# How to confidently work with clients with diastasis

**Part 1: Anatomy & causes**

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# About me

- Bachelor of Exercise & Sport Science, Master of Clinical Exercise Physiology
- CEO of Breathe Education
- My mission is to use science to help you become a better, happier & more successful movement professional
- Coffee person
- Dog person
- Introvert
- Pineapple on pizza person

# Learning goals

1. Diastasis is a widening of the linea alba
2. We don't know the normal width of the linea alba
3. All the abdominal muscles insert into the linea alba
4. Rectus abdominis narrows the linea alba, TrA & pelvic floor widen the linea alba
5. Diastasis may be a result of a combination of variation in the internal oblique insertion, less collagen in connective tissue, plus factors that increase intra-abdominal pressure

# What diastasis is

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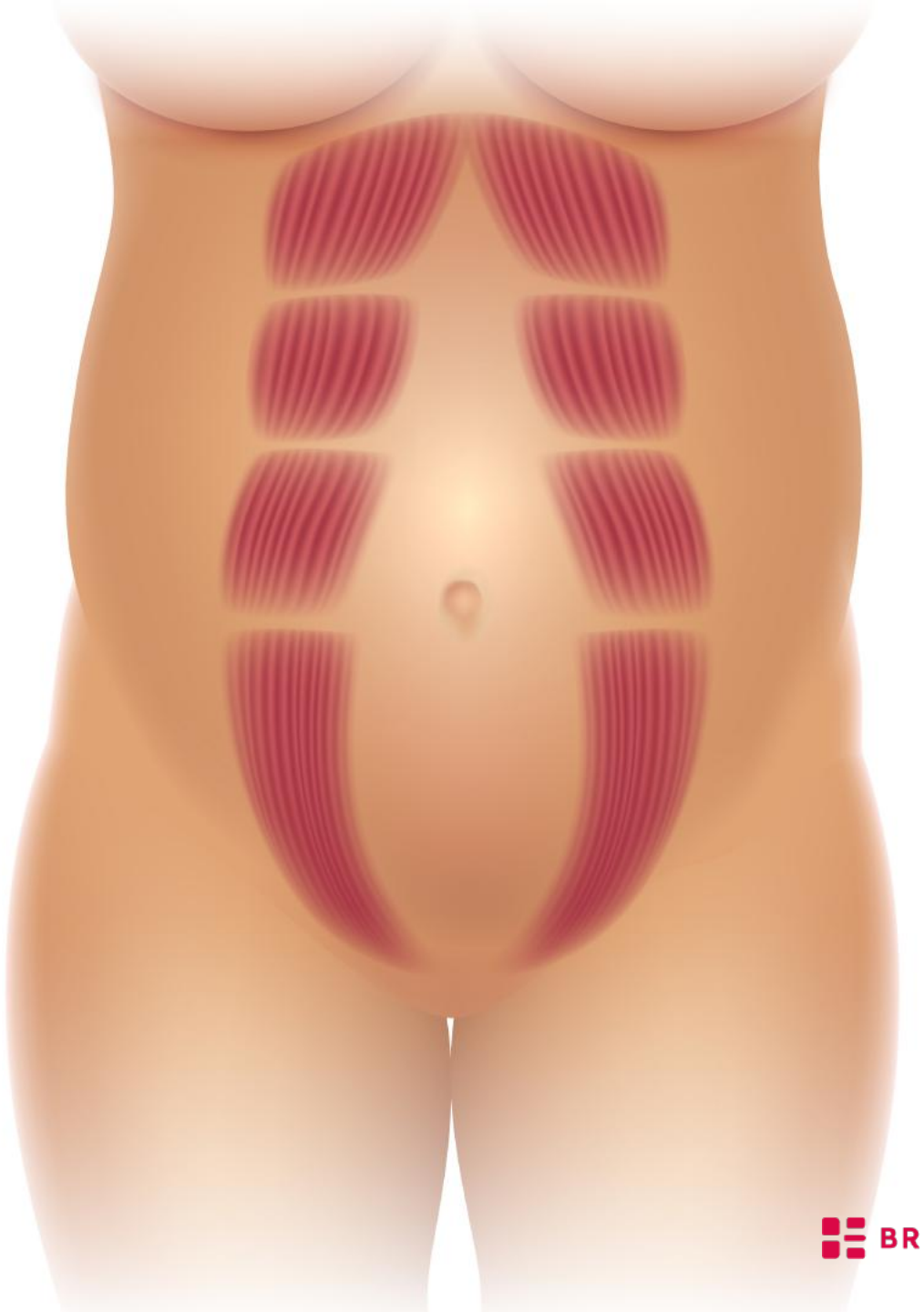

# Diastasis Recti Abdominis

Aka DRAM / DRA / abdominal separation

Diastasis = separation

Recti = plural of rectus

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You have a left & right rectus abdominis

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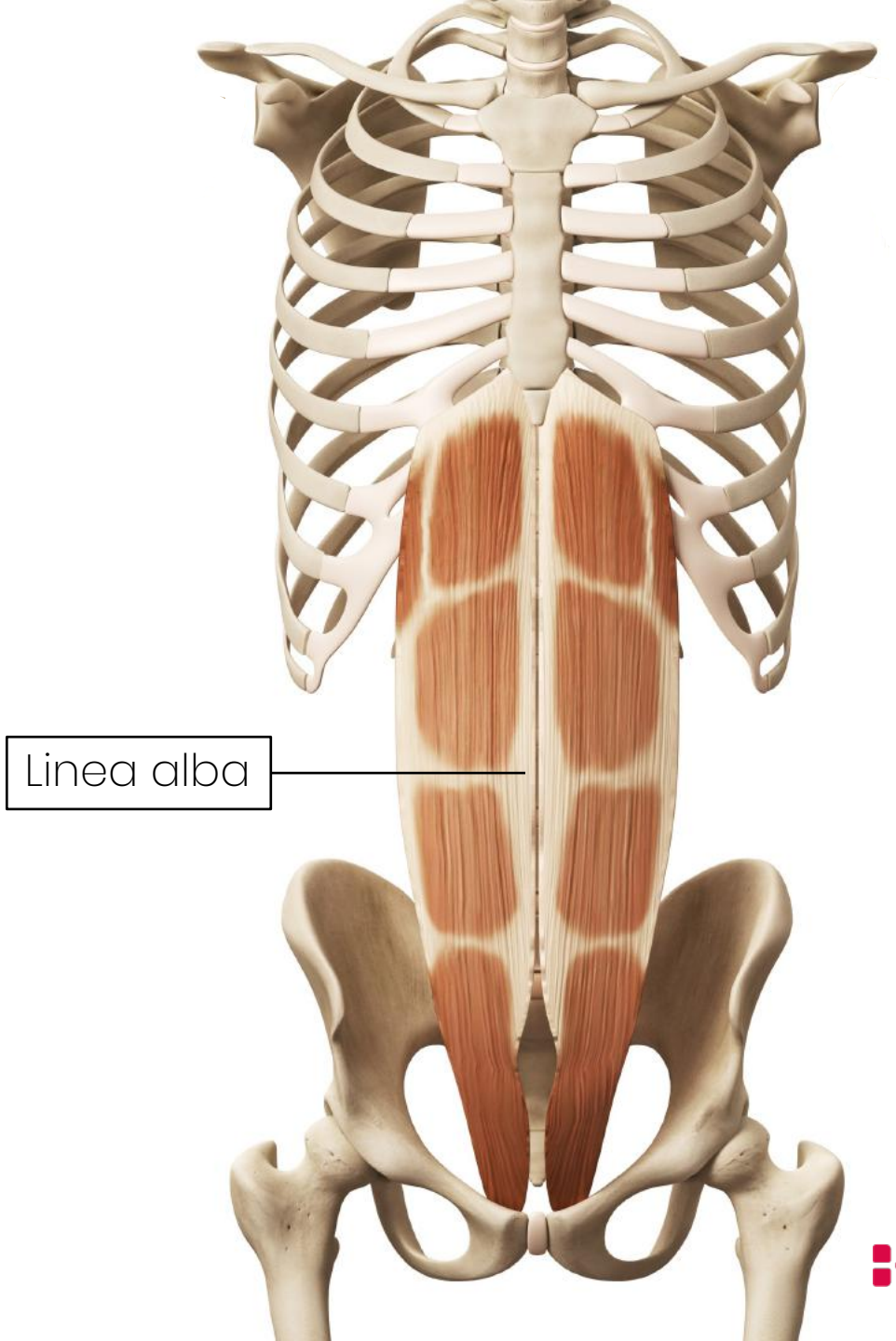


# The 2 halves of the rectus muscle are separated by the linea alba

Linea = line

Alba = white

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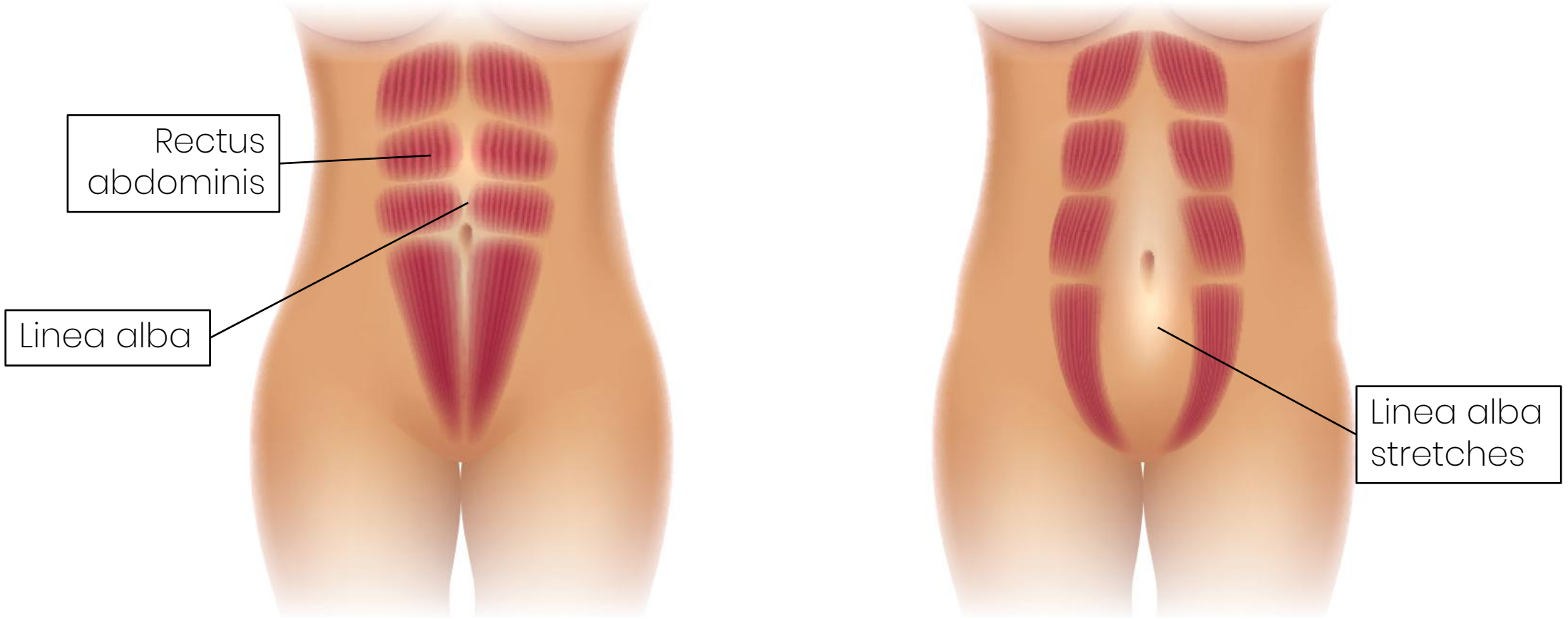
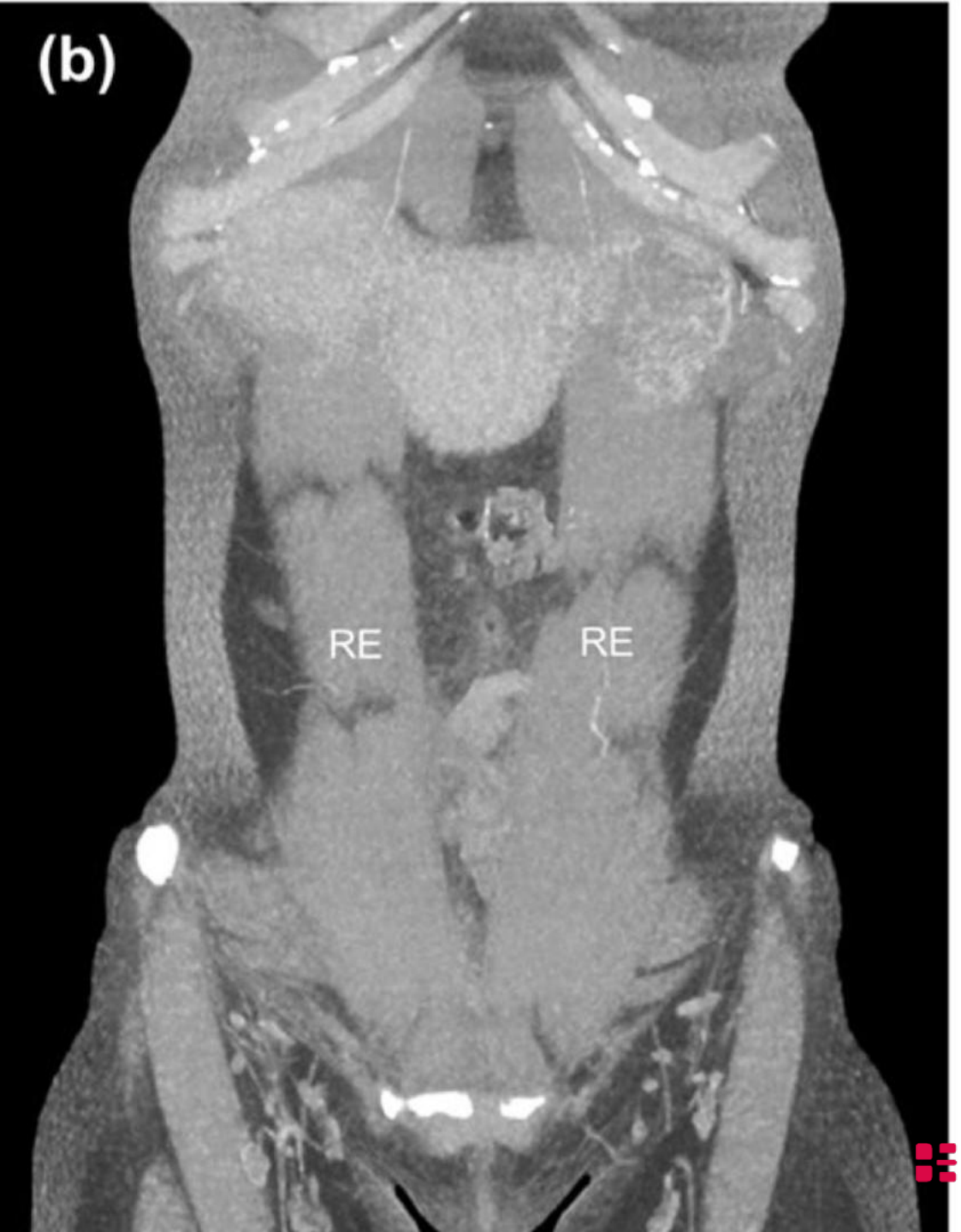
# In DRAM the linea alba stretches




Normal

Diastasis recti abdominis muscle (DRAM)





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CT scan

Plumb, A., Windsor, A., & Ross, D. (2021). Contemporary imaging of rectus diastasis and the abdominal wall. Hernia, 25(4), 921-927 https://be-lecture-notes.s3.amazonaws.com/Diastasis/plumb2021.pdf .


# Anatomy IRL

IRL = in real life

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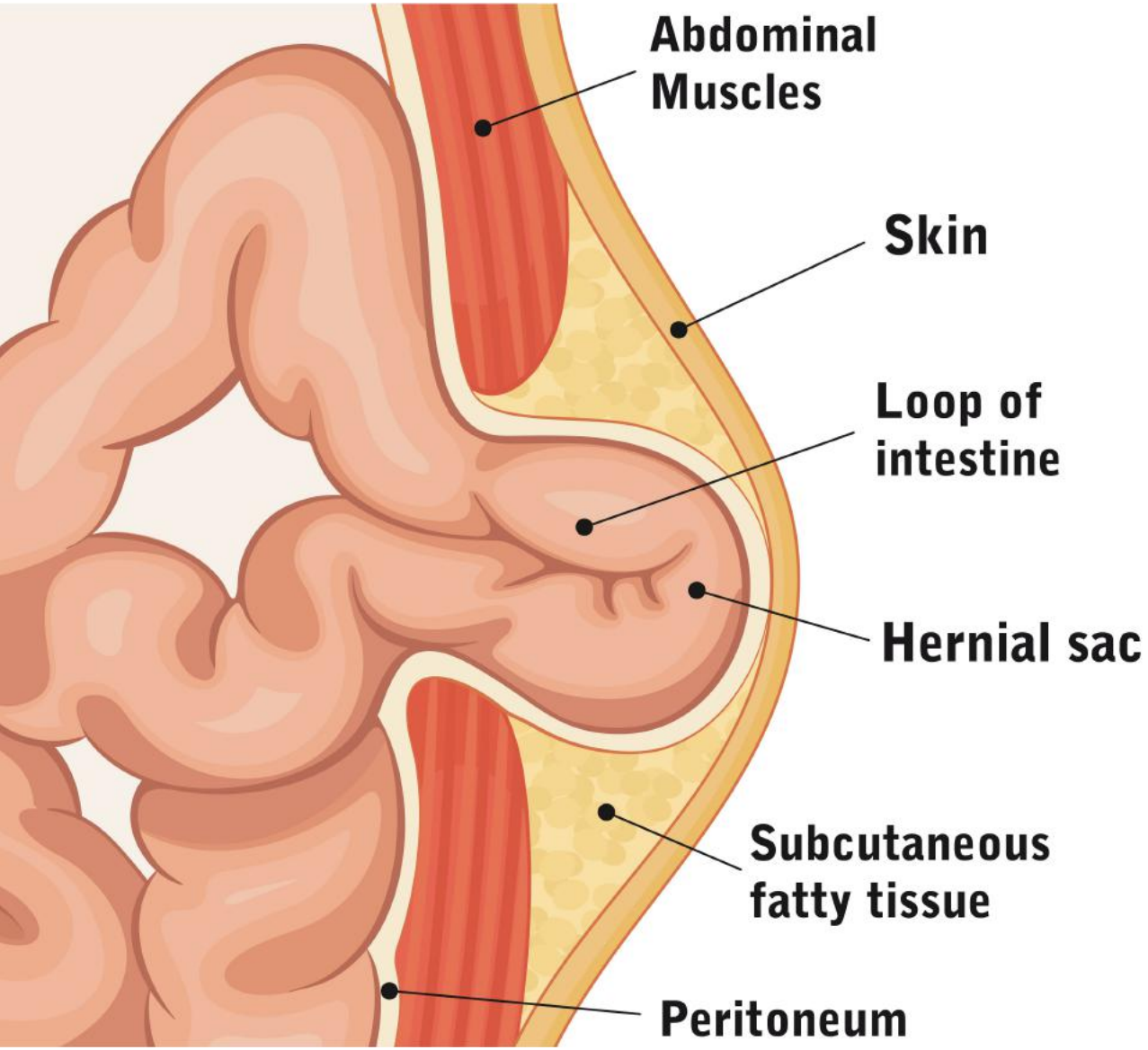


# Diastasis is different from hernia because the linea alba remains intact

In a ventral hernia a hole forms in the linea alba

Cavalli, M., Aiolfi, A., Bruni, P., Manfredini, L., Lombardo, F., Bonfanti, M., . . . Campanelli, G. (2021). Prevalence and risk factors for diastasis recti abdominis: a review and proposal of a new anatomical variation. Hernia, 1-8. https://be-research-papers.s3.amazonaws.com/Diploma%20lecture%20research%20papers/Lecture%2041%20Pre%20and%20postnatal/Cavalli-2021-Prevalence%20and%20risk%20factors%20for%20d.pdf

# Self-test

- True/False: You have a left and right rectus abdominis
- True/False: The two halves of the rectus abdominis are separated by the linea alba
- True/False: Diastasis recti abdominis is a widening of the linea alba

