



**International Conference
Health, Safety & Welfare of Jockeys**

**Report on 6th International
Conference on the Health, Safety & Welfare
of Jockeys**

**in Happy Valley Racecourse,
Hong Kong**

2015

Welcome and Introduction

Denis Egan - Chairman of the Conference welcomed everyone to the 6th International Conference for the Health, Safety and Welfare of Jockeys. He said the conference was being attended by 50 attendees from 11 countries representing 26 organisations. He said there would be 30 individual speakers. He thanked the Hong Kong Jockey Club for providing a top class venue and facilities and said he was looking forward to the presentations over the next 2 days.

William A. Nader - Executive Director of Racing from the Hong Kong Jockey Club welcomed everybody on behalf of the Club. He said they were delighted to be associated with the event and stressed the importance of the topics which would be discussed. He said he looked forward to meeting with attendees during the conference.

1. Current Sports Science Support for Hong Kong Jockeys – *Dr John Reilly*

Dr John O'Reilly updated on an interim report on the effect of a 6 month intervention study examining selected physiological markers and quality of life for a number of Hong Kong jockeys that took part in the study.

He said the main challenges for jockeys include making weight on a regular basis with limited time for the body to recover in between race meetings. It is commonly known among sport science practitioners that unnatural weight loss practices can have a harmful effect on the body over time. He said his talk would provide an update on the sports science work completed with Hong Kong based jockeys over the past 2 years, as well as providing a report on the effect of a recently completed 6 month nutritional and physical activity (PA intervention on bio markers for bone health, body composition, quality of life, attitudes towards PA and nutrition).

At the outset there was a recap on the previous research carried out which showed that riders had a high level of aerobic fitness. However on the negative side it found that there was a poor level of bone strength, particularly in the lower limb and that hydration levels on race day were poor. It also found that nutritional intake was well below the recommended daily level for athletes.

The main purpose of the 6 month jockey project was to examine the effect of an exercise and nutritional intervention on the markers of bone health and quality of life for the jockeys. In total 13 male jockeys took part in the study. There was nutritional and exercise intervention and indicators of bone health were also examined.

The study found that jockeys are relatively shorter, lighter and have less body fat percentage than the control group against which the results were compared. It also found that there was no significant change in their body fat levels before and after the programme.

With regard to bone assessment the study found that jockeys tended to have less bone specific PA than the control group before intervention.

The dietary assessment showed that the calcium intake by jockeys increased by about 100% post intervention as opposed to the control group where the calcium intake only increased by a small amount. The study also noted a significant improvement in the perceived physical quality of life amongst jockeys post intervention.

The key findings from the study on jockeys were:

The 6 month intervention led to:

- Increased calcium intake
- Improvement in left forearm bone strength
- Improvement in perceived physical quality of life

The presentation concluded by suggesting further research which needed to be carried out including:-

- Education at apprentice level regarding nutrition and PA habits
- Long term monitoring of bone density and bone health bio markers
- Longitudinal investigation on the effect of a holistic approach to enhance physical quality of life among jockeys
- Bone health of jockeys upon retirement from competitive racing

2. Sports Science and Medical Support Services for Irish Jockeys -

Dr Giles Warrington, Dr SarahJane Cullen, Dr Adrian McGoldrick, Gillian O'Loughlin & Frank Moran

The presentation was divided into four areas namely:

- Long term athlete development pathway for jockeys
- Current sport science support services for jockeys
- Standard physical fitness assessment protocol for jockeys – “fit to ride”
- Integrated care pathway for injured jockeys

At the outset it was noted that there is no specific structured training for jockeys in Ireland at present. Details of pathways available in other sports were outlined and in particular the soccer pathway was explained covering the period from the time a child enters the sport to retirement.

An outline of the jockey's pathway was presented in the context of the areas used in the soccer pathway.

There were five stages identified in the development of a jockey covering the period from pre-licensing to continual professional development for professional riders. The main benefits to jockeys are:

- Receive sufficient support and training at the appropriate stage of their development
- Equip them with the fundamental building blocks
- Optimize health, wellbeing, safety and performance
- Supports life-long participation

The main benefit to the horseracing industry is that the pathway can be used as a framework to guide thinking, practice and the services provided.

In conclusion, Dr SarahJane Cullen said it was important there was buy-in from the jockeys/trainers to ensure success of the pathway.

The current sports science support services in place for Irish jockeys were outlined and these covered areas such as sport specific exercise classes and tailored strength and conditioning programmes, pre-season boot camp for apprentices, group consultations on various topics, awareness of sports science and medical support available to jockeys and the use of Twitter, “jockeyFIT”.

An update was also provided on the standard physical fitness assessment protocol for jockeys. The physical components important to jockeys were highlighted and it was noted there are limited assessment protocols available to assess the various physical components. A number of recommendations were outlined which will address the deficiencies that exist at present. Further research is being conducted to identify an appropriate “Fit to Ride” protocol.

Frank Moran from the Irish Jockeys Trust provided an update on the integrated care pathway for injured jockeys in Ireland. He said it was very important that the care of injured jockeys must be part of any formal or informal strategy of support, provided at a national level, by regulators and governing bodies. He outlined the path followed by injured riders from the time they suffer an accident to the time they either come back to race riding or are forced to give up the sport and beyond.

