WELLNESS AND PHYSICAL ACTIVITY

Recent studies have shown that there is an increasing concern for the health and wellness of people. People can improve their health, fitness and quality of life by including moderate amounts of physical activity into their lives. Improvements in health can be achieved by most people through moderate activity, which is good news to those who dislike or have trouble adhering to a more intense or structured exercise program. For individuals who are already achieving moderate activity levels, more can be gained by further increasing the activity or exercise level.

Exercise and health experts agree that activity or exercise does not need to be vigorous or intense for improvements in health to occur. This is great news for the 25% of people who get little or no activity or exercise in their lives. And for those who are achieving health benefits from activity can improve their health, as the health benefits from physical activity appear to be proportional to the amount of activity – every increase in activity warrants additional health benefits. Most people agree that physical activity is good for you – but more than 60% of adults are not regularly active, and 25% of the adult population are not active at all.

The following 8 points highlight and give recommendations for improving health and wellness through physical activity:

- *People of all ages, both male and female, can benefit from regular physical activity.*
- *Significant health benefits can be obtained by including moderate amounts of physical activity on most, if not all, days of the week.*
- *People who can maintain a regular regimen of activity that is longer in duration or more intense are likely to derive greater benefit.*
- *Physical activity reduces the risk of coronary heart disease, high blood pressure, colon cancer, and diabetes. It also improves mental health and is important for the health of muscles, bones, and joints.*
- *More than 60% of adults are not regularly physically active and 25% are not active at all.*
- *Nearly half of youths 12-21 years of age are not regularly active.*
- *Daily enrolment in physical education classes is declining*.

What is Wellness?

Wellness can be defined as *"the optimal functioning and adapting that involves the whole person in striving in an ever increasing quality of life".* It is important to focus on physical wellness (physical fitness) since improving one's physical state of being often brings about improvements in other aspects of life.

Physical Fitness is one major aspect of wellness and can be defined as *"the ability of each individual to respond to the demands of every day life or emergency situations which may arise and still have enough energy remaining to pursue leisure and recreational activities."*

A healthy lifestyle is desired by most people however, cardiovascular disease is one of today's biggest killers. The best known way to reduce the chance of suffering from cardiovascular disease is by reducing or eliminating the risk factors associated with the disease. ***Risk factors*** are markers for susceptibility for disease. The following is a list of risk factors for cardiovascular disease:

- *Inactivity*
- *High blood pressure (hypertension)*
- *Cholesterol levels that are elevated*
- *Obesity*
- *Smoking*
- *Stress*

The Three Essential Elements of Exercise

Every exercise session should include the three essential elements of exercise. They are:

- Warm up (5-10 minutes) – The general warm up allows for gradual increases in circulation, heart rate and muscle temperature. Activity specific stretches may also be done once muscles are warm.
- Fitness Program (20-30 minutes) – This is the major portion of your workout. Perform your selected workout program, whether it be for muscular strength and/or endurance, or cardiovascular endurance.

- Cool Down (5-10 minutes) – The cool down is the final part of your workout. It should involve moderate movements in order to gradually return the heart rate to normal. Stretching can also be done as part of the cool down. The optimum time to stretch is just after the workout, when the muscles are warm. Stretching can help to speed recovery and reduce soreness, as well as improve flexibility.

Health-Related Components of Fitness

There are two major types of fitness – health and performance-related.

Performance–related fitness components, such as agility, balance, coordination, reaction time, speed and power are necessary for athletic performances, and more difficult to improve.

Health-related components are necessary for improved organic functioning, such as proper heart function and delivery of nutrients and oxygen to the cells of the body.

- ***Cardiovascular Endurance*** is associated with the fitness of the heart, lungs and blood vessels. Aerobic means "with oxygen". Exercises such as walking, running, circuit training can improve this component.

- ***Muscular Strength*** is the ability of the muscles to exert a maximal force against a resistance. Increased muscular strength can important for many reasons – it can make daily chores less fatiguing, improve posture, decrease chance of injury, help to prevent osteoporosis, improve self-esteem, and help to better prepare someone for possible emergency situations.

- ***Muscular Endurance*** is the ability of a muscle or group of muscles to sustain moderate activity for several minutes.

- ***Flexibility*** is the range of motion of a joint. Flexibility is very joint-specific and can be improved through a comprehensive stretching program. Maintaining the optimal range of motion in a

joint helps assure optimum muscle function in both strength and endurance.

- ***Body Composition*** is the relationship of muscle to fat mass to bone density. This is usually referred to as a percentage – such as "15% body fat". Maintaining an optimal percent body fat helps with all body functions including physical fitness.

Physical Activity Pyramid

This pyramid is a very simple guide for prescribing physical activity. A well-balanced person would partake in activities from all levels, but would spend more time involved in activities found near the base of the pyramid.

- Level 1 – ***Lifestyle Activity*** includes every day activities such as walking instead of driving to work etc. Level 1 effort equals to 30 minutes of brisk walking done on all days of the week.
- Level 2- ***Active Aerobics and Active Sport and Recreation*** groups involve activities that are more vigorous than level 1 and may require more time and equipment. Both involve elevating the heart rate more than level 1 so they can be done for 20 minutes a day to get the same benefit as level 1. ie. cardio dance, tennis etc.
- Level 3 – ***Flexibility and Muscle Fitness Exercises*** are designed to improve range of motion and muscular endurance characteristics.
- Level 4 – ***Inactivity*** – Rest and recovery from vigorous exercise is very important, but long bouts of inactivity, including lethargy or sitting watching TV should be avoided.

Remember, Level 1 activities should be performed nearly every day, but levels 2 and 3 less often because they are more intense. Level 4 should be a very small part of a person's day!

STUDY QUESTIONS
WELLNESS AND PHYSICAL ACTIVITY

Name: _____ Date: _____

1. Which of the following is true concerning people and physical activity?
    a. 60% of adults are not regularly active
    b. 25% of adults are completely inactive
    c. both A and B are true
    d. Neither A nor B are true

2. True or False
   Most adults need to participate in vigorous exercise programs in order to improve their health.

3. The optimal functioning and adaptations that involve the whole person in striving for a better quality of life is:
    a. Education
    b. Health
    c. Physical fitness
    d. Wellness

4. The ability of an individual to respond to the demands of every day life or emergency situations and still have enough energy remaining to pursue leisure and recreational interests is known as_____.
    a. Physical fitness
    b. Health
    c. Wellness
    d. Exercise

5. What is the number one killer in society today?
    a. Accidents
    b. Cancer
    c. Cardiovascular disease
    d. AIDS

6. Which of the following is **not** a risk factor for cardiovascular disease?
    a. Obesity
    b. Exercise
    c. Inactivity
    d. Smoking

7. Peggy-Sue plays racquetball for 30 minutes every Tuesday and Friday, and attends her cardio dance class on Monday and Friday mornings. What level of the Physical Activity Pyramid do her activities fall into?
    a. Level 1
    b. Level 2
    c. Level 3
    d. Level 4

8. What level of the Physical Fitness Pyramid should people try to avoid?
    a. Level 1
    b. Level 2
    c. Level 3
    d. Level 4

9. After his daily jog, Billy-Bob completes 3 sets of 40 abdominal crunches. Which health-related component of physical fitness is he focusing on with his abdominal work?
    a. Cardiovascular endurance
    b. Muscular endurance
    c. Body composition
    d. Flexibility

10. To include the essential elements of exercise in a workout, what should an exercise session include?
    a. Warm up, fitness program, cool down
    b. Warm up, fitness program
    c. Fitness program, cool down
    d. None of the above

CARDIOVASCULAR FITNESS, THE MUSCULAR SYSTEM, AND FLEXIBILITY

Aerobic vs. Anaerobic

AEROBIC means "with oxygen". Aerobic activity is continuous, large muscle, rhythmic activity, which uses carbohydrates, fat and small amounts of protein in the presence of oxygen to produce energy. Low to moderate intensity exercise performed for at least 15 minutes is aerobic. Aerobic activities include running, walking, swimming, and cycling.

