

# Who can Benefit from Pelvic Floor Muscle Exercises? How is the Evaluation before Treatment

許鈞碩

大林慈濟婦產科

台灣福爾摩莎婦女泌尿醫學會理事

台灣婦女骨盆關懷協會監事

慈濟大學醫學系助理教授

佛教慈濟醫療財團法人大林慈濟醫院

Dalin Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation



# Who Can Benefit from Pelvic Floor Muscle Exercises (Kegel Exercises)

- Pelvic floor muscles support the bladder, uterus, and rectum.
  - Weakness can result from childbirth, aging, surgery, or high-impact activities.
  - Benefits include:
    - Improved urinary and fecal continence
    - Prevention of pelvic organ prolapse
    - Enhanced sexual function
  - Suitable for all genders and ages.

\*Source: Vø K et al., Int Urogynecol J (2015) 26:1257–1275, DOI:10.1007/s00192-015-2687-1\*



# Postpartum Women

- Strengthens pelvic muscles stretched during pregnancy and childbirth
  - Benefits:
    - Improved bladder and bowel control
    - Reduced risk of pelvic organ prolapse
    - Enhanced healing and sexual function
  - Recommended: Start gently postpartum with medical clearance

Hay-Smith EJC et al., Cochrane Database Syst Rev. 2020; (7):CD007471.  
DOI:10.1002/14651858.CD007471.pub3



# Older Adults & Post-Surgical Patients

- Helps manage age-related incontinence and prolapse
  - Benefits for men after prostate surgery:
    - Regains bladder control
    - Improves erectile function
  - Women after gynecological surgery:
    - Prevents postoperative incontinence
    - Maintains pelvic organ support

Milios J et al., Transl Androl Urol. 2020 Jun; 9(3): 1153–1163.  
DOI:10.21037/tau.2020.03.30



# Athletes & Patients with Specific Conditions

Athletes & Patients with Specific Conditions

Female athletes in high-impact sports:

Reduce stress urinary incontinence  
Improve core stability  
Helps patients with: Mild pelvic organ prolapse  
Fecal *incontinence*

*Source: Leitner M et al., Neurourol Urodyn. 2017  
Apr;36(4):960-965. DOI:10.1002/nau.23051*



# Conclusion

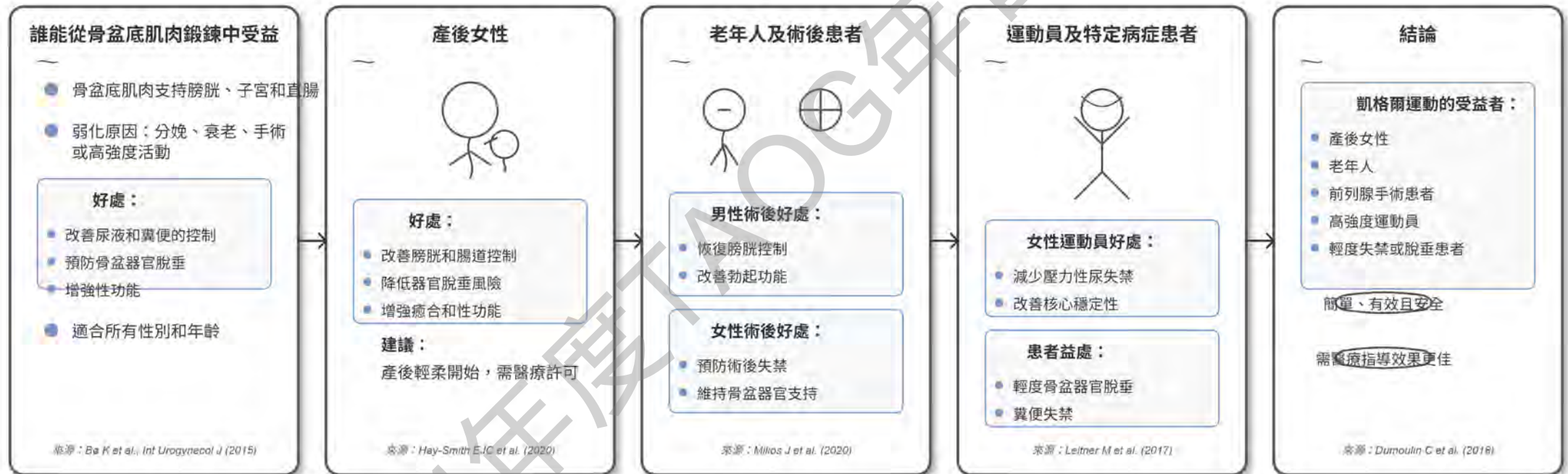
- Kegel exercises are beneficial for:
  - Postpartum women
  - Older adults
  - Prostate surgery patients
  - High-impact athletes
  - Patients with mild incontinence or prolapse
- Easy, effective, and safe with proper technique
- Best results with medical or physiotherapy guidance

