EXERCISE FOR YOU AND YOUR PATIENT

CHIRO SPORT SOUTH AFRICA

REMEMBER

NOT FOR CLINICAL CASE PRESENTATIONS:

TBI, VESTIBULAR, CEREBELLAR

CHRONIC ANKLE INSTABLITY, MSK INJURIES

AGE RELATED CHANGE

INTOXICATION

CHIRO SPORT SOUTH AFRICA


CHIRO
SPORT
SOUTH
AFRICA

PROPRIOCEPTION

Proprioceptive performance = proprioceptive information + proprioceptive ability

Sensory input → Central processing → Motor output

Jnt position / Kinesthesia / Sense of Change Velocity / Sense of Force

Ager, A.L., Borms, D., Deschepper, L., Dhooghe, R., Dijkhuis, J., Roy, J.S., & Cools, A.Proprioception and shoulder pain: A Systematic Review. *J Hand Ther*. 2019 Aug 31. pii: S0894-1130(19)30094-8. doi: 10.1016/j.jht.2019.06.002

Riemann, B. L., & Lephart, S.M. (2002). The sensorimotor system, part 1: the physiological basis of functional joint stability. *Journal of Athletic Training, 37*(1),71-79.

Aman JE, Elangovan N, Yeh I, Konczak J. The effectiveness of proprioceptive training for improving motor function: a systematic review. Frontiers in human neuroscience. 2015 Jan 28;8:1075. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4309156/

PROPRIOCEPTION

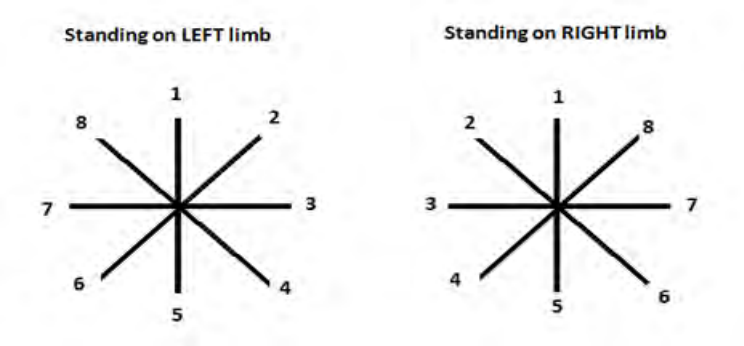
Quick test and measurable criteria to do at home……Repeatable

Tandem gait / Romberg walking (Quick screen)

Single leg stance (eyes open 40 secs) (Eyes Closed 20 secs)

Star excursion balance test

Functional reach test



Cohen et al, Tandem walking as a quick screening test for vestibular disorders, Laryngoscope. 2018 Jul; 128(7): 1687–1691.

Sell TC. An examination, correlation, and comparison of static and dynamic measures of postural stability in healthy, physically active adults. Phys Ther Sport. 2012;13:80–86.

Gribble PA, Hertel J, Plisky P. Using the Star Excursion Balance Test to assess dynamic postural-control deficits and outcomes in lower extremity injury: a literature and systematic review. Journal of athletic training. 2012 May;47(3):339-57.

Wernick-Robinson M, Krebs DE, Giorgetti MM. Functional reach: Does it really measure dynamic balance? Archives of Physical Medicine and Rehabilitation. 1999; 80(3): 262 - 269

PROPRIOCEPTION

PROPRIOCEPTION

EXERCISE / PERIPHERAL ADAPTABILITY / NEURAL PLASTICITY

Han et al, Assessing proprioception: A critical review of methods, Journal of Health and Sports Science, Volume 5, Issue 1, March 2016, Pages 80-90

YOUR STABILITY

Scapula Setting

Rotator Cuff Stability

Glute Med / Min / Piriformis

Feet and Ankle

Wrist

CHIRO SPORT SOUTH AFRICA

MOVEMENT = EXERCISE

- Barriers to entry – Language, equipment, perceptions.