ANAEROBIC means "without oxygen". Anaerobic exercise is an activity of *high intensity and short duration* that metabolizes carbohydrate without oxygen. Exercise at very high intensities, greater than 85 – 100% of your estimated heart rate (220-age X 85%), become anaerobic (without air). Athletes often train at very high intensities for a short duration because it is specific to their sport (sprinting). However, anaerobic exercise also *produces lactic acid*, which causes fatigue and is associated with "the burn". Short intervals of anaerobic exercise can help to improve fitness by challenging us to exercise at higher intensities and helping our bodies to tolerate higher levels of lactic acid. Fitness gains at high exercise intensities are small while the risk of injury increases. Individuals that train at high intensities decide that the small fitness benefits gained outweigh the increased risk of injury.

Benefits of Aerobic Exercise and Cardiovascular Fitness

1. Increases stroke volume (blood pumped with each beat) and cardiac output.
   - The heart becomes stronger pumping more blood with each beat.

2. Decreases resting heart rate.
   - Since the heart can pump more blood with each beat, the heart can beat at a slower rate.

3. Faster recovery rate.
    - After exercise, the heart can return to a resting state more quickly.

4. Decreases blood pressure (resting readings below 140/90 are normal).
    - Blood pressure is the pressure exerted by the blood on the artery walls.
        - ***Systolic*** blood pressure is the top number and indicates the pressure on the arterial walls when the heart pumps blood throughout the body.
        - ***Diastolic*** blood pressure is the bottom number and indicates the pressure on the arterial walls when the heart is refilling.

5. Increases aerobic capacity (ability to work longer and harder with less fatigue).
    - A fit person is able to do the same work with less effort than a sedentary person.

6. Decreases risk of heart disease and stroke.
    - Increases capillaries to heart and muscle.
    - Increases oxygen to the blood and muscles.

7. Increases HDL (good cholesterol).
    1. Total cholesterol values should be below 200 and consists of:
        - ***LDL*** *(bad cholesterol)* - a waxy substance that forms plaque and collects on the walls of arteries restricting blood flow. May cause atherosclerosis. Diets high in animal fats produce high levels of LDL's.
        - ***HDL*** *(good cholesterol)* collects LDL (plaque) and transports it to the liver where it can be discarded from the body. HDL levels can be increased with aerobic exercise.

Benefits of Training the Muscular System

1. Increases strength, endurance and flexibility and improves performance of daily tasks and recreational activities.
2. Increases work capacity (harder and longer without fatigue).
3. Decreases risk of injury.
4. Decreases risk of low back pain.
5. Increases or maintains bone density – less bone injuries and lower chance of developing osteoporosis.
6. Maintains and improves posture.
7. Maintains and/or increases lean body mass.

Benefits of Adequate Flexibility and Static Stretching

1. Develops flexibility and improves range of motion for performance of daily tasks.
2. Helps prevent muscle soreness and injury.
3. Increased blood supply and nutrients to joint structures.
4. Increased neuromuscular coordination.
5. Improved balance and postural awareness.
6. May help in preventing and treating lower back pain.
7. Reduced stress levels.
    - ❖ ***Do not bounce while stretching to avoid tearing muscles!***

Psychological and Other Benefits of an Active Lifestyle

1. Decreases mental tension.
2. Improves ability to deal with stress.
3. Increases energy levels and reduces fatigue.
4. Improves self image.
5. Increases sense of well-being.
    - ❖ Endorphins are naturally secreted hormones that act as natural opiates. These work in your brain to lower the sensation of pain and provide a sense of well-being. *Exercise can be nature's best tranquilizer!*
6. Assists with regular digestion and excretion.
7. Improves quality of sleep.
8. Improves coordination and skill.
9. Improves quality of life!

STUDY QUESTIONS
CARDIOVASCULAR FITNESS, THE MUSCULAR SYSTEM AND FLEXIBILITY

Name: _____ Date: _____

1. Which of the following refers to ***anaerobic*** exercise?
    a. An activity of high intensity and short duration that metabolizes the body's protein with oxygen.
    b. Beginners should exercise anaerobically because it is an activity of long duration, and metabolizes fat in the presence of oxygen.
    c. Anaerobic exercise is used by athletes to improve fitness because it is an activity of short duration and high intensity that metabolizes carbohydrates without oxygen.
    d. One should never exercise anaerobically because it is an activity of very high intensity that metabolizes fat without oxygen.

2. Which of the following ***is not*** a benefit of exercising the cardiorespiratory system?
    a. Lower resting heart rate and a faster recovery heart rate.
    b. Increased ability to metabolize fat and ability to exercise longer with less fatigue.
    c. Improved self-concept and reduction in stress.
    d. Decreased stroke volume (blood pumped with each beat) and fewer capillaries.

3. Which of the following refers to blood pressure?
    a. Blood pressure is the amount of blood pumped by the heart in 1 minute.
    b. Resting blood pressure readings below 140/90 are considered normal.
    c. Diastolic or the bottom number refers to the pressure when the heart contracts.
    d. All of the above.

4. Health benefits associated with good flexibility include all ***except***:
    a. Decreased risk of developing low back pain.
    b. Improved range of motion only if you bounce while performing the stretch.
    c. Less risk of muscle or joint injury.
    d. Greater work efficiency and greater freedom of movement.

5. Which of the following applies to the psychological benefits associated with exercise?
    a. Exercise helps to improve self-image and increases confidence.
    b. Endorphins are released during periods of inactivity and cause depression.
    c. Regular exercise can only reduce stress when done in a quiet setting.
    d. Exercise usually makes you feel worse if you are a little tired or depressed.

PRINCIPLES OF TRAINING
BEHIND ALL EXERCISE PROGRAMS

Overload

♦ A system must be stressed beyond its normal capabilities to improve its function.

♦ In cardiovascular training the heart must work harder than normal by beating at a rate faster than normal while performing sustained, large muscle rhythmic activities such as running, walking, stair climbing, swimming or bicycling.

♦ In weight training the overload principle means that the muscle to be developed must be forced to work harder than normal against a resistance.

♦ In flexibility training the muscles and connective tissue must be stretched beyond normal extension.

Adaptation – phases of response to stress

♦ *Shock* – After a strength workout the muscles may feel sore and performance may decrease; after a vigorous cardiovascular workout the body may feel fatigued.

→**DOMS** (**D**elayed **O**nset **M**uscle **S**oreness) refers to muscle soreness that peaks 24 to 48 hours after unfamiliar exercise or vigorous eccentric contractions (the lowering of lifting weights).

♦ *Adaptation* – During the 48 – 72 hours between workout sessions, the muscles recover and adapt; performance increases.

♦ *Plateau* – A fitness plateau is reached; adaptations may stop and performance may level off or decrease.

♦ *Overuse* – Full recovery and tissue building between successive workout cannot occur if too much exercise is performed.

Progression

♦ Once your muscles adapt to an overload (gets stronger), there is no longer an overload. You must increase the workload gradually to create a new overload.

♦ You can create a new overload by changing the:
→Resistance
→Number of repetitions
→Number of sets
→Amount of rest between sets
→Exercise you do for a specific muscle or muscle group

Specificity

♦A specific demand on the body results in a specific *adaptation*.
♦In cardio training the heart and lungs adapt specifically to the:
→Frequency of the activity
→Intensity of the activity
→Time – duration of the activity
→Type of activity
♦In resistance training the muscles adapt specifically to the:
→Exercises that are performed
→Muscle actions that are performed
►**Isometric contraction** – static; no movement occurs while a force is exerted against a resistance.
►**Isotonic contraction** – movement occurs while a force is exerted against a resistance.
• ***Concentric*** – the muscle shortens against a resistance; usually the lifting phase of the exercise.
• ***Eccentric*** – the muscle lengthens against the force of resistance; usually the lowering phase of the exercise; eccentric muscle actions are associated with the feeling of delayed onset muscle soreness (DOMS).
♦Muscles also adapt to how they are trained with respect to:
→resistance
→number of repetitions
→number of sets
→rest between sets
→rest between sessions
→nutrition

Reversibility

♦ When training is stopped, fitness gains deteriorate toward untrained levels (detraining).
♦ *Atrophy* – muscle size decreases
♦ *Hypertrophy* – muscle size increases

"Use it or lose it!"