Dumoulin C et al., Cochrane Database Syst Rev. 2018; (10):CD007471.  
DOI:10.1002/14651858.CD007471.pub4





## 骨盆底肌肉鍛鍊（凱格爾運動）受益人群



凱格爾運動—簡單有效的骨盆底肌肉鍛煉方法

# Physiotherapy 物理治療

Pelvic floor muscle exercise PFME

骨盆底肌肉運動(主動)

Biofeedback training 生理回饋(主動)

Electrical stimulation ,ES 電刺激(被動)

Magnetic resonance chair 磁波椅(被動)





# 骨盆底肌肉的臨床評估

## clinical evaluation of the pelvic floor muscles

- Lithotomy position
- 解釋所有檢查步驟避免尷尬
- 排空膀胱
- 骨盆及膝蓋彎曲向外展開



# 骨盆腔之基本檢測



# 檢查之注意事項

- 1.檢查之前要先叫病人將尿解乾淨
- 2.以棉被適度的覆蓋病人的身體，略抬高病人的頭、肩部有助於腹部肌肉的放鬆。
- 3.以布覆住大腿及膝蓋，並將兩腿及膝中間向下壓，讓病人及檢查者可以互相看到彼此的臉。
- 4.病人的雙手放於兩側或環抱在胸前但勿高過於頭，避免是腹部肌肉緊繃。



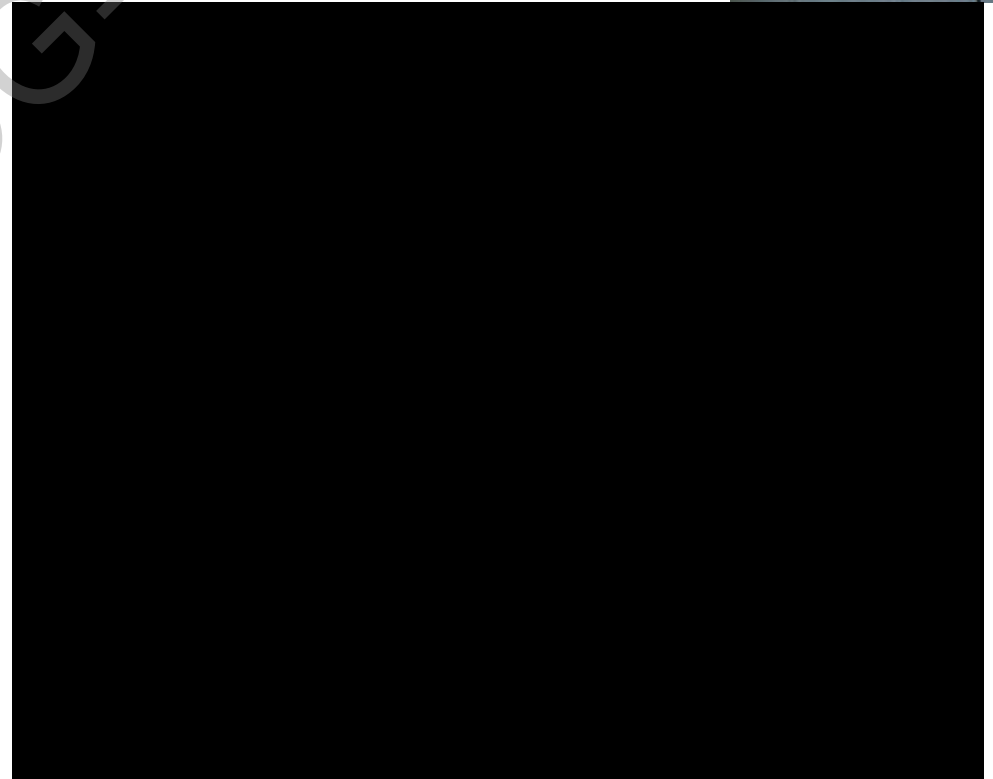
## 檢查之注意事項(2)

