Patient management in PT
4-phase Approach to rehabilitation
Algorithms in PT

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DIAGNOSIS

Both the process and the end result of evaluating examination data, which the physical therapist organizes into defined clusters, syndromes, or categories to help determine the prognosis (including the plan of care) and the most appropriate intervention strategies.

PROGNOSIS (Including Plan of Care)

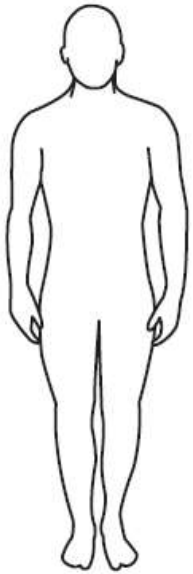
Determination of the level of optimal improvement that may be attained through intervention and the amount of time required to reach that level. The plan of care specifies the interventions to be used and their timing and frequency.

INTERVENTION

Purposeful and skilled interaction of the physical therapist with the patient/client and, if appropriate, with other individuals involved in care of the patient/client, using various physical therapy methods and techniques to produce changes in the condition that are consistent with the diagnosis and prognosis. The physical therapist conducts a reexamination to determine changes in patient/client status and to modify or redirect intervention. The decision to reexamine may be based on new clinical findings or on lack of patient/client progress. The process of reexamination also may identify the need for consultation with or referral to another provider.

OUTCOMES

Results of patient/client management, which include the impact of physical therapy interventions in the following domains: pathology/pathophysiology (disease, disorder, or condition); impairments, functional limitations, and disabilities; risk reduction/prevention; health, wellness, and fitness; societal resources; and patient/client satisfaction.



EXAMINATION

The process of obtaining a history, performing a systems review, and selecting and administering tests and measures to gather data about the patient/client. The initial examination is a comprehensive screening and specific testing process that leads to a diagnostic classification. The examination process also may identify possible problems that require consultation with or referral to another provider.

EVALUATION

A dynamic process in which the physical therapist makes clinical judgments based on data gathered during the examination. This process also may identify possible problems that require consultation with or referral to another provider.

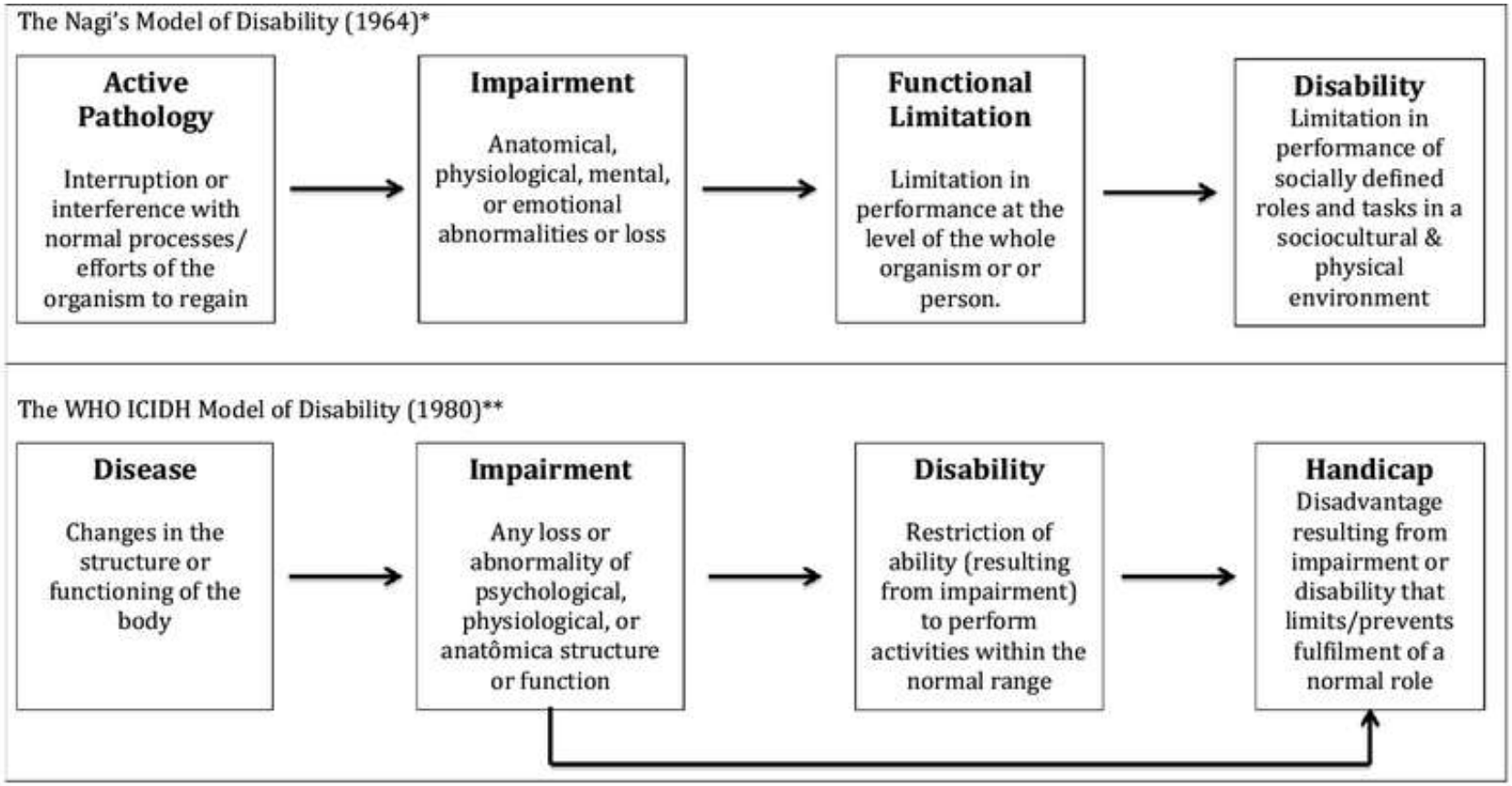
Source: Susan B. O'Sullivan, Thomas J. Schmitz, George D. Fulk: Physical Rehabilitation, Sixth Edition
www.FADavisPTCollection.com

DISABLEMENT MODEL (Saad Nagi, 1969)

- Nagi used the terms:
  - pathology, pathophysiology,
  - impairment,
  - functional limitation and
  - disability

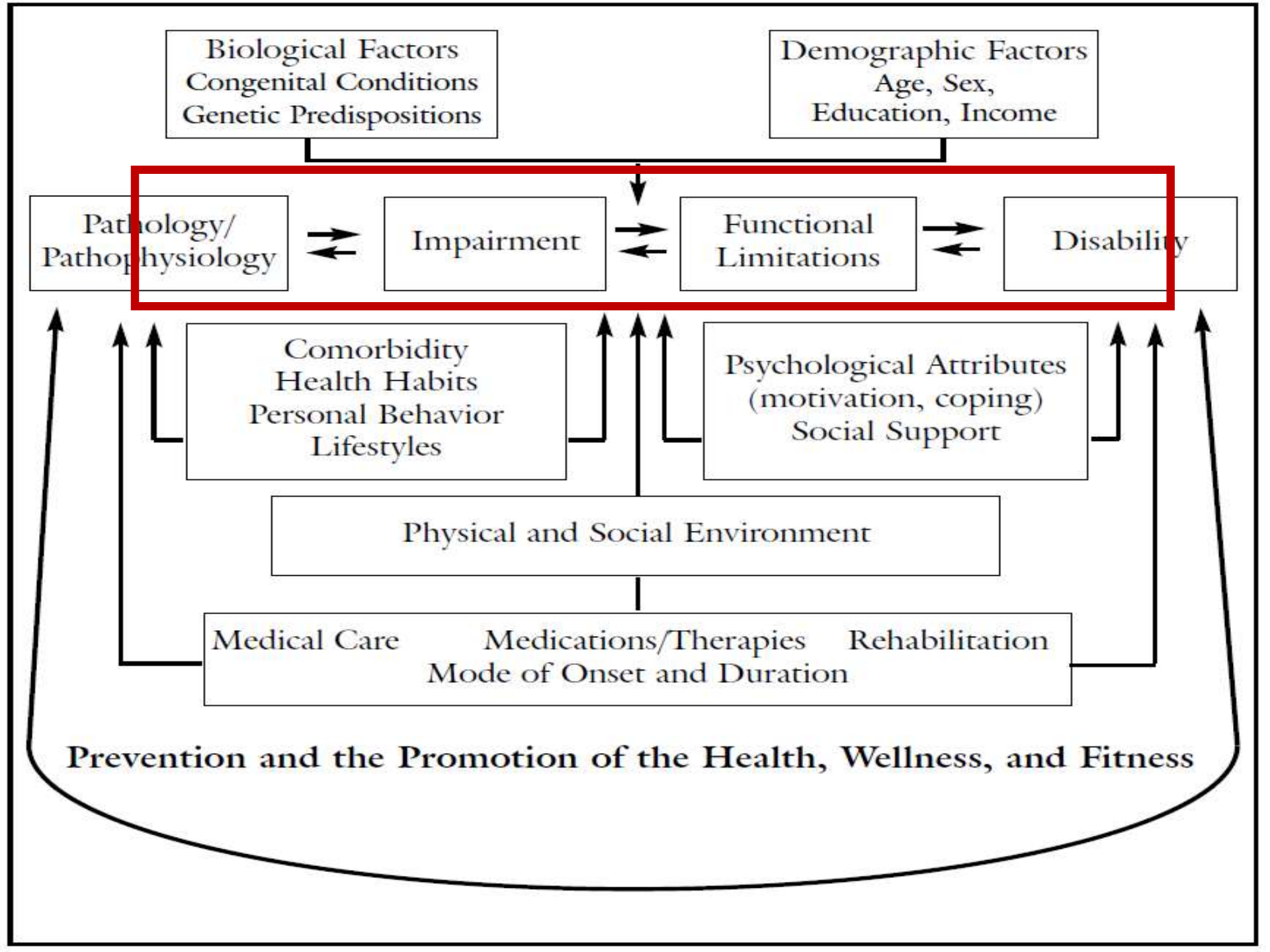
  to describe health status.

