

Dr. ARNOLD

**The new ally
strengthening the
pelvic floor muscles
and treatment of
urinary incontinence**

Tiziano Zingoni

Clinical, Research & Practice Manager

DISTRIBUTOR MEETING

Nice, September 15th 2021

***Clinical Research & Practice
Department:***

*Alessandra Comito
Francesca Madeddu
Irene Fusco
Lara Ronconi
Laura Pieri
Luca Giannoni*



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- Medical examination
- Patient positioning
- Protocol (about 30 minutes)

Introduction

Urinary incontinence (UI) is any **involuntary loss of urine**.

Risk factors*:

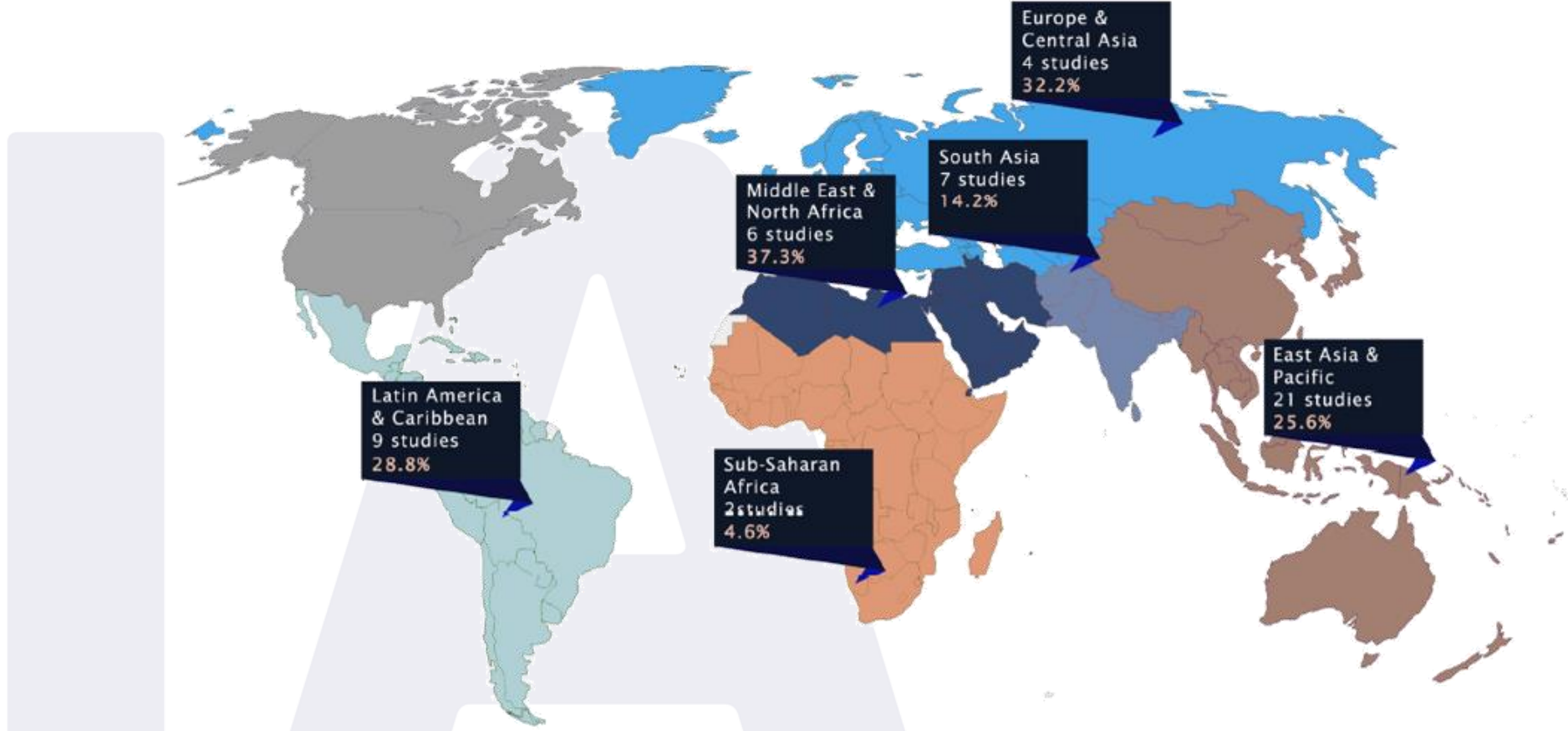
- Age /Menopause and hormonal balance
- Obesity
- Pregnancy
- Neurological diseases
- Hysterectomy
- Smoke
- Occupational factors such as work with heavy weights and efforts
- High impact physical activity
- Stress
- Familiarity

* Example of a list in order of prevalence

**Prevalence of female urinary incontinence in the developing world: A systematic review and meta-analysis—
A Report from the Developing World Committee of the International Continence Society and Iranian Research Center for Evidence Based Medicine**

Hadi Mostafaei^{1,2,3} | Homayoun Sadeghi-Bazargani^{1,2} |
Sakineh Hajebrahimi^{1,2,4,5} | Hanieh Salehi-Pourmehr^{1,2} |
Morteza Ghojazadeh^{1,2} | Rahmi Onur⁶ | Riyad T. Al Mousa⁷ | Matthias Oelke⁸

Urinary Incontinence Around the World



Urinary incontinence prevalence rates based on studies in different geographical locations

UI Total Costs

Direct Costs

Diagnostic
Treatment—Behavioral, pharmacological, surgical
Routine care—Pads, laundry, catheterization
Incontinence consequence—Skin irritation,
urinary tract infections, additional admissions
to institutions, longer hospitalization periods

Psychosocial Costs

Embarrassment, anger, social restriction
and isolation, loss of self-esteem,
inhibited sexual activity, caregiver
burden, job absenteeism

Indirect Costs

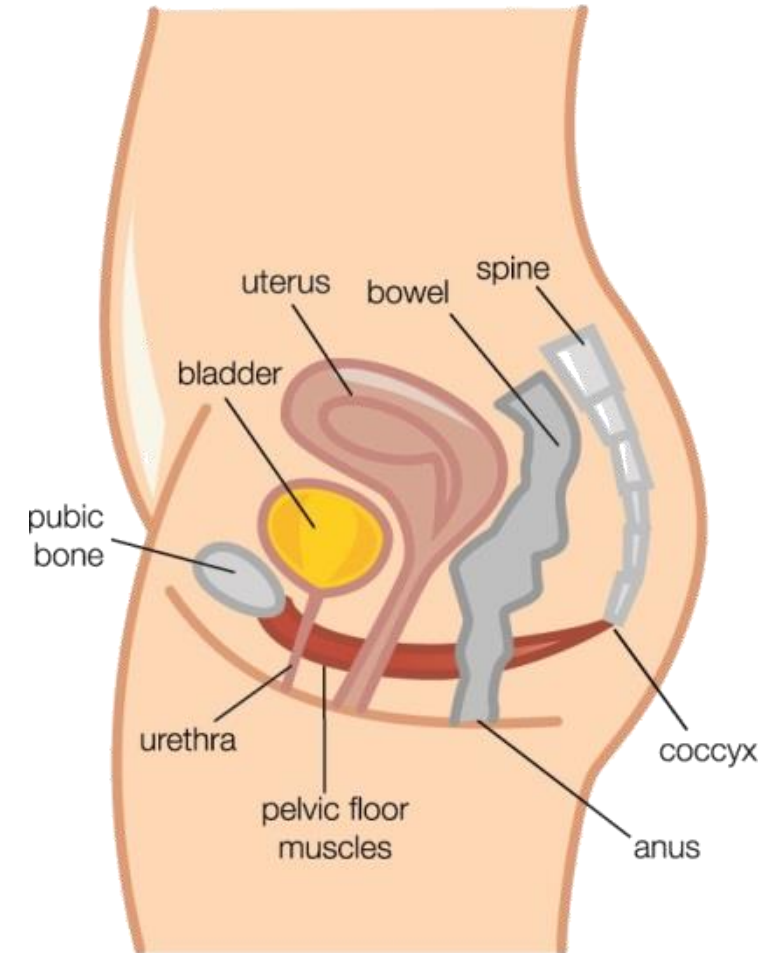
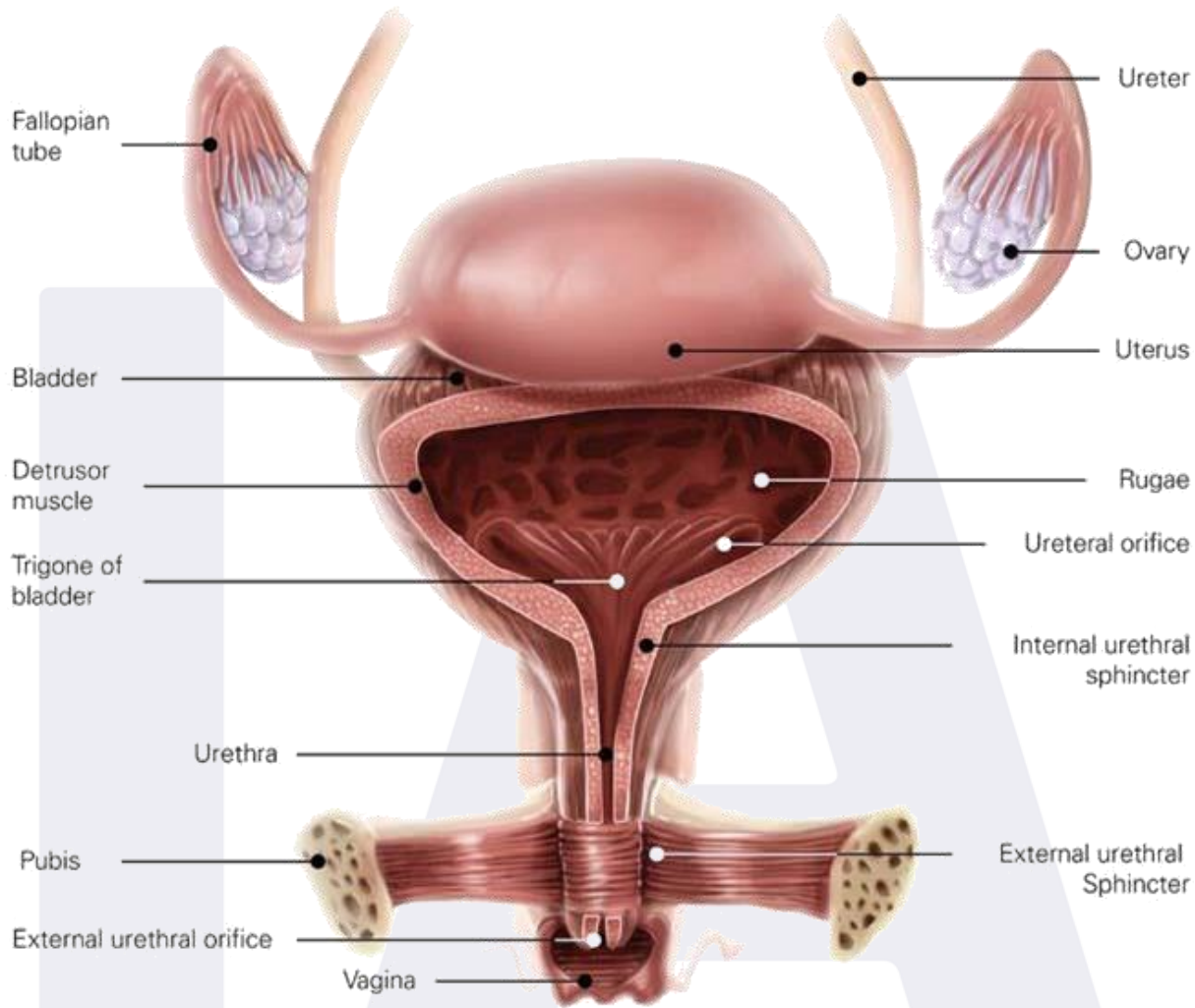
Value of productivity lost by
individual with UI, spouse, or
family

