



PRINCIPLES OF REHABILITATION

Designing exercise programme

Writing exercise prescription



ADVANCED

LATE

EARLY

RETURN TO SPORTS

TAPING/ BRACING

SPORTS SPECIFIC
TRAINING

AGILITY DRILLS

FLEXIBILITY

POWER

FUNCTIONAL ACTIVITIES

ENDURANCE

CARDIO-VASCULAR
FITNESS

PROPRIOCEPTION

STRENGTH

MOBILITY

? ELECTRICAL MUSCLE
STIMULATION

MUSCLE ACTIVATION
&

NEURO-MUSCULAR CONTROL

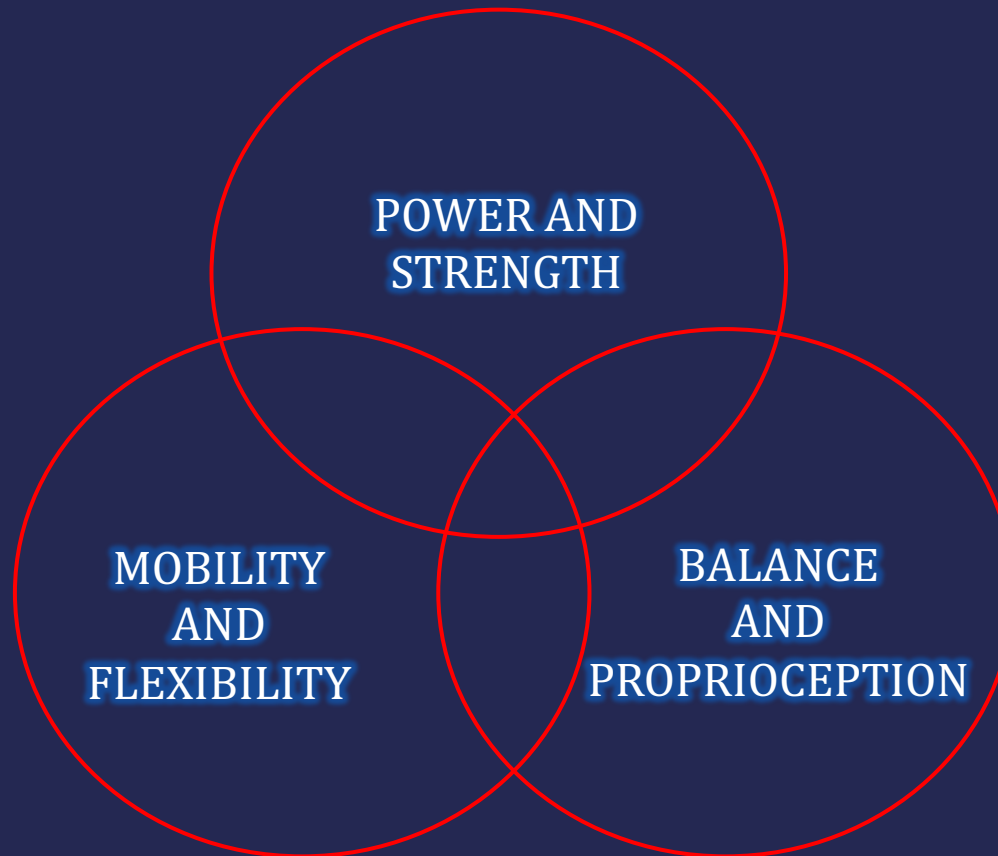


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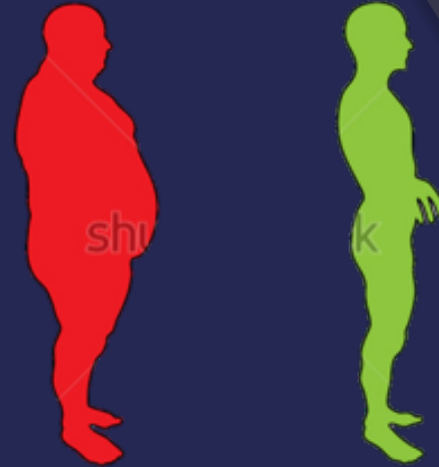


TERMINOLOGIES



PHYSICAL ACTIVITY

Any musculo-skeletal movement
that results in energy expenditure!



