

# SPORT

SPORTS  
MEDICINE  
AUSTRALIA

# HEALTH

VOLUME 34 ISSUE 2 2016

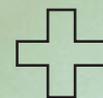
## WOMEN'S HEALTH ISSUE

Exercise in pregnancy  
and the postpartum  
period

Active mums and active children

Exercise, breasts and bra fit

Exercise and the menstrual cycle:  
the research



- Interview with Olympian Jessica Trengove
- Managing fractures in sport
- Sport and exercise medicine in France
- Activity levels of regionally based Australian pregnant women



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## FROM THE CHAIRMAN

# SPORT AND THE GENDER DIVIDE



Andrew Jowett  
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SMA CHAIRMAN, DR ANDREW JOWETT ADVOCATES FOR GENDER BALANCE ACROSS ALL FACETS OF SPORT AND SPORTS MEDICINE.

**A**s this issue of *Sport Health* shines a light on women's health and women in sport, it provides an opportunity to acknowledge the work of women in sports medicine, to support growing representation and to recognise some of the challenges faced by women in the field.

Women have been widely represented in Australian sports medicine for many years. Indeed, at Rio in the Australian team headquarters multidisciplinary medical unit, 11 of the 28 staff are female.

In examining the gender divide amongst Fellows of the Australasian College of Sport and Exercise Physicians however, the current representation of 29 females amongst 139 (21 per cent) is short of the female representation amongst medical graduates of 41 per cent. There are signs of change towards parity, with female registrars representing 37 per cent of all trainees, and the intake in 2016 reaching near 50:50. We clearly need to be mindful of promoting opportunity and retention of women especially in the medical fields of professional sport.

Women lead a number of academic institutions around Australia particularly in sports medicine research. They are highly regarded both nationally and internationally, often heading majority female academic and professional workforces. Leadership in other areas of sports medicine however is not consistently gender-balanced including some of our member associations and even the SMA Board itself. The current Board is committed to addressing this disparity across all its activities. The upcoming AGM and election provides a perfect opportunity through both elected and nominated positions to redress the balance.

Despite large numbers of women in the medical workforce, 2015 was notable in highlighting the problems of gender inequality in medicine with reports of bullying and sexual harassment, particularly in surgical training. Whilst newsworthy on a local level amongst our surgical colleagues, sports medicine wasn't immune with the very public harassment, condemnation and eventual dismissal of Dr Eva Carneiro, Chelsea FC Head Doctor by Jose Mourinho, then Chelsea Manager, for doing her job and attending to an injured player as instructed by the referee (August 2015). In Australia, the review by the Royal Australasian College of Surgeons and the development of policies and program implementation to address bullying and harassment should stand as an example to all leaders in the medical workforce. We should all be examining our behavior, not denying the existence of the problem, incorporating tools such as that developed by the Australian Medical Association Victoria and others into our professional development programs.

Professional and televised sport is still heavily biased towards male participants. The locker-room is still a very male bastion. Women in sports medicine not only have to deal with gender bias in their specialty training, they have to deal with it in professional and sporting environments. Many of the pioneer females in male professional sport I know report positive experiences and acceptance, but must have faced difficulties along the way.

I hope this issue of *Sport Health* provides a platform for the celebration of the contribution and representation of women in sports medicine, inspiring and supporting greater representation amongst our leadership.



*Despite large numbers of women in the medical workforce, 2015 was notable in highlighting the problems of gender inequality in medicine with reports of bullying and sexual harassment, particularly in surgical training.*

# WOMEN IN SPORT

FROM THE  
CEO

SMA CEO, ANTHONY MERRILEES SUGGESTS MORE NEEDS TO BE DONE TO REPRESENT WOMEN IN SPORT AND PHYSICAL ACTIVITY.

The 2016 Rio Olympic Games underline what an exciting time it is in women's sport all over the world. The Games are an important focal point for women's sport, largely because they provide a relatively level playing field in terms of the coverage provided of female athletes during the course of the Games.

This of course is not the norm in Australia where coverage of male sports and sporting news will occupy anywhere between 85 to 90 per cent of all sports media coverage. This is despite the fact that participation by women in sport and physical activity is increasing.

While there have been several high profile growth sports for women such as football, netball, rugby (and even AFL establishing its own women's league), it is interesting to note that participation by women is dramatically higher in the area of non-organised sport and physical activity such as walking, jogging or going to the gym. This would seem to suggest that many traditional barriers to participation in organised sport by women still exist, such as socio-economic and cultural factors, and thus more needs to be done to encourage increased participation in organised sport.

From the perspective of sports medicine, the increasing level of professionalism in women's sports is also serving to drive increased intensity of competition via access to improved strength and conditioning training for women athletes. The by-product of this will be the need for an increased emphasis on injury prevention and injury management for women athletes.

With sports medicine continuing to grow globally (the industry is expected to grow to \$53.6 billion by 2020), the lack of trained professionals may constitute a barrier to growth in our industry. From an organisational point of view, we therefore need to do more to increase the pool of women involved in providing medical support activities in sport and physical activity to ensure we have as level a playing field as possible.

Check out Sports Medicine Australia's Women in Sport injury prevention and management fact sheet series spanning nutrition, bone health, pregnancy, exercise for young women, exercise for women over 50 and breast support here.



**Anthony Merrilees**

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*We need to do more to increase the pool of women involved in providing medical support activities in sport and physical activity to ensure we have as level a playing field as possible.*

# 5 MINUTES WITH... DR ANITA GREEN

5 MINUTES WITH... DR ANITA GREEN, SPORTS DOCTOR AND SENIOR LECTURER, THE UNIVERSITY OF QUEENSLAND, SMA CONFERENCE COMMITTEE MEMBER, CHIEF MEDICAL OFFICER COMMONWEALTH GAMES 2018.



## ***What is your profession? How many years have you been working in this area?***

I am a Sports Doctor and have worked in medicine for over 30 years, with a 20-year interest in sports medicine.

## ***What is a typical day like for you?***

Every day is different. My roles consist of clinical work consulting in primary care, working in a tertiary hospital at the Heart Lung Institute, sports coverage (some weekends), board work with the local Brisbane North Primary Health Network looking at the broader health system and policy to generate change for better patient care and outcomes, and with Cancer Council Queensland on advocacy and support for research. I like to keep busy and do a variety of things; it makes life interesting when you get to use different parts of your brain and different skillsets.

## ***What has been the highlight of your career to date?***

To be appointed Chief Medical Officer for the 2018 Commonwealth Games. It is an enormous privilege to be offered the role and will be a great challenge. It not only allows you to bring together your general medicine and sports medicine skills but also your connections, networks and health systems skills. I was in disbelief when I was selected for this role however attribute it to my voluntary work in sports medicine, i.e. SMA and other Board work, the roles outside of my GP stuff. It's always important to take on different roles outside of your comfort zone as you never know where they might lead.

## ***When, why and how did you become involved with Sports Medicine Australia?***

I have always had an interest in sport and wanted to become 'better' at sports medicine. Early in my career, I worked in an emergency department and realised I and my colleagues were not well prepared for some of the commonest presentations to our department. We received almost no training in sports or musculoskeletal medicine in our undergraduate course, nor in those first few years as a doctor. I wanted to seek out further guidance so I completed the SMA six-month course for doctors in Brisbane in the early 90s. From there, I got to know a few people, joined the SMA QLD Board, and took on the responsibilities of teaching the SMA Sports Trainer courses and organising the coverage for the SMA QLD Branch.

## ***When, why and how did you become involved with SMA Conferences?***

In 2002, while President of Sports Medicine Australia, I took on the role of Conference Chair (when the incumbent could not continue in the role). From my years on the SMA Board I knew it was vital to ensure we run a high quality scientific

conference for our members. I enlisted the help of Professor Wendy Brown, a highly credentialed and well known academic to assist me as Co-Chair. Her skills and academic experience complemented mine. Over the years I have worked with Wendy as Co-Chair and then invited Professor Jill Cook to join us to take over as Chair and then Kay Copeland. In fact, I have just realised that women have been steering the SMA Conference for the last 14 years.

### What are you most looking forward to at this year's conference?

I am looking forward to connecting with colleagues who live around the country, people you may only see once a year, but it is like being back with family. I am also excited about holding the conference at the MCG as it is such an iconic venue. As always it is the multidisciplinary nature of our conference that excites me. I am particularly looking forward to meeting and hearing our Refshauge Lecturer Professor Peter O'Sullivan speaking about his research into the mechanisms of pain and treatment approaches to disabling chronic back pain.

### Tell us a little bit about your involvement with women in sport practice.

Being one of the few female sports doctors in Brisbane, I guess you tend to see more female athletes. I was also heavily involved with injury

prevention and treatment of the elite dance performance students at the Queensland University of Technology and the Queensland Dance School of Excellence, who were mostly female. I was also invited to contribute to the Exercise in Pregnancy Symposium with the Australian Sports Commission which was triggered by the Australian Netball Board banning an athlete who was pregnant.

### Describe your role with the Commonwealth Games in 2018.

The role of Chief Medical Officer requires me to be in charge of the medical program and the anti-doping program.

Under the medical program I need to ensure:

- Provision of medical services for elite athletes and team officials.
- Provision of health services for employees, general volunteers and spectators.
- In partnership with Queensland Health, that health services in the region can manage the increased amount of visitors to the Gold Coast, and Queensland in general.
- The polyclinic and all of the medical facilities at each of the competition and training venues run smoothly.
- Highly skilled sports medicine professionals are recruited to work the entire Games period.
- Health services, like hospital and ambulance, link seamlessly to provide appropriate levels of care.
- In partnership with Public Health, that food and water quality and

environmental safety standards are met for athletes in the village, triathletes in the water and spectators to the games.

Under the anti-doping program, working with ASADA, WADA and other National anti-doping agencies, we aim to deter and detect doping, to allow clean athletes to compete on a level playing field. Sadly, this issue is currently overshadowing sport at the Rio Games.

### What's the best piece of advice anyone has ever given you?

"You should see your medical degree as a passport to working and travelling where you want to go and taking as many opportunities as you can". I feel you only regret the things you haven't done rather than the things you have done.

### Outside of work, what else are you passionate about?

I love the arts – ballet, opera and theatre; and travel.

### Name four people, living or not, you would invite for a dinner party and why?

Charles Darwin – I have visited his home – 'Down House' in Kent – and you feel he has just stepped out for one of his daily walks. All those specimens from 'The Beagle' are still there. I want to ask how the most extraordinary natural history theory evolved in his mind.

William Shakespeare – of course – to hear some of that exceptional prose emerge from his lips.

Gustav Mahler – to ask how you imagine such sublime music. And, to ask him to play something after dinner.

Dr Who – well he's been everywhere in time and space – so you could ask him about any period in history.

## FAVOURITES

**Travel destination:** I have two. Turkey – exotic – beautiful landscapes and exceptional Roman, Byzantine and Ottoman historic sites. And, the food is fantastic. Iceland – a land of fire and ice. It's a bit like visiting Middle Earth.