The integrated care pathway was described as a multidisciplinary and multiagency outline of anticipated care, placed in an appropriate timeframe, to help a patient with a specific condition or set of symptoms, move progressively through a clinical experience, including psychosocial needs, to positive outcomes. He said the integrated care pathway provides for clarity, responsibility, communication, respect and desired outcomes to be delivered with an agreed and objective timescale.

An update was given on the services provided by the Irish Jockeys Trust (jockeys benevolent fund).

It was noted there is an increase in the number of new cases being dealt with by the Trust on an annual basis. With regard to cases 44% of all cases are self referred by the riders themselves. 36% of all presenting issues are as a result of anxiety and depression. Employment is the next biggest issue at 17% of cases dealt with. 36% of the services provided relate to counselling and in the first eight months of 2015, 53% of cases dealt with were completed. The results achieved were set out and 28% of the results related to employment while 20% related to the provision of funding for training courses which were completed.

3. Controlled trial of Calcium and Vitamin D supplementation in young male jockeys

Leslie Silk (School of Exercise Science – Australian Catholic University)

Background: Young male jockeys undertake calorie restriction and high volumes of physical activity during periods of musculoskeletal growth and development, which combined, place jockeys at high risk of fracture and compromised bone health. Furthermore, there is growing evidence that maintaining a restricted weight can negatively impact on physiological and cognitive health. More specifically, participating in weight restricted activity can limit the attainment of peak bone mass during growth and have damaging short and long term musculoskeletal effects.

Jockeys have a propensity to engage in unhealthy weight-loss behaviours coupled with disordered eating, resulting in a high risk of inadequate nutrition in an effort to maintain low body weight. Evidence of low calcium intakes and vitamin D deficiency in Jockeys has been found [4,5]. There are indicators of compromised musculoskeletal health with approximately 50% of jockeys developing osteopenia as young as 20 years of age, and apprentice riders displaying reduced bone strength.

The aim of this study was to assess whether a calcium and vitamin D supplement would improve bone properties of young male jockeys.

Methods: We conducted a 6-month, randomised, double-blind placebo-controlled trial with two groups of weight-, height- and age-matched apprentice male jockeys (age=20.18 ±3.23yrs). Participants were supplemented with 800mg of calcium and 400IU of vitamin D (n=8) or a placebo (n=9) daily for 6-months. Peripheral quantitative computed tomography (pQCT) was used to measure 4% and 66% distal tibia and radius bone properties at baseline and 6 months. Blood-borne markers of bone turnover, P1NP and CTX and vitamin D status were assessed.

Results: After co-varying for height, weight and baseline bone measurements, the supplemented group displayed greater post-intervention bone density at both the radius and tibia. At the tibia, greater bone density at the 66% proximal site for the supplemented group were observed in cortical content (mg·mm) which was 6.6% greater ($p < 0.001$, partial $\eta^2 = 0.701$), cortical area (mm²) 5.9% larger ($p < 0.001$, partial $\eta^2 = 0.7$), cortical density (mg·cm²) 1.3% greater ($p = 0.001$, partial $\eta^2 = 0.6$), and total area (mm²) 4% larger ($p = 0.003$, partial $\eta^2 = 0.5$). No other between group differences were observed at the tibia or radius. Blood analysis indicated higher vitamin D levels (18.1%, $p = 0.014$, partial $\eta^2 = 0.4$) and lower CTx (ng/L) (-24.8%, $p = 0.011$, partial $\eta^2 = 0.4$) in the supplemented group with no differences observed in P1NP.

Conclusions: This is the first randomised controlled trial to examine the efficacy of calcium and vitamin D supplementation in improving bone properties in a highly vulnerable, young athletic, weight-restricted population. Our results indicate the beneficial effects of supplementation on bone

properties in as little as six months. Whilst the study size is small, this intervention appears promising as a strategy for improving bone health in young male jockeys.

4. **Dietary intake, Energy expenditure and Lifestyle habits of apprentices at the South African Jockey Academy – *Kathy Krog***

The aim of this study was to determine the dietary intake, energy availability and weight control practices of South African male apprentice jockeys between the ages of 16 and 20 years.

The participants (n=21) completed a 59-item nutrition, health and lifestyle questionnaire including questions on weight control and weight making practices. Dietary intake was recorded with a 24-hour dietary recall on four non-consecutive days including a rest day, two training days, and a race day. On these days, exercise energy expenditure was also recorded with Actiheart® monitors with the aim to calculate energy availability. Total mean reported energy intake of the participants was 7088±2337kJ (35.6±12.5kcal/kg). Mean calculated energy availability was 29.2±11kcal/kg fat free mass (n=17). Five jockeys had a mean low energy availability (<30kcal/kg/fat free mass) over three days. Ninety one percent of all the jockeys reported the use of one or more weight control method including food avoidance (81%), restricting food intake and meals (67%), exercising to sweat (48%) and using the sauna (43%). The top three reported side effects from making weight included thirst (80%), hunger (75%) and tiredness (75%).