  These term can be used to categorize clinical observations systematically.

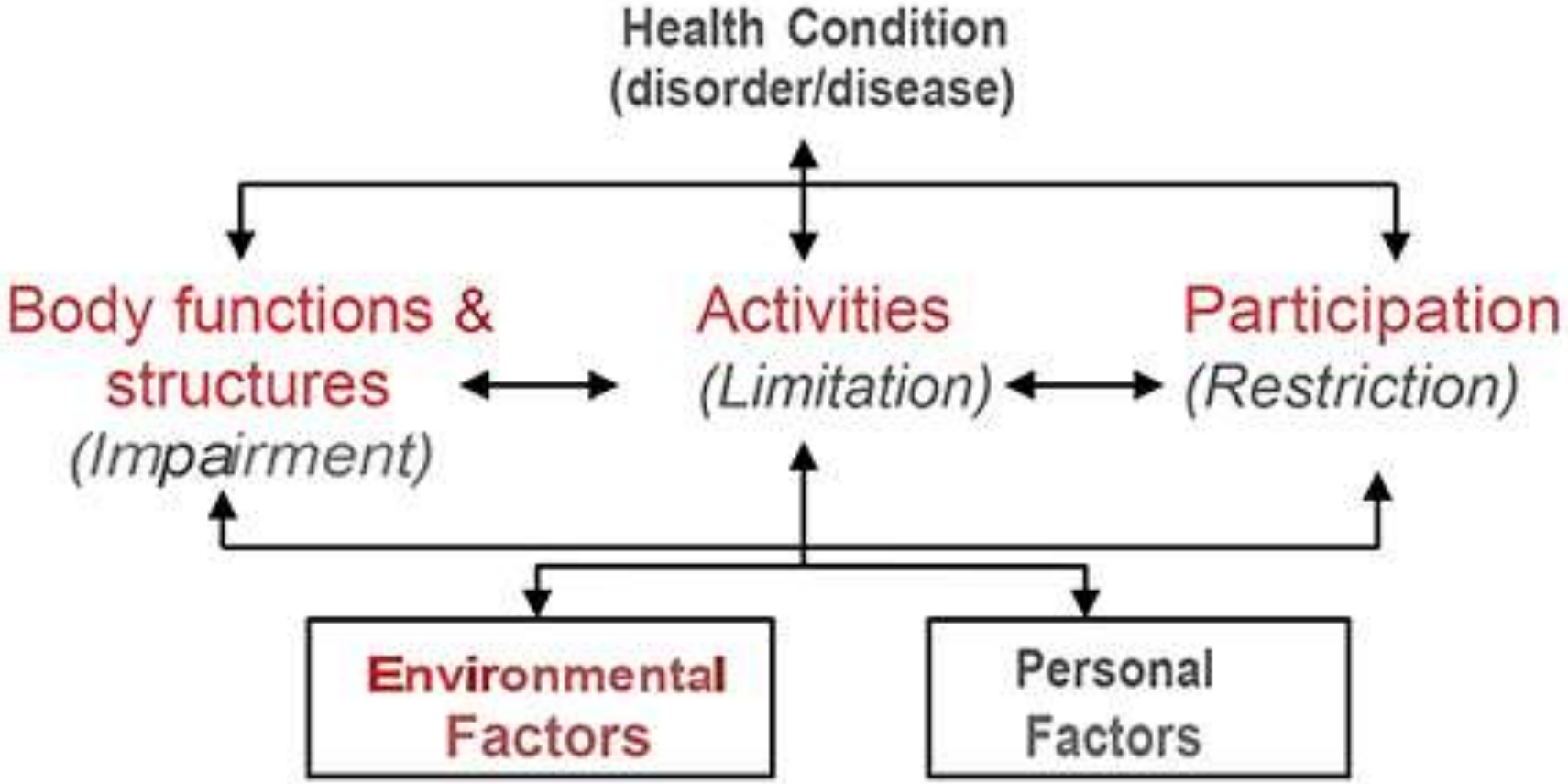


*Adapted from: Appendix A: Disability Concepts Revisited: Implications for Prevention ."*Disability in America: Toward a National Agenda for Prevention"* . Washington, DC: The National Academies Press, 1991.

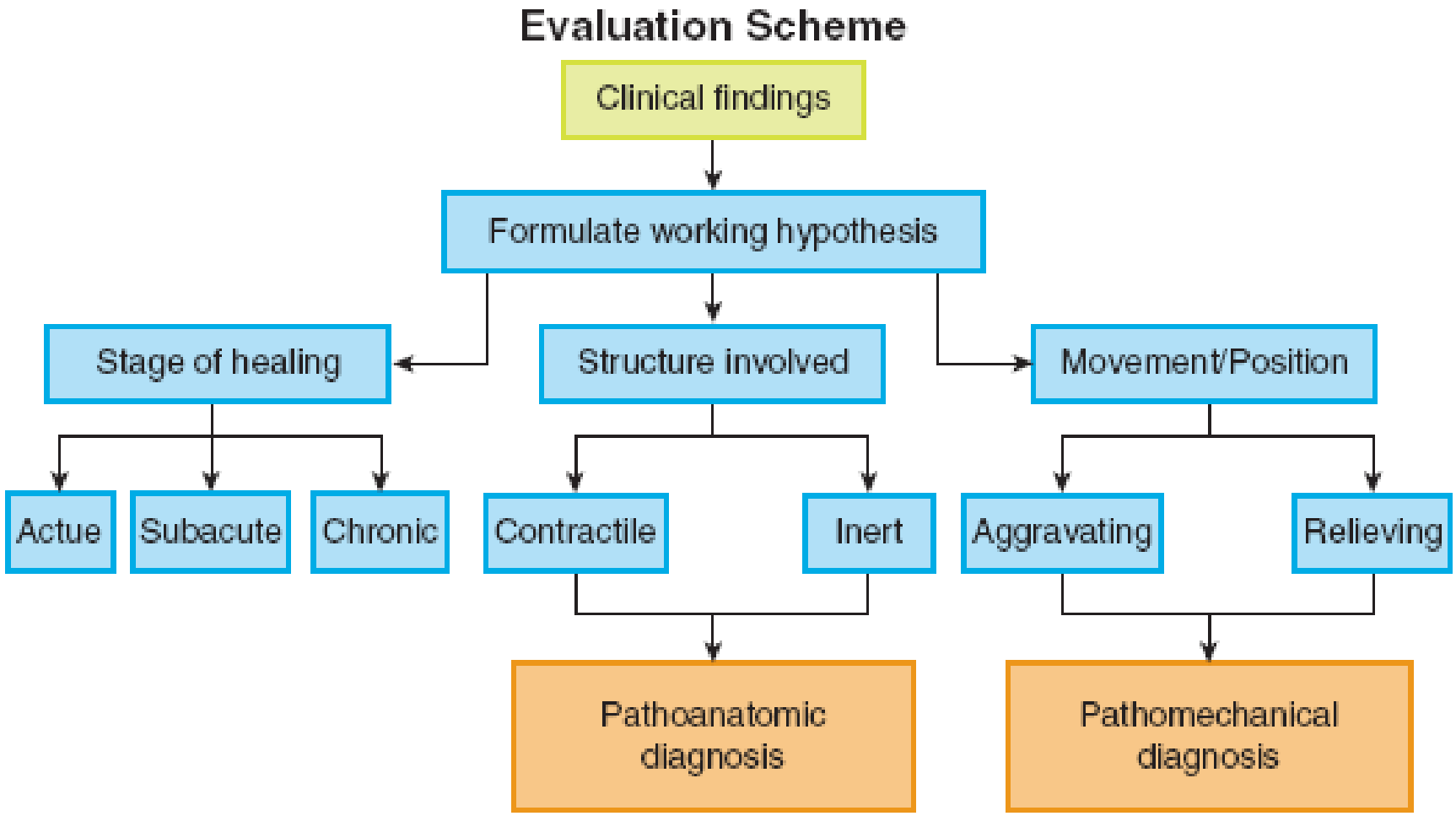
** Adapted from: World Health Organization (WHO). *International Classification of Impairments, Disabilities, and Handicaps: A manual of classification rating to the consequences of diseases.* WHO, Geneva, 1980.


