



UNIVERSITY OF
PORTSMOUTH

BREAST HEALTH NEWS

Research Group In Breast Health
University of Portsmouth
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WELCOME TO THE 10TH EDITION OF THE RESEARCH GROUP IN BREAST HEALTH NEWSLETTER

The group, based at the University of Portsmouth and led by Professor Joanna Wakefield-Scurr, is internationally renowned for conducting pioneering, fundamental and applied research into this important aspect of women's health.

MEET THE TEAM

Lewis Clarke has recently joined our group to undertake a professional doctorate with a focus on elite female golfers. He will be exploring if varying breast support effects the golf swing. Outside of his research, Lewis is a performance coach who specialises in Biomechanics. He coaches professional and elite amateur golfers and offers a biomechanics analysis service, utilising 3D motion capture and pressure plates to improve performance and to reduce the risk of injury.



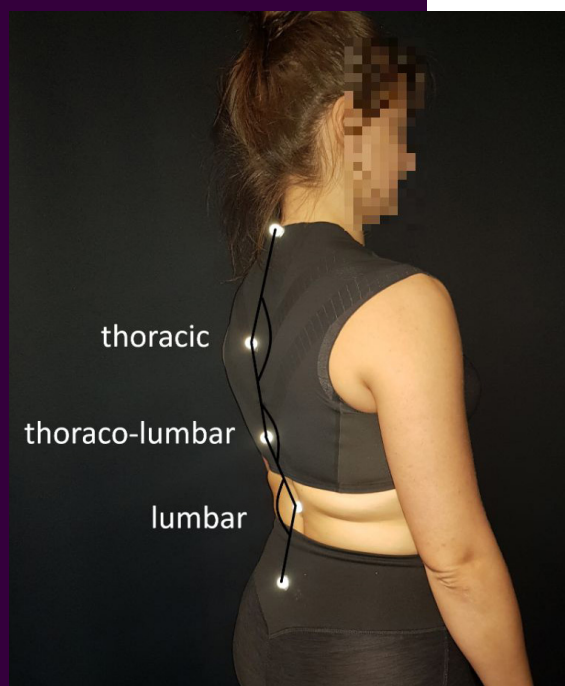
THE SHORT-TERM AND LONG-TERM EFFECTS OF WEARING A POSTURE BRA.

Poor standing posture has been reported in women with larger breasts, increasing the risk of back pain. Whilst breast reduction surgery can improve posture, conservative measures such as special bras may offer short or long-term relief of symptoms without surgical intervention. Our researchers aimed to utilise a multi-study intervention to investigate the short and long-term biomechanical effects of wearing a posture bra.

After several stages of posture bra development informed by biomechanical and physiotherapy expertise, 24 females were assigned to either a control group or an intervention group. The control group wore their everyday bra; the intervention group wore the new posture bra for a period of three months. Posture and breast kinematics were assessed during sitting, standing and walking; before and after the intervention. Pre-intervention, the posture bra significantly reduced rounded shoulder position by 6° during both sitting and standing, but also increased deviation of whole body alignment compared to everyday bra and no bra conditions. During walking, the posture bra reduced breast motion by 17% compared to the everyday bra. Following the three-month wearer intervention, shoulder depression significantly improved in the intervention group.

These results demonstrate how a biomechanically informed posture bra can effectively support the breasts and improve shoulder position without compromising spinal curvature, reducing the risk of musculoskeletal pain associated with poor posture.

Jones, M., Mills, C., Exell, T., & Wakefield-Scurr, J. (2021). A novel multi-study intervention investigating the short and long term effects of a posture bra on whole body and breast kinematics. *Gait and Posture*, 83, 194-200. <https://doi.org/10.1016/j.gaitpost.2020.10.031>



Dr. Nicola Brown



At Your Cervix The Podcast Session 5
"Boobs, bras and breast health"

PODCAST FEATURES

Our researchers have been guests on some exciting podcasts over this last year. Catch up via your chosen streaming service:

At your Cervix The Podcast - Boobs, bras and breast health (Session 5), with Dr Nicola Brown.

