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# **Exercise IS Medicine**

## **EXERCISE PRESCRIPTION FOR SPECIAL POPULATIONS AND THE INFLUENCE OF GENETIC FACTORS**

Presented by

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**INTRODUCTION:** Most medical and allied health professionals have studied various diseases and health states but are not as well versed on 1) how a certain problem might affect the ability to exercise, 2) how exercise might affect the medical problem and 3) prescribing exercise for their patients. Because many people seek the advice of physicians about to what to do and what to avoid, physicians need information on what role exercise programs might play in modifying a person's health status. The goal of this seminar is to provide information on the interactions between exercise and health. Health Care providers have studied various diseases and health states but most are not as well versed on 1) how a certain problem might affect the ability to exercise, 2) how exercise might affect the medical problem, 3) how to prescribe exercise for their patients, or 4) what changes might occur if their patients do become more active. Because many people seek the advice of Primary Care Physicians about exercise, Physicians need information about 1) what to emphasize and what to avoid with each medical problem and 2) what role exercise programs might play in modifying a person's health status. In addition, there is a great deal of new information on the role that genetic factors play relative to how people are now and how they respond to any type of intervention (for example, medication, therapy, diet, or training). The goal of this seminar is to provide useful and practical information on the interactions between exercise and health and on the influence of genetic factors that Primary Care Physicians can use in their practice.

**OVERALL OBJECTIVES:** The overall objective is to provide the participant with practical and clinically relevant information to prescribe exercise to a variety of special need patients and be able to describe the interrelationships between exercise and health for the general population. The participant also should be able to describe the influence of genetic factors on health and the response to medical and lifestyle interventions.

# EXERCISE PRESCRIPTION FOR SPECIAL POPULATIONS AND THE INFLUENCE OF GENETIC FACTORS

## SPECIFIC OBJECTIVES

**Day 1 Physical Activity and Health** – After completing this session, the participant should be able to:

1. Describe the interrelationships between physical activity and the incidence of various diseases and medical problems in the general population.
2. Understand that the biggest drop in mortality occurs when going from doing little or no exercise to doing some activity on a regular basis.

**Exercise Testing** – After completing this session, the participant should be able to:

1. Describe how to use exercise test results to prescribe exercise when there are normal and abnormal findings.
2. Understand that minor modifications in exercise tests will enhance the usefulness of the results for prescribing exercise.

**General Principles for Prescribing Exercise** – After completing this session, the participant should be able to:

1. Assess who can be given general information about activity and who needs individualized prescriptions.
2. Describe the principles of training and the basic components of an exercise program.
3. Understand how to refine and individualize exercise programs.
4. Describe the problems associated with overuse and how to avoid them.
5. Understand how to determine the degree of supervision needed for each patient.

**Modifications in Exercise Prescription for the Elderly** – After completing this session, the participant should be able to:

1. Describe the general effects of aging on the structure and function of the body.
2. Describe how to differentiate between the normal effects of deconditioning or age-related changes and those associated with disease processes.
3. Describe the medical, physiological and psychological factors that may influence exercise prescription for the older patient.
4. Understand the adaptability of older patients to exercise and how this affects their goals of self-sufficiency and independence.

**Exercise Prescription for Coronary Heart Disease** – After completing this session, the participant should be able to:

1. Understand that most preventive and therapeutic measures for CHD focus on maintaining or reestablishing a balance between myocardial oxygen supply and demand.
2. Describe how medications and lifestyle can increase supply or decrease demand.
3. Differentiate between the effects of dynamic and static exercise.
4. Understand the importance of teaching patients about signs and symptoms of myocardial ischemia and myocardial dysfunction during exertion and about the proper actions to reduce the risk of sudden cardiac death.
5. Describe how to classify patient risk and how this will influence the prescription and proscriptio of exercise.

**Exercise Prescription for Hypertension** – After completing this session, the participant should be able to:

1. Describe the various blood pressure control mechanisms involved in the cause and pathophysiology of hypertension.
2. Describe how various medications affect blood pressure at rest and during exercise.
3. Differentiate between the effects of dynamic and static exercise on blood pressure.
4. Describe the acute and chronic effects of exercise on blood pressure in normal persons and in patients with hypertension.
5. Differentiate between exercise prescribed for hypertensive patients in stages 1 and 2 and those in stage 3.