Biological Factors
Congenital Conditions
Genetic Predispositions
Demographic Factors
Age, Sex,
Education, Income
Pathology/
Pathophysiology
Impairment
Functional
Limitations
Disability
Comorbidity
Health Habits
Personal Behavior
Lifestyles
Psychological Attributes
(motivation, coping)
Social Support
Physical and Social Environment
Medical Care
Medications/Therapies
Rehabilitation
Mode of Onset and Duration
Prevention and the Promotion of the Health, Wellness, and Fitness

ICF: Interaction of Concepts



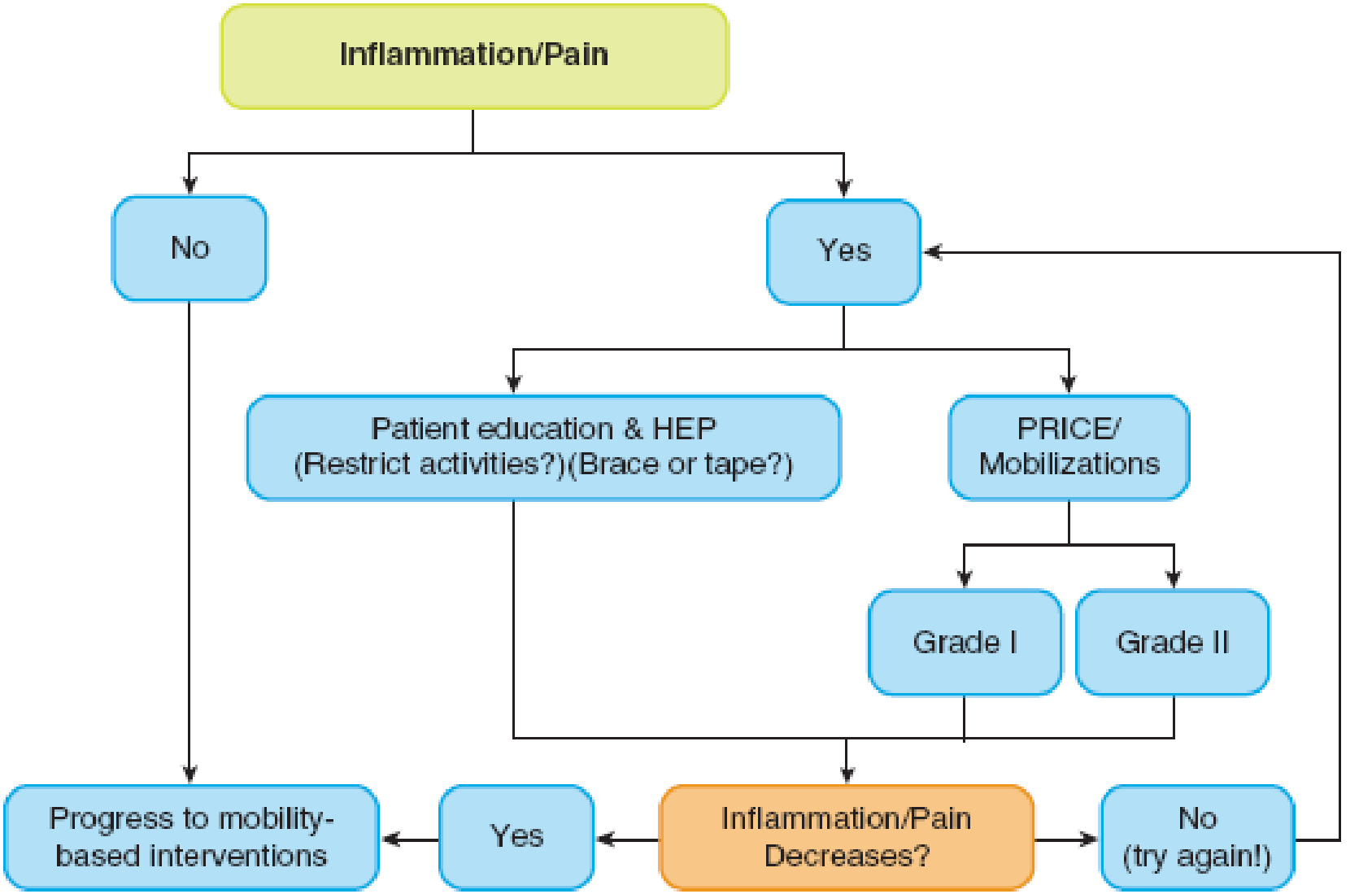
General evaluation scheme algorithm

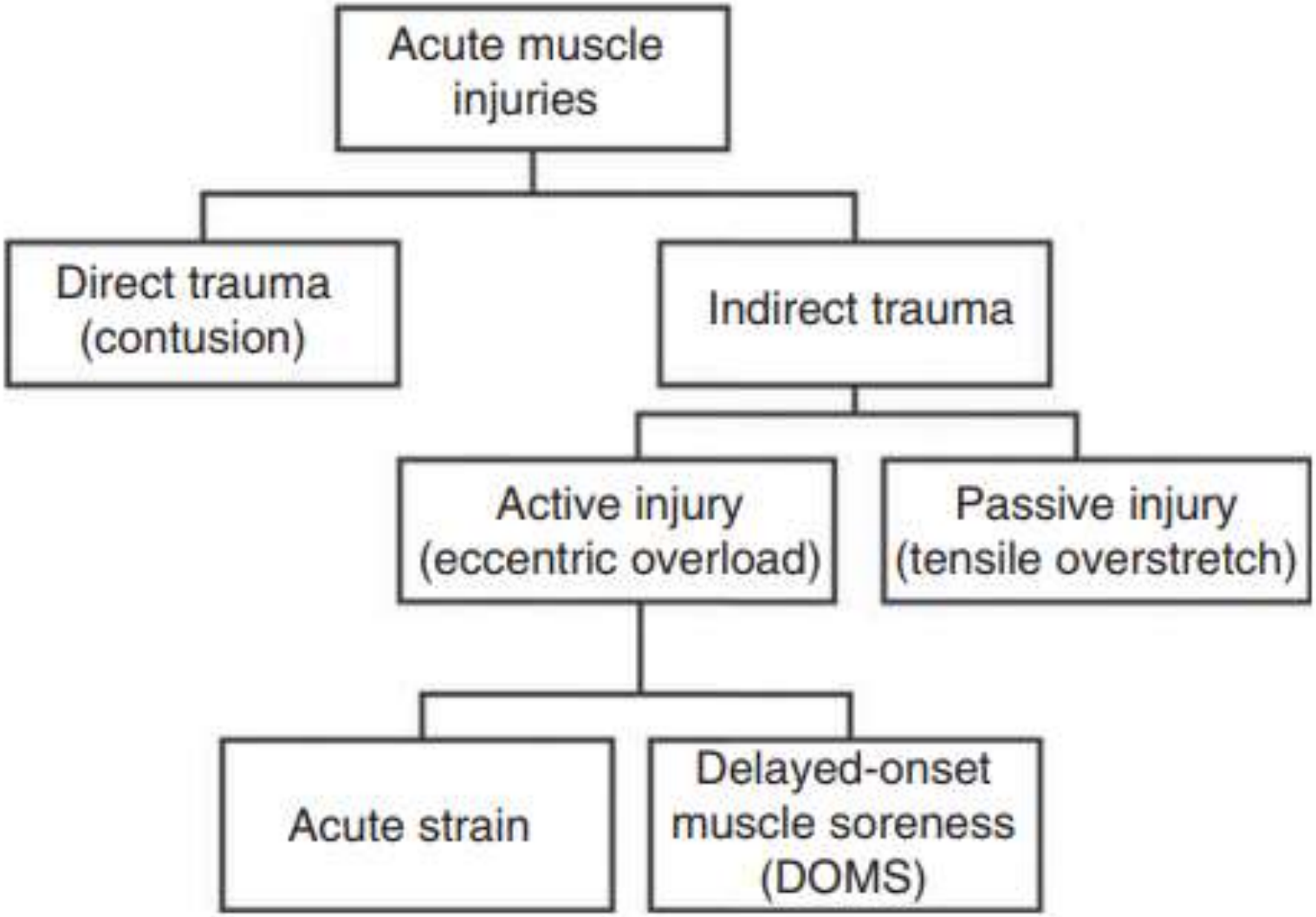


4-phase Approach

- I – acute (**control pain and inflammation**)
- II – Intermediate (**restore full and pain-free ROM**)
- III – advanced (**restore muscular strength, power, endurance**)
- IV – return to function (**restore neuromuscular efficiency**)

Inflammation / pain algorithm





Malanga, G. A., Yan, N., & Stark, J. (2015). **Mechanisms and efficacy of heat and cold therapies for musculoskeletal injury**. *Postgraduate medicine*, 127(1), 57-65.