The Food Medic Podcast - Breast biometrics and finding the right sports bra (Season 5, Episode 6), with Dr Jenny Burbage.

Under Armour (UA) Sweat the Details Podcast - Science of the Sports Bra, with Professor Joanna Wakefield-Scurr

The Period of the Period Podcast - Boobs, breast biomechanics and sports bras, with Dr Nicola Brown and Dr Jenny Burbage

TREASURE YOUR CHEST- NEW RESOURCES COMING SOON!

We are passionate about improving breast education opportunities for adolescent girls and we are very proud that following the launch of our 'Treasure Your Chest' initiative in 2019, thousands of schoolgirls across the country have benefitted from these breast education resources within schools, sports clubs and youth organisations.

Over the past year, we have been working to update and expand our Treasure Your Chest initiative and have worked closely with Nike to gain more insight into the needs of adolescent girls and to create some exciting new educational material. **Look out for our new and improved resources coming soon in 2022!** treasureyourchest.org

THE IMPORTANCE OF BREAST SUPPORT FOR FEMALE BRITISH ARMY SERVICE WOMEN

Women currently make up 9.8% of regular British Army personnel, and 12.1% of British Army officers, with this figure increasing year on year. All new recruits undertake a period of basic training (BT) to transform civilians into trained soldiers and prepare them for a career in the military. With the growing number of women entering the military, the importance of understanding breast health and the bra demands of recruits in BT is increasing. Whilst the need for appropriate sports bras during physically demanding tasks is widely known, especially during running, it is not known whether the bras designed for running are suitable for use during non-linear movements e.g. obstacle courses and fire movement drills (undertaken during BT). Therefore, there is a lack of research and consideration to equip female recruits with the necessary breast support.

Recently, a sports bra fitting and issue service has been introduced for female recruits entering the British Army. Whilst this service is an important addition to support female recruits through BT, a high number of breast and bra issues (e.g. rubbing/chafing, straps and underwire digging in) are still reported by recruits (Burbage et al, 2021). It is of great importance to understand the demands placed upon the breast during BT, determine the requirements for sports bras and whether there are sports bras currently on the market which meet these requirements, or whether there is a need for a bespoke military sports bra. Whilst the focus of the current service and project is breast support for female recruits in BT, it could have wider implications to all female military personnel and other occupations in the future.

Burbage, J., Rawcliffe, A. J., Saunders, S., & Corfield, L. (2021). The incidence of breast health issues and the efficacy of a sports bra fit and issue service in British Army recruits. *Ergonomics*, 1–11.





RGBH AT THE LONDON BREAST MEETING, 2021

KEYNOTE LECTURE: WHY DOES THE BREAST SAG? BREAST BIOMECHANICS; IMPLICATIONS AND OUTCOMES

The London Breast Meeting unites surgeons and practitioners from around the world to discuss the latest strategies, techniques and innovations in breast surgery. The conference welcomes respected international experts, who share technical tips, tricks and insights around the theme of: The art and science of aesthetic, reconstructive and oncologic breast surgery.

The programme for 2021 focused on what is new in aesthetic, oncological and reconstructive surgery, and this included a keynote lecture from Professor Joanna Wakefield-Scurr, Head of our Research Group in Breast Health. Her lecture introduced the concept of quantifying the biomechanics of the breast during daily and sporting activity, why breast biomechanics is an important consideration in breast surgery, including tissue strain, breast pain and gross functional adaptations associated with breast biomechanics.

Joanna's session was very well received, with some audience members commenting that they never considered, or had forgotten about, the application of real world mechanics in the operating theatre.

Breast Surgeon Ian Brown commented:

"Absolutely brilliant talk and important incredible research.

Understanding biomechanics of the breast and the strain and pain in macromastia seems to provide the evidence of real harm patients suffer - hopefully this could support funding for reduction surgery on the NHS." (Twitter)

Joanna has been invited to present again at the next London Breast Meeting, in September 2022.

COULD VARYING BREAST SUPPORT INFLUENCE FEMALE GOLF PERFORMANCE?