**Sport to play/watch:** Swimming and surfing to participate. Swimming, athletics, soccer, rugby league, AFL to watch.

**Cuisine:** Thai.

**Movie:** *Women on the verge of a nervous breakdown* (Pedro Almodovar).

**Song:** Going to be a real opera nerd here – The Quartet from *Rigoletto* (Verdi) – why would you settle for a band when you can have four superb soloists and a full orchestra?

**Book:** *The Book Thief* by Markus Zusak and *To Kill a Mockingbird* by Harper Lee.

**Gadget:** Dr Who Sonic Screwdriver Universal Remote Control.

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# WOMEN & SPORT...

HOW FAR WE  
HAVE COME

SPORTS DOCTOR,  
DR ANITA GREEN  
HIGHLIGHTS THE  
ARDUOUS JOURNEY  
WOMEN HAVE HAD  
IN SPORT OVER THE  
LAST CENTURY.

# WOMEN & SPORT...

## HOW FAR WE HAVE COME

Ten days ago I had the privilege of watching the Trans-Tasman netball final between the Queensland Firebirds and the New South Wales Swifts. A capacity crowd of over 10,000 fans was treated to another edge-of-your-seat contest, won in double extra time by the Firebirds. I was struck by the passionate support tempered by respect for the quality of the opposing teams' play. Equally, both captains' speeches revealed why they are such icons and role models for girls and young women; intelligent, humble, grateful to all those families, coaches and supporters integral to their journey to the pinnacle of their sport, and genuinely respectful of the quality of their opposition and the closeness of the contest. Excitement too, for the new Australian Netball League with greater broadcast exposure and revenue for women's sport.

At the Athens Olympics in 1896, there were no female competitors. Pierre de Coubertin, the 'Father' of the Olympics of the 'modern' era had a more 'ancient' view of women's participation in sport. He considered the inclusion of women to be "impractical, uninteresting, unaesthetic and incorrect". Women were allowed to compete in 1900. There were two official women's sports: lawn tennis and golf. Women also competed and won medals in sailing, croquet and equestrian. There were 22 women competitors out of a total of 997 athletes. In Stockholm in 1912 swimming was open to women for the first time – Australia's 'Fanny' Durack and 'Mina' Wylie took gold and silver in the only race on offer, the 100m freestyle. A century later, at London 2012, with the addition of boxing, women were finally eligible to compete in all Olympic sports.

From Sydney 2000 onwards, women have made up 45 per cent of the Australian Olympic Team. Finally, in Rio 2016, women represent 50 per cent of our team. And, the Australian Women's team have just won the inaugural Rugby Sevens gold medal.

Just as there have been barriers to women's participation in sport at all levels, there have been significant barriers to inclusion of women in clinical and physiological studies. Lack of knowledge about the effects of hormones and cycles have created scientific and economic barriers to recruiting women for research. Results from clinical and performance studies in men have been assumed to be able to be extrapolated to women. Concern about potential risks to women of childbearing age has resulted in a gender imbalance in scientific study. Overly protective policies regarding research may exclude the very groups of people most at risk of injury or illness, who would be the beneficiaries of that research.

Pregnancy and exercise is one of those areas where lack of research and fear of litigation has conspired to limit the advice we can provide to women. In 2001, an elite Australian netball player who was in the early stages of pregnancy was banned from competing by Netball Australia. She took the Board to the Australian Human Rights and Equal Opportunity Commission (HREOC). Sports Medicine Australia was invited to participate and provide expert scientific advice to the Australian Sports Commission. SMA was able to draw on our highly credentialed, multidisciplinary members to review the current literature in clinical sports medicine, physiology, exercise science, sports and injury epidemiology, and physical activity. This valuable synthesis of the evidence was then captured in a 2002 Special *Pregnancy and Sport*

edition of our *Journal of Science and Medicine in Sport*. Additional publications and seminars provided advice to Parliament, our National Sporting Organisations and the HREOC.

Two of SMA's esteemed members, Professors Wendy Brown and Karim Khan, have been involved in the IOC Expert Group reviewing the literature on exercise and physical activity in pregnancy. These findings *Exercise and Pregnancy in Recreational and Elite Athletes: 2016 Evidence from the IOC Expert Group Meeting* were published recently in the *British Journal of Sports Medicine*.

In this edition of *Sport Health* we publish SMA's new position statement: *Exercise in pregnancy and the post-partum period*. This document emphasises the vital message of the importance of sufficient physical activity throughout a woman's life, including the many benefits specific to pregnancy. We know that the birth of a child is one of several key times in a woman's life when she may cease exercising and never restart, so continuing exercise in the postpartum period is equally important. This document provides evidence based advice for sports clinicians and all of our members who prescribe exercise.

I hope you enjoy this issue of *Sport Health*, taking a look at how far women in sport have come over the years, and celebrating and highlighting the importance of women in sport.

### ABOUT THE AUTHOR

Dr **Anita Green** is a Senior Lecturer at The University of Queensland and a SMA Conference Committee Member.



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# EXERCISE IN THE POSTPARTUM NEW POSITION STATEMENT

SPORTS MEDICINE AUSTRALIA HAVE JUST RELEASED THEIR *EXERCISE IN PREGNANCY AND THE POSTPARTUM PERIOD POSITION STATEMENT*. LEAD RESEARCHERS, MELANIE HAYMAN FROM CQUNIVERSITY AND PROFESSOR WENDY BROWN FROM THE UNIVERSITY OF QUEENSLAND, DISCUSS THE EVIDENCE-BASED PROCESS AND SHARE THE NEW GUIDELINES.

# IN PREGNANCY AND PARTUM PERIOD: POSITION STATEMENT

Historically, pregnancy was believed to be a time for rest. Women were encouraged to 'take it easy' and refrain from participating in exercise for fear it may cause harm to the mother and/or her unborn child.<sup>1</sup> However, an increasing body of epidemiological and empirical evidence has recently challenged this view.<sup>2</sup> It is now widely acknowledged that appropriate exercise undertaken during pregnancy promotes many benefits including a reduced risk of pregnancy-related conditions such as pre-eclampsia and pregnancy-induced hypertension, and reduced incidence of delivery complications such as caesarean delivery.<sup>3-7</sup> In addition, regular physical activity during pregnancy also helps to reduce back and pelvic pain,<sup>8-10</sup> fatigue, stress, anxiety and depression.<sup>3, 8, 11</sup> Moreover, regular physical activity during pregnancy leads to greater control over gestational weight gain during pregnancy

and also postpartum,<sup>3, 7, 10, 12</sup> and assists in the prevention and management of urinary incontinence.<sup>13-14</sup>

Despite these benefits, few women are sufficiently active during their pregnancy to obtain the associated health benefits.<sup>15-16</sup> In fact, recent research suggests that fewer than 30 per cent of Australian pregnant women are sufficiently active in accordance with exercise during pregnancy guidelines.<sup>15-17</sup> Research also suggests that women significantly reduce the frequency, intensity and duration of exercise as their pregnancy progresses, or cease exercise altogether once they become pregnant.<sup>15-16</sup>

In an attempt to help educate pregnant women and healthcare providers, Sports Medicine Australia (SMA) released the first Australian position statement '*Exercise during Pregnancy*' in 2002.<sup>18</sup>

Since the release of this statement several other peak industry bodies have recently released guidelines for physical activity and/or exercise during pregnancy, targeting general practitioners, exercise and fitness professionals, and pregnant women. However, these guidelines present inconsistent recommendations to one another, and lack evidence-based research to guide and support their recommendations.<sup>19</sup> Therefore, a working group of academics (n=3) and health professionals (n=2) was established in 2014 to review the current exercise during pregnancy and postpartum literature. The findings were used to guide the development of a new evidence-based SMA Position Statement on *Exercise in pregnancy and the postpartum period*.<sup>20</sup>

# EXERCISE IN PREGNANCY AND

## PURPOSE OF THIS STATEMENT

The primary purpose of this document is to provide an evidence-based, best practice summary to assist Sports Medicine Australia (SMA) members [including: health professionals (e.g. general practitioners, sports doctors, sports physicians, physiotherapists, chiropractors, exercise physiologists, occupational therapists, podiatrists, sports scientists, psychologists, nurses, etc.); fitness professionals (e.g. fitness instructors, personal trainers, aqua instructors etc.)], others who are involved in sport (e.g. coaches, officials, administrators, journalists), and players and athletes themselves, to understand the benefits and risks of participation in physical activity/exercise in pregnancy and the postpartum period.

This position statement is based on:

- A review of the evidence from twelve systematic reviews and meta-analyses published since 2010.<sup>1-12</sup>
- A review of the findings of nine additional more recent narrative reviews of the evidence on exercise and pregnancy outcomes and recommendations, published since 2010.<sup>13-21</sup>
- A review of the information included in 11 statements on exercise and pregnancy from 9 countries, as summarised in two peer-reviewed summary papers.<sup>22-23</sup>
- Information included in six 'guidelines' or 'fact sheets' on exercise during pregnancy.<sup>24-29</sup>
- Information from the scientific reports on the Australian and US physical activity guidelines, and a WHO factsheet on obesity and overweight.<sup>30-32</sup>

*Note: A number of high quality reviews of evidence were excluded from this review as they examined physical activity/exercise and diet, not physical activity/exercise as an independent variable.<sup>33-35</sup>*

## DEFINITIONS

The term 'physical activity' is used in this document to describe participation in activities such as walking, cycling, swimming and jogging which are typically undertaken for leisure or transport. The term 'exercise' is used to describe more structured forms of activity, including sports and recreational activities, where the focus is usually on performance or competition. In cases where there is no distinction in terms of the evidence review, the term 'physical activity/exercise' is used.

## PERSPECTIVE

Reflecting a perception that exercise might be harmful to the mother and/or her unborn child, pregnancy was once considered a time for rest, when women were advised to take it easy and refrain from participating in physical activity/exercise. Despite the difficulties of conducting carefully controlled randomised trials, this view is now challenged by a growing body of systematic review level evidence.

## FOCUS OF THIS STATEMENT

This statement focuses on safe physical activity/exercise for healthy women who are free of the medical and obstetric contraindications outlined in Section 6.

### 1. Summary

- It is important that all pregnant women (inactive, active, sportswomen and athletes) consult with their health care providers (which could include a GP, obstetrician, midwife

# AND THE POSTPARTUM PERIOD

or physiotherapist) about physical activity/exercise during and after pregnancy.

- Evidence from twelve systematic reviews suggests that, for healthy women, physical activity/exercise during pregnancy is safe and is associated with numerous benefits to the mother and unborn child/foetus (Section 6).
- International guidelines on exercise during pregnancy concur that there are contraindications, signs and symptoms, which indicate that physical activity/exercise is not

recommended. SMA suggests that exercise professionals and health care providers should be familiar with these (Section 7).