Immediate treatment – the RICE / PRICE principle

- P – protection,
- R – rest,
- I – ice,
- C – compression,
- E – elevation.

- the combination of ice (cryotherapy) and compression are applied in bouts of 15-20 min. in duration, repeated at intervals of 30–60 min. for at least several hours.
- 6 hours - to obtain a substantial effect on limitation of the hemorrhaging and tissue necrosis at the site of the injury.

Cold therapy

↓ Temperature of skin and muscle

↓ Blood flow

↓ Metabolism

↓ Inflammation
↓ Edema
↓ Pain
↓ Muscle spasm
↓ Elasticity

Heat therapy

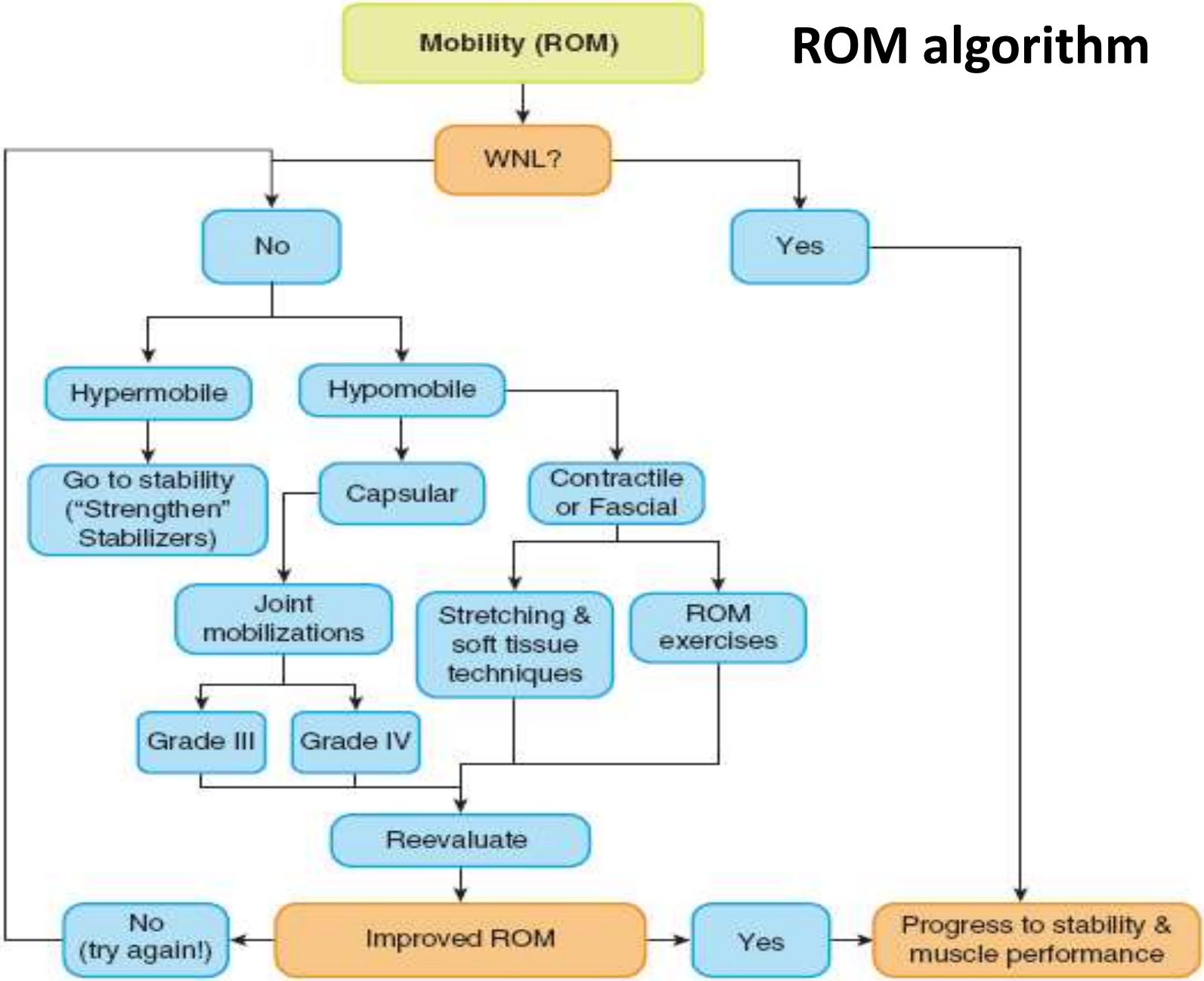
↑ Temperature of skin and muscle

↑ Blood flow

↑ Metabolism

↓ Pain
↑ Healing
↑ Elasticity

ROM algorithm



A hierarchy for the ROM exercises

- Passive ROM

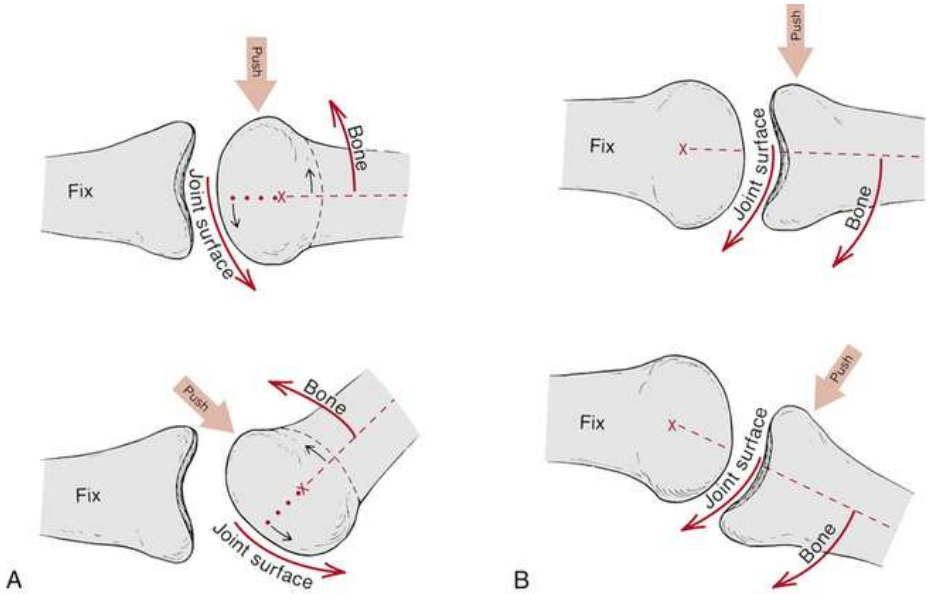
- Active-assisted ROM

- Active ROM

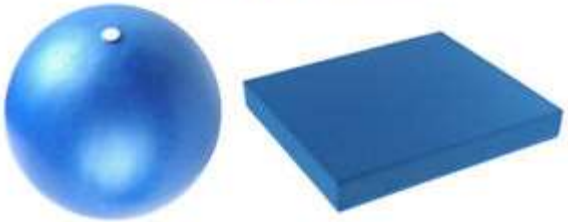
Soft tissue mobilization

- Massage
- Myofascial release techniques
- Muscle energy techniques:
  - PIR (6s isometric contraction +6 s passive stretching)
  - PRR (7-8 s isometric contraction + 7-8 s active stretching)