In conclusion, the majority of South African apprentice jockeys are practicing weight control methods, specifically restricting energy and food intake rather than active dehydration, to control their weight. This was supported by the mean low dietary energy intake and sub-optimal mean energy availability. These apprentices are therefore at risk for long-term health consequences including low bone mineral density.

5. **Injury and illness surveillance in apprentice jockeys at the South African Jockey Academy – *Tarryn Sneyd***

Introduction: To describe the incidence rates of illnesses and injuries in apprentice jockeys at the South African Jockey Academy (SAJA)

Methods: The study involved surveillance of injury and illness in 61 apprentice jockeys (6 females and 55 males, ages 15-23 years old) at the SAJA. An injury and illness surveillance report form adapted to the sport of horse racing was developed from the Sports Injury Tracker form. Injury and illness surveillance was implemented from January 2013 to December 2014. The following information was recorded; date, participant code, sex, reason for presentation, activity, mechanism, duration of absence, general classification of injury/illness and body part affected. The SAJA registered nurse, reported illness and injury on a daily basis. All injury and illness information was retrieved by the SAJA Sports Scientist and recorded into a database. No injury or illness was recorded twice. Incidence rates and rate ratios in injury were based on 1000 athlete-exposures (AEs), with AE defined as 1 athlete's participation in a race ride, track session and stable work. Clinical incidence in illness was defined as the number of incident illnesses divided by total number of athletes at risk.

Results: Clinical incidence illness data suggest that the most common illnesses suffered by apprentice jockeys are upper respiratory tract infections at 2.72 and 2.3, gastrointestinal at 0.7 and 1.9, infections at 0.4 and 0.4, and dehydration at 0.4 and 0.8 for 2013 and 2014, respectively. A total of 270 apprentice jockey injuries were reported during 2013 and 2014. Injury data suggest muscle spasm at 3.53 and 1.92, contusion at 3.03 and 0.64, joint strain at 2.08 and 0.96, mild strain at 1.96 and 0.53, and concussion at 1.83 and 1.28 injuries per 1000 AEs for 2013 and 2014, respectively, are most prevalent among apprentice jockeys. Concussion is shown to be most prevalent during the first quarter of the year at 2.98 and 2.24 concussions per 1000 AEs for 2013 and 2014, respectively. Total injury incidence rate decreased from 14 to 5.6 injuries per 1000 AEs in 2013 and 2014, respectively.

Conclusions/recommendations: Compulsory strength and conditioning sessions were implemented in 2014 and may have reduced the total injury risk. Apprentice jockeys represent a group that are at a high risk of injury and illness. Further investigation into preventive measures is needed.

6. Update on the Irish Research Programme – *Dr Giles Warrington & SarahJane Cullen*

The background to the Irish research programme, which commenced in 2003, was outlined as well as the key findings to the most recent research conducted in Ireland. In total 1 Masters and 2 PHD's have been achieved, as well as 1 post-doctoral researcher. There have been 12 peer reviewed journal articles and presentations were made to 15 conferences. Details of the publications to date were outlined.

Updates were provided on the current research projects, namely:-

- a. **Body composition and bone health characteristics in apprentice jockeys**
- b. **Updated analysis of the incidents of falls and injuries in flat horseracing in Ireland**
- c. **Mental health and performance issues in current and retired jockeys**

The background to the carrying out of the research into the **body composition in bone health characteristics in apprentice jockeys** was outlined. Reference was made to the high incidences of poor bone health in professional jockeys and apprentice jockeys which were findings from studies completed previously in Ireland and Australia. Musculoskeletal health of apprentice jockeys however has not yet been investigated using DXA.

An outline was provided on the evaluation of body composition and musculoskeletal health in apprentice jockeys using DXA. All apprentice jockeys (male N=46; Female N=6) holding a racing license in Ireland in 2014 had a DXA scan and results of the scan were compared to a control group. The main finding was that apprentice jockeys had a compromised bone quality when compared to age, gender and BMI matched controls despite only being at the early stages of a flat horse racing career. It was noted that differences in musculoskeletal health can predominantly be explained by age, body height and lean mass. The importance of continually educating jockeys and encouraging the adoption of healthy eating and appropriate physical fitness training was stressed. Longitudinal tracking of musculoskeletal health in jockeys was emphasized.

The second research project related to an **updated analysis of the incident of falls and injuries in flat horse racing in Ireland**. The main aim of the research was to detail the specific type and location of injuries sustained in flat racing. The work covered a 4 year period from 2011 to 2014. It was noted that while the number of falls had increased, the injury rate had decreased. This may be due to current injury prevention strategies.

The final research project related to **mental health and performance issues in current and retired jockeys**. The research was undertaken to identify what mental health and performance support structures are needed for jockeys.

The method used was that all current (greater than 18 years) and retired jockeys were encouraged to complete an anonymous on-line survey. The survey covered 10 areas ranging from physiological distress, depression, anxiety to mental toughness, motivation and mental skills. The survey found that 75% of current jockeys and 63% of retired jockeys are currently experiencing symptoms of at least one of the mental health problems assessed. 69% of current jockeys and 57% of retired jockeys said they were suffering moderate to high stress levels. 45% of current jockeys and 43% of retired jockeys displayed symptoms of depression. These percentages were significantly higher than those for the same mental health issues in other sports.