EXERCISE

Planned, structured programme
involving repetitive body movements
to improve/ maintain health!



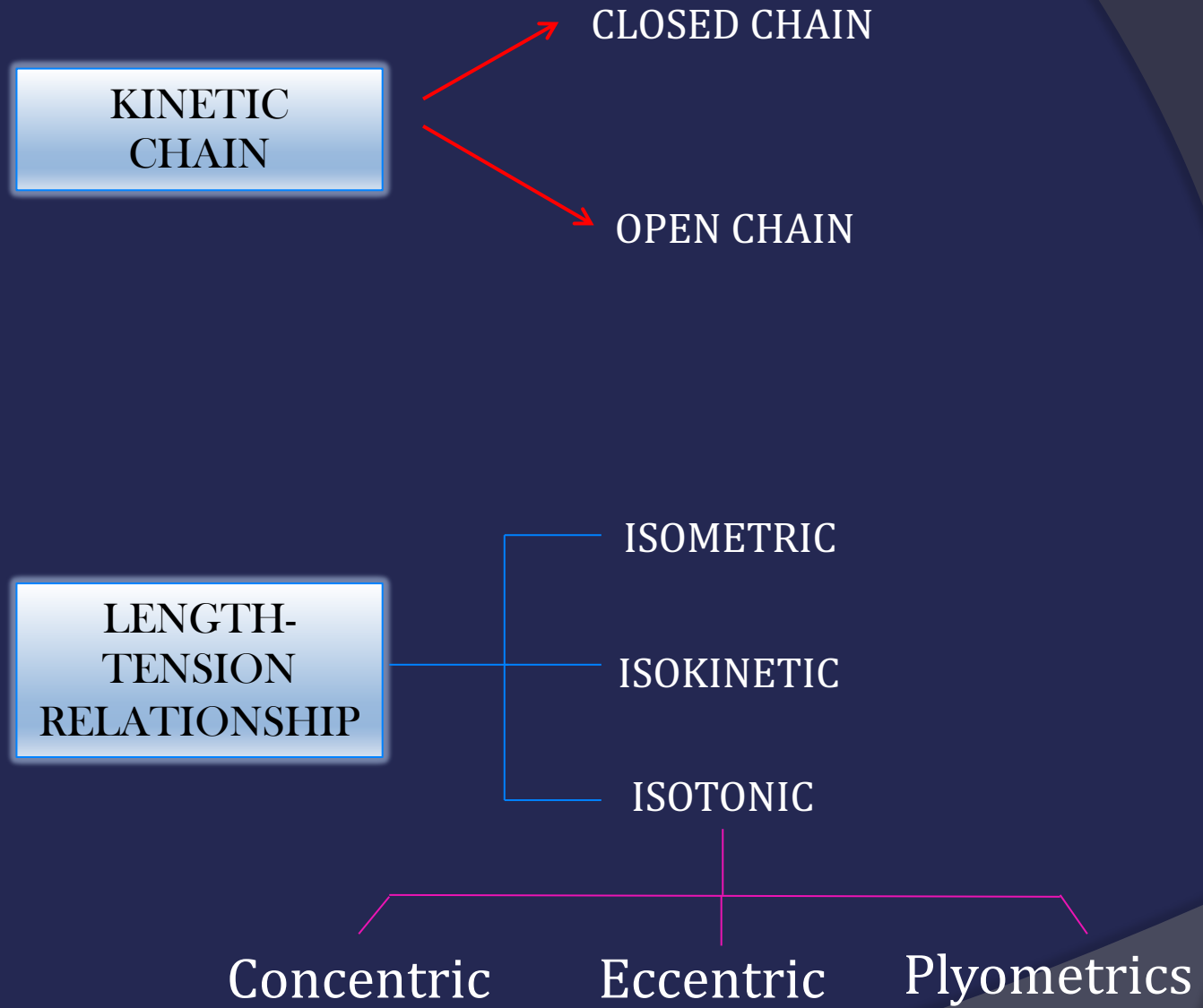
PHYSICAL ACTIVITY



EXERCISE



EXERCISES



KINETIC CHAIN

[Steindlar, 1955]

A system where movement at one joint
has effect on all joints above and below
(mechanical engineering definition)

**OPEN
CHAIN
EXERCISES**



**CLOSED
CHAIN
EXERCISES**



ISOMETRIC EXERCISES

Length of contracting muscle remains constant such that muscle contracts **without any movement at the joint!**



RULE OF 10!