STUDY QUESTIONS
PRINCIPLES OF TRAINING

Name: _____ Date: _____

1. Garfield wants to improve his lower body strength and power. He chooses lifts such as squats, leg extensions and leg curls. What is the principle of training that he is adhering to?
    a. Specificity
    b. Progression
    c. Overuse
    d. FITT Principle

2. What characteristic is representative of the "overload" principle?
    a. Working to the point of pain
    b. The overuse syndrome
    c. Specific adaptations are the result of specific demands
    d. Stressing systems slightly beyond normal stresses

3. Which of the following utilizes principles of progression and overload?
    a. Increasing the bench press resistance by 5%
    b. Increasing the bench press repetitions from 10 to 12 reps
    c. Both A and B utilize progressions and overload
    d. Neither A nor B utilize progression and overload

4. During the performance of the biceps curl, what is the role of the low back muscles?
    a. They contract eccentrically during the lifting phase
    b. They contract isometrically to stabilize the back
    c. They should contract isotonically to arch the back
    d. They should contract concentrically during the lowering phase

5. What type of muscle action occurs in the upper arm as the bar is lowered during the biceps curl?
    a. Concentric
    b. Eccentric
    c. Atrophy
    d. Static

IDENTIFYING YOUR FITNESS GOALS

"Success in what you do is in the journey and not necessarily the destination. It is important that you enjoy the process and have fun during exercise in order to make physical activity part of your life."

Reasons for Exercise

Each individual has different needs and is affected differently by different motivators. The following are major reasons most people give for exercising.

1. **Health and Fitness** – most people know that exercise is good for them and can improve the quality of life.

2. **Enjoyment** – People stick with programs they enjoy and are drawn to activities that are fun; if the activity is not enjoyable people have trouble making it a part of their life.

3. **Social Experience** – Many people use an exercise environment to meet new people or to get together with friends and enjoy recreational pursuits.

4. **Psychological Benefits** – Exercise can make one feel better – from "feeling good" to helping with anxiety or depression.

5. **Improve Appearance** – Many people exercise for weight management or to increase muscle mass in order to look more appealing.

6. **Other Reasons** – Rehabilitation, challenge of new task, fear of disease, stress relief.

Goal Setting

Goal setting is a motivational technique that has been found to be effective in sticking with an exercise program. How to set and attain a goal is not as simple as "just do it". Set ***S***pecific, ***M***easurable, ***A***ttainable, ***R***ealistic and ***T***imely goals (SMART). Use these guidelines for setting goals:

1. Specific goals are much more effective than general goals.
2. Challenging goals result in better performance than goals that are too easy.

3. Use short-term goals to help attain long-term goals.
4. Develop a strategy or plan of action to facilitate goal achievement.
5. Allow time to reach the goals.
   "I will lose 10 pounds in one week" - not enough time to lose 10 pounds
6. Set safe goals.
7. Base goals on correct information.
   "I will do 300 crunches each day to burn fat from my abdomen" "Spot reduction" is a myth – abs will get stronger, but aerobic activities must be used to burn calories and reduce body fat.
8. Make it fun!
9. Document your goals by writing them down and re-evaluating periodically.

Steps to Help Achieve Goals

1. Specify the objective or tasks to be done.
2. Determine how the progress toward the goal will be measured.
3. Specify the standard to be reached.
4. Prioritize goals.

Intrinsic and Extrinsic Motivation

Intrinsic motivators come from within the person and are based on feelings, beliefs and needs. Examples of intrinsic motivators are: "I'll have more energy if I exercise; I'll feel more positive when I'm done my workout; I like feeling stronger; I know I am healthier when I exercise."

Extrinsic motivators come from external sources through positive or negative reinforcement. Positive reinforcement is very important, especially for those beginning a new program. Rewards can include getting a good grade, getting new clothes, time to socialize with friends.

Evaluation of Goals You Have Set

- If you are not reaching your goals, re-evaluate your goals and program.
- Maybe your goals were not specific or realistic. Check to see if your exercise program is specific to your goals. Are you doing the exercises required that will help you reach your goals?

STUDY QUESTIONS
IDENTIFYING YOUR FITNESS GOALS

Name: _____ Date: _____

1. Which are guidelines for realistic goal setting?
    a. Keep your goals to yourself so others won't be tempted to discourage your starting fitness level.
    b. Allow time to reach your goals, set safe goals, and base your goals on correct information.
    c. Keep your goals to yourself so others won't be tempted to discourage you.
    d. Set long-term, general goals and stick to them until they are attained.

2. Bob does 200 curl ups each day to burn fat off his abdominal area. Which of the following is **false**?
    a. Bob has based his goal on incorrect information.
    b. If Bob adheres to this program, he will burn the fat off his abdominals.
    c. Bob will be increasing the strength of his abdominals.
    d. Bob has a misunderstanding of "spot-reduction".

3. Which strategy motivates one to make exercise a part of life?
    a. Extrinsic motivators are not effective for beginner exercisers.
    b. Exercise at maximal intensity to achieve short term goals quickly.
    c. Sign a lifetime membership contract at a health club.
    d. Choose a variety of activities that are enjoyable and will prevent boredom.

4. What should be done if the results of your exercise program do not indicate achievement toward your goals within a realistic time frame?
    a. Change your goals or change your program.
    b. Continue to stick to your goals and the program until you get results.
    c. Go to your doctor and have tests done.
    d. Make your goals more general; they were probably too specific.

5. List the long-term benefits you expect to receive from participating in regular physical activity.

_____

_____

_____

_____

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con't

6. What are your short-term goals? List specific goals that are realistic **and** how they can be measured to track your results.

_____

_____

_____

_____

_____

_____

ADHERING TO EXERCISE

Most adults know that regular moderate physical activity reduces the risk of developing or dying from some of the leading causes of illness and death in Canada. Heart disease, diabetes, colon cancer, and high blood pressure are serious nationwide health problems and are lifestyle related. In addition to reducing the risk of developing chronic illnesses, regular participation in physical activity appears to reduce symptoms of depression and anxiety, improve mood, and enhance ability to perform daily tasks.

Despite having an awareness of the benefits of regular physical activity, 25% of all adults get no physical activity at all and more than 60% do not achieve the recommended amount of regular physical activity. Older people are less active than younger people, women are less active than men, and those with lower incomes and less education are less active than those with higher incomes and more education.

Active healthy lifestyles are within the grasp of everyone just by accumulating 30 minutes of moderate activity on all or most days of the week. For individuals who are already active, greater fitness benefits can be gained by exercising more vigorously and for longer periods of time.

Studies have found that approximately 50% of those who start an exercise program drop out within the first six months. Adhering to an exercise program is a challenge, but the rewards of sticking with it are well worth it! Most people know there are health benefits from being physically active, but only 25% are active enough to obtain those benefits. Changing behaviours is difficult, but not impossible. To start, it is a good idea to know where you stand in terms of making a behaviour change that will make physical activity part of your daily schedule.

Stages of Change

1. **Pre-Contemplation** – not yet thinking about changing.

2. **Contemplation** – thinking about changing.

Strategy: Seek out information about the benefits of activity; think about what activities you enjoy.

3. **Preparation** – deciding and preparing to change, but not actually or consistently doing it yet.
   Strategy: Set a "kick – off" date; register for a class; buy new shoes; be prepared to start slow and progress gradually.

4. **Action** – attempting to change; the first six months of performing a "new" behaviour.
   Strategy: Call on a family member and friends for support.

5. **Maintenance** – long term change; practice a "new" behaviour for longer than six months.
   Strategy: Feel good about your progress (intrinsic motivation); don't get too cocky; prepare for relapse – especially during times of emotional stress; continue to seek support.

6. **Relapse** – Adhering to exercise is the exception and not the rule. Only about 20% of the population will get to the maintenance stage on the first try. Remember, those who take action and fail are twice as likely to succeed in the future attempts as those who have never taken any action.
   Strategy: Understand that change is not a smooth process; forgive yourself for slipping – self blame and guilt are not good motivator; use relapse as a learning experience – if you don't make it the first time, you can always try again!