The survey also found that 46% of jockeys under 25 years of age suffer symptoms of depression as compared to 28% in Irish young people. The researchers said the questionnaire showed there were some worrying trends emerging and that further work needed to be carried out.

In conclusion, details of the future research plans were outlined. Future research will cover such areas as a refining of the sport specific nutritional and training guidelines for jockeys by investigating the physiological demands of racing, further investigation into the physiological health of current and retired jockeys and the implementation and evaluation of the jockey pathway. This research will be carried out by the Irish Turf Club in conjunction with the University of Limerick and Waterford Institute of Technology.

7. The Jockey Diet – *Stephanie Preston & Mike Meuser*

An outline was provided on the preparation of a book which will be called “The Jockey Diet”. The book is a project taken on by Stephanie Preston who was originally a jockey for 10 years.

The purpose of the project is to celebrate jockey as athletes and to portray them in a positive light and to educate the public about the challenges of being a jockey, as well as motivating jockeys and the general public to develop lifelong eating and exercise habits. The proceeds from the book, when it is published in May 2016, will be used to benefit non profit organisations namely the Permanently Disabled Jockeys Fund and the North American Riding Academy. The book will help jockeys and the general public to lose weight while remaining strong, fit and healthy. It will outline favourite tricks, trials and tribulations, as well as eating and exercise habits of jockeys with an emphasis on healthy tips for eating and weight loss to maintain ideal weight. The book will also contain a history of race riding, racing glossary and favourite stories from jockeys.

8. Racing and Training Minimum Venue and Equipment Guidelines – *Kevin Ring*

The presentation outlined the requirements in Australia for the preparation and maintenance of racetracks, training tracks and equipment as matter of safety for horse and rider.

The areas covered include turf tracks, sand, dirt and synthetic tracks, inside running rail, outside fence/rails, crossings on turf tracks, mounting yards and barrier stalls.

In relation to tracks in general, the importance of having a uniform surface capable of withstanding the rigors of horse training and racing schedules was stressed. Items which were specific to various types of tracks to ensure consistency and safety were outlined.

With regard to running rail, the criteria that should be met was outlined for inside and outside rail.

The requirements for track crossings on both turf and artificial tracks were outlined as were the requirements that should be met in mounting yards and barrier stalls.

9. Country Updates (*Dr Benoit le Masson*)

Dr Benoit le Masson provided an update on jockeys weights, research projects, safety guidelines for racecourses, rules regarding helmets, medical and psychological emergency cells and a partnership that they have entered into with the French Judo Federation which will provide education on fall techniques.

The protocols in France to deal with jockeys weights were outlined and a minimum fitness weight is determined for each jockey in conjunction with the medical officer. The minimum riding weights in France are currently 51kgs in flat and 61kgs in jumps and will remain at this weight. There is a proposal to increase weights in all races except handicaps in jump by 1 kilo and when the weight is less or equal to 56Kgs in flat by 1kilo. It is estimated that 50% of the rides in flat racing and 80% of the rides in jump will be covered by the increase.

Details of the new research projects were also outlined. The first is a project with the French National Institute of Sport dealing with jockey’s accidents over the past 10 years. The second project relates to helmets and the third project is on stereoscopic performance.

An update was also provided on the new safety guidelines for racecourses and new rules relating to helmets.

Finally, the partnership with the French Judo Association was outlined and this will provide for ten, sixty minute training sessions per year in judo falling techniques.

Great Britain (Dr Jerry Hill)

Dr Jerry Hill updated on the current situation in Great Britain. He divided his presentation into strategic, operational and research.

The strategy for growth was outlined, as was the jockey training and development strategy.

In relation to operational, Dr Hill outlined plans for medical provision on racecourses. This includes increased training for medical teams and a roll out of enhanced physiotherapy provision. He also referred to risk assessments and audits which will be carried out.

Dr Hill provided an outline on the research work which is being carried out by the BHA in conjunction with John Moore's University in Liverpool and in particular the Jockey Health and Nutrition Education which will be the subject of a major new racing PHD. The PHD will be co-funded by the BHA and Liverpool John Moore's University. The study will focus on jockey nutrition, physiology and health. The outputs will include a comprehensive health education package for riders and best practice guides on catering for racecourses. The PHD will be carried out over 3 years will be made up of 4 studies which were outlined.

Reference was also made to the Professional Jockeys Association and University of Oxford Jockey Bone Health Study. The aim of the research, amongst other things, is to describe how common osteoporosis is amongst the jockey population and to understand how bone strength and muscle mass effect the risk of falling and sustaining a serious injury. It will also produce a simple clinical tool to define the risk of low bone strength and fracture for individual jockeys. The study will examine the long term consequences of injuries in retired jockeys, focusing on osteoporosis and osteoarthritis.

Japan (Dr Akihiro Ito)

Dr Akihiro Ito outlined details of falls and injuries in professional horseracing in Japan in 2014. He referred to the Japan Racing Association's (JRA) to improve jockey's safety on the racecourse.

