

## Poster digest

### Introduction

We are pleased to present summaries of two posters exhibited by POGP members. These are accompanied by thumbnail images of the actual presentations. Samantha Gillard and her colleagues displayed their poster at the Physiotherapy UK 2015 conference held at the BT Exhibition Centre in Liverpool on 16–17 October last year. It won the award for research into practice. The poster by Funmi Odofin was presented at a regional National Health Service (NHS) meeting that was held to support advanced physiotherapy roles in clinical and community care. The full-sized versions can be viewed on the POGP microsite (<http://pogp.csp.org.uk/>).


**Andrew J. Wilson**  
Managing Editor

### Effects of posture and anatomical location on inter-recti distance measured using ultrasound imaging in postnatal women

The widening of the linea alba postpartum leads to a divarication of the rectus abdominis muscle (DRAM). This increases the inter-recti distance (IRD), which is associated with lumbopelvic pain and pelvic floor dysfunction (Benjamin *et al.* 2014). Postnatal women with a DRAM receive physiotherapy to restore abdominal muscle function and reduce the IRD.


The aims of the study (Fig. 1) were to: (1) quantify the effects of posture on the linea alba IRD in postnatal women; and (2) test the hypothesis that the width of the linea alba is dependent on the anatomical measurement position.

Convenience sampling was used to recruit 41 postpartum women who had undergone a vaginal delivery more than 8 weeks before (mean age  $\pm$  standard deviation = 43  $\pm$  9 years). The participants completed a replicated crossover design, which facilitates good statistical power. The IRD was imaged using ultrasound scanning and a 38-mm linear probe at three points on the linea alba: (1) one-third of the distance between the umbilicus and xyphoid (superior umbilicus); (2) just superior to the umbilicus (umbilicus); and (3) halfway between the umbilicus and pubis (inferior umbilicus). All points were scanned in three postures: crook-lying, sitting and standing. The order of the postures was random, and



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**Effects of posture and anatomical location on inter-recti distance measured using ultrasound imaging in postnatal women**



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**Introduction**  
Postpartum, the widening of the linea alba leads to a divarication of the rectus abdominis muscle (DRAM). This increases the inter-recti distance (IRD), which is associated with lumbopelvic pain and pelvic-floor dysfunction. In postnatal women it is unknown whether the IRD alters in different postural positions and anatomical locations along the linea alba.

**Method**  
Convenience sampling was used to recruit 41 women more than eight-weeks postpartum (mean 9.8years  $\pm$  8.9) and who had a vaginal delivery (mean  $\pm$  SD age: 43  $\pm$  9 years).  
The IRD was measured using ultrasound imaging (Mindray DP50) with a 38-mm, 5MHz linear probe at three points on the linea alba: 1) a third of the distance between the umbilicus and xyphoid (superior umbilicus); 2) superior to the umbilicus (umbilicus) and half-way between the umbilicus; and 3) pubis (inferior umbilicus) (Figure 1). All sites were scanned in three postures; crook-lying, sitting and standing. Posture order was randomised and all scans were repeated twice within-session and the mean of the two measurements used in the analysis. Participants attended on two occasions one week apart. The IRD was measured offline with Matlab software (Figure 2).

**Aims**  
The aims of the study were:  
1. To quantify the effects of posture on the linea alba IRD in postnatal women.  
2. To test the hypothesis that the width of the linea alba is dependent on the anatomical measurement site.




Figure 1: Anatomical locations scanned (green lines)

**Analysis:** The data were analysed with a linear mixed model using SPSS. Mean differences are presented along with respective 95% CI.

**Results**  
Posture: The IRD was wider for standing than lying at both the superior umbilicus and umbilicus (Figure 3) by 0.30 cm (0.21 to 0.39cm 95%CI) and 0.20 cm (0.11 to 0.30), respectively (p<0.01).

