

DEPARTMENT OF PHYSICAL THERAPY

TO: Academic Council Board of Directors
FROM: Marilyn Moffat
RE: Task Force Exercise
DATE: June 5, 2013

Members:
Marilyn Moffat, Chair
Ted Angelopoulos
Jim Farris
Dennis O'Connell
Shane Phillips
Ben Rogozinski
Kathy Zalewski, Liaison from Academic Council

A Task Force was appointed by the Board of Directors of the Academic Council to review entry-level curricula to determine the current status of program curricula in advanced exercise physiology/science, exercise prescription and nutrition as it relates to exercise and physical activity, with the purpose of developing recommendations for educational approaches to address the APTA position statement. The recommendations reflect what the Task Force determined to be realistic expectations given overall curricula as well as the intent of the position statement.

Position statement: The American Physical Therapy Association (APTA) promotes physical therapists as health service delivery providers of choice for the exercise and physical activity prescription component of the spectrum of management strategies intended to prevent or treat the non-communicable diseases (NCDs) and their related risk factors; and, seeks participation in the development and/or update of physical activity or exercise guidelines for these NCDs.

Meetings occurred via four conference calls (2/11/13, 3/18/13, 5/7/13, and 5/21/13) and all business was conducted in between the meetings via electronic communication. A memo was sent to all School Directors requesting information on any course work in their curricula that pertained to the charge of the Task Force. Twelve replies were received. All materials were collated by the chair and distributed to the other members of the Task Force. The materials fell generally into several major categories: physiology (exercise, clinical, applied, including principles of nutrition; exercise (principles, therapeutic principles, scientific principles, exercise in health and disease, strength and conditioning course, special topics for CSCS workshop, personal training in rehab certification, fitness theory and practice); health and wellness (educational aspects of PT/health promotion and wellness, health promotion and disease prevention, health promotion/wellness/prevention at individual and community levels); and other (CVP

physical therapy, CV and P science, Topics related to CVP PT, PT interventions/physical agents and therapeutic exercise).

Some points were raised during the first conference call that included the following:

- PT education appears to not be very unified in exercise prescription related to non-communicable diseases
- Physical therapist graduates are comfortable with the musculoskeletal system, but they just don't think about the cardiovascular/pulmonary system and yet aerobic/endurance testing and exercise prescription essential in all NCDs
- Exercise physiology seems to be placed in a number of different areas of the curriculum with no set of ideal practices such as would be found in the normative model
- Some of the examples presented in the courses sent were indeed unique and wonderful learning experiences, however there is no representative foundation for them
- Cannot build a glass house on a sandy cliff (pretty substance and no foundation)
- Will meet resistance if we try to add credits
- Graduates must be comfortable with exercise prescription
- Initial grouping of responses begins to set framework
- Perhaps best to determine knowledge and skills that we want DPT students to have upon graduation in these arenas
- Begin with generating core objectives that will include precisely what needed to meet the charge

After discussion by all, 3 major domains were agreed upon and these are: 1) exercise physiology; 2) exercise testing and prescription; and 3) health promotion/wellness/prevention including special populations.

Curricular expectations were then developed in each of these areas to allow programs to integrate into their curriculum design as would best meet their needs. As the work of the Task Force progressed, the initial major categories were further refined into the following five areas: 1) Exercise Physiology/Nutrition; 2) Exercise Testing; 3) Exercise Principles and Prescription; 4) Fitness Theory and Practice; and 5) Health Promotion, Wellness, and Prevention. The curricula expectations in each of the five areas were finalized and are presented to the Board as the final work of the Task Force.

