



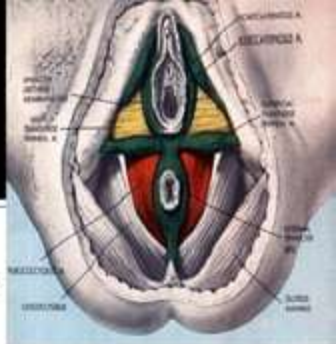
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PELVIC FLOOR

ANATOMY

- The PF consists of three muscle layers:
- Superficial perineal layer: innervated by the pudendal nerve
 - Bulbocavernosus
 - Ischiocavernosus
 - Superficial transverse perineal
 - External anal sphincter (EAS)
- Deep urogenital diaphragm layer: innervated by pudendal nerve
 - Compressor urethra
 - Uretrovaginal sphincter
 - Deep transverse perineal
- Pelvic diaphragm: innervated by sacral nerve roots S3-S5
 - Levator ani: pubococcygeus (pubovaginalis, puborectalis), iliococcygeus
 - Coccygeus/ischiococcygeus
 - Piriformis
 - Obturator internus



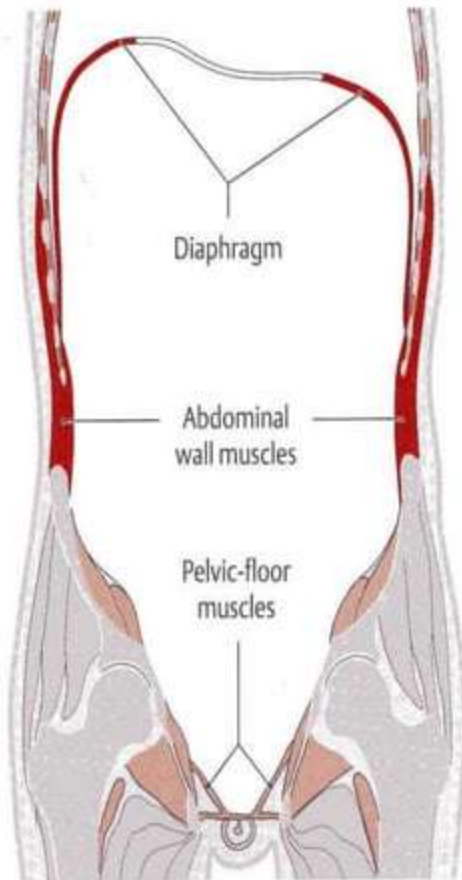
INTRODUCTION

- 2 types of muscle fibres
- Type I slow twitch fibers
- Type II fast twitch fibres
- 70% PFM are slow twitch fibres
- The PFM are the only transverse load bearing muscle group in the body.

ROLE OF PELVIC FLOOR MUSCLE

- In females, supports and gives tone to the vaginal wall
- Supports pelvic organs against gravity
- Increase intra abdominal pressure
- Maintain ano-rectal angle.
- Relaxation for defecation/contraction
- Prevent incontinence (urinary & fecal)

- Allow for opening of the pelvic floor to accommodate excretory functions and parturition
- Reinforce urethral closure during increase of intra abdominal pressure
- Has an inhibitory effect on bladder activity
- Assist in unloading the spine
- Assists in pelvispinal stability
- Contribute to sexual arousal and performance

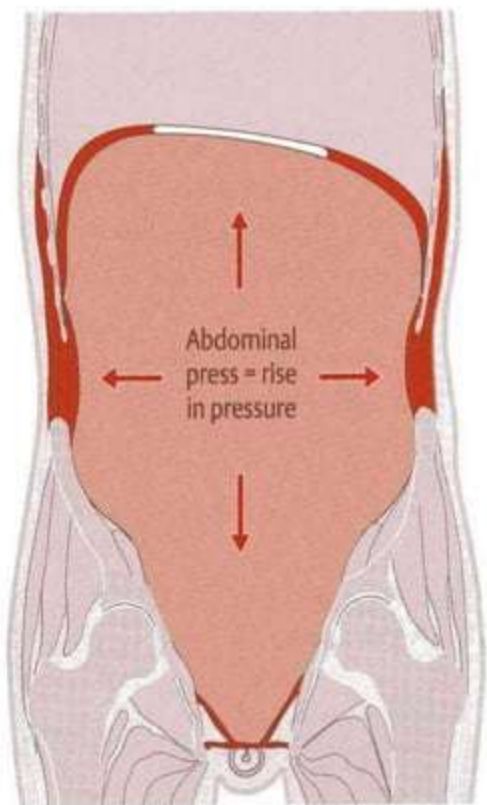


Diaphragmatic-

The abdominal wall, respiratory and pelvic diaphragms create a functional cylinder

This cylinder is created by muscles that must contract and become rigid in order to protect the spine and pelvis during **any** mechanical loading

In some patients, the pelvic diaphragm does not contract. This causes weakness of this entire support mechanism