- 5.每個檢查步驟要先告知病人，並告知檢查時大概會有什麼感覺，避免無預警的檢查。
- 6.檢查者的手及陰道鏡不要過於冰冷，在檢查時可先觸及大腿內側再接觸生殖器。
- 7.檢查時注意病人的臉及反應以掌握病人心理的感受。
- 8.檢查過程中及之後的操作機械，手皆要戴手套。



# 病人姿勢

- 1.先將病人做適當的覆蓋，協助病人擺成截石術的姿勢。
- 2.協助病人把腳跟一隻一隻的踩在馬鐙上。
- 3.躺好後移動病人臀部至一點點在抬緣之外為止。
- 4.大腿彎曲而外展，頭部可墊枕頭。





# 外檢

檢視病人的外陰部

檢查者坐在椅子上，詳細視診病人之陰阜、陰唇、會陰，用戴手套的手將陰唇分開檢視。

注意看有無發炎、潰瘍、分泌物、腫脹或腫塊，若有則需觸診之。

如果脫垂尿失禁，內診台椅背調高到60度



# Pelvic floor muscle exercise

## 骨盆底肌肉運動

最早由Arnold Kegel 於1948年提出 (Kegel 's exercise)

最早期婦產科凱格爾醫師提倡在產後教導產婦使用骨盆底收縮來訓練肌肉強度，使得產後具有尿失禁的婦女可以儘早恢復尿不失禁的情況

PFMT advocated for treatment of SUI POP, defecatory dysfunction



# 骨盆底肌肉運動

骨盆底肌肉→ levator ani

60-70% type 1 , slow twitch (POP)

30-40% type 2 , fast twitch (SUI)

Decreased type 2 in the periurethral perineal area  
in women with symptoms of urinary stress  
incontinence



# 骨盆底肌肉運動

進行骨盆底肌肉運動有4個階段

Identification of the pubococcygeus 辨認骨盆底肌肉

Instruction 教導

Correct contraction 正確的收縮

Continuation of therapy 持續治療



# Pelvic floor assessment

Modified oxford grading scale (Laycock,2008)

PERFECT scoring

Power

Endurance

Repetitions

Fast contractions

Every

Contraction

Timed





# The P.E.R.F.E.C.T. 表格

縮寫 (Scale)	英文描述 (Description)	中文翻譯
P	Power (measurement of strength): Graded from 0 (no movement) to 5 (strong movement) based on the Oxford grading system. Both slow and fast twitch muscle fibers contribute to power.	力量 (肌力測量) : 根據牛津評分系統, 從 0 (無動作) 到 5 (強力動作) 分級。包括慢縮及快縮肌纖維的力量。
E	Endurance measured in seconds: Duration of time (in seconds) that a maximum vaginal contraction can be maintained before dropping 50% of strength.	耐力 (以秒計) : 最大陰道收縮可以維持的秒數, 直到力量下降 50% 的時間長度。
R	Number of repetitions that a woman is able to achieve: Determining endurance by counting how many repeated contractions can be performed.	可達成的重複次數 : 透過計算女性可以進行多少次連續收縮來評估耐力。
F	Number of fast (1-2 second) contractions that can be performed: Measures fast-twitch muscle fiber contractility.	可以完成的快速收縮次數 (1-2 秒內) : 評估快縮肌纖維的收縮能力。
E	Every (每一次收縮): Recording each contraction for consistency and monitoring.	每一次收縮 : 紀錄每次收縮以維持一致性及監測進度。
C	Contraction (收縮): The action of tightening the pelvic floor muscles.	收縮 : 指收緊盆底肌的動作。
T	Timed (計時): Emphasizes timing of each contraction to evaluate muscle response and fatigue.	計時 : 強調每次收縮的時間以評估肌肉反應和疲勞度。

