Exercise Principles and Guidelines for Persons with Cerebral Palsy and Neuromuscular Disorders

INTRODUCTION:

Health and well being are the result of many factors:

- **Physical activity** is one of these factors. Participation in activities of daily living is important for maintaining health; examples are household activities, gardening, and leisurely walking or wheeling.
- **Physical Fitness** is another factor such as sports, nutrition and exercise. This is true for persons of all ages.
- **Exercise** is particularly important for persons with disabilities due to cerebral palsy and neuromuscular disorders.

BENEFITS OF EXERCISE:

- Increases participation in individual and community activities
- Improves the sense of well being and reduces anxiety
- Increases and maintains heart and lung efficiency
- Increases and maintains strength, flexibility, mobility and coordination
- Improves and maintains bone structure and strength
- Assists in weight control
- Reduces risk of several chronic diseases (e.g.: high blood pressure, osteoporosis)

GENERAL PRINCIPLES:

- A physician or other health care provider should be consulted before initiating an exercise program, particularly if you have health problems or are taking medication for a chronic health problem.
- The assistance of a professional knowledgeable in exercise principles and techniques is often useful to help devise a program to meet your specific needs.
- An exercise program should be individualized to meet the goals and potential of each person.
- An exercise program can be carried out at home, in a general facility, or in a specialized facility. Special arrangements for accessibility, equipment or assistance may be necessary.
- Realistic performance goals need to be set at the beginning: the
- An exercise program should be individualized to meet the goals and potential of each person.
- An exercise program can be carried out at home, in a general facility, or in a specialized facility. Special arrangements for accessibility, equipment or assistance may be necessary.
- Realistic performance goals need to be set at the beginning; the goals should be assessed at least every six months.
- Exercise should be engaged in regularly; at least 3-5 times a week.
- The duration of each exercise session needs to be adjusted periodically. In general, 20-30 minutes per session is the minimum goal. However, during the first few weeks, several short sessions (e.g.: 5-10 minutes) per day can be better than a longer period.
- Exercise should aim at strengthening weak muscles and stretching tight muscles.
- It is particularly important to increase the duration, intensity, and frequency of the exercise activity **gradually**. If you are at a beginning level, duration should be increased progressively before increasing intensity.
- Physical activity and exercise need not be overly strenuous to achieve health benefits. A moderate level will accomplish the same purpose. Muscle soreness may accompany early progress.
- Exercise with a partner for both social and safety benefits.
- For people with severe contractures or weakness, extra caution is advised to minimize muscle strain.
- Light headedness, chest pain, difficulty breathing, excessive fatigue, nausea, moderate to severe joint or muscle pain are all important danger signals. **Stop exercising!** Discontinue the exercise program and seek a physician or other health care provider's advice before starting again.

HEALTH AND SAFETY:

Certain health and safety issues must be addressed in all exercise activities.

- Participants should drink plenty of water before, during and after exercise. The exact amount will depend upon a number of factors including temperature, humidity and length of the workout.
- Clothing and footwear appropriate for each specific exercise program should be worn at all times. Apparel that could cause an accident and/or injury should be avoided (e.g.: loose slacks or pants that could get caught in the chain of a bicycle). Head gear and knee and elbow pads may be needed in some activities.
- Extra precautions should be taken for strenuous outdoor activity during times of extreme heat or cold. The amount of time exercising often must be adjusted for extremes of heat, cold and high humidity. The length and intensity of the workout should decrease as the temperature and humidity increase.
- If exercising outdoors, care should be taken to wear the appropriate clothing depending upon the weather. Clothing should be layered so that items can be removed or replaced if the participant becomes too warm or too cold.
- If exercising outdoors at night or in poor visibility, use brightly colored clothing and/or reflectors on shoes, bicycles or wheelchairs.
- Medications can alter the body's response to an exercise program. Individuals should be familiar with how their medication affects their participation in an exercise program or they need to consult their physician or health care provider about this.
- Weight bearing and joint flexing exercises must be done with caution by persons with significant contractures and/or loss of bone density.