- Movement is stimulus into the CNS
- Novel movements create better neural adaption

BREATHING PATTERNS

- Diaphram Drills – hold sides of rib wall and diaphragmatically breath
  - hand on stomach and hand on chest
  - box breathing 4x4x4x4
  - DNS

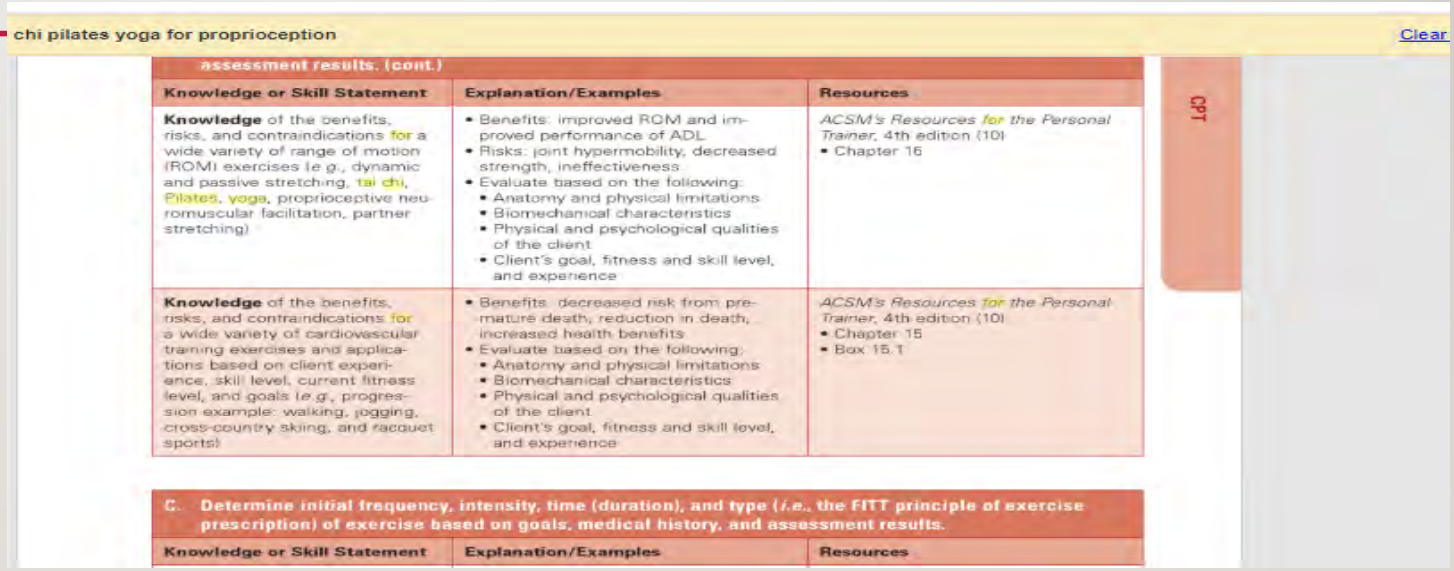
MOBILITY VS FLEXIBILITY

- Flexibility, is the ability for the connective tissue to move *PASSIVELY* through a ROM
- Mobility, is the ability for a joint to move *ACTIVELY* through a ROM.
- Mobility is having strength within your flexibility.

- Mobility flow Dr Jen Esquire https://youtu.be/0ZTHccktrPU (Mobility for beginners)

MOBILITY VS FLEXIBILITY

- Pilates / Yoga / Tai Chai
- Dancing



chi pilates yoga for proprioception

Clear

assessment results. (cont.)

Knowledge or Skill Statement	Explanation/Examples	Resources

Knowledge of the benefits, risks, and contraindications for a wide variety of range of motion (ROM) exercises (*e.g.*, dynamic and passive stretching, tai chi, Pilates, yoga, proprioceptive neuromuscular facilitation, partner stretching)	• Benefits: improved ROM and improved performance of ADL
	• Risks: joint hypermobility, decreased strength, ineffectiveness
	• Evaluate based on the following:
	  • Anatomy and physical limitations
	  • Biomechanical characteristics
	  • Physical and psychological qualities of the client
	  • Client's goal, fitness and skill level, and experience
		ACSM's Resources for the Personal Trainer, 4th edition (10)
		• Chapter 16

Knowledge of the benefits, risks, and contraindications for a wide variety of cardiovascular training exercises and applications based on client experience, skill level, current fitness level, and goals (*e.g.*, progression example: walking, jogging, cross-country skiing, and racquet sports)	• Benefits: decreased risk from premature death, reduction in death, increased health benefits
	• Evaluate based on the following:
	  • Anatomy and physical limitations
	  • Biomechanical characteristics
	  • Physical and psychological qualities of the client
	  • Client's goal, fitness and skill level, and experience
		ACSM's Resources for the Personal Trainer, 4th edition (10)
		• Chapter 15
		• Box 15.1

C. Determine initial frequency, intensity, time (duration), and type (*i.e.*, the FITT principle of exercise prescription) of exercise based on goals, medical history, and assessment results.