- International guidelines also concur with the view that walking, jogging, cycling and swimming (at moderate intensity), muscle strengthening exercises (including pelvic floor exercises), water based exercise, and pregnancy-specific exercise classes are safe for pregnant women. These guidelines also list activities/situations which should be avoided (Section 8).
- Evidence from systematic reviews also supports the view that returning to physical activity/exercise in the postpartum period has benefits in terms of the mothers' physical and mental health and wellbeing (Section 10).

## 2. Exercise during pregnancy for previously inactive women

Pregnant women who were **inactive prior to pregnancy** should be encouraged to be active during pregnancy<sup>11, 14, 17-18, 29</sup>, commencing with low intensity activities such as walking or swimming, and progressing to the lower end of the range recommended in the Australian, Canadian and US national guidelines (i.e. 150 minutes per week or 30 minutes per day of moderate intensity activity on most days).<sup>26, 29-32</sup> Activity can initially be accumulated in short (say 15 minute) bouts, building towards bouts of longer duration.<sup>11, 26, 29-31</sup>

Pregnant women who were inactive prior to conception are advised to consult a health care provider before commencing physical activity/exercise.

## 3. Exercise during pregnancy for previously active women

For healthy pregnant women who participated in physical activity/exercise **prior to pregnancy**, and are experiencing an uncomplicated pregnancy, physical activity/exercise can be continued throughout pregnancy, or until such time that it becomes uncomfortable to do so.<sup>11, 14, 17-18, 21, 29</sup>

A typical 'prescription' for a moderate to vigorous intensity physical activity/exercise program<sup>23, 29</sup> that can be continued during healthy pregnancies (free of medical and/or obstetric complications) is shown below:

### **Aerobic activities:**

**Frequency:** Daily.

**Intensity:** Intensity (12-14 on *Borg* rate of perceived exertion scale (RPE) – perceived as somewhat hard, can talk but not sing).

**Time:** Accumulate 150-300 minutes (30-60 minutes on most, if not all, days each week. Longer duration (closer to 300 minutes, instead of 150 minutes/week) is associated with more benefits i.e. reduced risk of excess weight gain and gestational diabetes.

**Type:** Brisk walking/running/jogging, cycling (stationary bike), swimming, aerobics etc.

As a general rule of thumb, count each minute of vigorous intensity exercise as two minutes of moderate intensity exercise (i.e. 75 minutes of vigorous intensity exercise equates with 150 minutes of moderate-intensity exercise).<sup>30-31</sup>

### **Muscle strengthening exercise:**

**Frequency:** 2 sessions per week.

**Intensity:** Sub-maximal intensity using own body weight, light weights and/or resistance bands (exhale on effort).

**Type:** Work all large muscle groups (refer to PARmed-X for Pregnancy<sup>25</sup> for specific exercises).

**Programming:** 1 set of 12-15 repetitions of up to 8-10 exercises.<sup>17, 20, 28, 30-31</sup>

## 4. Exercise during pregnancy for the elite pregnant athlete

Exercise during pregnancy does not increase the risk of adverse pregnancy or birth outcomes, not even for elite



# EXERCISE IN PREGNANCY AND THE POSTPARTUM PERIOD

athletes.<sup>16-18</sup> However, pregnant women who were **very active or elite athletes/sportswomen** should have their physical activity/exercise regime overseen and managed by an expert health care provider to ensure the safety and wellbeing of the mother and her unborn child.<sup>17, 26, 29</sup> This is particularly important in cases where the foetus is small for gestational age. The PARmed-X for Pregnancy<sup>25</sup> can be used to assist health care providers in the exercise prescription process.

## 5. Exercise modifications during pregnancy

Most exercises/activities during pregnancy present minimal risk to the mother or the child. However, some modifications to exercise techniques and/or programs may be required to accommodate the anatomical and physiological changes which occur as pregnancy progresses.<sup>29</sup> In addition to their regular aerobic activity and muscle strengthening exercises, all pregnant women are advised to do pelvic floor exercises.<sup>10, 12, 26</sup>

### Pelvic floor exercises:

Pelvic floor exercises help to strengthen and improve the tone of the pelvic floor muscles, which provide perineal support for the pelvic structures, the urethra, vagina and rectum. There is strong evidence to suggest that women who do intensive, supervised pelvic floor exercises during pregnancy may reduce the risk of urinary incontinence (leakage) postpartum.<sup>10, 12, 26</sup> These exercises involve repetitive contraction of the pelvic floor muscles to build strength and muscle tone. The movement is a voluntary inward and upward contraction of the pelvic floor. Specific advice should be sought from a physiotherapist, nurse continence adviser, or midwife with qualifications and expertise in pelvic floor muscle training. A typical 'prescription' for a pelvic floor exercise program<sup>10, 12, 25</sup> is shown below:

**Frequency:** At least 8-12 contractions 3 times per day, three to four times per week.

**Intensity:** Women should be encouraged to 'contract maximally' with an inward and upward squeezing movement.

**Time:** Vary the duration of the 'squeeze' from 4 to 30 second holds; with a mixture of slow and controlled, and fast and controlled contractions.

**Type:** Try sitting with weight forward (hands on knees), and also sitting upright, as this will help to recruit all muscles, anterior (front) and posterior (back), involved in the squeeze movement. These exercises can be done in a sitting, kneeling, standing, lying down or standing with legs astride position.

## 6. Benefits of physical activity/exercise during pregnancy

There is strong evidence, from fifteen systematic reviews/meta-analyses, nine review papers, and a narrative review of national exercise during pregnancy guidelines, to suggest that the **benefits** of physical activity/exercise for pregnant women include:

- Improved muscular strength and endurance.<sup>11, 17, 29</sup>
- Improved cardiovascular function and physical fitness.<sup>1, 17, 21, 29</sup>
- Decreased risk of pregnancy related complications such as pregnancy-induced hypertension and pre-eclampsia.<sup>5, 9, 18, 29</sup>
- Reduced back and pelvic pain.<sup>11, 16-17</sup>
- Reduced fatigue, stress, anxiety and depression.<sup>4, 11, 21, 29</sup>
- Decrease in excessive gestational weight gain and post-partum weight retention.<sup>13, 16, 18, 21, 29</sup>
- Fewer delivery complications in women who are active during pregnancy.<sup>15, 21, 29</sup>
- Prevention and management of urinary incontinence.<sup>10, 12</sup>

*Note: Evidence on the role of physical activity/exercise in the prevention of gestational diabetes is mixed. It is clear that women who gain more than the recommended amount of weight during pregnancy are at increased risk of developing gestational diabetes. Although many randomised controlled studies have shown that lifestyle intervention (involving both physical activity and diet) can reduce the risk of gestational diabetes,<sup>2, 6-8, 11</sup> systematic*



*reviews suggest that the effects of physical activity alone are currently unclear.<sup>34</sup> Women are advised therefore to follow both physical activity AND healthy eating guidelines to reduce the risk of gestational diabetes.*

## 7. Contraindications to physical activity/exercise during pregnancy<sup>23-24, 26-27, 29</sup>

Although no systematic level evidence exists, national physical activity guidelines from around the world agree that in the following situations the risks of physical activity/exercise are likely to outweigh the benefits. Pregnant women who experience any of the following are advised not to exercise, and to seek medical advice:

- Ruptured membranes.
- Signs of preterm labour.
- Hypertensive disorders of pregnancy.
- Incompetent cervix.
- Growth restricted foetus.
- High order multiple gestation (>triplets).
- Placenta praevia after 28<sup>th</sup> week.

For women who have a history of any of the following, we recommend



*Recent research suggests that fewer than 30 per cent of Australian pregnant women are sufficiently active in accordance with exercise during pregnancy guidelines. Research also suggests that women significantly reduce the frequency, intensity and duration of exercise as their pregnancy progresses, or cease exercise altogether once they become pregnant.*

professional collaboration between medical (e.g. obstetrician or midwife) and training (e.g. coaches/trainers) professionals to ensure that women exercise with caution or at a low level, provided they are asymptomatic at rest.

- Previous spontaneous abortion.
- Previous preterm birth.
- Mild/moderate cardiovascular or respiratory disorder.
- Anaemia (Hb <100 g/L).
- Malnutrition or eating disorder.
- Twin pregnancy after 28th week.
- Extreme overweight/obesity (BMI >30).<sup>32</sup>
- Intrauterine growth restriction in current pregnancy.
- Other significant medical conditions (e.g. poorly controlled type 1 diabetes, hypertension, hyperthyroidism etc).

Women who experience any of the following symptoms should seek advice from their ante-natal care provider before continuing with their physical activity/exercise program.

- Abdominal pain.
- Amniotic fluid leakage.
- Calf pain or swelling.
- Chest pain/tightness/palpitations.
- Decreased foetal movement.

- Dizziness or presyncope.
- Dyspnoea, before exertion.
- Excessive fatigue.
- Excessive shortness of breath.
- Muscle weakness.
- Pelvic pain.
- Preterm labour.
- Severe headaches.
- Uterine contractions (premature and/or painful).
- Vaginal bleeding.

#### **8. Activities that are/are not recommended**<sup>17, 23-24, 26-27, 29</sup>

Although no systematic level evidence exists, national guidelines concur that the following activities are considered to be **generally safe** for pregnant women with an uncomplicated pregnancy:

- Walking, jogging, cycling and swimming (at moderate-intensity).
- Muscle strengthening exercises, including pelvic floor exercises.
- Water-based exercise.
- Pregnancy specific exercise classes.

Activities which are characterised by the following are **considered unsafe** for pregnant women and should be avoided:

- Abdominal trauma or pressure (e.g. weight lifting).
- Contact or collision (e.g. soccer, ice hockey, martial arts etc).
- Hard projectile objects or striking implements (e.g. hockey, cricket, softball etc).
- Falling (e.g. judo, skiing, skating, horse riding etc).
- Extreme balance, coordination and agility (e.g. gymnastics, water skiing etc).
- Significant changes in pressure (e.g. scuba diving, sky diving etc).
- Heavy (greater than submaximal) lifting.
- High intensity training at altitudes greater than 2000m.
- Exercise in the supine position, or even motionless supine posture (e.g. in some yoga positions) may cause hypotension in some women; for safety, avoid supine exercise positions after 28 weeks' gestation; some exercises can be adapted to lying on the side.

*Specific activities listed above are examples only; participation in specific activities should be discussed with the health care provider and should be reviewed as pregnancy progresses.*

# EXERCISE IN PREGNANCY AND THE POSTPARTUM PERIOD

## 9. Additional recommendations

23-24, 26-27

As for all exercise programmes, there is consensus (but not always scientific evidence) that each session should incorporate applicable warm up and cool down activities, clothing should be non-restrictive and made of 'breathable' fabric, shoes should be appropriate for the activity and a supportive bra should be worn. Avoiding large increases in body temperature during exercise is important. The following should be considered when planning exercise during pregnancy:

- Avoid hot and/or humid exercise environments and take care to remain well hydrated.
- Stretching should be controlled and not 'over-extended' as joints and ligaments are already loose due to the release of the hormone *relaxin* in preparation for birth.
- Avoid wide squats, lunges or any unilateral leg exercises that place excessive shearing forces on the pubic symphysis.