# Power

Graded from 0-5,  
oxford scale

等級 (Grade)	英文描述 (Description)	中文翻譯
0	Nil – lack of any discernible response in the peri-vaginal muscles.	0 無反應 — 陰道周圍肌肉沒有明顯反應。
1	Flicker – 'flicker' describes a fluttering/quivering of the muscle.	1 輕微顫動 — 指肌肉有輕微顫動感。
2	Weak – contraction which is not fluttering.	2 微弱 — 有收縮感但非顫動。
3	Moderate – increase in pressure, compressing the examiner's fingers and incorporating a small degree of lift, as the fingers are moved in a cranial direction.	3 中等 — 壓力增加，壓迫檢查者手指，同時伴有小幅度向頭側抬升的動作。
4	Good – contraction is firm causing lifting of the PFM up and in against resistance.	4 良好 — 收縮力強，能將盆底肌向上抬升並對抗阻力。
5	Strong – implies a very strong grip of the examiner's finger and positive movement in a cranial direction against strong resistance.	5 強力 — 具有強烈的抓握感，能明顯帶動檢查者手指向頭側移動，對抗強大阻力。

■ 臨床肌力評估分級表 Clinical Scale

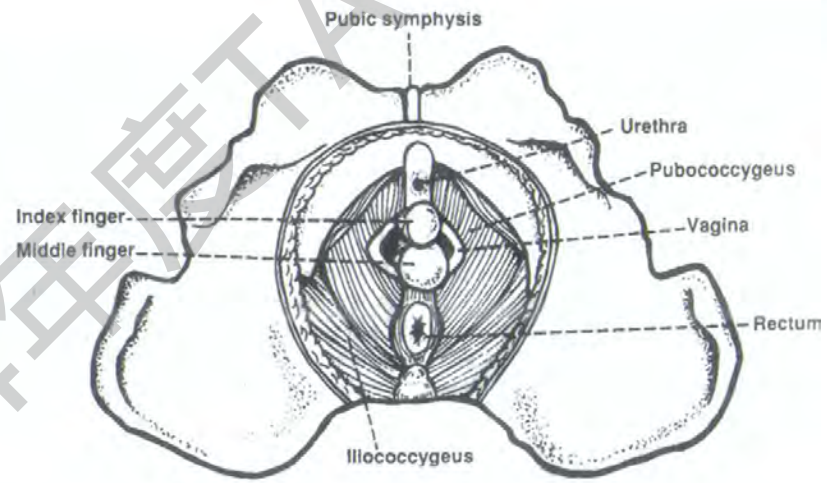
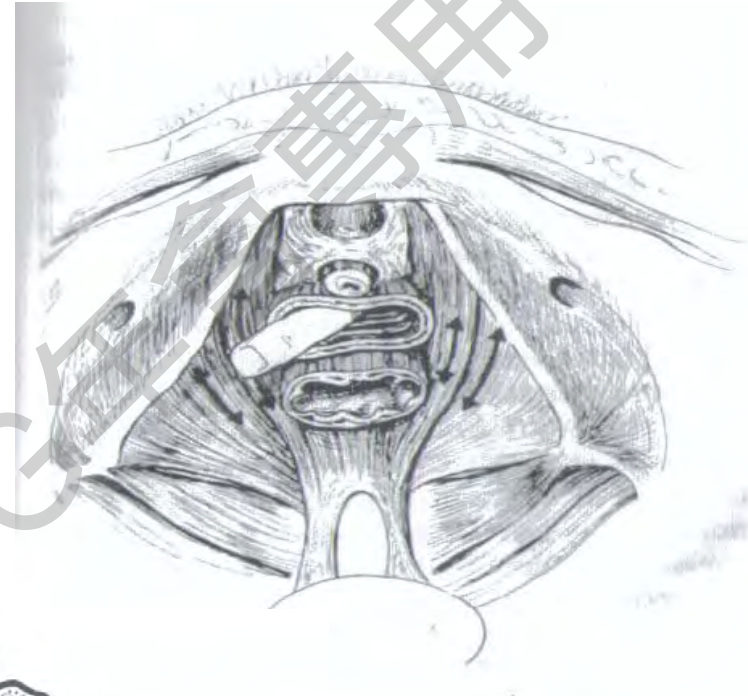
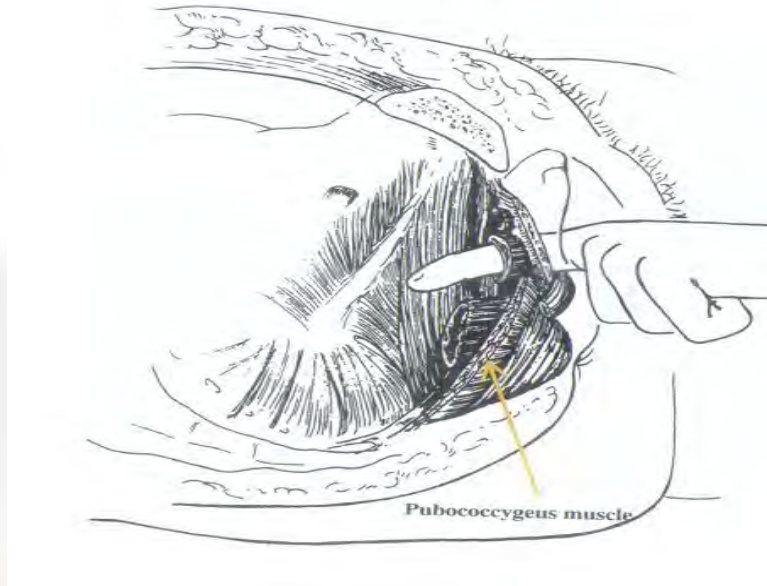
等級 (Grade)	英文描述 (Description)	中文翻譯
0 - None	No duration of muscle contraction, pressure, <u>displacement</u> . Recruitment of large muscle group (e.g., gluteals, adductors, abdominals).	無肌肉收縮、壓力或位移持續時間。可能出現大肌群代償（如臀肌、內收肌、腹肌）。