Knowledge or Skill Statement	Explanation/Examples	Resources

CPT

- ACSMS Certification Review, Lippincott and Williams, Wolters Kluwer Health, Chapter11Pg 27

PRIMAL MOVEMENTS

- Central theme – Awareness
- Remember no Coach, no cues, YOU have to be aware and stay this side of safe!

- Bending / Pushing / Squatting / Gait / Pulling / Lunging / Twisting

CRAWLING

- Central theme – Awareness
- Remember no Coach, no cues, YOU have to be aware and stay this side of safe!

CRAWL VARIATIONS

- Gorilla
- Spider
- Monkey

SEGMENTAL ROLLING

ENERGY SYSTEMS

Table 3.1 Relationships Between Energy Systems and Strength Training Methods

ENERGY SYSTEM	ANAEROBIC (OXYGEN INDEPENDENT)				AEROBIC (OXYGEN DEPENDENT)		
	Alactic		Lactic acid				
Modality	Power	Capacity	Power	Capacity	Power		Capacity
Duration	1–6 seconds	7–8 seconds	8–20 seconds	20–60 seconds	1–2 minutes	2–8 minutes	8–>120 minutes
Type of strength training needed	MxS, P		MxS, P, PE	MxS, P, PE, MES	MxS, P, PE, MEM	MxS, PE, MEM	MxS (<80% of 1RM), PE, MEL

Key: MEL= muscle endurance long, MEM = muscle endurance medium, MES = muscle endurance short, MxS = maximum strength, P = power, and PE = power endurance.

CHARACTERISTICS	SLOW-TWITCH or SLOW-OXIDATIVE (SO)	FAST OXIDATIVE-GLYCOLYTIC (FOG)	FAST-GLYCOLYTIC
Average Fiber Percentage	50	35	15
Speed of Contraction	Slow	Fast	Fast
Time to Peak Tension (seconds)	0.12	0.08	0.08
Force of Contraction	Lower	High	High
Size	Smaller	Medium	Large
Fatigability	Fatigue Resistant	Less Resistant	Easily Fatigued
Aerobic Capacity	High	Medium	Low
Capillary Density	High	High	Low
Anaerobic Capacity	Low	Medium	High

TABLE 4.2 CHARACTERISTICS OF MUSCLE FIBERS

ymca awards

ymcaawards.co.uk

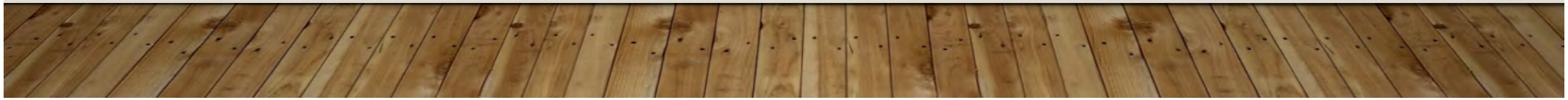
Energy systems – summary

System	Fuel	Duration	Intensity	Considerations
CP	Creatine stored in the muscle	Sections	Maximum	The potential duration of this system is dependant on the individual's fitness level and training
Lactic acid	Glycogen stored in the muscle	Minutes	Moderate – High	As above. Through training we are able to increase the capacity of this system. This enables us to work at a higher intensity for longer and extend the duration of this system.
Aerobic system	Predominantly fat with the assistance of carbohydrates	Ongoing	Low – Moderate	Fitness level and effective fuelling will effect an individual's aerobic capacity.

