# EXERCISE AND SPECIAL POPULATIONS

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# LEARNING OBJECTIVES

Basic guidelines for working with individuals with health conditions like hypertension, obesity and coronary heart diseases etc

# SPECIAL POPULATIONS

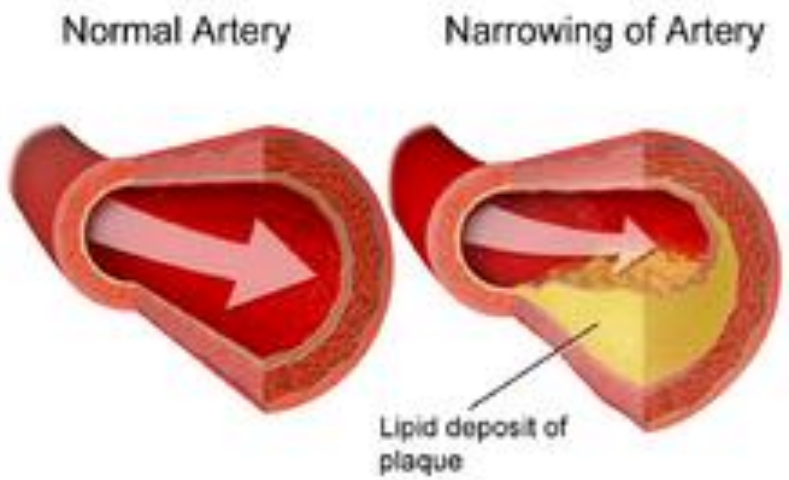
- Coronary heart disease
- Hypertension
- Obesity
- Diabetes
- Asthma
- Bronchitis
- Emphysema
- Arthritis
- Fibromyalgia
- Osteoporosis
- Low back pain
- Multiple sclerosis

The following populations are discussed as well:

- Children
- Older adults

# CORONARY HEART DISEASE

- Coronary Heart Disease is the end result of the accumulation of lipid-rich plaques within the walls of the arteries that supply the myocardium (the muscle of the heart)