Barriers to Exercise

Despite the known benefits to exercise, most people still do not get enough activity to improve health. The most common reasons people give for not exercising are:

- Lack of time
- Too tired; lack of energy, fatigue
- Lack of convenient facilities; too expensive
- Lack of knowledge about fitness
- Lack of power; viewing oneself as lazy

Adherence/Barriers to Exercise
Worksheet

Name: _____ Date: _____

1. What keeps you from exercising regularly?
Rank your **top five** (5) reasons for not exercising regularly.

_____ I don't have time
_____ I don't have the energy
_____ I need to lose weight first
_____ It's too expensive
_____ It hurts to exercise
_____ …doesn't like it when I exercise
_____ I'd rather diet
_____ I don't like to change clothes and carry a gym bag
_____ I just can't stick to it
_____I'm too old
_____I'll exercise when …
_____ I'd exercise but …
_____ I don't like to sweat
_____ the gym is too far away

2. What are some specific strategies you might use to overcome your barriers?

3. How will you reward yourself when you reach your short term goals?

4. Ziggy has been sedentary most of his adult life. Recently, he has decided to lose weight and get into shape. He bought a yearly membership at a gym, but has not come in to exercise yet. What "stage of change" does Ziggy currently fall into?
    a. Pre-contemplation
    b. Preparation
    c. Action
    d. Maintenance

5. All of the following our common reasons people give for **not** exercising **except**..
    a. Lack of responsibility
    b. Lack of time
    c. Lack of facilities
    d. Lack of knowledge about fitness

6. Which strategy helps one to make physical activity a part of daily life?
    a. Rely on intrinsic motivation, since extrinsic motivators are rarely effective.
    b. Keep your goals general to avoid failure
    c. Choose activities that are enjoyable and fun
    d. Keep your goals to yourself

7. What percentage of people who start an exercise program drop out within the first six months?
    a. 20%
    b. 30%
    c. 40%
    d. 50%

8. Sylvia has started several exercise routines, but can never seem to stick with it - children get sick, extra hours at work, never time in her busy day. What is the best way for Sylvia to deal with relapse?
    a. Sylvia tells herself that she never did like to exercise and decides to go on a diet so she won't gain weight
    b. Sylvia feels guilty about wanting some time for herself and decides to wait until summer when she has more time.
    c. Sylvia reminds herself that people who take action and relapse are twice as likely to succeed in the future. She tries again.
    d. Sylvia blames her high school P.E teacher for making her dislike exercise and wishes she had more will power.

9. The most effective way to use the "Stages of Change" model to change lifestyle behaviour is to:
    a. Be sure to keep your plans to change secret, so others won't undermine your efforts.
    b. Expect to see physical improvements within the first week.
    c. Understand that change is a process that takes time.
    d. Move immediately to the Action stage and "Just Do It!"

YOUR PERSONAL FITNESS PROGRAM

Part 1 - Aerobic (Cardiovascular) Exercise

The term aerobic means "with oxygen". These are endurance-type activities, such as running, walking, swimming, bicycling, aerobic dance, circuit training, and hiking. These activities involve moderate intensities for which the body furnishes a constant supply of oxygen to be used as fuel for the working muscles. Aerobic exercises are recommended for many reasons, such as cardiovascular conditioning, stress reduction, and weight management. A high number of calories can be burned with aerobic exercise, and thus can aid in weight (body fat) management. There are many benefits gained through aerobic training, including:

- ♦ Decreased risk of cardiovascular disease
- ♦ A more conditioned cardiovascular system
- ♦ Maintenance or reduction in body fat %
- ♦ Decrease in blood pressure or maintenance of healthy blood pressure
- ♦ Reduction in stress
- ♦ Increase in metabolism

Selecting Exercises that are Right For You

There are many aerobic exercises to choose from. Which one works for you depends upon several factors, such as time, your personal interests, your exercise partners, available facilities, weather conditions, and your own motivation. Certain types of exercise are more effective than others in raising heart rate levels and using large number of muscle groups. Weight bearing exercises tend to burn more calories than do non-weight bearing activities, simply because fighting gravity to move your body takes extra effort. For instance, 30 minutes of running will burn more calories than 30 minutes of swimming, because you must fight gravity each step you take while you run. Conversely, running can also be more dangerous for beginners due to the impact of your feet with the ground. Which is better for you? You need to decide for yourself.

1. Select activities you like to do. Match your activities with your interests.
2. Select an activity that fits into your schedule. Try circuit training if you have only 30 minutes. Walk or ride a bike to school.
3. Find out what facilities are available and work for you.

Exercise Intensity

How hard should you exercise aerobically? There are several methods to determine your exercise intensity, to assure that you are working out a level that will give you the most from your exercise program. There are three simple ways to monitor exercise intensity in order to assure that you are exercising aerobically.

1. **Rate of Perceived Exertion** (RPE) Scale - "Listen to your body" to determine how hard you are exercising. Use cues such as your breathing pattern, rate of sweating, how warm you feel, and fatigue level to help you decide the intensity.
    - For example, if Joe rates himself as exercising at an intensity of 15 (hard), his heart rate should correspond to about 150 beats per minute. Once you have determined your RPE is an accurate measure of your intensity, simply add a zero to the number from the RPE Scale for an *estimated* heart rate.

Perceived Exertion Scale

6	Rest	
7	Very, very light	
8		
9	Very light	
10		
11	Fairly light	↓
12		***Exercise***
13	Somewhat hard	***Training***
14		***Zone***
15	Hard	↑
16		
17	Very hard	
18		
19	Very, very hard	
20		

2. **Talk Test** – This is a simple way for beginners to determine exercise intensity. While exercising, attempt to talk to someone. If you are out of breath and cannot complete your sentence, you may be exercising too hard. If you can talk at length with no shortness of breath, pick up the pace. You should be able to carry on a conversation with short sentences and no great shortness of breath. The conversation should feel "comfortably difficult".

3. **Target Training Zone** – This is a zone, or range of heart rates, that you should stay within to achieve optimal conditioning benefits. Exercise too high above your zone and you will not be able to sustain the activity long enough to benefit from the conditioning effect. This zone refers to between 70% and 85% of your estimated maximum heart rate. To determine your target heart rate:
    a. 220 – age = estimated Maximum Heart Rate (Max. HR)
    b. Max. HR x 70% = lower end of range
    c. Max. HR x 85% = upper end of range.

Example: George is 23 years old and wants to find his Target training zone.

a. 220 – 23 = 197
b. 197 x 70% = 138
c. 197 x 85% = 167

George should keep his heart rate between 138 and 167 bpm for optimal conditioning benefits.

Types of Training

Several methods of training the cardiovascular system exist. All are effective in improving the fitness of the heart and lungs.

1. Long, Slow Distance – This type of training is the most common. It involves low to moderate level aerobic exercise over a long period of time. This type of training is great for burning calories and stimulating conditioning effects of the heart and lungs. Recommended for those with lower levels of fitness.

2. Interval Training – Involves bouts of high intensity exercise, with "intervals" of rest, or lower intensity exercise, in between the highly intense bouts. This type is only recommended for athletes and those with very conditioned aerobic systems. An example of an interval training session is as follows: 10 minute warm up of jogging, followed with 6 repeats of 400 metres of hard running, with 400 metre jog intervals as recovery between each. A 10 minute cool down follows the workout. Interval

training can burn lots of calories and can improve the conditioning of the cardiovascular system beyond the level that long, slow training can produce.

3. Circuit Training – Is a very effective way to do aerobic exercise with muscular strength and endurance training in one quick workout. The goal with circuit training is to keep the heart rate elevated with aerobic stations and by using low intensity, high repetition sets on weight machines. You should keep your heart rate elevated for at least 20 minutes. Circuit training is great for those who have a short amount of time, but want a complete workout.

4. Interval Training (emphasizes anaerobic system) – Uses short periods of intense work alternated with short active or passive rest periods for recovery.