BASIC ENDURANCE

- Treadmill
- Stationery Bike
- Indoor Trainer
- Ergo
- Running on the spot

- JUMP ROPE! Fantatsic *SELF LIMITING* exercise



EQUIPMENT

- Think out the box, this creates novel movements – unilateral load, off center etc
- KB, DB, BB,
- Jump Rope,
- TRX – Tow Ropes
- Sandbags
- Handbags
- Battle Rope – Chains, nylon rope
- Bands
- Steps

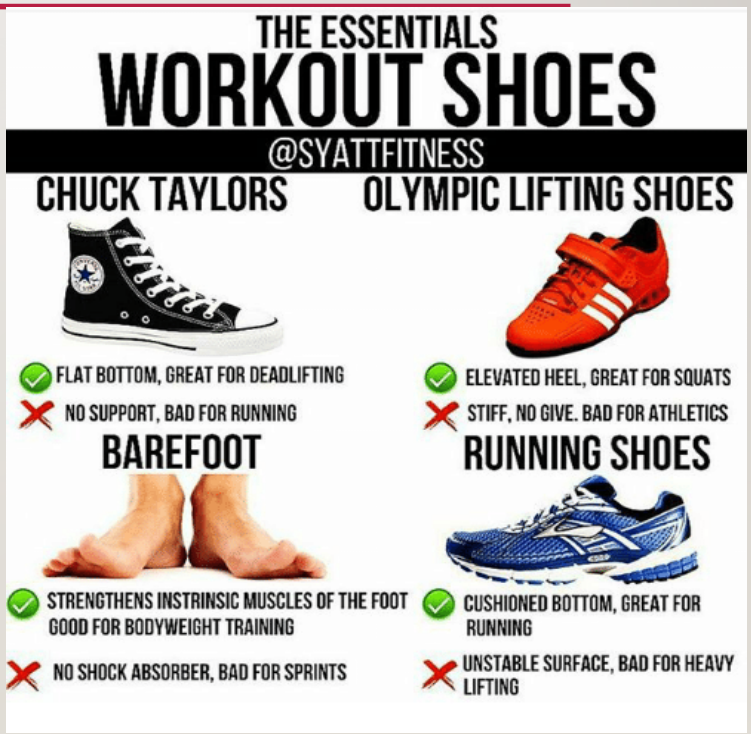
SHOES VS BAREFOOT

Biomechanical impacts on the squat

Weightlifting shoes vs Barefoot

- 2.5cm raised heel condition produced less forward trunk flexion angles at peak knee flexion and peak external hip moments in comparison to barefoot
- Produced greater knee external rotation

- Produced greater internal knee rotation



HIIT

- 80-95% of Max HR
- From 5s – 8min
- Work intervals altered with Rest periods of same length or longer (40-50% HR)
- Increases Metabolic rate, burns body fat (fat oxidation process), Increases Testosterone, GH
- Slows ageing at a cellular level

Eg. https://youtube.be/QXmdXilQaqA

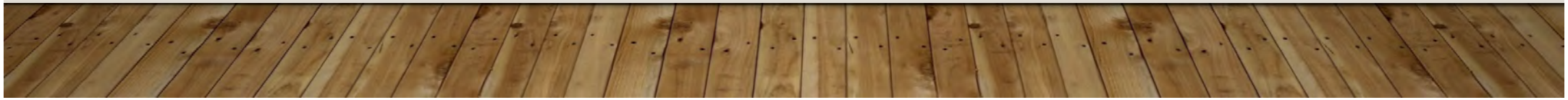
Zsolt Radák, 2018, Acute Exercise at Maximal and Submaximal (> 85% of Maximum) Intensity Will Bring About the Following Physiological Responses, Physiology of Physical Training

Fu, Xiao et al, 2018, Exercise-Based Cardiovascular Therapeutics: From Cellular to Molecular Mechanisms, chapter 7, Lifestyle in Heart Health and Disease, Pages 87-97

- **10-Minute Beginner HIIT Routine**

- You don't need any equipment to get started with this beginner's HIIT routine. Do each exercise for 20 seconds and then rest for 10 seconds. Cycle through the exercises as numbered until you've completed 10 minutes total of exercise (including the rest periods).