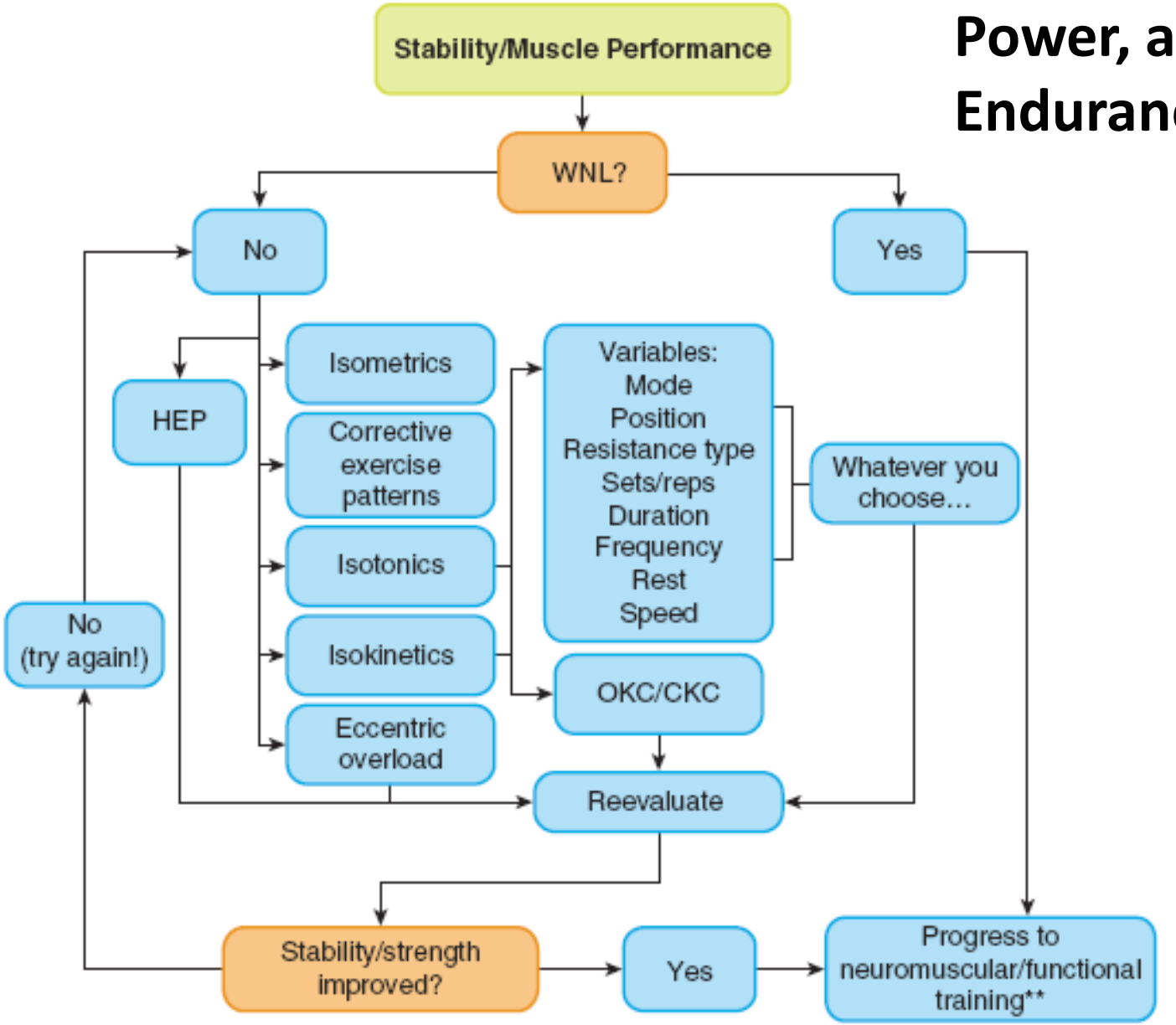
Joint mobilization



Joint instability → stability training



Muscular strength, Power, and Endurance algorithm



Isometrics

Advantages

- An isometric contraction provides stabilization strength

Disadvantages

- gain strength only for a specific tension point.

- May be life-threatening

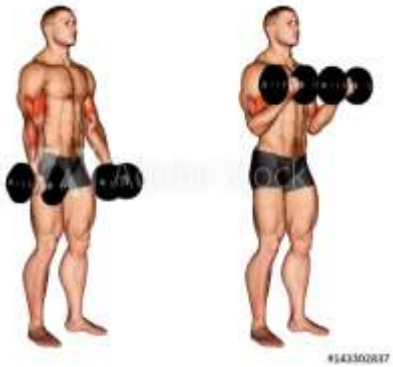
Isokinetics

Corrective exercise

- Improves posture
- Reduces stress
- Improves strength and flexibility
- Reduces pain
- Enhances functional & athletic performance.
- Prevents further injuries
- Helps in differentiating movement quality
- Improves daily living activities

Progressive Resistive exercise

- Isotonic (concentric / eccentric).
- C – 1-2 s.
- E – 2-4 s.
- C / E = 1:2



Progressive Resistive exercise

- 8 to 12 repetitions of a resistance training exercise for each major muscle group at an intensity of 40% to 80% of a one-repetition max (RM) depending on the training level of the participant.

- 2-3 min. of rest is recommended between exercise sets to allow for proper recovery.

- 2-4 sets are recommended for each muscle group.

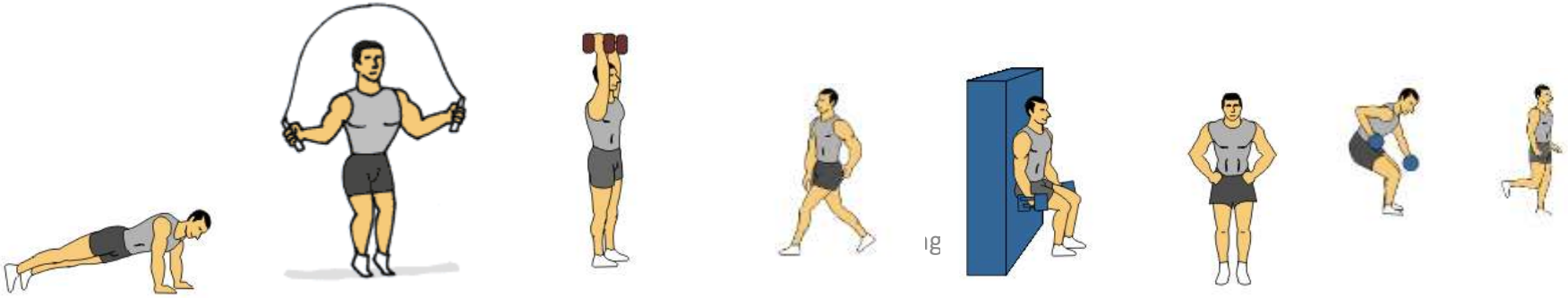
Exercise	Description	Primary Muscles Recruited
Supine bridge[9,21,52,54,56] 	Supine, knees flexed ~90° with feet flat on floor; raise hips to create straight line between shoulder and knees	Gluteus maximus Gluteus medius Longissimus thoracis Lumbar multifidus
Supine unilateral bridge[21,52,56] 	Perform supine bridge; lift 1 leg into full knee extension	External oblique Gluteus maximus Gluteus medius Hamstrings Longissimus thoracis Lumbar multifidus
Side bridge[9,12,21,46,54,55] 	Side lying with upper body supported on forearm with elbow flexed to 90°; lift trunk to create straight line between shoulders and feet	External oblique Gluteus medius Longissimus thoracis Lumbar multifidus Rectus abdominus
Plank[21,55] 	Prone on elbows; lift trunk to create straight line between shoulders and feet	External oblique Gluteus medius Rectus abdominus
Bird dog[12,21,42,46,52,54,56] 	Quadruped with neutral spine alignment; can perform unilateral arm/leg raises, progressing to simultaneous contralateral arm/leg raises	External oblique Gluteus maximus Gluteus medius Hamstrings Longissimus thoracis Lumbar multifidus