EXERCISE PHYSIOLOGY/NUTRITION

OBJECTIVES – EXERCISE PHYSIOLOGY

Upon successful completion of the curriculum, the students will be expected to:

1. Understand the importance of bioenergetics (energy transformation) on exercise response and health
 - a. Recognize the substrates utilized by each energy system and the process of substrate depletion and repletion depending on the activity
 - b. Incorporate understanding of bioenergetic principles into analysis and prescription of exercise and physical activity
 - c. Describe the basic concepts of endocrinology and its relationship to exercise and physical activity
2. Understand the importance of energy systems on exercise response and health
 - a. Describe the systems responsible for energy metabolism at rest and during exercise
 - b. Describe how fatigue impacts exercise and physical activity
 - c. Compare and contrast metabolic pathways that are active during any form of movement in the healthy person (eg, aerobic, anaerobic)
3. Analyze the energy transfer and expenditure during rest and various exercise and physical activity intensities
4. Identify the energy producing and energy conserving processes related to aerobic exercise
5. Understand the integration and regulation of the cardio/vascular and pulmonary systems during varied exercise types (eg, arm cycle, bicycle ergometer, treadmill, etc)
6. Define and describe steady-state for VO_2 , heart rate, respiratory rate, tidal volume, minute ventilation
7. Describe the lactate and ventilatory thresholds and their relationship under exercise conditions
8. Understand the methods used to measure human energy expenditures
9. Assess the functional capacity of the cardiovascular system
10. Understand basic concepts of a normal electrocardiogram (ECG) and recognize basic arrhythmias
11. Identify normal and abnormal physiologic responses to exercise across the lifespan
12. Identify adaptation and the physiological responses to immobility, inactivity, deconditioning/detraining, and sedentary lifestyles
13. Identify the acute vs chronic physiological responses (eg, cardiovascular/pulmonary, musculoskeletal, neuromuscular, genito-urinary, integumentary, immunological, endocrine, thermoregulatory mechanisms) that occur with varied types of training in normal individuals
14. Understand the impact of body composition on health

OBJECTIVES – NUTRITION

Upon successful completion of the curriculum, the students will be expected to:

1. Understand the importance of the macromolecules (protein, carbohydrate, fat)
 - a. List and describe the basic micronutrients and macronutrients
 - b. Describe the difference in the caloric content of the three macronutrients
2. From a chemical perspective, differentiate food energy sources as carbohydrates, fats, or proteins
3. Identify and describe how food energy is stored, how and where it is catabolized
4. Describe the production of ATP as food energy sources are catabolized

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5. Describe time-frames and intensities related to the utilization of ATP-PC, glycolytic, and aerobic (fat and carbohydrate, amino acid) fuel source
6. Describe the effects of caloric restriction on body weight and body fat
7. Analyze the impact of balanced nutrition, water, vitamins, minerals, and other supplements on exercise response and health
8. Understand the importance of nutrition for health and human performance across the lifespan
 - a. Identify differences in nutritional needs and exercise prescription in individuals with chronic conditions
 - b. Explain principles of nutrition as they relate to metabolism and performance in athletes and individuals beginning recreational sports and weight management programs
 - c. Differentiate the causes and consequences of overweight and obesity
 - i. Explain the principles of nutrition as they relate to metabolism and performance of athletes and participants of weight management programs
 - ii. Recognize that each food item contains units of energy (calories) and calculate the caloric value of foods found in the diet
 - iii. Define obesity and patterns of fat distribution and the relationship to health risks for the non-communicable diseases
 - iv. Compare and contrast ways of determining adiposity, fatness, and regional fat distribution [eg, BMI, % fat, waist circumference, waist/hip ratio, body volume measurement (hydrostatic weighing, air displacement plethysmography); skinfold/fatfold measurement; bioelectrical impedance analysis (BIA); ultrasound; computed tomography; magnetic resonance imaging; dual-energy x-ray absorptiometry (DXA)]
 - v. Discuss the etiology of obesity as it relates to genetic predisposition, diet, and lifestyle
 - vi. Discuss the impact on quality of life of mild, moderate and morbid obesity including discussion of community access, environmental modification, and disability status
 - vii. Understand the role of obesity as a significant risk factor for heart disease and other conditions that contribute to heart disease (eg, diabetes mellitus)
 - viii. Discuss the relationship between lifestyle modification, obesity, and cardiovascular disease risk.
 - ix. Explain guidelines for safe weight loss and gain.
 - x. Have students do a 3-day dietary recall (keep track of all consumed in 3 days – use phone apps to record and analyze dietary choices, web sites)
 - d. Recognize signs, symptoms and behaviors associated with eating disorders and altered eating habits:
 - i. Signs and symptoms associated with disordered eating, bulimia and anorexia
 - ii. Body composition changes and performance variations associated with eating disorders
 - e. Recognize the nature of an athlete's nutritional status and determine the appropriateness of a referral to a qualified health care professional
9. Discuss the health implications and long and short-term physiological effects of using ergogenic aids (eg, caffeine) and nutritive supplements
10. Understand methodologies to estimate energy expenditure needs (eg Harris-Benedict, Mifflin)