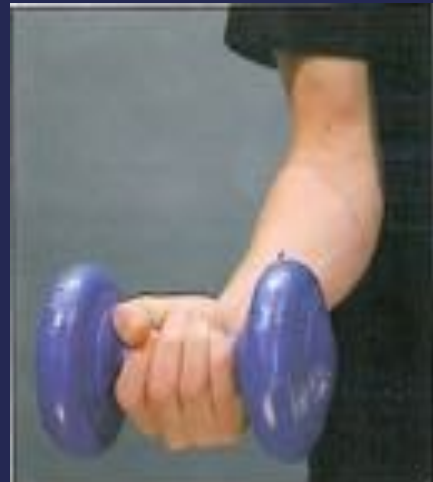


Multiple angles!



ISOTONIC EXERCISES

Joint moves through a range of motion against a constant load/ **RESISTANCE** *(speed can be variable)*



Free weights
Weight machine
Resistance bands



THERABANDS





**CONCENTRIC
EXERCISES**

**ECENTRIC
EXERCISES**





**CONCENTRIC
EXERCISES**

**ECENTRIC
EXERCISES**

PLYOMETRICS



ISOKINETIC EXERCISES

Here the joint moves through range of motion at a **constant speed** (*resistance is variable*)

Since speed is to be kept constant these are performed on machines- **Isokinetic machines**

Cybex, Biodex, Kinkom, Lido





MOBILITY AND FLEXIBILITY



MOBILITY

Limits of range of motion!

*Primarily a function of **capsulo-ligamentous** structures.*



FLEXIBILITY

BEYOND Limits of range of motion!

*Primarily a function of **musculo-tendinous** structures.*



MOBILITY

ROM exercises

Manipulative techniques
[joint manipulation, joint mobilization]



FLEXIBILITY

STRETCHING

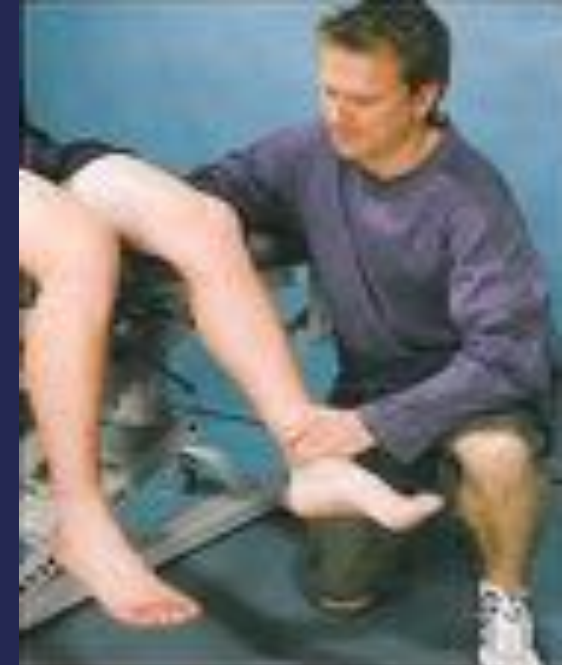
YOGA



ROM EXERCISES

Active ASSISTED exercises

Active exercises



Passive exercises





Prone knee bend



STATIC STRETCHING



PROPRIOCEPTIVE NEURO- MUSCLULAR FACILITATION



PNF Stretch

STRETCHING

Ballistic
stretching





BALANCE AND PROPRIOCEPTION





BALANCE

Person's ability to maintain posture!

