

Conclusion

Underlying eccentric IKD torque weaknesses exist in players with previous HSI. IKD ratios including opposite hamstring to hamstring ratios, conventional and functional ratios are all lower in players with previous HSI.

iprsmediquipe

Telephone: +44 (0)1473 835743
Email: mediquipe@iprsgroup.com

Our Clinical Training covers the basic requirements of how to set up and use the Biodex System 3, 4 and BX Hybrid systems, along with ensuring all Health and Safety elements are covered.

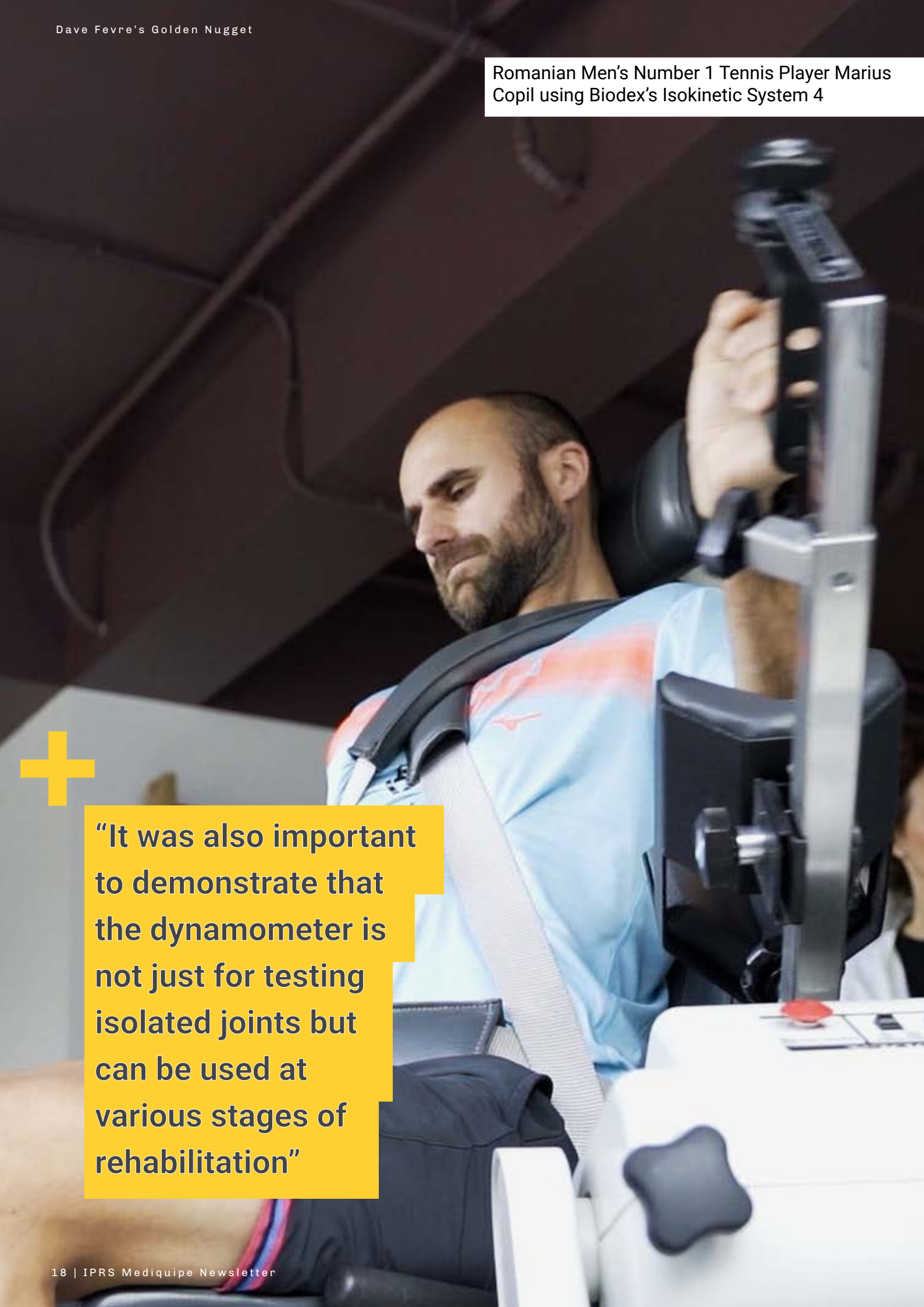
The training will enhance your understanding of the equipment and how it can be clinically applied for effective results, ensuring you receive the most out of your investment. It is accommodating to the different skill levels of users and extends from a basic understanding and usage of the system through to the more advanced levels of understanding.

The training sessions, lasting around 4 hours for a max of 6 people, follow a set syllabus, but we allow the ability to bespoke areas of the training to fully meet your needs.

Covering:

Introduction to the Biodex Isokinetic System and Advantage BX software | Powering on and adjusting the Biodex Isokinetic System | Software Navigation | Training Mode Operations and Uses | Testing Mode Operations and Uses | Data Interpretation | Positional Set-ups | Calibration | Powering Off | Any areas of focus specific to your requirements

Romanian Men's Number 1 Tennis Player Marius Copil using Biodex's Isokinetic System 4



"It was also important to demonstrate that the dynamometer is not just for testing isolated joints but can be used at various stages of rehabilitation"

Dave Fevre's Golden Nugget

I was very kindly invited over to the Provita (Nord) clinic in Bucharest, Romania at the end of January 2024 to present a 2-day isokinetic theory and practical course to the rehabilitation team at the clinic.

They have a Biodex system four unit and a rehabilitation team consisting of a doctor and five physiotherapists. The idea of the courses was to help the team develop new opportunities to utilise the isokinetic dynamometer in both the sporting environment of Bucharest as well as the musculo-skeletal outpatients who attend for rehabilitation.

Several of the football clubs in Bucharest have their own isokinetic unit within their own medical department so the clinic sees mainly tennis players from the Bucharest Academy alongside orthopaedic post operative patients who are referred directly to them from the associated consultants. This therefore means they are involved with a higher percentage of upper limb assessments/injuries which tends to be atypical to most rehabilitation centres I have been fortunate enough to work in.

They are the first clinic in Romania to start an isokinetic educational programme to run alongside the day-to-day use of the dynamometer so they can develop several members of the rehabilitation team who are competent in testing and rehabilitating clients rather than the more normal single clinician use. From this continuous professional development Provita want to show themselves as the specialist isokinetic centre in Romania.

Over the 2 days we covered many aspects of isokinetic testing and rehabilitation, so it made for a very intense but productive process, in the main looking at shoulder, ankle and knee joints. It was also important to demonstrate that the dynamometer is not just for testing isolated joints but can be used at various stages of rehabilitation. This brought into the discussions the use of passive, sub maximal, isometric, and isokinetic modes of contraction which are necessary in the maximal, moderate, and minimal protection phases of injury rehabilitation.

It is hoped by both parties for more educational days in Bucharest to be held in the not-too-distant future as over 2 days we only really scratched the surface in the use of isokinetic dynamometry as part of the injury rehabilitation process.

Written by Dave Fevre | IPRS Mediquipe's Clinical Support Lead

Thank you!

Thank you for reading the very first IPRS Mediquipe Newsletter, we hope you have found our content beneficial. Look out for the next edition in a few months!