The importance of wearing a well-fitted and supportive bra during physical activity is well established (Starr et al., 2005). Varying breast support conditions has been shown to influence mechanical variables within the body such as changing ground reaction forces during running (White et al., 2009), thorax and pelvis rotation (Risius et al., 2017), and torso moment of inertia (Milligan et al., 2015). However, research is yet to understand the effects of changes in breast support on **female golfer performance**. Improvements in breast support could not only have significant impact on performance, but also comfort and enjoyment. Lewis Clarke aims to investigate this through the research he is undertaking as part of his professional doctorate with our research group.

Torso acceleration in golf is higher than many other sports. Research has found increased breast mass and breast displacement has resulted in an increase in torso forces (McGhee & Steele, 2020). This suggests that breast movement could influence the performance of female golfers. During running, peak vertical ground forces have been shown to change under varying breast support conditions. In golf, increasing peak vertical forces has significantly increased club head speed (Han et al., 2019). Changes to breast position could affect torso moment of inertia, which could alter torso rotation and angular acceleration. This could have significant effects on club head speed in golf with increases in torso range of motion, which will increase hand path length.



Also, torso inertia changes can help a player who struggles with segment sequence (the sequence that the segments of the body move, in the transition phase of the golf swing from backswing to downswing) when the torso rotates and/or accelerates too late.

Our research is going to investigate the role of breast support conditions and how they affect elite female golf swings. This has yet to be investigated and could have significant implications on performance and health for female golfers.

If you would like to be involved with this novel area of research, please get in touch with Lewis Clarke (Lewis.Clarke5@myport.ac.uk)

SUPPORTING ELITE FEMALE ATHLETES IN COLLABORATION WITH THE ENGLISH INSTITUTE OF SPORT AND CLOVER INTERNATIONAL, THE RESEARCH GROUP IN BREAST HEALTH CONTINUES TO SUPPORT ELITE FEMALE ATHLETES IN THE UK.

This initiative aimed to educate, assess, intervene and communicate with the athletes in the following way;

Educational workshops

To 80 elite athletes, with 60 athletes from 13 different sports surveyed about their breasts and bras. The results showed:

- 83% average/poor bra knowledge
- 51% breast pain
- 29% breast pain affects performance
- Some used pain medication
- Clothing regulations affected bra choice for 25%

Individual bra assessments

149 athletes were assessed and these were the findings:

- 61% wanted style/fit advice
- Some never had a bra fitting
- 21 never wore everyday bras
- Almost all wore compression sports bras (86%)
- Most wore ill-fitting bras, with loose under bands and limited support
- Largest size adjustment was from a 36D to 32DD
- Many used bras provided to them regardless of fit or appropriateness.

Intervention (Bespoke bras)

Some athletes had breast and bra needs that could not be resolved with commercially available products and so bespoke bras were developed. These were for a **rower**, a **shooter**, a **hockey** player and the **cycling** team; with the following outcomes:

- Eliminated breast pain
- Front fastening for aerodynamics
- Resolved conflicts between sports bras and smart devices
- Allowed for large chest expansion
- Reposition of breast tissue
- Improved performance
- Improved thermal comfort

Intervention (Bra prescription)

98 athletes breast and bra needs could be resolved with a sports bra prescription for either an appropriately fitted encapsulation or compression sports bra. Findings and outcomes were:

- The athletes bra sizes ranged from 30-40, A-G.
- Prior to fittings, the most popular style was compression, this changed to encapsulation after fittings.
- 97% reported their new bra was better than their old one/s.
- Significant improvements in; fit, perceived support, suitability, comfort, upper body pain and poor posture.

Communication

14 national news stories, disseminating knowledge on breast health. Including BBC sport, The Guardian, The Evening Standard.

Study outcomes

- 87% of athletes felt they had benefitted from the project via, less breast movement (73%), more comfort (53%), improved sporting performance (17%), improved aesthetics (17%), less breast pain (13%).
- 60% reported that they would replace their bra more regularly.
- 63% reported improvement in their breast health and bra knowledge.

'They're not treating us as small men' Team GB women get the right bras

Female Olympic athletes have been fitted with individually designed sports bras to enhance performance



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