PROPRIOCEPTION

Ability to perceive the position of an object in 3D space

— *Visual input*

— *Auditory input*

— *Tactile input*

— *MECHANO-RECEPTORS*

KINESIA

Ability to perceive the 3D form of an object





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HYDROTHERAPY





EXERCISE PRESCRIPTION




Writing exercise prescription





F- Frequency
I- Intensity
T- Timing
T- Type



F- Frequency
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T- Type

CARDIO-VASCULAR
FITNESS



AEROBIC EXERCISE INTENSITY



Maximal Oxygen Uptake
(VO_2 Max)

Maximum Heart Rate
(HR Max)

Metabolic equivalents
(ME)





Maximum Heart Rate
(HR Max)

220-Age

ACSM

*Moderate intensity exercise
Target HR: 55-70% of HR_{max}*



***RESISTANCE EXERCISE
INTENSITY***



**Repetition
Maximum**





F- Frequency
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T- Type

FREQUENCY

ACSM

Aerobic exercises: 5 days a week

Resistance sessions: 3 days a week



TIMING/ DURATION



Muscle
(Creatine Phosphate)

< 1 minute



Glycolysis
(Glucose)

1-20 minutes



Kreb cycle
(Fats: Acetyl CoA)

> 20 minutes



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STRUCTURE OF AN EXERCISE PROGRAMME

MUSCLE ACTIVATION

ROM Exercises

STRENGTH

CARDIO-VASCULAR
FITNESS

BALANCE &
PROPRIOCEPTION

JOINT
FLEXIBILITY



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POWER & STRENGTH

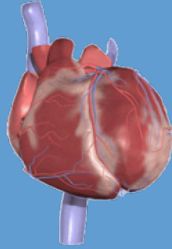
Frequency: 3 sessions per week

Intensity: 50-75 % of Repetition Maximum

Type: Isotonic exercise

Timing: 2-5 repetition x 2-5 sets per muscle





$$HR_{\max} = 220 - \text{Age}$$

*Weight
Reduction*

Frequency: 5 sessions per week

Intensity: 50-70 % of HR max

Type: Aerobic exercises

Timing: 20-30 minutes in a session a day





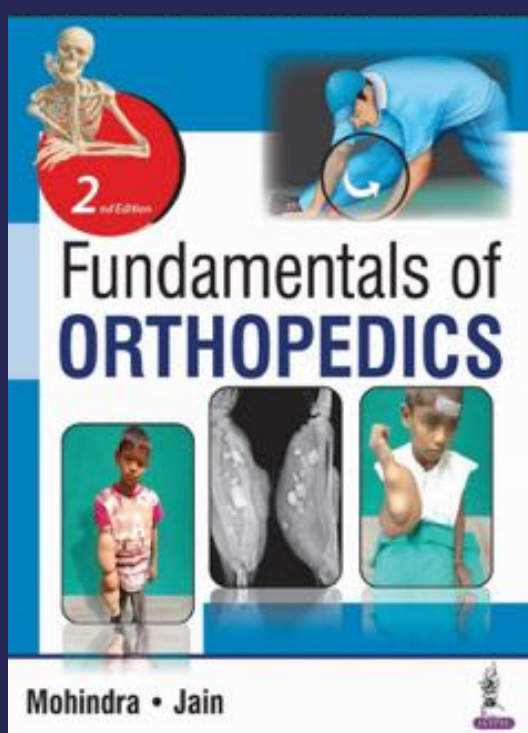


THANKYOU!

याद रखें-

आप नहीं चलोगे..

