

### The Female Pelvic Floor: is your finger really doing the talking?

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### Anatomy

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### Female Anatomy

- Superficial Layer
  - External anal sphincter
    - Subcutaneous
    - Superficial (only part of EAS attached to bone)
    - Deep (responsible for 30% of resting pressure)
  - Superficial transverse perineal muscle
    - Joint action with deep transverse perineii
  - Ischiocavernosus
    - Compresses clitoris, retards venous return and serves to erect the clitoris thereby enhancing sexual responses
  - Bulbocavernosus
    - Closes vagina, expresses secretions and compresses deep dorsal vein of clitoris

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## Pelvic Diaphragm

- **Pubovisceral muscle**
  - Pubococcygeus (proper)
    - Supports pelvic organs and compresses vagina and rectum
  - Pubovaginalis
    - Elevates the urethra
  - Puborectalis
    - Forms the anorectal angle / flap valve
- **Iliococcygeus**
  - Elevates rectum
- **Levator plate**
- **Ischiococcygeus**
  - Supports pelvic contents, assists stability of SU

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## Ligaments

- Anterior longitudinal ligament
- Iliolumbar ligament
- Sacroiliac ligament
- Sacrotuberous ligament
- Sacrospinous ligament
- Anterior sacrococcygeal ligaments
- Inferior (arcuate) pubic ligament
- Pubovesical ligament
- Sacrouterine ligament
- Cardinal ligament

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## Fascia

- **Arcus tendineus fascia pelvis**
  - Linear fascial thickening of obturator fascia
  - Attached anteriorly to pubic bone and posteriorly to ischial spine
  - Connection between iliococcygeus and endopelvic fascia

Important in continence mechanism

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## Fascia

- Endopelvic fascia
  - Surrounds vagina
  - Attaches laterally to ATFP
  - Thought to act as connection between bladder neck and urethra to ATFP

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## Fascia

- Umbilical prevesical fascia
- Transversalis fascia
- Vesicocervical fascia
- Superior fascia of pelvic diaphragm
- Iliac fascia
- Uterine fascia
- Rectal fascia
- Vaginorectal fascia

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## Fascia

- Obturator internus fascia
- Presacral fascia
- Pubocervical fascia
- Piriformis fascia
- Thoracolumbar fascia

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The Downs and Ups!

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Continence Mechanism  
in the Female

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Discreet Muscles

- Detrusor loop
- Pubovesical muscles
- Pubovisceral muscle (pubococcygeus)
  - Puborectalis
  - Pubovaginalis
- Perineal membrane
  - Compressor urethrae
  - Urethrovaginal sphincter
- Bulbospongiosus

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### Continence Mechanism

- Proximal urethra moves downwards and backwards
- Stretch resistance (stiffness) of pelvic floor muscles counteracts force
- Proximal urethra compressed against endopelvic fascia, vagina and levator ani

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### Assessing the Problem

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### Basic Muscle Assessment

- P performance
- E endurance
- R repetitions
- F fast
- E elevation
- C co-contraction
- T timing

Haslam J, Laycock J (Eds). Therapeutic Management of Incontinence and Pelvic Pain. 2nd Ed, 2008: Springer-Verlag, London.

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## Grading

- Modified Oxford Scale
- 0 - nothing
- 1 - flicker
- 2 - weak
- 3 - moderate
- 4 - good
- 5 - strong

Laycock J. Assessment and treatment of pelvic floor. PhD Thesis; University of Bradford 1992.

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## Grading

- Modified Oxford Scale (Laycock 2002)
- 0 - no discernible contraction
- 1 - flicker of movement or pulsation under examining finger
- 2 - weak contraction without lift or squeeze
- 3 - moderate contraction, lift of posterior wall and squeeze on finger
- 4 - good contraction, elevation of posterior wall against resistance
- 5 - strong contraction against strong resistance

If we test muscle action against gravity is our recording mechanism the same?

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## Myotomes

- Quadriceps - L3
- Tibialis anterior - L4
- Extensor hallucis longus - L5
- Toe extensors - L5 & S1
- Calf - S1 & 2
- Toe flexors - S2
- Puborectalis - S2, 3, & 4
- EAS - S2, 3 & 4

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## Reflexes

- Knee jerk - L3
- Ankle jerk - S1 and S2
- Plantarflexor - S2
- EAS - S4

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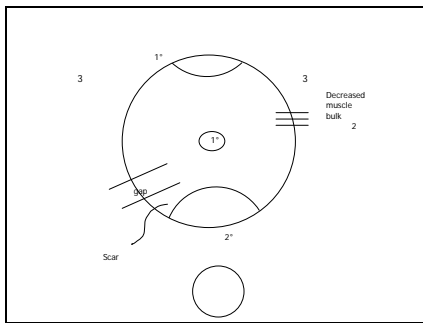
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## Latest Techniques

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**Advanced Palpation and  
Assessment**

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**Improved Assessment  
Techniques**

- How do I palpate
- What do I feel
- Am I right in my assumptions
- How do I record my findings
- What do I teach my patients
- Will I make any difference?????

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**Palpation**

- Horizontal plane of palpation
  
- Vertical plane of palpation
  
- But the pelvis is a 'bowl'
  
- Which muscles are being palpated?