1/5 - Trace	Slight but instant contraction: <1 second. Recruitment of large muscle group (e.g., gluteals, adductors, abdominals).	輕微且瞬間的收縮，持續時間少於 1 秒。可能伴隨大肌群代償（如臀肌、內收肌、腹肌）。
2/5 - Weak	Weak contraction with or without posterior elevation of fingers, held for >1 second but ≤3 seconds.	收縮力弱，有無指頭向後抬高均可，能維持 1 至 3 秒。
3/5 - Moderate	Moderate contraction with or without posterior elevation of fingers, held for at least 4-6 seconds, repeated 3 times.	中等強度的收縮，有無指頭向後抬高均可，可持續 4-6 秒，重複 3 次。
4/5 - Good	Strong contraction with posterior elevation of fingers, held for at least 7-9 seconds, repeated 4-5 times.	良好的收縮伴隨指頭向後抬高，可持續 7-9 秒，重複 4-5 次。
5/5 - Strong	Unmistakably strong contraction with posterior elevation of fingers, held for at least 10 seconds, repeated >5 times.	非常明顯且強力的收縮，伴隨指頭向後抬高，可持續至少 10 秒，重複超過 5 次。

# Evaluation of muscle hypertonus/spasm

## 痙攣/高張力評估

分級↵	英文描述↵	中文翻譯↵
0↵	No pressure, tenderness or pain.↵	無壓力、壓痛或疼痛。↵
1↵	Comfortable pressure, slight tenderness but bearable.↵	可接受壓力，稍有壓痛但可忍受。↵
2↵	Uncomfortable pressure, slight pain.↵	不舒服的壓力，輕微疼痛。↵
3↵	Moderate pain that intensifies with muscle contraction.↵	中度疼痛，隨著肌肉收縮而加劇。↵
4↵	Severe pain, woman unable to perform muscle contraction due to pain.↵	劇烈疼痛，患者因疼痛無法執行肌肉收縮。↵