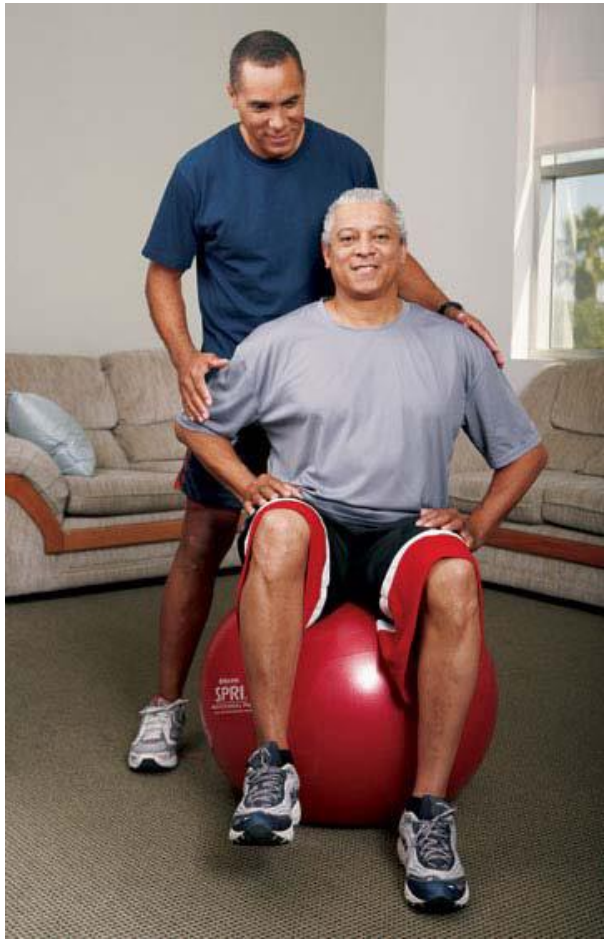
Coronary Artery Disease

# General Exercise Guidelines for Participants With Known Coronary Heart Disease

| General Exercise Guidelines for Participants With Known Coronary Heart Disease |
| --- |
| • Avoid extremes of heat and cold that can place a greater stress on the heart. |
| • Use heart-rate monitors to regulate exercise intensity, and avoid activities that cause large fluctuations in heart rate. |
| • Stay within the blood-pressure and target heart-rate zones established by the participant's physician. |
| • Report all symptoms, especially lightheadedness, chest pain, or dizziness, to the participant's physician. |
| • Make sure that heart rate and blood pressure return to resting levels before the participant leaves the exercise setting. |
| • If a participant complains of chest pain before, during, or after exercise, contact emergency medical services. |

# EXERCISES AND CORONARY HEART DISEASE

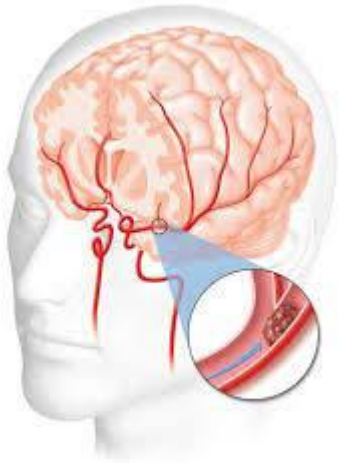
- Avoid high intensity exercise
- Include an extended warm up that consist of low intensity exercise
- Several different stretching exercises
- Some mild breathing exercises
- Teach the proper use of RPE
- Ask weather they are under medication



# STROKES

**Causes:**

- Years of living with high blood pressure
- Years of living with cholesterol



**Unhealthy lifestyle:**

- Poor eating habits
- Lack of physical activity
- Obesity

# TYPES OF STROKES

## Hemorrhagic strokes -

- a ruptured blood vessel in the brain
- Usually more life threatening

## Ischemic strokes -

- More common and involve a reduced blood supply to the brain
- Many people with strokes have hyper tension, exercise should be postponed until blood pressure is under control.

# PRECAUTIONARY MEASURE (PARTICIPANTS SHOULD COMPLETE A DETAILED EVALUATION BEFORE EACH EXERCISE SESSION)

- Check weather the participants have taken medication
- Generally feel good
- Have no signs of fatigue or chest discomfort
- Have had a good night's sleep
- Have eaten a light breakfast or meal earlier in the day
- Have a resting blood pressure within their normal range
- Have consumed adequate amounts of fluid
- at the end of the exercise session, participants blood pressure and HR should be checked before leaving the exercise setting
- ***Exercise Intensity***
- ***Exercise Time***

# POINTS TO REMEMBER

- Ensure that the individual is under appropriate medical care before recommending and/or supervising an exercise program.
- Avoid sudden strenuous efforts with inadequate warm-up or prior
- lower-level activity.
- Avoid having the individual perform vigorous exercise when suffering from viral infections, colds, flu, etc.
- Understand and monitor signs and symptoms of cardiac decompensation (excessive shortness of breath, unusual or sudden-onset fatigue, palpitations, lightheadedness or dizziness, chest discomfort) for an extended period of time after cessation of the exercise session.

# HYPERTENSION

- Pressure of the blood within the arteries
- The force of circulating blood on the walls of the arteries
- Blood Pressure is the force exerted in the arteries by blood as it circulates

- Normal range: 120/80 mm Hg
- Elevated BP: 120-129/<80 mm Hg
- Stage 1 Hypertension: 130-139/80-89 mm Hg
- Stage 2 Hypertension: >140/>90 mm Hg
- Hypertensive crisis: exceed 180/120 mm Hg

# EXERCISE AND HYPERTENSION

Managing hypertension -

- Exercise

Lifestyle components for managing this disease include:

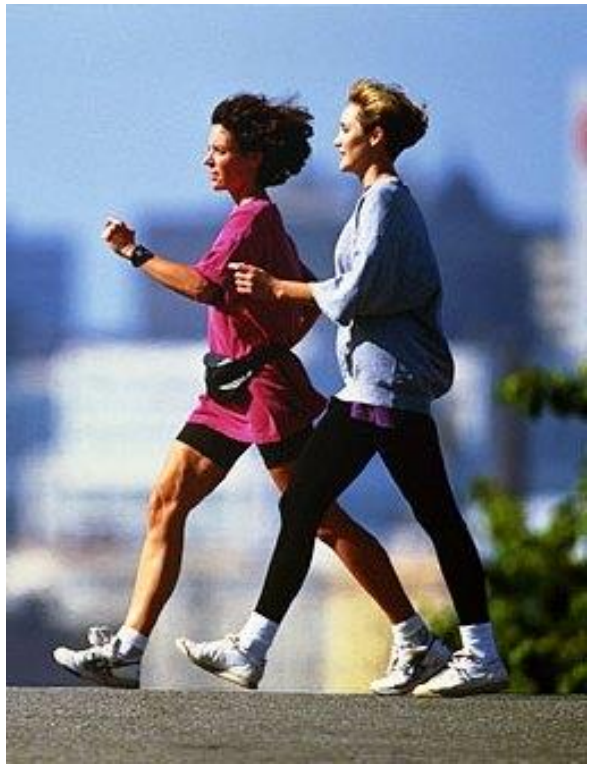
- Consuming a diet rich in fruits
- Vegetables and low fat dairy products
- Reducing dietary sodium to no more than 2.5 g daily
- Limiting alcohol consumption

# HYPERTENSION AND EXERCISE

- Hypertension is an important CHD risk factor.
- Hypertension is classified as blood pressure ≥140/90 mmHg.
  - Blood pressure medication may affect heart rate.
  - Participants should avoid exercise if their resting
  - blood pressure is >200/110 mmHg.
  - **Moderate exercise** appears to be as effective as vigorous exercise for controlling blood pressure.
  - Multiple short bouts of exercise may benefit clients due to post exercise hypotension effect.
  - Avoid head below heart exercises.

# OTHER LIFESTYLE RECOMMENDATION

- Maintaining normal body weight (BMI  of 18.5 – 24.9)
- Engaging in regular aerobic activity (at least 30 minutes per day)



# METABOLIC DISORDERS - OBESITY

- The most prevalent health disorder in India
- Common method to calculate overweight
- According to ICMR-INDIAB, prevalence rate of obesity is 11.8 % to 31.3 %

# EXERCISE AND OBESITY

- Make the activity as enjoyable and pain free as possible
- Identify the right combination of activities
- Keep the activity at an intensity level that does not cause pain or soreness
- Emphasize low intensity and high duration activities (E.g)
- Ensure that they have positive feeling about being physically active
- Weight maintenance is a lifelong process, so daily dose of physical activity is needed.
- Arthritis and obese condition
- Include water based activities
- Resistance training – 10 – 15 minutes a day (2 to 3 days a week)