# Why we don't know the normal width of the linea alba

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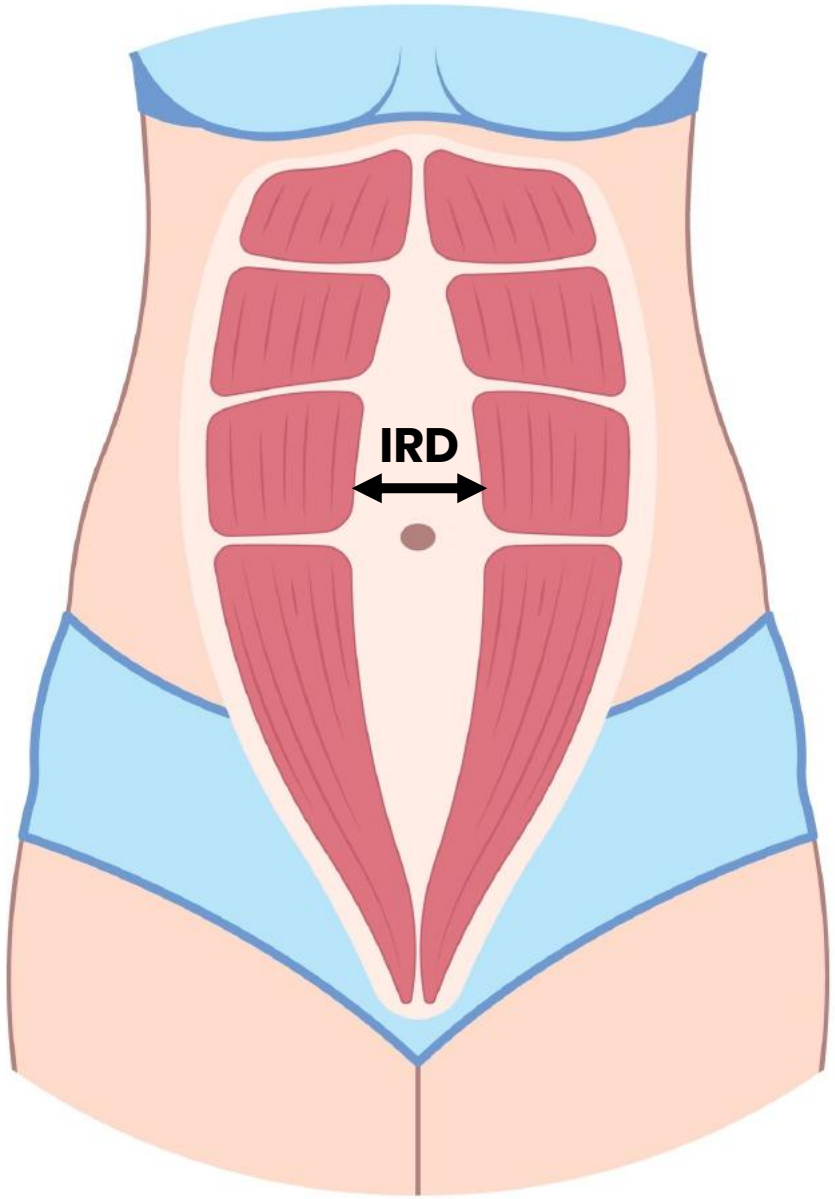



# Diastasis is measured by inter-recti distance **IRD**

IRD = the distance between the left & right halves of the rectus abdominis muscle

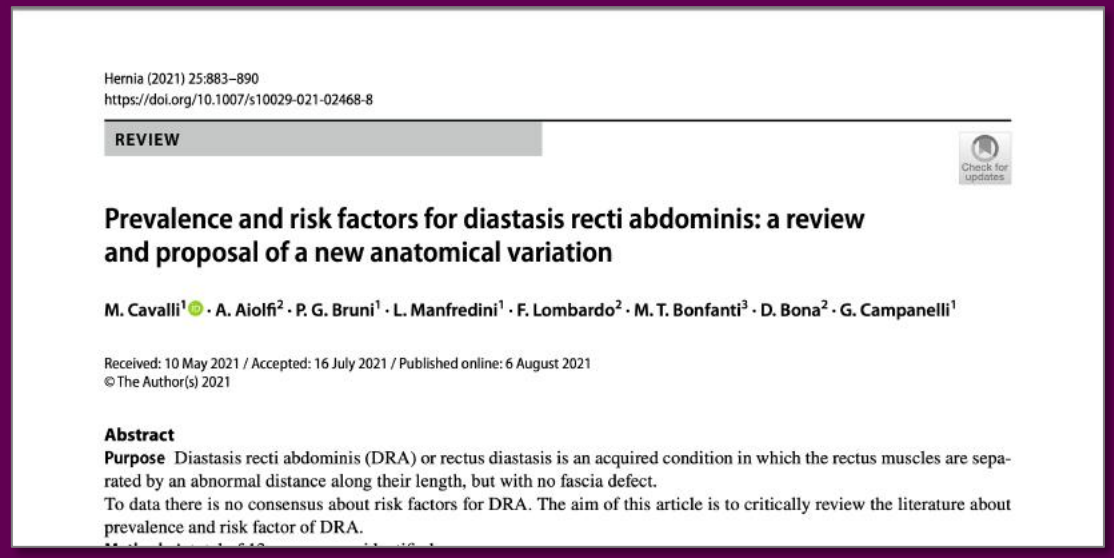
# There is no single agreed definition of diastasis

van de Water, A., & Benjamin, D. (2016). Measurement methods to assess diastasis of the rectus abdominis muscle (DRAM): A systematic review of their measurement properties and meta-analytic reliability generalisation. Manual Therapy(21), 41-53. https://be-lecture-notes.s3.amazonaws.com/Diastasis/vandewater2016.pdf

# Because studies on the “normal” width of the linea alba:

- Use different measurement methods: calipers, fingers, ultrasound
- Measure at different locations above or below the navel
- Measure in different body positions standing, seated, supine
- Measure with abdominal muscles relaxed or contracted

Cavalli, M., Aiolfi, A., Bruni, P., Manfredini, L., Lombardo, F., Bonfanti, M., . . . Campanelli, G. (2021). Prevalence and risk factors for diastasis recti abdominis: a review and proposal of a new anatomical variation. Hernia, 1-8. https://be-research-papers.s3.amazonaws.com/Diploma%20lecture%20research%20papers/Lecture%2041%20Pre%20and%20postnatal/Cavalli-2021-Prevalence%20and%20risk%20factors%20for%20d.pdf



Hernia (2021) 25:883–890
https://doi.org/10.1007/s10029-021-02468-8

REVIEW

Check for updates

**Prevalence and risk factors for diastasis recti abdominis: a review and proposal of a new anatomical variation**

M. Cavalli[1] · A. Aiolfi[2] · P. G. Bruni[1] · L. Manfredini[1] · F. Lombardo[2] · M. T. Bonfanti[3] · D. Bona[2] · G. Campanelli[1]

Received: 10 May 2021 / Accepted: 16 July 2021 / Published online: 6 August 2021


**Abstract**
**Purpose** Diastasis recti abdominis (DRA) or rectus diastasis is an acquired condition in which the rectus muscles are separated by an abnormal distance along their length, but with no fascia defect.
To data there is no consensus about risk factors for DRA. The aim of this article is to critically review the literature about prevalence and risk factor of DRA.

"The real prevalence of DRA is unknown because the prevalence rate varies with measurement method, measurement site and judgment criteria, but it is certainly an extremely frequent condition."

Cavalli, M., Aiolfi, A., Bruni, P., Manfredini, L., Lombardo, F., Bonfanti, M., . . . Campanelli, G. (2021). Prevalence and risk factors for diastasis recti abdominis: a review and proposal of a new anatomical variation. Hernia, 1-8. https://be-research-papers.s3.amazonaws.com/Diploma%20lecture%20research%20papers/Lecture%2041%20Pre%20and%20postnatal/Cavalli-2021-Prevalence%20and%20risk%20factors%20for%20d.pdf

# The avg width of the linea alba in men & nulliparous women is 2.2cm

Nulliparous = never been pregnant

Parous = to give birth

*Measured with ultrasound 3cm above the navel, in supine with the neck flexed, legs straight and rectus relaxed.

Beer, G. M., Schuster, A., Seifert, B., Manestar, M., Mihic-Probst, D., & Weber, S. A. (2009). The normal width of the linea alba in nulliparous women. Clinical anatomy, 22(6), 706-711. https://be-lecture-notes.s3.amazonaws.com/Diastasis/beer2009.pdf

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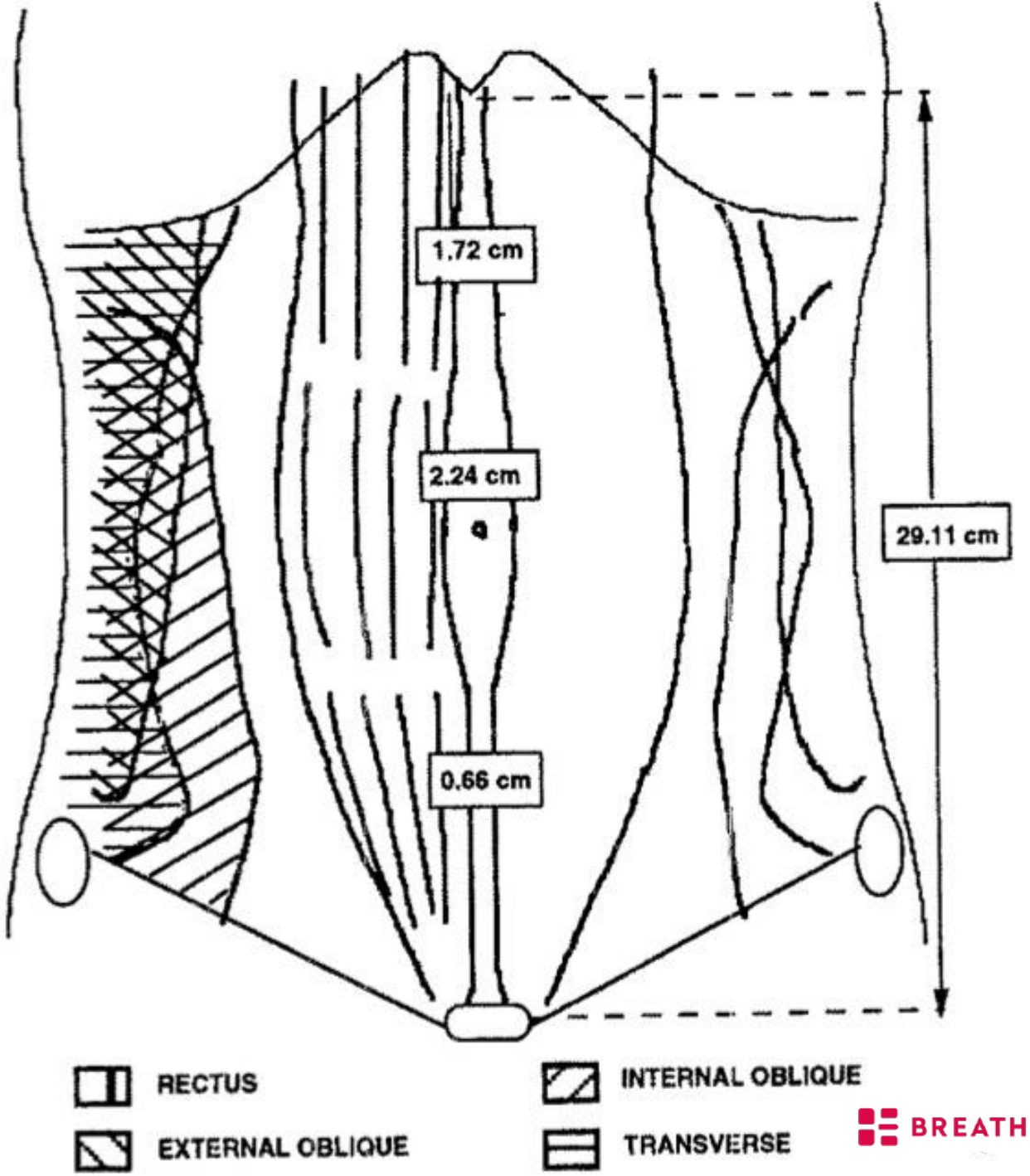
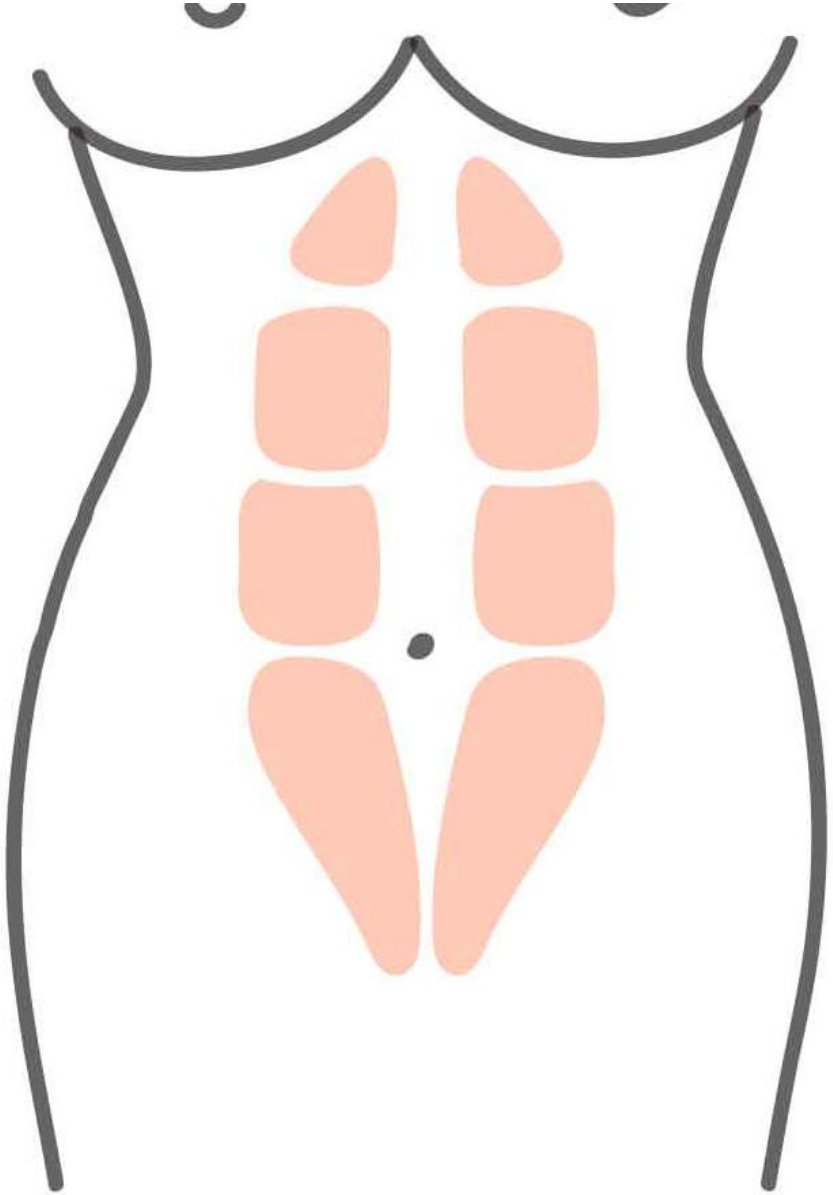


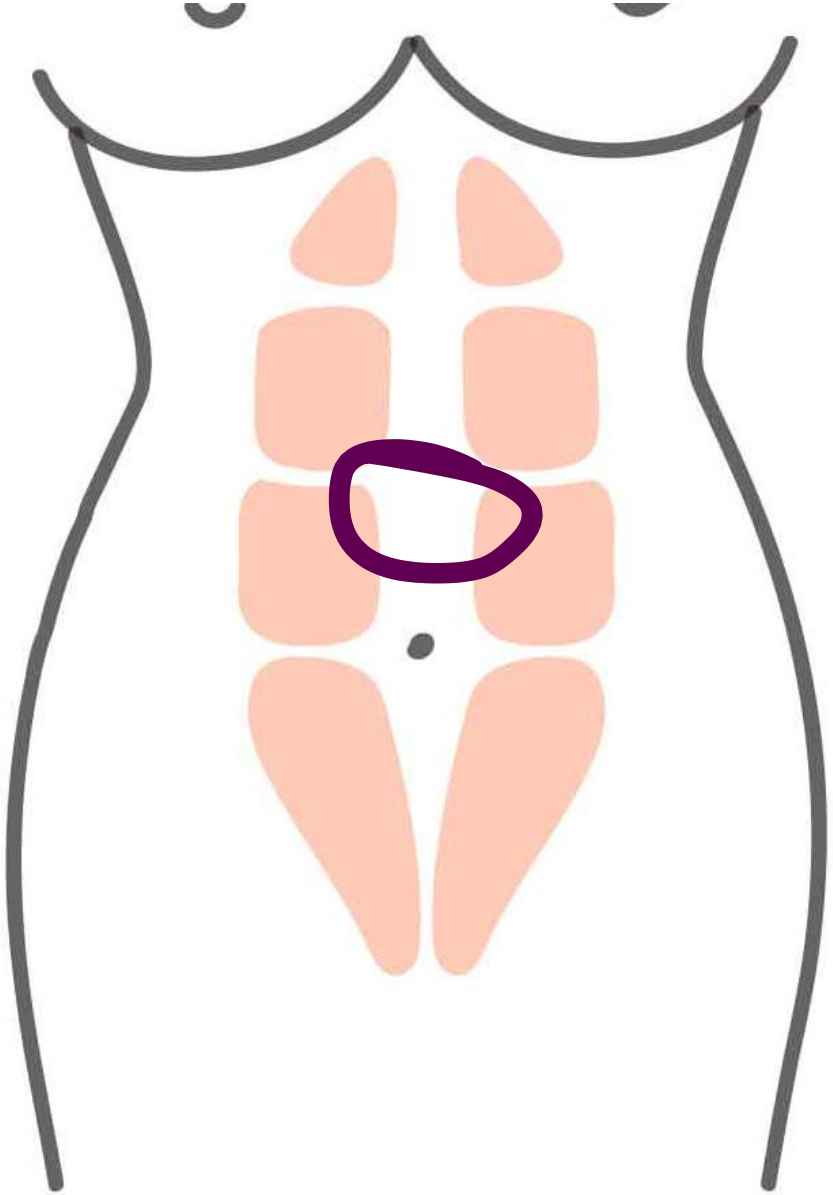

# Rath et al. defined diastasis as IRD >2.7cm at the level of the navel

Rath, A., Attali, P., Dumas, J., Goldlust, D., Zhang, J., & Chevrel, J. (1996). The abdominal linea alba: an anatomo-radiologic and biomechanical study. Surgical and Radiologic Anatomy, 18(4), 281-288. https://be-lecture-notes.s3.amazonaws.com/Diastasis/rath1996.pdf



# Candido et al. define diastasis as IRD >2.5cm anywhere on the linea alba

Candido, G., Lo, T., & Janssen, P. (2005). Risk factors for diastasis of the recti abdominis. JOURNAL-ASSOCIATION OF CHARTERED PHYSIOTHERAPISTS IN WOMENS HEALTH, 97, 49. https://be-lecture-notes.s3.amazonaws.com/Diastasis/riskfactorsfordiastatis.pdf



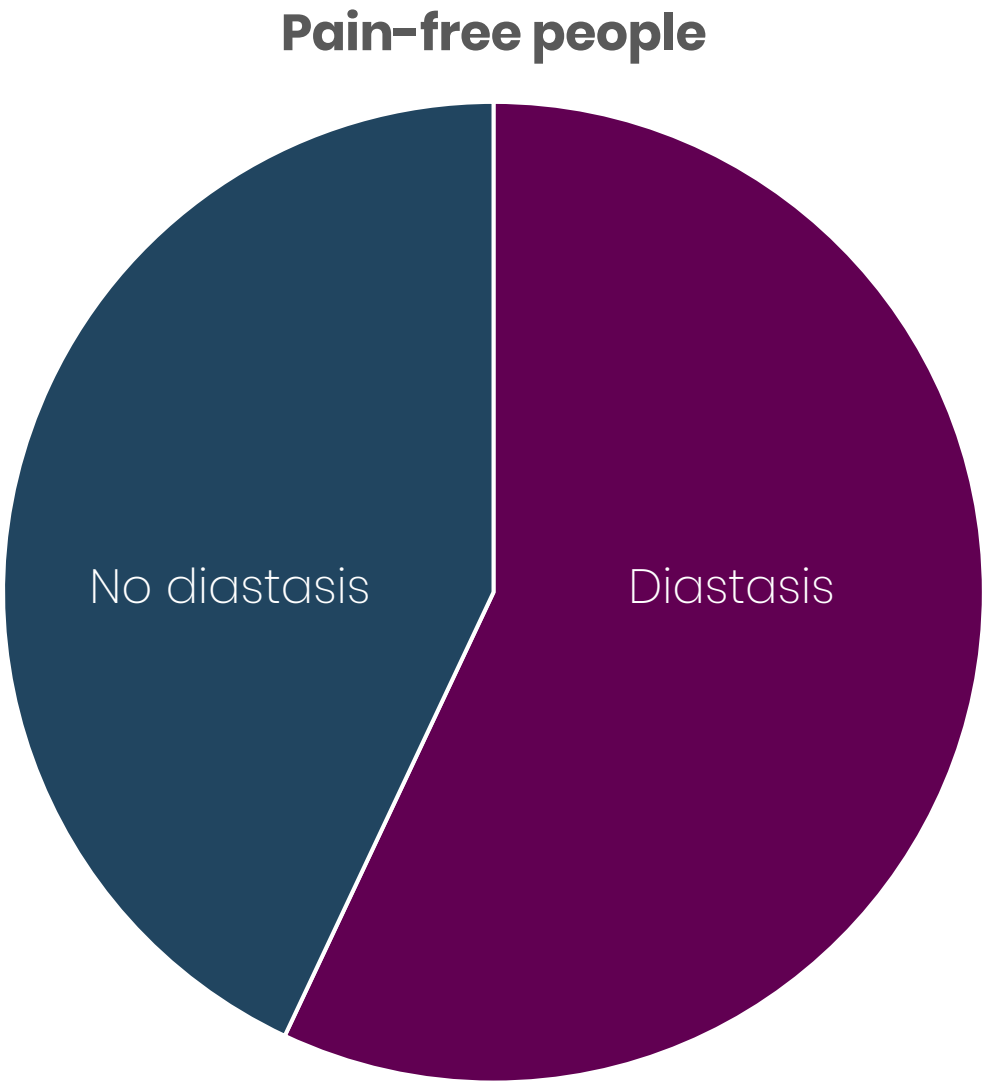
# The surgeon general defines diastasis as separation of more than 2.2cm, 3cm above the navel