COMPONENTS of an EXERCISE SESSION:

An exercise session should always include:

- A warm-up period of 5-10 minutes:
- 2-5 minutes to warm-up the muscles and joints to be exercised by gentle activity such as slow walking/slow wheeling
- 2-5 minutes of stretching that includes the muscles and joints of primary concern.
- A specific exercise activity such as aerobic exercise, resistance exercise, swimming, aquatics, cycling, etc. for at least 20-30 minutes
- A cool-down period of 5 minutes or longer; continue until you feel cooled down and your pulse rate has returned to near resting level.
- 3-5 minutes of slow walking or slow wheeling.
- 2-5 minutes of stretching that includes the muscles and joints of primary concern

EXERCISE PRINCIPLES and GUIDELINES for

PERSONS with CEREBRAL PALSY and NEUROMUSCULAR DISORDERS

Part One

Originally prepared by:

The United Cerebral Palsy Research and Educational Foundation

EXERCISE GOALS

Bone structure and strength (B)

- Persons with cerebral palsy and neuromuscular disabilities are at risk of being inactive or immobile
- Inactivity or immobility decrease bone density and strength (e.g. osteoporosis)
- Weight bearing in conjunction with movement of the body and limbs, and muscle exercises are believed to prevent loss of bone structure and strength.
- If you have been inactive, start at a level that is comfortable for you. Increase the effort and duration gradually.

Flexibility and range (FR)

- Persons with cerebral palsy are at risk of having muscle tightness that limits motion at joints; loss of functional mobility can be associated with pain.
- Focus on muscles that are causing the most problems with mobility in activities of daily living.
- Stretch the muscle **slowly** to the point of tension, but not pain.
- Hold each stretch for 10-60 seconds; do it 2-3 times.
- Stretch the muscles to improve both flexibility and range of motion several times daily.

Heart and lung efficiency (HL)

- Often referred to as aerobic exercises, these exercises can also contribute to weight control.
- Characterized by increasing your heart rate to a moderate level above the resting level for a sustained period of time during moderate to vigorous activity.
- Start the program with 5 minutes of exercise, gradually increasing the length of exercise as tolerated to 20-60 minutes.
- Best if done at least 3 times a week; can be done daily.
- **Caution:** It is important to choose exercises that minimize stress on joints and muscles, particularly in already overstressed areas.

Strengthen muscles and increase endurance (M)

- Higher weight, not repetition, increases strength. Moderate weight and more repetition increases endurance. You can exercise one muscle or joint at a time or several muscles. Focus on a balanced program with emphasis on those muscles that will help you in everyday activities.
- Following a strength training exercise for a particular muscle group, a one day rest period is necessary before repeating the exercise for that muscle group.
- Expect mild temporary soreness for up to 48 hours at the beginning of the program and as you increase intensity.
- Initiate the program for each muscle group by performing 10 comfortable movements against a resistance over time. Gradually increase the load and decrease the number of repetitions. Two sets of each of the movements can be performed in a beginning program,
- If muscles fatigue after 204 repetitions, the load is too high. If you can perform 12-15 repetitions, the load is too low. Aim for 10 repetitions.
- Muscle strengthening exercises are most effective when they are focused primarily on the muscle group **opposite** the tight muscle group. For example, if the muscles that bend the elbow are tight, stretch and strengthen the muscles that straighten the elbow.
- It is particularly important to have a period of warm up and stretching before and after strength training exercises to prevent muscle strain.
- **Precautions:** Loads should not be at a maximum. Weights should not be allowed to dangle on the limb. Free weights (e.g. bar bells) should be used with caution by persons with athetosis (involuntary body movement.) Weights are not advisable for persons who cannot control the weights. If using free weights, it is recommended to have a partner or spotter. Do not hold your breath during the resistance phase. If there is significant muscle or joint pain or swelling for more than 48 hours, seek medical consultation.

EXERCISE CONCERNS

AGE: Exercise is not reserved for any age group. At all ages, exercise can strengthen bone, enhance mobility, build strength and improve coordination.

TRAUMA: An appropriate exercise program does not aggravate conditions that accompany cerebral palsy or neuromuscular disorders.

FATIGUE: Exercise does utilize energy; however, by exercising regularly, people build stamina that makes it easier to meet daily demands.

FALLS: Exercise does not cause falls or injuries; if done properly exercise improves balance, mobility, strength and coordination that protect against injuries in activities of daily living.

REMEMBER:

- YOU CAN DO IT! Focus the exercise program on your goals.
- Exercise can be done at home and/or at an exercise facility.
- You may require specialized equipment or assistance from a person qualified on exercise programs for persons with disabilities due to neuromuscular disorders.
- Start modestly; each time begin with a warm-up and stretching period.
- Gradually increase exercise intensity, duration and frequency.
- End with a cool-down period
- Be alert to danger signals and stop when they occur.
- An effective exercise program will be beneficial; a poorly planned exercise program can be harmful.
- Enjoy exercise; however, don't overdo it.

