

## Diastasis Rectus Abdominis (DRAM)

### Introduction

Pregnancy-related pelvic girdle pain is said to affect 45% of women during pregnancy (Lee et al, 2008). It is recognised that the transversus abdominis plays an important role in supporting the lumbo-pelvic region in pregnancy. DRAM (diastasis rectus abdominus or split rectus) has the potential to disrupt this mechanism.

33% of women have DRAM at 21 weeks gestation, 60% at 6 weeks post-partum and 45% at 6 months post-partum (Bakken Sperstad et al, 2016). Inter-recti distance (IRD) decreased markedly from day 1 to 8 weeks post-partum without any intervention (Boissonnault & Blaschak, 1988) but 1 year post-partum 32.6% of women still had abnormally wide IRD. From the limited evidence, there is nothing to support further spontaneous closure at the end of the first year post-partum which has important implications for therapy rehabilitation.

### Anatomy:

- The antero-medial abdominal wall consists of the abdominal rectus muscles separated by the linea alba, which is a fascia stretching from the xyphoid process to the pubic symphysis. It consists of aponeuroses of the transverses abdominal, external and internal abdominal oblique muscles (Akram & Matzen, 2014).
- DRAM is the separation of the abdominal muscles and is a common after some pregnancies, or many years of abdominal load with poor technique (Lee, 2007).
- DRAM is diagnosed when the width of the linea alba (inter-recti distance) is wider than the accepted normal levels.
- Normal distances can be highly variable (see appendix 1).

### Risk Factors for DRAM:

- Being overweight or obese
- Being an athlete
- DRAM during a previous pregnancy
- There may be a genetic link
- Caesarean-section delivery may increase the risk of DRAM compared to vaginal delivery (Candido et al. 2005) however this is disputed (Sancho et al. 2015).

### Scope of practice

These guidelines are designed to guide physiotherapists when treating patients following DRAM diagnosis. A process of systematic review of the current evidence based literature, medical and peer consultation produced these guidelines. They were correct at the time of writing. The guidelines should be used in conjunction with the clinical reasoning skills of the physiotherapist and patients should always be treated on a case-by-case basis.

### Aim

The aim of these guidelines is to provide physiotherapy staff with a series of recommendations from the current evidence base to assist them in the assessment and management of patients who have been diagnosed with DRAM, with emphasis on post-partum women.

**Literature review question**

What is the best physiotherapy assessment and rehabilitation for DRAM in the post-natal population?

**Search Process**

Appraisal process: Question formulated, keywords selected using PICO, databases searched, articles obtained, reference lists searched of selected articles, articles appraised, consolidation of evidence, evidence graded and report written.

Total number of articles selected: 15

Total number of articles discarded: 133

CASPs used: 0

Data Bases:

Data Bases:	Dates	Limitations
Cinahl	2010 to current	English
PubMed	2010 to current	English
Ahmed	2010 to current	English
Medline	2010 to current	English
Cochrane	2010 to current	English
The NHS Knowledge Network	2010 to current	English

Key words:

diastasis rectus	split rectus
rectus abdominis	post-natal
post-birth	pregnancy
ante-natal	physiotherapy
physical therapy	strengthening
advice	core stability
rehabilitation	exercise

**Results**

There is limited robust evidence evaluating the assessment and management of DRAM to date.

**Assessment:**

- Dial callipers and finger-breadth distance measurement both have good intra-rater reliability (Boxer & Jones 1997) (D).
- Finger-breadth measurement had moderate (63%) inter-rater agreement. (van de Water & Benjamin, 2016) (A3).
- Calipers and ultrasound have a low measurement error was found (above the umbilicus), and good agreement (83%) for discriminative purposes (van de Water & Benjamin, 2016) (A3).
- Ultrasound imaging is the gold standard but may have clinical feasibility issues (Chiarello & McAuley, 2013; van de Water & Benjamin, 2016) (A3).
- IRD should be measured at rest and during activation of rectus abdominis ('curl up') (Hsai & Jones 2000) (C).

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### Exercise:

- Current literature supports the following ante-natal intervention:
  - Walking
  - Vigorous activity/exercise
  - 6 weeks of abdominal strengthening programme (a 90 minute weekly class)
  - Antenatal classes from week 30-39 (Benjamin et al. 2014) (A3).
- Post-natal individual abdominal and pelvic floor exercise from physiotherapy at 6 hours and 18 hours post-delivery.(Benjamin et al 2014) (A3)
- Quadruped exercises should be avoided until the patient can maintain contraction of the transverse abdominis against gravity to prevent bulging of the linea alba (Litos 2014) (C). Good early starting positions include:
  - Crook lying
  - Supported backward lean sitting
  - Side lying (Sheppard 1996) (C)
- Exercise regimes may include:
  - Supine crook lying – deep diaphragmatic breathing to enable deep abdominal contraction on exhalation
  - Supine crook lying – pillow between knees and contraction of the pelvic floor. Then add a pelvic tilt to contract transverse abdominis followed by an isometric contraction
  - Supine crook lying – contract obliques by rotating trunk and lifting scapula off the bed (Mesquita et al. 1999 cited in Benjamin et al. 2014, p. 4) (B).
- Progress to prone lying once comfort allows then into prone kneeling as patient is able to contract the transverse abdominis in this position (Sheppard 1996) (C).
- Exercises should be individualised and progressed to include functional activities (Litos 2014; Benjamin 2014) (A3).