## 10. Resuming physical activity/exercise after pregnancy<sup>11, 22, 24, 26, 29</sup>

The postpartum period is defined as the time immediately after birth. There is no clearly defined end to the post-partum period, but it is usually considered to be 6 to 26 weeks following the birth. Many of the physical and physiological changes that occur during pregnancy will persist for four to six weeks after delivery. SMA

recommends that women seek guidance from their health care provider before they begin or recommence their physical activity/exercise regime, but in general all healthy women should aim (through gradual progression) to accumulate 150-300 minutes of moderate-vigorous intensity aerobic exercise per week. Return to high impact activities or those that cause high gravitational load on the pelvic floor should occur gradually, and in consideration of recovery to any damage to the pelvic floor and abdominal muscles, which will vary according to the mode of delivery.

There is systematic review level evidence to show that benefits of physical activity/exercise to the mother **after** pregnancy include:

- Improvements in emotional well-being.<sup>3-4, 13, 19</sup>
- Reduced anxiety and depression.<sup>3-4, 19</sup>
- Improved physical conditioning.<sup>13, 29</sup>
- Reduced postpartum weight gain and faster return to pre-pregnancy weight.<sup>13, 21, 35</sup>

## Postpartum physical activity/exercise and effects on breastfeeding

Moderate to vigorous intensity physical activity/exercise and sports will not negatively affect breast milk volume, as long as there is appropriate food and fluid intake.<sup>24, 26, 29</sup> This type of exercise or physical activity has also been shown not to affect the composition of breast milk or infant growth. However, if babies

appear to be unsettled after feeding immediately after maternal exercise, mothers could feed their baby before exercise, postpone feeding to one hour after physical activity/exercise, or express milk before exercising, so that it may be used after the activity.<sup>24, 26</sup> The caloric cost of breast feeding is estimated to be about 600 kcal/day.

Sports Medicine Australia would like to acknowledge the following for their valuable contributions to this position statement.

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**Professor Wendy Brown** BSc, GradDip (Phys Ed), MSc, PhD, Professor, School of Human Movement and Nutrition Sciences, Faculty of Health and Behavioural Sciences, University of Queensland

**Dr Katia Ferrar** BAppSc (Physio), BHlthSc (Hons), PhD, Lecturer, Alliance for Research in Exercise, Nutrition and Activity, School of Health Sciences, University of South Australia

**Rosemary Marchese** BAppSc (Physio), Certificate IV in Training and Assessment, Physiotherapist, Fitness and Health Vocational Educational Consultant, Right Way Fitness Industry Advisor for Service Skills Australia

**Jon Tan** BSc (Chiro), BChiro, ICCSP, Cert III/IV Fitness, Chiropractor, Personal Trainer, National Chairman – Sports Chiropractic Australia

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# SMA MEMBER NEWS



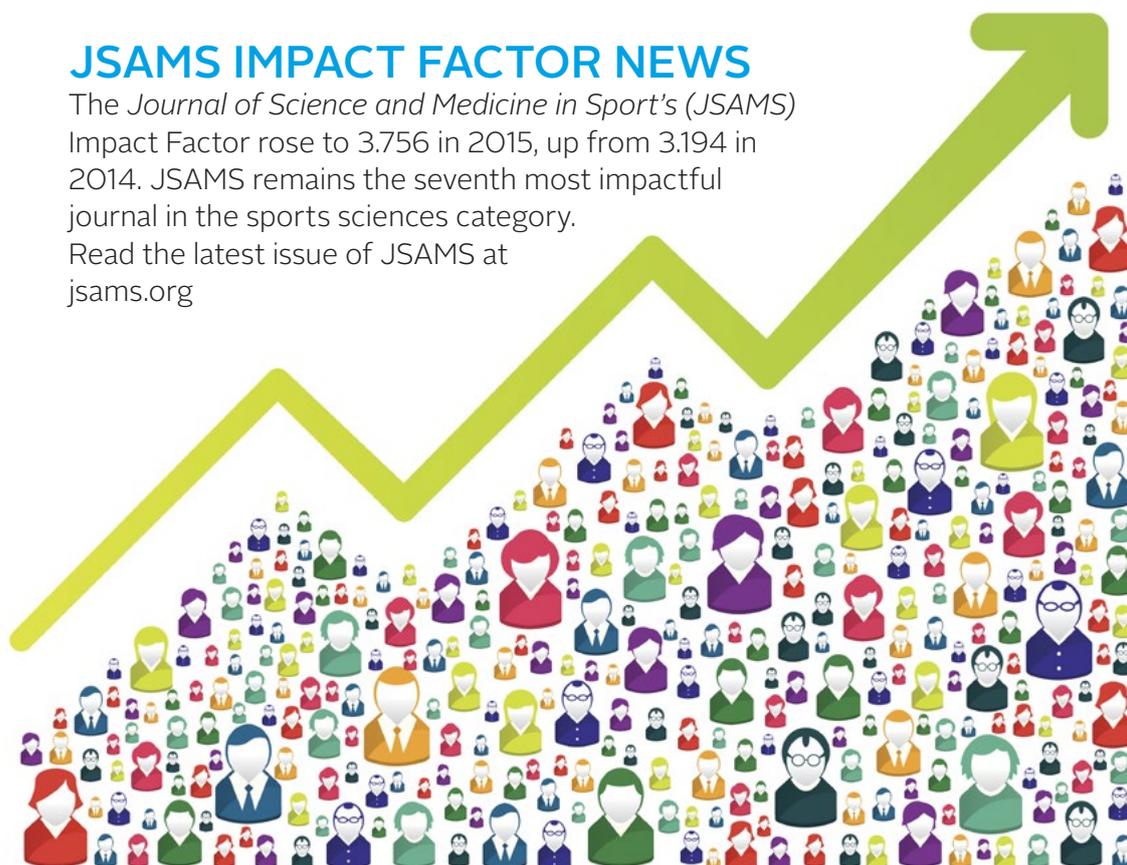
## 2016 SMA CONFERENCE

October 12-15 – MCG, Melbourne

With just over a month to go, stay up-to-date on the latest information on speakers, social events, sessions and trade via the @smaconf16 Instagram account (hashtag #SMAConf16 #illbethere), @SMA\_Events Twitter account, and the conference app (search '2016 SMA Conference' via the App Store). Or visit the conference website.

### JSAMS IMPACT FACTOR NEWS

The *Journal of Science and Medicine in Sport's* (JSAMS) Impact Factor rose to 3.756 in 2015, up from 3.194 in 2014. JSAMS remains the seventh most impactful journal in the sports sciences category. Read the latest issue of JSAMS at [jsams.org](http://jsams.org)



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## POSITION STATEMENTS

Have you checked out Sports Medicine Australia's latest position statements?

- Concussion
- Exercise in Pregnancy and the Postpartum period



## SMA SOCIAL MEDIA

In streamlining Sports Medicine Australia's social media, all state Facebook and Twitter accounts have been replaced by **@SMA\_Courses** on Twitter and the **Sports Medicine Australia Courses** page on Facebook. These accounts will feature sport safety course information nationwide.

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# ARE REGIONAL AUSTRALIAN PH WOMEN ACT



THE FOLLOWING IS A REPUBLISHED EDITORIAL WHICH FEATURES IN **THE JOURNAL OF SCIENCE AND MEDICINE IN SPORT** (VOLUME 19, ISSUE 8, AUGUST 2016) WRITTEN BY EDITOR-IN-CHIEF, GORDON S. WADDINGTON, PHD.

**W**elcome to the August 2016 issue. In the physical activity section, Hayman, Short and Reaburn's report on physical activity levels of regionally based pregnant women suggests that activity levels fall well short of guidelines and reflects a need to re-visit public health initiatives in this group. A study of 1,000 workers in Xi'an China by Sun and co-workers suggest that significant work is needed to increase the physical activity levels of civil servants. Wickel and Belton describe the impact of the transition from childhood to adolescence on the amount of after school physical activity time, suggesting the need for programs to

focus on increasing activity across this period. Fraser's research team describe the physical activity and sedentary behaviour patterns of inpatient adults with mental illness and suggest work needs to be done on reducing sitting time in this group.

In a systematic review and meta-analysis, in the sports and exercise science section, Slysz, Stultz and Burr suggest that blood flow restriction when combined with exercise is an effective mechanism for enhancing both muscle strength and size over relatively short duration of intervention. Almeida and colleagues randomised controlled trial on the impact

# REGIONALLY BASED PREGNANT WOMEN? ACTIVE?



*Hayman, Short and Reaburn's report on physical activity levels of regionally based pregnant women suggests that activity levels fall well short of guidelines and reflects a need to re-visit public health initiatives in this group.*

of cold water immersion on heart rate variability during recovery suggests that this technique is beneficial if used for 15 minutes at 14°C. Ramirez-Campillo and co-workers describe a potential technique for enhancing plyometric training in female football players with dietary creatine supplementation. Delevatti's group describe the differences in glucose control in dry land versus aquatic training in individuals with type 2 diabetes.

In the sports and exercise medicine section Maddison and colleagues suggest that there is significant variability in activity profiles and risk of cardiovascular disease in 30-70 year olds meaning that interventions need to be tailored to activity profiles and responsive to change in the profile over time. Tang's group provide evidence to support the concept that ratings of perceived exertion can guide exercise intensity in everyday

clinical practice environments. Cox and co-workers show that the cognitive function of even apparently healthy young adults can benefit from exercise in a systematic review.

Prinold and Bull lead off the sports injury section with a paper describing the kinematics of shoulder pull up techniques and how best to minimise impingement risk. Hanninen's group provide normative reference values for the SCAT3 in ice hockey players and Kluitenberg and colleagues describe training related factors related to injury in novice runners from the NLstart2run study.

The August 2016 issue provides a wealth of information for researchers and clinicians and researchers across the physical activity, sport sciences, and exercise medicine fields.

## ABOUT THE AUTHOR

**Gordon S. Waddington** is the Editor-in-Chief of *The Journal of Science and Medicine in Sport*.

*The Journal of Science and Medicine in Sport*, published by Sports Medicine Australia (SMA), is the major refereed research publication on sports science and medicine in Australia. The Journal provides high quality, original research papers to keep members and subscribers informed of developments in sports science and medicine. Produced for SMA six times a year by Elsevier Australia, it reflects SMA's commitment to encouraging world-class research within the industry, and its commitment to the continuing education of its members. Journal articles can be found at [jsams.org](http://jsams.org)

## SPORT AND EXERCISE MEDICINE

# IN FRANCE

THIS ARTICLE, WRITTEN BY D RIVIERE, MD, PHD FORMS PART OF A SERIES PUBLISHED IN *SPORT HEALTH* TO LOOK AT THE STRENGTHS AND WEAKNESSES OF THE SPORT AND EXERCISE MEDICINE (SEM) SYSTEMS IN VARIOUS COUNTRIES, PROVIDING IDEAS AND INSPIRATION FOR ALL COUNTRIES ON HOW TO IMPROVE INFRASTRUCTURE IN THIS EMERGING SPECIALTY.