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Part Two

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SUGGESTED EXERCISES

Key:

B – bone structure and strength

FR - flexibility and range

HL - heart and lung efficiency

M - strength and endurance

Arm Cycling (HL; M; FR)

This activity simulates bicycling but is done with the arms instead of the legs. Participants may use stationary indoor equipment called "erogmeters" or specially designed arm-driven cycles for outdoor cycling. When cycling outdoors, wearing a helmet is recommended.

Chair Aerobics (HL; M; FR)

This exercise combines upper body movements and stretches designed to increase flexibility and cardiovascular endurance. These are performed in a seated position; usually done to music.

Dancing (HL; B; FR)

This exercise is done to music so the tempo of the music determines the speed of movement and the intensity. A specific heart rate zone should be predetermined. Correct body alignment, breathing intensity and range of motion must be carefully considered. **Caution:** can be harmful to persons having significant contractures or bone density loss.

Exercise Bands (M; B)

This involves the use of wide elastic bands for resistance training and stretching. Bands are often made of latex and come in several different styles, lengths and resistance levels. One end is usually attached to a stationary object. The other end is grasped and then stretched to exercise the desired body part. All stretching should be slow. Precaution should be taken not to release the band when it is in a stretched position.

Jogging (HL; B; M)

Jogging – the act of fast walking or running at a steady pace - can be done inside: in place, on a treadmill, or on a track; it can also be done outdoors. Use of properly fitting exercise shoes is recommended. Mild muscle soreness may result at the start of the program. If joint discomfort develops, consider a lower type of impact exercise such as vigorous walking or swimming. **Caution:** can be harmful to persons having significant contractures, bone density loss or degenerative joint disease.

Leg Cycling (HL; M; FR)

This activity is on a mobile vehicle (2 or 3 wheel) or on stationary equipment. Outdoor equipment often has gears to assist on hills; indoor equipment often has mechanical or electronic programs for controlling resistance. When leg cycling outdoors, wearing a helmet is recommended.

Rowing (HL; M; FR)

Rowing is a total body exercise in a seated position using stationary equipment. It involves repetitive pulling by both arms against a resistance, coordinated with straightening and bending of both legs.

Stair Climbing (HL; M; B)

This exercise can be done on specific exercise equipment which simulates stair climbing or on actual stairs. Mild upper leg muscle soreness or joint soreness may result at the beginning of the program.

Swimming (HL; M; FR)

This involves moving progressively in water by means of purposeful use of the arms/hands and of the legs/feet. Accommodate yourself to the water temperature slowly; 75° F to 85° F are ideal water temperatures. If the pool is chlorinated, wear goggles. Never swim alone. Use a proper fitting flotation device if necessary.

Walking (HL; B)

Vigorous walking (moving or advancing by foot with one foot on the ground at all times) is a convenient exercise that can be done anywhere with or without an assistance device (cane, crutches, walker). **Caution:** can be harmful to persons with significant contractures or advanced bone density loss. Joint pain is a warning sign of too much impact.

Water Exercise (HL; B; FR)

This activity includes many features similar to swimming. Water should be 80° F. Focus exercise on one area at a time with repeated motions, gradually increasing speed and duration. Devices also should be used such as an aquavest, weights, Styrofoam dumbbells/exercise equipment, special gloves, etc. Water resistance is less intense and can produce the same cardiovascular effect as exercise on land.

Weights Training (M; B)

This exercise can involve the use of free weights or exercise machines that provide resistance; done at home or in an exercise facility. Weak muscles can be made stronger by placing resistance against the target muscles for short duration. Load increases strength; repetition increases endurance. The level of resistance and the number of repetitions of each exercise can be varied to produce the desired results. Don't lift free weights alone.

Wheeling (HL; M)

Wheeling involves propulsion of a wheelchair by the arms or legs over an extended distance. Vigorous wheeling can be done inside or outside. It can be done using a conventional wheelchair or a specialized sport wheelchair, with or without a wheelchair roller. If wheeling outside, precautions should be taken for street traffic.

Yoga and Tai Chi (FR; B)

A physical form of Yoga involves breathing and stretching exercises, and maintaining various positions for a short period of time. Tai Chi is a series of individual dance-like movements linked together in a slow, continuous, smooth flowing sequence. For these activities, no additional equipment is needed. Non-binding comfortable clothing should be worn.

If you need adaptive sports or recreation equipment, contact

United Cerebral Palsy Association

of Greater Indiana, Inc.

(317-632-3561)

donnar@ucpaindy.org

Ask about our DL Sports Fund

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