Mommers, E. H. H., Ponten, J. E. H., Al Omar, A. K., de Vries Reilingh, T. S., Bouvy, N. D., & Nienhuijs, S. W. (2017). The general surgeon's perspective of rectus diastasis. A systematic review of treatment options. Surgical Endoscopy, 31(12), 4934-4949. doi:10.1007/s00464-017-5607-9
https://be-lecture-notes.s3.amazonaws.com/Diastasis/Mommers-2017-The%20general%20surgeon%E2%80%99s%20perspective.pdf

# 2022 research found IRD of up to 3.4cm is normal

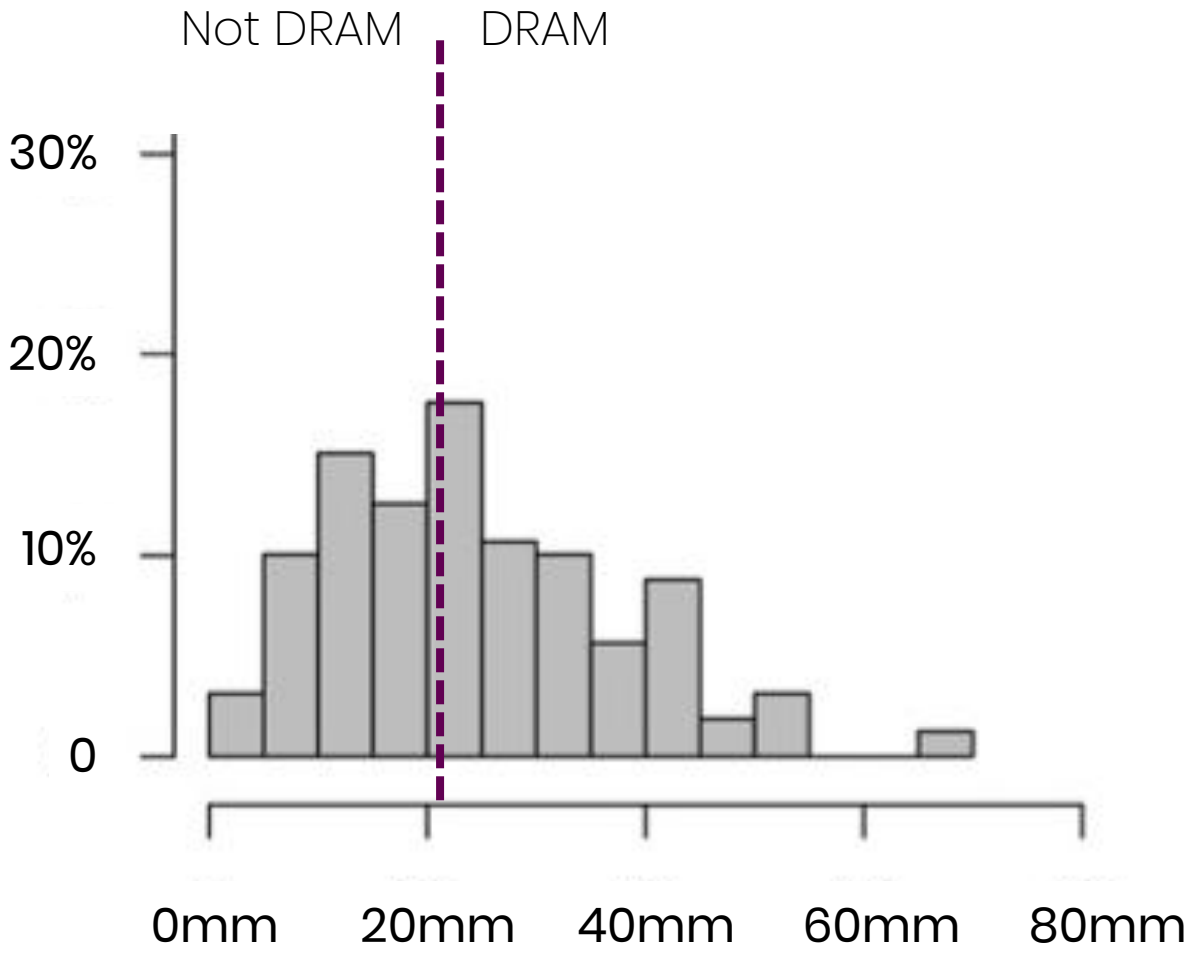
Measured with CT in supine, 3cm above the umbilicus

Kaufmann, R., Reiner, C., Dietz, U., Clavien, P., Vonlanthen, R., & Käser, S. (2022). Normal width of the linea alba, prevalence, and risk factors for diastasis recti abdominis in adults, a cross-sectional study. Hernia, 26(2), 609-618. . https://be-lecture-notes.s3.amazonaws.com/Diastasis/Kaufmann2022_Article_NormalWidthOfTheLineaAlbaPreva.pdf



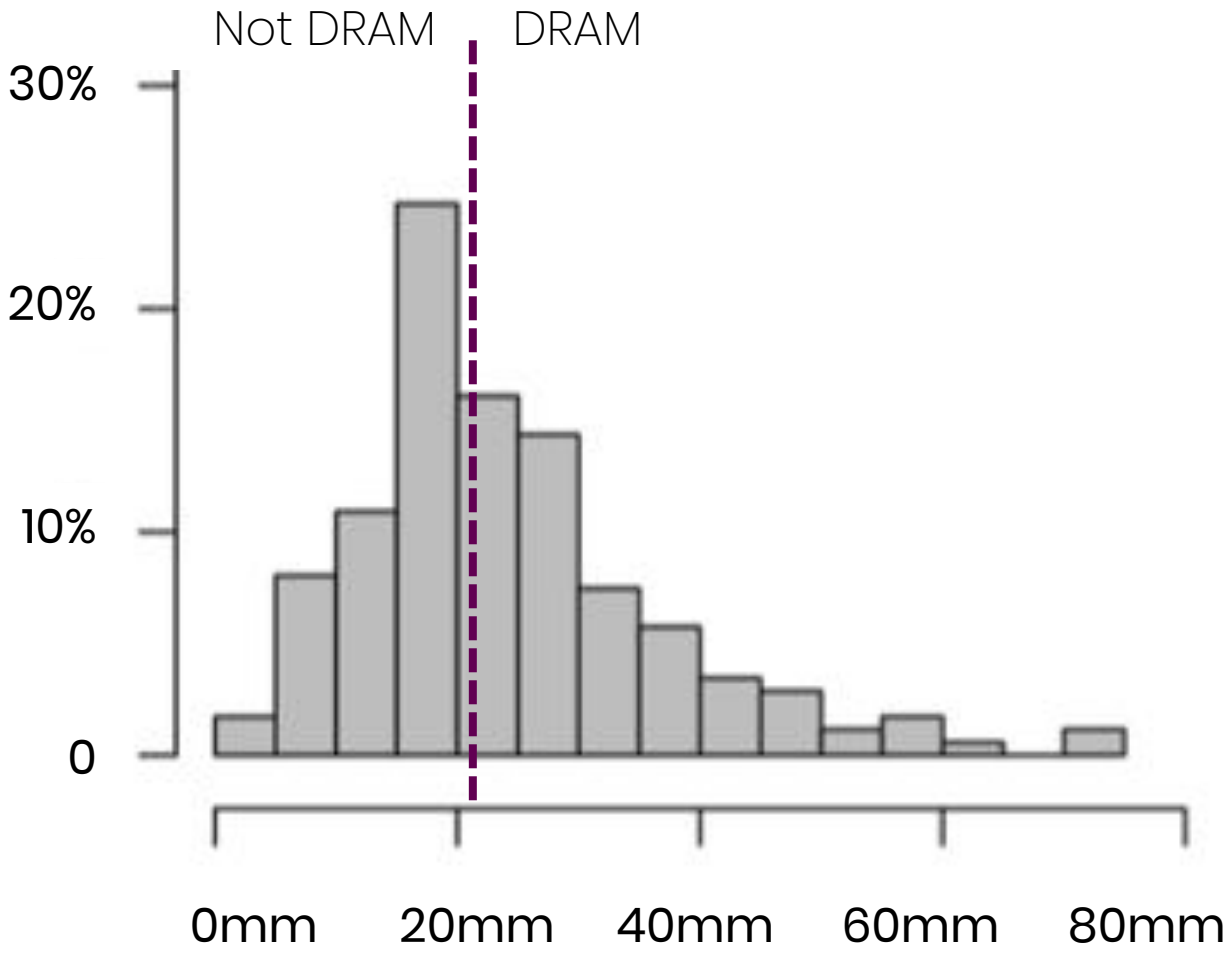

# 57% of pain-free women have diastasis

Kaufmann, R., Reiner, C., Dietz, U., Clavien, P., Vonlanthen, R., & Käser, S. (2022). Normal width of the linea alba, prevalence, and risk factors for diastasis recti abdominis in adults, a cross-sectional study. Hernia, 26(2), 609-618. . https://be-lecture-notes.s3.amazonaws.com/Diastasis/Kaufmann2022_Article_NormalWidthOfTheLineaAlbaPreva.pdf




# IRD of asymptomatic women

Kaufmann, R., Reiner, C., Dietz, U., Clavien, P., Vonlanthen, R., & Käser, S. (2022). Normal width of the linea alba, prevalence, and risk factors for diastasis recti abdominis in adults, a cross-sectional study. Hernia, 26(2), 609-618. https://be-lecture-notes.s3.amazonaws.com/Diastasis/Kaufmann2022_Article_NormalWidthOfTheLineaAlbaPreva.pdf



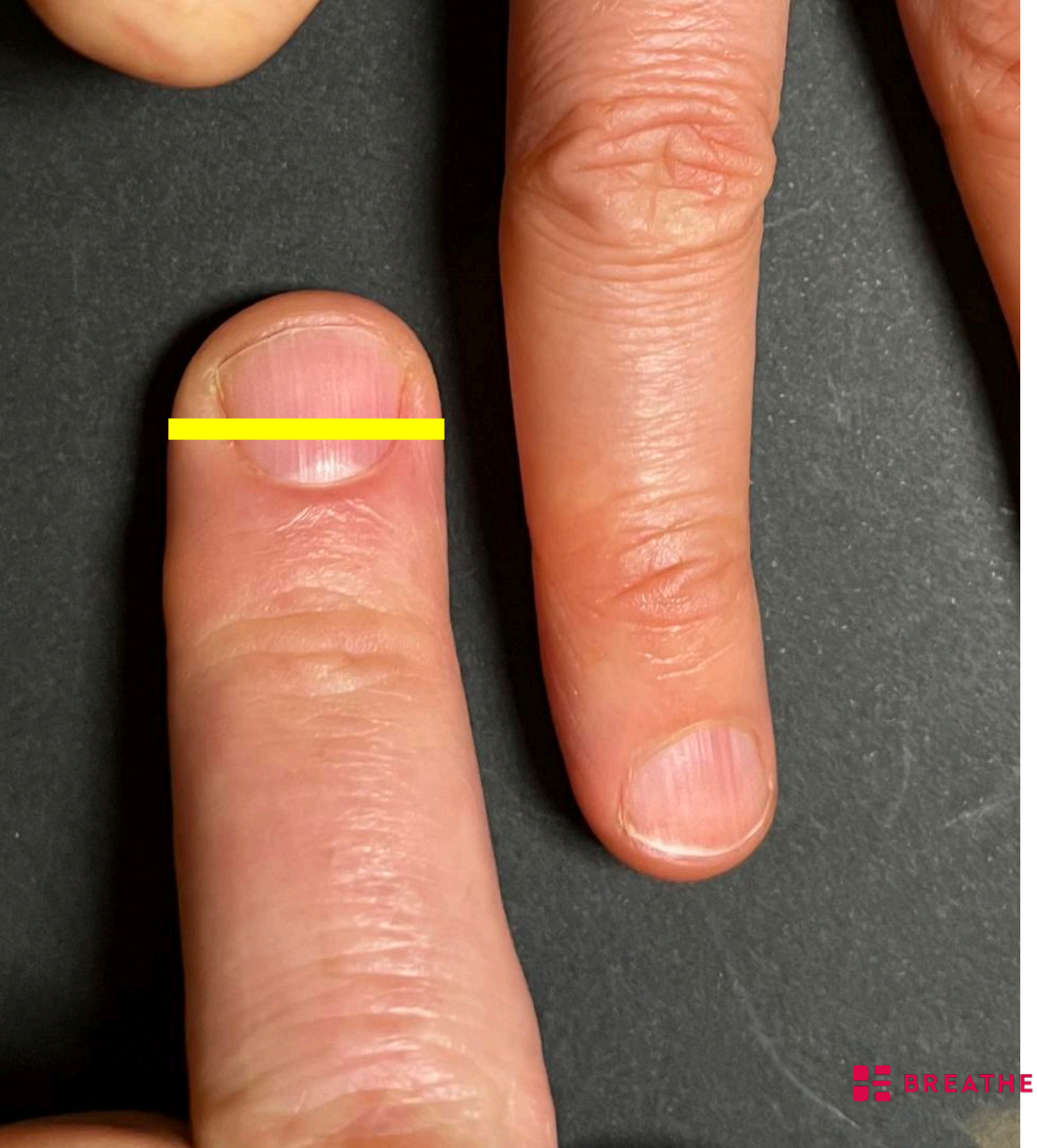

# IRD of asymptomatic men

Kaufmann, R., Reiner, C., Dietz, U., Clavien, P., Vonlanthen, R., & Käser, S. (2022). Normal width of the linea alba, prevalence, and risk factors for diastasis recti abdominis in adults, a cross-sectional study. Hernia, 26(2), 609-618. https://be-lecture-notes.s3.amazonaws.com/Diastasis/Kaufmann2022_Article_NormalWidthOfTheLineaAlbaPreva.pdf

**Results** DRA (defined as > 2 cm at 3 cm above the umbilicus) was present in 57% of the population. The 80th percentile of the interrectal distance was 10 mm at the xiphoid (median 3 mm, 95% confidence interval (CI) 0–19 mm), 27 mm halfway from xiphoid to umbilicus (median 17 mm, 95% CI 0–39 mm), 34 mm at 3 cm above the umbilicus (median 22 mm, 95% CI 0–50 mm), 32 mm at the umbilicus (median 25 mm, 95% CI 0–45 mm), 25 mm at 2 cm below the umbilicus (median 14 mm, 95% CI 0–39 mm), and 4 mm halfway from umbilicus to pubic symphysis (median 0 mm, 95% CI 0–19 mm). In the multivariate analysis, higher age ($p = 0.001$), increased body mass index ($p < 0.001$), and parity ($p < 0.037$) were independent risk factors for DRA, while split xiphoid, tobacco abuse, and umbilical hernia were not.

**Conclusion** The prevalence of DRA is much higher than commonly estimated (57%). The IRD 3 cm above the umbilicus may be considered normal up to 34 mm. To avoid over-treatment, the definition of DRA should be revised.

Kaufmann, R., Reiner, C., Dietz, U., Clavien, P., Vonlanthen, R., & Käser, S. (2022). Normal width of the linea alba, prevalence, and risk factors for diastasis recti abdominis in adults, a cross-sectional study. Hernia, 26(2), 609-618. https://be-lecture-notes.s3.amazonaws.com/Diastasis/Kaufmann2022_Article_NormalWidthOfTheLineaAlbaPreva.pdf



# Finger measurement is not accurate

- People have different width fingers
- Hard to tell the difference between DRAM & slack abdominal wall

van de Water, A., & Benjamin, D. (2016). Measurement methods to assess diastasis of the rectus abdominis muscle (DRAM): A systematic review of their measurement properties and meta-analytic reliability generalisation. Manual Therapy(21), 41-53. https://be-research-papers.s3.amazonaws.com/Diploma%20lecture%20research%20papers/Lecture%2041%20Pre%20and%20postnatal/van%20de%20Water-2016-Measurement%20methods%20to%20asses.pdf


# Callipers & ultrasound both accurately measure DRAM

Chiarello, C. M., & McAuley, J. A. (2013). Concurrent validity of calipers and ultrasound imaging to measure interrecti distance. Journal of Orthopaedic & Sports Physical Therapy, 43(7), 495-503 https://be-research-papers.s3.amazonaws.com/Diploma%20lecture%20research%20papers/Lecture%2041%20Pre%20and%20postnatal/Chiarello-2013-Concurrent%20validity%20of%20calipers.pdf

# Unfortunately many of the studies on diastasis use finger measurement

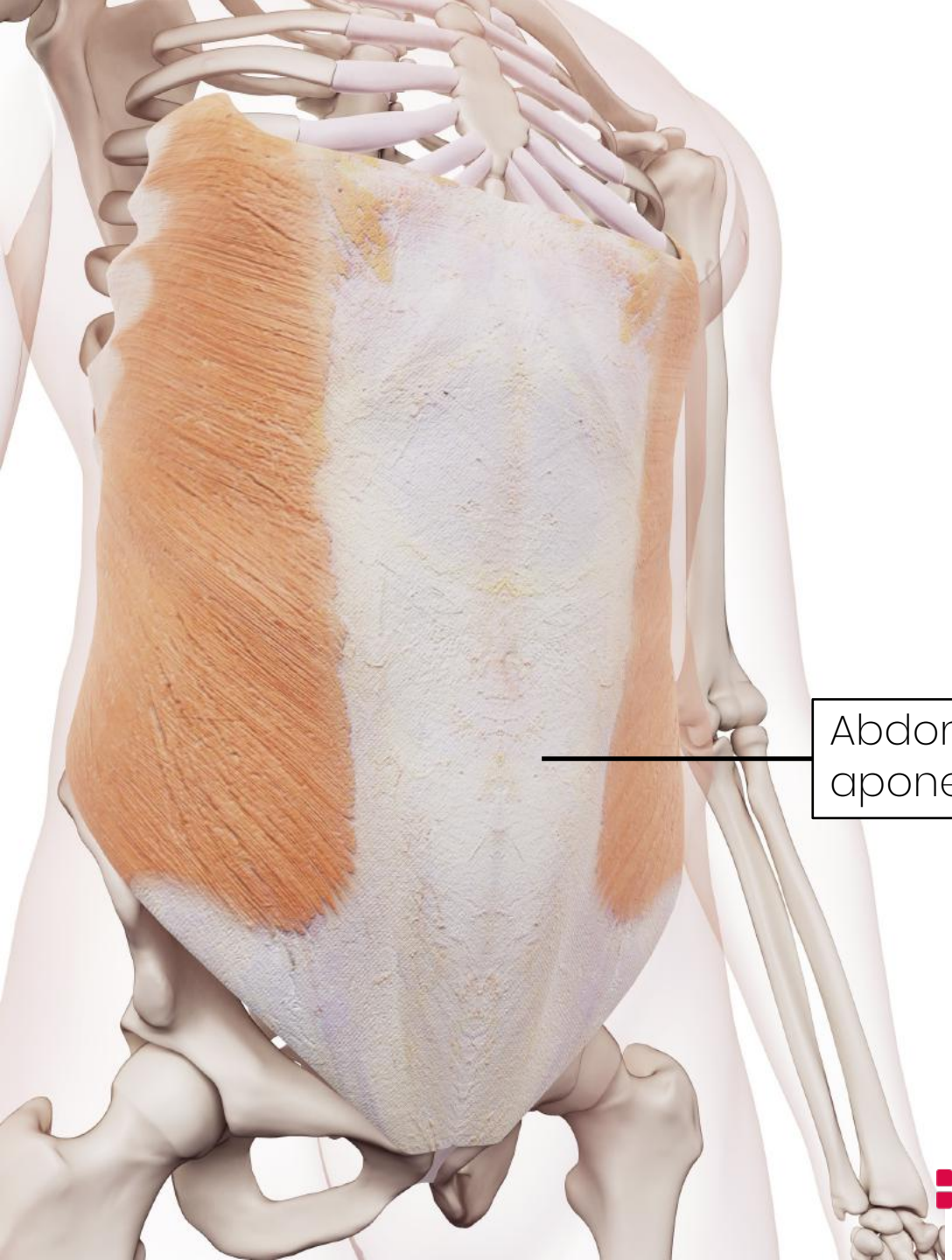
Gluppe, S., Engh, M. E., & Bø, K. (2021). What is the evidence for abdominal and pelvic floor muscle training to treat diastasis recti abdominis postpartum? A systematic review with meta-analysis. Brazilian Journal of Physical Therapy. https://be-lecture-notes.s3.amazonaws.com/Diastasis/Gluppe-2021-What%20is%20the%20evidence%20for%20abdominal.pdf