EXERCISE PRINCIPLES AND PRESCRIPTION

OBJECTIVES (Exercise Prescription)

Upon successful completion of the curriculum, the students will be expected to:

1. Defend the importance of exercise in prevention of disease and promotion of wellness across the lifespan
2. Utilize the principles of motor learning and motor behavior in designing an individualized exercise program/prescription
3. Analyze the exercise principles of overload/intensity, specificity, progression, recuperation/recovery, and use/disuse
4. Interpret physiological and subjective responses at appropriate intervals during prescribed exercise (eg, symptoms, ECG, BP, RR, HR, RPE, oxygen saturation, and oxygen consumption measures) to develop safe effective exercise programs
5. Explain the use of the subjective scales for rating of levels of exertion during exercise prescription (eg, Borg's RPE, Borg's Dyspnea Scale, angina scale, claudication scale)
6. Understand differences between submaximal and maximal exercise prescription
7. Describe and account for the effects during exercise of the following medications on exercise heart rate, blood pressure, ECG, and aerobic exercise capacity: α and β -blockers, nitrates, calcium channel blockers, angiotensin-converting enzyme inhibitors, angiotensin II receptor antagonists, glycosides, peripheral vasodilators, diuretics, anti-arrhythmic agents, antilipemic drugs, anticoagulants, steroidal anti-inflammatory drugs, bronchodilators, diabetic medications
8. Utilize the Ainsworth MET Compendium for prescribing functional activities
9. Administer and interpret the following behavioral measures for optimal compliance
 - i. Physical Activity Stages of Change
 - ii. Self-Motivation Assessment Scale
10. Describe, apply, analyze, and have skill in aerobic capacity/endurance exercise prescription and training
 - a. Describe rationale and develop exercise training programs at or above steady-state using heart rate, respiratory rate, lactate and ventilatory thresholds (eg RPE, Talk Test, Counting Talk Test) and their relationship to exercise intensity
 - b. Know how to use heart rate, blood pressure, respiratory rate, RPE, O_2 saturation, and ejection fraction to prescribe, monitor, and progress exercise programs
 - c. Compare and contrast moderate vs. vigorous exercise
 - d. Have skill in the determination of aerobic capacity/endurance exercise intensity (eg, target heart rate, talk test, counting talk test, Borg's Rate of Perceived Exertion Scale, Angina Scale, Borg's Dyspnea Scale, Claudication Scale) and progression
 - f. Describe, analyze, and manipulate frequency, intensity, time, and type (FITT) for aerobic capacity/endurance exercise prescription across the age span
 - g. Utilizing the reserve formula, create submaximal programs using heart rate, oxygen consumption, and METs
 - h. Describe and analyze the components of aerobic capacity/endurance exercise [warm-up, physical stress theory (intensity, specificity, progression, recuperation/recovery, use/disuse), cool down]