Details of the fall rates for the 3,451 races held in 2014 were outlined. In total there were 135 falls from 50,144 rides, which represents a fall rate of 0.27% per ride. The fall rate in flat racing averaged 0.14% while in national hunt racing it average 4.36%. In total 22 of the 135 falls resulted in an injury which led the rider to be absent for work. It was noted the injury rides ratio in 2014 was much lower than in previous years. Details were also given of the location of falls and injuries. In flat racing most injuries tend to occur in the final turn and home straight of the racecourse. The majority of injuries were fractures. Details of the medical facilities on racecourse were provided and in particular the ambulance room equipment that is available.

10. Presentations from Jockeys Associations

Paul Innes from the Australian Jockeys Association (AJA) outlined the main achievements of the AJA since it was set up. He also referred to the meeting of International Jockeys Associations yesterday and said that they hoped to set up an international federation of jockeys associations. The main aim of the federation will be the improvement of health, safety and welfare for jockeys across the board. He said they will establish a board and have a voice at the various conferences including the Asian Racing Conference etc. He said cooperation with the authorities can only improve the welfare of members.

Paul Struthers of the Professional Jockeys Association in Great Britain outlined the six main issues that concern jockeys in Britain. He described these issues as regulation, finances, injury, fitness, mental health and nutrition. He outlined the life of typical jockey in Great Britain and in particular the

difficulties for riders who are not at the top end of their profession. He also outlined the work carried out by the Professional Jockeys Association and their plans for the future.

Andrew Coonan on behalf of the Irish Jockeys Association outlined the various benefit funds that are in place in Ireland for injured riders. He spoke about jockey's pensions and what the situation is in Ireland with specific reference to career jockeys. He explained the benefits of the pension scheme in Ireland in particular for jockeys who devote their professional lives to race riding but may not achieve at a high level. He then spoke about funding and the deductions from winnings that are currently in place. Andrew spoke about the membership of the pension scheme and the contribution from prize money. He then made reference to the Jockeys Accident Fund and explained how it works and where the funds come from. Andrew touched on career-ending insurance and the fact that the scheme will ultimately be self-funded. He mentioned the other funds that are in existence in Ireland at the moment such as the Jockeys Trust and the Irish Injured Jockeys Fund. He spoke about the possibility of there being too many schemes and the hope that they would eventually all be drawn together under one umbrella group. Finally, Andrew spoke about the benefit of having educational schemes aimed at early retirement of riders.

11. Introduction of a Jockeys Insurance Certificate for jockeys riding abroad – *KL Cheng*

KL Cheng outlined the background to the introduction of jockeys insurance certificate which was originally mentioned at the last conference in Monmouth Park. He said it is planned to make a presentation to the Technical Advisory Committee of the International Federation of Horseracing Authorities in October 2015 with a view to implementing the certificate. He outlined the concept of how the certificate would work and what type of insurance a rider should have in place prior to riding in a foreign jurisdiction. He outlined issues that needed to be addressed and concluded by saying it would be up to the foreign country and the jockey to decide whether or not what is presented is acceptable.

A number of concerns were expressed by the jockeys associations who had not been consulted on the introduction of the certificate and it was agreed that a period of time would be allowed to the associations to make submissions, prior to the matter being finalised.

DAY 2 – Friday, 25th September 2015

1. Weight making and minimum riding weights

Dr Graeme L. Close, Dr James P. Morton & Dr George Wilson

Professional jockeys are unique amongst weight-making athletes given that they face the requirement to make weight daily. Furthermore, unlike other weight limited sports, jockeys who have engaged in rapid weight loss cannot fully rehydrate prior to competition because post-race weight must not be more than 1 kg different to their pre-race weight. As such, jockeys have reported a variety of acute and chronic methods to make weight that include sporadic eating, caloric restriction, diuretics, laxatives, vomiting and fluid restriction as well as regular use of sweat suits and saunas.

Previous work (including by our group) have shown jockeys typically consume a daily energy intake ~ 6.5–8.0 MJ (carbohydrate 3 g kg⁻¹ body weight, fat 1 g kg⁻¹ body weight, protein 1 g kg⁻¹ body weight) and jockeys also exhibit micronutrient deficiencies that include vitamin D and calcium. Accordingly, the combination of low macronutrient, micronutrient and fluid intake results in poor bone health and abnormal mood profiles. Work by our group has also demonstrated that common weight-making practices can also impair simulated riding performance and strength.

Interestingly we shown that the body fat percentages of both flat and jump jockeys (11 – 13.5%) is higher than other both weight-making and non-weight making athletes (<10%) and therefore there is scope to reduce body fat that may reduce the necessity to engage in weight making practices deemed deleterious to health. Indeed, we have demonstrated that the use of daily diets that emphasise a high

protein and reduced carbohydrate intake (in the form of five and six meals and snacks) in combination with structured exercise has proven effective in reducing body mass and maintaining target racing weight.

To date, in consideration of energy expenditure in order to format accurate dietary advice, we have previously reported the energy cost during simulated race riding and total daily energy expenditure using portable monitors (0.20 and 11.0 MJ, respectively). Further on, we are currently in the process of gathering data (in conjunction with the BHA) using doubly-labelled water (DLW). In regards of the previous data we have accrued to hand, such estimates of energy expenditure are considerably lower than that of other sports and therefore suggest that conventional sports nutrition guidelines may not be applicable to the elite jockey. Indeed this has been borne out in the CHO daily intake that we used in our recent dietary intervention (2.5-3.5 g kg⁻¹ body weight) with significant reductions in body fat and maintenance of lean mass plus increased resting metabolic rate observed and reported. Furthermore, we believe that jockeys will find it difficult to make weight using conventional guidelines (6-10g kg⁻¹ body weight), hence, as shown in food diary records, jockeys historically have gone 'low carb' as they know they could not make weight otherwise. The main observation(s) we report are the importance of manipulating food frequency (5 to 6 meals/snacks) and food composition (low GI CHO) in order to reduce body fat in jockeys.