Diagnostic & Therapeutic Approach

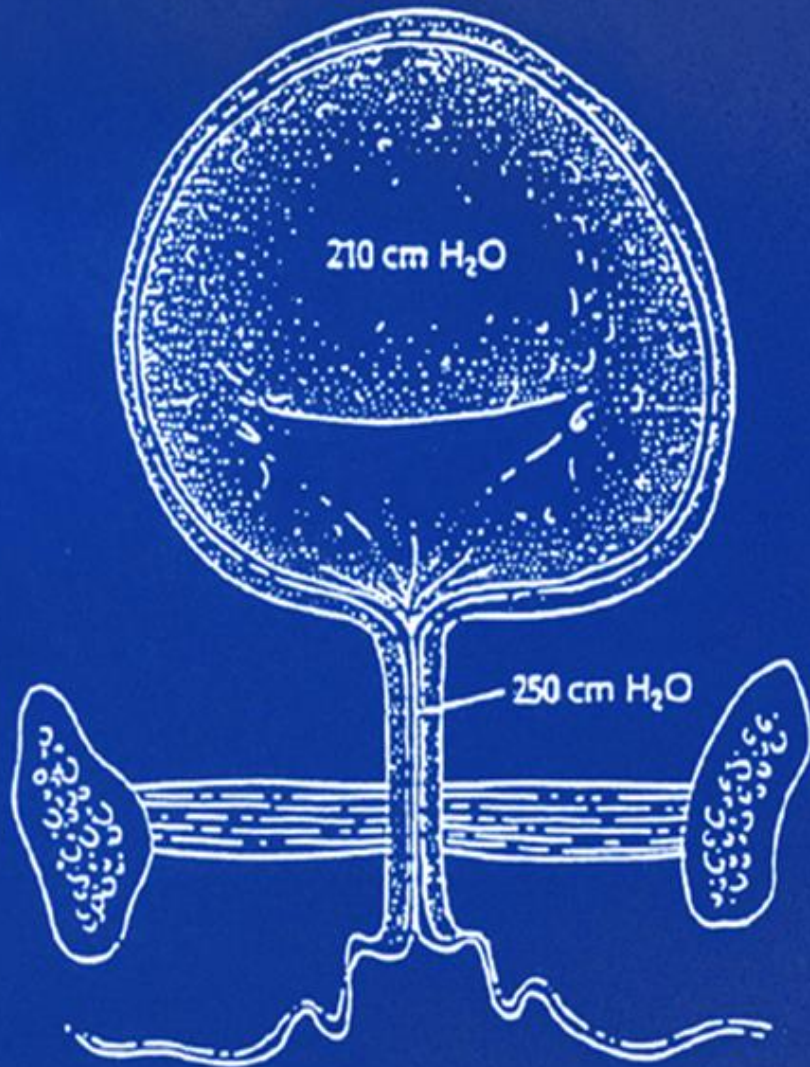
MULTIDISCIPLINARY involves several specialists:

- Urologist
- Gynecologist
- Proctologist
- Neurologist
- Surgeon
- Psychiatrist
- Nurse
- Physiotherapist
- Social worker

Female Urinary Bladder

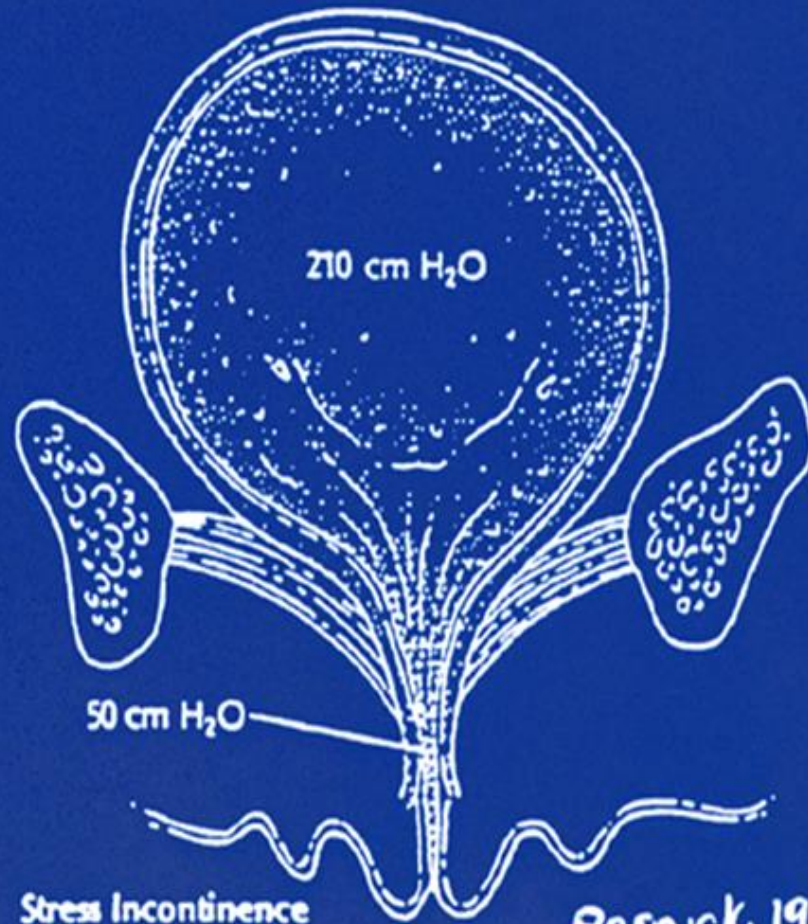


Abdominal Pressure 205 cm H₂O



Normal

Abdominal Pressure 205 cm H₂O



Stress Incontinence

Resnick 1986



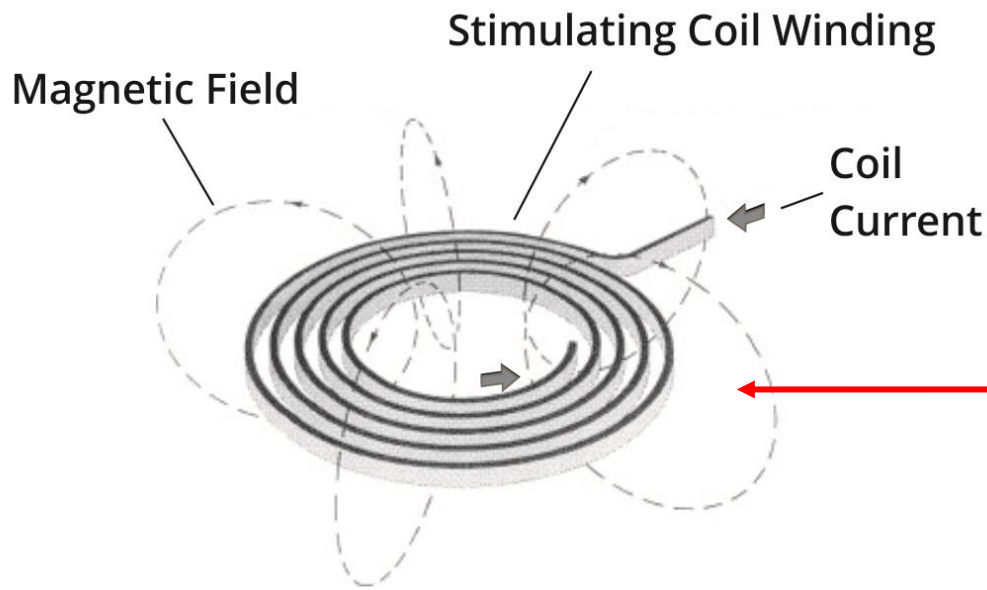
Types of Urinary Incontinence

- **Stress (SUI):** Leakage of small amounts of urine as a result of increased pressure on the abdominal muscles (coughing, laughing, sneezing, lifting).
- **Urge (UUI):** Strong desire to void but the inability to wait long enough to get to a bathroom.
 - **Overactive bladder (OAB):** is a condition where there is a frequent feeling of needing to urinate. If there is loss of bladder control then it is known as urge incontinence.
- **Mixed (MUI):** A combination of SUI and UUI.

... **Pain** management



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Type of energy	Magnetic field
Intensity	up to 2.5 T
Repetition Rate	1-150 Hz
Pulse duration	250±20% μ s

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Indications for use

Pelvic floor muscle strengthening for treatment of urinary incontinence.

It is a non-invasive therapeutic device.

Mainly affected structures are muscular and neuronal tissue:

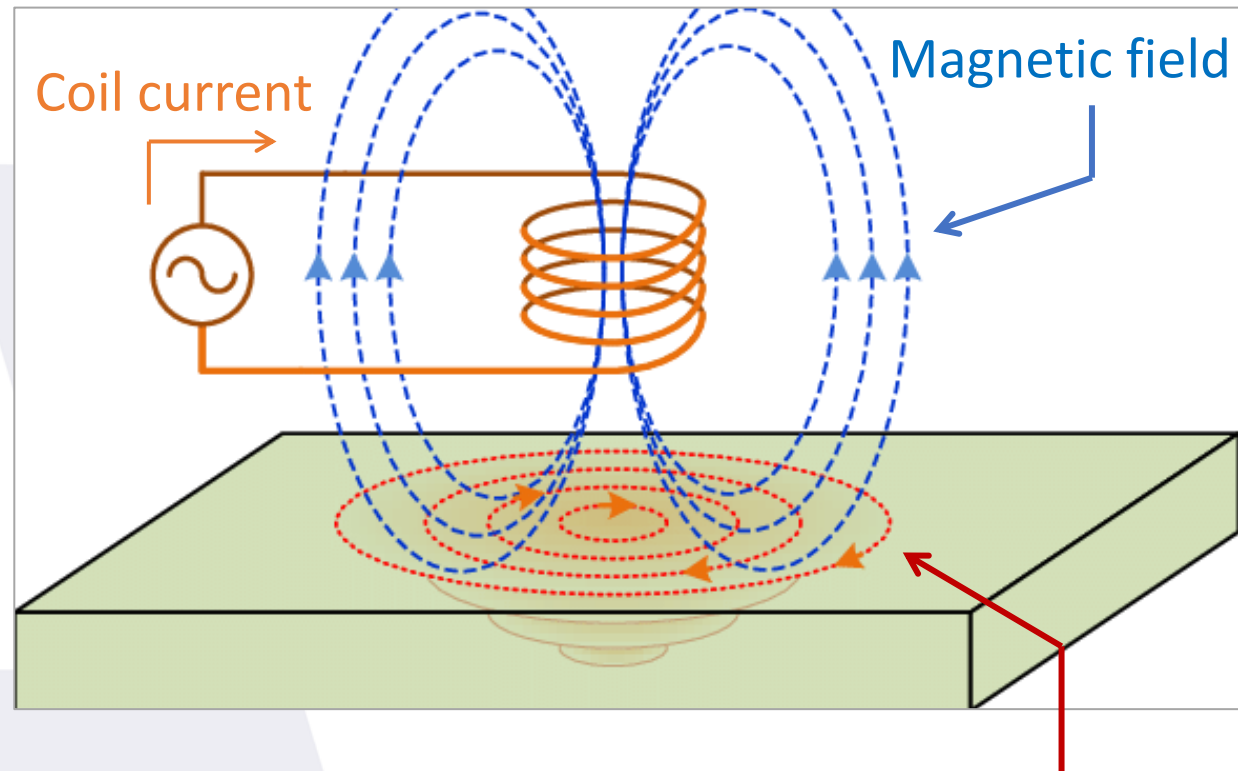
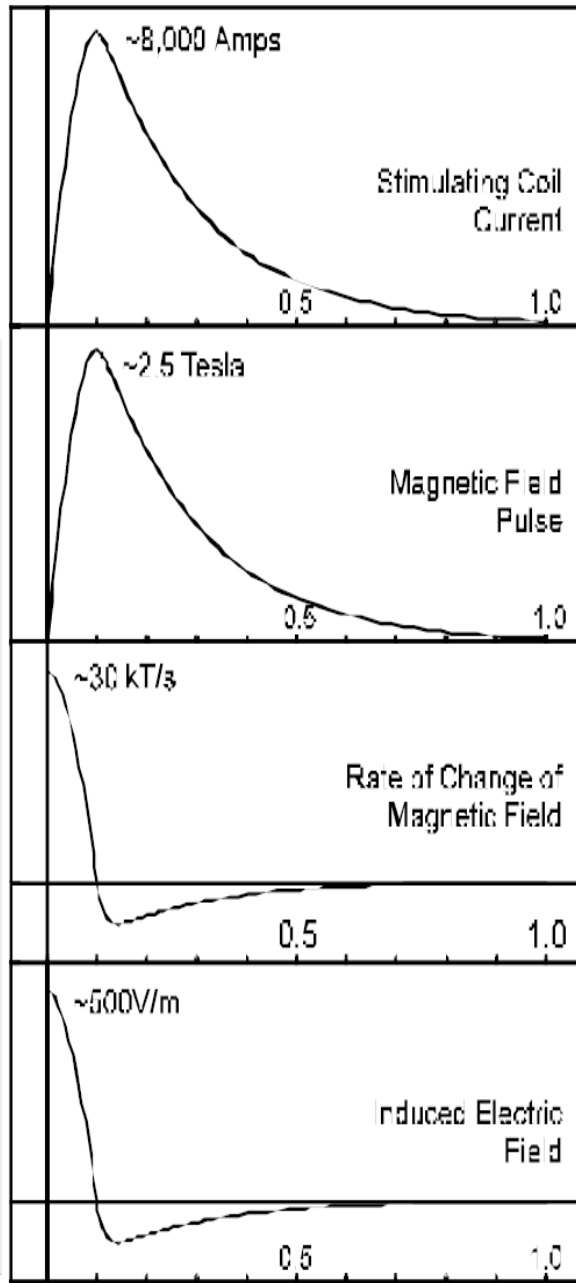
- **Muscular contraction**
- **Depolarization of neuronal cells**
- **Influence on blood circulatory system**





