What makes for the perfect golf swing?

My PhD was a series of five unique studies on golf biomechanics, which used 3D motion analysis to understand how technique (upper body movements) and equipment (driver shaft) factors help to produce fast clubhead speed and optimum ball flight.

The first two studies aimed to investigate how upper body trunk movement produced fast clubhead speed. A new 3D model was used for elite male golfers and it was discovered that the lower trunk helped to produce fast clubhead speed. This supported previous research that the upper trunk should be viewed as multi-segments rather than simple shoulder and hip turn, as it allows a greater understanding of the timing of upper body movement in the golf swing when aiming to maximise clubhead speed.

The third and fourth studies investigated how the golf club performed during the golf swing. Current methods used by golf club-fitters to fit the right club for a player rely on static measurements of the club, rather than how it performs when a player swings the club. Three-dimensional motion analysis helped to explain the clubs bending performance during the golf swing, and how that affects the flight of the ball. The results from this
Honours’ students in 2014

In 2014 there were 5 students who completed their Honours degrees in the School of Health Sciences. The outcomes are shown below.

**Carmen Papaluca** BHPE Hons H1
“Pictures of #me: does instagram and facebook use influence body image and depressive symptoms in university aged females?”
Supervisor A/Prof Farringdon

**David Orr** BESS Hons 2A
“Ankle and knee joint coordination variability in elite adolescent ballet dancers during single and double leg hopping”
Supervisor Dr Luke Hopper

**Adam Edwards** B. Biomed.Sc Hons H1
“Neuroprotective efficacy of polyarginone-9 (R9) using an in vitro stroke model; implications for therapeutics”
Supervisors: Dr R. Anderton (UNDA) and A/Prof. Bruno Meloni (WANRI)

**Karolina Gorsevski** B. Biomed.Sc Hons H1
“The role of MiE-193b in erythropoiesis”
Supervisors: Dr Louise Winteringham, Prof Peter Klinken (HPIMR) and Dr Ryan Anderton (UNDA)

**James Nelson** B. Biomed.Sc Hons 2A
“Influence of physical activity, diet and genetics on progression to Alzheimer’s disease.”
Supervisors: Dr Stephanie Rayney Smith, A/Prof Simon Laws, Dr Belinda Brown (AD Research Centre ECU) and Prof Gerard Hoyne (UNDA)

Both Adam and Karolina presented part of their Honours project work at the Combined Biological Sciences meeting that was held at the UWA Club in August 29th 2014.

The perfect golf swing (contd)

study showed that drivers fitted with different shafts (mass) had different bending performances during the golf swing and produced different ball flights. This would allow club-fitters to more accurately fit the right club based on a player’s swing style.

The final study investigated how elite male golfers modified their golf swing when hitting with drivers fitted with heavy and light shafts. The wrist joint was also investigated along with upper body movement from studies one and two, to further understand upper body movement in the golf swing. The results of this study show that golfers do modify their golf swing pattern when using heavy and light drivers to influence ball performance. By investigating the wrist for study five, it was discovered that it helped to produce fast clubhead speeds.

It was also discovered that elite golfers delay their wrist movement to produce faster clubhead speeds, which is something lesser able players cannot do.
Grant Success with Diabetes Research W.A

Professor Gerard Hoyne, has been awarded a $75,000 grant from local funding group Diabetes Research WA to investigate if mutations in the Cdk4 gene could be responsible for a subset of type 1 diabetes in humans. Most people with type 1 diabetes develop the disease when their body's own immune system mistakenly destroys insulin-producing beta cells in the pancreas but in some patients that's not the case. These people show no evidence of autoimmune markers in the blood so what is triggering their diabetes, and the death of their beta cells, is a mystery.

The study will investigate if these people are affected by a mutation in the Cdk4 gene that, in mouse models, have been shown to be linked to the development of type 1 diabetes. Preliminary studies revealed the recessive gene mutation caused a protein error that led to a critical loss in insulin production due to the premature death of islet beta cells. Currently we do not know why the mutation in the Cdk4 protein shortens the lifespan of beta cells and the project will investigate which biochemical pathways are affected in the beta cell.

Summer Vacation Cadetship – Lung Institute of WA

Danny Bigelow a Biomedical Science student was awarded a Summer Vacation Cadetship 2014/2015 at the Institute for Respiratory Health (IRH) formally known as the Lung Institute of Western Australia.

The IRH is located on the QEII Medical Centre Campus in Nedlands in the Harry Perkins Institute building. The IRH is a leading research organisation dedicated to fighting diseases such as asthma, chronic bronchitis & emphysema (COPD), bronchiectasis, lung cancer and pneumonia.