STUDY QUESTIONS
AEROBIC (CARDIOVASCULAR) EXERCISE

Name: _____ Date: _____

1. Which of the following is **NOT** a benefit of aerobic exercise?
    a. Decrease in rate of heart disease
    b. Reduction in stress levels
    c. Decrease in body fat percentage
    d. Decrease in metabolism

2. Suzie has trouble finding her pulse when she jogs. What is another way she can estimate her exercise intensity?
    a. Physical Activity Pyramid
    b. RPE Scale
    c. ACSM Guidelines
    d. None of the above

3. Ritchie uses the Rate of Perceived Exertion to "listen to his body" while he uses the stationary bike. He rates his intensity as somewhat hard, about 13 on the RPE scale. What would his approximate corresponding heart rate be?
    a. 130
    b. 140
    c. 150
    d. 160

4. Fifteen minutes into her bike ride, Zoe decides to mix-up her workout a little and throws in five 1-mile repeats of very hard riding, with 1-mile rests between each hard effort. What type of training is Zoe using?
    a. Long, slow distance
    b. Circuit training
    c. Strength training
    d. Interval Training

5. Calculate your Target Training Zone. **Show your work** by following the appropriate steps and enter your answers on the lines below.

Your Maximum Heart Rate = _____ **Range: Upper number _____**

Lower number _____

YOUR PERSONAL FITNESS PROGRAM

Part 2 – Strength Training

It might help to understand that "resistance" is an opposing force, like weight or gravity. In order for your muscles to get stronger, you must work against resistance. So technically, strength is the result of resistance training, which usually uses a resistance such as additional weight.

Benefits of Strength Training

The benefits realized through resistance training include:

- Increased strength
- Increased muscle size **(hypertrophy)**
- Improved performance in agility, power, speed, and balance.
- Reduced risk of injury
- Improved flexibility
- Stronger bones and connective tissue
- Better posture
- Increased metabolism and body composition (increased muscle, reduced body fat)
- Psychological benefits

Training Guidelines for Basic Strength Training

- 8-10 exercises that include the major muscle groups.
- 8-12 repetitions to the point of fatigue
- At least 2 days per week.
- Use correct postural alignment
- Move weight through a full range of motion
- Lift and lower (concentric and eccentric phases) the weight in a controlled manner.
- Use a normal breathing pattern. Inhale before the contraction and exhale during the contraction phase or lifting phase. The **Valsalva maneuver,** or holding one's breath while exerting against a resistance, can cause excessive increases in blood pressure – blacking out.
- Use a training partner, if possible, for assistance, feedback, and motivation.

Elements of a Resistance Training Program

MAJOR MUSCLE GROUPS
If you neglect any of the major muscle groups, you may create an imbalance and become susceptible to injury. Muscle groups work in pairs. For example:

- Chest muscles push away and the back muscles pull toward the body

- The front of the thigh extends the knee while the back of the thigh flexes the knee

- Abdominal muscles flex the spine and the back muscles extend the spine
- Biceps flex the elbow and triceps extend the elbow

Muscle groups should include:

Lower Body Buttocks (gluteus) Front of thighs (quadriceps) Back of thighs (hamstrings) Calves
Trunk

Abdominals and Low Back
Upper Body Chest (pectoralis) Back (latissimus dorsi) Shoulders (deltoids) Front of upper arm (biceps) Rear of upper arm (triceps)

FREQUENCY OF TRAINING SESSIONS
After you have worked a muscle, it is important to rest that muscle at least 48 hours before you work it again. When you lift weights, there is some damage to the muscle cells.
The **rest principle** refers to the idea that sufficient recovery must be allowed if optimal fitness gains are to occur.

- Rest: A muscle usually requires 1-3 days of rest to repair itself so that it can adapt and become stronger.
- Too much rest: If you allow more than 3 days (72 hours) to go by between sessions you may not be overloading the muscle frequently enough to achieve your goals.

You can lift weights on consecutive days - just don't exercise the same muscle two days in a row.

- Exercise all major muscle groups in one day for 3 non-consecutive days per week.
- Exercise different body parts on different days to train 4 or more days per week.

EXERCISE SELECTION

The exercises you select are limited to the equipment that is available to you. While many people debate over which is better, free weights or machines, neither is superior. Every exerciser must decide what exercise works best for each individual muscle group. Beginners often start exercising on machines. As they gain more experience they soon develop preferences for specific exercises and equipment. For example, they might use the machine for working the chest but prefer the barbell for exercising the biceps.

Machines

Advantages:

- Machines are easy to use; beginners can train immediately after they learn the purpose of the machine and how to adjust the machine properly.
- Some muscle groups can be exercised better with a machine (isolation of quadriceps on the leg extension machine and isolation of hamstrings on the leg curl machine).

Disadvantages:

- Limited adjustments and movement plane

Free Weights

Advantages:

- Can move in multiple planes
- Aids in the development of assisting muscle groups

Disadvantages:

- More difficult to learn

Multi-joint exercises (squats, lunges, bench press)

- Integrated movement develops coordination and assisting muscle groups
- More difficult to learn

Single-joint exercise (leg extension, leg curl)

- Isolation exercises are sometimes used in rehabilitation exercises
- Easier to learn

EXERCISE ORDER

"Large muscle groups before small groups".

Large muscles are generally worked before small muscles. Another way to look at exercise order is to perform the multi joint exercises before performing isolation exercises or single joint exercises.
Larger muscles require assistance from your smaller muscles.

Example: the bench press is performed to strengthen your chest, but your shoulders and triceps assist in the action of the chest press. If you worked your shoulders and triceps first they may be too tired to assist the chest (pectoralis) muscles.

- Working the larger muscles first ensures that they are sufficiently challenged before the smaller muscles fatigue.
- Upper body: the chest and back are the largest muscles, followed by the shoulders, and then the biceps, triceps, and forearms.
- Lower body: the gluteus, thighs (quadriceps and hamstrings) and then the calves and shins. Multi joint exercises (leg press) followed with single joint exercises.

♦ Alternating muscle group order

- Advantage: If you are alternating upper body and lower body exercises or alternating opposing muscles groups, you do not have to rest between exercises. The muscle or muscle group that was just worked will be resting while you work an opposing or distant muscle group. Using this type of program (**circuit training**) is important for those with limited time to exercise.

- Alternate lower body with upper body muscle groups

- Alternate opposing muscle groups (chest/back; quadriceps/hamstrings; biceps/triceps)

♦ Small to large

- Advanced lifters occasionally use this pre-exhaust system to create a new overload.

- The small muscles are fatigued prior to the larger muscles.

Example: work the shoulders and triceps before performing bench press.

REPETITIONS

Repetition maximum (RM) is the greatest amount of weight than can be lifted for a specified number of repetitions.

A 10 RM is the amount of weight that can be lifted for ten repetitions but not eleven.

One repetition maximum **(1 RM)** is the heaviest resistance that can be lifted only one time with good exercise technique.

Repetition Continuum - Muscular strength is usually gained by training with a heavy weight and few repetitions.

Heavy Resistance (>85% 1 RM)

Few Repetitions (1-5 reps)

Muscular endurance is the result of training with light to moderate resistance for many repetitions.

Light-Moderate Resistance (<70% 1 RM) Many Repetitions (>12 reps)

- There is not a specific point along the continuum where strength ends and endurance begins. 8-12 repetitions performed to fatigue has been shown to elicit the benefits of both muscular strength and muscular endurance.

- 8-12 repetitions is approximately 70% to 85% of the maximum amount of weight you can lift one time (1 RM).

- Untrained beginners can gain strength from a muscular endurance program because even a light resistance will create an overload on the muscular system.

♦ **Perform each set to fatigue.** It is important to lift enough weight so that you exert enough effort to create an overload on your muscles.

- Whether your goals determine that you do 8 repetitions or 12 repetitions, the muscle should feel like you can't squeeze out one more repetition in the set.
- Remember, you will get to rest that muscle when you are finished. Rest is essential for the muscle to get stronger.