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- i. Analyze the principles of specificity of exercise training and differentiate the tissue's adaptation to acute and long-term training activities
 - j. Have skill in the prescription of aerobic capacity/endurance types of exercise (eg, continuous, interval/intermittent, circuit, cross)
 - k. Have knowledge of varied training principles (eg, periodization, threshold walks/runs, peaking threshold walks/runs) for aerobic capacity/endurance exercise
 - l. Describe, analyze, and demonstrate skill in the performance of aerobic capacity/endurance exercises [treadmills, ellipticals, gliders, bicycles (stationary, movable, upright, recumbent, arm cycling/upper extremity ergometer), jump ropes, mini tramps, stairs/steppers/climbers, cross country skiers, rowing machines, classes (aerobic, dance aerobic, step), water]
 - m. Given a target VO_2 , calculate treadmill speed, treadmill elevations, stepping rates/heights, and cycling workloads
 - n. Understand and integrate safety awareness in the use of aerobic capacity/endurance exercise equipment and procedures and describe plans for medical and other emergencies
11. Describe, apply, analyze, and have skill in strength/resistance exercise prescription and training
- a. Review the adaptations of the musculoskeletal, cardiovascular/pulmonary, neuromuscular, endocrine, hormonal, and immune systems to strength/resistance exercise
 - b. Describe and analyze the components of strength/resistance exercise (warm-up; stretching; strength-isometric, concentric, eccentric, isokinetic, and plyometric; power; speed; endurance)
 - c. Describe and analyze the evidence-based guidelines for frequency, intensity, time, and type (FITT) for strength/resistance exercise prescription across the healthy age span
 - d. Describe and analyze the evidence-based guidelines for frequency, intensity, time, and type (FITT) for strength/resistance exercise prescription for persons with non-communicable diseases (eg, cardiovascular conditions, chronic obstructive pulmonary diseases, diabetes, some forms of cancer, osteoarthritis, and their risk factors), chronic diseases, and disability
 - e. Have skill in the determination of strength/resistance exercise intensity (30-60% 1RM, 70-80% 10 RM, 1 RM, fatigue, loss of good form, postural deviations, loss of stabilization, DOMs) and progression
 - f. Know the absolute contraindications for strength/resistance training
 - g. Perform a needs analysis for athletes and occupational athletes including evaluation of the sport (movement analysis, physiological analysis, injury analysis)
 - h. Have skill in the prescription of strength/resistance types of exercise (strength; power; endurance; active assistive, closed/open chain; plyometric)
 - i. Have knowledge of varied training principles (eg, core/assistive exercises, structural/power exercises, muscle balance (agonist-antagonist), training frequency, exercise order, training load, volume, rest, and periodization)
 - j. Describe, analyze, and demonstrate skill in the performance of strength/resistance exercises [eg, elastic bands, tubes, free weights, machines, body weight, weighted bars, medicine balls, mini tramps, pulleys,

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- body blade, hydraulics, robotics, parachutes/sleds, water, PNF, with functional activities (climb stairs with weights)]
- k. Know and have basic skill in use of complementary exercise techniques for strength/resistance training (eg. Yoga, Tai Chi, Pilates)
- l. Understand and integrate safety awareness in the use of strength/resistance exercise equipment and procedures
- 12. Describe, apply, analyze, and have skill in flexibility exercise prescription and training
 - a. Review the adaptations of the musculoskeletal systems to flexibility exercise
 - b. Describe and analyze the evidence-based guidelines for frequency, intensity, time, and type (FITT) for flexibility exercise prescription across the healthy age span
 - c. Have skill in the determination of flexibility exercise intensity (eg, overload, slight sensation of resistance with mild discomfort)
 - d. Describe, analyze, and demonstrate skill in the performance of flexibility exercises (eg, static, ballistic, dynamic, gravity assist, body position, PNF)
 - e. Know and have basic skill in use of complementary exercise techniques for flexibility training (eg. Yoga, Tai Chi, Pilates)
- 13. Describe, apply, analyze, and have skill in balance exercise prescription and training
 - a. Review the adaptations of the musculoskeletal and neuromuscular systems to balance exercise
 - b. Describe, analyze, and demonstrate skill in the performance of balance exercises (static and dynamic)
 - c. Describe and analyze the frequency, intensity, time, and type (FITT) guidelines for balance exercise prescription across the age span
 - d. Have skill in the determination of balance exercise intensity (eg, challenge limits of balance both statically and dynamically)
 - e. Have skill in the prescription of balance types of exercise (change base of support, surface, shoes, arm assist, vision, impose body movement, lower extremity moving balance, etc)
 - f. Describe, analyze, and demonstrate skill in balance exercises (static, moving, balance boards, wobble boards, BOSU, dynadiscs, harbinger core trainer, ball exercises, foam pads, foam rollers, slide boards, trampolines, etc)
 - g. Know and have basic skill in use of complementary exercise techniques for balance training (eg. Yoga, Tai Chi, Pilates)
 - h. Understand and integrate safety awareness in the use of balance exercise equipment and procedures
- 14. Analyze the environmental influences on exercise testing and exercise and physical activity prescription
 - a. Describe the effect of ambient temperature, humidity, carbon dioxide, ozone, and altitude on functional capacity for normal individuals and those with cardiovascular/pulmonary and metabolic diseases, disorders, and conditions
 - a. Adapt the exercise prescription appropriately for environmental extremes for normal individuals and those with cardiovascular/pulmonary and metabolic diseases, disorders, and conditions

