



EXERCISE PRESCRIPTION PART 3

Orthopaedic Manual Physical Therapy Series
Charlottesville 2017-2018



Orthopaedic Manual Physical Therapy Series 2017-2018

Dr. Mike Evans: 23 ½ Hours

**OBESITY
+ NO EXER**



Orthopaedic Manual Physical Therapy Series 2017-2018

www.vompti.com

Exercise is medicine and physicians need to prescribe it!



R E Sallis

Br J Sports Med January 2009 Vol 43 No 1

- Inactivity related dz accounts for significant and growing healthcare costs
- Clear evidence exists proving benefits of exercise in prevention of chronic dz
- Little is being done by organized medicine to increase physical activity
- **Healthcare systems must think of exercise as a medication that should be prescribed to patients**



Orthopaedic Manual Physical Therapy Series 2017-2018

www.vompti.com

If Exercise is Medicine, Where is Exercise in Medicine? Review of U.S. Medical Education Curricula for Physical Activity-Related Content

Authors: Bradley J. Cardinal *, Eugene A. Park *, MooSong Kim *, Marita K. Cardinal *

- MD/DO, private and public institutions
- >1/2 physicians trained in US in 2013 received no formal education in physical activity
- Physical activity related courses were not offered,
 - If they were they were not required



Orthopaedic Manual Physical Therapy Series 2017-2018

www.vompti.com



Exercise Is Medicine At Any Dose?

Thijs M. H. Eijssvogels,
PhD
Radboud University
Medical Center,
Department of
Physiology, Nijmegen,
the Netherlands.

JAMA November 10, 2015 Volume 314, Number 18

- Exercise below the recommendation resulted in reduced all-cause mortality after 15 yrs
 - 15 min a day or 8 minutes of vigorous exercise
- Every additional 15 min of moderate activity led to 4% further reduction of all-cause mortality
- People exercising 3-5x the recommendation showed lowest mortality over 14 years



Orthopaedic Manual Physical Therapy Series 2017-2018

www.vompti.com



Exercise Is Medicine At Any Dose?

Thijs M. H. Eijssvogels,
PhD
Radboud University
Medical Center,
Department of
Physiology, Nijmegen,
the Netherlands.

JAMA November 10, 2015 Volume 314, Number 18

- Cardiovascular Disease
 - Largest reduction in mortality noted in patients who exercised 38-96 min/day
 - High doses of daily activity well above the recommendations are associated with increased mortality risk
 - Recommendations (Am College of Cardiology & Am Heart Assoc)
 - 30-60 min moderate exercise 5-7 days/wk
 - Increased daily lifestyle activities



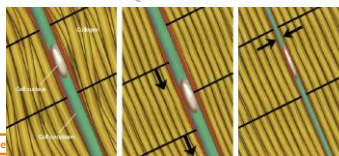
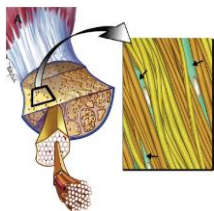
Orthopaedic Manual Physical Therapy Series 2017-2018

www.vompti.com

Mechanotherapy: how physical therapists' prescription of exercise promotes tissue repair

K M Khan, A Scott

- Mechanotherapy
 - Use of therapeutic exercise is prescribed to promote the repair or remodeling of injured tissue
- Using specific loading through exercise to cause changes at a cellular level resulting in tissue repair



Br J Sports Med 2009;43:247-251. Series

Optimal loading: key variables and mechanisms

Philip Glasgow,¹ Nicola Phillips,² Christopher Bleakley³
Br J Sports Med March 2015 Vol 49 No 5

- The load applied to structures that maximizes physiological adaptation
 - Driven by tissue type, pathological presentation and goals for eventual function
 - Goals: increased tensile strength, collagen reorganization, increased muscle-tendon unit stiffness and neural reorganization
 - Influenced by magnitude of load and rate of loading



Orthopaedic Manual Physical Therapy Series 2017-2018

www.vompti.com

Optimal loading: key variables and mechanisms

Philip Glasgow,¹ Nicola Phillips,² Christopher Bleakley³
Br J Sports Med March 2015 Vol 49 No 5

| Optimal loading | Suboptimal loading |
|---|--|
| Directed to appropriate tissues | Non-specific generalised loading |
| Loading through functional ranges | Loading through limited ranges of movement |
| Appropriate blend of compressive, tensile and shear loading | Loading exclusively in a single manner |
| Variability in magnitude, direction, duration and intensity | Constant, unidirectional load |
| Include neural overload | Minimal neural stimulus |
| Tailored to individual characteristics | Generic, non-individualised |
| Functional | Non-functional, isolated segmental loading |



Orthopaedic Manual Physical Therapy Series 2017-2018

www.vompti.com

What Type of Load?

- Should be tissue specific
 - Bone
 - In line of stress without shear
 - Ligament/Tendon
 - In line of stress
 - Articular Cartilage/Meniscus/Disc
 - Compression/Distractio
 - Muscle
 - In line of stress



Orthopaedic Manual Physical Therapy Series 2017-2018

www.vompti.com

Overview

- Dosage is dictated by type of tissue and goal of exercise
 - Too aggressive will be destructive
 - Too conservative will have no effect
 - Can be for pain inhibition, decreasing muscle guarding, reducing edema, increasing tissue tolerance to tension/compression and improving joint mobility
- Load is dictated by irritability, type of tissue and goals
- Strength is an eventual goal, not the primary goal
- Consider sequencing of exercises
 - Be creative with mix and order of global, semi global and local exercises
- Supervision is critical
- Consider RAMS for progression framework
 - Retrain, Attain, Maintain, Sustain



Orthopaedic Manual Physical Therapy Series 2017-2018

www.vompti.com