### Advice:

- Once patient able to recruit transverse abdominis for 10 secs x 10 repetitions (arbitrary aim), encourage 25% of maximal voluntary contraction in all daily postures (Sheppard 1996) (C).
- Advice to avoid abdominal exercises that may further gap the inter-recti muscles such as sit-ups, crunches, aggressive stretching of the abdominals and rotational trunk exercises should not be given (Litos, 2014) (C).
- Symmetrical weight-bearing to avoid excessive load transfer (Litos 2014) (C) e.g. avoid holding the baby on one hip.
- Good postural alignment with sitting and standing activities for optimal muscle activation (Litos 2014) (C).
- Biomechanical strategies activating abdominals, pelvic floor muscles with diaphragmatic breathing during functional transfers (such as rolling over, supine to sit, sit to stand) and lifting activities (Litos 2014) (C).
- Self-bracing abdomen with hands or pillow to approximate the recti muscles during laughing, coughing and sneezing (Litos 2014) (C).
- Tubi-grip/abdominal corset may be helpful reducing DRAM post-natally (Benjamin et al. 2014) (A3).

N.B.: Asking patient's post-vaginal delivery to initiate pelvic floor contraction to facilitate transabdominis is often very difficult (Sheppard 1996) (C).

### **Surgery:**

Abdominoplasty is the term used to describe a variety of procedures to reshape the abdomen. Patients requesting abdominoplasty have excess abdominal skin and subcutaneous tissue with or without laxity of the abdominal wall musculature. The causes vary, although pregnancy, particularly multiple pregnancies is the most common factor.

There is limited research in the area of abdominoplasty specifically in the management of patients with DRAM, however there is consensus that this surgery cannot be purely considered for cosmetic reasons. There is some evidence by Lee et al (2008) regarding considerations for surgery:

- The IRD remains greater than the normal (as quoted in appendix 1) and the abdominal contents are easily palpated through midline fascia.
- Surgery could be considered for patients 1 year post-partum if they have failed to regain normal function and have not improved their lumbo-pelvic pain despite a multi-modal exercise regime.\*
- Morbid obesity is generally considered a contraindication for abdominoplasty.
- Another consideration is the intention to have further pregnancies making the procedure potentially redundant – the rationale is that further pregnancy will potentially reverse the effects of the abdominoplasty.

\*On contacting obstetric surgeons and women's health physiotherapists within NHS Lothian, we have found no evidence abdominoplasty is carried out in our health board for DRAM.

**Appendix 1**

Table 1 Normal inter-recti distance Beer et al (2009) (A2)

Level	Inter-recti distance
xyphoid	7mm +/- 5mm
3cm above umbilicus	13mm +/- 7mm
2cm below umbilicus	8mm +/- 6mm

Table 2 Normal Inter-recti Distance Rath et al (1996) (D)

Level	Inter-recti distance	
	< 45 years old	> 45 years old
Supra umbilical level	10mm	15mm
Umbilicus	27mm	27 mm
Between symphysis pubis and umbilicus	9mm	14mm

Abnormal gaps have been reported as:

- >1.5cm (Engelhardt, 1998; Gilleard & Brown, 1996)
- >2cm (Potter et al, 1997; Lo et al, 1999)
- >2.5cm (Candido et al 2005)
- >2.7cm (Benjamin et al, 2014; Boissonault & Blaschak 1988)
- >2 fingers when measured in crook lying (Bursch, 1987; Sheppard, 1996)

} Lying  
at rest

## Appendix 2

### Levels of Evidence

Evidence from large randomised controlled trials (RCTs) or systematic review (including meta analyses)† A1

Evidence from at least one high quality cohort A2

Evidence from at least on moderate size RCT or systematic review A3

Evidence from at least one RCT B

Expert opinions C

Laboratory Evidence\* D

† *Arbitrarily, the following cut-off points have been used: large study size \_ 50 patients per*

*intervention group; moderate study size \_ 30 patients per intervention group.*

\* *Arbitrarily, added by Lothian Physiotherapy Musculoskeletal Network Group*

Modified from: MacAuley D and Best TM (2007) Evidence-based Sports Medicine. 2nd Edition. BMJ Books. Blackwell Publishing. Oxford, UK.

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