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VIEW PAST SPORT AND EXERCISE MEDICINE AROUND THE WORLD EDITORIAL [HERE](#)



*At the end of the first year of common studies, a very selective entrance examination permits only one person per 7-10 candidates (depending on the medical school) to be accepted into the second year of study, making it a very selective field.*

In France, approximately 8,000 physicians have a practice solely dedicated to (a small number) or partly focusing on (often a small part) sports medicine. Sports medicine is not a specialty like cardiology or neurology for instance. In fact, it is an additional competence recognised by the French National Medical Chamber (Ordre des Médecins).

Until 2002, two types of diplomas allowed physicians to obtain certification in sports medicine. The former was called C.E.S (Certificat d'Etudes Spécialisées), i.e. Specialised Studies Certificate which has since ceased to exist and has been replaced with the present Sport Medicine and Biology Capacity, SMBC (Capacité de Médecine

et Biologie du Sport). This is obtained after acquiring a practising physician license, i.e. at the end of medical studies and thesis validation.

Medical education in France (France has 37 schools of medicine) spans nine to ten years depending on the specialty, with six 'common' years followed by either a three-year internship (specialisation in general medicine) or four-year internship (other specialties). At the end of the first year of common studies, a very selective entrance examination permits only one person per 7-10 candidates (depending on the medical school) to be accepted into the second year of study, making it a very selective field.



When undertaking SMBC, the physician can perform the learning either immediately after their medical thesis, or several years after. This education is performed in approximately 20 countries (several schools of medicine gather together) and lasts only one year with approximately 120 hours of theoretical learning on all fields of sports medicine (physiology, orthopaedics, cardiology, physical activity for health, doping). Forty half days of practical education in accredited hospitals, clinics or medical centres within high level sport institutes are also required. The final diploma is delivered after a written examination, with added oral examination depending on the school of medicine. Numerous physicians seek even greater knowledge and complement their existing studies with specific university diplomas, such as sport trauma medicine, undersea and hypobaric medicine, mountain and emergency medicine, and nutritional aspects of sport, to name a few.

Since 2002, a more specialised path than SMBC has become possible. It is called Specialised Complementary Study Diploma, i.e. in French, DESC (Diplôme d'Etudes Spécialisées Complémentaires). Compared with SMBC, the main interest is the practical training. This education is not accessible to physicians who have already completed their studies (they can only undertake SMBC) but is available to those involved in the internship part of the diploma as this education includes

two internship stages; one of six months in a sports medicine functional exploration department and another six months in a sport orthopaedic department. After thesis, the physicians perform another practical year, called post-internship, in accredited departments of hospitals, clinics or medical centres in high level sport institutes (e.g. National Institute of Physical Education, National Institutes for Soccer or for Rugby). During these two years, six periods of three days of theoretical knowledge complementing the knowledge acquired during the internship stages is completed. The diploma is delivered at the end of the post-internship, during a national examination (usually the day before the annual meeting of the Sport and Exercise Medicine French Association). This examination is based on the appreciation of a written report based on original research work which is orally presented. Taking into account the relatively small number of possibilities in post-internship stages, only one 'student' per university and per year can perform the DESC (20-24 per year for the whole of France).

Learning in medicine is never finished. Professional training in sports medicine can be undertaken by joining the Sport and Exercise Medicine French Association and attending the national meeting and/or by joining regional affiliated associations. More recently, two new 'authorities' were created – The French

College of Sports Medicine and Trauma Teachers (for all aspects of sports medicine education) and the National Professional Council of Sport Medicine (for all aspects of professional practice). An aim of these associations is the development of the post graduate training in sport medicine included in the post graduate training for all French physicians called DPC (Développement Professionnel Continu), i.e. Continuous Professional Training. In 2014, the first official sessions were held during the national meeting of the Sport and Exercise Medicine French Association, one on the nutritional aspects of sport medicine and the second on medical 'prescription' of physical activity in chronic pathologies. And very recently, the French Parliament voted for a law on the Prescription of Physical Activity as part of the treatment for long term affections. Looking to the future, in 2020-2021, the DESC and SMBC will be replaced by a Transverse Specialist Training (*Formation Spécialisée Transversale*) which is currently being developed.

#### ABOUT THE AUTHOR

**D Riviere**, MD, PhD is the Vice President of the Sport and Exercise Medicine French Association and President of the French College of Sport Medicine and Trauma Teachers.

# INTERVIEW WITH...

# JESSICA TRENGOVE

MARATHON RUNNER, 2014 COMMONWEALTH GAMES  
BRONZE MEDALLIST, AND PHYSIOTHERAPIST.

SPORT HEALTH INTERVIEWED MARATHON RUNNER AND 2014 COMMONWEALTH GAMES BRONZE MEDALLIST, JESSICA TRENGOVE IN THE LEAD UP TO HER SECOND OLYMPIC GAMES AND DISCUSSED HER PREPARATION FOR RIO, RELATIONSHIP WITH HER SPORTS MEDICINE SUPPORT TEAM AND PHYSIOTHERAPY BACKGROUND.

**Firstly, congratulations on being selected for the Rio Olympics. How are you feeling about it all with less than two months to go?**

Thank you. I cannot believe I will be leaving for the Australian team pre-Olympic camp in just over five weeks! Excitement and anticipation about seeing Rio, moving into the Olympic Village and of course, race day is building at a fast rate. I look forward to getting another month and a half of solid training and preparation under my belt before the Marathon taper begins.

**What has been/is your training regime in the lead up to Rio, i.e. when did you start, how often are you training, at what capacity, types of training, locations of training?**

My coach, Adam Didyk and I are basing my preparation on what has worked previously and what areas we can progress. I have run six Marathons to date so am fortunate to have the conditioning in my legs and experience under my belt from those events. Ultimately I am aiming to achieve consistency and quality with my training.

A typical training week includes two key interval or repetition sessions and a third session of either fartlek or threshold running. My program often also features a light recovery jog or some form of cross training on these days. I perform two long

runs of between 90 minutes to 2.5 hours – usually on a Wednesday and Sunday. Mondays and Fridays involve a light to steady running or cross training session, followed by gym. The focus of my gym sessions is to condition the stabilising muscles specific to running, achieve functional mobility and reinforce optimal movement patterns for injury prevention.

**Tell us about your relationship with sports medicine professionals in the lead up to an event and during an event such as the Olympics?**

The team of health professionals who support me pre-, during and post-event play an integral role and I am very grateful to have the support of such passionate, generous and understanding people. Over the past four years I have worked closely with the South Australian Sports Institute (SASI) and Athletics Australia sports doctors, my physiotherapist, podiatrist, massage therapist and gym coach to ensure that my body responds positively to the training program set by my coach, Adam Didyk. Sessions with SASI's exercise physiologist, sports dietitian and sports psychologist have also helped me to get more out of myself as an athlete. These sports medicine professionals know me well as a person not just as an athlete. They have all played a part in assisting me to develop my knowledge and skills whilst also helping me to achieve a positive head-space for optimal performance.

**What are your hopes for the Rio Olympics?**

My hopes in the race are to achieve a personal best performance. Ultimately this would be in the form of a time below 2 hours 27 minutes and 45 seconds but given the unknown conditions for this Marathon my coach and I will set a more specific target in the couple of days before the race. I hope to cross the line in Rio feeling proud of the way I prepared and raced for Australia and to be confident that I got the most out of myself. As for the Rio Olympics in general, I hope to have a fantastic time, to learn a lot from the experience and to support my teammates in as many events as possible.

\*NOTE: Jess Trengove finished 22nd in the women's marathon at the Rio Olympics in a time of 2:31:44.

**What is your recovery like after a marathon?**

I like to take it easy for two to four weeks, depending on what competitions I have coming up. My coach doesn't set specific sessions during this time. Instead, I listen to my body and go for light jogs or cross training sessions as I feel appropriate. Usually the delayed onset muscle soreness is greatest in my calf muscles but the mental break from heavy training is just as important as the physical recovery.

**Let's rewind to the start. Tell us about becoming involved in marathon running.**

We had a fantastic sporting culture in my home-town of Naracoorte. My primary school was surrounded by a pine forest and cross-country was a big event on the calendar every year. After opting to sit on the sidelines because of nerves during my first opportunity to race as a

six year-old, I soon discovered a love for endurance running! At the age of twenty-one I started to train more seriously for running and decided to stop playing netball to free up my weekends for running. After my first half marathon in 2010, I was excited about the prospect of testing myself over the full Marathon distance one day. In March of 2012 my coach and I decided to attempt an Olympic qualifying standard for the London Olympics at the Nagoya Marathon in my debut over the distance – we figured we had nothing to lose.

**What are some of the injuries you've dealt with over your career?**

I have experienced a proximal hamstring insertion tendinopathy and a second metatarsal bone injury in each foot.

**How have sports medicine professionals aided in your recovery of injuries?**

Sports medicine professionals have helped me with the diagnosis and management of these injuries. Following assessment, imagery was arranged to help determine the best management approach. From there, my physiotherapist, podiatrist and gym trainer worked closely with my sports doctor and running coach to plan my rehabilitation. Manual treatment, active management strategies, taping, in-shoe orthoses, specific exercises, cross training and progressive running training are some of methods that were discussed among the team.

**Obviously shoes are an important part in any marathon runner's life. Tell us a little about your involvement with ASICS.**

I have been an ambassador for ASICS since 2013. I have really enjoyed being

a member of the ASICS team and am so happy with their footwear, clothing and apparel as well as the working relationship that we have developed over the years. My favourite pair of ASICS shoes are the DS racer and I have worn this shoe for my past four Marathons!

**You are also a trained physiotherapist. Why physiotherapy? Does your physiotherapy knowledge help with your marathon running at all?**

I initially dreamed of being a Veterinarian like my Dad but didn't feel ready to travel to Murdoch University in Western Australia in my first year out of school. Consequently, I enrolled in Physiotherapy at UniSA to see what it would be like and I never looked back. I love learning about the human body and feel that my physiotherapy knowledge helps me get the most out of my own. I also love encouraging people to be active and helping others to enhance their general wellbeing by having a body that operates well!

**How do you achieve work/training balance?**

I find that my physiotherapy work and ambassador roles complement my running. They are a helpful distraction outside of training and provide an additional source of fulfilment and inspiration. The balance is best achieved for me by having a list to work through each day, having an organised diary, getting enough sleep for my body's needs and having a supportive group around me – my family, boyfriend, coach, manager at Stride sports, training squad, employers, sports medicine team and friends.