# TYPES OF DIABETES

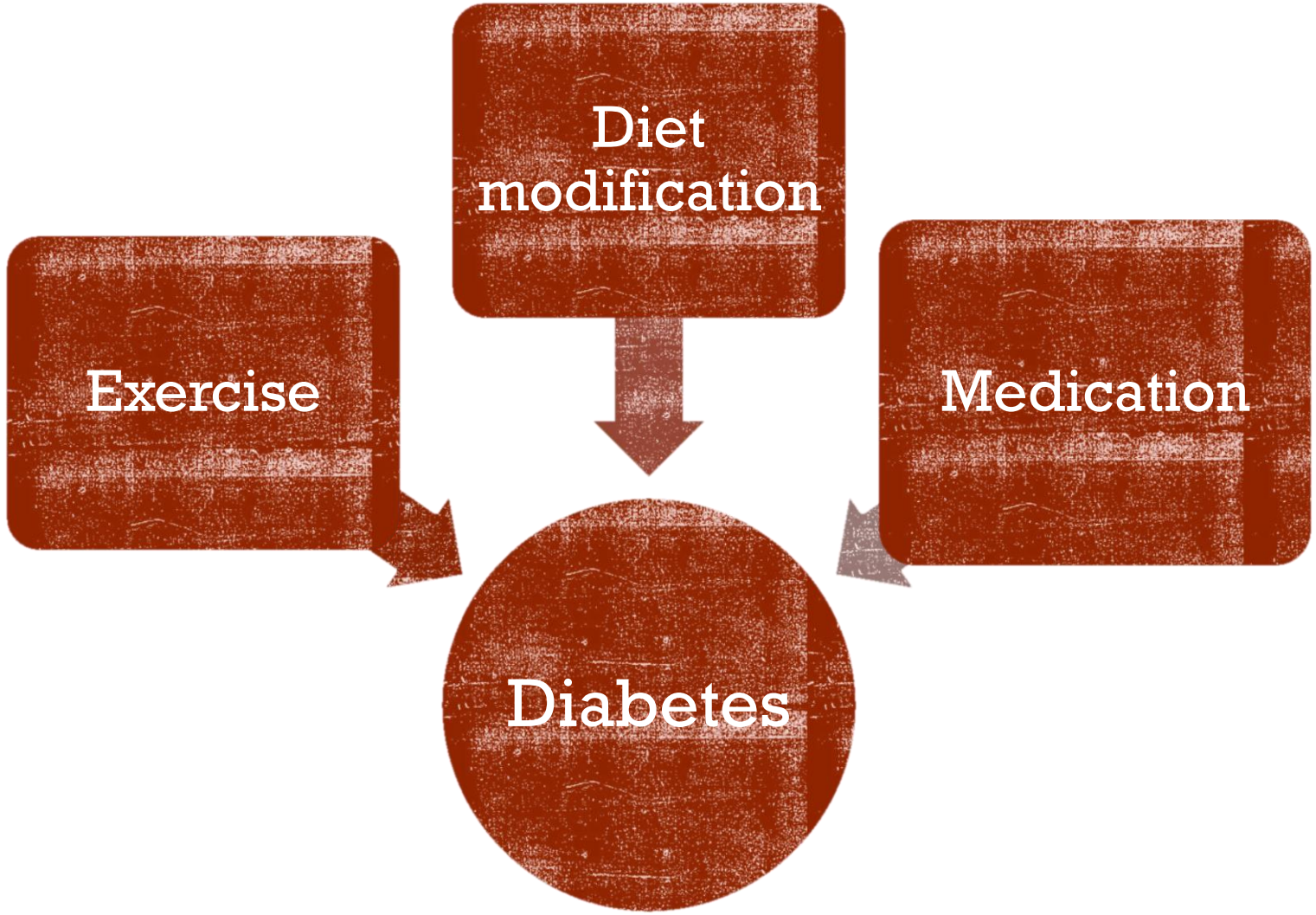
## Type 1 Diabetes

- It is caused by destruction of the pancreatic cells that produce the body's insulin

## Type 2 Diabetes

- Defective insulin secretion

# TREATMENT FOR DIABETES



# EXERCISE AND DIABETES

Important considerations:

- Knowledge of the type of medication they take
- Timing of medication
- Blood glucose level prior to exercise
- Timing, amount, and type of previous food intake
- Presence and severity of diabetic complications
- Intensity, duration and type of  exercise

# EXERCISE AND DIABETES

- Carry a portable glucometer with them
- Do not start exercising if your client has glucose level lower than 70 mg/dL
- Trainer should keep rapidly absorbed carbohydrates on site (e.g., orange juice or other fruits drinks in case of emergency.
- Aerobic exercise that involves repetitive submaximal contractions of major muscle groups, such as swimming, cycling and brisk walking
- Duration of activity – 20-60 minutes
- The intensity, frequency, and duration of exercise should be based on the age, fitness level, medical level, medical status and motivational level of the participant.
- Avoid exercise in the late evening
- Good quality exercise shoes also are very important

# INSULIN REACTION (HYPOGLYCEMIA)

## Early Symptoms

- Anxiety
- Uneasiness
- Extreme hunger
- Confusion
- Headaches
- Insomnia

## Late Symptoms

- Double vision
- Sweating, palpitations
- Nausea
- Loss of motor coordination
- Pale, moist skin
- Strong, rapid pulse
- Convulsions
- Loss of consciousness
- Coma