- Learn to distinguish between pain and fatigue. If you feel any pain in the muscle or joint, you should not continue the lift. "Pain is not gain".

♦ *Variation #l*: lift for strength with heavy weight on Monday (6 reps), for endurance with lighter weight on Wednesday (12-15 reps), and for strength and endurance with moderate weight on Friday (8-12 reps).

♦ *Variation #2*: perform **pyramid sets** by doing a 12 RM on your lst set, 9 RM on your 2nd set and 6 RM on your 3rd set. Of course, all sets are performed to volitional fatigue.

NUMBER OF SETS

♦ While some controversy exists as to how many sets are optimal for developing strength, hypertrophy, and/or muscular endurance, each individual must consider their exercise goals, their strength training experience and the amount of time they have for each workout session.

♦ **One set** of each exercise

* One well-performed set of each exercise to volitional fatigue has been shown to elicit strength gains for beginners. Beginners should start by performing single sets of each exercise.
* One set can be used to maintain strength
* One set is insufficient for long term strength gains

♦ **Two or more sets** of each exercise

* More than one set will recruit additional muscle fibers (those not previously stimulated.
* Multiple sets will increase the intensity as well as the duration of your workout session.

♦Sets do not have to be the same for all exercises. Perform multiple sets for muscle groups where the greatest gains are desired.

- For example, if your goal is to increase the strength in your upper body, you might perform multiple sets for your chest, shoulders and back and single sets for the lower body and arms.

REST BETWEEN SETS

Your goals and the amount of weight you lift determine the length of rest between exercises or sets. Rest does not have to be the same for all exercises or muscle groups.

♦ **Extremely short rest:** 30 seconds or less

• If alternating upper body and lower body exercises, alternating opposing muscles groups, or performing cardiovascular activity between sets, you do not have to rest between exercises. The muscle or muscle group that was just worked will be resting while you work an opposing or distant muscle group. Using this type of program (circuit training) is important for those with limited time to exercise.

♦ **Short rest:** less than 1 minute

• Used to train for muscular endurance - high reps/light to moderate resistance.

• Increases tolerance for lactic acid; increases resistance to the "burn".

♦ **Medium rest:** 1-3 minutes

• Used to train for increases in muscle size (hypertrophy).

♦ **Long rest:** greater than 3 minutes

• Used to increase maximal strength/power.

• Allows sufficient rest so a very heavy resistance can be used for desired reps.

Example #1: Some day you might have more time to exercise so you challenge your muscles by lifting a relatively heavy weight with 2 minutes between sets.

Example #2: On another day you might be rushed and zoom through your workout with just 30 seconds rest between sets. Note, if the rest periods are shorter, you will probably have to lift less weight.

SUMMARY OF GOALS, LOAD, REPS, SETS, & REST

GOAL	LOAD	REPS	SETS	REST
Muscular Endurance	light-40-60% 1RM	10-20	1-3	20-30 sec.
Strength/Endurance	moderate-60-75% 1 RM	8-12	1-5	30-90 sec.
Muscular Strength	heavy-75-100 1 RM	1-6	3-5	2-5 min.

DETERMINING THE RESISTANCE AMOUNT

Select the exercise and determine the proper path of motion and body alignment to perform the movement. If you are on a machine, adjust the seat - your body joint should line up with axis of the cam of the machine.

♦ With a very light weight or no weight at all, perform the exercise through a full range of motion.
♦ If everything feels "right", select an estimated resistance for 8-12 reps (10 RM).
♦ Control the movement in both directions (concentric and eccentric phases).
♦ Time your breathing - exhale during the greatest exertion or lifting phase - "exhale through the sticking point". Avoid holding your breath (Valsalva Maneuver).
♦ If you are unable to complete 8 reps, decrease the weight.
♦ If you are able to complete more than 12 reps, increase the weight slightly. • Rest between each set; continue to make adjustments.
♦ Your final trial (in fewer than 5 attempts) should cause muscle fatigue (not pain).

PERIODIZATION

One way to avoid getting in a rut and to continue making strength gains is to use periodization. **Periodization** means organizing your program into different periods or cycles, each lasting 4-8 weeks. Each period has a different theme. Different phases manipulate the repetitions and sets to determine duration and intensity. Below is an example of **five phases of periodization** for general fitness. The phases may vary depending on goals, but this model uses preparation, endurance, hypertrophy, strength, and active rest. You don't have to progress linearly through all 5 phases, but it is important to change your program every 4-8 weeks. The active rest phase may include other activities for recreation and fun or may include lifting with very light weights. The active rest phase could last from 1-4 weeks and then begin again with the preparation or endurance phase.

SUMMARY OF PERIODIZATION

Phase	Weight	# of Total Sets per Muscle Group	Reps per Set	Rest between Sets
Preparation	Light	1-3	12-15	90 sec.
Endurance	Moderate	3-8	10-12	30 sec - 60 sec.
Hypertrophy	Moderately heavy	8-15	8-10	30-90 sec.
Strength	Heavy	15-20	3-8	2-3 min.
Active Rest	Light weights or other activity	1-2	12-15	90 sec.

INTERMEDIATE TECHNIQUES

SUPER SETS - Perform 2 different exercises without resting between the sets.

♦ 2 sets / same muscle group

Example: Bench press immediately followed with incline flys; rest 1 min. then repeat the two exercises again

♦ 2 sets / different muscle group

Example: Bench press/lat pulldown (no rest between sets)

GIANT SETS - Perform 3 exercises for one muscle group without rest between the exercises; rest 1 minute then repeat the sequence

♦ *Examples*

Legs and Buttocks: Squats + leg extension + leg curl,

Abdominals: Abdominal crunch + hip lift reverse crunch + abdominal crunch with twist

Back: Lat pulldown + cable row + seated back machine

Chest: Barbell chest press + dumbbell chest fly + cable crossover

Shoulders: Shoulder press + front raise + lateral raise

PYRAMIDS

If you are performing at least 5 sets of an exercise, consider a pyramid. Start with a light warm-up set and gradually progress to the heaviest weight you can lift for 3-5 repetitions and then progress down each set until you are lifting a weight that allows you to perform 8-12 repetitions.

♦ **Ascending pyramid**: start with a light weight and gradually increase the weight and decrease the reps for each set until you can only perform 1-3 reps.

♦ **Descending pyramid**: after a warm-up set start with the heaviest weight you think you can lift once; decrease the weight each set until you can lift a weight for 12-15 reps.

♦ **Ascending/Descending pyramid**: start light (10 RM), use 2 sets to work up to a heavy set (3 RM) and then use 2 more sets to work back down to a light set (10 RM).

♦**Modified pyramid**: instead of increasing the weight to 1 RM, stop at 5 RM (the point where 5 or 6 reps are difficult).

BREAKDOWNS

Breakdowns are multiple sets of one exercise without resting between sets, while decreasing the weight for each set.

♦ After a warm-up set, do 10 reps with the heaviest weight you can, decrease the weight and do 8 reps, decrease the weight and do as many reps as you can, continue until the muscle is totally fatigued.
♦ Breakdowns work well on machine exercises; instead of adjusting barbell plates or dumbbells, it is easier to move the pin to a lighter weight.

NEGATIVES

Muscles can generally generate more force during the lowering phase than during the lifting phase of an exercise. A negative is an advanced technique that emphasizes the lowering or eccentric phase of the lift. Eccentric muscle actions are associated with severe delayed onset muscle soreness; beginners should not perform negatives.

♦ Help with concentric phase; a spotter helps lift the weight during the concentric phase (positive)
♦ No help with eccentric phase; lower the weight without assistance

PROGRESSION TIPS

♦ Progress slowly to keep muscle soreness to a minimum and to avoid injuring the muscle or joint.
♦ Change a progression variable only when you can perform all repetitions of the exercise with good form and you are not experiencing muscle soreness.
♦ Change the exercise or the exercise order
- Changing the exercise from machine to free weights, or from free weights to machines creates a new overload. Example: Machine chest press to barbell bench press or dumbbell flys to pec deck machine

♦ Increase the resistance
- *Example*: When you are able to complete sets of 12 or more reps for two or more consecutive workouts, increase the resistance. A weight increase of not more than 5% is recommended. If you cannot maintain correct lifting technique, chose a lighter weight.