# Self-test

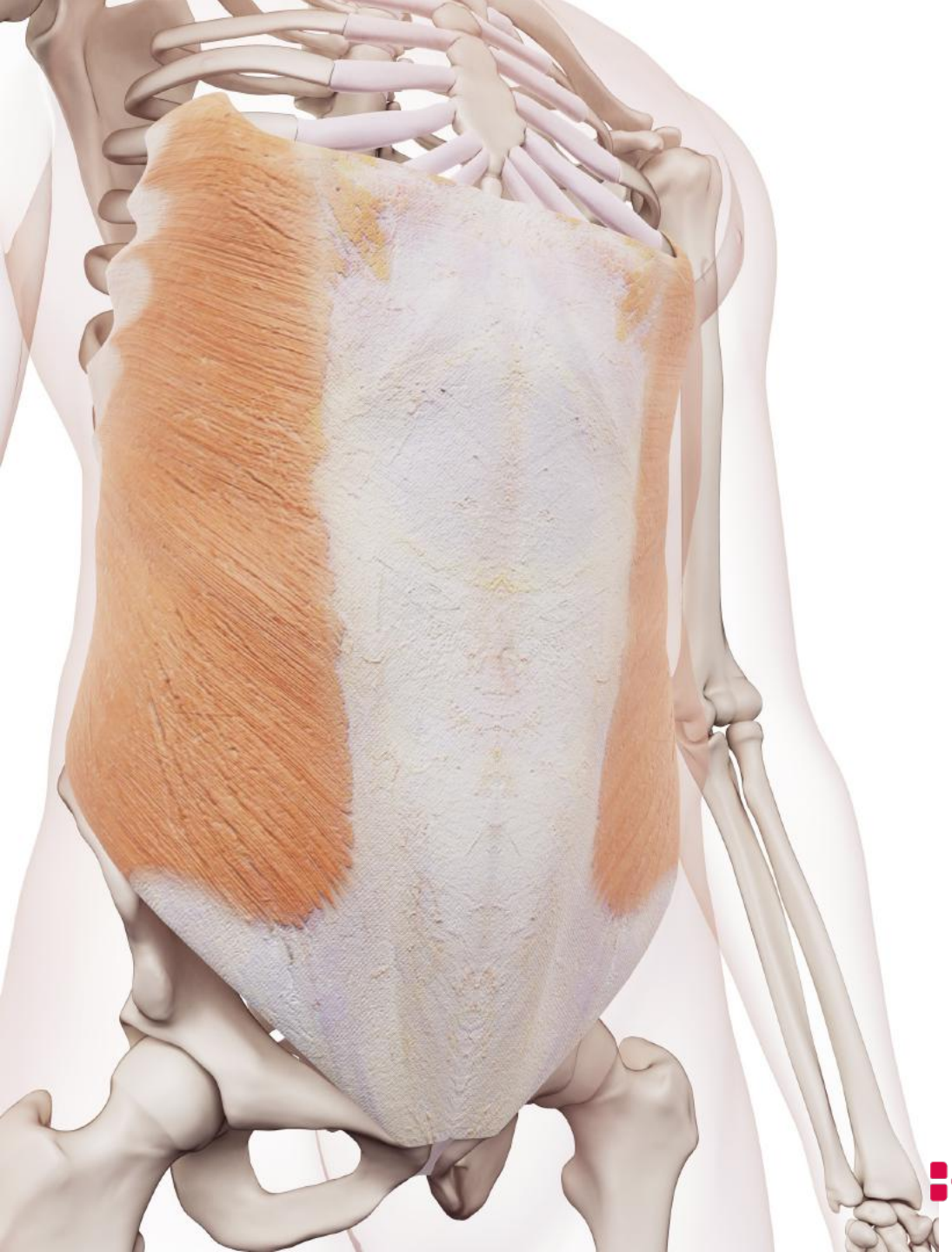
- True/False: Diastasis recti abdominis is a widening of the linea alba
- What is the cut off value for diagnosing diastasis?
- Why don't we know the normal width of the linea alba?
- Which methods of measuring IRD are accurate?


# Anatomy of the linea alba

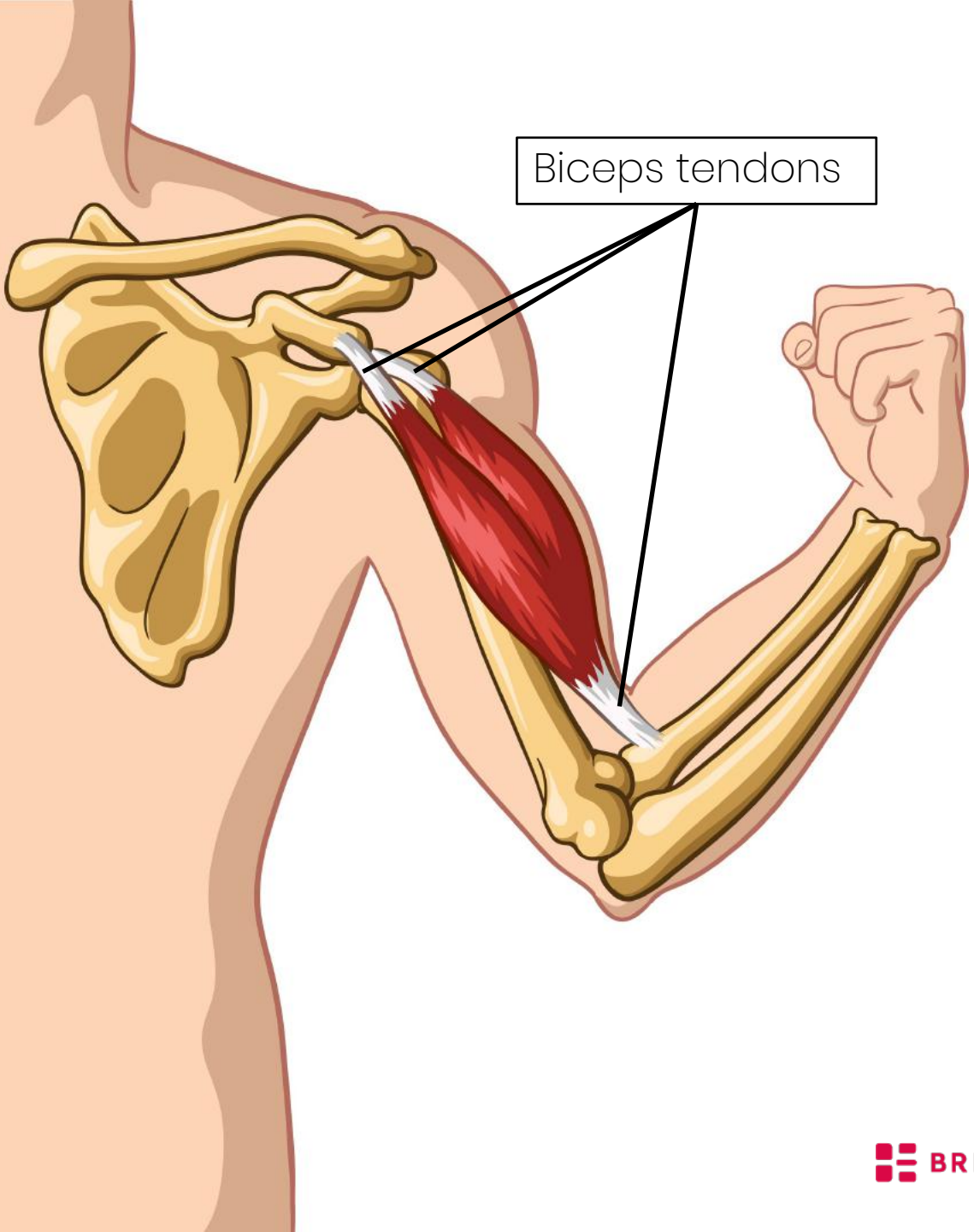
In pregnancy melanin production increases and the linea alba darkens & changes its name to the linea nigra




The linea alba is the midline of the abdominal aponeurosis



An aponeurosis is a big flat sheet of fascia that functions as a tendon for one or more muscles

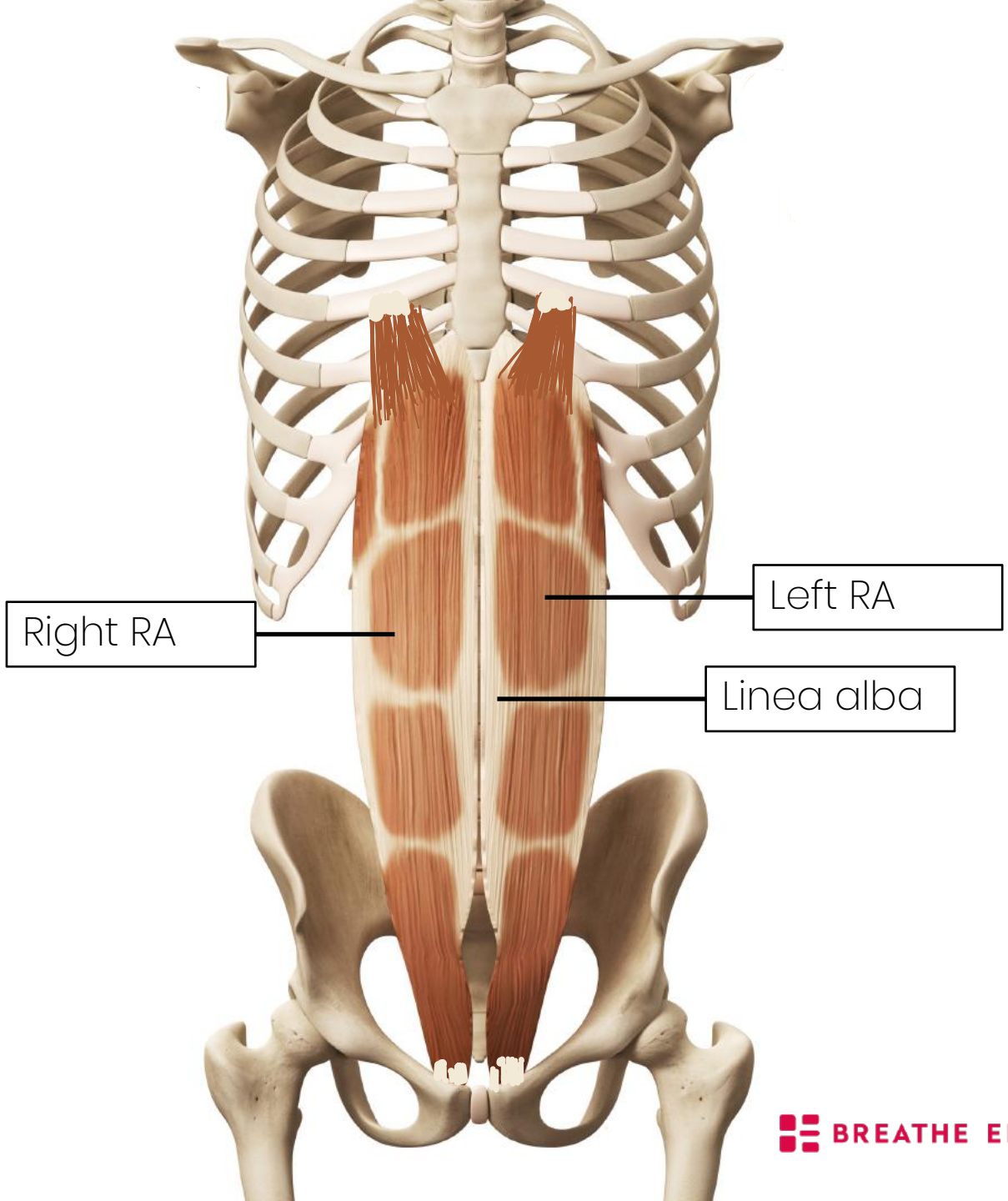



# All muscles have tendons

Generally, tendons connect muscle to bone

But the abdominal aponeurosis connects the left abdominal to the right abdominal

All the abdominal muscles insert into the abdominal aponeurosis




# Rectus abdominis

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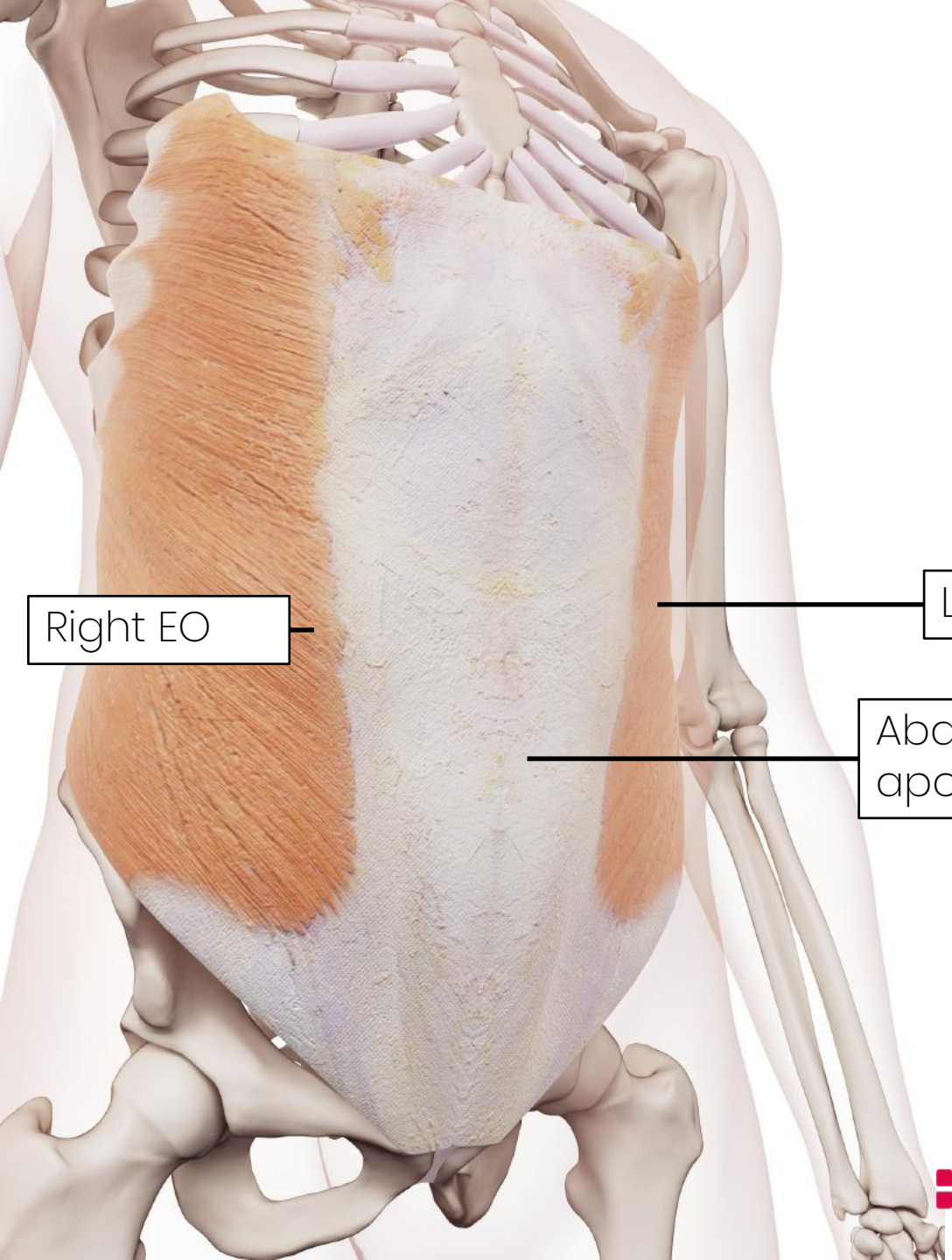


# External obliques

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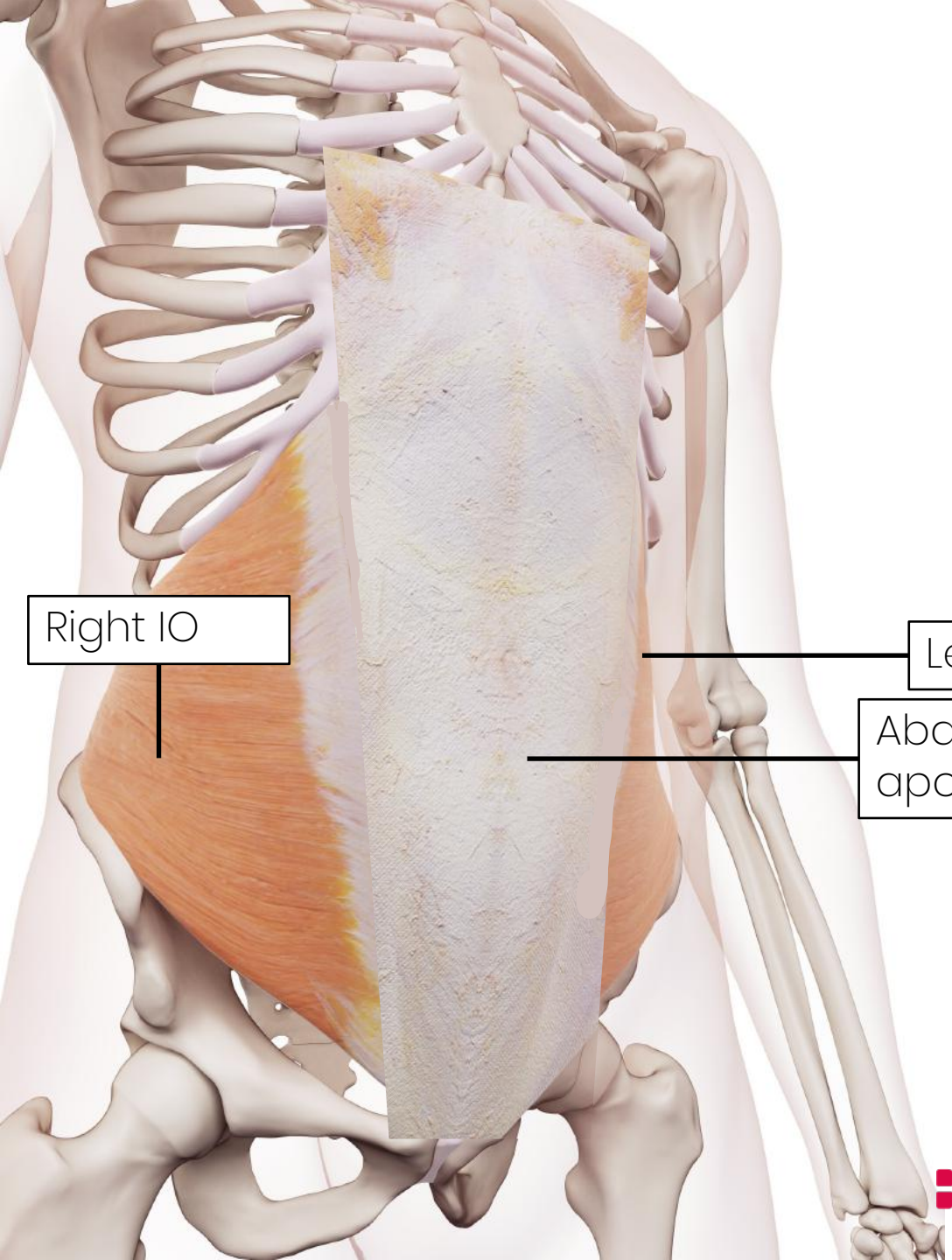