Mechanism of Action

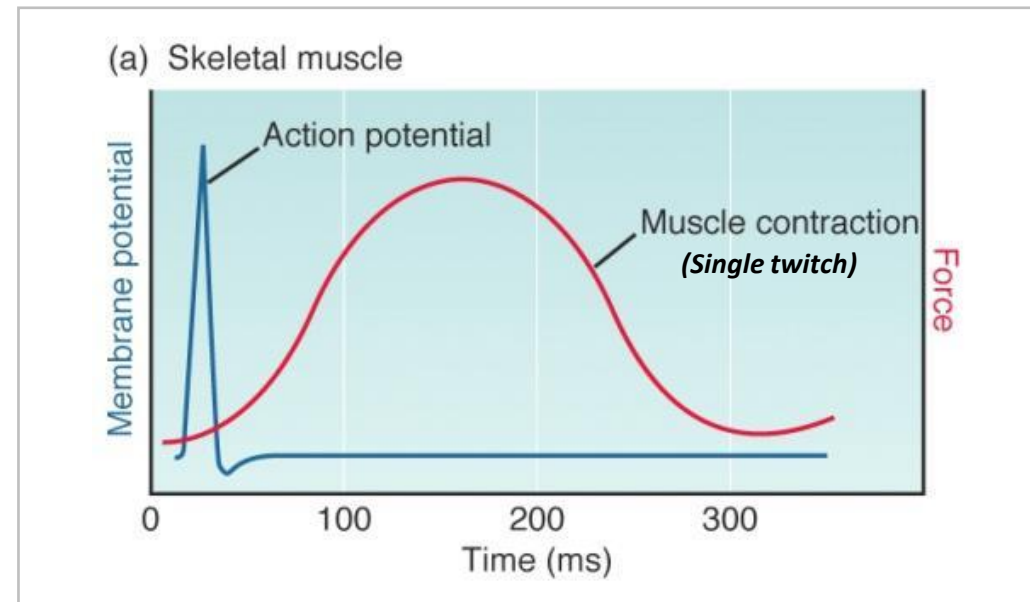
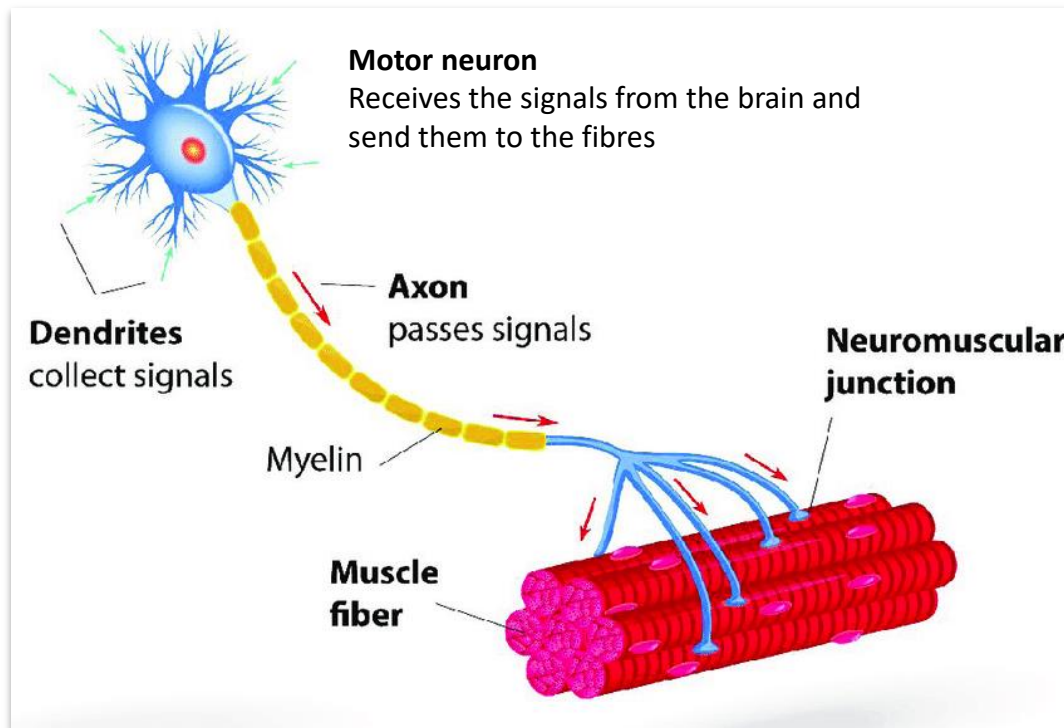
The magnetic field in turn generates a current inside the body, and this depolarizes axons of motor units, stimulating the muscle fibers contraction.



$$\mathcal{E} = -\frac{d\Phi_B}{dt}$$

Electric field generated by the magnetic field

Action Potential vs. Muscle Contraction

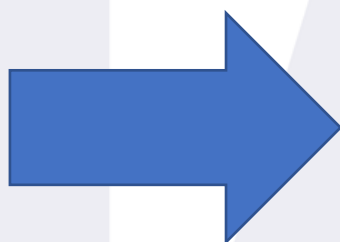
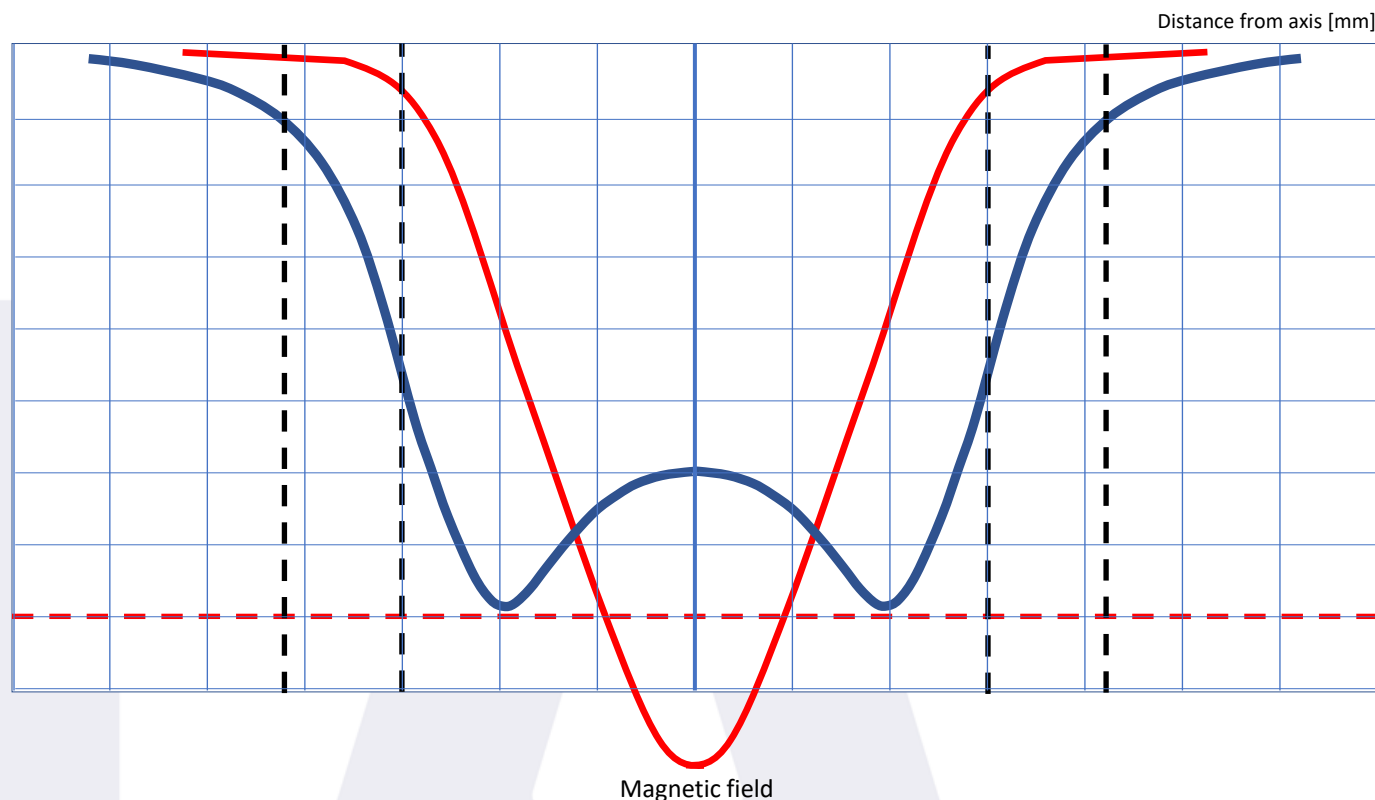


Top Flat Magnetic Stimulation



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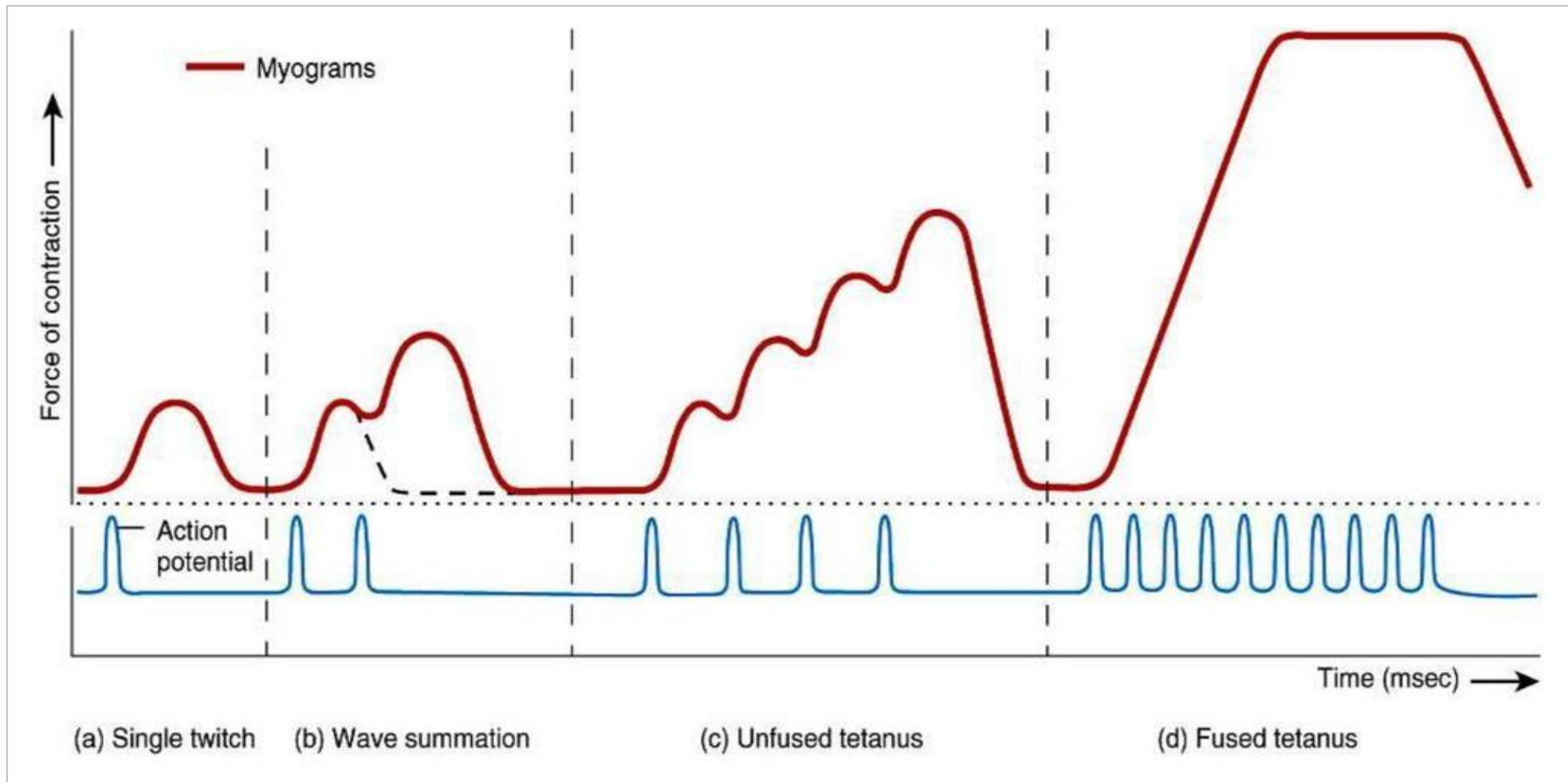
Magnetic field spatial profile