OBJECTIVES (SPECIAL POPULATIONS)

Upon successful completion of the curriculum, the students will be expected to:

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1. Analyze sport specific movements for exercise training
2. Describe the benefits versus risks of exercise for at risk individuals versus those with established stable diseases, disorders, or conditions
3. Describe and analyze the evidence-based guidelines for persons with non-communicable diseases (eg, cardiovascular conditions, chronic obstructive pulmonary diseases, diabetes, some forms of cancer, osteoarthritis, osteoporosis, etc) and their risk factors (tobacco use, harmful use of alcohol, unhealthy diet, insufficient physical activity, overweight/obesity, hypertension, elevated blood sugar, and raised cholesterol), chronic diseases, and disability in terms of frequency, intensity, time, and type (FITT) for aerobic capacity/endurance, strength/resistance, flexibility, and balance exercise prescription

EXERCISE TESTING

OBJECTIVES (Tests and Measures)

- I. Upon successful completion of the curriculum, the students will be expected to administer the following:
 1. Screening/safety measures across the life span
 - a. Determine if exercise testing is safe and beneficial or if referral to another health professional is warranted prior to testing
 - b. Determine safe end points for exercise testing including signs and symptoms for exercise cessation
 - c. Determine an emergency plan related to exercise testing
 - d. Identify the contraindications for exercise testing of apparently healthy individuals
 - e. Administer and interpret the following screening/safety measures:
 - i. PAR-Q and You Questionnaire
 - ii. Risk factor assessment, including but not limited to: age, family history, cigarette smoking, sedentary lifestyle, obesity, hypertension, dyslipidemia, pre-diabetes
 - iii. Signs and symptoms of diseases, disorders, or conditions including: pain, discomfort, angina, dyspnea, syncope, orthopnea, paroxysmal nocturnal dyspnea, peripheral edema, palpitations, tachycardia, intermittent claudication
 - iv. American Heart Association and AACVPR risk stratification criteria and analyze the differences between the two
 - v. Signs/symptoms of exercise intolerance causing exercise test termination
 2. Administer and interpret various physical activity measures, including
 - a. Perceived Functional Ability (PFA) questionnaire
 - b. Physical Activity Rating (PA-R) questionnaire
 - c. Duke Activity Status Index
- II. Upon successful completion of the curriculum, the students will be expected to:
 1. Describe progressive, acute responses and steady-state responses in energy metabolism, heart rate, blood pressure, oxygen saturation, stroke volume, cardiac output, ejection fraction, respiratory rate, tidal volume, minute ventilation, and lactate levels during exercise testing
 2. Describe aerobic function in terms of METs, VO_2 in $\text{L} \cdot \text{min}^{-1}$, and $\text{ml} \cdot \text{kg} \cdot \text{min}^{-1}$, kcal/min and be able to convert one unit to the other
- III. Upon successful completion of the curriculum, the students will be expected to administer the following tests and measures:
 1. Aerobic capacity/endurance tests and measures
 - a. Know the absolute contraindications for aerobic capacity/endurance testing
 - b. Identify the guidelines for stopping a exercise test
 - c. Describe, apply, analyze, and have skill in aerobic capacity/endurance tests and measures, including:
 - i. 6-minute walk test
 - ii. 2-minute walk test
 - iii. 12-minute walk test
 - iv. 400-meter walk test
 - v. Rockport one-mile walk test
 - vi. 2-minute step test

