

# Exercise Prescription for Health

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**INSPIRING GREATNESS**



# Workshop Goals

- Using your unique Physicians skills to improve patients' exercise habits
- Using traditional clinical competencies to prescribe exercise for different conditions
- Technical competencies to correctly prescribe exercise
- Referral network - Multidisciplinary

# Introductions



- Name
- Specialization
- What exercise, sport or activity do you participate in?
- Do you prescribe exercise?



# Introduction – Exercise as Medicine

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EDITORIAL

## Exercise is medicine: a call to action for physicians to assess and prescribe exercise

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### Abstract

Engaging in regular physical activity is one of the major determinants of health. Studies have demonstrated the benefits of exercise in the treatment and prevention of most every common medical problem seen today. It is clear that patients who engage in an active and fit way of life, live longer, healthier, and better lives. For these reasons, every patient should be asked about exercise at every visit using an exercise vital sign (EVS) and, when needed, provided with an exercise prescription that encourages them to get 150 minutes or more moderate-to-vigorous physical activity. Physicians have an obligation to assess each patients exercise habits and inform them of the risks of being sedentary. Such an approach is critical to help stem the rising tide of deaths around the world due to noncommunicable diseases, which are so closely associated with a sedentary lifestyle.

### Keywords:

Chronic disease, exercise, physical inactivity, prevention, sedentary

### History

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## Exercise as medicine – evidence for prescribing exercise as therapy in 26 different chronic diseases

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This review provides the reader with the up-to-date evidence-based basis for prescribing exercise as medicine in the treatment of 26 different diseases: psychiatric diseases (depression, anxiety, stress, schizophrenia); neurological diseases (dementia, Parkinson's disease, multiple sclerosis); metabolic diseases (obesity, hyperlipidemia, metabolic syndrome, polycystic ovarian syndrome, type 2 diabetes, type 1 diabetes); cardiovascular diseases (hypertension, coronary heart disease, heart failure, cerebral apoplexy, and

claudication intermittent); pulmonary diseases (chronic obstructive pulmonary disease, asthma, cystic fibrosis); musculo-skeletal disorders (osteoarthritis, osteoporosis, back pain, rheumatoid arthritis); and cancer. The effect of exercise therapy on disease pathogenesis and symptoms are given and the possible mechanisms of action are discussed. We have interpreted the scientific literature and for each disease, we provide the reader with our best advice regarding the optimal type and dose for prescription of exercise.



# Exercise is medicine

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## KEYWORDS

exercise, medicine, functioning, health, physical activity

## Introduction

The increase in the population of the elderly and the prevalence of chronic diseases has resulted in a growing number of people living with disabilities (Cieza et al., 2021). In such cases, mortality and morbidity cannot adequately describe the clinical outcomes of most health conditions. Hence, in 2016, the World Health Organization (WHO) proposed functioning as the third clinical outcome indicator (Stucki and Bickenbach, 2017). Exercise is an important modality for improving functioning and health conditions. The American College of Sports Medicine and the American Medical Association have suggested that “exercise is medicine<sup>®</sup>” (Lobelo et al., 2014), and this marks a new direction in healthcare. Exercise plays an important role in the prevention, treatment, and rehabilitation of diseases, and is the basis of active and universal health. However, the initiative that “exercise is medicine” has been disputed. This article discusses this statement from the perspective of the proposal of “exercise is medicine” initiative, consequences of exercise in health, and considerations of exercise.



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# Integration of exercise prescription into medical provision as a treatment for non-communicable diseases: A scoping review

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**Background:** The purpose of this scoping review is to stimulate interest and to raise awareness, among researchers, healthcare practitioners, and policymakers regarding the current scientific literature related to exercise prescription for non-communicable diseases (NCDs). Exercise prescription is a safe and cost-effective method that enables physicians to use exercise as a complementary addition to NCDs management and treatment.