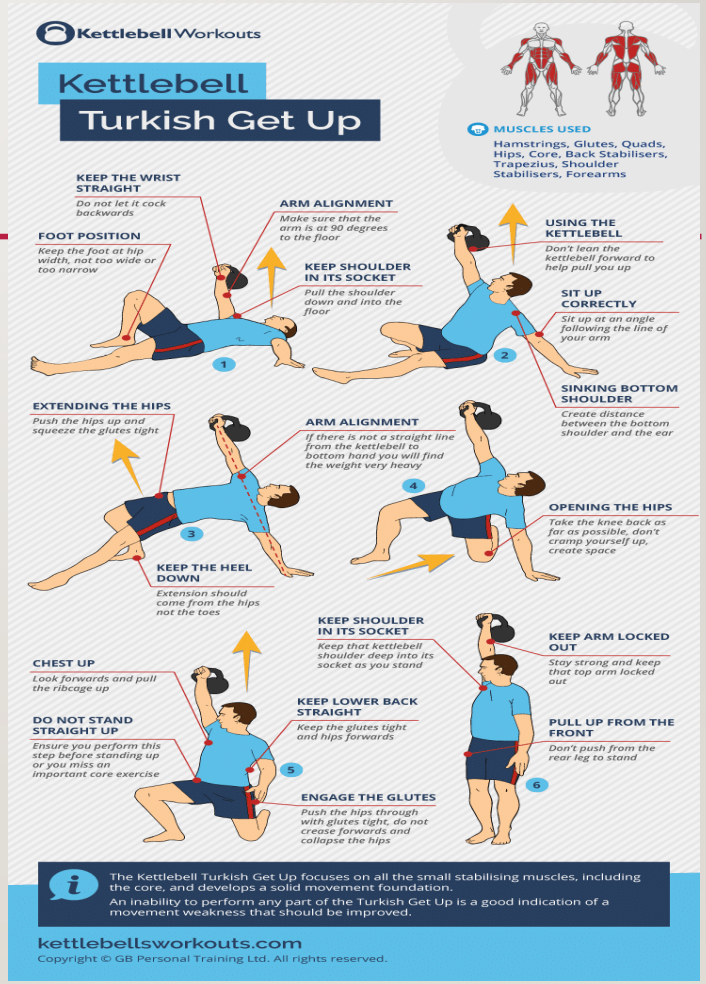
- Left-Right Punching Combo – Stand with your left foot forward, hips angled slightly to your right side. Place your arms up in a boxing position. Throw a straight punch with your left hand, then follow it up by throwing a punch with your right arm, rotating your right hip forward as you do so. Reset yours arms and hips back to the original position. Repeat.
- Right-Left Punching Combo – Do the same sequence as above, but stand with your right foot forward and start with the right side. *Note: either exercise one or exercise two is likely to feel awkward for you, but don't fuss about that, just keep moving.*
- Sumo Squats – Place feet a bit further than hip-width apart with toes pointing out. Keep back straight, chest upright, and weight on the heels. Lower down until thighs are parallel to the ground. Engage the quads and glutes, push back up.
- Jumping Jacks – Do jumping jacks as quickly as possible. If they're too difficult or uncomfortable for you, try stepping from side to side while you raise your arms up to the ceiling



TURKISH GET UP

Shoe get up.

Increasing body awareness, shoulder stability, central cylinder engagement, mobility



GO TO'S…….

- Push up relatively strict (Lats, lats and more lats) , be aware of Anterior head carriage, dolphin, upper trap recruitment….Eccentric
- Squat
- Lunge
- Mountain climbers (conditioning)
- Burpees……conditional

Today's Workout Phrase: "21 Day Shutdown Workout"

popupgym®

2 – 1min skipping

1 – 10 mountain climbers

D – 10 burpees

A – 10 push ups

Y – 1min skipping

S – 20 mountain climbers

H – 20 mountain climbers

U – 20 squat kicks

T – 10 jump squats

D – 10 burpees

O – 20 knee to elbow jumps

W – 10 burpees

N – 1min plank

W – 10 burpees

O – 20 knee to elbow jumps

R – 1min skipping

K – 10 burpees

O – 20 knee to elbow jumps

U – 20 squat kicks

T – 10 jump squats

REPEAT PHRASE TWICE (2 SETS)
15sec break between each exercise

Parting thoughts

Removing a bar/db can help expose where we are weak.

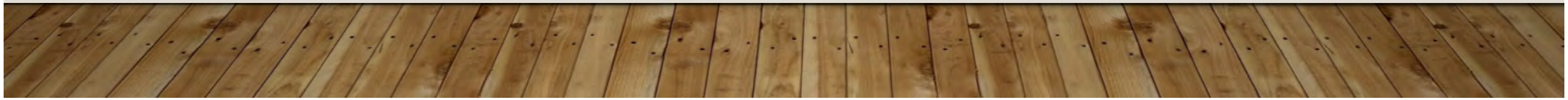
Variability – don't just count, use time ie.30 secs

Tempo training 3:3:1, Holds

Eccentric loading

Single leg patterns (1-leg deadlift, 1-leg hip hinge, single leg glute bridge)

Training on uneven surfaces, fatigued or not

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