# HELPING A PARTICIPANT WHO IS HAVING AN INSULIN REACTION

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- Stop the activity immediately
- Have the person sit down and check his or her blood glucose level
- Have the participant drink orange juice or some other rapidly absorbing carbohydrate
- Allow the individual to sit quietly and wait for a response
- When the participant feels better, check the blood glucose level again
- If the blood glucose level is above 100 mg/dL and the participant feels better, resume activity.
- Check blood glucose level after 15 to 30 minutes to reassure that levels are within a safe range
- Do not allow the participant to leave the facility until blood glucose levels are within a normal range
- If the participant does not improve, seek medical attention immediately.

# General Guidelines and Safety Tips for Persons With Diabetes

- Regulating blood glucose levels requires optimal timing of exercise periods in relation to meals and insulin dosage.
- Aim to keep blood glucose levels between 100 and 200 mg/dL one to two hours after a meal.
- Exercise can have a significant effect on insulin reduction (American Diabetes Association, 2006). Some experts note that insulin may need to be reduced by 10 to 50% when starting an exercise program (Wallberg-Henriksson, 1992).*
- If blood glucose levels are lower than 100 mg/dL, have the person consume a rapidly absorbing carbohydrate to increase blood glucose.
- If blood glucose is greater than 300 mg/dL before exercise (some doctors may recommend that exercise not be initiated at blood glucose levels greater than 250 mg/dL), make sure that insulin or the oral hypoglycemic agent has been taken. In some circumstances, participants with a high blood glucose level (>300 mg/dL) may lower it to a safe enough level to exercise by drinking water.
- No participant should be a lowed to exercise if his or her blood glucose level does not fall to a safe range before exercise.
- Teach participants to check their feet periodically to avoid foot ulcers. If an ulcer is found, have the person consult with his or her physician immediately for proper treatment. Foot ulcers can worsen and cause major problems if left untreated.
- Check blood glucose at the end of the exercise session to make sure that the person does not become hypoglycemic. This could happen very quickly, particularly after high-intensity or long-duration activities or when the person is not accustomed to understanding how the body reacts to exercise.
- Make sure the participant is well hydrated and drinking water frequently during the exercise class. Be especially cautious in hot environments, as blood glucose can be impacted by dehydration, and the sweating response of diabetics may be impaired, limiting their thermoregulatory abilities.

# RESPIRATORY AND PULMONARY DISORDERS - ASTHMA

" A condition in which a person's airways become inflamed, narrow and swell and produce extra mucus, which makes it difficult to breathe "

- Frequent cough especially at night
- Shortness of breath
- Wheezing or coughing after exercise
- Feeling tired, easily upset, grouchy, or moody
- Chest tightness, pain or pressure
- Signs of a cold
- Trouble sleeping

# EXERCISE AND ASTHMA

- Make sure that the exercise program is coordinated with the timing of the asthma medication
- Know the types of medication
- Encourage the participant to use a peak flow meter
- When peak flow drops more than 20% from normal values, activity should be reduced on that day
- Light warm ups – cardiovascular activity at 40 to 50 % of THR for 5 to 10 mnts
- 3 sets – 4 to 6 mnts aerobic exercise routine – 5 m rest interval
- Exercise intensity should lie within the participants comfort zone
- Use RPE and peak flow readings along with HR to monitor the intensity of the exercise
- Individuals with EIA should always carry their inhalers with them
- Cold air – use mask to reduce heat loss

# Steps for managing an asthma attack

The time to treat an asthma episode is when the symptoms (e.g., coughing, wheezing, chest tightness, and difficulty breathing) first appear.