The IRH has internationally recognised scientists and clinicians that conduct research to better understand and treat lung disease.

Danny worked in the Tissue Repair Unit which is headed by Assoc. Prof Steven Mutsaers & Dr Cecilia Prele.

His project was to characterize the immune cellular infiltrate observed in the lung biopsy samples from patients with idiopathic pulmonary fibrosis (IPF).

IPF is an interstitial lung disease that affects 1 in 100,000 people throughout the world. Currently there is no treatment that is usually fatal within 5 -10 years of diagnosis and there is currently no effective cure for the disease.
Honours’ students in 2015

2015 will see a record number of students undertaking Honours’ in the School of Health Sciences.

**Bachelor of Biomedical Science Honours**
- Naomi Fleury
- Ingrid Duff
- Gabby MacDougall
- Peter Alfrich
- Sarah Howarth

**Bachelor of Health and Physical Education (Secondary) Honours**
- Emma Ackland

**Bachelor of Exercise and Sports Science Honours**
- Brad Goddard
- Toby Edwards
- Izzy Jacobs
- Blake Taylor

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**Postgraduate Students in Health Sciences 2015**

**Ben Piggott** Doctor of Philosophy (Exercise and Sports Science)
“The relationship between physical capacity, perceptual motor skill, mental toughness and individual match performance in a semi-professional Australian Rules Football Team”

The PhD will be a multidisciplinary investigation that looks at physical, skill and mental components of match performance in semi-elite sport.
Supervisors: Prof G. Hoyne, Dr P. Chivers, and Dr Sean Muller (Murdoch University)

**Amanda Timler** Doctor of Philosophy Institute for Health Research
“Determinants of motor coordination in children and adolescents: A longitudinal study”
Supervisor Prof Beth Hands

**Karla Seaman** Doctor of Philosophy, Institute of Health Research
“Does increasing consumer co-payment impact on health outcomes and health service utilization?”
Supervisors: Prof Max Bulsara (UNDA), Prof Anna Kemp (UWA) and Dr Caroline Bulsara (UNDA)

**Tegan Bulman** Master of Ex Sci.
“Feeling better now: The impact of an exercise intervention on self-concept and happiness in adolescents with low motor competence”
Supervisors: Tanya Blee and Prof Beth Hands

**Ellouise Clark** Doctor of Philosophy (Exercise and Sports Science)
“Feeling better now: The impact of an exercise intervention on self-concept and happiness in adolescents with low motor competence”.
Supervisors: A/Prof F Farringdon and Dr F McIntyre.

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**School of Health Sciences**

The School of Health Sciences was established in 1999 as the College of Health. The mission of the School is to graduate young professionals who will be working at the cutting edge of health sciences knowledge, research and practice to further personal and community health. The healthcare industry has diverse needs and we provide through our various courses, professionals who will work across a spectrum of approaches to improving health. We aim to produce graduates who have a strong service ethos and a human-centred focus.
Retirement of Institute of Health Research Foundation Director

Professor Beth Hands was appointed the Founding Director of the Institute of Health Research in 2009. Beth had previously held the position of the Associate Dean in the School of Health Sciences.

Beth announced that she was going to step down from her position as Director in November 2014 and will continue to work with The University of Notre Dame Australia on a part-time basis to help a number of postgraduate students through to the completion of their degrees.

Beth began teaching at The University of Notre Dame Australia in 2002 and with Prof Helen Parker together they helped to establish the Bachelor of Health and Physical Education degree. Beth has been involved in a range of research projects at Notre Dame but one for which she will be most remembered for is the “AMP –it-up” program.

Beth pioneered the program that was designed to give adolescent children with developmental coordination disorder (DCD) the opportunity to undertake a structured exercise program to help build confidence, self-esteem and general health and wellbeing. The program has also fostered a number of research projects, which have been undertaken by HDR students within SOHS.

The SOHS held a Research Symposium on October 26th 2014 to celebrate her career achievements.

We wish Beth well for her retirement from full-time employment and look forward to a lasting relationship into the future.

Sarah Harris PhD student
Completed BExSc / B Prev Health degree in 2010

Sarah has worked at a local WAFL football club as a trainer since 2008.

After 5 seasons at the club and working full time in the sport and recreation industry, she commenced a Masters by Research in 2014 and converted to a PhD in 2015.