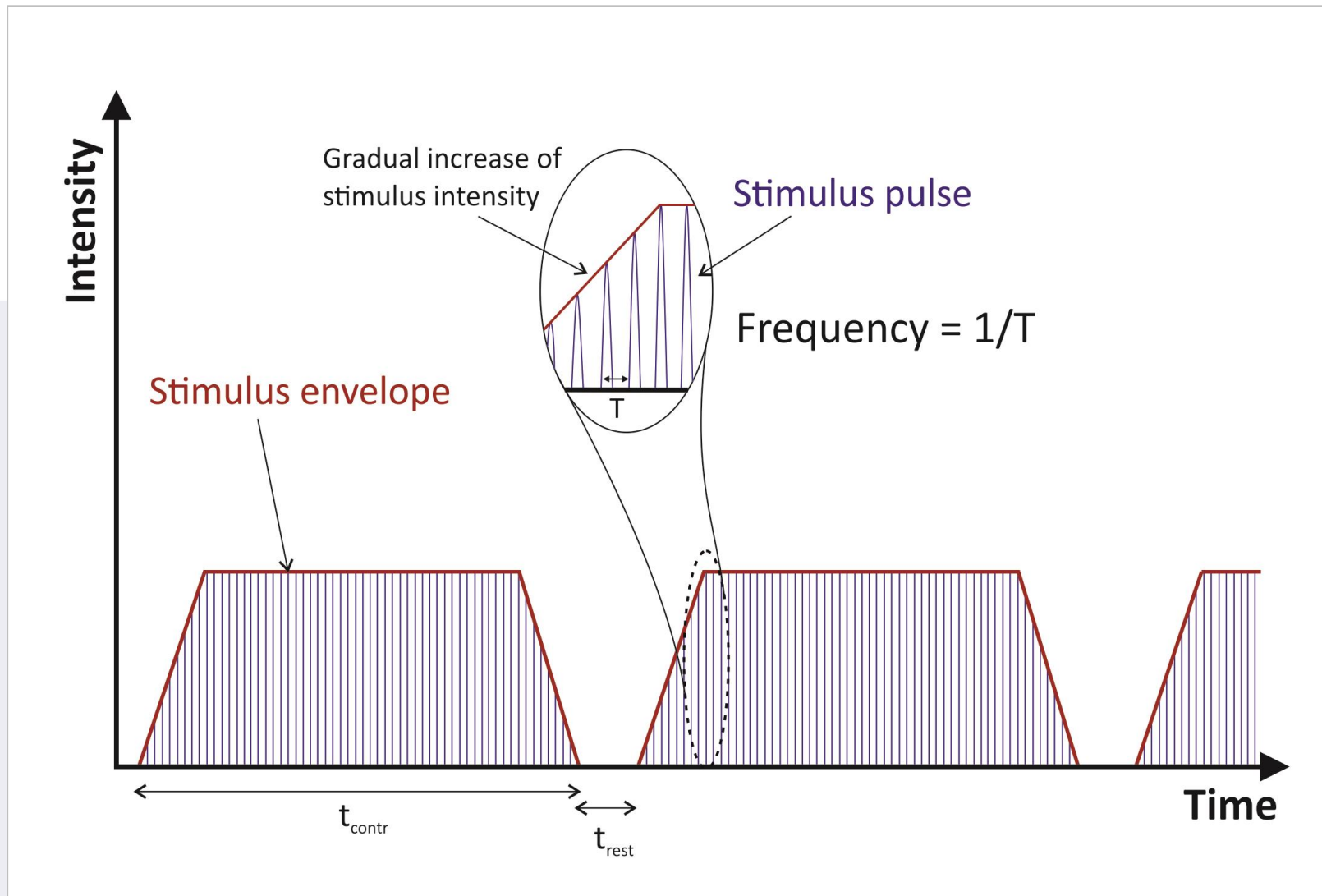
Homogeneous volumetric stimulation

- Correct recruitment of fibers
- Large stimulation
- Minimal pain

In Depth: Twitch, Summation and Tetanus

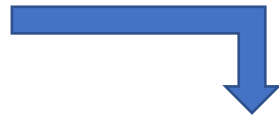


Pulse Envelope Shapes

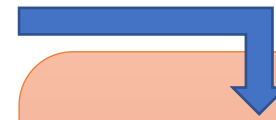


In Depth: Fiber Types & Their Recruitment

- **Type I fibers:**



Lower Frequency

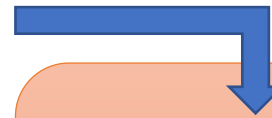


TONE

- **Type II fibers :**



Higher Frequency



STRENGTH



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UI Therapeutic Strategies

➤ Conservative Therapy:

- Behaviors
- Perineal Rehabilitation:
 - *Pelvipерineal Kinesitherapy*
 - *Vaginal cones/Biofeedback Therapy*
 - *Functional Electrical Stimulation*
- Pharmacological Therapy

➤ Surgical Therapy:

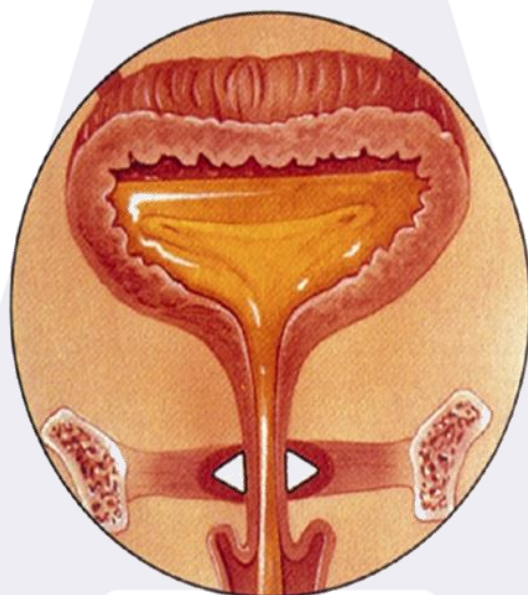
- Periurethral Volumizing Agents
- Surgery



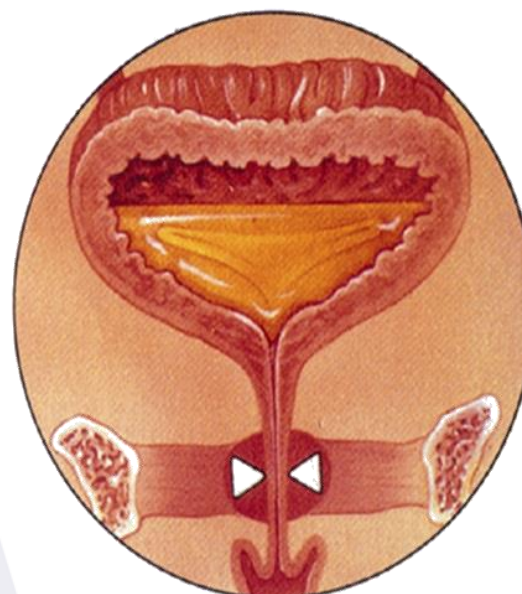
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Behaviors

- **Lifestyles:** weight reduction, reduction of caffeine, no smoking, correct posture, cure constipation.
- **Exercises:** bladder retraining, timed voiding and bladder re-education.



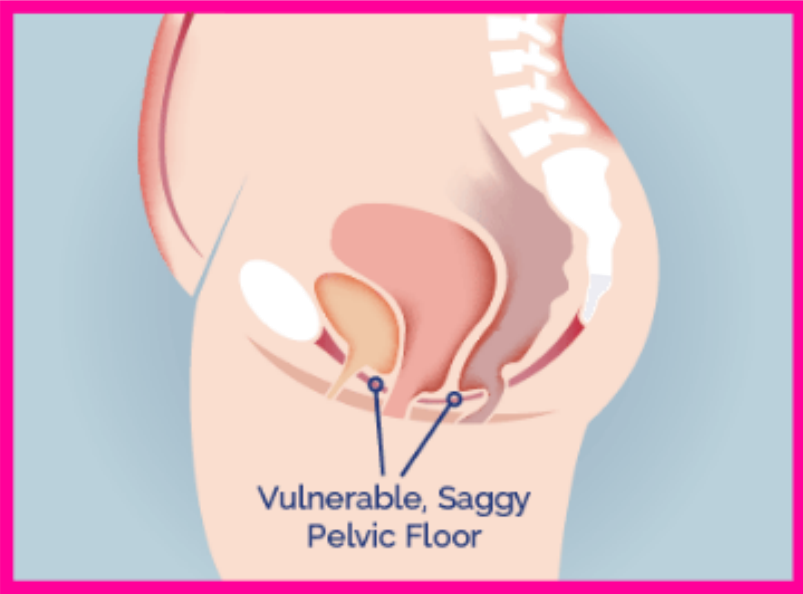
Practice pelvic floor muscle exercises while urinating. When you relax the muscles, urine can flow out.



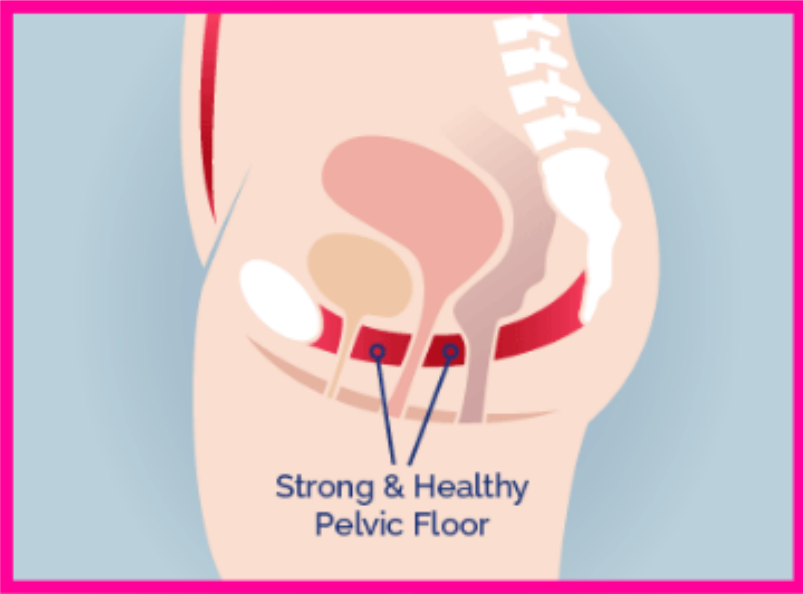
Tighten the pelvic floor muscles to stop the flow midstream. Repeat the relaxation and contraction.