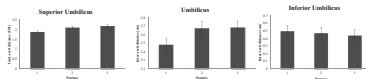


Figure 3 : Mean & 95%CI, 1=Lying, 2=Sitting, 3=Standing

At the inferior umbilicus (Figure 3), the difference between standing and lying was small and not statistically significant (0.03 to -0.15cm 95%CI, p=0.22). Differences between sitting and standing were also small at all measurement sites (p>0.09).

Anatomical: Measurements at the inferior umbilicus were, on average, 1.6 and 2.1 cm lower than superior umbilicus and umbilicus sites, respectively (p<0.01). The 95%CI for the mean difference between superior umbilicus and umbilicus was 0.51 to 0.61 cm (p<0.01).

**Conclusion**  
The study showed that posture effects the IRD. The IRD is wider in sitting and standing compared with lying, at both the superior umbilicus and umbilicus. There is a difference in IRD between all sites measured.  
**Impact and Implications**  
In clinical practice the IRD is measured in crook-lying, a non-functional position. Our data show that measurement of IRD in functional positions produces larger IRD values questioning the clinical usefulness of measurements in lying. The findings also have implications for the posture in which exercises are carried out, but this requires further research. The marked difference in IRD between imaging sites illustrates the importance of anatomical location. Clinicians and researchers should consider this when assessing patients and interpreting the literature.

**Figure 1.** “Effects of posture and anatomical location on inter-recti distance measured using ultrasound imaging in postnatal women” poster.

all scans were replicated twice within each session. The participants attended on two occasions, which were one week apart. The IRD was measured offline with MATLAB 7.1 software (MathWorks, Inc., Natick, MA, USA). The data were analysed with a linear mixed model using the SPSS Statistics V22.0 software package (IBM Corporation, Endicott, NY, USA), and are presented as means and 95% confidence intervals (CIs).

The IRD was wider for standing versus lying at both the superior umbilicus and the umbilicus by 0.30 cm (0.21–0.39 cm) and 0.20 cm (0.11–0.30 cm), respectively ( $P < 0.00005$ ). At the inferior umbilicus, the difference between standing and lying was small and not statistically significant (0.03 to -0.15,  $P = 0.22$ ). Differences between sitting and standing were also small at all measurement points ( $P > 0.09$ ). Measurements at the inferior umbilicus were, on average, 1.6 and 2.1 cm lower than the superior umbilicus

and umbilicus sites, respectively ( $P < 0.0005$ ). The 95% CI for the mean difference between the superior umbilicus and umbilicus was 0.51–0.61 cm ( $P < 0.0005$ ).

It was concluded that the IRD is wider at the superior umbilicus and umbilicus in sitting and standing compared with lying. There was a difference in IRD between all the points measured.

In clinical practice, IRD is measured in crook-lying, a non-functional position. The present data show that the measurement of IRD in functional positions produces larger IRD values. This result calls the clinical usefulness of measurements made in lying into question. The findings also have implications for the posture in which exercises are carried out, but this requires further research. The marked difference in IRD between imaging points illustrates the importance of anatomical location. Clinicians and researchers should consider this when assessing patients and interpreting the literature.

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**Reference**

Benjamin D. R., van de Water A. T. M. & Peiris C. L. (2014) Effects of exercise on diastasis of the rectus abdominis muscle in antenatal and postnatal periods: a systematic review. *Physiotherapy* **100** (1), 1–8.

**Introduction of independent physiotherapy prescribing: a potential for efficiency savings on the NHS**

Supplementary prescribing rights for physiotherapists were initiated in May 2005. In August 2013, the legislation was changed in order to

**Figure 2.** “Introduction of independent physiotherapy prescribing: a potential for efficiency savings on the NHS” poster.

allow independent prescribing rights for practitioners. The present poster illustrates the journey a clinical specialist physiotherapist took to become an independent prescriber practitioner (Fig. 2). The potential benefits to patients and the service are discussed, including efficiency savings within the NHS and a personal formulary peculiar to the specialty. While there are some potential barriers to practitioners gaining independent prescribing rights, future practice looks to allow for more-integrated and efficient women’s health, men’s health and pelvic rehabilitation services.

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