# Examples of the P.E.R.F.E.C.T. assessment techniques

範例 (Example)↵	評估 (Assessment)↵	說明 (Explanation)↵	評論 (Comment)↵
1↵	P/E/R/F↓ 4/7/5/6 — brisk response↵	P = 4, good contraction↓ E = 7, held for 7 seconds↓ R = 5, repeated 5 times↓ F = 6, six fast contractions↵	這名女性能進行 5 次良好的收縮（持續 7 秒），接著有 6 次快速收縮。每個動作都有計時（E.C.T.），並且這將成為她的訓練計畫。'迅速反應'描述其良好的協調性。↵
2↵	P/E/R/F↓ 2/5/2/3 — sluggish response↵	P = 2, weak contraction↓ E = 5, held for 5 seconds↓ R = 2, repeated 2 times↓ F = 3, three fast contractions↵	這名女性能進行 2 次較弱的收縮（持續 5 秒），接著有 3 次快速收縮。每個動作皆有計時（E.C.T.），並且這將成為她的初步訓練計畫。'遲鈍反應'描述在要求快速收縮時協調不佳的現象。↵

# 骨盆底肌肉運動

Reduced endurance of pelvic floor contraction is mainly a slow twitch fiber disorder

Endurance training by increasing the length of contractions and the number of repetitions

藉由增加收縮的長度和重複次數可以將骨盆底肌肉耐力增強



# Principles of general muscle training

Overload

Specificity

Reversibility: loss of hypertrophy





1. Are the muscles morphologically symmetric?  
1. 肌肉形態上是否對稱？
2. Are there any defects in the muscles, such as hernias or tears from obstetrical trauma?  
2. 是否有肌肉缺損，例如疝氣或分娩造成的撕裂？
3. Is there any scarring?  
3. 是否有疤痕？
4. What is the strength and bulk (volume) of the muscles?  
4. 肌肉的力量及厚度（體積）如何？
5. Is there voluntary symmetric contraction?  
5. 是否有自主且對稱的收縮？
6. Does contraction elevate the bladder neck and anorectal angle?  
6. 收縮時是否能提升膀胱頸及肛直角？
7. Is there tenderness and pain during the examination? With a contraction?  
7. 檢查過程或收縮時是否有壓痛或疼痛？





# Principles in pelvic floor muscle training

Overload and specificity

Reversibility: loss of Function with Deterioration of Co factors

Pelvic Floor Muscle exercises : Coactivation of Synergists



# 骨盆底肌肉運動

Reduced pelvic floor strength is predominantly a fast twitch fiber disorder

Require strength training with maximum voluntary contractions until the muscles fatigue

需要最大的主動收縮，直至肌肉疲勞可以將骨盆底肌肉力量增強



# 骨盆底肌肉運動

In patients with stress urinary incontinence, even moderate pelvic floor contractions before increases in intraabdominal pressure can reduce stress incontinence

應力性尿失禁的患者，在腹壓上升之前，做中度的骨盆底收縮可以降低尿失禁的發生

**the 'Knack'**: Urethral compression can be maximized by timing the muscle contraction at the exact moment of intraabdominal force

強而快速的盆底肌收縮可關閉尿道、增加尿道壓力，以防止因腹內壓突然上升（如咳嗽時）而導致漏尿。透過在腹內壓產生的瞬間進行收縮（稱為『**Knack**』技巧）可以達到最佳效果。女性可在咳嗽前約1秒主動收縮盆底肌，並維持收縮狀態直到咳嗽結束

In patients with OAB, during an episode of urgency, several **maximum** contractions may help by inhibiting the overactive detrusor muscle

在OAB患者，尿急發作時，幾個最大的收縮可藉由抑制過度活化的逼尿肌壓抑膀胱過動





# 骨盆底肌肉運動

Adherence to a pelvic floor exercise program is influenced by the patient's understanding of the causes , the consequences of the condition, and the perceived sequelae of noncompliance

骨盆底運動計畫是否堅持主要在於病人對本身疾病的瞭解程度，包括疾病的原因及結果，不遵從的後果。



# Course of PFME

Frequency of exercises

15-20 mins three times daily

15contractions three times daily

Length of training program: 12weeks

Goal :hold maximum voluntary contraction (MVC) for 10s  
and repeat 10 times





# Biofeedback

將不易察覺的生理活動透過機器或器材轉換成較易被病人理解及判讀的訊號。病人可以經由轉換後的訊號，訓練及調節自我的生理功能。



# Biofeedback

Digital (tatile)