Pelviperineal reeducation (Arnold Kegel 1948)

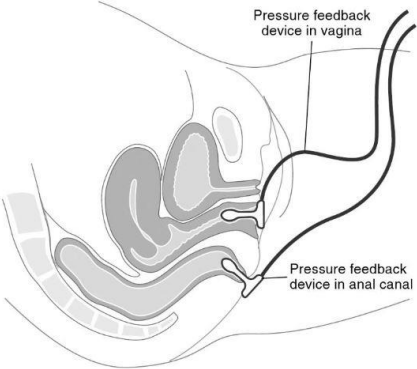
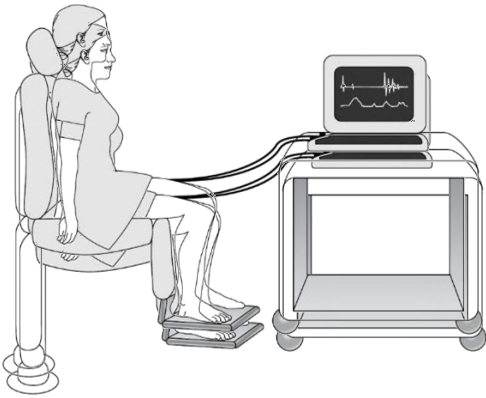
Weak Pelvic Floor



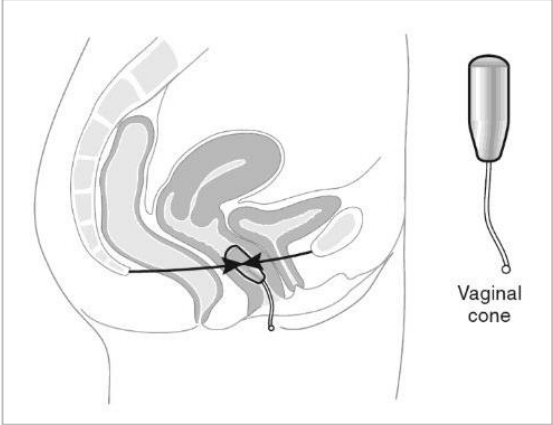
Strong Pelvic Floor



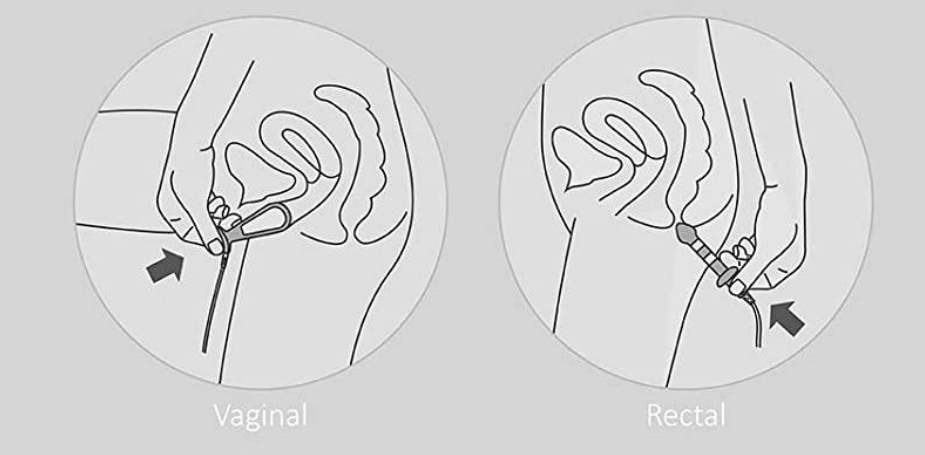
Biofeedback



Vaginal Cones



Functional Electrical Stimulation





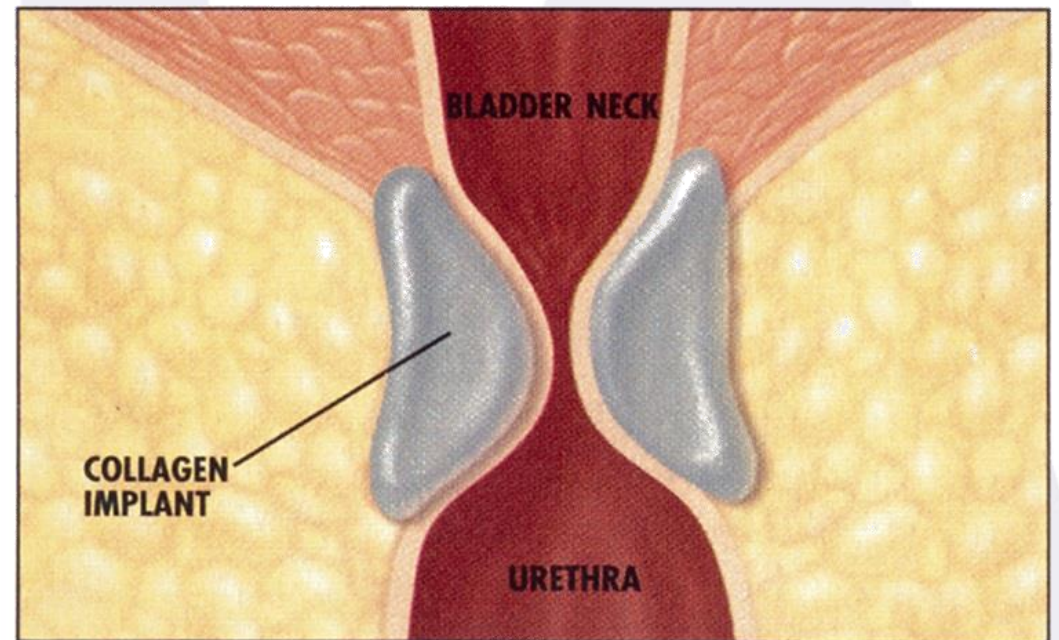
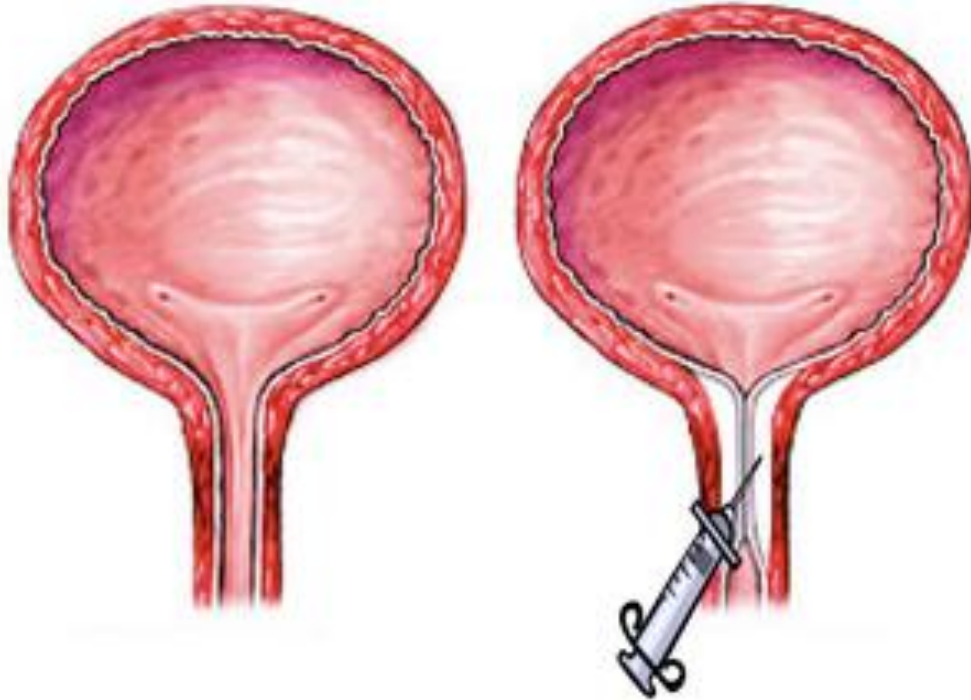
Drug therapy

Pharmacological treatment mainly affects Urge Urinary Incontinence (UUI) and is mainly based on the use of antimuscarinics/anticholinergics.

These agents work by inhibiting involuntary bladder contractions, increasing bladder capacity and delaying the initial urge to urinate.

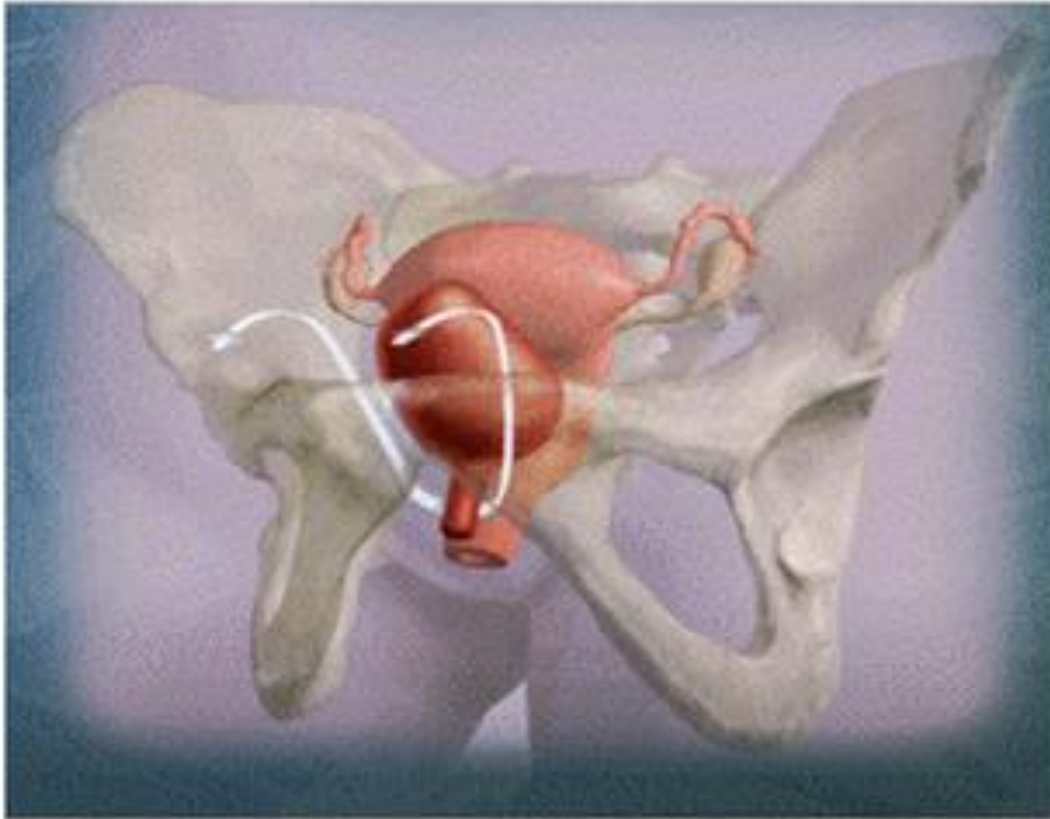


Periurethral Volumizing Agents





Surgery



Tension-free Vaginal Tape - TVT



Trans Obturator Tape - TOT

Advantages



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Technology

- Greater penetration
- No dermo-epidermal involvement
- Selective activation
- Non-invasive system

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- Intense treatment with intensity progressions
- Protocols for both the hypotonus and the hypertonus
- Ergonomic seat to facilitate correct posture
- Customizable protocols
- Flat Top Pulse



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Hypotonus/ Weakness 1

Heat Up - Blood Circulation
Warm-up and muscle activation
phase

Muscle Toning
Muscle work aimed at
recovering trophism and muscle
tone

Muscle Relaxation – Massage
Final phase of cool-down and
muscle recovery

Hypotonus/ Weakness 2

Heat Up - Blood Circulation
Warm-up and muscle activation
phase

Muscle Strength
Muscle work aimed at
increasing trophism (volume)
and muscle strength

Muscle Relaxation – Massage
Final phase of cool-down and
muscle recovery

Overtone/Pain

Heat Up - Blood Circulation
Warm-up and muscle activation
phase

Inhibition
Muscle work aimed to muscle
inhibition a reduction of pain

Muscle Relaxation – Massage
Final phase of cool-down and
muscle recovery



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Clinical Benefits

- **Rehabilitating** the musculature of the perineal plane
- Prevent the **loss of urine**
- Establish adequate **awareness** of the pubococcygeus function
- Increase the tonic and phasic **contractility** of the pubococcygeus muscles

- **Gynecological**: prevention and / or therapy of genital prolapse;
- **Urological**: prevention and / or therapy of urinary incontinence;
- **Colonproctological**: prevention and recovery of anorectal function;
- **Sexological**: positive impact on sexual life.