- vii. 3-minute step test
 - viii. Seated step test
 - ix. Total body recumbent stepper exercise test
 - x. Shuttle walk test
 - xi. 6-minute treadmill walk test
 - xii. Ebbeling single stage treadmill test
 - xiii. Naughton treadmill test
- 2. Muscle performance tests and measures
 - a. Describe, apply, analyze, and have skill in functional muscle performance tests and measures, including:
 - i. Chair rise test
 - ii. Single-step test
 - iii. Getting Up from Lying on the Floor
 - iv. Timed Stair Climb
 - v. Arm curl
 - vi. Grip strength
 - vii. Bench press
 - viii. Heel rise
 - ix. Supine hip extension
 - x. Modified ramp power test
 - xi. Abdominal core muscles
 - xii. Biering-Sorensen back endurance test
 - xiii. Toe tap
 - b. Know the indications and contraindications for functional muscle performance testing
 - c. Have skill in the determination of strength/resistance exercise intensity (30-60% 1 RM, 70-80% 1 RM, 10 RM, fatigue)
- 3. Anthropometric tests and measures
 - a. Describe, apply, analyze, and have skill in functional anthropometric tests and measures, including:
 - i. BMI
 - ii. Waist circumference
 - iii. Waist-to-hip ratio
 - iv. Skin/fat fold thickness
- 4. Functional gait tests and measures
 - a. Describe, apply, analyze, and have skill in functional gait tests and measures, including:
 - i. Gait speed
 - ii. Narrow corridor walk
 - iii. Tandem walk / Alternate tandem procedure
 - iv. Figure of eight walk test
 - v. Dynamic gait index (DGI)
 - vi. Functional gait assessment
- 5. Functional mobility and balance tests and measures
 - a. Describe, apply, analyze, and have skill in functional mobility and balance tests and measures, including:
 - i. Timed up and go (TUG)
 - ii. Functional reach
 - iii. Modified functional reach
 - iv. Modified total body rotation
 - v. Four square step test

- vi. One leg stance test (OLST)
- vii. Sitting balance scale
- viii. Modified clinical test for sensory interaction of balance (mCTSIB)
- ix. Berg balance scale (BBS)
- x. Fullerton advanced balance scale (FAB)
- xi. Balance evaluation systems test (BESTest)
- xii. Mini BESTest
- 6. Functional posture tests and measures
 - a. Describe, apply, analyze, and have skill in functional posture tests and measures, including:
 - i. Wall/occiput distance
 - ii. Rib/pelvis distance
 - iii. Historical height loss
- 7. Functional range of motion tests and measures
 - a. Describe, apply, analyze, and have skill in functional range of motion tests and measures, including:
 - i. Back scratch
 - ii. Chair sit and reach
- 8. Arousal, attention, and cognition
 - a. Describe, apply, analyze, and have skill in arousal, attention, and cognition tests and measures, including:
 - i. Geriatric depression scale
 - ii. Two question depression test
 - iii. St Louis University mental status test
 - iv. Montreal cognitive assessment
 - v. Medicare Annual Wellness Visit Cognitive Screen (the General Practitioner Assessment of COGnition, the Mini-COG, and the Memory Impairment Screen)
- 9. Multiple test batteries
 - a. Describe, apply, analyze, and have skill in multiple battery tests and measures, including:
 - i. Physical Performance Test
 - ii. Modified PPT
 - iii. Short physical performance battery
 - iv. Elderly mobility scale
 - v. De Morton Mobility (DEMMI)

FITNESS THEORY & PRACTICE

OBJECTIVES (General)

Upon successful completion of the curriculum, the students will be expected to:

1. Demonstrate knowledge of basic fitness training principles
2. Understand and apply the principles of physical fitness to the development of a healthy lifestyle
3. Analyze the factors influencing fitness – age, sex, culture, health status, body composition, psychological condition, and nutrition
4. Identify fitness levels for different populations across the lifespan, eg, childhood, adolescence, adulthood, and older adults
5. Understand the cultural influences on fitness and the considerations of cultural issues needed for patient/client education
6. Understand the psychological aspects of fitness training – motivation, group dynamics, compliance, training techniques, equipment, and facilities
7. Differentiate physical fitness testing from standard physical therapy tests and measures
8. Choose basic fitness equipment and describe facility requirements for fitness testing and performance, including emergency equipment and procedures
9. Understand the management necessary for a fitness training center
10. Assess the safety of a fitness setting to minimize risk to the patient/client and to the equipment
11. Student performance of the following fitness tests
 - a. Aerobic capacity
 - i. 1-Mi walk or
 - ii. 1.5-Mi run test or
 - iii. Bicycle ergometer test
 - iv. Queens College step test
 - b. Anaerobic capacity - 300-yd shuttle run
 - c. Agility – Edgren side step test
 - d. Flexibility - sit and reach test, Apley's test
 - e. Muscle endurance - Sit-up test and push up test
12. Perform a fitness evaluation for healthy young adults (see attached)
13. Perform a fitness evaluation for children (see attached)
14. Perform a fitness evaluation that can be done in schools (IOM)
15. Perform the Senior Fitness Test (see attached)

EXERCISE FITNESS TESTING

FITNESS EVALUATION FOR HEALTHY YOUNG ADULTS

Subject Name _____

Date of Birth _____ Age: _____

Gender _____ Height _____ Weight _____ BMI (kg/m²) _____

BMI Online Calculator <http://www.nhlbisupport.com/bmi/>

Personal History Form:

Previous Medical Diagnoses:

Recent Illness, hospitalization, or surgical procedures:

Orthopedic Problems:

Medication use, drug allergies:

Other Habits:

Exercise History:

Work History:

Family History:

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CARDIOVASCULAR

Resting BP _____ / _____ mmHg Resting HR _____ bpm

Resting Respiratory Rate: _____ SaO₂ _____ %

SPIROMETER (norms are in spirometer case)

Forced Vital Capacity (FVC) _____ liters _____ % of predicted

Forced Expiratory Volume (FEV₁) _____ liters _____ % of predicted

FEV₁ / FVC Ratio _____ %

ANTHROPOMETRIC DATA:

Waist Circumference Measure narrowest part of torso above umbilicus and below the xiphoid process.

Trial 1 _____ Trial 2 _____ **Average** _____ cm

Hip Circumference—Measure diameter at largest excursion of buttocks. Typically at level of greater trochanters.

Trial 1 _____ Trial 2 _____ **Average** _____ cm

BODY COMPOSITION (ACSM)

Female: Abdomen _____ mm Suprailiac _____ mm Triceps _____ mm
Thigh _____ mm

%BF= $0.29669 (\text{Sum of four skinfolds}) - 0.00043 (\text{sum of four skinfolds})^2 + 0.02963 (\text{Age}) + 1.4072$

Male: Abdomen _____ mm Suprailiac _____ mm Triceps _____ mm
Thigh _____ mm

%BF= $0.29288 (\text{Sum of four skinfolds}) - 0.0005 (\text{Sum of four skinfolds})^2 + 0.15845 (\text{Age}) - 5.76377$

Percent Body Fat: _____ %

Fat Weight = %Fat (in decimal form) X Body Weight = _____ lbs.

Lean Weight = Body weight - Fat weight = _____ lbs.

Ideal Body Weight: $(\text{Lean Body Weight}) / (1.00 - \text{proposed \% BF in decimal form}) =$
_____ lbs.