In summary, given the high occupational risks associated with race riding (e.g. falls and bone fractures), future research should specifically target strategies to improve bone health through the use of structured weight-bearing exercise and correcting nutritional deficiencies. Additionally, given the poor dietary practices evident (and the fact that we have demonstrated that these are not necessary to make weight), In this regard, we suggest the need for those organisations responsible for jockey welfare to implement widespread educational programmes to assist in improving both the physical and mental well-being of professional jockeys.

2. Individualised minimum riding weights for apprentice jockeys in Ireland

Dr SarahJane Cullen, Dr Adrian McGoldrick & Gillian O'Loughlin

In 2013 a new minimum weights structure was brought into Irish horse racing for Apprentice jockeys and the pilot protocol was presented at ICHSWJ in 2013. A review of the implementation of the minimum riding weights was provided in this session along with a discussion on the updated advised minimum riding weights protocol. Information was provided on the annual educational training day for apprentices titled "The Heathier Way to Make Weight", a requirement of the new advised minimum weights protocol. Individual case studies of apprentice jockeys were discussed to allow a clear understanding of the current diet and exercise strategies undertaken in Ireland. The importance of long-term education to empower the jockeys with fundamental skills was emphasised.

3. Concussion and Helmets – Dr Michael Turner

The long-term effects of concussion – reality or exaggeration?

Protocols for the immediate management of concussed athletes are now the norm in most contact sports but little research has been published on the long-term effects of concussion.

The work of Professor Ann McKee in Boston has suggested that concussion can lead to Chronic Traumatic Encephalopathy (CTE) but causation has yet to be agreed by other researchers.

Longitudinal cohort studies are already underway in Australia (the Florey Institutes, Melbourne), the USA (the Centre for Research on Retired Athletes, University of North Carolina) and the UK (the International Concussion and Head Injury Research Foundation, London).

The talk highlighted some of the research in progress in other sports - Australian Rules Football, Rugby League, National Football League (NFL), National Hockey League (NHL) – and explained how this has now been extended to include horse racing (jockeys – professional and amateur).

4. Concussion – Rehabilitation better than Rest? – Emma Edwards

Post concussion syndrome, where symptoms fail to recover spontaneously within 7 to 10 days, affects a reported 15 to 30 % of individuals diagnosed with concussion. While the identification, diagnosis and

initial management of concussion in sports people has improved, the management and guidelines for treating those who do not recover in normal time scales has had less attention. Few if any other forms of injury result in athletes being advised to rest until they are completely symptom free, and then continue to be prescribed just rest (not treatment) even if they fail to recover within expected timescales. In those used to a daily exercise regime, the prolonged rest can create rather than resolve symptoms.

After reviewing the current assessment and treatment guidelines, a more comprehensive assessment and range of treatments, directed at any deficits identified, is outlined. Key to the treatment of slow to recover symptoms is an understanding of the normal mechanisms for balance and orientation in space. The complicated interaction between sensory systems that give us the information needed to remain upright and function needs to be assessed fully. Faults in either the peripheral information collecting systems or centrally, in the information processing systems, must be identified and corrected before full recovery can happen. Physiotherapy treatment methods of vestibular rehabilitation, oculomotor retraining, balance and movement re-education and exertion therapy can all assist in those who are slow to recover. Support from other professionals to examine cognitive difficulties or identify when prescribed medication is indicated gives a full comprehensive assessment and treatment for concussion.

5. Head impact conditions in case of equestrian accident – *Dr Benoit le Masson*

[Research Project/University Strasbourg ICUBE-CNRS Nicolas Bourdet,pr Remy Willinger/FRANCE GALOP](#)

The most common injury mechanism in case of equestrian accident is falls from the horse, and the head is one of the most commonly injured parts. Currently, there is very little information available concerning the head impact condition for this kind of accident. The objective of the present work, therefore, is to identify the initial condition of head impact in the case of a horse rider experiencing a fall accident. A parametric study using multibody modelling to simulate a number of virtual accidents based on detailed real-world situations allowed us to propose realistic rider's head impact conditions in terms of normal and tangential velocity. Five parameters, such as the human posture, the initial horse velocity, horse kinematic, the orientation of the falls and the human size, have been varied. The results showed three main impact areas: frontal; parieto-occipital; and temporo-facial. The head impact velocities typically range from 6.6m/s to 7.5m/s, with an inclination versus normal to surface between 20deg and 30deg. These results, together with advanced model based brain injury criteria will contribute to the development of a new helmet test method including tangential impacts conditions.