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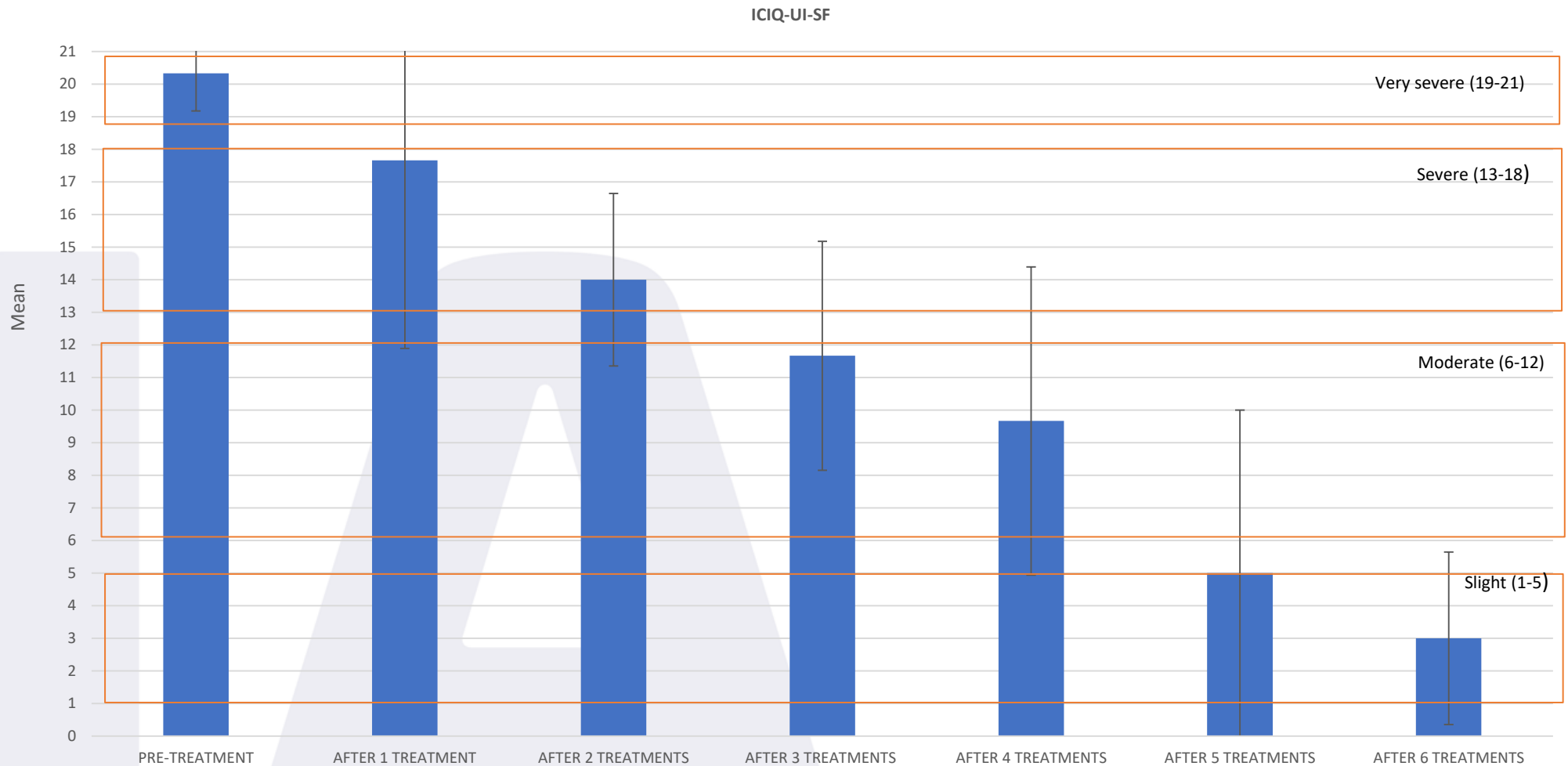
PROTOCOL: RECOVERING TROPHISM AND MUSCLE TONE

- **AVERAGE AGE OF THE POPULATION** : $65,33 \pm 20,42$
- **PATHOLOGIES**: Stress incontinence, bladder prolapse, bladder tenessm, urinary urgency

Clinical Cases by:

Dr. Graziella Lopopolo (Gynecologist)
Dr.ssa Benedetta Salsi
Reggio Emilia-Italy

Results of International Consultation on Incontinence Questionnaire Urinary Incontinence Short Form (ICIQ-UI-SF)

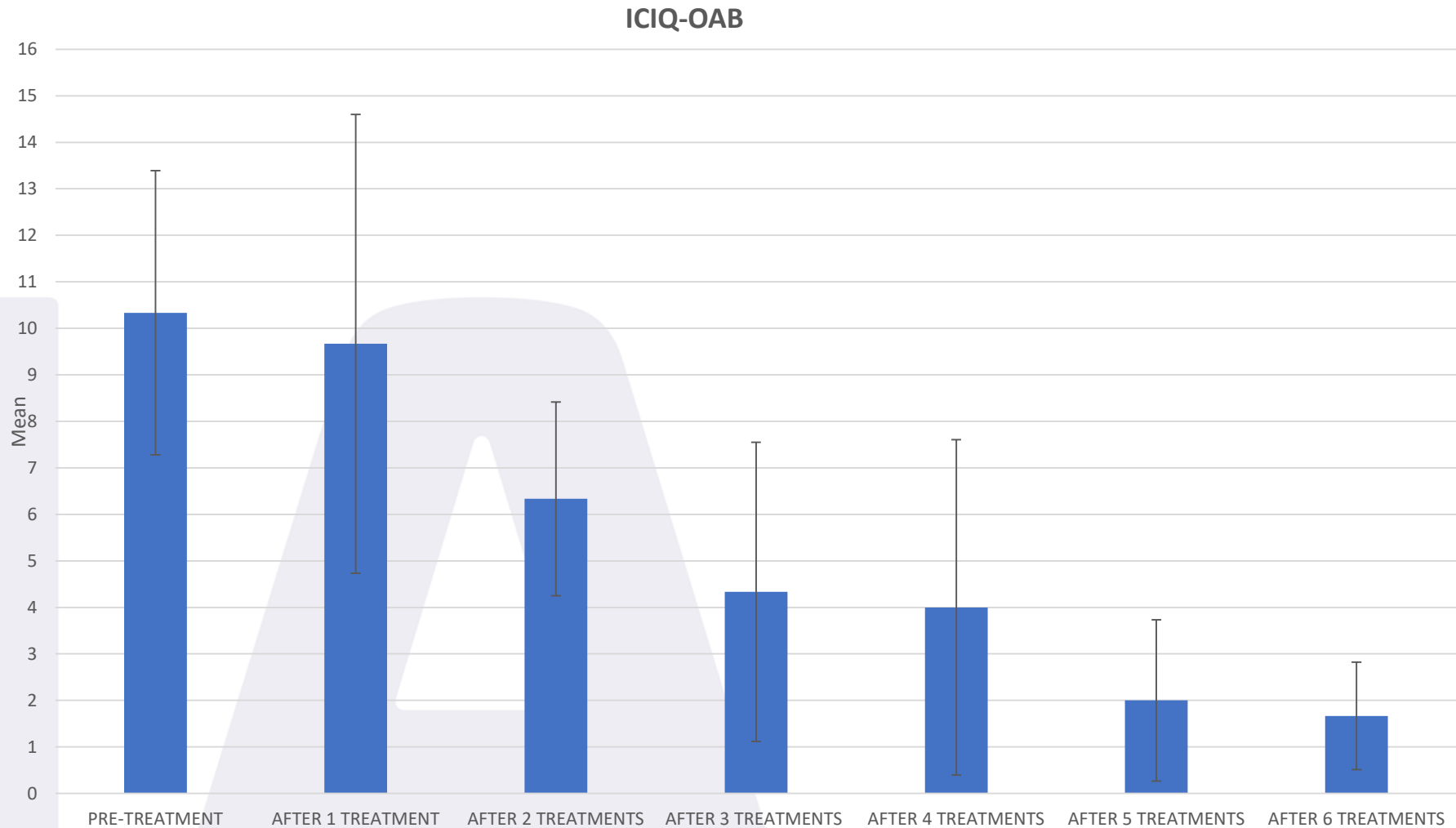


ICIQ-UI-SF: Evaluation of clinical manifestations of urinary incontinence, of severity of urinary loss and impact on quality of life

Results of Incontinence Questionnaire Overactive Bladder Module (ICIQ-OAB)



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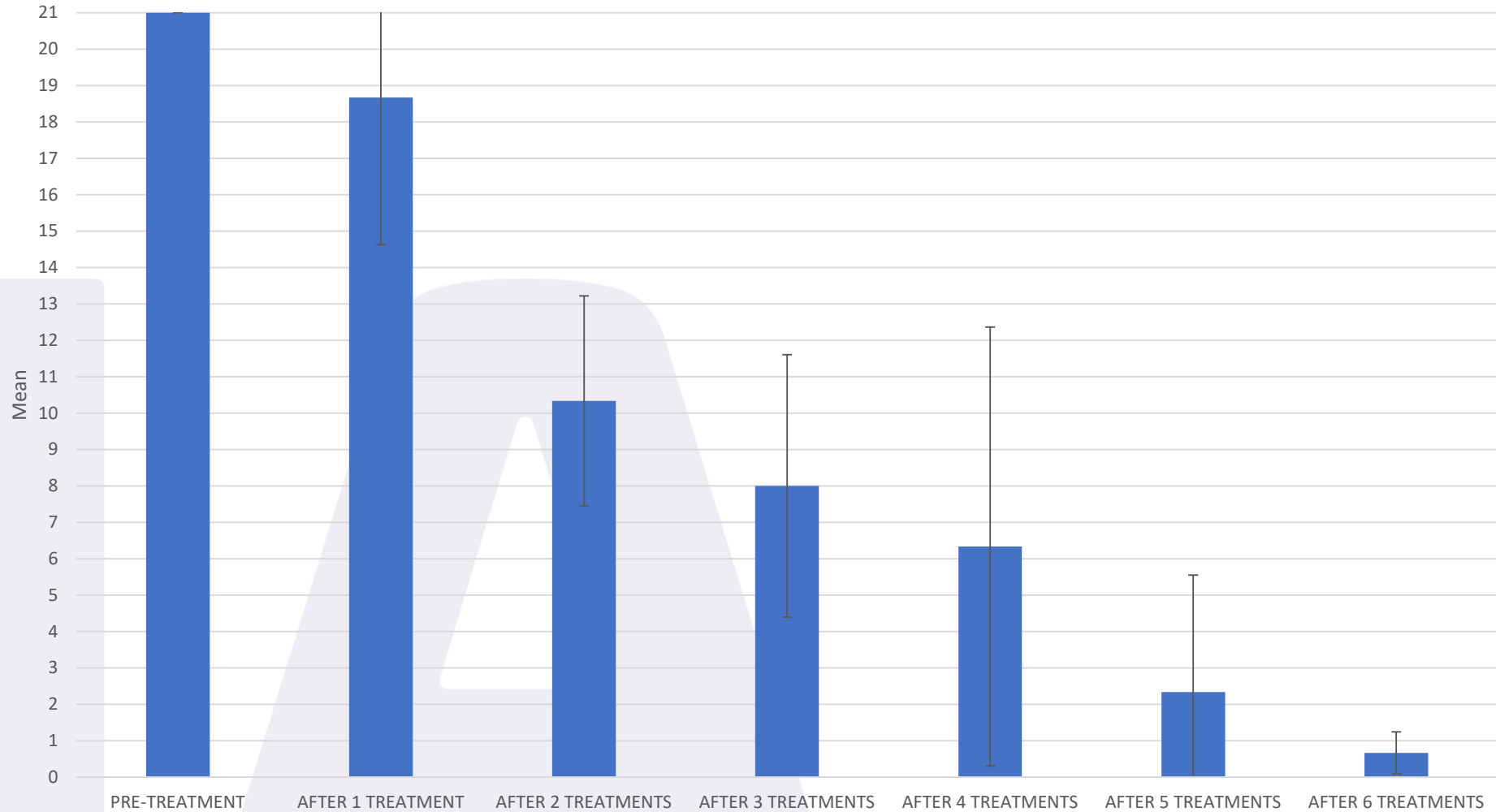
ICIQ-OAB: For overactive bladder, evaluation of urgency, frequency, nocturia, urgency leakage

Results of Incontinence Impact Questionnaire-Short Form (IIQ-7)



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IIQ-7



IIQ-7: Evaluation of impact of urinary incontinence on activities, relationships, and emotional states