# Internal obliques

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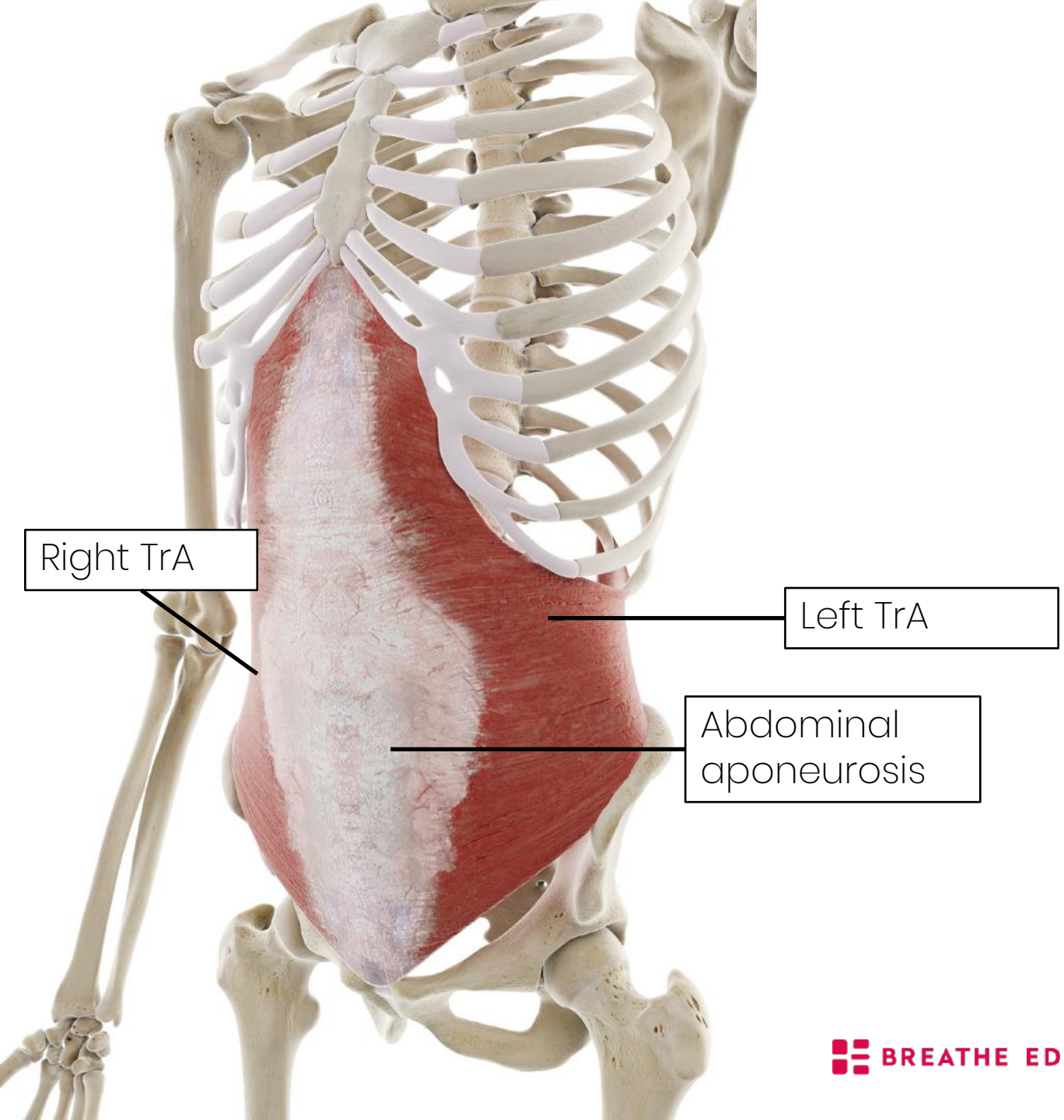
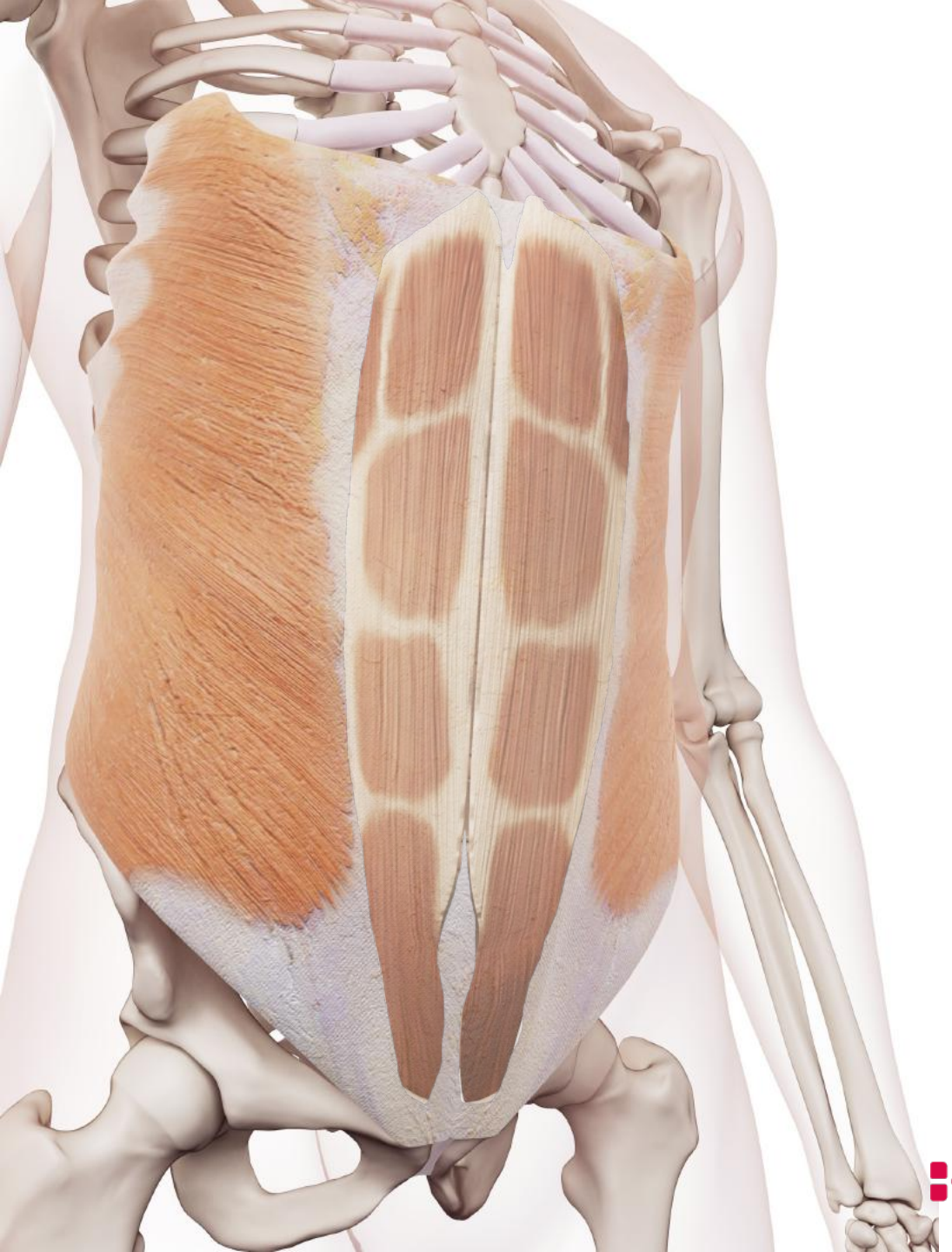



# Transversus Abdominis



The abdominal aponeurosis forms a sheath around the rectus abdominis muscle

# Self-test

- List the 4 abdominal muscles
- What is an aponeurosis?
- Which muscles insert into the abdominal aponeurosis?
- True/False: The rectus abdominis is sheathed within the abdominal aponeurosis
- True/False: The linea alba is the middle of the abdominal aponeurosis


# Transverse section of the abdominal wall

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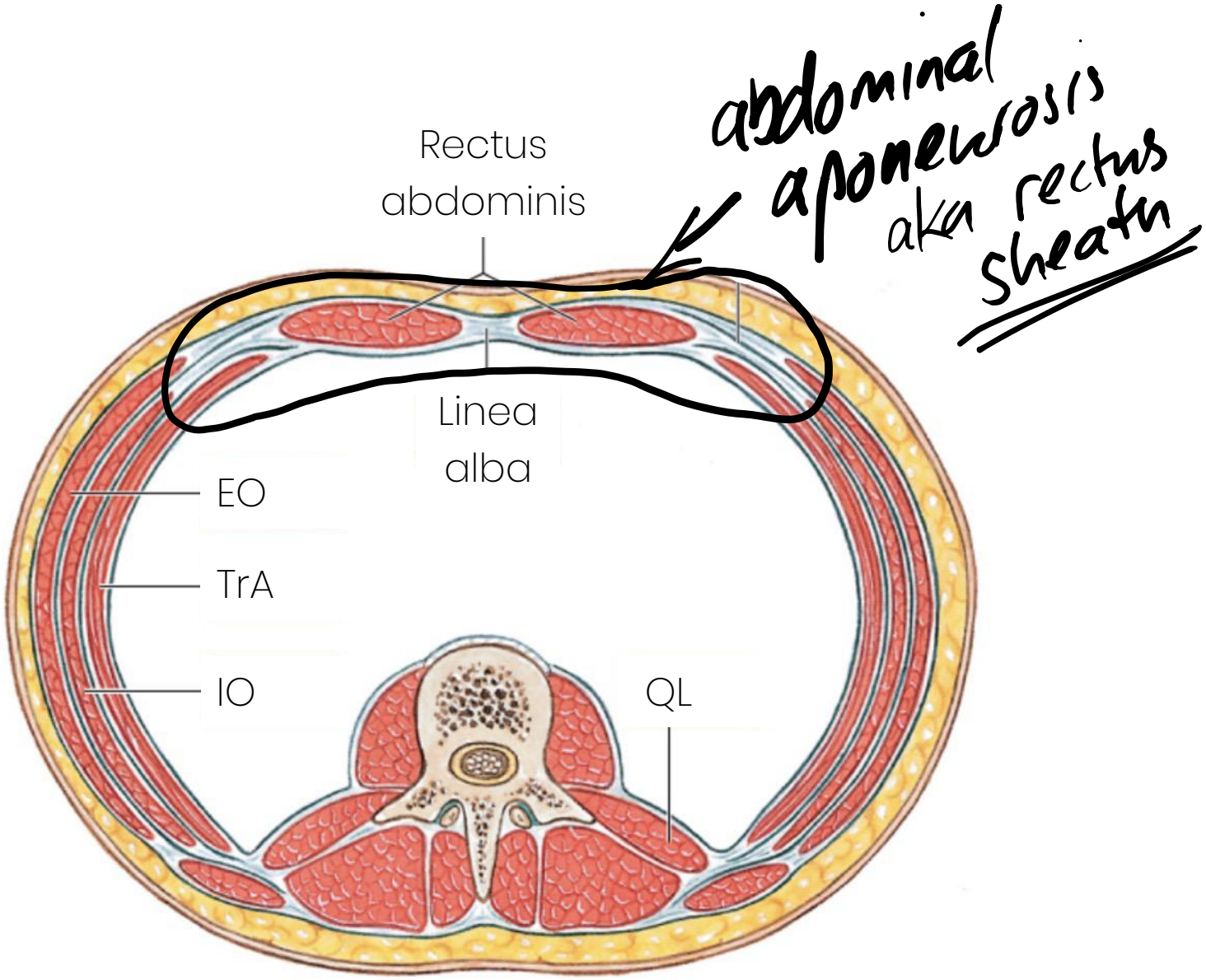
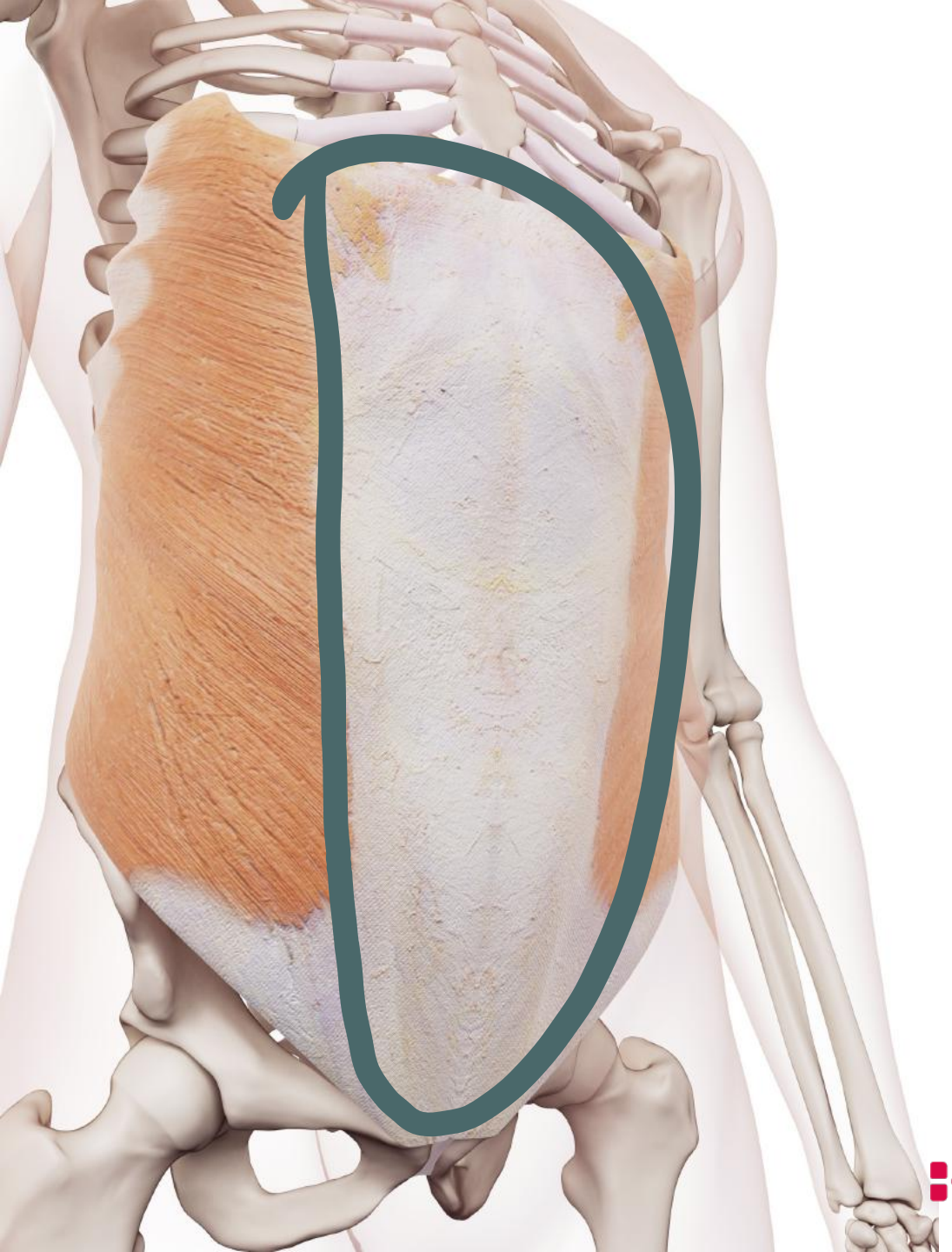
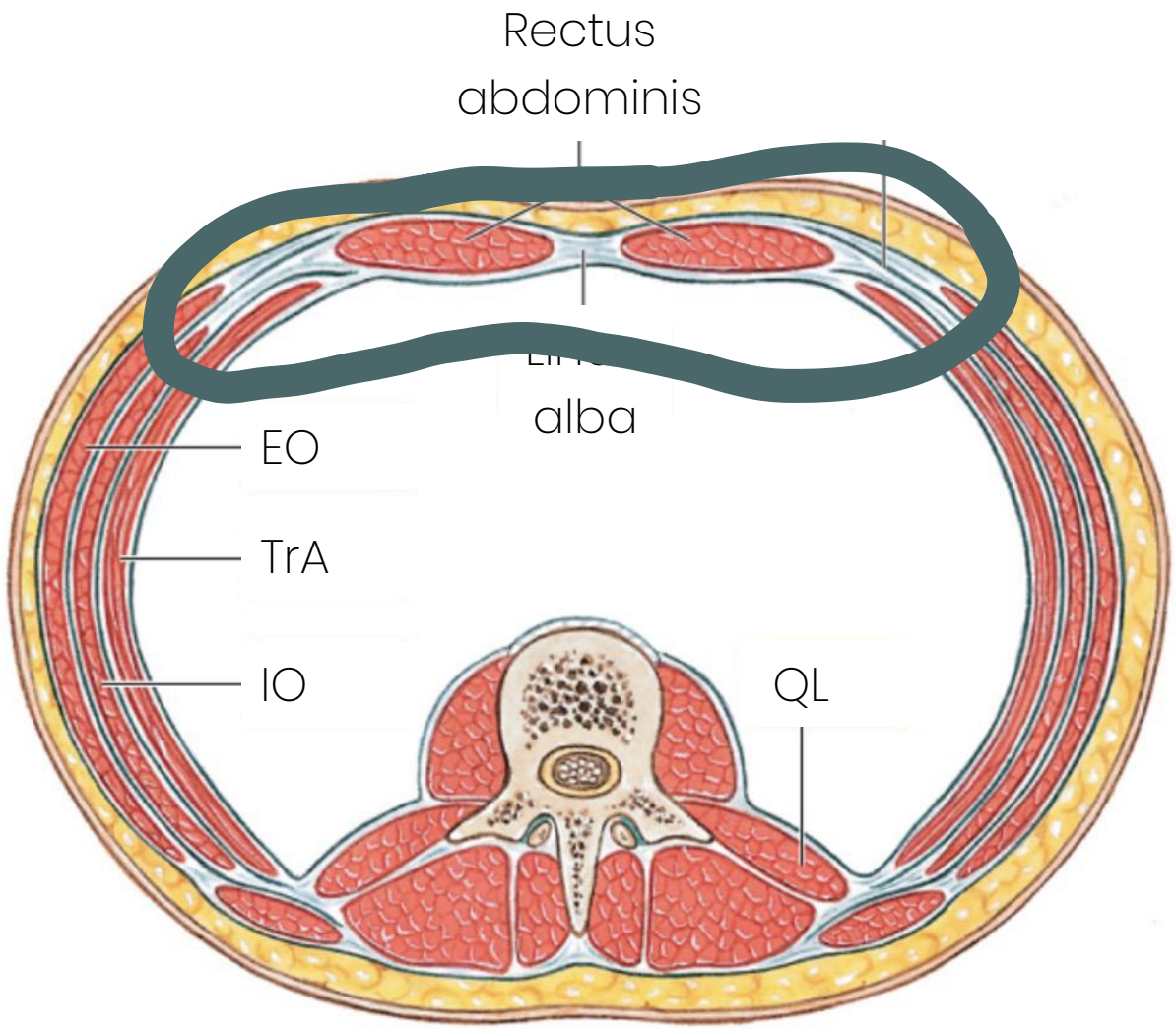



# Transverse section of the abdominal wall



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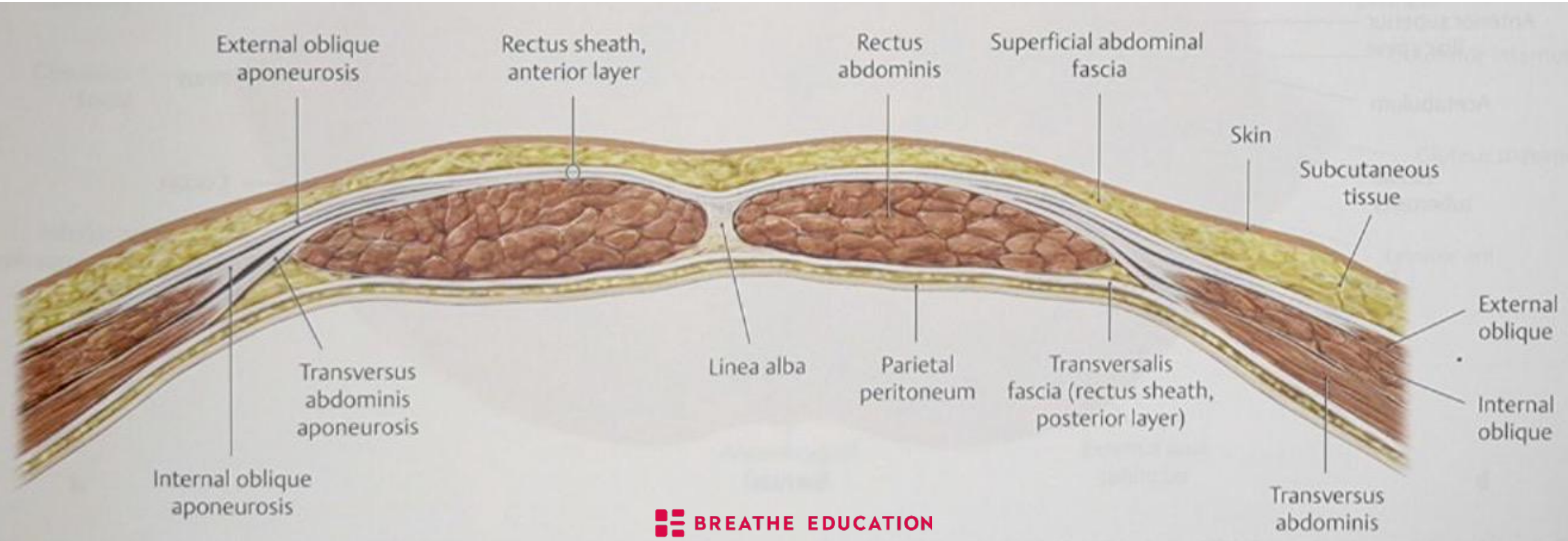
# Anatomy of the linea alba & rectus sheath

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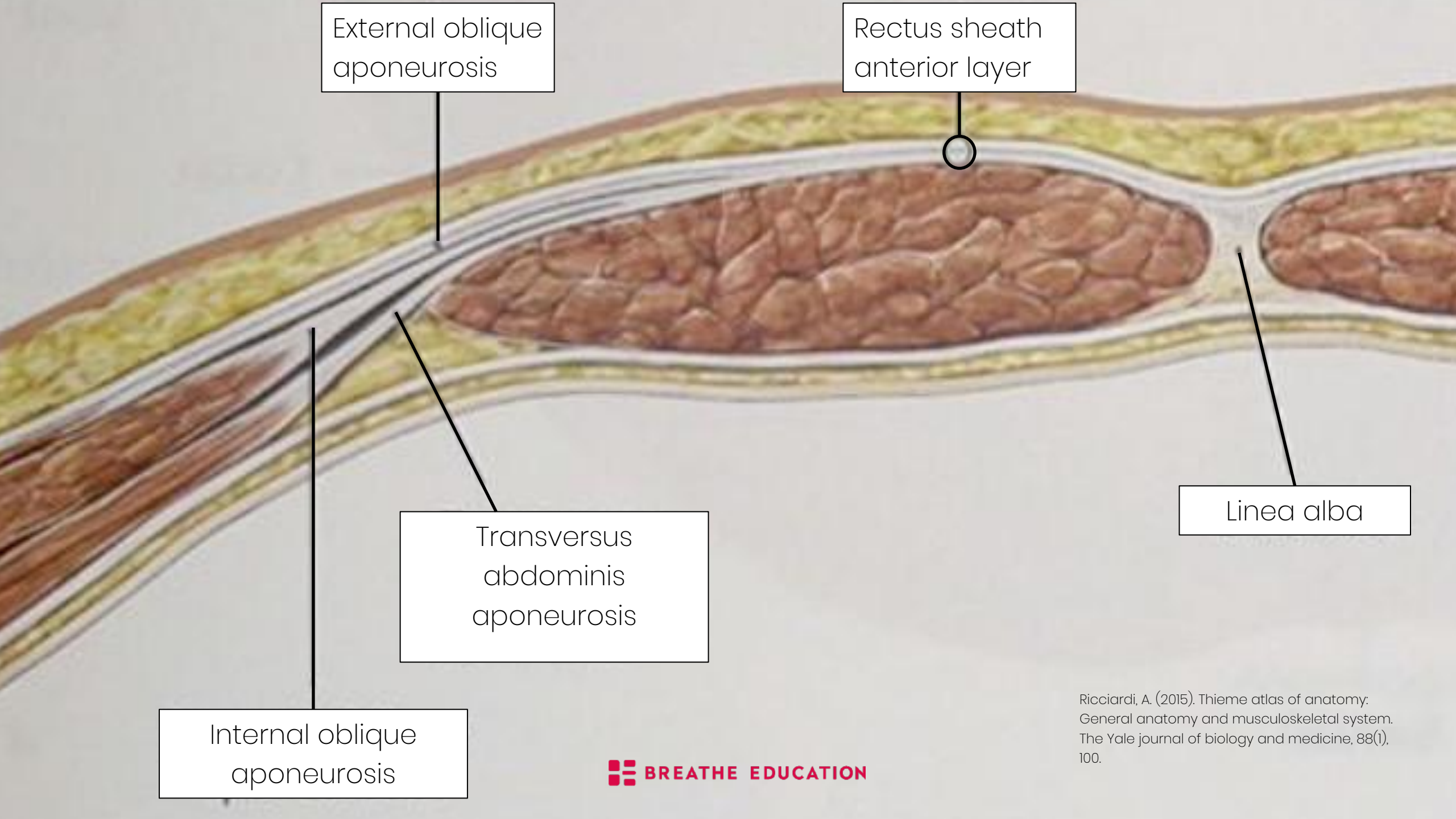
Ricciardi, A. (2015). Thieme atlas of anatomy: General anatomy and musculoskeletal system. The Yale journal of biology and medicine, 88(1), 100.