**Exercise Prescription for Peripheral Arterial Occlusive Disease** – After completing this session, the participant should be able to:

1. Understand that the primary factors that determine the rate of development of claudication pain during exercise are exercise intensity and severity of the disease.
2. List the characteristics of exercise rehabilitation programs that are most important for eliciting improvements in ambulatory ability.
3. Describe the improvements resulting from an exercise program and understand the potential mechanisms involved in those improvements.

**Exercise Prescription for Obesity** – After completing this session, the participant should be able to:

1. Understand the practical and theoretical factors associated with using body mass index to estimate overweight and obesity.
2. Understand the importance of the pattern of body fat distribution for health.
3. Describe the effects of obesity on the ability to exercise.
4. Describe the effectiveness of exercise or diet alone and in combination for treating and managing obesity.
5. Describe the characteristics of a good exercise program for losing body fat and for maintaining the body fat that was lost.

**Exercise Prescription for Diabetes Mellitus (Types 1 and 2)** – After completing this session, the participant should be able to:

1. Understand the importance of diet, exercise and medication for managing Type 1 diabetes.
2. Describe the role of aerobic exercise in the primary prevention of Type 2 diabetes.
3. Understand that before engaging in an exercise program, the diabetic patient should rule out possible limitations and learn how to prevent exercise-induced complications.
4. Describe the guidelines for avoiding hypoglycemia before, during or after exercise for patients on insulin therapy.
5. Differentiate between exercise programs for patients with Type 1 and Type diabetes.

**Exercise Prescription for Asthma** – After completing this session, the participant should be able to:

1. Understand that a bout of exercise can induce an episode of asthma but that regular exercise is an important component in its management.
2. Describe the effects of warm-up and of air temperature and humidity on exercise-induced asthma.
3. Understand that the type, duration and intensity of exercise, as well as the type of exercise loading, the environmental conditions, where one exercises, and pharmacological intervention can all modify the responses to a bout of exercise.

4. Describe the physical, physiological, social and psychological benefits of regular exercise.

**Exercise Prescription for Osteoarthritis (OA) and Rheumatoid Arthritis (RA) –**

After completing this session, the participant should be able to:

1. Understand the relationship between exercise and sports and the risk of OA.
2. Assess a patient's needs, abilities, risks and opportunities for exercise.
3. Describe the benefits of stretching, resistance exercise and aerobic exercise for OA and for RA.

**Day 2 Differences between Men and Women –** After completing this session, the participant should be able to:

1. Understand that while there are absolute differences in the responses of men and women to exercise and training, the differences are qualitatively similar and much smaller relative to differences in body size and body fat.
2. Describe the differences in neuromuscular, cardiovascular, respiratory and metabolic responses of men and women to an acute bout of exercise.
3. Understand that few adjustments need to be made to the general principles of exercise testing and exercise prescription for women.
4. Describe the influence of the menstrual cycle on the ability to exercise and to perform, as well as the influence of exercise and competition on menstruation, pregnancy and childbirth.

**Exercise Prescription for Pregnancy –** After completing this session, the participant should be able to:

1. Understand the relative risks of exercise and of inactivity on the well-being of the fetus and of the mother.
2. Describe the maternal adaptations to acute exercise, as well as the fetal responses to that exercise.
3. Understand that the best time for previously sedentary women to begin a new aerobic exercise program is during the second trimester when the discomforts of pregnancy and the risks to fetal well-being are lowest.
4. Describe the types of activities and environments to emphasize and to avoid during pregnancy.

**Exercise Prescription for Chronic Fatigue Syndrome (CFS) and Fibromyalgia (FM)**

– After completing this session, the participant should be able to:

1. Describe similarities between CFS and FM.
2. Describe problems associated with doing exercise tests with CFS and FM patients.
3. Describe special considerations when prescribing exercise for CFS and FM patients.
4. Understand why it is better to emphasize being active rather than being fit and how this influences the exercise prescription.

**Exercise Prescription for Osteoporosis –** After completing this session, the participant should be able to:

1. List the risk factors associated with osteoporosis and the risk of falling.
2. Understand how to evaluate the risk of falling.
3. Describe characteristics of a good exercise program to improve skeletal status and to reduce the risk of falling.