Verbal

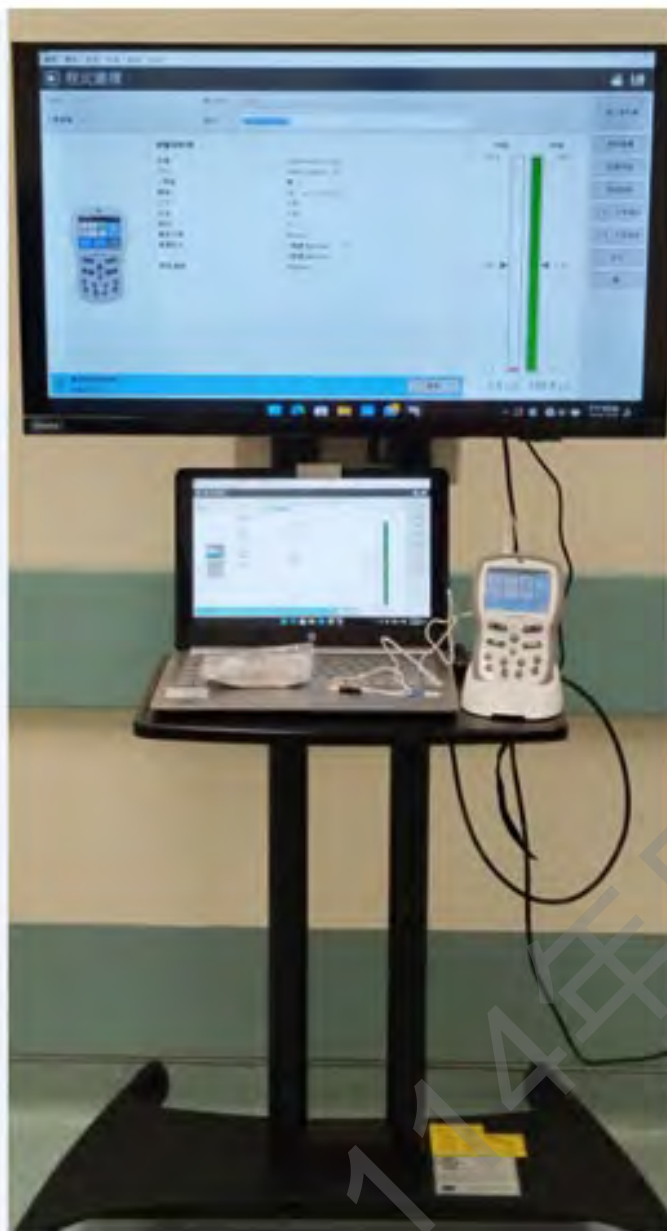
Visual

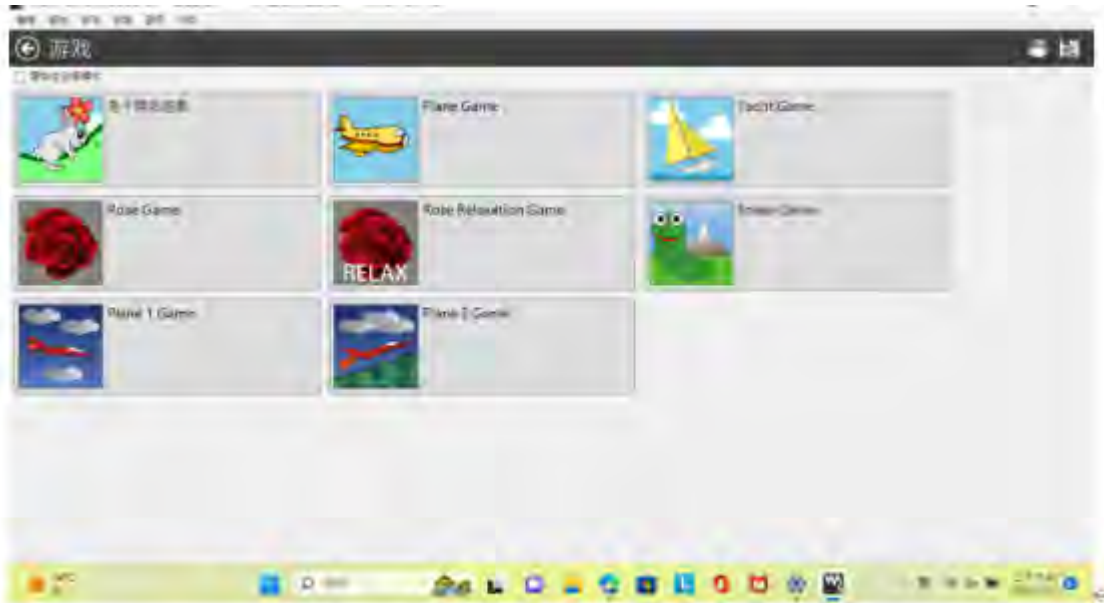
Kinesthetic ( vaginal cone)

