

UNIVERSITAS Aisyiyah PROFESIONAL - QUR'AN

SURFACE ELECTROMYOGRAPHY (EMG) BIOFEEDBACK



TRI LAKSONO, SST., M.S.PT., AIFO.

PRODI FISIOTERAPI
UNIVERSITAS AISYIYAH YOGYAKARTA

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PENGERTIAN

- Elektromiografi (*electromyography*) adalah sebuah metode untuk pengukuran, menampilkan, dan penganalisaan setiap signal listrik (*electrical signals*) dengan menggunakan bermacam-macam elektrode.




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Sinyal yang diterima elektrode disaring kemudian diproses menjadi tegangan listrik yang ditampilkan dalam bentuk grafik, suara, atau sinar.



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PENGERTIAN

- Gambaran yang diberikan oleh EMG dalam bentuk grafik, suara atau sinar pada lampu indikator merupakan data hasil pengukuran untuk digunakan sebagai bahan analisis.
- Umpan balik (*feedback*) terhadap otak dari aktivitas kelistrikan pada saat terjadi kontraksi otot.


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MODEL DAN JENIS EMG

SURFACE ELECTROMYOGRAPHY

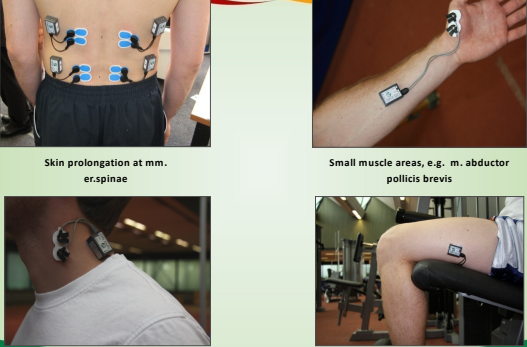


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Flexible Configuration (continued)



Skin prolongation at mm. er.spinae

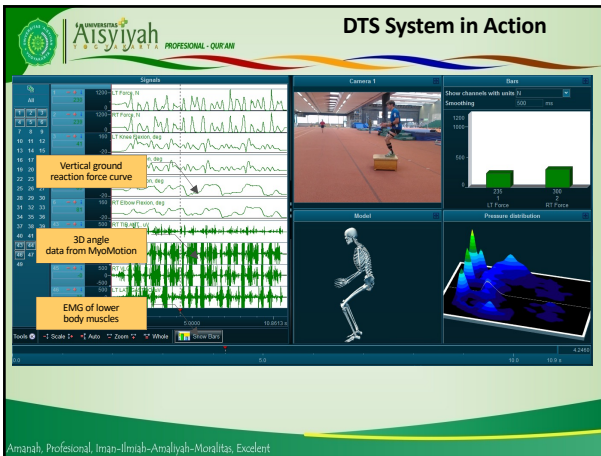
Small muscle areas, e.g. m. abductor pollicis brevis

Thin muscle regions (e.g. m. trapezius)

Transmission probe is moved away from pressure area

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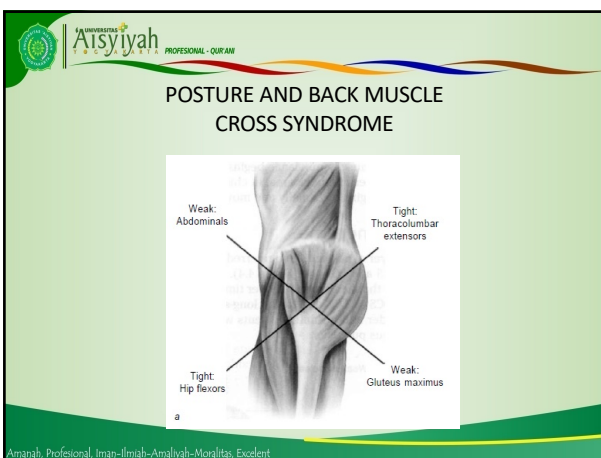
**CLINICAL EMG
BIOFEEDBACK TRAINING
FOR
STROKE**

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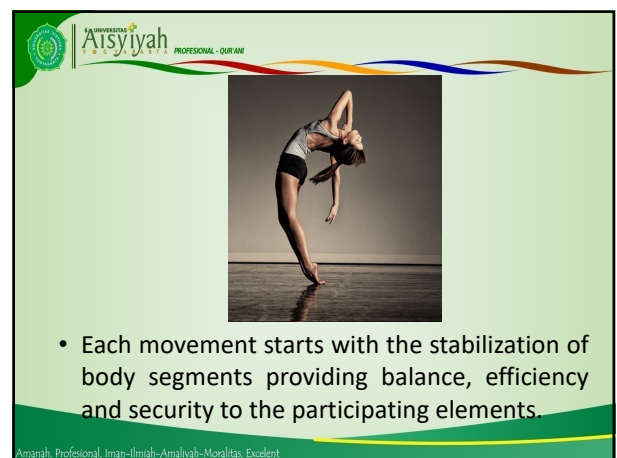
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- BASIC CONCEPT**
1. TISSUE RESPONSE
 2. STRUCTURE ADAPTATION
 3. STABILITY AND MOBILITY
 4. FEELING – APPROPRIATE FACILITATION
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THE CORE