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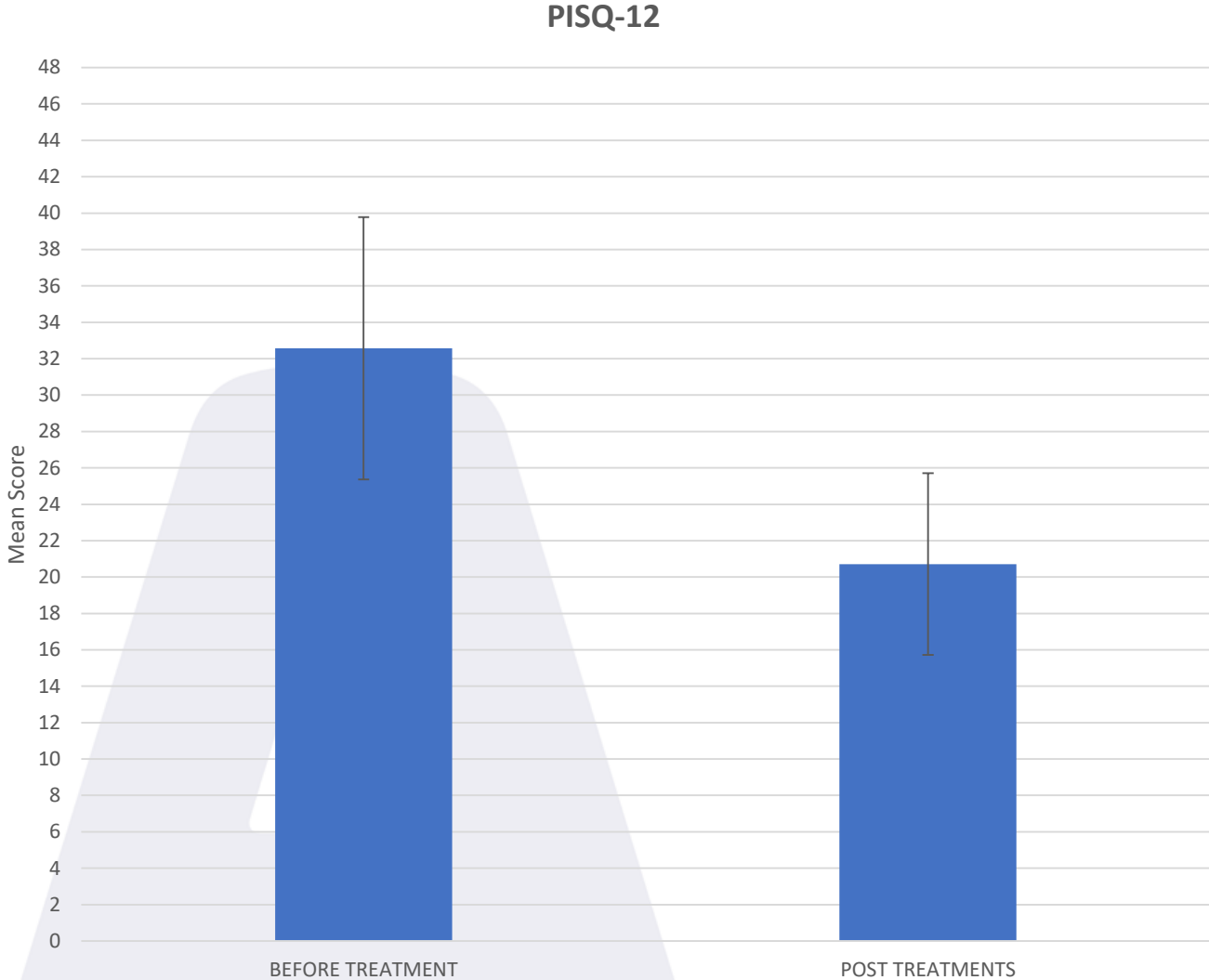
PROTOCOL: MUSCLE INHIBITION AND REDUCTION OF PAIN (HYPERACTIVITY AND HYPERTONE)

- **AVERAGE AGE OF THE POPULATION** : 42,42±14,40
- **PATHOLOGIES**: : Vulvodynia

Clinical Cases by:

**Dr. Andrea Biondo (Gynecologist)
Palermo-Italy**

Results of of Pelvic Organ Prolapse/Urinary Incontinence Sexual Function Questionnaire (PISQ-12)

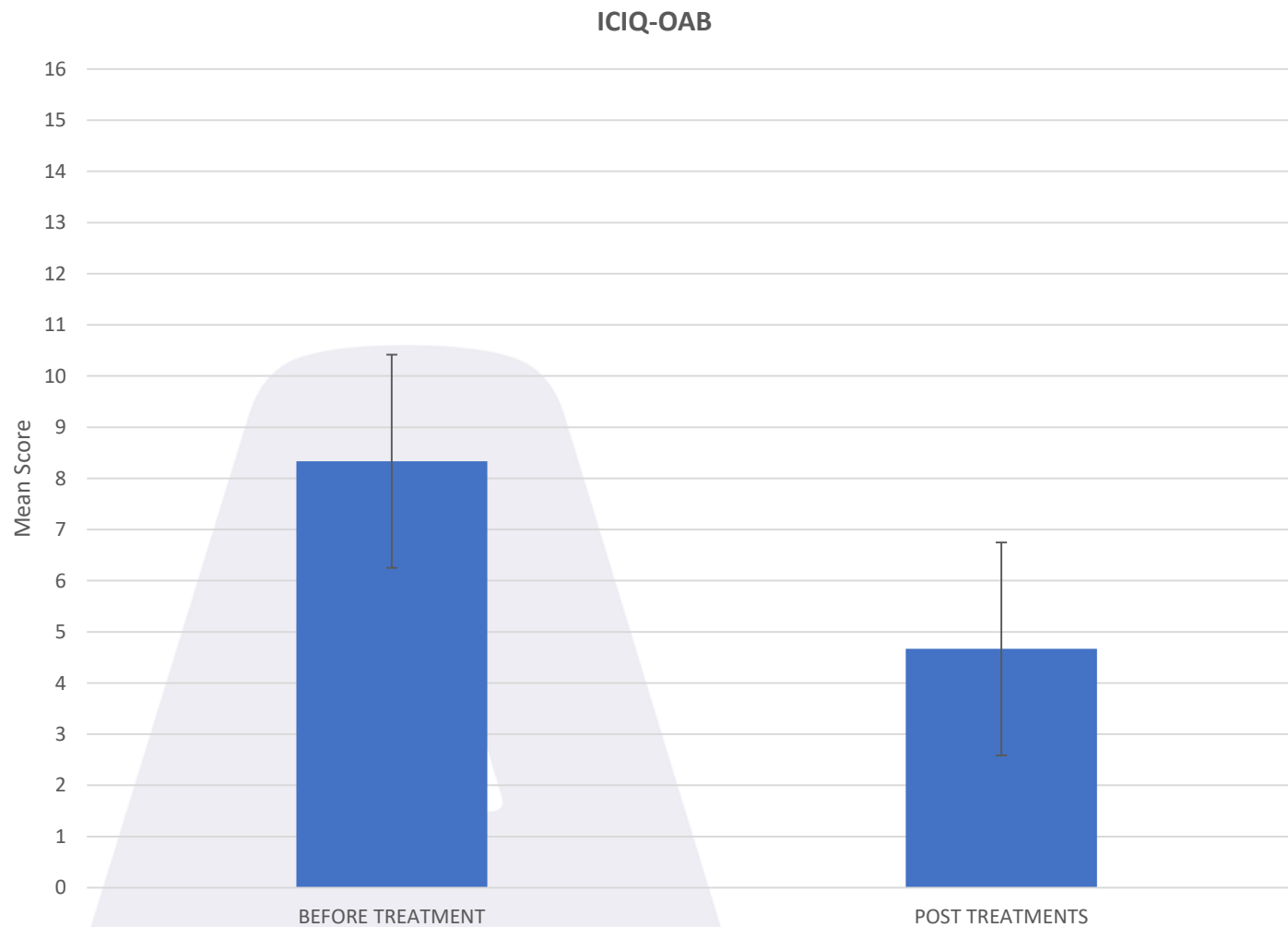


PISQ-12: to assess the sexual function in women with urinary incontinence or pelvic organ prolapse

Results Incontinence Questionnaire Overactive Bladder Module (ICIQ-OAB)



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ICIQ-OAB: For overactive bladder, evaluation of urgency, frequency, nocturia, urgency leakage

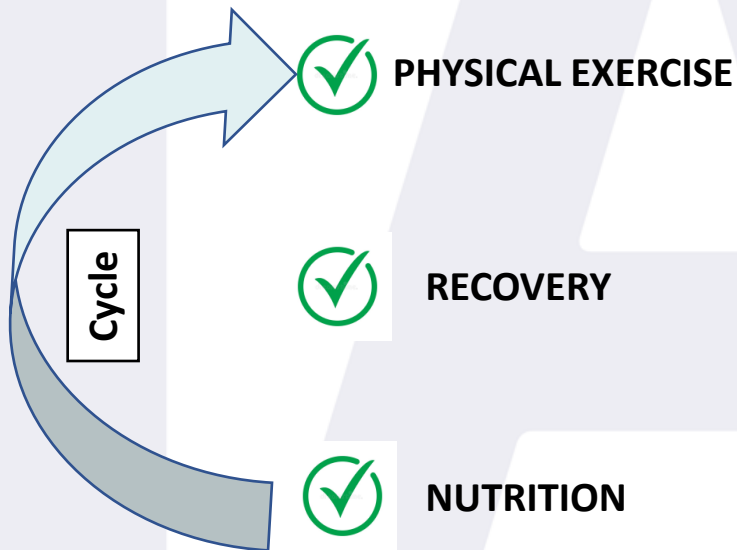
Protocolo(DEKA-MEXICO) 30 Pacientes sin tx. previos

- De 30 pacientes en nuestro protocolo 19 han terminado tratamiento (63%)
Síntomas/patologías de la población estudiada (Resultados Preliminares)

Pacientes Finalizadas 19	Patología	Mejoría (%)
10/19	IUE	70 %
3/19	IU Mixta	100 % mejoría de IUU 20% quedando con IUE
3/19	Nicturia	66 %
1/19	Dispareunia	100 %
1/19	Incontinencia Fecal	80 % de acuerdo a cuestionario
6/19	Estreñimiento leve	80 %
11/19	Reflejos perineales afectados	90 %

Fundamental concept for physical preparation and training

Performance improvement is determined by the cyclical alternation (and repeated frequently) of 3 **phases**:



Training causes a strong imbalance of body homeostasis and it is therefore necessary :

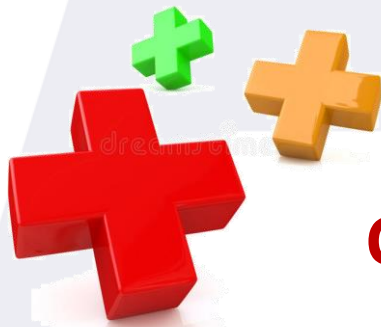
- to optimize **quality of performance**
- to accelerate and support the physiological processes of **adaptation between training sessions**

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Fundamental concept for physical preparation and training

- ✓ **RIGHT “DOSE” OF PHYSICAL EXERCISE**
 - Calibrated in relation to the needs of the subject
 - Training is the result of a continuous adaptation effect to the load

- ✓ **REPETITION AND REGULARITY**
 - Organic adaptation
 - **Super compensation**