The project combines her love of AFL football and will explore the relationship between risk taking predisposition, injuries in particular concussion and negative emotional states in football players. With concussion currently being a hot topic in the media, it is hoped that my research may provide a greater understanding in this area. The purpose is not to change the way the game is played, but to identify at risk players and enable the clubs, players and community to be educated in the potential short term and long-term consequences of this prominent issue.
Staff Research Publications 2014


Farringdon, F., Johns, D., McIntyre, F & Hands, B., (2014). We just want it to stop: adolescents with DCD’s experiences’ with bullying, Qualitative Health Research (submitted)


Summer Vacation Research Projects

The major Research Institutes in Perth offer a number of Summer Vacation Research Scholarships (SVRS) and they are a great way to prepare students for an Honours program in the Biomedical Sciences.

We have had students undertake SVRS’s with Harry Perkins Institute of Medical Research and the Institute of Respiratory Health (formerly known as the Lung Institute of WA).

The Cancer Council offers a limited number of scholarships. These awards are highly competitive and are given to students
(i) with a strong academic background,
(ii) who are in their final year of study
(iii) who are looking at undertaking an Honours project in the following year.

2 students awarded Scholarships in recent years were:
Claire McLaughlin B Biomed Sc 2012/13
Sarah Howarth BExSc/BBiomed 2013/14

The SVRS’s normally run for 6-10 weeks over the summer period.

Students who are interested in applying for a summer vacation project in 2015/2016 should speak to Gerard Hoyne or Ryan Anderton.

Growth in Postgraduate Student numbers in Health Sciences

Masters of Philosophy
There has been a steady increase in the number of students studying the M. Phil degree. The advantage of the degree is that it is an 18-month course that can articulate into a PhD degree.

We have had 3 students in the Biomedical Sciences and there are 2 students from Exercise Science

Doctor of Philosophy
2015 will see the largest number of PhD students in the SOHS.

Currently we have 8 students enrolled in the PhD degree but there is a potential for a further increase numbers as their has been interest from a number of recent Honours graduates who have applied for a postgraduate research scholarship.

The Doctor of Philosophy is the highest academic award at the university. It requires students to undertake a major research project that will normally take 3 – 4 years to complete. Students must have a minimum of an Honours degree before undertaking a PhD, or alternatively students who have completed a Master’s degree can apply to undertake a PhD.

The SOHS has a close collaboration with the Institute of Health Research and there are a number of PhD students who are enrolled through the SOHS.
School of Health Science Research Seminars

The School of Health Sciences holds a seminar series each semester that examines contemporary topics in Health Science research encompassing Exercise and Sports Science, Biomedical Science and Preventive Health.

Speakers include Health Science staff members and external speakers from other Universities, Research Institutes and Government and Non-Government Organizations around Perth.

This is a great way to learn about the latest developments in scientific research across the Health Science disciplines.

Time: Friday 4-5pm (during semester)
Venue: ND46-302 School of Health Sciences Seminar series

Highlights of Seminar topics from 2014 included:

Dr Kym Guelfi, UWA
“Exercise and Appetite: The key to tipping the scales in your favour”

Dr P Chivers, A/Prof F Farringdon
“Mixed Messages: Is young people’s food intake being affected by confusion over healthy weight and healthy eating messages?”

Dr Chris Joyce
“Changes in golf swing mechanics and shot outcome through driver modification”

Mr Carl Woods, ECU
“Talent Identification in U18 Australian Football”

Growth in Postgraduate Student numbers in Health Sciences (contd)

In the Biomedical Science field we have had a number of students working at Research Institutes across Perth.

They have included:
- The Harry Perkins Institute of Medical Research,
- The Lung Institute of Western Australia,
- Western Australia Neuroscience Institute,
- The Centre of Excellence for Alzheimer’s Disease Research and Care School of Medical Sciences, Edith Cowan University,
- The Human Lactation Research Group UWA,
- Metabolomics Australia Murdoch University.

Graduate Diploma of Clinical Exercise Physiology

The postgraduate degree allows students from an ESSA accredited Exercise Sports Science course from anywhere in the country to come and study at The University of Notre Dame Australia to complete the Grad Dip Award. Since its inception the Grad Dip has attracted 4 international students (3 from Brazil) and has also attracted 3 applicants from Universities on the east coast of Australia.

The Grad Dip Course has also been attractive for university graduates from the University of Western Australia, Edith Cowan University, Murdoch University and Curtin University. Each of these tertiary institutions offer Exercise and Sports Science courses but according to Tanya Blee the Course Coordinator it is the structure of the Notre Dame Australia Grad Dip program that appeals to many students.