Attack-management steps :

- Have the person rest and relax
- Have the person use medicines (inhaler) prescribes for an attack
- Have the person drink warm liquids

Rest and relax :

- At the first sign of breathing difficulties, the person should stop and rest for at least 10 minutes
- Make the person feel comfortable and relaxed

Take medication:

- Make sure the prescribed medicine is available and that person understands how to correctly take the medicine (inhalers require practice)

Drink warm liquid:

- Have the person drink slowly
- Do not allow the person to ingest cold drinks

Emergency care:

- If you have doubts about the severity of the attack, get medical help immediately
- If the person's lips or fingernails are turning blue or if he or she exhibits shallow breathing and is focusing all attention or breathing, get medical help immediately.

# BRONCHITIS AND EMPHYSEMA

## Bronchitis

- Bronchitis is a lung condition that destroys tiny hairs, called cilia in the airways of the lungs

## Emphysema

- Emphysema is a lung condition wherein the air sacs, or alveoli become damaged. These air sacs supply oxygen to the blood, so with damaged air sacs, less oxygen can enter the blood.

# EXERCISE AND BRONCHITIS AND EMPHYSEMA

- Interval training – exercise for 30 to 60 seconds – rest for 30 to 60 seconds
- Low variability exercises
- Low intensity weight training is relatively safe for individuals with COPD – weight shouldn't be too heavy – person should not hold the breath.
- The goal of exercise program is to gradually increase HR so that the lungs can slowly adjust to the increased workload.
- make sure cool down includes exercises of decreasing intensity.
- Teach participants to decrease their breathing frequency and to increase the amount of air they take their lungs with each breath.
- Teach diaphragmatic breathing and pursed-lip breathing

# Diaphragmatic and Pursed – lip Breathing Techniques

**Diaphragmatic Breathing:**

- Have the participant lie down on his or her back
- Have the participant place one hand on the abdomen and one hand on the chest
- Teach the participant to inspire with maximal outward movement of the abdomen
- Once the participant is comfortable in the supine position, he or she can perform the technique in sitting and standing positions.

**Pursed-lip Breathing:**

- This can be performed separately or during diaphragmatic breathing exercises
- Teach the participant to slowly exhale against a slight resistance created by lightly pursing the lips. The resistance has the potential to increase oxygen saturation.

# JOINT AND BONE DISORDERS

Arthritis is a general term for a group of several different conditions.

- Osteoarthritis
- Rheumatoid arthritis (RA)
- Systemic lupus erythematosus (SLE)

Important considerations for participants with arthritis:

- Loading of the joints should be minimized and strengthening of the muscles around the joints should be emphasized.
- Participants will probably have to tolerate some pain with activity.
- Activities that cause pain to linger longer than two hours after exercise should be avoided.

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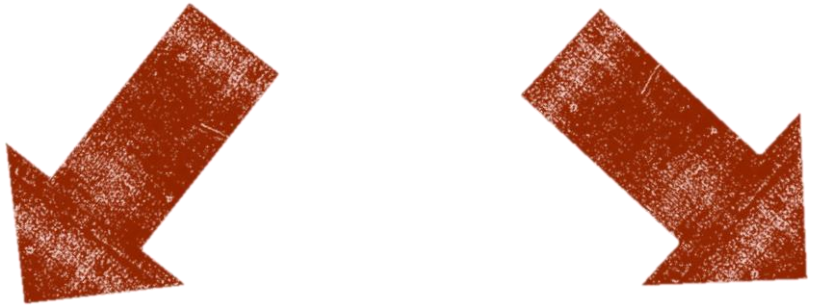
# TYPES OF ARTHRITIS



Osteoarthritis

Rheumatoid Arthritis

# EXERCISE AND ARTHRITIS

- Increasing muscle strength
- Swimming  and water based exercises
- Low -impact and non-weight bearing activities are recommended
- Not overusing the damaged joint
- Use recumbent steppers, stationary bikes – sitting
- Use elliptical machines and cross-country ski machines – standing
- Resting the damaged joint – while doing cardio
- Avoid stair climber , treadmill running high impact aerobic classes