**What are your goals for the rest of 2016/2017?**

My goals for this year are to put my best foot forward at the Rio Olympics and produce a result that Australia, my team and I can be proud of. Beyond Rio I look forward to becoming an Auntie for the first time and enjoying some travel before getting back into a set running routine. I look forward to 2017 and the opportunities that lie ahead but at this stage have not set any specific sporting goals.

## FAVOURITES

**Athlete:** Benita Willis and David Rudisha.

**Travel destination:** Italy, Germany and Switzerland – hoping to add Brazil to this list too.

**Sport to watch:** Tennis, gymnastics and a good game of AFL.

**Cuisine:** Thai.

**Movie:** Notting Hill.

**Song:** Toto – Africa.

**Book:** *Open* by Andre Agassi and *Running for my life* by Lopez Lomong.

**Gadget:** Garmin Forerunner 630.

# EXERCISE AND MENSTRUAL *WHERE IS THE RESEARCH*

PHD STUDENT, GEORGIE  
BRUINVELS SUGGESTS  
MORE NEEDS TO BE  
DONE TO ALLEVIATE  
THE MENSTRUAL CYCLE  
EFFECT ON EXERCISE  
PERFORMANCE IN ELITE  
WOMEN ATHLETES.

**O**n January 21 2015, the taboo is broken, British tennis superstar Heather Watson bows out of the first round of the Australian Open citing that her menstrual cycle prevented her from playing to her best. Since then numerous global sports stars have spoken out, highlighting that their performance has been affected by their menstrual cycle.

Our research group recently found nearly half of the 1,862 people questioned feel that their menstrual cycle affects their exercise performance, with this increasing to 51.1 per cent in those who are of an elite level. But why is this the case, and surely something can be done about it? The crazy thing is that the answers to this are as yet inconclusive. So how is it that in the 21<sup>st</sup> century when driverless cars are in operation and trips to Mars are on the horizon we still don't know the answers to this.

The participation of girls and women in exercise has exponentially increased over the past 30 years. The Olympics in Rio broke previous records with 45 per cent of the total participants being female, the greatest to date. The Australian team actually has a 52:48 split with more women competing than men.

While this is brilliant and hugely positive, it doesn't stop the Heather Watson type scenarios. To avoid putting off future participation or holding women back from performing to their best something needs to be done about it.

## **WHY DO WE NOT KNOW THE POSSIBLE CAUSES FOR PERFORMANCE IMPACTS FROM THE MENSTRUAL CYCLE?**

Female representation in research is greatly lagging behind that of men. The reasons for this are largely historical – traditionally, and largely because of concerns over damaging unborn babies research was predominantly conducted in men. In the past females and males were considered to be the same except for the difference in reproductive hormones which was initially thought to be insignificant. When it was subsequently appreciated that women are much more biologically variable than men it was too late, there was too much ground to make up. As scientists we are always guilty of wanting to progress research, not go back and repeat it. As a result, the research gender gap has grown. From a more medical perspective numerous laws have been passed in an attempt to try and address this, and female representation is gradually starting to increase in the world of sports and exercise medicine. However, potentially the most concerning fact is that typically when research has involved women it doesn't explore the possible impacts that the menstrual cycle may have. Most studies:

1. Are conducted at one specific phase of the menstrual cycle (days 1 to 5 of the follicular phase), as here hormone levels are at their lowest and the female hormonal profile is actually

# D THE CYCLE...

RESEARCH?

# EXERCISE AND THE MENSTRUAL CYCLE...

## WHERE IS THE RESEARCH?

most similar to that of a man, diminishing or even removing the potential impacts that the ovarian hormones may have.

2. Only test women who are taking the oral contraceptive pill so their physiology is much less variable.
3. Disregard any effects of the menstrual cycle whatsoever so don't include this as a potential factor/confounder.

### WHY ARE WOMEN MORE BIOLOGICALLY VARIABLE? THE SCIENCE

Typically, from the ages of 13 to 50 years, females experience a predictable fluctuation in ovarian hormones over an average of 23 to 38 days, called the menstrual cycle. It can be split into two main phases, the follicular phase (days 1 to 14] and the luteal phase (days 15 to 28), with ovulation occurring between. The sex hormones oestrogen (oestradiol) and progesterone are primarily responsible for driving the changes that take place. These are regulated by a feedback system that involves two hormones which are secreted from the pituitary gland located in the brain – follicle stimulating hormone (FSH) and luteinising hormone (LH).

Menstrual bleeding occurs at the beginning of the follicular phase marking day 1 of the cycle and typically lasts 3 to 7 days. During this time levels of oestrogen and progesterone are very low. Oestrogen and progesterone then begin to increase towards the end of the follicular phase in preparation for ovulation. After ovulation oestrogen falls but progesterone still gradually increases into the luteal phase. Oestrogen then starts to increase again. Towards the end of the luteal phase both hormones fall, marking the premenstrual period, and the cycle begins again.

As is evident therefore the menstruating female body is constantly changing, so women have to be tested many times throughout their cycle in line with the hormonal variation to gain a full understanding of biological and

physiological functioning. Therefore, factoring for the menstrual cycle is likely to be costly, and more time consuming, as more tests will be needed. In comparison men can be tested at any point due to the significantly smaller biological variability.

### SO HOW COULD THE MENSTRUAL CYCLE BE AFFECTING EXERCISE PERFORMANCE?

There are a whole range of different hypotheses suggesting how and why performance may vary at different menstrual cycle phases, the majority of these are likely to be driven by the changes in hormone levels. Some suggest that muscular strength increases proportionally with oestrogen levels, so females feel at their strongest around ovulation. While ACL injury risk is also said to increase at this time as a result of increases in joint laxity. Some suggest that fuel utilisation can vary, in addition to endurance capacity, lactate production, blood pressure or even immunity. Many feel that they put on weight or retain water at certain times, while others definitively cite that they perform best at one particular time. However, evidence is largely inconclusive and more extensive research is required.

The oral contraceptive pill is another option often used to gain control of the menstrual cycle, however both the long and short term repercussions of this are unknown. With a number of different pills on offer and varying responses seen it is hard to pass judgement.

Somewhat surprisingly we recently found heavy menstrual bleeding to affect more than one third of marathon runners (n=1073), and remarkably, this was as common amongst elite athletes. Heavy menstrual bleeding is associated with an increased risk of iron deficiency, and since those with heavy menstrual bleeding were more likely to cite that their menstrual cycle impacts upon their exercise training and performance it could be suggested that a possible cause for poor performance could be iron deficiency be it known or unknown.

“

*Numerous global sports stars have spoken out, highlighting that their performance has been affected by their menstrual cycle.*

Regardless of heavy menstrual bleeding those who exercise have an increased susceptibility to iron deficiency due to small iron losses occurring as a result of foot-strike haemolysis (destruction of blood cells caused by foot impact), sweating, haematuria and gastro-intestinal bleeding in some cases – exacerbating iron deficiency risk amongst this population.

However, prior to drawing this conclusion the impact of iron deficiency on exercise capacity needs to be ascertained and this is what we are currently researching.

#### WHAT CAN BE DONE NOW?

Women have learnt to ‘just get on with it’, and with many male coaches in sport, females often do not feel comfortable discussing menstrual issues, but with 75 to 85 per cent of all menstruating females

suffering from premenstrual distress of some sort, and with more than 200 symptoms it cannot be ignored.

While records have been broken at all phases of the menstrual cycle, this taboo cannot be ignored much longer. Women will line up on the start line knowing that someone else is likely to be in their situation, however we need to address this head on, and not allow the menstrual cycle to get in the way of females performing at their best.

#### ABOUT THE AUTHOR

**Georgie Bruinvels** is a PhD student at University College London in collaboration with St Mary's University and a Research Scientist with Orreco.



# EXERCISE, BREASTS & BRA FIT



APA SPORTS  
PHYSIOTHERAPIST AND  
RESEARCHER FROM  
BREAST RESEARCH  
AUSTRALIA (UNIVERSITY OF  
WOLLONGONG), DR DEIRDRE  
MCGHEE EXPLAINS HOW  
WOMEN CAN ENSURE THEIR  
BRA IS SUPPORTIVE AND  
CORRECTLY FITTED WHEN  
THEY ARE ACTIVE.

**B**reast support during physical activity is an important but often neglected women's health issue. In 2011, Sports Medicine Australia became the first medical organisation in the world to develop evidence-based guidelines for women on breast support and bra fit during exercise. In conjunction with researchers from Breast Research Australia (University of Wollongong) they published ***Exercise and Breast Support*** as one of their Women in Sport Fact Sheets. This free resource helped to raise the profile of this sensitive topic and

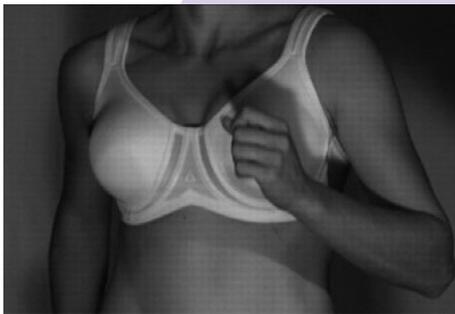


Figure 1: Three-dimensional sinusoidal motion. Left photo: Breasts at high point with left forward arm swing; Middle photo: Breasts at low point; Right photo: Breasts at high point with right forward arm swing.

educate clinicians, coaches and female athletes on how to achieve sufficient breast support and correct bra fit to allow women to exercise in comfort and maximise their athletic performance.

## BREAST BOUNCE

During activities such as running, the breasts move in a three-dimensional sinusoidal motion, following the movement of the trunk and arms (Figure 1). This movement is called “breast bounce”. The breasts move in an anterior/posterior and medial/lateral direction following arm swing and trunk rotation, and in a superior/inferior direction following the vertical movement of the body and trunk<sup>1,2</sup>. The downward vertical motion of the trunk and, in turn, breasts is halted with heel strike. Any lag in time between when the trunk and the breasts stop their downward motion results in “breast slap”, where the breasts slap against the chest or abdominal wall<sup>1</sup>.

## THE EFFECT OF BREAST SIZE ON BREAST SUPPORT

Breast size is usually measured by bra size, with bra sizes greater than a D cup generally considered to be large

breasted<sup>3</sup>. Breast size is measured more accurately in biomechanical studies as a volume measurement from a three-dimensional scan of the breasts and trunk. Breast volumes can range from 75ml to 2,500 ml per breast<sup>3,4</sup>. A size 10D breast may be 400ml while a 16D may be 1,500ml<sup>3</sup>. Generally, breasts over 500ml are considered to be large breasted. The larger the breasts, the greater the breast movement, breast force, breast slap and not surprisingly, associated breast discomfort<sup>5</sup>. Consequently, women with larger breasts require a higher level of breast support provided by a bra.