♦ Change the repetitions.
- *Example*: When your goal is to increase muscular endurance, you can create a new overload by increasing your reps from 12-15.

♦ Change the rest between the sets.

SPOTTING & SAFETY

A spotter is someone who is in a position to help complete the lift if the lifter should be unable to complete the exercise movement.

For safety and to get the maximum benefit from the exercise, you should always be spotted on lifts where you could get pinned under a weight if you could not complete the lift. Communication between the lifter and the spotter is essential to increase safety and reduce misunderstandings. Both the lifter and spotter need to know:

1. Which exercise will be performed?
2. How many repetitions the lifter expects to complete?
3. How much help the lifter expects; will there be forced reps, or negative reps at the end of the set?
4. Does the lifter expect help with the "lift off', getting the weight into position, or getting the weight back onto the rack at the end of the set?

GUIDELINES FOR SPOTTERS

1. Be sure the spotter is strong enough to assist with the weight being lifted. If not, find another person to spot the lift.
2. Know how the lifter expects to be spotted. Communicate this before the lift is attempted.
3. Know what signs or signals the lifter will use to let the spotter know what to do.
4. Before the lift, check the bar for balanced loading and secure collars.
5. Stay alert! Give full attention to spotting the lift. Do not allow yourself to be distracted. Stay in proper position so you are ready if assistance is needed.
6. If the lifter can complete the lift without your help, do not touch the bar during the exercise. This may reduce the overload stimulus for the lifter.
7. If the lifter does need assistance, gently provide the amount of help needed to complete the lift. Jerking the bar away from the lifter might throw it off balance.
8. Keep the floor area clean and uncluttered to avoid trips and falls. Help the lifter rerack all weights upon completion of all sets of the exercise.

GUIDELINES FOR LIFTERS BEING SPOTTED

1. Make sure the spotter knows what to expect. Communicate your intentions before beginning the lift. The spotter cannot read your mind.
2. Don't quit on a repetition. Even if you need the spotter's assistance, keep trying to complete the repetition. It should take very little lifting by the spotter to help you complete the lift.
3. Never let go of the bar or quit on a lift when the spotter touches the bar.
4. Thank the spotter after each set and re-rack all weights upon completion of the exercise.

GENERAL SAFETY

1. Always be aware of your surroundings in the weight room. Watch where you are going. Do not back up without looking behind you. Move carefully and slowly in the weight room.
2. Stay clear of other people and equipment. Avoid collisions with lifters, spotters and equipment.
3. Do not attempt to use broken equipment. Ask the fitness instructor to set broken equipment aside or put a sign on it.
4. Keep the weight on the bar balanced as evenly as possible when adding and removing weight from each end of the bar. If you load or remove all the weight from one end of the bar, the bar could flip off the rack and create a dangerous situation. Use collars on all plate loading equipment.
5. Always use a knowledgeable spotter when performing lifts where you could be trapped under the weight if you are unable to complete the lift.
6. Adjust seats and levers of each machine to accommodate your body size. Select an appropriate weight load and insert selector keys all the way in. Fasten seat belts if provided. Do not allow the weight stack to bounce during the lowering phases.
7. Warm-up before exercising.
8. Make sure you are in a stable position and proper alignment before you attempt a lift.
9. Perform all lifts using strict exercise form. Perform all repetitions throughout the full range of motion. Control the speed and direction of the lift. If you cannot control the lift, the weight is too heavy.
10. Do not bounce the weight off your body or a weight stack. If you must bounce a weight to lift it, the weight is too heavy.
11. Do not twist your body or arch your back while attempting to complete a lift. If your body is not stabilized during the lift, the weight is too heavy.
12. Do not hold your breath and strain to lift a weight. Holding your breath throughout the lift results in the Valsalva maneuver which can elevate your blood pressure.
13. Return all weights to the appropriate rack when you have completed the exercise. Offer to help others pick up equipment that is out of place.
14. Don't lift when you are sick.
15. Always be polite, courteous, and helpful to create a safe and pleasant environment for everyone. Serious injuries can result from horse play in the weight room. The weight room is not the place for practical jokes or inappropriate behavior.

STUDY QUESTIONS
RESISTANCE TRAINING AND SPOTTING

Name: _____ Date: _____

1. Which of the following is a benefit of strength training?
   A. Increased strength
   B. Better posture
   C. Larger muscles
   D. All of the above

2. What term describes muscle size increases?
   A. Atrophy
   B. Hypertrophy
   C. Strength
   D. Tonus

3. Jack's goal when he began exercising was to lose 10 pounds in 10 weeks. At the end of 10 weeks he only lost 5 pounds, but his percent body fat went from 15% to 12%. What is the best explanation for Jack's results?
   A. Jack didn't do enough aerobic activity; he should quit lifting weights and begin a running program
   B. Jack's muscles atrophied which prevented him from losing weight
   C. Jack didn't eat enough protein and should have been taking supplements
   D. Jack increased his muscle mass, which increased his metabolism and reduce his percent body fat

4. Imelda's schedule allows her to lift weights every day, but only for 20 minutes. The best training program to follow is to:
   A. Exercise all muscle groups every day
   B. Exercise different body parts on different days to allow the muscles to recover and adapt before they are exercised again
   C. The program doesn't matter as long as she rests more than 72 hours between lifting sessions
   D. Never lift weights every day

5. Bob's goal is to obtain the benefits of both muscular strength and muscular endurance. When trying to determine the amount of resistance for the leg press he selects a resistance where he is able to complete 20 repetitions before fatiguing his leg muscles. He should:
   A. Decrease the weight and perform 3 sets of eccentric contractions
   B. Increase the weight and perform isometric contractions
   C. Increase the weight so that he experiences muscle fatigue in 8-12 repetitions
   D. Perform the Valsalva maneuver with each repetition for maximal contraction

6. The rationale for performing more than one set of an exercise is:
   A. More than one set recruits additional muscle fibers and increases intensity
   B. More work can be accomplished in less time
   C. The risk for injury is reduced when one performs additional sets
   D. Overload cannot occur with only one set

7. What guidelines should be considered regarding the length of rest between sets?
   A. The heavier the resistance the greater the rest time between sets
   B. When alternating upper and lower body exercises within a workout, long rest periods between sets are essential for muscle adaptation
   C. Both A and B
   D. Neither A nor B

8. Correct form for the overhead shoulder press involves:
   A. Controlled speed of movement, the Valsalva maneuver during exertion, and partial range of motion
   B. Full movement range, proper body alignment, controlled speed of movement, and exhalation through the sticking point
   C. Proper body alignment, arching the back and inhaling while pressing the weight upward
   D. Exhalation during exertion, the Valsalva maneuver while lowering the weight, and partial range of motion

9. Arnold is an advanced weight lifter and performed "negatives" with the help of his training partner. The next day he experienced a great deal of muscle soreness. What is the most likely explanation for his soreness?
   A. His lifting partner didn't help him lift the weight during the concentric phase
   B. The weight was so heavy he couldn't maintain good form
   C. Since he lowered the weight without assistance, the eccentric phase contributed to his soreness
   D. His lifting partner helped him lower the weight while he performed isometric contractions

10. What must Veronica communicate to her spotter when doing squats?
   A. Ask the spotter if he or she is strong enough to help
   B. How much weight and how many repetitions will be performed
   C. Discuss how much help she expects with the lift, help lifting the bar off, and what signals she will use to let her spotter know what to do
   D. All of the above

NUTRITION AND BODY COMPOSITION

Proper nutrition needs to go hand-in-hand with a well-designed exercise program, to ensure adequate amounts of energy, the right building blocks for muscle maintenance, repair and development, and to maintain a healthy body composition.
There are three major nutrients your body needs to function well - carbohydrates, protein and fat.