Electromyographic

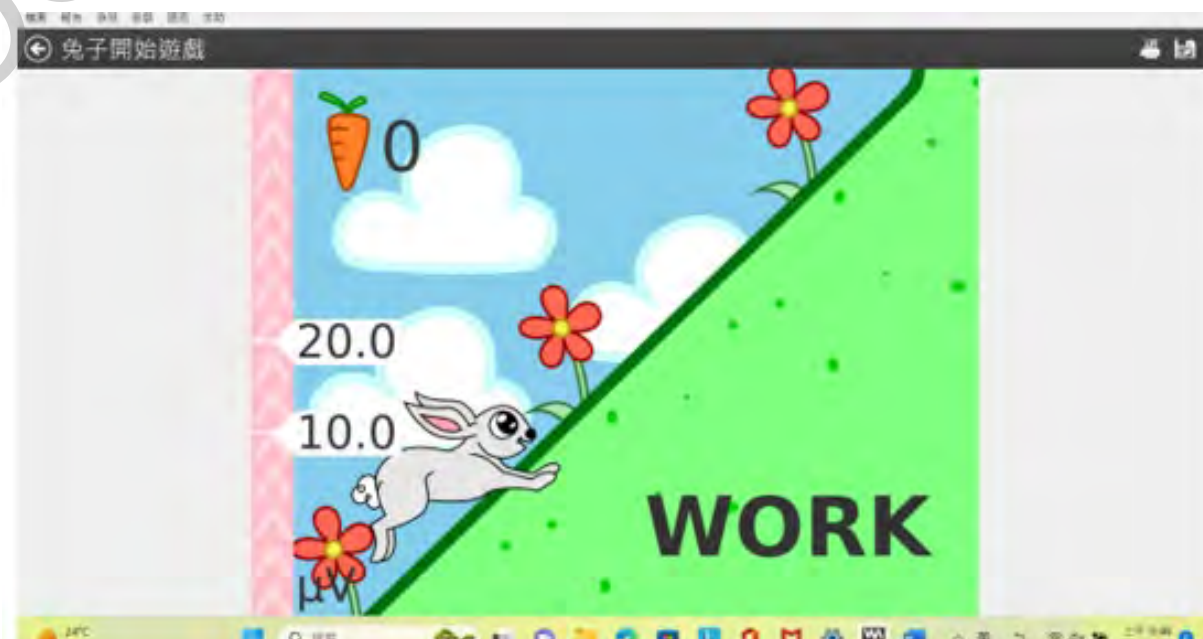
Manometric visual







儀器內有遊戲設計，對於骨盆底肌肉訓練已經有初步肌耐力的婦女，可以透過遊戲的訓練讓他們知道自己訓練的成效與挑戰骨盆底的肌耐力與持久力。



# Key message

**Clinical examination** is the basis of diagnosis of urogynecological disorders

examination is performed by a well-trained person with the appropriate skills

The patient should **actively** participate in the examination and be able to carry out pelvic floor muscle (PFM) contractions in a coordinated way when required.

**Digital self-examination** is an important part of pelvic floor re-education, and women should be able to do this herself.





the **P.E.R.F.E.C.T.** scheme is an important assessment technique, and necessary when planning a treatment program

**The Knack** is a useful maneuver





Thanks you for your attention