## THE EFFECT OF AGE ON BREAST SUPPORT

The breasts have their own anatomical support structure, the overlying skin and a three-dimensional fascial network within each breast<sup>5</sup>. Research has found however that the skin of the breast thins and decreases its elasticity with age. A significant decline in breast skin thickness has been found to occur by the fourth decade<sup>6</sup>. This means that the level of support provided anatomically is also likely to decline with age and that a higher level of external breast support provided

by a bra is required by women once they reach their 40s.

## HOW CAN I TELL IF MY SPORTS BRA IS SUPPORTIVE ENOUGH?

There are three major considerations to determine if you have sufficient breast support:

### 1. Magnitude of breast movement

Breast movement will vary with the exercise a woman performs. As a general rule, the more the trunk moves, the more the breasts will move<sup>5</sup>. The breasts will move more during running compared to walking, during horse riding compared to cycling. Therefore, women need to consider how much trunk movement will occur during their chosen exercise and the force of their arm movement (tennis compared to badminton) to determine how much breast support they need. The greater the trunk movement and the greater the force of the arm movement, the higher the level of support required. It is not possible to completely stop breast movement however it should be minimised by a high support bra.

# EXERCISE, BREASTS & BRA FIT

Breast Research Australia has developed a web-based App called **Sportsbra** (<https://bra.edu.au/sportsbra/>) that uses high-speed movies to guide women on 'acceptable' and 'unacceptable' amounts of breast movement. The high-speed movies are of women with small, medium and large breasts.

## 2. Level of discomfort

In conjunction with breast movement, Sports Medicine Australia and Breast Research Australia also recommend that women use breast discomfort during exercise as a guide of adequate breast support. Breast discomfort during exercise should be nil to mild with adequate breast support. Both the bra and the breasts need to be comfortable. Sports bras that are very constrictive can be

uncomfortable to wear<sup>7</sup>. Breast movement and discomfort should be minimal BUT the sports bra MUST also be comfortable to wear!

## 3. Number of breast bounces

Women are often very shocked by the number of times their breast bounce during an exercise session. The breasts bounce every time the heel strikes the ground. During a 60-minute run, this would approximate 10,000 breast bounces<sup>5</sup>. The higher the total number of breast bounces, the higher the level of support required. Therefore, women involved in hours of exercise per week that involves running and jumping, need a high level of breast support even if their breasts are NOT a large size. Furthermore, biomechanical studies measuring breast movement have found that the faster the cadence

of the lower limb (running versus jogging), the greater the magnitude of breast movement also<sup>8</sup>.

## WHAT DOES A HIGH SUPPORT SPORTS BRA LOOK LIKE?

Sports bras come in two basic designs; crop top sports bras (which compress the breasts as a unit against the chest wall) and encapsulating bras (which encase each breast separately in a cup – these bras come both with and without underwire [soft-cup bras]). Research has found encapsulating sports bras are superior to crop top sports bras in limiting breast movement<sup>9</sup>. Therefore, encapsulating sports bras are recommended for women with large breasts, however women with bra sizes greater than a DD size cup may require two bras (an encapsulating sports bra with a crop top worn over it) to achieve an acceptable level of breast movement and comfort.

The basic features of high support crop tops and encapsulation sports bras are similar:

- **Band:** made of strong elastic material, wide enough relative to the breast mass (A cup – 1 clip wide; B/C cup – 2 clips wide; D+ – 3 clips wide).
- **Cups:** cover the breasts completely by supportive material (not lace/lycra).
- **Straps:** wide and padded for comfort.



Figure 2: Top two photos: High support crop top sports bra. Below two photos: High support encapsulation underwire sports bra.



The presence of underwire is a personal preference. If women choose to wear an underwire sports bra it is vital that it fits correctly. That is, the underwire must sit on bone (ribs and sternum) – NOT breast tissue. Depending on the shape of a woman’s breast, correct underwire fit may NOT be possible. There are many soft-cup encapsulation sports bras on the market that provide a high level of breast support.

### CHANGE ROOM TEST

When trying on a new bra, women are recommended to perform a version of the exercise they plan to participate in within the change room to assess if the bra provides adequate breast support. Breast movement should be an ‘acceptable’ (as per the web App **Sportsbra**), breast discomfort should be nil to mild and the bra should be comfortable to wear. Research conducted by Breast Research Australia has found that 85 per cent of women are wearing the wrong size bra<sup>10, 11</sup>. Wearing the wrong size bra is not only uncomfortable; it will also affect the level of support the sports bra provides. That is, a high support sports bra in the wrong size, will not be supportive as per its design. Correct bra fit is as important as a supportive sports bra design!

### WHAT IS CORRECT BRA FIT?

- **Band:** does not ride up with movement of arms (too big), no flesh bulging over the superior edge of the band (too small).
- **Cup:** no wrinkles or gaps (too big), no bulge of breasts over the top or sides of the cup (too small).
- **Straps:** not sliding off (too big), or digging in (too small).
- **Underwire:** sitting on ribs and sternum, not on any breast tissue (too small).
- **Front band:** sits flat against sternum.



*Figure 3: Top two photos: Side-view correct and incorrect underwire fit, with the underwire sitting on ribs in the first photo and on breast tissue in the second photo. Below two photos: Front-view correct and incorrect underwire fit, with the underwire sitting on the sternum in the first photo and on breast tissue in the second photo.*

The SMA **Exercise and Breast Support** Women in Sport Fact Sheet can be a useful icebreaker of this important women’s health issue for coaches and clinicians, as well as an educational resource for any active female. The ability to find a comfortable, supportive bra that fits correctly is fundamental to keeping women both active and healthy throughout their lives.

#### ABOUT THE AUTHOR

Dr **Deirdre McGhee** is an APA Sports Physiotherapist and researcher from Breast Research Australia (University of Wollongong).



# DO ACTIVE MUMS HAVE ACTIVE CHILDREN?

RESEARCHER, KATHRYN HESKETH PROVIDES INSIGHT INTO HER STUDY WHICH LOOKED AT THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY IN MOTHERS AND THEIR PRESCHOOL AGED CHILDREN.

**A**mongst sport, academic and health professionals, it is well known that physical activity is beneficial for physical health and mental wellbeing, in both adults and children. Higher activity levels are also related to improved metabolic health, social and motor development, and decreased adiposity in very young children (2 to 5 years).<sup>1</sup> Yet despite these benefits, there is a general decline in activity levels throughout childhood into adulthood. This lack of physical activity is particularly marked, perhaps unsurprisingly, during the childbearing years: new parents are usually less active than their childless peers, and often fail to accrue the recommended levels of activity each day.<sup>2</sup> Worryingly, activity levels in new parents frequently fail to return to pre-parenthood levels.

## RECOMMENDED GUIDELINES

**ADULTS:** 150 minutes of moderate to vigorous physical activity (ideally on five or more days) per week.

**PRESCHOOLERS:** 180 minutes of any activity above sedentary each day.

But it is not only their own activity levels that may be affected, as parents also influence their children's behaviour across a range of domains. Importantly, behaviours established in young children during the early years have a large influence on their future health and development. The mechanisms suggested for the relationship between parental-child activity can be direct and/or indirect, ranging from genetics,



through modeling or support, to mutual participation. Engaging in activity together seems to be important for activity levels in school-aged children, but there is less evidence that this is the case in younger children. However, studies have often used different methods of data collection, and in particular, the use of self-report measures to assess physical activity. We therefore conducted a study using an objective measure of physical activity – the Actiheart, a light-weight heart-rate accelerometer – to look at the relationship between physical activity in mums and their preschoolers.

We used data from the Southampton Women's Survey (SWS), a population-based longitudinal cohort study based in Southampton, UK. Women in their 20s and 30s were recruited during pregnancy from General Practices during the late 1990s, and those that went on to have live births have been followed up, along with their children, at various intervals since.<sup>3</sup> Children turning four in the late noughties and their mothers were invited to take part in a sub-study to assess their habitual or daily physical activity. Mother-child pairs both wore an Actiheart activity monitor for seven days continuously, and completed a validated questionnaire to provide background socio-demographic data. Physical activity was then matched exactly in the pairs by hour and day (excluding sleep) to provide a like-for-like comparison between mother-child physical activity levels.

#### **INTENSITIES OF PHYSICAL ACTIVITY *with examples***<sup>4,5</sup>

Sedentary (1-1.4 METs):  
Sitting quietly, reading.

Light (1.5-2.9): Standing, slow walking.

Moderate-to-vigorous (MVPA; >3.0):  
Walking, running, playing with balls, skipping.



# DO ACTIVE MUMS HAVE ACTIVE CHILDREN?



*Undoubtedly, the role of mums, be it through co-participation, facilitation or as a role model, is very important for their child(ren)'s physical activity.*

By far the largest sample of mother-child dyads assessed to date, we included data from 554 mothers and preschoolers. We found that daily activity levels were positively associated across a range of intensities (i.e. sedentary, light and moderate-to-vigorous activity[MVPA]),<sup>6</sup> So for example, for each additional 10 minutes of MVPA a mum did each hour, her 4-year-old was 4 minutes more active. Whilst this doesn't sound like a lot, mothers who met the recommended guidelines (i.e. 30 minutes of MVPA per day) had children who did 12 minutes more MVPA on average each day compared to children of mothers who engaged in no physical activity. When combined over the course of the week and month, this can add up to a large amount of additional physical activity.

Due to the way data were collected, we weren't able to tell exactly what mothers and their children were doing when they were active: active kids likely require mums to run around after them, and active mums may encourage their children to get moving. In reality, it's probably a bit of both, but even if mums aren't active with their children, they can still help promote physical activity by providing a positive active environment, encouraging active play, and being a positive role model. Our results also suggest that by encouraging the lesser-active of a mother-child pair to move a little bit, it might be possible to boost activity in the other.

Of course the role of fathers should not be discounted, and smaller studies have shown that fathers also influence their children's physical

activity. Though the evidence base is less well formed and more studies are needed, dads likely compliment maternal influences on physical activity, engaging in active play with children at different times of the day and week. Indeed, we found that the relationship between mother-child activity was stronger at the weekend for light activity and during the week for MVPA. Speaking to mothers of 4-year-old children, this seems to hold true. Jess, a mother of a 4- and 2-year-old stated that her partner 'took over' the childcare at weekends, allowing her to get on with household chores: "[He] will take them out at weekends – maybe to the park or the swimming pool in summer – to get them out from under my feet. I'm running around after them during the week, so it gives me chance to get things done". Others may use the

weekends to get out and get active as a family. Anna, who has a 7- and 4-year old, and is currently also pregnant, said that they often went out as a family "to the swimming pool on Saturday morning or historical places of interest, where the children can run around."

Though we looked at the relationship between mother-child pairs, we also explored women's physical activity levels in more detail. As is the case with many adults, only 53 per cent of the women we assessed managed to get 30 minutes of moderate-to-vigorous physical activity on at least one day per week.<sup>6</sup> Moreover, higher BMI was related to increased sedentary and decreased light physical activity. And the number and age of children at home, and women's working





hours also seemed to influence women's inactivity/activity.