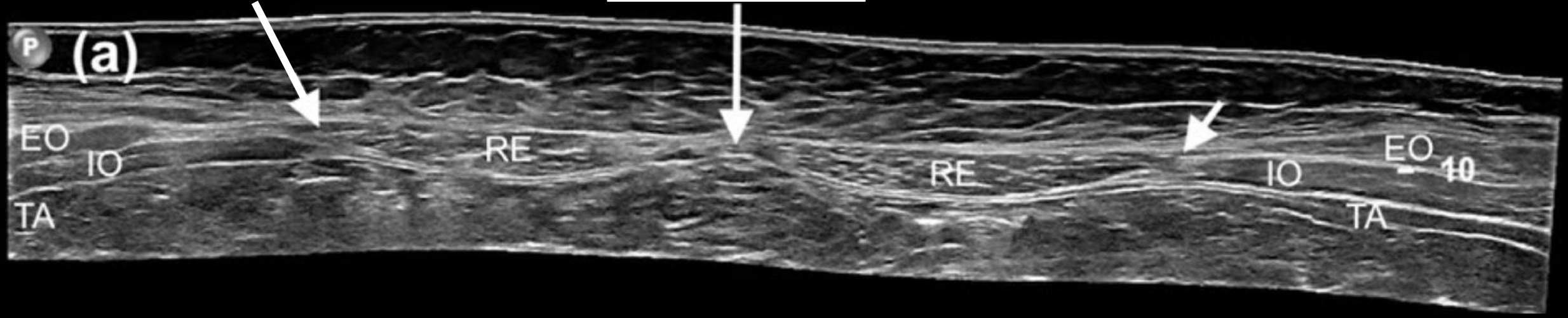



Ricciardi, A. (2015). Thieme atlas of anatomy: General anatomy and musculoskeletal system. The Yale journal of biology and medicine, 88(1), 100.

# Ultrasound

EO, IO & TA attachments to the rectus sheath

Linea alba




RE = rectus abdominis

EO = external oblique

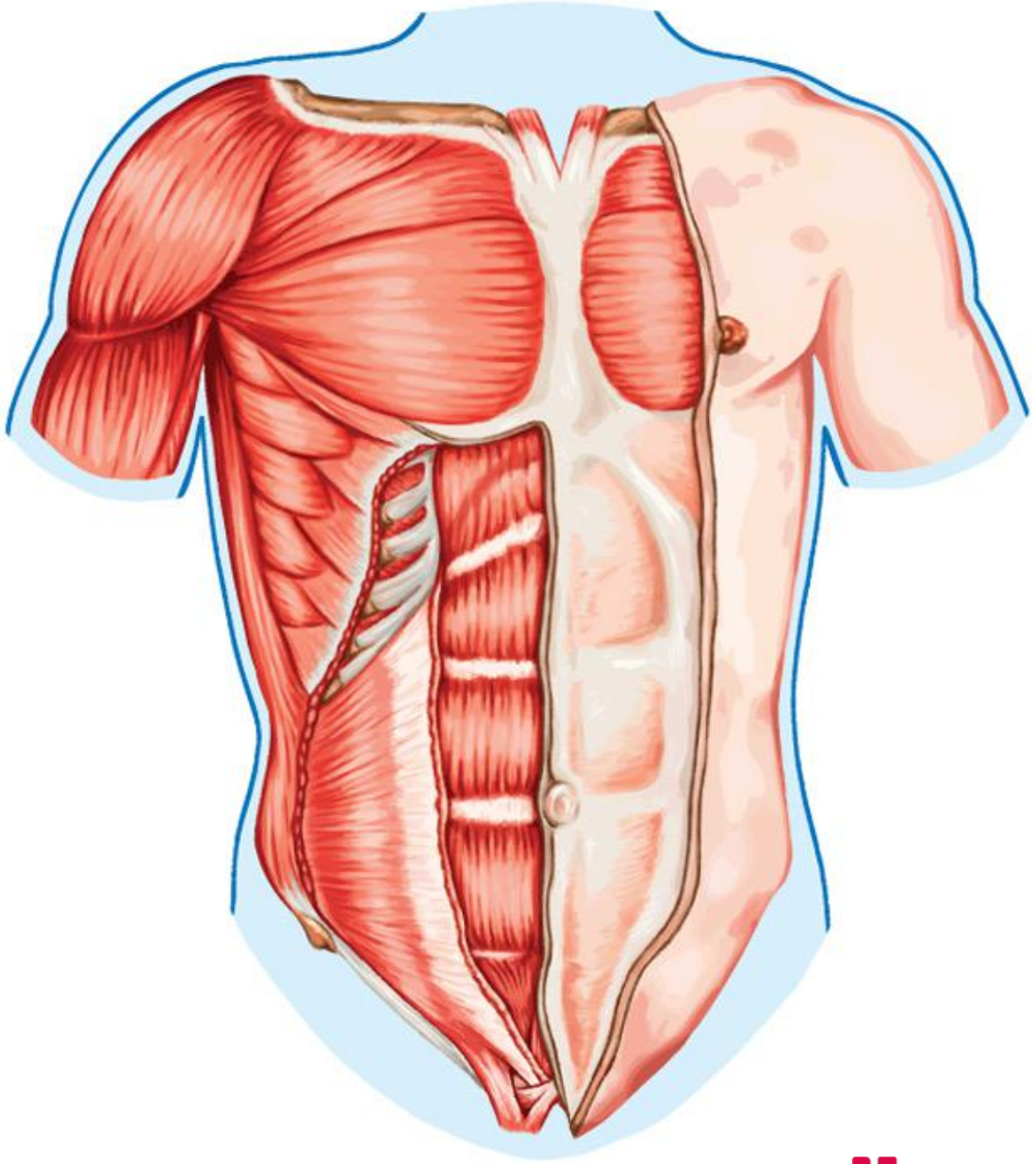
IO = internal oblique

TA = transversus abdominis

Plumb, A., Windsor, A., & Ross, D. (2021). Contemporary imaging of rectus diastasis and the abdominal wall. Hernia, 25(4), 921-927 https://be-lecture-notes.s3.amazonaws.com/Diastasis/plumb2021.pdf

# Self-test

- True/False: The linea alba is the tendon of the internal & external obliques and TrA
- True/False: The internal & external obliques & TrA all pull laterally on the linea alba
- Do the tendons of the obliques and TrA pass anteriorly or posteriorly to the rectus abdominis?
- Is rectus abdominis the most superficial (closest to the surface) abdominal muscle?



# Effects of abdominal muscles on the linea alba

# These are the effects of the muscles on IRD **during** a contraction

IRD = inter-recti distance, the distance between the 2 halves of the rectus abdominis muscle

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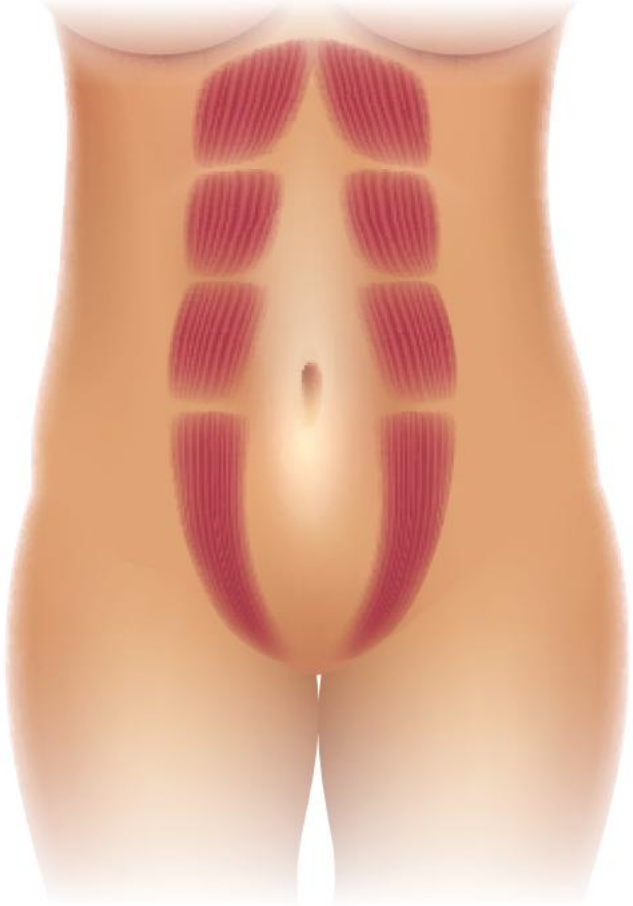
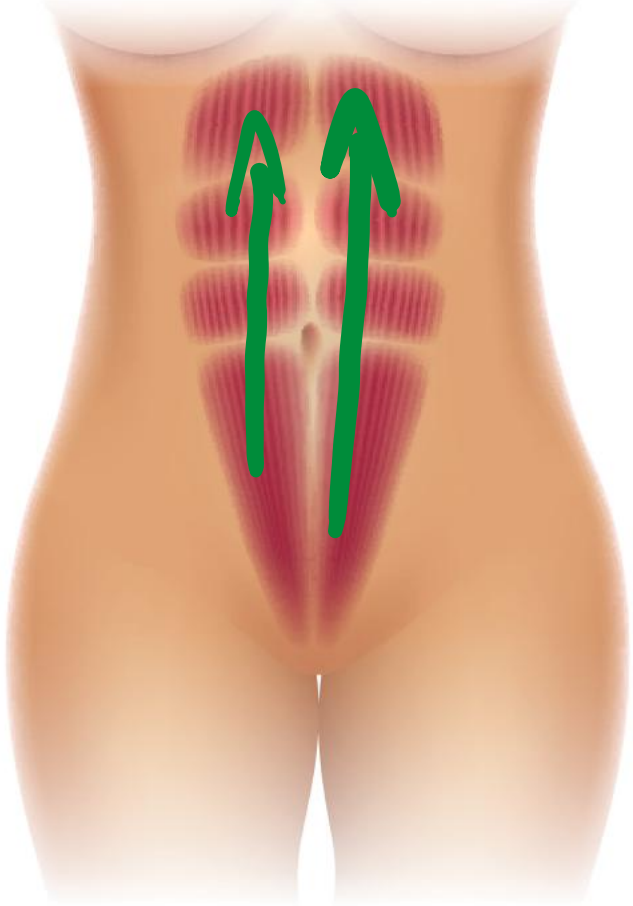
# During a curl-up diastasis gets **smaller**


Chiarello, C. M., McAuley, J. A., & Hartigan, E. H. (2016). Immediate effect of active abdominal contraction on inter-recti distance. Journal of Orthopaedic & Sports Physical Therapy, 46(3), 177-183. https://be-research-papers.s3.amazonaws.com/Diploma%20lecture%20research%20papers/Lecture%2041%20Pre%20and%20postnatal/Chiarello-2016-Immediate%20effect%20of%20active%20abdo.pdf

Gluppe, S. B., Engh, M. E., & Bø, K. (2020). Immediate effect of abdominal and pelvic floor muscle exercises on interrecti distance in women with diastasis recti abdominis who were parous. Physical therapy, 100(8), 1372-1383. https://be-lecture-notes.s3.amazonaws.com/Diastasis/Gluppe-2020-Immediate%20effect%20of%20abdominal%20and.pdf



The fibres of rectus abdominis are vertical



The shortest distance between 2 points is a straight line

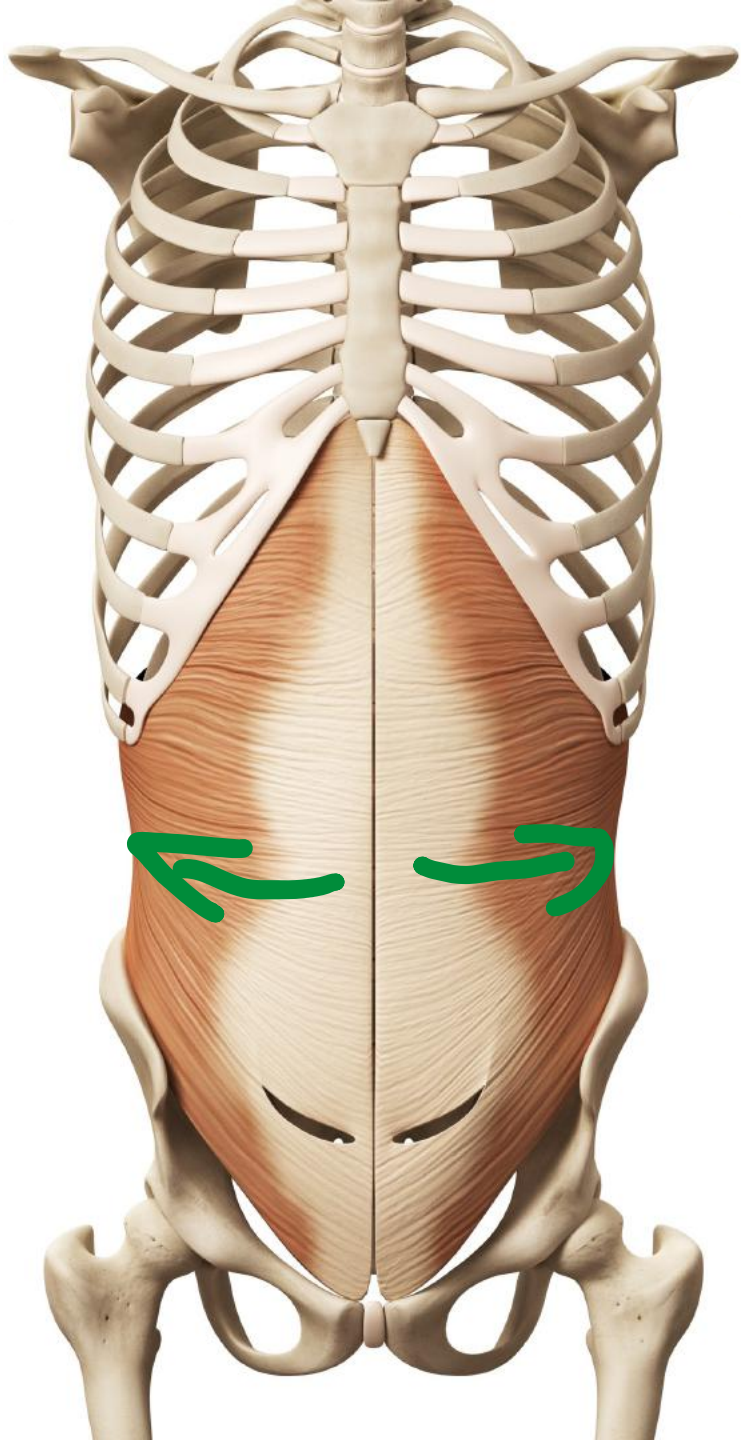
# During isolated TrA activation diastasis **widens**


Chiarello, C. M., McAuley, J. A., & Hartigan, E. H. (2016). Immediate effect of active abdominal contraction on inter-recti distance. Journal of Orthopaedic & Sports Physical Therapy, 46(3), 177-183. https://be-research-papers.s3.amazonaws.com/Diploma%20lecture%20research%20papers/Lecture%2041%20Pre%20and%20postnatal/Chiarello-2016-Immediate%20effect%20of%20active%20abdo.pdf

Gluppe, S. B., Engh, M. E., & Bø, K. (2020). Immediate effect of abdominal and pelvic floor muscle exercises on interrecti distance in women with diastasis recti abdominis who were parous. Physical therapy, 100(8), 1372-1383. https://be-lecture-notes.s3.amazonaws.com/Diastasis/Gluppe-2020-Immediate%20effect%20of%20abdominal%20and.pdf

The fibres of transversus abdominis are horizontal

They pull sideways on the linea alba



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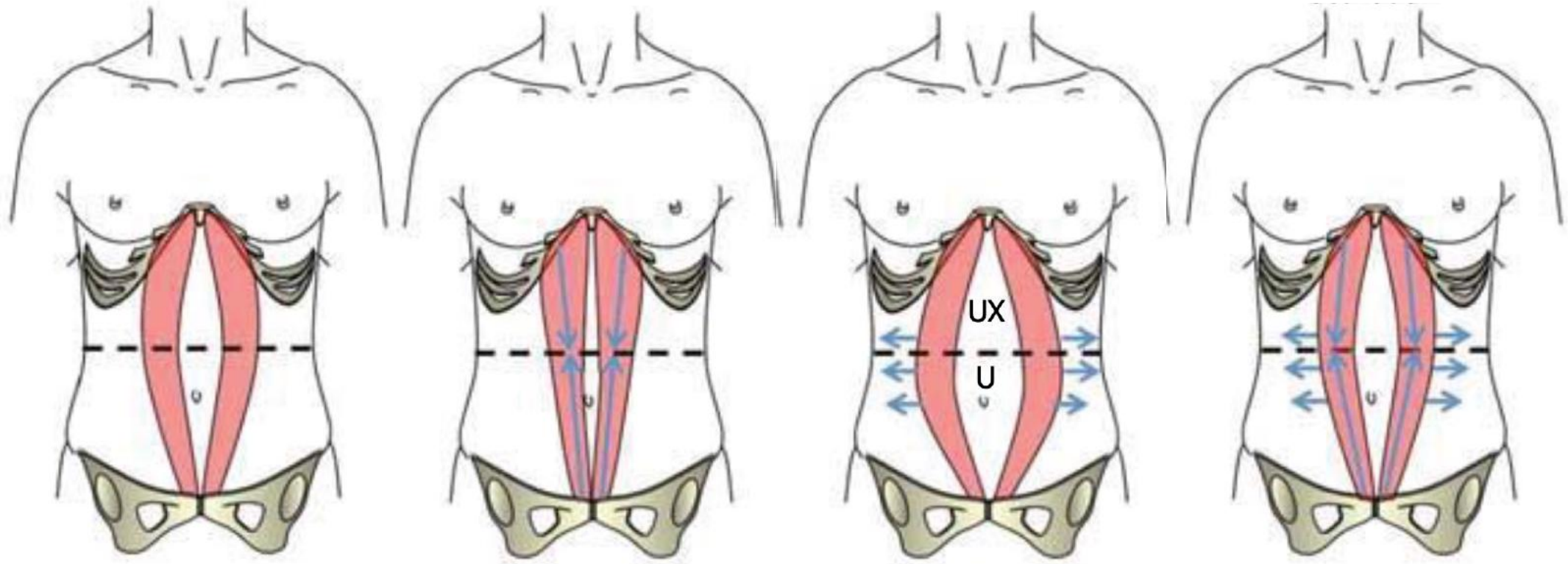