- As the abdominal muscles respiratory and pelvic diaphragms contract
The intra-abdominal pressure increases
The entire abdomen becomes more rigid, able to transmit greater mechanical loads without hurting the spine nor pelvic joints

Type of impairment

- Anatomic impairment
 - Birth injuries
 - Neurological dysfunction

- Psychological impairment
 - Motivation
 - Sexual abuse

Evaluation or examination

- Pt assessment should include
- Presenting symptoms in order of importance
- Relevant obstetric , medical , gynecological and surgical h/o
- Investigation, and previous and current treatment
- Details of voiding dysfunction/ incontinence
- Details from frequency / volume charts, fluid intake

■ Rectal function-defecation pattern

■ Objective assessment

- Digital per vaginal examination
- Digital per anal muscle assessment
- Effect of coughing and straining on vaginal wall and organ position
- Six point scale- (0 for nil contraction, 1- flicker, 2- weak, 3- moderate, 4- good, 5- strong)
- Position – supine or standing
- One finger or two finger
- Perineometer- records vaginal pressure

PERFECT

- P-power
- E-endurance
- R –resting tone
- F- fast contraction
- Ect- each contraction time
- C- coordination



- Other impairments ,such as pelvic floor trigger points, decreased sensation, and scars or myofascial adhesions should be noted

Thirteen ways of confirming a contraction of the PFM

- 1. vaginal examination by the physiotherapist
- 2. self-examination by the patient
- 3. hand on perineum by the physiotherapist
- 4. hand on perineum by the patient
- 5. observation of perineum by the physiotherapist
- 6. observation of perineum by the patient – using a mirror
- 7. perineometer



- 8. stop and start midstream
- 9. using the Neen Healthcare 'Educator'
- 10. using a cone in the vagina and applying traction to the string while
- trying to grip the cone
- 11. asking the partner at intercourse
- 12. manometric and EMG biofeedback
- 13. transperineal or labial ultrasound.





Peritron

Peritron is a hand-held clinical Perineometer intended for assessing the strength of pelvic floor (PF) muscles and teaching pelvic floor exercises.

In operation, air pressure in the sensor caused by a pelvic floor contraction is transferred by a tube to the Readout Unit where it is displayed in several ways .

The pressure is displayed either numerically in centimetres water pressure or as a multi-range analogue bar-graph.

Stop test

- Grades
- 1/5- unable to slow the stream of urine
- 2/5- can slow the stream of urine but cannot stop it
- 3/5- can stop the flow of urine slowly and with difficulty
- 4/5- urine stop abruptly but cannot be repeated
- 5/5- urine stops abruptly and stopping can be repeated.

Other methods

- Jumping jack test
- Pad test
- EMG
- Urodynamic assessment
- Pelvic floor dynamometer



Contraindication of internal evaluation of the pelvic floor muscle

- Pregnancy
- Within 6 weeks of vaginal or cesarean delivery and pelvic surgery
- Atrophic vaginitis
- Active pelvic infection
- severe pelvic or vaginal pain
- Children and pre sexual adolescents
- Lack of informed consent
- Lack of therapist training

IMPAIRMENTS

- Endurance impairment
- Mobility impairment
- Posture impairment
- Coordination impairment

TYPE OF DYSFUNCTION

- Supportive dysfunction
- Hypertonic dysfunction
- In coordination dysfunction
- Visceral dysfunction