This seems perfectly feasible. But whilst we found that the more hours a woman worked, the less active she was, it is also important to consider just what women are doing at work that might contribute to their physical inactivity/activity. For example, as a Pediatric Accident and Emergency Nurse, Anna works two 12 hour shifts per week – but as the shift lead, this involves being on her feet for at least 11 hours, with rarely a moment to sit down. When she gets home, understandably she flops. In contrast, Jess *“sits on [her] bum for eight hours a day at work. But there is a gym near work so I tend to pop out during my lunch hour most days to do a class. It means I don't need to worry about additional childcare in the evening.”*

Women with children of differing ages are also likely to face differing challenges both in and outside the home. Anna explained *“When Jack was four, Sara was one, so I was limited to what I could do. When Jack was at school I would walk for an hour about once a week with Sara in her pram. But she was a physically demanding baby and I had very little energy so the most I could manage was keeping up with the housework, with the occasional trip to the park with both of them. But when Sara turned three and started preschool, I joined the gym. I could do a couple of classes a week and also swim when Jack was at swimming lessons. My husband also helped out with the childcare on the odd evening too.”*

Taken together, both our work and first-hand accounts from mothers of preschoolers highlight that many factors contribute to inactivity/activity in women and their children including time constraints; varying degrees of fatigue and partner support; the cost and availability of childcare; and opportunities to be active. These also represent just some of the competing demands that must be balanced in order for women and their children to meet activity guidelines over the course of a week.

Undoubtedly, the role of mums, be it through co-participation, facilitation or as a role model, is very important for their child(ren)'s physical activity. Yet considering how all members of a household can contribute is likely to provide the greatest number of opportunities to boost physical activity. With siblings and parents influencing each other's activity, positive gains are likely to occur when practitioners harness the family's potential, seeing it for what

it is – far greater than the sum of their individual parts. Physical activity is vitally important for health and wellbeing, but it does not have to be synonymous with hours at a gym or in organised classes. Simply by 'moving a bit more, sitting a bit less', mums and practitioners alike can ensure that our children remain active today, and do not become the inactive parents of tomorrow.

#### ABOUT THE AUTHOR

Dr **Kathryn R. Hesketh** is a Sir Henry Wellcome Postdoctoral Fellow at the Centre for Diet and Activity Research (CEDAR).

# FRACTURES

SPORTS MEDICINE AUSTRALIA PROVIDES SPORTS TRAINERS WITH ADVICE ON HOW TO MANAGE FRACTURES EFFECTIVELY.

A fracture is an injury where bone tissue loses its normal structure, usually as a result of direct or indirect trauma. Although many fractures are not immediately life threatening, fractures can cause shock and major internal and external bleeding.

## SIGNS OF A FRACTURE

- Deformity – the affected part is changed in shape.
- Bone protruding from an open wound.
- Localised swelling.
- Movement in a limb occurring other than at a joint.
- Loss of normal movement or function.
- Signs of shock.

## SYMPTOMS OF A FRACTURE

- Pain and tenderness at the site.
- The sound of a snap or pop at the time of injury.
- Feeling/sound of bone ends grating.
- Tingling or numbness.
- Symptoms of shock.

## MANAGEMENT OF FRACTURES

Acute management of fractures depends on the location of the injury and the type of fracture; however, for the purposes of providing immediate treatment, the following steps apply to most fractures.

- Follow DRSABCD principles as appropriate.
- If the athlete is conscious, reassure them and advise them not to move.

- Call for an ambulance or medical assistance.
- Control bleeding if there is an open wound and cover it with a sterile dressing to reduce infection.
- Check that circulation is present distal to the fracture. If not, call for urgent medical aid.
- If the athlete needs to be moved, immobilise the area of the suspected fracture first.
- Immobilise the injured limb in the position you found it.
- Be sure to immobilise the area above and below the fracture.
- If the fracture needs to be splinted, the splint must be long enough to extend past the joints above and below the fracture site as well as wide enough to support the fracture site.
- Check the athlete for other injuries and treat appropriately.
- Apply ice packs or cold compresses, if possible, for up to 20 minutes if pain permits. Reapply ice every two hours if necessary. Do not apply ice to open fractures.
- Assess for shock and treat as required.

**Want to learn more on managing fractures? Sports Medicine Australia runs a range of sports safety courses. Visit [sma.org.au](http://sma.org.au) for more information.**

# RES





## PEOPLE WHO SHAPED SMA

# JENI SAUNDERS

JENI SAUNDERS' START IN SPORTS MEDICINE BEGAN DURING MEDICAL SCHOOL WHEN PLAYING SPORTS FOR UNIVERSITY. UPON TEAM MEMBERS ASKING HER ADVICE ON INJURY TREATMENT SHE QUICKLY REALISED NO ONE SPECIALISED IN NON-OPERATIVE CARE. HER INTEREST IN SPORTS MEDICINE WAS THUS BORN AND SHE BEGAN RESEARCHING VARIOUS INJURIES TO PASS ON HER KNOWLEDGE.

Jeni undertook her undergraduate medical degree at the University of New South Wales and spent three years within the hospital system. She established her sports medicine clinic shortly after. At this time there were no formal post-graduate programs for sports medicine. She went

on to assist and teach the initial post-graduate course run by the *Royal Australian College of General Practitioners* and is a Founding Member and Fellow of the Australasian College of Sports and Exercise Physicians (ACSEP) – a college dedicated to promoting and

educating doctors in this specialty. Jeni is still very active in ACSEP Committees and continues to advocate for her profession amongst medical colleagues.

Jeni's career began when Sports or Exercise Medicine was not common practice. She 'made it happen'. She opened her clinic door and the injured came (it took a while though!). During this time, she was also the Team Doctor for St George Rugby League Football Club and travelled with the Australian Women's Hockey Team.

Her work also includes being a volunteer doctor on the Westpac Rescue Helicopter and was Medial Director for a period of time. Later she became a founding

*Pictured from left: Ian Badham, Peter MacCormick, Jeni Saunders, Rick Mailey and John Hoad. Some of CareFlight's founding members came back to our Westmead base on July 29 to celebrate CareFlight's first flight 30 years ago.*

## A MOMENT WITH JENI



### What have been your career highlights?

Attending my first Olympic Games as a Medical Officer, becoming a Founder of a new Medical College and securing the College Specialist Registration, and being a Founding Director of CareFlight.

### What do you believe is your most important contribution to your industry?

I am very proud to be a founder of the Australasian College of Sports and Exercise Physicians. I am also proud that I was the first woman to be allowed into a professional Rugby League dressing room, paving the way for women in our profession. I have never considered my ability to be a good professional was impeded by my gender so I have never let it get in the way.

### What is your advice to those starting out in their career?

Follow your passion, listen and work hard!

### Do you have any career regrets?

Not really. It has been a highly varied, interesting career so far. I have met many wonderful people and had the opportunity to work with some amazing colleagues.

Director of CareFlight – a medical evacuation, rescue and retrieval helicopter service based in Sydney which now has a presence in other states of Australia and will celebrate its 30<sup>th</sup> anniversary later this year.

Since the early years she has travelled with Track and Field, Women's Volleyball, Netball, Swimming and attended the Summer Olympic Games as a Team Medical Officer.

Over her career, Jeni has played a leading role in Sport Medicine Australia (SMA). She joined SMA as a student member and shortly after she graduated she was involved in the NSW Council. From there she became a Council Member, Treasurer,

Secretary and then National Councillor – positions she held for many years. More recently she has re-joined the NSW Committee and has been Vice President.

Some of the major initiatives Jeni has been involved in during her time with SMA include: the initial development of the Sports Trainer Course and developing this as a two tier program, establishing this course as a pre-requisite for trainers in the Australian Rugby League (then the NSW Rugby League), and being appointed to the NSW Ministerial Committee on Women in Sport which provided a great avenue to promote the role of sports and exercise medicine and the role in which SMA plays in this.

Jeni currently works as a self-employed Sports and Exercise physician working in private practice, predominantly in Sydney with a travelling component to the Alpine region of NSW to look after NSW Institute of Sport winter athletes.

# ERS

# COUNCIL OF DISCIPLINE NEWS AND EVENTS

## Australasian Academy of Podiatric Sports Medicine (AAPSM)

The AAPSM national regional series came to the Gold Coast at Metricon Stadium in July. Sixty delegates attended the full day lower limb seminar. Presenters included sports physicians, physiotherapists, podiatrists, a musculoskeletal physician and a dietitian. Other recent events around the country have included strapping workshops, running load management, and footwear research and development.

It is a jam-packed final half to 2016 for AAPSM! AAPSM will launch the sports career pathway, run a pre-conference workshop before the SMA Conference featuring Professor Jay Hertel on the unstable ankle and host a regional series in South Australia, Western Australia, Victoria and Tasmania.



## Sports Physiotherapy Australia (SPA)

The Australian Physiotherapy Association now offers more courses in more areas to Sports Physiotherapists after centralising their professional development management. Check out some of the courses below.

SPA is a member of IFSPT. If you are a Titled Sports Physiotherapist you can apply for reciprocal recognition as a Sports Physiotherapist in other countries.

Sports Physiotherapy Australia is now on Facebook. Become involved, engage in clinical discussion, learn about courses nationally and internationally and keep up to date on your profession.

## Sports Dietitians Australia (SDA)

As summer pre-season training begins, don't forget to engage your local Accredited Sports Dietitian. Their versatility can support you and your athletes with meal planning, anthropometry and hydration testing, supplement recommendation, injury prevention and rehab nutrition, and food suggestions for intolerance and allergies, to name just a few. To find one in your local area visit [www.sportsdietitians.com.au](http://www.sportsdietitians.com.au) or follow Twitter @sportsdietaust and Facebook for credible sports nutrition information.



## CALENDAR

### SEPTEMBER 2016

**16**

Sports Physiotherapy Australia  
Mastering Lower Limb Tendinopathy  
with Dr Peter Malliaras, Eights Mile  
Plains, QLD

**21**

Sports Physiotherapy Australia  
Lateral Hip Pain – Why It's Probably  
NOT Hip Bursitis, Camberwell, VIC

**24**

Australasian College of Sport and  
Exercise Physicians (ACSEP)  
Mackay Sport and Exercise Medicine  
Symposium 2016, Mackay, QLD

### OCTOBER 2016

**4**

Sports Physiotherapy Australia  
Marathon & Distance Running Training:  
A Coaches' Perspective, Kent Town, SA

**29**

Sports Physiotherapy Australia  
Advanced Knee Rehabilitation,  
Silverwater, NSW

### FEBRUARY 2017

**7-14**

Australasian College of Sport and  
Exercise Physicians (ACSEP)  
Keeping You Active Conference  
Surfers Paradise, Marriott Hotel,  
Gold Coast, QLD



# ASICS Professional Buyers Program for SMA Professional Members

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