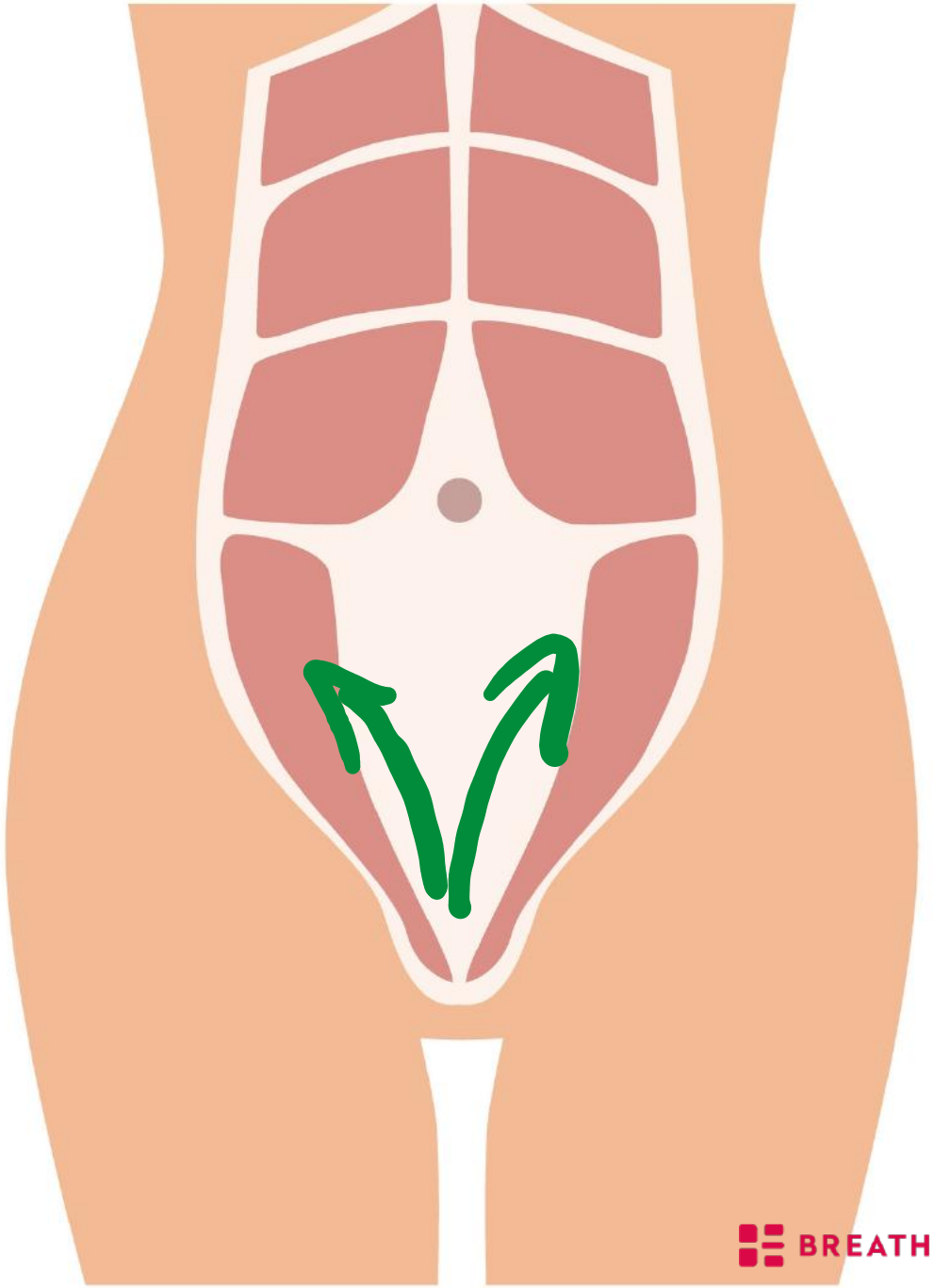

Rest

Rectus abdominis activation

Transversus abdominis activation

Rectus & transversus activation

Werner, L. A., & Dayan, M. (2019). Diastasis Recti Abdominis-diagnosis, Risk Factors, Effect on Musculoskeletal Function, Framework for Treatment and Implications for the Pelvic Floor. Current Women's Health Reviews, 15(2), 86-101. https://be-research-papers.s3.amazonaws.com/Diploma%20lecture%20research%20papers/Lecture%2041%20Pre%20and%20postnatal/Werner-2019-Diastasis%20Recti%20Abdominis-diagnosi.pdf



# During pelvic floor muscle contraction diastasis **widens**

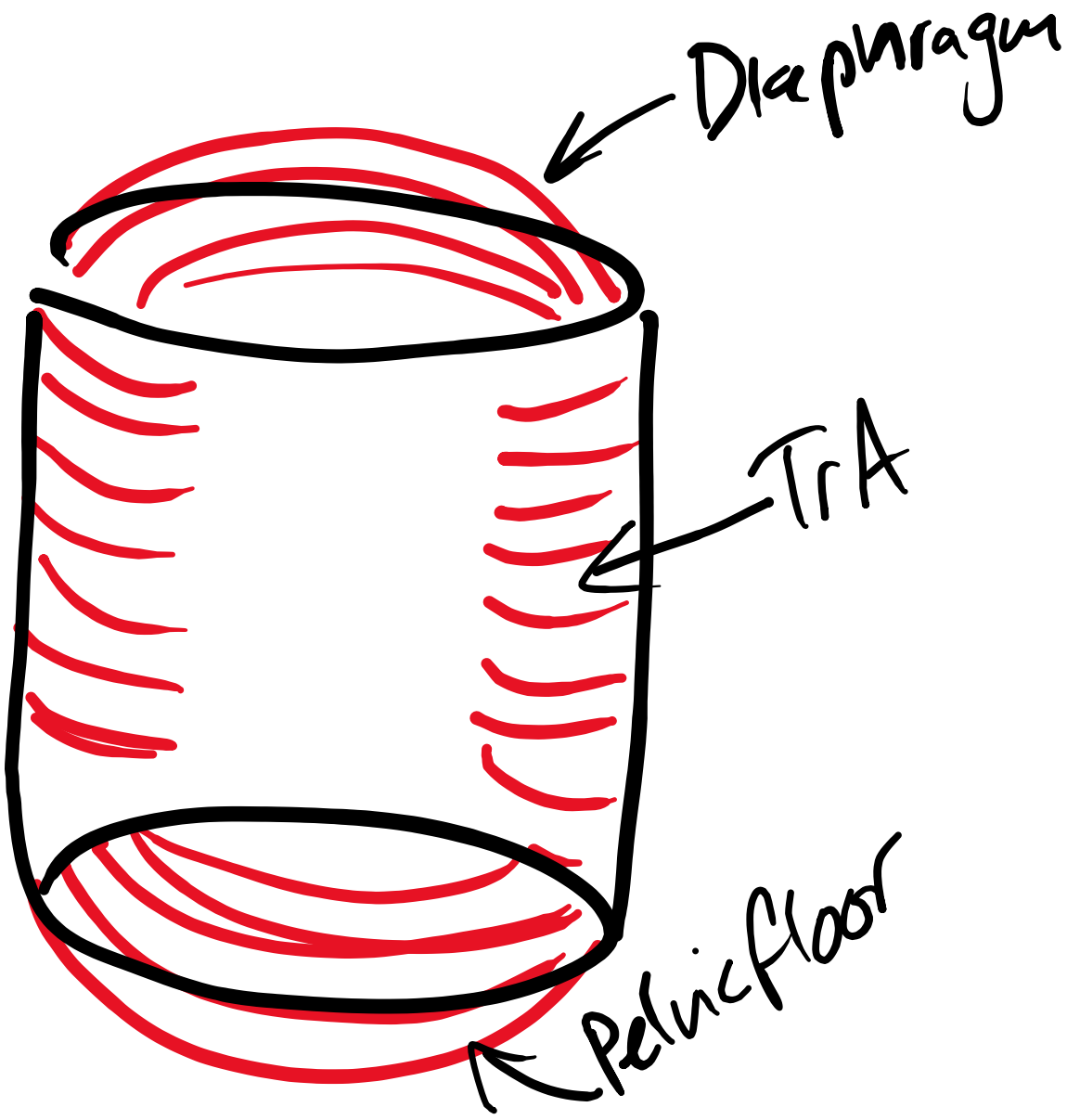
Probably by increasing intra-abdominal pressure

Theodorsen, N., Strand, L., & Bø, K. (2019). Effect of pelvic floor and transversus abdominis muscle contraction on inter-rectus distance in postpartum women: a cross-sectional experimental study. Physiotherapy, 105(3), 315-320. https://be-lecture-notes.s3.amazonaws.com/Diastasis/Theodorsen-2019-Effect%20of%20pelvic%20floor%20and%20tra.pdf

# During combined TrA & pelvic floor contraction diastasis **widens**


Theodorsen, N., Strand, L., & Bø, K. (2019). Effect of pelvic floor and transversus abdominis muscle contraction on inter-rectus distance in postpartum women: a cross-sectional experimental study. Physiotherapy, 105(3), 315-320. https://be-lecture-notes.s3.amazonaws.com/Diastasis/Theodorsen-2019-Effect%20of%20pelvic%20floor%20and%20tra.pdf

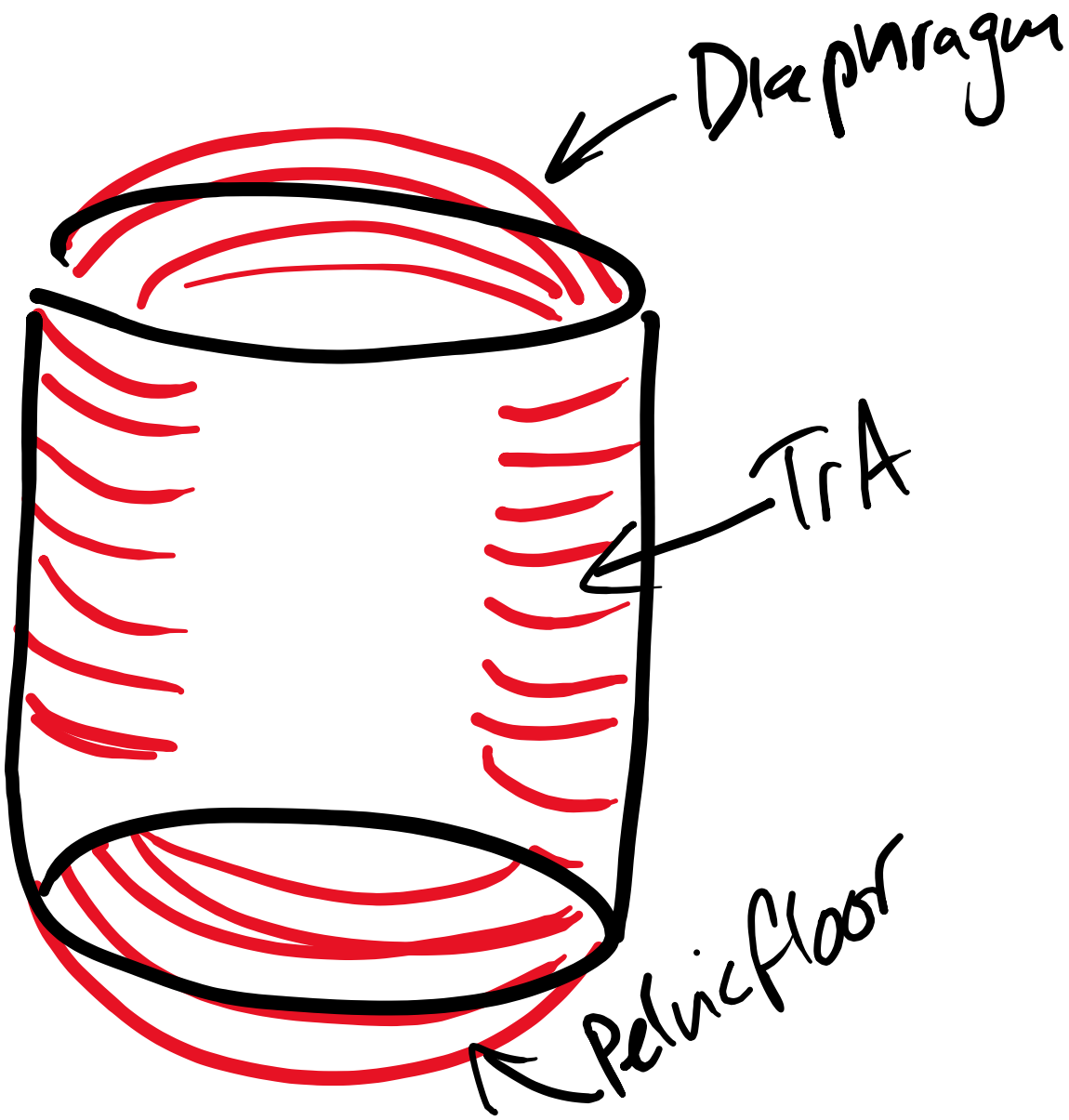
Gluppe, S. B., Engh, M. E., & Bø, K. (2020). Immediate effect of abdominal and pelvic floor muscle exercises on interrecti distance in women with diastasis recti abdominis who were parous. Physical therapy, 100(8), 1372-1383. https://be-lecture-notes.s3.amazonaws.com/Diastasis/Gluppe-2020-Immediate%20effect%20of%20abdominal%20and.pdf



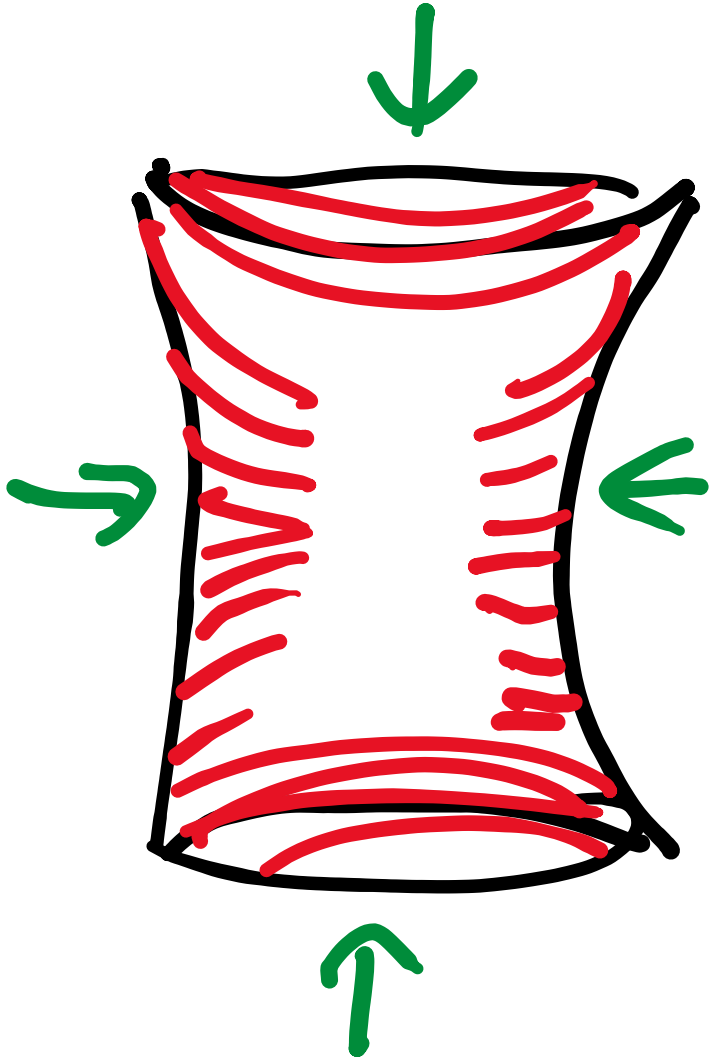

Trunk relaxed

# Probably because pelvic floor contraction increases intra-abdominal pressure

Neumann, P., & Gill, V. (2002). Pelvic floor and abdominal muscle interaction: EMG activity and intra-abdominal pressure. International urogynecology journal, 13(2), 125-132. https://be-lecture-notes.s3.amazonaws.com/Diastasis/neumann2002.pdf



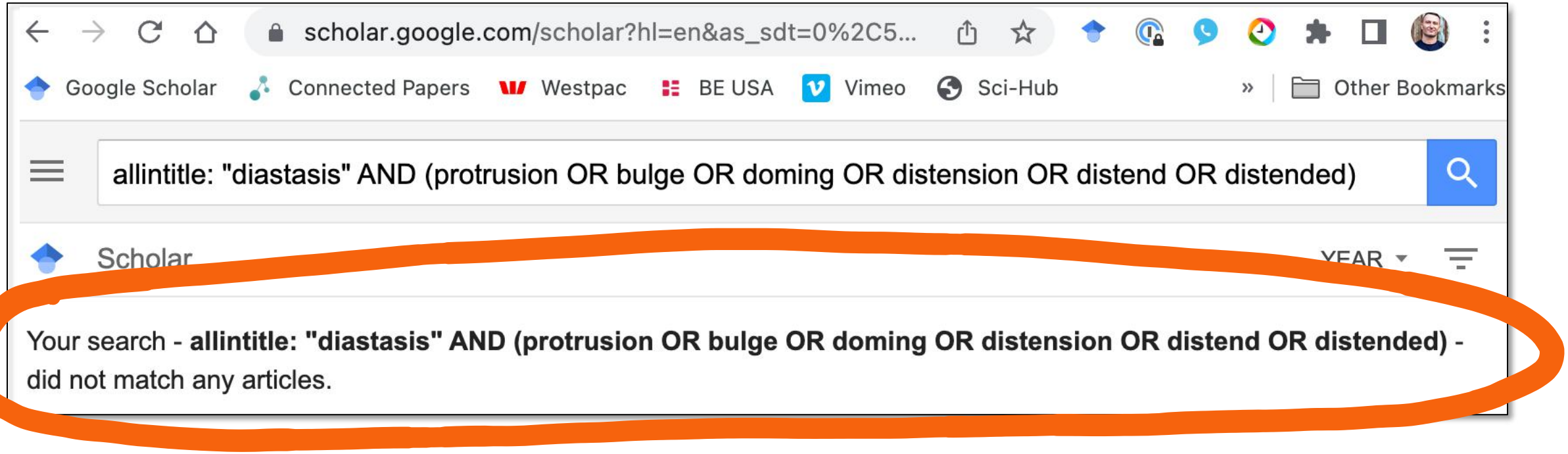

Trunk relaxed



TrA, PF & diaphragm contract, intra-abdominal pressure increases


What about doming?

# There is **literally no research** on doming



# But 36% of women with diastasis have an umbilical hernia

Hernia = the viscera protrude through a hole in the linea alba

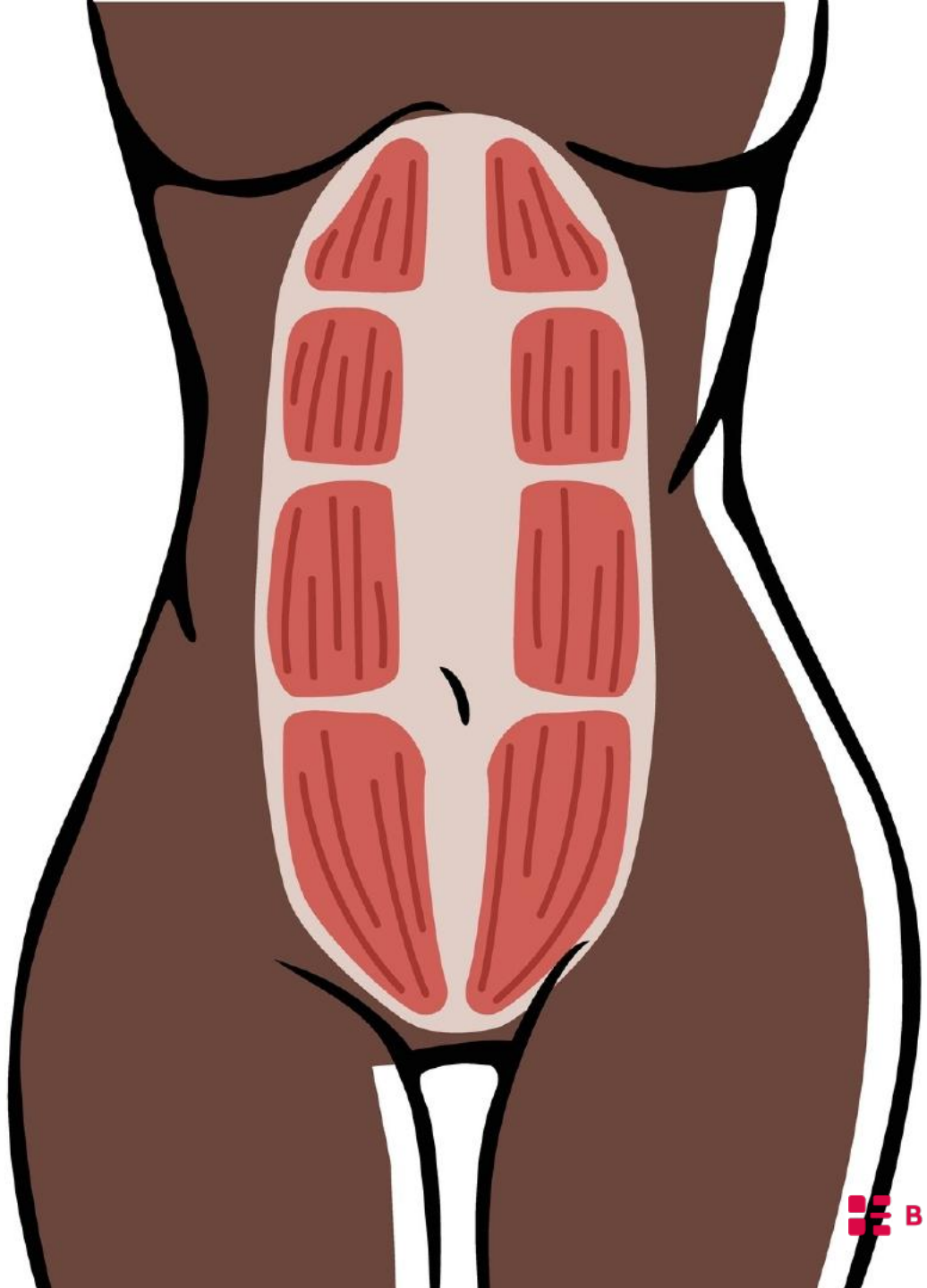
Diastasis = the linea alba stretches but remains intact