GLOBAL MUSCLES

- Rectus abdominus
- Obliquus abdominus
- Erector spinae
- Quadratus lumborum

LOCAL MUSCLES

- Transversus abdominis
- Multifidus
- Psoas (Post fiber)
- Illiocost. Lumb (Lumbale fibers)
- Quadr. Lumb (mediale fibers)

DIAFRAGMA

PELVIC FLOOR MUSCULATURE

➢ Lebih Responsif
➢ Lebih berperan Mobility

➢ Kurang Responsif
➢ Lebih berperan Stability

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The Integrated Stabilizing System Of The Spine

- Short intersegmental spinal muscles (multifidi)
- The deep neck flexors
- The diaphragm
- The abdominal wall
- The pelvic floor

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INDEPTH ANALYSIS OF LOCAL MUSCLES

M. Multifidus

Deep fascicles (3 vertebral levels)

Intermediate fascicles (3 vertebral levels)

Superficial fascicles (4 vertebral levels)

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Short intersegmental spinal muscles (multifidi)

Deep fascicles (3 vertebral levels)

Intermediate fascicles (3 vertebral levels)

Superficial fascicles (4 vertebral levels)

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Short intersegmental spinal muscles (multifidi)

Intertansversarii
Spinous process of vertebra
Rotatores thoracis
Interspinales
Transversa process of vertebra

(b) Intervertebral muscles, posterior view

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Aksi - Reaksi example

Cross Syndrome

OVERACTIVE: Lumbocervical, Hip Flexor Group

WEAKENED: Abdominal Group, Gluteal Group

Postural Examples: Lordosis, Kyphosis/lordosis, Sway back, Military

Effects: Tight, Weak, Tight, Weak, Pelvis anteriorly tilted, Pelvis anteriorly displaced, All muscles appear too tight

Mechanism: Tight iliocostalis muscle causes pelvic tilt, leading to tight iliocostalis and weak iliocostalis, resulting in lateral flexion and lateral rotation.

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PRINCIPLES

- Tissue Response

Participative Resistance 1
Protective Resistance 2
Reactive Resistance 3

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Multifidus

- Multifidus – Smallest Yet Most Powerful Muscle that gives support to the spine.
- The Multifidus muscle help to take pressure off the vertebra discs.
- Multifidus - That our body weight can be well distributed along the spine.

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Transversus Abdominis

Abdominal Wall Muscles (4)

Transversus abdominis (d)

- The transverse abdominis (TA) muscle is the front wall of the inner core.
- It is the deepest layer of the abdominal muscles and the fibers of the muscle run horizontally across the abdomen.
- When this muscle contracts the abdomen pulls inward. There needs to be balance between the four layers of the abdominal muscles.
- We often find that the more superficial muscles tend to be used more than the deep TA creating a situation of muscle imbalance and poor stabilization.

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Internal Oblique

- The specific movements created or supported by these muscles depends on whether just one, or both, of the internal oblique muscles is contracted.
- Specifically:
 - Contraction of both external oblique muscles compresses the abdomen and flexes the vertebral Column
 - Contraction of one external oblique muscle alone flexes the vertebral column laterally and rotates it.
 - Support the viscera (i.e. the organs within the body cavities, and especially the organs of the abdominal cavities, such as the stomach and other digestive organs).
 - Assist with exhalation.

Internal Oblique

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Iliocostale (Lumbale Fiber)

- The **iliocostalis lumborum** is the muscle that attaches to the iliac crest and the back of the ribs.
- It is part of the iliocostalis column of muscles, which are responsible for the primary movement of back extension.
- The iliocostalis lumborum provides resistance when the body bends forward and provides the force necessary to bring the body back into an upright position.

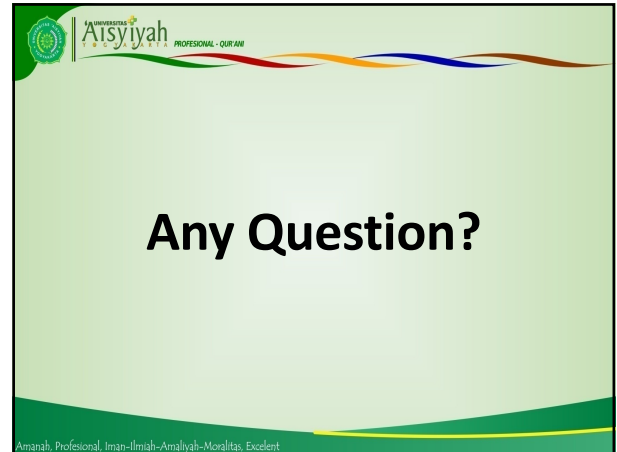
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PROFESIONAL - QUIRAN

PRAKTIKUM

- Setiap kelompok mencari 1 jurnal internasional yg membahas mengenai efektivitas EMG Myomuscle, di resume dan di kritisi jurnal tsb.
- Rangkuman / resume meliputi populasi, tujuan penelitian, design penelitian, pelaksanaan intervensi, outcome, alasan lengkap mekanisme efek terapi (diskusi), limitasi, dan kesimpulan.
- Setiap Kelompok jurnalnya tidak boleh sama.
- Presentasi Kelompok dan tanya jawab.

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