6. New Australian racing helmets – *Allen McMillan*

- i) How as a manufacturer, we went about meeting ARB HS 2012 with 2 different styles of helmets
- ii) Issues / problems faced during the development stage
- iii) The remarkable findings of extensive testing to ARB HS 2012 with respect to reduction in injury likelihood
- iv) Things about helmet standards that make helmet makers anxious
- v) Discussion of current issues around equestrian standards, i.e. test methods, comparative testing, human testing
- vi) Discussion of various types of helmets (bicycle etc) claiming assistance in rotational injuries. Do they really offer a benefit to the user, or are they "robbing Peter to pay Paul?"

7. New Australian jockey helmet Regulation – *Dr Andrew McIntosh*

The new Australian jockey helmet regulation ARB HS 2012 requires that a helmet meets one of five equestrian helmet standards (Australian, European, British or USA) and additional stringent impact test requirements.

An ARB HS 2012 compliant jockey helmet's impact performance is targeted at reducing severe head

injuries arising from falls and other incidents. The research on jockey helmets was initiated by Racing NSW in 2007. The project was largely funded by a grant from the Rural Industries Research and Development Corporation (RIRDC) and undertaken at the University of New South Wales (UNSW) by the author. A series of projects was undertaken at UNSW that examined jockey helmet standards and performance specifications, helmet performance in laboratory tests and innovation in helmet design and construction.

The focus of the research was on identifying the potential for improving safety performance in a lightweight jockey helmet. In 2010, the Australian Racing Board (ARB) took over from NSW Racing and saw the project to a successful conclusion with the assistance of the author. ARB HS 2012 built on the existing helmet regulation and was informed by the research undertaken from 2007 to 2011. In the drafting of ARB HS 2012, consideration was given to the ARB's injury risk management objectives and the capacity of helmets to fulfil a wide range of objectives. As a result, ARB HS 2012 extends the performance of helmets so that they offer greater protection to the head in more severe impacts than helmets previously mandated for horse racing activities. Since 2012, the ARB has worked with helmet suppliers to identify and assist those willing to meet the challenge of making the world's best jockey helmet. The results of research and other activities will be presented, and future plans will be outlined.

8. Helmet testing and design – *Jeff Johnston*

Prompted by questions regarding the helmet standard, EN1384, The Jockeys' Guild has done some independent testing of helmets to ensure helmets that meet the EN standard are comparable to the United States standard, ASTM1163. We gathered the most popular helmet models used in the US, most of which were certified only to the EN1384 standard and tested them to the ASTM1163 standard to see how they compare. The tests revealed that EN helmets seem to also meet the ASTM standard although the helmets were not put through the full range of tests required to receive ASTM certification. We also did some testing with add on products that claimed to reduce impacts and we tested certified helmets on natural surfaces to see how they performed.

During my presentation I will be discussing the testing we did with added focus on the testing on natural surfaces, as these test results were interesting and alarming. We have set up a Research and Development Committee to review the findings, schedule additional tests, and develop a plan to improve safety products. Initial testing indicates current helmet standards tests are focusing only on high energy falls and taking no account for low energy falls which could be making riders more susceptible to concussions in the short run, and CTE in the long run.

Recommendations will include the development of a new helmet standard for racing or competitive equine sports.

9. Helmets by *Dr Adrian McGoldrick*

Dr McGoldrick's presentation outlined the background to British helmets leading to the European Helmet standard EN1384:1996 and subsequent developments leading to the writing of a new high performance helmet for equestrian activities (EN 14572:2005).

In 2010 the European Commission contracted an independent expert to examine the technical specifications of the standard as no manufacturer had developed it.

Working Group 5 of CEN (Helmets for horse riders) met in 2010 and agreed to revise EN1384 and to recommend withdrawal of reference to EN14572. CEN withdrew EN14572 in Nov 2011.

Lack of progress in the revision of EN1384 led the Commission to launch a formal objection against the standard and to withdraw reference to it for the Official Journal of the Commission in 2013.

WG5 have submitted a rewrite of EN1384 to CEN with a view to it going to Formal Vote in Feb 2016 and if accepted to be notified in the Official Journal of the Commission in Autumn 2016.

10. Jack Berry House – update & anonymised case study – *Daloni Lucas*

This presentation outlined the background to the setting up of the Injured Jockeys Fund in the U.K and

the work it carries out. It also referred to Oaksey House which is a rehabilitation center for jockeys opened in Lambourne in 2009. This facility provides rehabilitation for in-patients and out-patients, fitness testing/enhancement, permanent and temporary (respite residential accommodation), conference facilities, jockey coaching as well as a multi-disciplinary team consisting of physiotherapists, sports therapist, strength and conditioning coach, dietitian, sports physiologist, jockey coach and medical advisor.

The presentation also outlined a typical patient journey following an injury to returning to ride and how the facility provides the required assistance.

One of the main reasons for the setting up of Jack Berry House for the development of this facility was the requirement for a northern support facility. Details were outlined as to how the project was funded. The building commenced in November 2013 and was opened in June 2015. The total build cost was Stg£3.1m and the anticipated running costs of the facility are between Stg£200,000 and £250,000 per annum. Full details of the facilities available at Jack Berry House were outlined and the challenges to ensure that the facility is a success on an on-going basis.