तो दवाइयां चलने लगेंगी। 🙌



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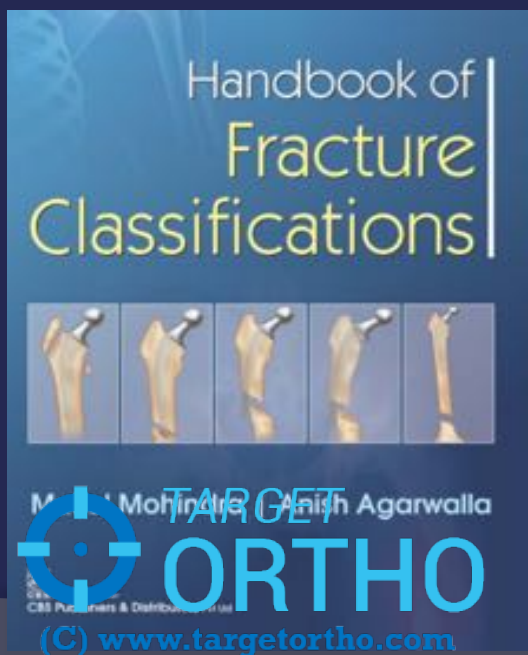
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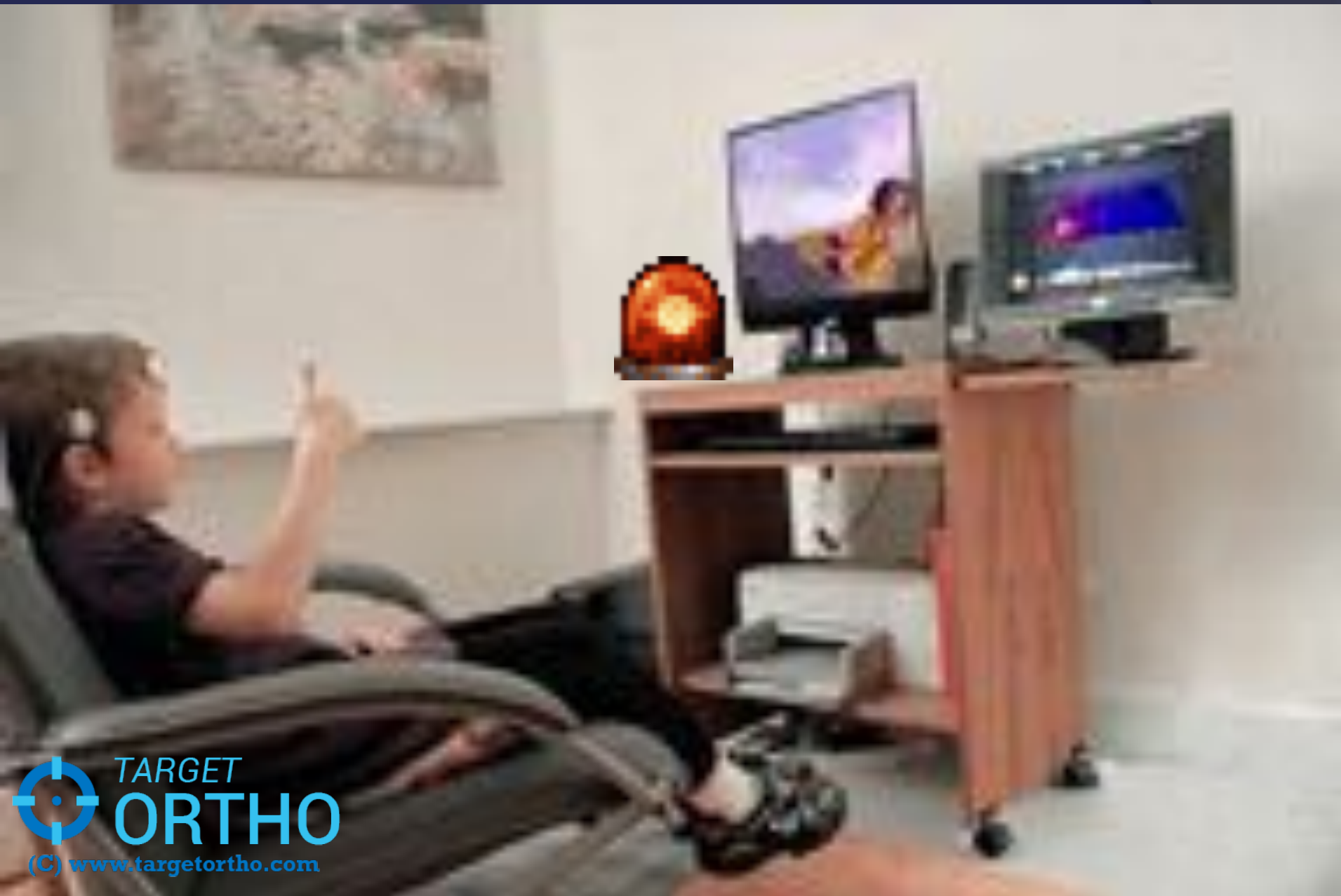
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BIOFEEDBACK



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***I AM A DOCTOR SO I DON'T
HAVE A GOOD HANDWRITING!***



**F- Frequency
I- Intensity
T- Timing
R- Type**

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MUSCLE ACTIVATION

ROM Exercises

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