# Exercise guidelines for persons with arthritis

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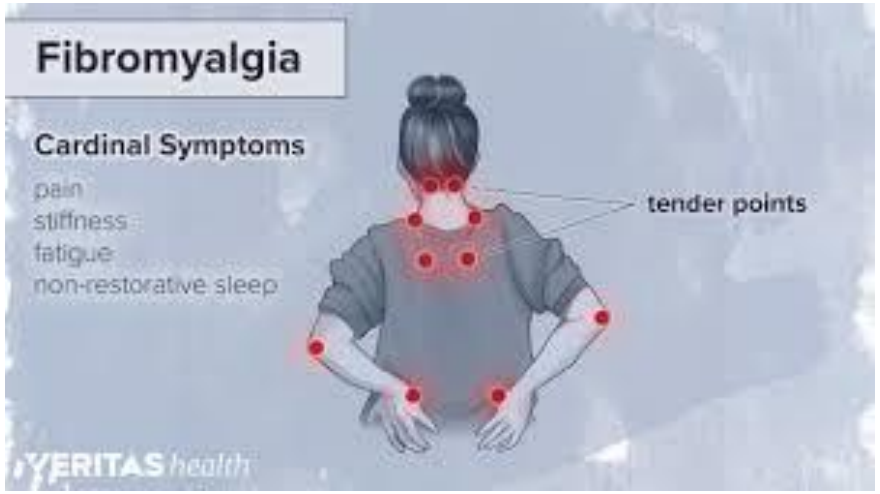
| Any exercise that causes pain during exercise, two after exercise, or 24 to 48 hours after exercise should be discontinued. |
| Find alternative ways to exercise muscles around painful joints. For example, straight-leg exercises are a good way to strengthen the leg muscles around a painful knee. |
| Warm-up and cool-down segments are essential components of most exercise programs, but are especially important for persons with arthritis due to joint stiffness. |
| Resistance-training activities should be conducted, but exercises that cause pain to a particular joint should be replaced with isometric strength exercises. |
| If conducting aquatic exercise, try to maintain a water temperature between 85 and 90 degree F (29 and 32 degree C) |
| Use smooth, repetitive motions in all activities |
| Keep the exercise intensity level below the discomfort threshold |
| Be aware that acute flare-ups can occur in persons with rheumatoid arthritis. Exercise may not be advisable until the flare-up subsides |
| Participants with osteoarthritis often perform better in the morning, while participants with rheumatoid arthritis may be better off exercising several hours after waking. |

# FIBROMYALGIA




Definition:

"Fibromyalgia is defined as a group of common nonarticular disorders characterized by achy pain, tenderness, and stiffness of muscles, areas of tendon insertions, and adjacent soft-tissue structures ".

# EXERCISE AND FIBROMYALGIA

- Aerobic training: 50 to 60% of MHR for 20 to 40 minutes – two to three days per week
- Cycling
- Treadmill walking – 15 to 20 minutes to 40 minutes
- Flexibility training: controlled, dynamic movements through pain free range of motion may be used
- Functional training

# OSTEOPOROSIS

- Silent disease
- Drains the bones of their mineral content and increases their susceptibility to fractures
- Reduced weight bearing due to disuse or immobilization leads to progressive thinning of the bone and eventual loss of bone mineral.
- When a person reaches 60s and 70s signs of osteoporosis may develop

# EXERCISE AND OSTEOPOROSIS

- All the clients who are male participants above 65 and postmenopausal women should be tested for osteoporosis
- Checklist – to be answered by your older clients
- Is there a family history of osteoporosis?
- Did the person go through early menopause?
- Has the person had a hysterectomy?
- Does he or she have a low calcium intake?
- Are there any signs of osteoporosis (previous fracture,  stooped posture)?
- Does the person have a thin, small build?
- Is he or she taking any medication that may increase bone loss

# EXERCISE AND OSTEOPOROSIS CONTD...

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- If diagnosed with osteoporosis, resistance exercises should be approved by a physician.
- Progress slowly, using light weights for the first month of the program
- Begin with 6 to 12 repetitions – 1 to 3 sets
- Participants with advanced osteoporosis – use elastic bands – progress at a much slower rate
- Resistance exercises – two to three days a week
- Younger individuals (<50 years) – polymeric type exercises to improve bone density
- Avoid these types of high impact classes in consecutive workouts
- Advanced stages of osteoporosis – do cardiovascular exercises from a seated position
- Circuit training programs are recommended
- Swimming and aquatic exercises
- Water activities are not recommended  for improving bone density