Core stability training

- **1 level - stabilization**

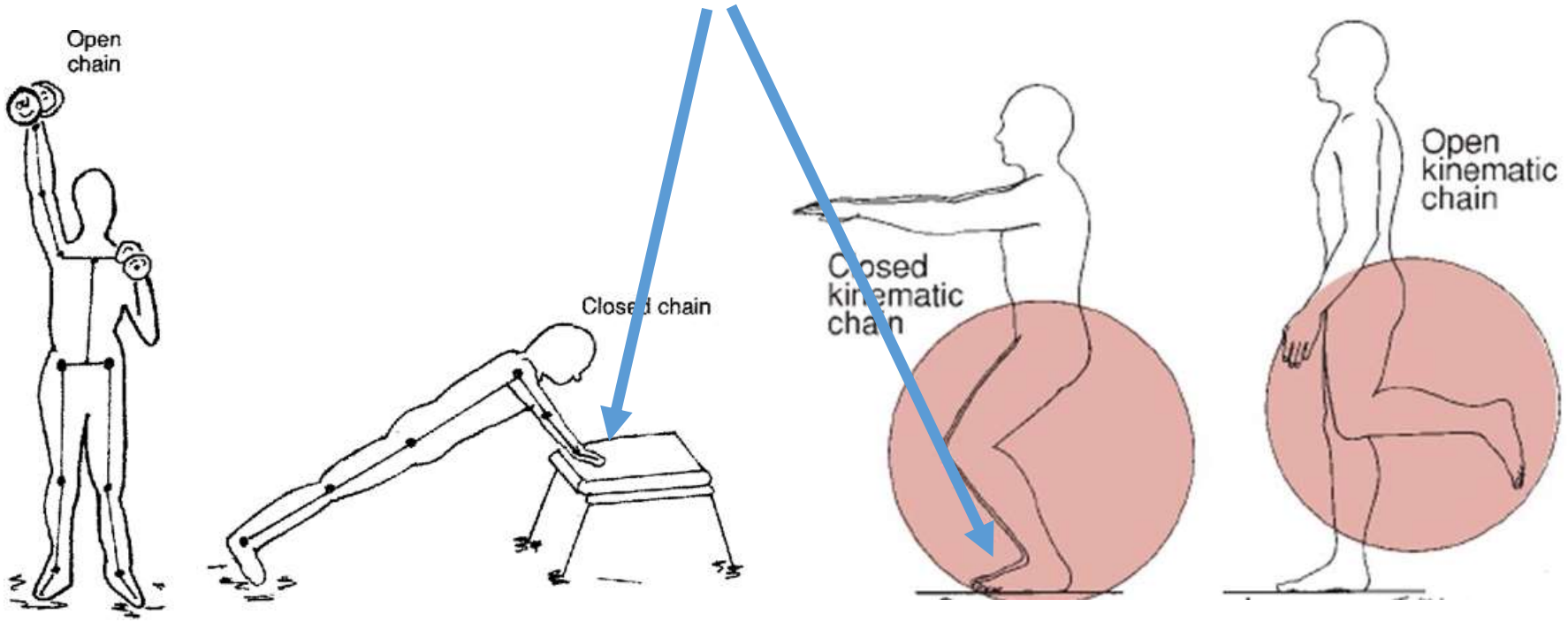
- **2 level – strength training**

- **3 level - power**



Open vs Closed

Closed – distal joint is stationary



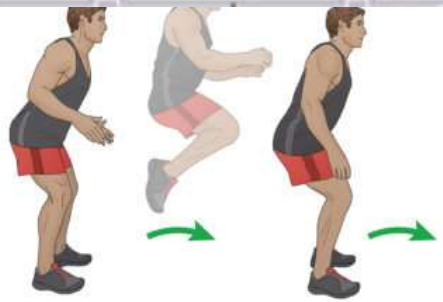
Plyometric

Jump onto, over and from 35 cm benches

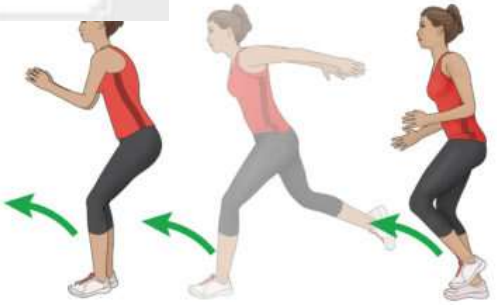
Heavy medicine ball throw

Reactive / drop jumps

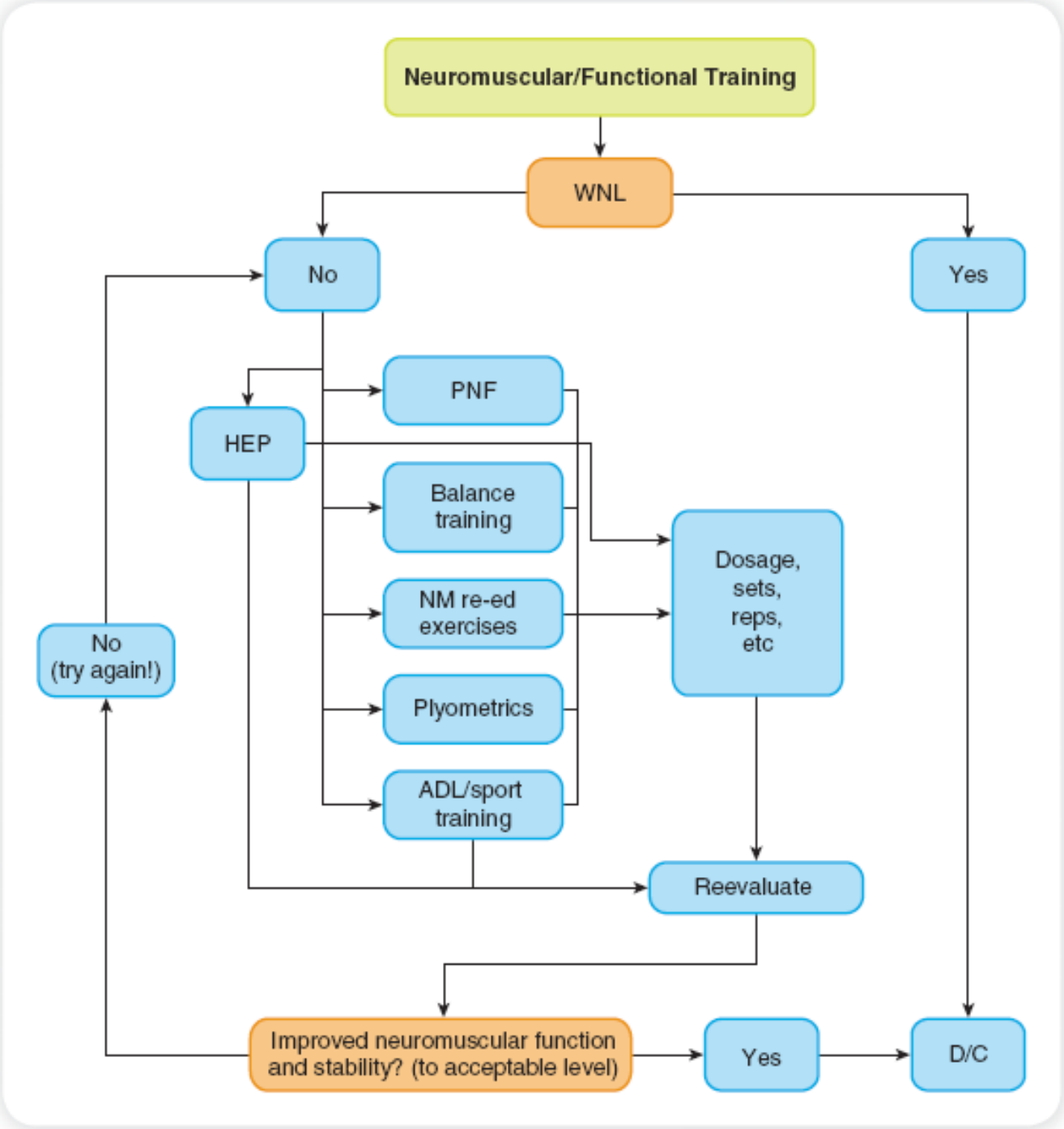
Bilateral In Place	Unilateral In Place	Bilateral For Height/Dist	Unilateral For Height/Dist	Bilateral Continuous	Unilateral Continuous