Carbohydrates are used by the body in the form of glucose as an energy source. Carbohydrates provide the body with *4 calories per gram*. Major uses for carbohydrates by the body include energy for the brain and nervous system, and fuel for muscles. Carbohydrates are divided into two types: **simple and complex.** Simple carbohydrates are sugars - they provide energy in the form of calories but do not provide great nutrient value. They should be used sparingly in one's diet. Complex carbohydrates are found in fruits, vegetables, and whole grain products. These are nutritionally dense foods which also supply the body with essential vitamins, minerals and fiber.

Protein is made up of amino acids which are used as structural components for the body's cells. Protein also supplies *4 calories per gram*, but the body does not like to use protein as energy like it does carbohydrate. Protein is necessary for building and repairing cellular structures throughout the body - including muscle cells. The body will spare protein as an energy source as long as there is carbohydrate available.

Fat is a nutrient that is broken down into fatty acids and used by the tissues of the body as energy. Fat is a necessary part of the diet for energy. It also to provides and utilizes essential fat-soluble vitamins. Fat yields *9 calories per gram*, over twice that of carbohydrate or protein. The two major types of dietary fats are **saturated and unsaturated.** High levels of saturated fat has been linked to heart disease, so it is best to get most dietary fat in the form of unsaturated fat. Coincidentally, Americans eat more animal products than almost any other country in the world, and most animal products are high in saturated fat.

Carbohydrates, protein and fat are necessary parts of a well-balanced diet. One needs to consider how much of each nutrient to include in a proper diet. Too much of one nutrient and/or not enough of another can be detrimental to health. People should consume a diet composed of carbohydrate, protein, and fat in the following proportions.

CARBOHYDRATES 55%-60% **PROTEIN 10%-15%**

FAT 20% - 30% (no more than 10% saturated)

Minerals help build strong bones and teeth, form hemoglobin in red blood cells, assist in nerve transmission and muscle contraction and regulate fluid levels and the acid-base balance of the body. It is important for females to obtain enough calcium and iron in their diets. **Calcium** helps to build strong bones and prevent stress fractures and osteoporosis. Good sources of calcium are low or non-fat dairy products, salmon with bones, leafy dark greens, and calcium fortified orange juice or tofu. **Iron** supplies working muscles with oxygen. If your iron level is low you may not have enough stamina for daily activities. Menstruating women need adequate iron to prevent anemia. Good sources of iron include low fat red meat, dark meat poultry, beans, dark leafy green vegetables and iron fortified cereals and breads.

Water provides the medium for nutrient and waste transport and plays a vital role in nearly all of the body's biochemical reactions. Drink before you are thirsty and at least 8 glasses of water per day.

THE BOTTOM LINE

Many Canadians consume too many total calories, often in the form of excess fat and simple sugars. Along with this, Canadians tend not to burn enough calories through physical activity. Keep in mind that an excess of calories consumed in any form - carbohydrate, protein or fat - will be stored by the body in the form of fat, to be "used" later.

Portion control in the amounts a person eats are important considerations. Just because a food says "fat free" does not mean it is calorie free. If a person eats more calories than they burn, whether it is low fat or not, that food will be stored as fat. It is best to read the food labels on items to determine the portion size and calories per serving for a particular food.

One pound of fat equals 3500 calories. This means in order to lose one pound of fat, a person must burn 3500 more calories than are consumed.

Canadians seem to be doing the opposite, consuming more and burning less. Calorie-restricted diets or nutrient-restricted diets can be equally as dangerous eating too many calories. In order to get all the proper nutrients and have enough energy to function properly, it is recommended that women consume no less than 1500 calories per day, and men 1800 calories per day (these figures include the 10% calorie burning allowance for eating and a 30% calories burning allowance for daily activity). This will ensure that there will be enough energy to sustain homeostasis (proper body functioning) and provide essential vitamins and minerals.

BODY COMPOSITION

A well-rounded exercise program should include all the health-related components of physical fitness. Thus, aerobic exercise needs to be included not only to condition the cardiovascular system, but also to help maintain a healthy body composition. Body composition refers to the ratio of fat mass to lean mass on one's body. This figure is usually expressed as a percentage - such as "17% body fat." This means the body is comprised 17% of fat and 83% of lean tissues and water. There are recommended ranges of body fat that are considered healthy for men and women. They are:

	Under age 30	Over age 30
WOMEN	18%-22%	18%-25%
MEN	15%-18%	15%-20%

Lower levels of body fat, such as those found on athletes and very active individuals, can be safely maintained, as long as eating habits are normal and adequate caloric intake is assured.

Obesity, now considered a disease, is the state of being overfat, or having a level of excess body that is detrimental to health. Generally, it is accepted that men and women with a body fat percentage 10% or more above ideal are considered to be obese. It is estimated that near 50% of the U.S. population now has a weight problem, and that as high as 35% of Americans are considered obese. Since obesity is considered a controllable risk factor for heart disease, body composition management should be an important component of any exercise program.

The healthiest way to maintain a healthy body composition is to include a well-rounded exercise program with a well-balanced diet. In order to lose body fat, a caloric deficit must be established so that the body will use up extra stored body fat as fuel. Contrary to popular belief, **spot reducing** will not burn body fat! Spot reducing is an exercise myth which is still believed

today! The idea is that exercising a certain body part will burn fat in that specific area. This does not work! Doing sit-ups will not burn fat off the stomach. Aerobic exercise, along with strength training and a proper diet, is the only safe and natural way to reduce body fat percentage.

Opposite of obesity are eating disorders, such as bulimia and anorexia nervosa. These are dangerous diseases that can be life-threatening and can go undetected for long periods of time. ***Anorexia nervosa*** is a condition of self-imposed starvation and dangerously low body weight. Up to 95% of anorexics are young women.

Bulimia involves a pattern of bingeing and purging (eating and then throwing up). It is more prevalent than anorexia. Bulimia is hard to detect because the person may appear to have normal body weight. Along with malnutrition, medical problems associated with eating disorders include heart problems, amenorrhea (loss of menstruation), osteoporosis, kidney and bladder damage, immune system depression, ulcers, dehydration, and depression.

STUDY QUESTIONS
NUTRITION & BODY COMPOSITION

Name: _____ Date: _____

1. _____is a disease state of being overfat, or having a level of excess body fat that is detrimental to health.
    A. Obesity
    B. Anorexia
    C. Bulimia
    D. Heart Disease

2. Research has found that as high as -% of Canadians are considered obese:
    A. 5%
    B. 15%
    C. 25%
    D. 35%

3. Hagar wants to reduce the size of his ominous belly. He asks his fitness instructor "how many sit-ups do I need to do to flatten my belly and burn off the fat?" The fitness instructor explains to him that spot reducing is:
    A. An exercise principle
    B. An exercise myth
    C. A great way to burn off the fat
    D. The proper way to tone body parts

4. Jane, a 21-year old college student, looks very healthy. But recently her roommate, Tarzan, has noticed that after meals she spends a lot of time in the bathroom. On occasion, Tarzan has heard Jane getting sick in the bathroom, although she claims to feel fine. Jane may be exhibiting signs of:
    A. Obesity
    B. Anorexia
    C. Bulimia
    D. Heart Attack

5. T or F Carbohydrates are the body's major source of energy

6. T or F Protein provides 4 calories per gram, which makes it a great and readily available energy source.

7. Why is fat a necessary part of a person's diet?
    A. It is used as an energy source
    B. It provides and uses fat soluble vitamins in the diet
    C. Both A and B
    D. Neither A nor B

8. Carbohydrate (CHO), Protein and Fat are the three major nutrients. Which diet is the BEST selection for the recommended proper percentages of each nutrient for a healthy, balanced diet?
    A. CHO 40% Protein 30% Fat 30%
    B. CHO 60% Protein 15% Fat 25%
    C. CHO 70% Protein 20% Fat10%
    D. CHO 80% Protein 10% Fat 10%

9. How many calories are there in one pound of fat?
    A. 2500 calories
    B. 3000 calories
    C. 3500 calories
    D. 4000 calories

10. According to the Canada Food Guide, what food group should you get the majority of your calories from?
    A. Grains (bread, cereals, rice, pasta)
    B. Dairy products
    C. Fruits and Vegetables
    D. Meat, poultry and fish

Bibliography

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