The second part of the presentation related to a clinical case study of a 25 year old male professional jump jockey. Details of injuries sustained by the rider during his short career were outlined, as well as the history of this present condition which occurred following a fall whilst race riding when he misjudged the take off. As a result the injury impacted the base of his neck into floor with “spine inflexed tuck position”. The rider immediately complained of abdominal pain, diffuse low back pain and there was an audible “crack”. The rider was transferred to the local hospital and the injured was diagnosed through an MRI scan. The treatment options were six weeks bed rest or surgical intervention. The rider concerned opted for surgical management which took place in 2011. Details of the post-operative management clinical review and rehabilitation were outlined.

The rider returned to race riding in May 2012 and participated in an extreme charity challenge in August 2012 that involved riding 1,000kms on horseback. The rider retired from riding in September 2013 and returned to Ireland completing the National Stud (Diploma) Course through the Jockeys Employment Training Scheme (JETS) in January 2014. He then commenced employment in a stud in October 2014. The former rider felt significant fatigue in November 2014 and the onset of weakness through his right leg. He was reluctant to seek assessment due to only recently commencing new employment and he attributed the symptoms to his previous back injury and working long hours on his feet. The former rider contacted the presenter who liaised with the Irish Turf Club’s Senior medical officer. The rider was reassessed and referred to a neurologist in London. The rider was diagnosed with motor neurons disease. He was referred to the world’s leading motor neurons disease center in Dublin and is currently being supported by the Injured Jockeys Fund, who will continually liaise with him and his family on his changing needs.

11. The Life of a racecourse doctor / spinal injuries – *Dr Peter Wind & Dr Benjamin Kienast*

As experienced racecourse-physicians for many years we would like to share our experience to other racecourse-physicians and medical advisors. Racing is for sure among the most dangerous forms of sport concerning risk and consequences of injury. It is important to us to present an ideal preparation of a race day or event. Frequently life threatening situations occur where it is extremely important to immediately take the correct reactions and measures. Beside diagnostic investigation, stable positioning and sufficient analgesia the actions to be taken include endotracheal intubation and resuscitation at the scene of injury to protect the Jockeys life. In our experience spinal fractures and spinal cord injuries occur above average. Therefore Dr. Kienast will give some details about recent achievements in spinal cord injury research of the Hamburg research team.

12. Country updates

Australia (*Paul Innes*)

Paul Innes stressed the importance of collaboration and referred to the fact that there is no national medical officer in Australia.

He also referred to the current whip rules in Australia and the proposed changes.

Reference was made to jockey's insurance and their main concern was public liability insurance. "He said there is limited cover in place for care custody and control (under the general Public Liability policy) which is a concern because a jockey could be sued by the owners of the horse if the injury to the horse was due to the jockey's carelessness or negligence."

There was also reference to the role out of plastic running rail which was noted could be very costly for the country tracks.

27% of all jockeys and 48% of all apprentice jockeys in Australia are female.

Hong Kong (Steve Railton)

A presentation was made on the 5 year statistics on race falls in Hong Kong as well as a breakdown on the cause of all race falls. The average number of falls is in the region of 8 per 10,000 runners. The main reasons for the falls occurring are – incidents at the start, accidental/clipped heels and horses breaking down. Following a benchmarking exercise with the racing jurisdiction in Singapore it was established that the rate of falls and horse breakdowns is comparable.

Part of the presentation focused on the issue of horses breaking down and how the HKJC has in place a practice of pre-race veterinary inspections being conducted on all runners on the day prior to racing. Statistics relating to the number of horses that are withdrawn on veterinary grounds were also compared against those provided by the Singapore Turf Club.

USA Jockeys Guild (Jeff Johnston)

An update was provided on the injury database which is being compiled in the USA. Concern was expressed with the difficulty in accumulating accurate data. The majority of incidents occur at the start and most injuries occur between the last turn to the finishing line.

Reference was also made to concussion and it was noted there is now a greater awareness of concussion in the USA. However there are still issues with return to ride practices. Since the last conference, two jockeys were recommended by their personal physicians to retire, as it wasn't in their best interest to return to ride, so they retired.

An update was provided on helmet testing which was carried out to determine whether or not helmets that met the European standard EN1384, also met the American standard ASTM1163. The tests revealed that the helmets did meet the standard.

Ireland (Dr Adrian McGoldrick)

An update was provided on the research carried out in Ireland, helmet standard, safety vests (trial of level 2), mandatory gum shields for national hunt (jump) riders, nutrition on racecourse, extending physiotherapy on the racetracks, physiological backup for riders and mobile medical units.

New Zealand (Dr Phil White)

An update was given on two significant safety developments namely the Health and Safety Reform Bill and Rider Safety Reforms.

The Health and Safety Reform Bill has been adapted from Australian Federal Legislation and would have a significant impact on New Zealand racing. The key principal is that all parties who have the ability to impact on health and safety in the racing industry will have to work together to eliminate or minimise risks to health and safety. Details were provided of how the bill will impact on the clubs and details of the reform steps taken so far were outlined.

The rider's safety developments include the introduction of brain injury management and dehydration management.

South Africa *(Dr Richard Albrecht)*

An update was provided on the use of Grounding as a method of healing injuries and its effectiveness on five jockeys who used the treatment to deal with ailments they had.