**Methods:** This scoping review followed the PRISMA Extension Guidelines for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Using this framework, we considered information from qualitative and quantitative studies to identify research gaps. We provide feasible suggestions to guide future research for the implementation of exercise prescription in the healthcare environment. The literature search was conducted using SPIDER and PICO tools for qualitative, quantitative, and mixed-study designs. Inclusion criteria included articles that investigated patients with NCDs and considered exercise interventions. Systematic searches of PubMed, Web of Science, MEDLINE, EMBASE, and ScienceDirect were undertaken on 26 July 2022 and all reference lists were manually searched. Data processing was performed using EndNote 2.0 software and data charts were used for numerical summary and thematic analysis.

# Prescribing exercise and physical activity to treat and manage health conditions

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## Introduction

The significant health benefits of physical activity (PA), which includes exercise, have long been recognised.<sup>1</sup> As well as reducing non-communicable diseases (NCDs) such as heart disease, diabetes and specific cancers, regular physical activity leads to improvements in mental health and cognitive function. Shockingly, around 5 million deaths per year are attributable to physical inactivity.<sup>2</sup> Within the UK, this accounts for 1 in 6 deaths, which is on par with smoking. Of equal importance, it is estimated that 40% of long-term conditions could be prevented if the population successfully met the UK Chief Medical Officer's physical activity recommendations.<sup>3</sup> Furthermore, once a chronic illness is diagnosed, treatment is better managed with physical activity as part of the disease medical management plan, leading to the idea that "exercise is medicine" and should be part of every treatment plan. Indeed there is objective evidence that exercise can be used as an effective first-line treatment for an array of cardiovascular, metabolic, musculoskeletal, psychiatric and neurological conditions.<sup>4</sup>

a lack of understanding of how to safely prescribe exercise might lead to an exercise intervention with a higher degree of relative risk.<sup>9</sup>

Therefore this article aims to outline the key considerations when making an exercise prescription, so that it can be tailored individually for each patient with the ultimate goal of increasing accessibility of PA for all. To do this, we will use examples to demonstrate what an exercise prescription may consist of in patients with a range of chronic conditions.

## What is physical activity and exercise and how much should we recommend?

Physical activity (PA) can be defined as any bodily movement produced by skeletal muscles that requires energy expenditure. Already, this definition is important when considering how best to prescribe PA to patients. It should be emphasised that PA includes all movement, whether this involves structured exercise, occupational activity, housing and gardening, or even transport. Exercise is a subcategory







# Case Studies

- Obese individual
- Older individuals with multimorbidity – hypertensive and type 2 diabetic (Metabolic Syndrome)
- Orthopedic chronic injury – Lower Back Pain
- Cardiovascular disease
- Osteoporosis – fall risk



# What to consider...

- What is the etiology of the condition? How will exercise impact the condition?
- Patient history
- Medication
- Doctors Clearance
- Baseline assessments – Body composition, Blood tests, exercise specific tests
- Physiology of the condition – can impact the frequency, intensity, type and timing of exercise (FITT principle)
- Does the patient require supervised exercise?
- Referral - Multidisciplinary



# Obese individual

- Mrs Reddy is 35-year-old female with a BMI of  $28.5\text{kg/m}^2$ . She asks you for the types of exercise she should do for shaping up her body. Her past medical history is unremarkable and she has got no other significant risk factors for cardiovascular disease and is in the low risk category for exercise participation.



# Older individuals with Metabolic Syndrome

- Mr. G is a White man, 54 years of age, with a past medical history of hypertension. At his yearly physical, he reports that he is doing well overall, with no complaints other than some dyspnea on exertion, which has been long-standing. Current medications include a thiazide diuretic and aspirin. He works as an accountant and does not get much physical activity during the day. BMI is 29. This classifies him as overweight. Laboratory data as follows:
- Total cholesterol: 6.9 mmol/L
- HDL: 0.88 mmol/L
- LDL: 3.9 mmol/L
- Triglycerides: 2.4 mmol/L
- Glucose (fasting): 4.5 mmol/L
- Mr. G. meets the definition of metabolic syndrome.