Yuan, S., Wang, H., & Zhou, J. (2021). Prevalence and risk factors of hernia in patients with rectus abdominis diastasis: a 10-year multicenter retrospective study. Frontiers in surgery, 8. https://be-lecture-notes.s3.amazonaws.com/Diastasis/Yuan-2021-Prevalence%20and%20risk%20factors%20of%20herni.pdf

# Self-test

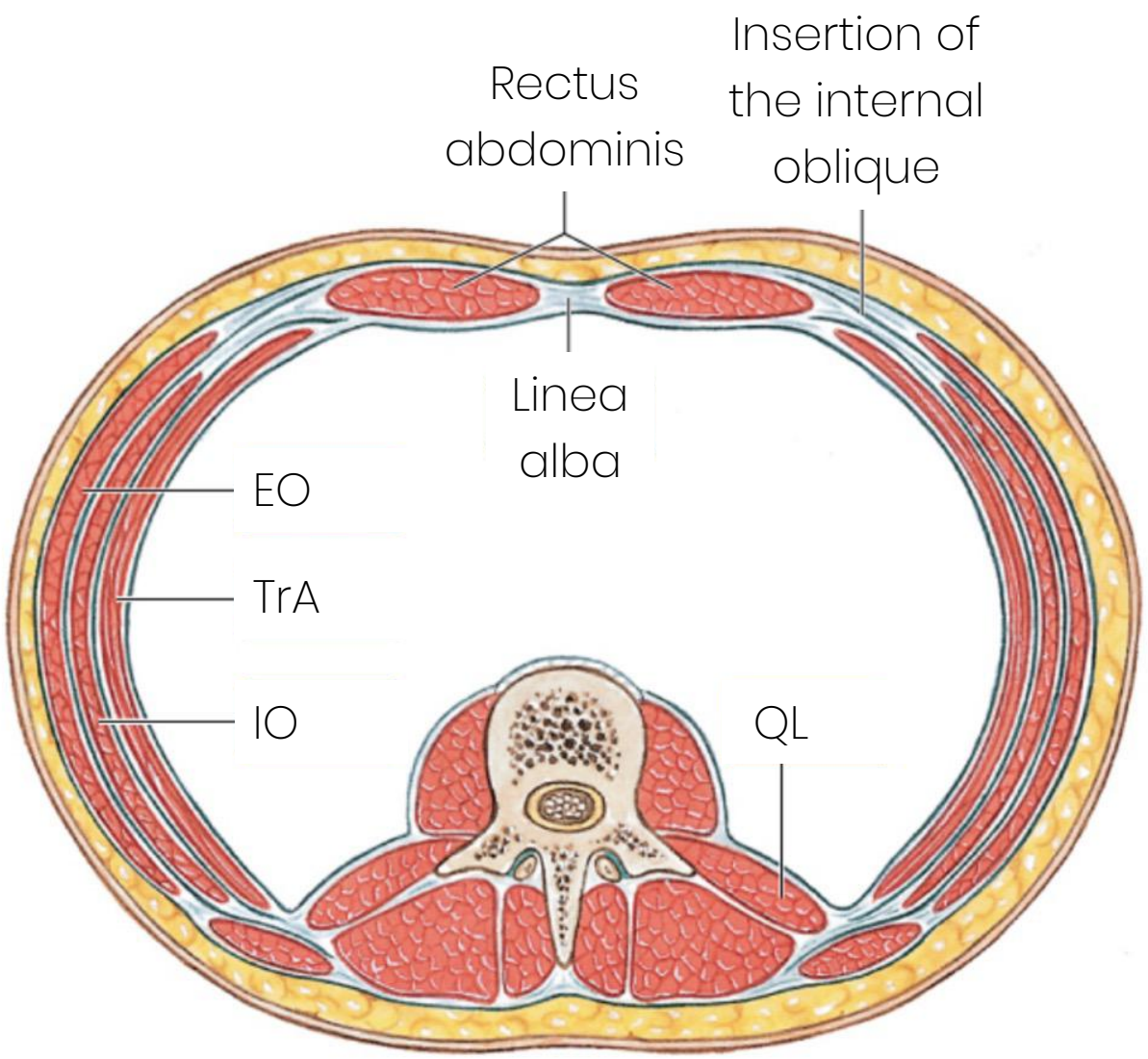
- What is the action of the rectus abdominis contraction on the linea alba?
- What is action of TrA contraction on the linea alba?
- What is the effect of pelvic floor contraction on the linea alba?
- What is the effect of pelvic floor contraction on intra-abdominal pressure?
- What do we know about the causes & effects of doming?

# Possible contributing factors to diastasis



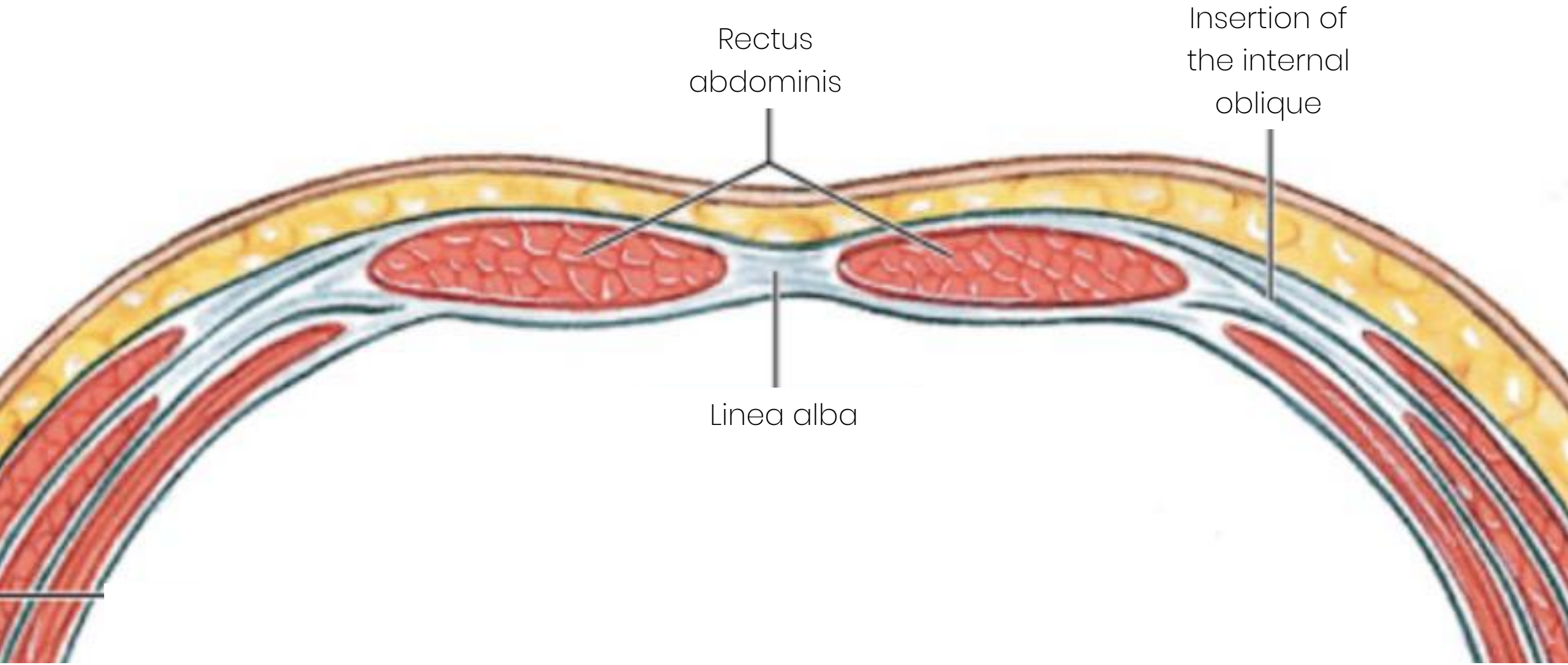
# Possible factors contributing to diastasis

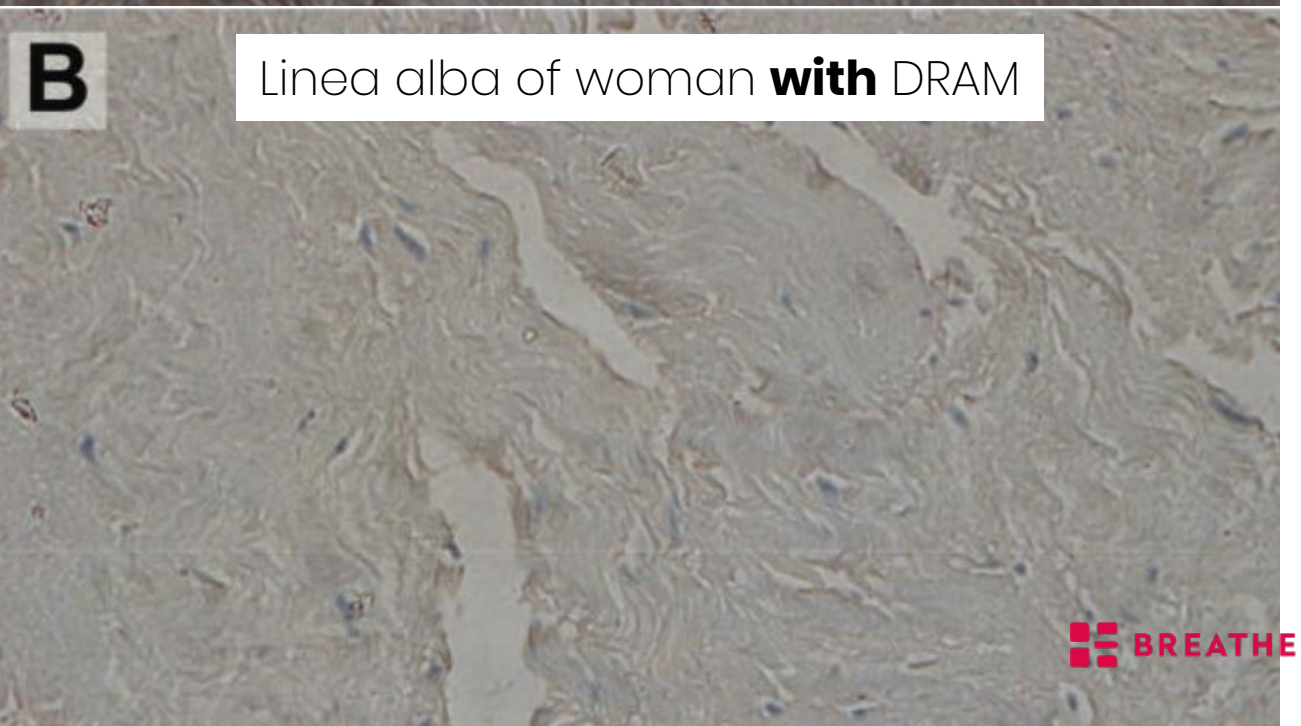
1. Internal oblique aponeurosis insertion absent in rectus sheath
2. Less type 1 & type 3 collagen in the linea alba
3. More pregnancies
4. Higher BMI
5. Diabetes
6. Lower abdominal strength?




# Women who lack anterior insertion of the internal oblique into the rectus sheath have more diastasis

Cavalli, M., Aiolfi, A., Bruni, P., Manfredini, L., Lombardo, F., Bonfanti, M., . . . Campanelli, G. (2021). Prevalence and risk factors for diastasis recti abdominis: a review and proposal of a new anatomical variation. Hernia, 1-8. https://be-research-papers.s3.amazonaws.com/Diploma%20lecture%20research%20papers/Lecture%2041%20Pre%20and%20postnatal/Cavalli-2021-Prevalence%20and%20risk%20factors%20for%20d.pdf


Rectus abdominis
Insertion of the internal oblique
Linea alba


# Women with less collagen in their connective tissue have more diastasis

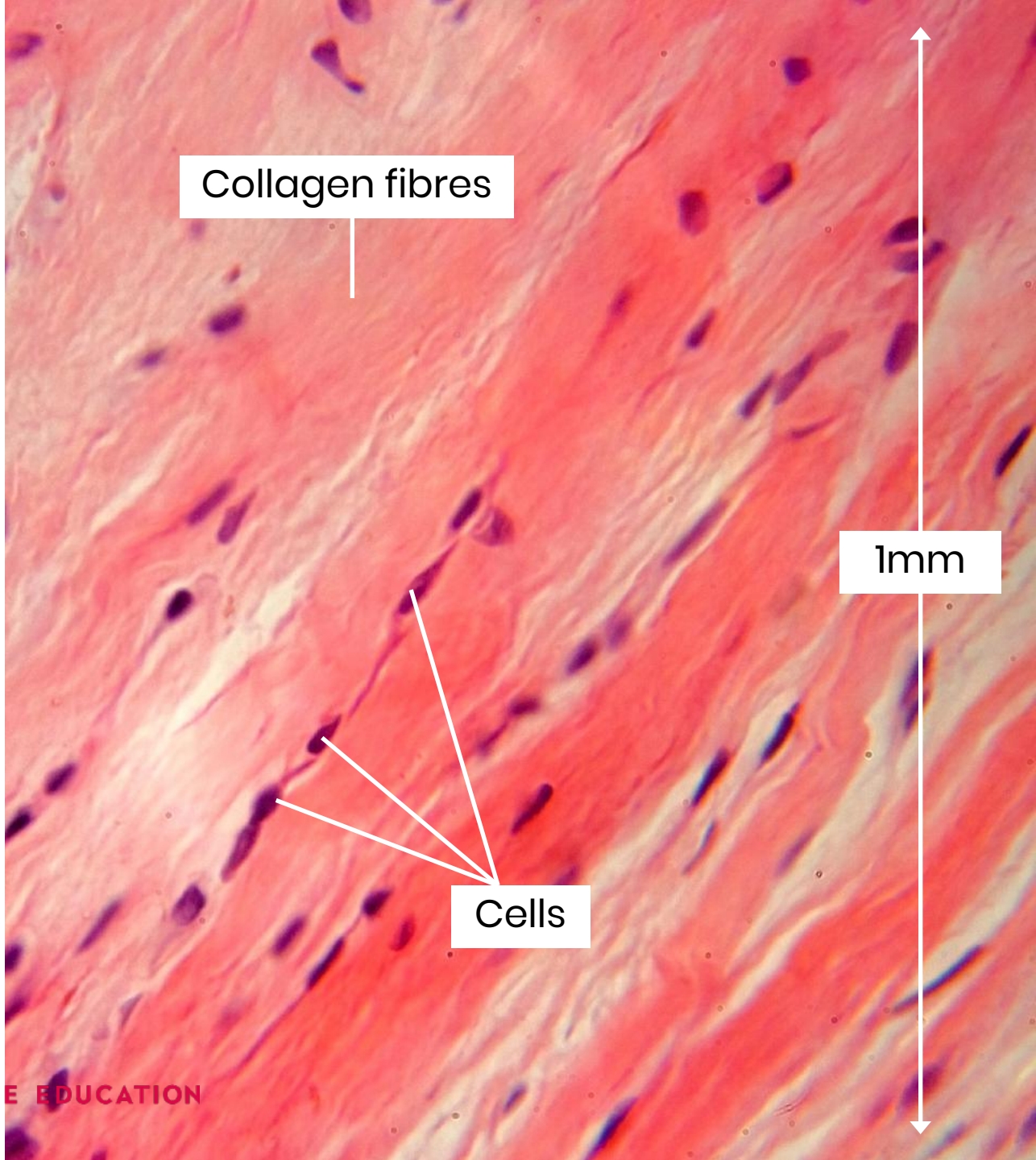
Blotta, R. M., Costa, S. d. S., Trindade, E. N., Meurer, L., & Maciel-Trindade, M. R. (2018). Collagen I and III in women with diastasis recti. Clinics, 73. https://be-research-papers.s3.amazonaws.com/Diploma%20lecture%20research%20papers/Lecture%2041%20Pre%20and%20postnatal/Blotta-2018-Collagen%20I%20and%20III%20in%20women%20with%20d.pdf

Collagen is the main structural protein in connective tissue

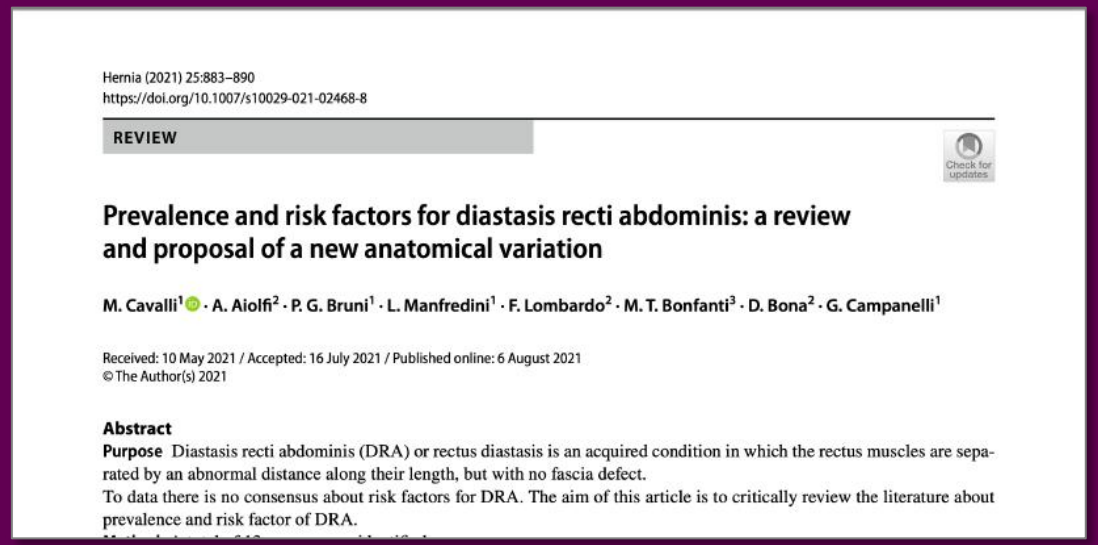
Ligaments & tendons are made of dense connective tissue

Connective tissue is comprised of a few cells scattered in a matrix of collagen & elastin fibres.

This image shows a 1mm cross-section of a ligament.



Things that increase intra-abdominal pressure are risk factors for diastasis



Hernia (2021) 25:883–890
https://doi.org/10.1007/s10029-021-02468-8

REVIEW

Check for updates

**Prevalence and risk factors for diastasis recti abdominis: a review and proposal of a new anatomical variation**

M. Cavalli[1] · A. Aiolfi[2] · P. G. Bruni[1] · L. Manfredini[1] · F. Lombardo[2] · M. T. Bonfanti[3] · D. Bona[2] · G. Campanelli[1]

Received: 10 May 2021 / Accepted: 16 July 2021 / Published online: 6 August 2021


**Abstract**
**Purpose** Diastasis recti abdominis (DRA) or rectus diastasis is an acquired condition in which the rectus muscles are separated by an abnormal distance along their length, but with no fascia defect.
To data there is no consensus about risk factors for DRA. The aim of this article is to critically review the literature about prevalence and risk factor of DRA.

# “Numbers of parity, high BMI & diabetes are the most plausible risk factors.”

Parity = pregnancy

Cavalli, M., Aiolfi, A., Bruni, P., Manfredini, L., Lombardo, F., Bonfanti, M., . . . Campanelli, G. (2021). Prevalence and risk factors for diastasis recti abdominis: a review and proposal of a new anatomical variation. Hernia, 1-8. https://be-lecture-notes.s3.amazonaws.com/Diastasis/Cavalli-2021-Prevalence%20and%20risk%20factors%20for%20d.pdf

Other potential factors that **may** influence diastasis risk

# Lower vaginal pressure & less POP in women with diastasis?

POP = pelvic organ prolapse

Bø, K., Hilde, G., Tennfjord, M. K., Sperstad, J. B., & Engh, M. E. (2017). Pelvic floor muscle function, pelvic floor dysfunction and diastasis recti abdominis: prospective cohort study. Neurourology and urodynamics, 36(3), 716-721. https://be-lecture-notes.s3.amazonaws.com/Diastasis/B%C3%B8-2017-Pelvic%20floor%20muscle%20function%2C%20pelvic%20f.pdf

# Women who exercise during pregnancy have less diastasis

Chiarello, C. M., Falzone, L. A., McCaslin, K. E., Patel, M. N., & Ulery, K. R. (2005). The effects of an exercise program on diastasis recti abdominis in pregnant women. Journal of Women's Health Physical Therapy, 29(1), 11-16. https://be-research-papers.s3.amazonaws.com/Diploma%20lecture%20research%20papers/Lecture%2041%20Pre%20and%20postnatal/Chiarello-2005-The%20effects%20of%20an%20exercise%20prog.pdf

# Self-test

- What are 2 possible genetic contributions to diastasis risk?
- What lifestyle factors contribute to diastasis risk?
- What is the relationship of exercise to diastasis risk?

# Summary

1. Diastasis is a widening of the linea alba
2. We don't know the normal width of the linea alba
3. All the abdominal muscles insert into the linea alba
4. Rectus abdominis narrows the linea alba, TrA & pelvic floor widen the linea alba
5. Diastasis may be a result of a combination of variation in the internal oblique insertion, less collagen in connective tissue, plus factors that increase intra-abdominal pressure

# Questions?

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