**Introduction to the Practical Application of Genetics** – After completing this session, the participant should be able to:

1. Define the terms genotype and phenotype.
2. Understand the relative roles of the genotype, the environment and their interaction on the variation within a given phenotype.
3. Understand that genetic factors affect how a phenotype is expressed now and how it will respond to a change in the environment.
4. Understand that genetic influences are generally stronger on structural components of the body, while its functions are influenced more by environmental factors.

**Influence of Genetic Factors on Health** – After completing this session, the participant should be able to:

1. Understand that most health problems in industrialized countries today are associated more with lifestyle than with genetics.
2. Understand that low fitness (affected more by genetic factors) and inactivity (affected more by behavioral factors) are independent risk factors for cardiovascular disease.
3. Describe how genetic factors may predispose the risk of developing certain diseases, as well as how they may influence how a person responds to therapy.
4. Understand that monozygotic or identical twins have similar initial phenotype values and respond similarly to dietary restrictions and exercise.

**Influence of Genetic Factors on Fitness and Physical Activity** – After completing this session, the participant should be able to:

1. Describe the influence of genetic factors on fitness levels of sedentary people.
2. Understand that activity and fitness are different phenotypes and should be treated as different factors in a patient's treatment.
3. Understand why the patient may be more successful and healthier if the physician promotes activity rather than promoting fitness.

**Influence of Genetic Factors on the Response to Exercise and Training** – After completing this session, the participant should be able to:

1. Describe the influence of genetic factors on how people respond to training.
2. Understand that there are high, average and low responders to training.
3. Understand that it is not possible to predict who will be a high, average or low responder.

**Implications for Medical Care** – After completing this session, the participant should be able to:

1. Understand that patients will respond differently to any treatment (medication, therapy, diet or exercise) and that it is not possible to predict how an individual patient will respond.
2. Understand that there is little or no relationship between initial phenotype values and how those phenotypes will respond.
3. Understand that there is little or no relationship between changes in fitness after training and changes in risk factors for cardiovascular disease and diabetes.
4. Understand that a patient who responds well or poorly to treatment for one phenotype may or may not respond similarly for another phenotype.
5. Understand the need to emphasize that not all patients can improve their health, fitness, body weight, etc. after treatment.
6. Describe how it may be possible in the future to use genetic profiles to individualize treatment and advice.

### **Jason Conviser**

**Jason Conviser** earned his Ph.D. from the University of Wisconsin in Exercise Physiology and also an MBA from Northwestern University – Kellogg Graduate School of Business. He has held multiple positions as a senior executive with international health and fitness companies specializing in operations, strategic planning and marketing of health care, fitness, wellness products and services. Currently he is Chief Operating Officer of INSIGHT, one of the largest eating disorder and obesity clinics in the United States. Past experiences include Vice President of Clinical Services for Bally Total Fitness, directly responsible for operations of 158 sport medicine clinics. Jason has consulted with hospitals, multi-site outpatient ambulatory care centers, corporate fitness programs and health clubs on strategic planning, business plan development, marketing and program development. Clients have included CNA Insurance, Brunswick, Life Fitness, HealthSouth, McKinsey Consulting USA, Leo Burnett, Quaker Oats, Pritikin Longevity Centers, Fruit of the Loom, Oscar Mayer Foods, and 68 independent fitness centers. He has taught ACSM courses on five continents and in over 18 countries over the past three years

### **Jim Skinner**

**Jim Skinner** is a Professor Emeritus in the Department of Kinesiology, Indiana University. He is a former president of the American College of Sports Medicine and a former Vice President of the International Council of Sports Science and Physical Education. From 1988-2008, he was the Chair, Medical Advisory Committee of the YMCA of the USA. He is co-Chair of the 2010 and 2011 World Congress on Exercise is Medicine and Chair of the International Advisory Council for Exercise is Medicine. He was one of the five principal investigators of the HERITAGE Family Study, a large multi-center investigation of the role that genetic factors play in the response to training of risk factors for cardiovascular disease and diabetes. As principal investigator, co-principal investigator or member of an executive committee, he has been involved in research grants totaling more than \$50 million. He has written over 280 articles and 5 books. He has been actively investigating the relationships between exercise, training and health for more than 45 years and has lectured in English, French, German and Spanish in 58 countries about these relationships.