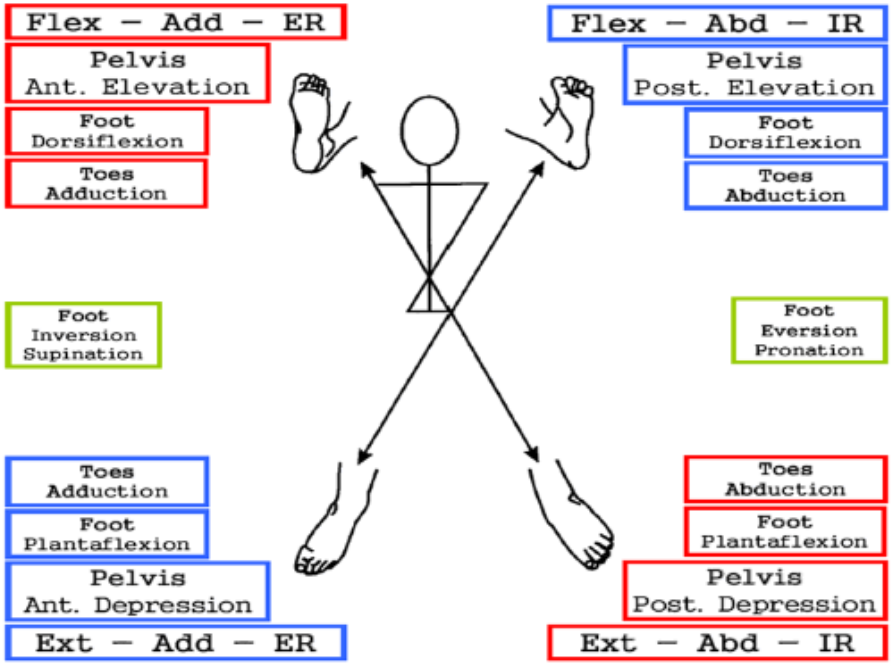
Double leg bounding

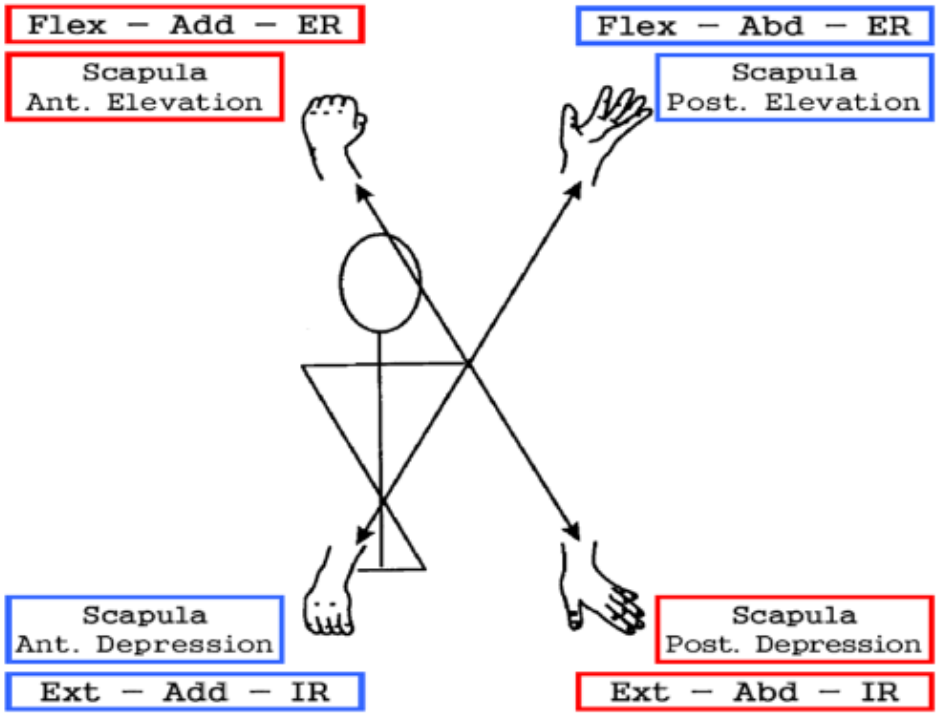


Hop, step, jump

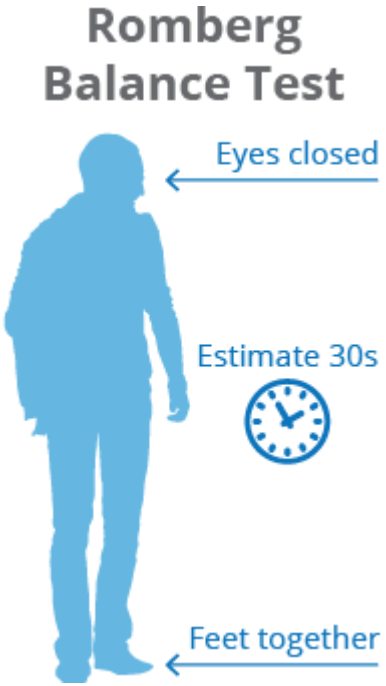

Neuromuscular/Functional Training
WNL
No
Yes
PNF
HEP
Balance training
NM re-ed exercises
Plyometrics
ADL/sport training
Dosage, sets, reps, etc
No (try again!)
Reevaluate
Improved neuromuscular function and stability? (to acceptable level)
Yes
D/C

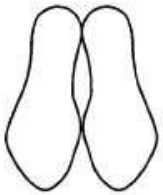
PNF


Flex – Add – ER
Pelvis
Ant. Elevation
Foot
Dorsiflexion
Toes
Adduction
Flex – Abd – IR
Pelvis
Post. Elevation
Foot
Dorsiflexion
Toes
Abduction
Foot
Inversion
Supination
Foot
Eversion
Pronation
Toes
Adduction
Foot
Plantaflexion
Pelvis
Ant. Depression
Ext – Add – ER
Toes
Abduction
Foot
Plantaflexion
Pelvis
Post. Depression
Ext – Abd – IR


Flex – Add – ER
Scapula
Ant. Elevation
Flex – Abd – ER
Scapula
Post. Elevation
Scapula
Ant. Depression
Ext – Add – IR
Scapula
Post. Depression
Ext – Abd – IR


PNF STRETCHING
CONTRACT
3-5 Seconds
3-5 Seconds
3-5 Seconds
RELAX
5-10 Seconds
5-10 Seconds
10-30+ Seconds
PNF Autogenic Inhibition
Contract/Activate
Reciprocal
Muscle Group
To
Lengthen/Release
Targeted
Muscle Groups
PNF Reciprocal Inhibition



1. Feet together stand	2. Semi-tandem stand
	
• Hold for 10 seconds	• The person chooses which foot is placed in front • Hold for 10 seconds
3. Tandem stand	**4. One leg stand**
	
• The person chooses which foot is placed in front • Hold for 10 seconds	• The person chooses which leg to stand on • Timing starts as soon as the person raises one foot off the ground • We chose to extend the maximum length of time of the one leg stand test from 10 seconds to 30 seconds to lessen the ceiling effects of this test

Open vs closed eyes

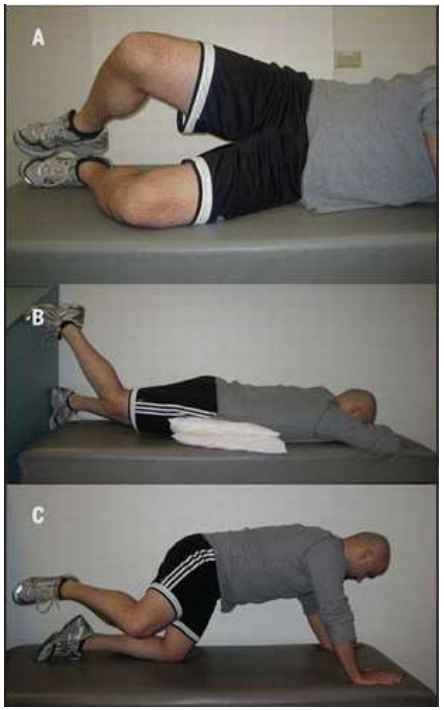
Stable vs unstable

→

Static dynamic

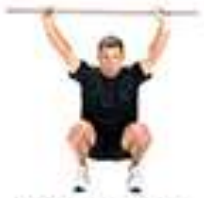
Neuromuscular reeducation

- Phase 1: Isolated Muscle Recruitment (Weeks 0–4)
- Phase 2: Weight-Bearing Strengthening (Weeks 5–16)
- Phase 3: Functional Training (Weeks 17–24)



Wagner, T., Behnia, N., Ancheta, W. K. L., Shen, R., Farrokhi, S., & Powers, C. M. (2010). Strengthening and neuromuscular reeducation of the gluteus maximus in a triathlete with exercise-associated cramping of the hamstrings. *journal of orthopaedic & sports physical therapy*, *40*(2), 112-119.