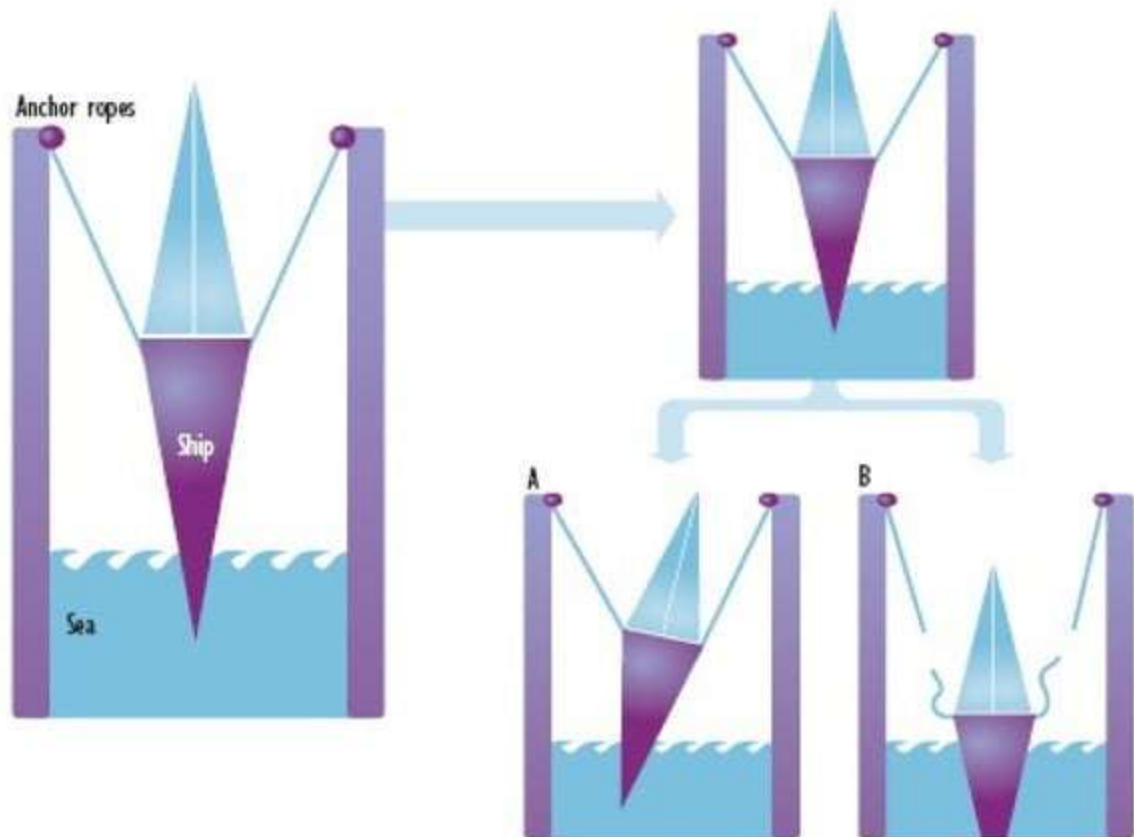
Supportive dysfunction

- Results from loss of strength and integrity of contractile and non contractile tissues.
- This dysfunction is weakness and sagging of PFM.
- Common diagnosis associated with supportive dysfunction are stress incontinence, mixed incontinence and pelvic organ prolapse.

Boat in Dock Analogy

- Boat- pelvic organs
- Water- pelvic floor muscles
- ropes –ligaments that support pelvic organ
- Problem is with the water or ropes or both
- Result is sinking of the boat
- Really the boat itself is fine

Figure 1: The De Lancey Image of the Ship



Etiology

- Anatomic impairment of PFM and nerves in the area
- Vaginal delivery
- Muscle atrophy due to central and peripheral nervous system defect
- Decrease awareness leads to weakness
- Prolong intra abdominal pressure may result in stretching of PFM or their tendons.
- obesity

Common impairments

- Impaired performance and endurance of PFM
- Increased PFM length
- Increased connective tissue length and muscle atrophy
- Impaired abdominal muscle performance
- Coordination of the PFM decreased
- Pain in PFM
- Mobility impairment of pelvic joint.
- Symptom of incontinence

Hypertonic dysfunction

- Related to pain and spasm
- Medical diagnosis associated with hypertonia dysfunction, include levator ani syndrome, pelvic floor tension myalgia, coccygodynia, vulvodynia , vestibulitis, vaginismus, chronic pelvic pain and dyspareunia.
- Hypertonic dysfunction may result from pelvic joint dysfunctions, hip muscle imbalance, and abdomino pelvic adhesions and scars affecting the PFM function.

Etiology

- Lumbo pelvic joint mobility impairments or pathology.
- Injuries, such as fall onto the coccyx or pubic ramus.
- Hip muscle imbalance with coordination, pain, altered tone, and muscle performance impairments.
- Abdominal and perineal adhesions due to pelvic or abdominal surgery or inflammatory condition of abdomen, such as endometriosis.

Impairments

- Altered tone of the PFM, associated muscle of hip, buttock and trunk.
- Mobility impairment of scar and connective tissue
- Mobility impairment(hypermobility, hypomobility) of pelvic joints: SI joint, pubic, lumbar, hip and sacrococcygeal.
- Faulty posture
- Pain in perineum
- Hypersensitivity of skin and mucosa.

Incoordination dysfunction

- Divided into neurological and non neurological
- Detrusor sphincter dyssynergia is a type of incoordination resulting from neurological lesion in the spinal cord between brain stem and T₁₀.the PFM and smooth internal sphincter contract during a bladder contraction so that urine is unable to be expelled.
- Non-neurological incoordination dysfunction is characterized by absent or inappropriate patterns of timing and recruitment of the PFM.

Etiology (non-neurologic)

- Discuse and decrease awareness of PFM.
- Pain in the pelvic or abdominal area may disrupt recruitment pattern.
- PFM weakness
- Coordination impairment

Visceral dysfunction

- Pseudo- PFM dysfunction dysfunction.
- It is an abnormality in mobility or motility of the abdominopelvic visceral tissue that leads to pain and musculoskeletal impairment.
- Detrusor instability

Etiology

- Endometriosis
- pelvic inflammatory disease.
- Dysmenorrhea
- Surgical scars
- Irritable bowel syndrome
- Interstitial cystitis.

Impairment

- Weakness of the abdominal muscles, especially the oblique and transverse layers may occur in response to pain in the abdomen, causing a pendulous abdomen with poor visceral and lumbar support.
- Secondary lumbo pelvic joint mobility impairment and posture impairments may result.
- Altered tone or impaired muscle performance of the PFM may also occur as result of pain in the lower pelvic pain.