## Orthopedic chronic injury – Lower Back Pain

- A fifty-two year old businessman presents to your rehabilitation clinic, complaining of lower back pain of some months duration. He volunteers a history of a back injury while playing club rugby many years ago – managed at the time only with rest and analgesics. He has subsequently re-injured his back on a few occasions, usually when lifting a heavy object, but none lasting as long as this episode. He has no pain when lying down, but has pain with most activities of daily living especially when bending forward. He also complains of pain going into his left leg, but no weakness or pins and needles in that limb.



# Cardiovascular disease

- Mrs Clout is 55 years of age and teaches high school English. Her cardiovascular risk factor profile includes a 30-pack-year history of cigarette smoking and altered lipid levels. Her HDL is only 0.91 mmol/L and her LDL is 3.75 mmol/L. She has tried with little success to control her cholesterol with diet. Her brother suffered a nonfatal MI at 46 years of age and her father had an MI at 53 years of age. Both of these cardiac events were medically managed.



# Osteoporosis – fall risk

- Mrs Grace is a 62-year-old Caucasian female who presents to the outpatient clinic with right wrist pain and swelling following a fall on an outstretched hand in the garage at home. This patient has a past medical history of hypertension (HTN), menopause (age 50), and stooped posture. The patient has a family history of a pelvic fracture in her mother (age 82), who was also diagnosed with osteoporosis. She reports to the clinic in acute distress and is oriented to time, person and place. The right wrist is swollen and hurts to move. X-ray of the right hand revealed Colle's fracture (distal radius) on the right hand. The blood test was normal in this patient except for low levels of Vitamin D. The patient was also asked to get a DEXA scan, which revealed a T score of -2.4 (less than -2.5 is osteoporosis). The patient was advised to start exercising daily and eat a healthy diet. She was also asked to be careful while walking.





# Reflections

- HR monitors
- HR training
- Pedometers
- Guidelines state 150 minutes of moderate intensity
- Progression
- FITT
- Pre and post assessments – see improvements
- Medication impacts – Beta Blocker - HR



# Reflections – Metabolic Syndrome

- Pre and post measurements
- \* Timing of the exercise
- \* Timing of the medication
- \* Timing of the meal
- Exercise has an insulin like effect
- Increase insulin sensitivity and uptake by the muscle – weight training
- Endurance training – improve glucose metabolism
- HITT - increase glucose metabolism in muscles and insulin sensitivity
- BP – lowering effect post exercise
- BP – Medication
- Adjust medication



# Reflections - Osteoporosis

- T score
- Prevent bone loss, loss of calcium
- Improve absorption of calcium and other minerals
- Load the bone and joints – intermittent types of exercise, free weights, walking, dancing, jogging, stepping
- Decrease fall risk by increasing muscular strength, supports the bone and joints



# Reflections – Orthopedic - LBP

- Assessment

Flexibility – straight leg raise, toe touch/forward bend

ROM – Squat, lunge, rotations

Strength – sit-up, core strength

Posture – curvature of the spine, bilateral differences

Palpation – tight and painful sites

QRST – of pain and discomfort

Mechanism of pain/injury

Working in a pain free/low pain range



# Reflections – Cardiovascular Disease

- Assessments – pre and post
- As the name suggests – cardiovascular/endurance exercise
- Moderate weight training
- Improves muscles ability to extract oxygen from the blood, reducing the burden on the heart
- Reduce stress hormones and inflammation (visceral fat reduction)
- Exercise works like BP medication
- Increase HDL and can control triglycerides



# Reflections – Obese

- Assessments – pre and post
- Doctors clearance
- Diet
- Many options – low risk
- Combination exercise – endurance, sport, group classes, strength training
- Progression of activity/exercise



# Reflections – Referral

- Assessments – pre and post
- Tests – scans, bloods
- Physiotherapist – pain management – orthopedic condition
- Biokineticist – exercise prescription, supervised exercise
- Doctors clearance join the gym, join group classes
- Contraindications to exercise
- Progression of activity/exercise
- HR monitoring
- Step counting
- Quality of life
- Activities of Daily living
- Diet

Thank you