The Functional Movement Screen



1. Squatting

2. Stepping

3. Lunging

4. Reaching

5. Leg Raising

6. Push-up

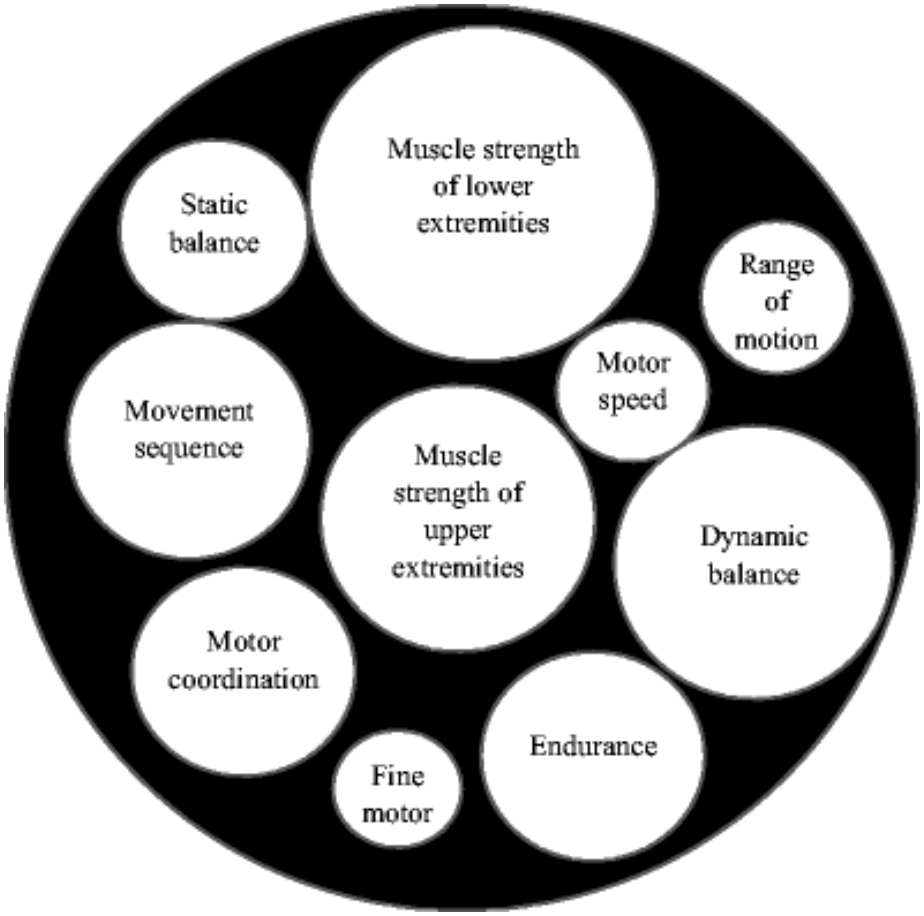
7. Rotary Stability

FUNCTIONAL MOVEMENT SYSTEMS — FMS — FUNCTIONALMOVEMENT.COM

What is the "Real" Objective?

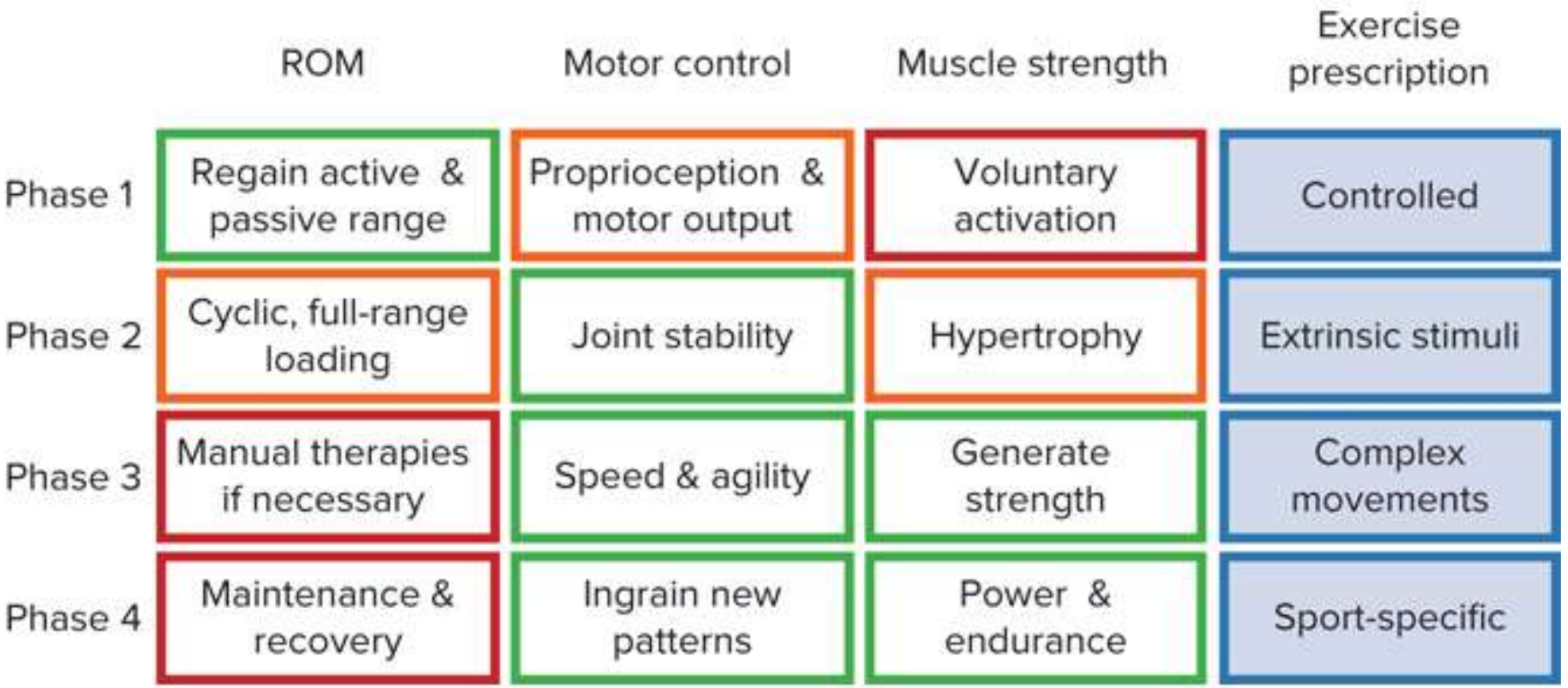
Activities of daily living

Possible body motor elements required to vacuum a room

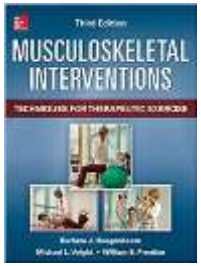


Liu, C. J., Shiroy, D. M., Jones, L. Y., & Clark, D. O. (2014). Systematic review of functional training on muscle strength, physical functioning, and activities of daily living in older adults. *European review of aging and physical activity*, *11*(2), 95-106.

Summary



	ROM	Motor control	Muscle strength	Exercise prescription
Phase 1	Regain active & passive range	Proprioception & motor output	Voluntary activation	Controlled
Phase 2	Cyclic, full-range loading	Joint stability	Hypertrophy	Extrinsic stimuli
Phase 3	Manual therapies if necessary	Speed & agility	Generate strength	Complex movements
Phase 4	Maintenance & recovery	Ingrain new patterns	Power & endurance	Sport-specific



Thank you for your attention