# Safety concerns when developing an exercise program for persons with osteoporosis

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| Always obtain physician consent before developing the exercise program |
| Screen the participant before developing the program. Consult with his or her physician on developing resistance exercises at the site where a fracture may have occurred |
| Avoid back exercises in participants who have localized pain in this region and show signs of hypnosis |
| Avoid jarring or high load exercises in persons with advanced osteoporosis |
| When performing standing exercises with older participants who have a high risk of injury from a fall or fracture, or who have fallen previously, make sure there is something to hold onto at all times (e.g., ballet barre, parallel bars, or chair) |
| Reevaluate the program if there are any signs of pain or fatigue during or after an exercise session in the osteoporosis zones hip, back, and wrist) |

# LOW-BACK PAIN

- Injury to a muscle, ligament
- Improper lifting
- Poor posture
- Lack of regular exercise
- A fracture or ruptured disc or arthritis

- Exercise is one of the cornerstones of both the prevention and treatment of low-back pain.

# EXERCISE AND LOW-BACK PAIN

**Guidelines to be shared with participants with low-back pain:**

- Get recommendation from physician
- Adequately warm up and cool down before and after
- Beware of proper form and alignment
- Do not work through pain
- Always maintain neutral pelvic alignment and an erect torso during exercising
- Avoid forward  head positions in which the chin is tilted up
- Avoid hyper extending the spine in an unsupported position

# DAILY ROUTINE FOR ENHANCING LOW-BACK HEALTH

## Cat and camel

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# Birddog

# Side Bridge

# Modified Curl-up

# EXERCISE AND CHILDREN

- Promote physical activity within families
- Engaging in school physical education and sports activities
- Involve children in community activities – riding bicycles and walking
- Min 60 minutes and up to several hours of moderate physical activity – daily
- Aerobic activity and age appropriate muscle and bone strengthening exercises
- Moderate to vigorous physical activity 10 to 15 minutes
- Fun and interesting exercise activities
- Be aware that children sweat less than adults during heat related exercise, so encourage them to drink fluids every 15 to 20 minutes
- MHR for children – 200 to 205 bpm

# EXERCISE AND CHILDREN CONTD…

- Resting breathing rate also differs
- Blood pressure responses during exercise are similar among children (SBP tend to be lower in children during exercise)
- Use PRE scale for children over age eight
- Muscle mass increases similarly in both males and females until puberty stage

# EXERCISE AND OLDER ADULTS

- Medical history
- Fitness level
- Mobility limitations
- Motivation to participate
- Self-efficacy
- Willingness to commit to a program
- Their goals and interests
- Ability and willingness to commit to a long term exercise program

# GENERAL EXERCISE RECOMMENDATIONS

- Provide systematic reinforcement
- Key components of physical activity program: endurance, strength, flexibility and balance activities
- Endurance: continuous movement that involves large muscle groups – sustains for max of 10 minutes. E.g.: biking, swimming and walking
- Strength activities: weight or elastic bands
- Flexibility activities: min of two days per week (preferably all days per week)
- Balance activities: static and dynamic

# AUTOIMMUNE DISEASES- MULTIPLE SCLEROSIS

- Neuro-muscular disorder
- Progressive disease, worsens as the person ages – varies from person to person
- Make exercise an integral part of their daily regimen
- Not too strenuous and should not be harmful
- Minimize the risk of falling during exercising
- Develop activities that can be performed in a sitting position . Change from free weights to machines
- Stationary bikes, recumbent steppers, and upper-arm ergometers can be used to enhance cardiovascular fitness in a seated position.

# MULTIPLE SCLEROSIS

- Flexibility should be a major component of the program as MS often experience a great deal of spasticity.
- Swimming – temperature below 80 degree F (27 degree Celsius)
- Avoid exercising in humid environments
- The bladder should be voided before and after the exercise

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# THANK YOU
# STAY HEALTHY!