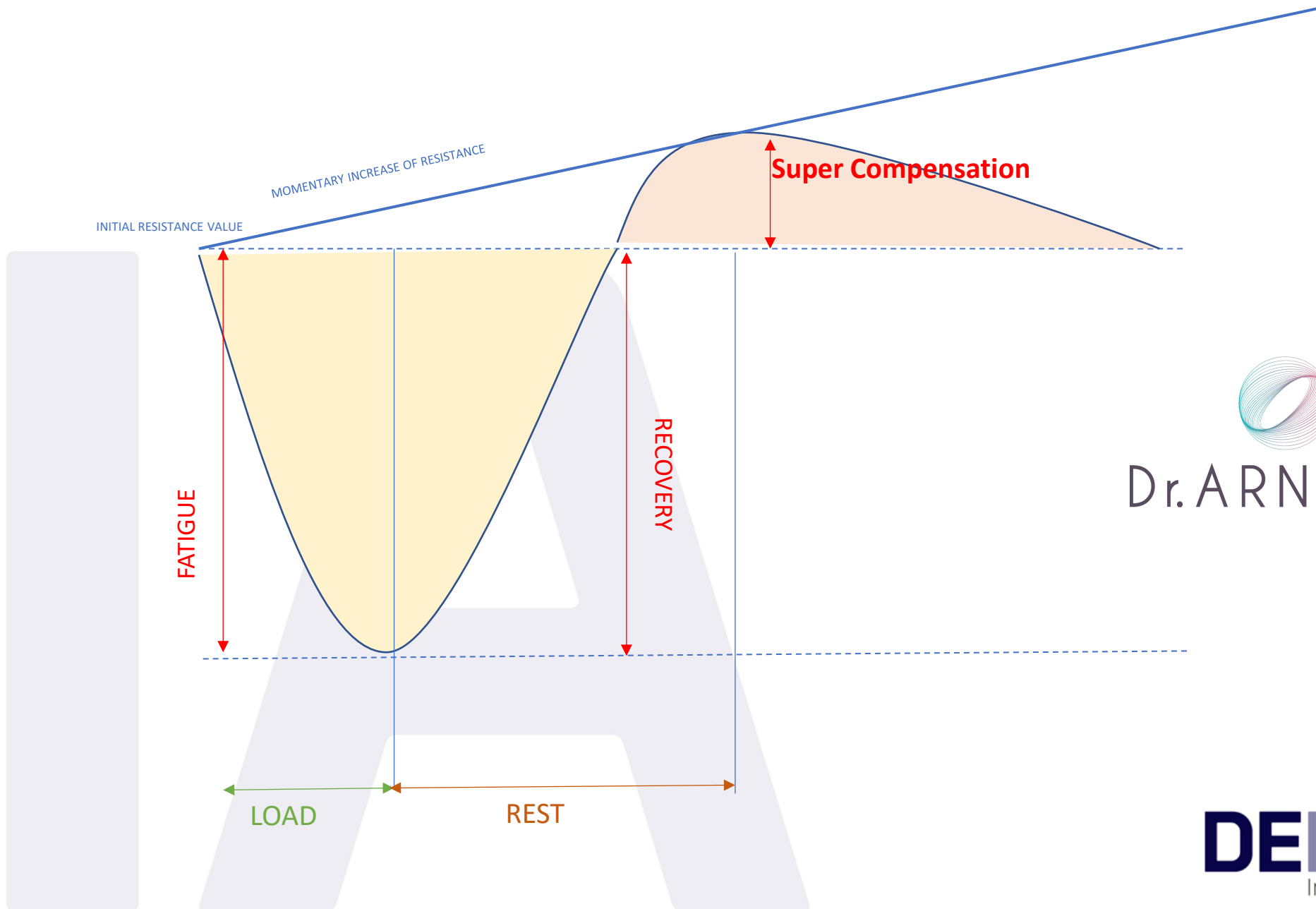
CUMULATIVE EFFECT



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Super Compensation

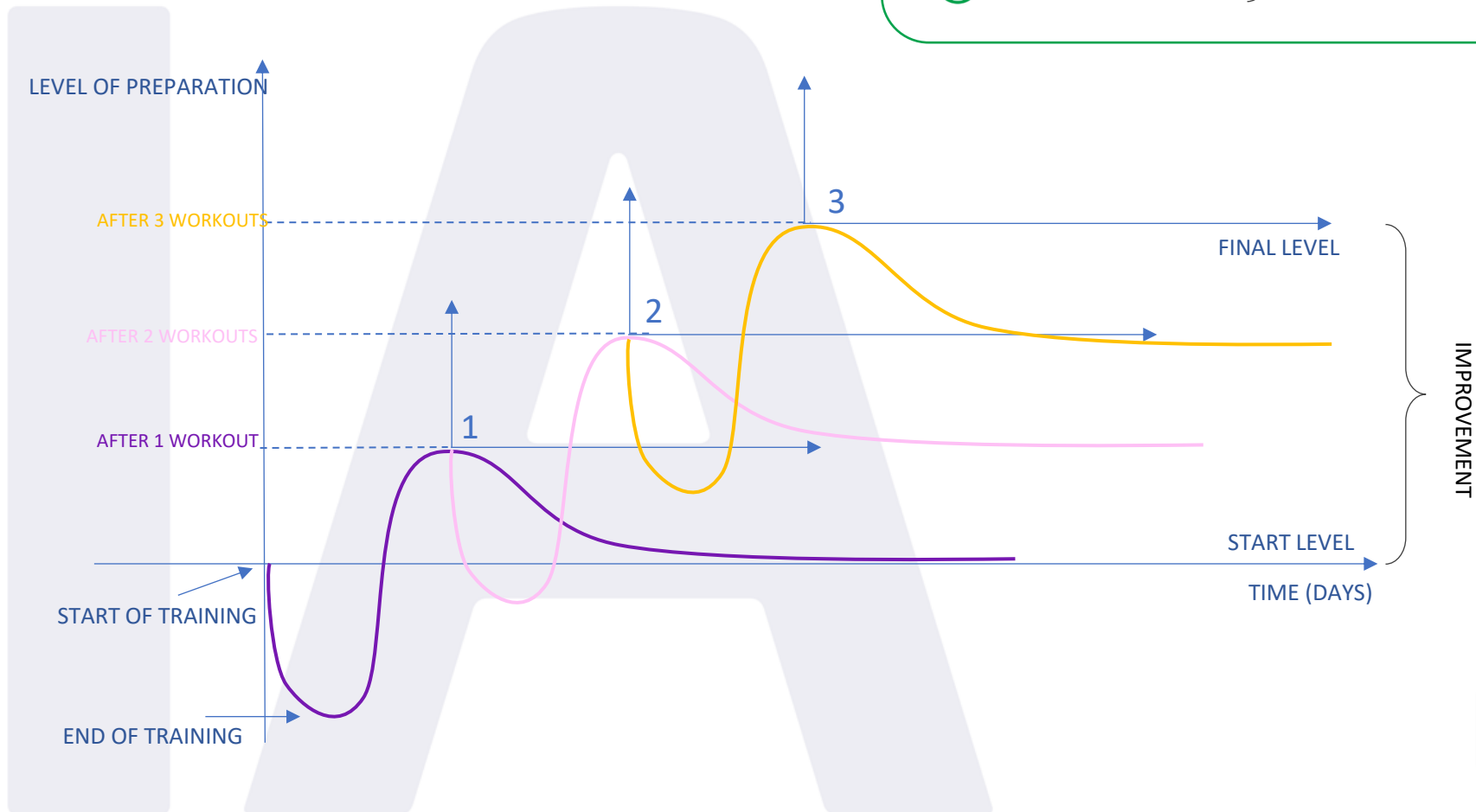


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Principles of Cyclicality (*continuous load*)

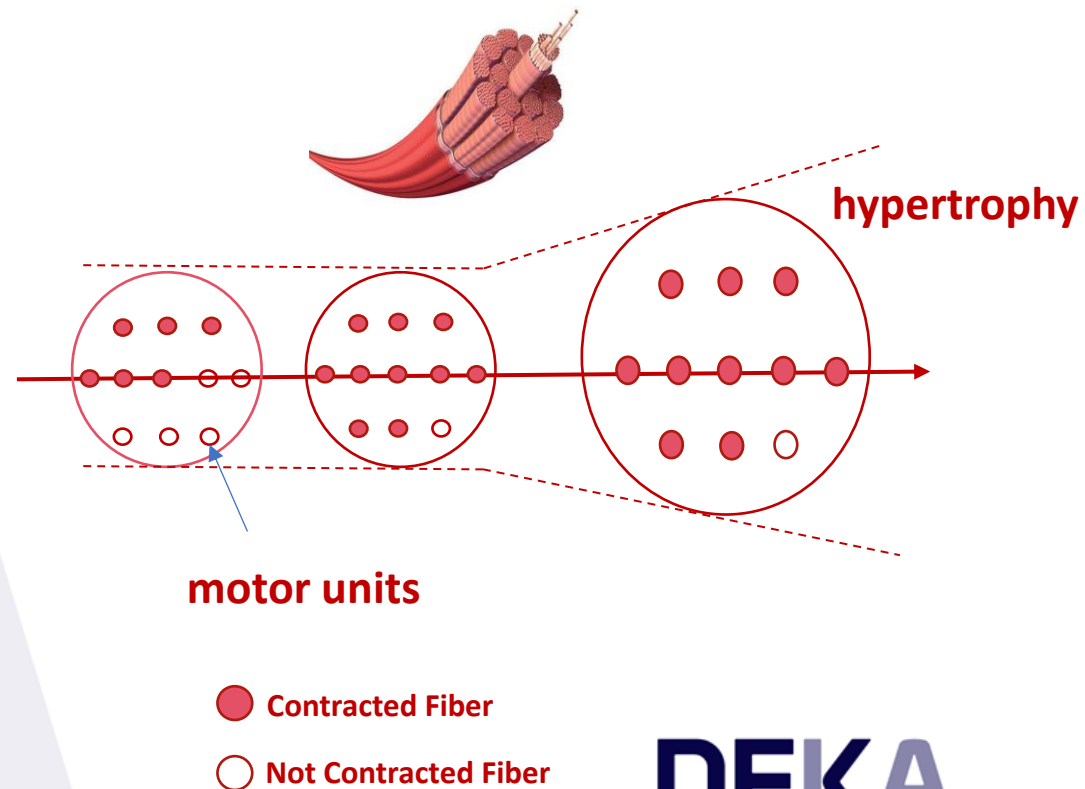
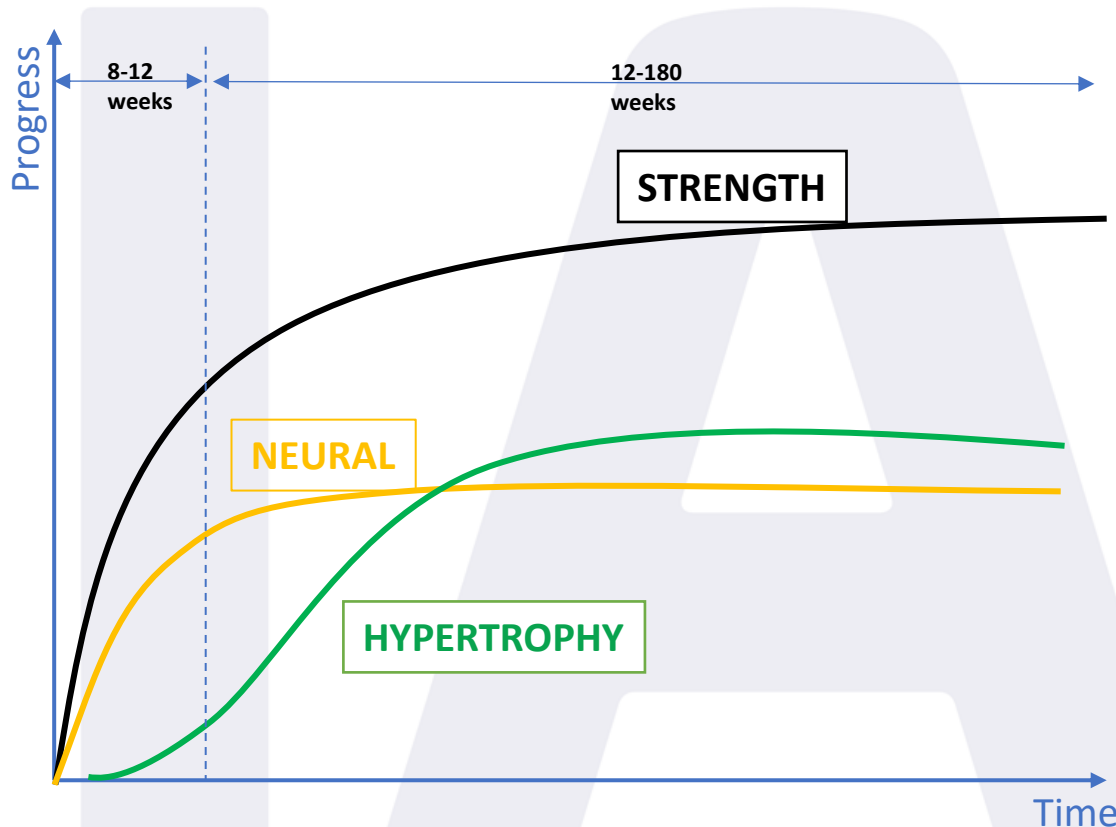
- ✓ RIGHT "DOSE"
 - ✓ REPETITION
 - ✓ SUMMATION
- ADAPTATION

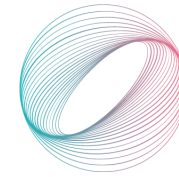


Neuronal Adaptation



The increase in strength that a muscle obtains after a period of training is due to adaptations and modifications of both the myogenic and the neural parts. **The first adaptations occur at the nervous system level and subsequently morphological changes occur (hypertrophy).**





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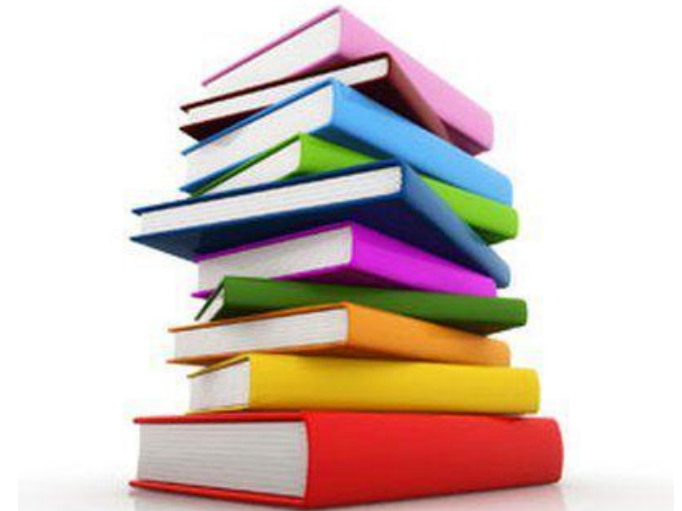
✓ FAQ: Frequently Asked Questions



✓ Scientific Evidence:



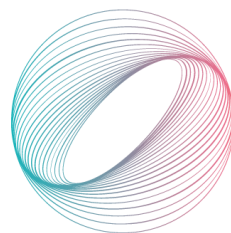
- Stress Urinary Incontinence
- Urge Urinary Incontinence
- Mixed Urinary Incontinence
- Pelvic Floor Muscle Strengthening
- Fecal Incontinence
- Postpartum



✓ Electrical Stimulation vs Magnetic Stimulation



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**THANK YOU FOR
YOUR ATTENTION**

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