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## Palpation

- Horizontal plane
  - Coccyx
  - Posterior vaginal wall
  - Rectum and contents
  - Pubovisceralis
    - Puborectalis portion
  - Levator ani
    - ilioococcygeus

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## Palpation

- Vertical plane
  - Pubic bone
  - Urethra
  - Anterior vaginal wall
  - Pubovisceralis
    - Pubovaginalis portion
  - Pubococcygeus, anterior fibres

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## Dynamic Imaging

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### Application

- Transabdominal
  - Simple bladder scanning
  - Confirmation of symmetry of PFM
  - Assessment of continence mechanism
  - Analysis of core stability
- Transperineal / Translabial
  - Confirmation of pelvic floor muscle activity
  - Assessment of continence mechanism

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### Transabdominal

- Simple bladder scanning
- Integrity of rectus abdominis
- Core stability

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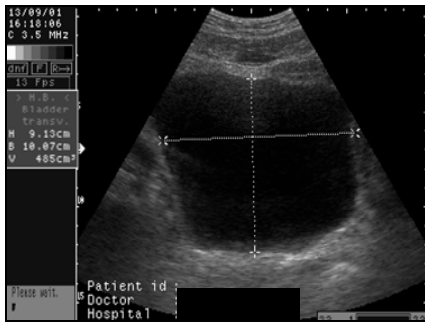
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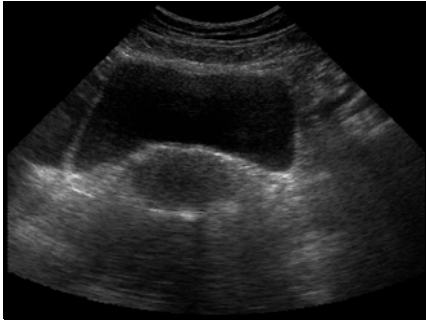
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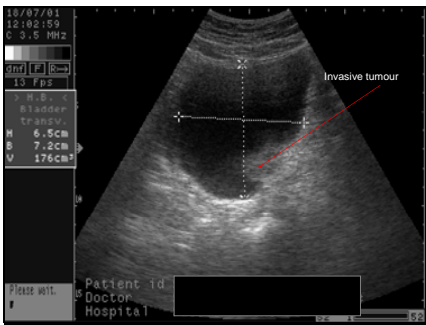
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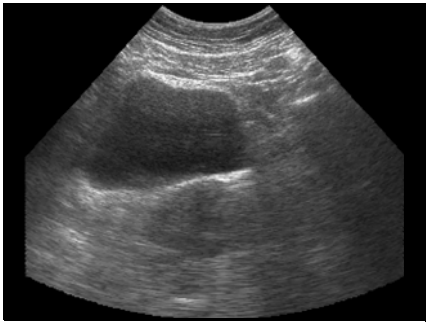
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**Cylinder of Stability**

A pubococcygeal contraction can be facilitated by a transversus abdominis contraction

Richardson & Jull 1995 Muscle control – pain control. What exercises would you prescribe? Manual Therapy 1:2

Activation of the abdominal muscles is a normal response to contraction of the pelvic floor muscles

Sapsford et al 2001 Co-activation of the abdominal and pelvic floor muscles during voluntary exercises. Neurorol & Urodyn 20:31

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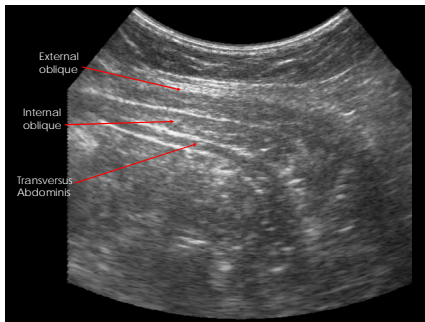
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### Transperineal / Translabial

- Continence Mechanism
- Pelvic Floor Muscle Activity

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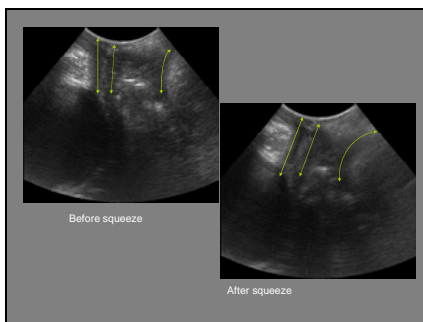
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### The Paperwork

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## Documentation

- How do you record your findings when palpating in two planes?
- Should we be simplifying the scoring?
- Should we be thinking gravity assisted, eliminated and resisted?
- How do you record specificity of muscle action?

It's just not that easy after all!

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## Oxford Classification    ICS Classification

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| <ul style="list-style-type: none"><li>• 0 = No contraction</li><li>• 1 = Flicker of contraction</li><li>• 2 = Weak. Small movement with gravity counterbalanced</li><li>• 3 = Fair. Movement against gravity</li><li>• 4 = Good. Movement against gravity and some resistance</li><li>• 5 = Normal</li></ul> | <ul style="list-style-type: none"><li>• 0 = No contraction</li><li>• 1 = Weak (Oxford 1&amp;2)</li><li>• 2 = Good (Oxford 3&amp;4)</li><li>• 3 = Strong (Oxford 5)</li></ul> |
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## Advanced Assessment

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| <ul style="list-style-type: none"><li>• P performance</li><li>• E endurance</li><li>• R repetitions</li><li>• F fast</li><li>• E elevation</li><li>• C co-contraction</li><li>• T timing</li></ul> | <ul style="list-style-type: none"><li>• S strength/stability/speed</li><li>• U urethral closure</li><li>• B bladder neck mobility</li><li>• T tone/timing (accuracy/control)</li><li>• L left/right symmetry</li><li>• E endurance at sub max level</li></ul> |
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