*(Propose/choose a different body fat percentage than what you have currently.
Ideal Body Weight should be higher than your lean body weight)*

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FLEXIBILITY (ACSM)

YMCA Sit and Reach Test _____ inches Percentile Grading _____

Back Hyperextension Index _____ Grading E G A F P

EXTREMITY VOLUMES (measure the **hands** of one partner and the **feet** of the other)

	Right	Left
Foot volume	_____ ml	_____ ml
Hand volume	_____ ml	_____ ml

STRENGTH

Microfet Handheld Dynamometer

	Trial 1	Trial 2	Trial 3	Mean
Elbow flexors (L/R)	_____	_____	_____	_____
Knee extensors (L/R)	_____	_____	_____	_____

Pinch & Grip Strength

	Right (mean*)	Left (mean*)
Grip	_____ lbs	_____ lbs
Lateral pinch	_____ lbs	_____ lbs
Palmar pinch	_____ lbs	_____ lbs
Tip pinch	_____ lbs	_____ lbs

(*Average of three trials)

Normative Data for Hand Strength

Record your patient's percent of normative data:

	Grip	Lateral	Palmar	Pinch
Dominant hand	_____ %	_____ %	_____ %	_____ %
Non-Dominant hand	_____ %	_____ %	_____ %	_____ %

ENDURANCE

ATTACHMENT 2

Muscular endurance

Push ups _____

Sit ups _____

POWER/AGILITY

Vertical Jump: _____ inches

T-Test: _____ sec.

Margaria-Kalamen Stair Test: _____ Watts Hexagon Test: _____ sec.

INSTRUCTIONS FOR SPECIAL TESTS:

BODY COMPOSITION MEASUREMENT:

When doing the skinfold, grasp the skin (two layers of skin plus subcutaneous fat layer) between your thumb and index finger. While holding the skin layer between the fingers, measure the thickness with the calipers. Place the calipers 1 cm from the fingertips, halfway between the crest and the base of the skinfold. While holding the calipers perpendicular to the skinfold, record the reading after the skinfold has stabilized (2-3 seconds). Measure only on the right side of the body. Take **3 measurements** at each site and use the average of the three measurements for your final calculations. After taking the measurements, use the formulas to determine the percent of body fat, fat weight, lean weight, and ideal weight. Then determine the classification of your partner from the chart provided.

Triceps Skinfold: The site is determined by taking half the distance between the tip of the acromion and olecranon process with the elbow flexed at a 90 degree angle. A vertical skinfold is then obtained on the back of the arm over the triceps muscle with the arm in a relaxed, extended position.

Suprailiac Skinfold: The skinfold is located immediately above the crest of the ilium with the fold running obliquely, from superolateral to inferomedial. The fold is taken at a point just superior to the iliac crest along a line that is a continuation of the anterior axillary line. The subject must sidebend slightly toward the side tested to adequately relax the tissue being evaluated.

Thigh Skinfold: This is a vertical fold taken on the anterior thigh, midway between the hip and knee joints. To find the midpoint, measure from the ASIS to the top of the patella while the hip and knee are flexed 90 degrees. Mark the midpoint of this measurement.

Abdominal Skinfold: A vertical skinfold taken 2 cm lateral to the umbilicus.

ATTACHMENT 2

FLEXIBILITY:

Sit and Reach: The individual sits with the legs extended and the knees pressed against the floor. The feet are placed against the stool with the yardstick attached to it. The individual reaches forward with outstretched hands as far as possible (perform the test slowly without bouncing). The distance reached is determined by the yardstick measurement.

Back Hyperextension: The test is performed with the patient lying prone on the floor. The individual's feet are held in place and the back is actively extended, lifting the chest and chin from the floor as far as possible. The distance between the floor and the sternal notch is measured. The individual then sits on the floor with the back and buttocks against the wall, and the distance between the floor and the sternal notch is again measured. The flexibility score is determined by the following:

$$\text{Hyperextension} = \frac{\text{hyperextension height}}{\text{Seated height}} \times 1000$$

Determine the rating from the chart provided.

SENIOR FITNESS TEST

(Rikli RE, Jones C.J. *Senior Fitness Test Manual*. Champaign IL Human Kinetics, Latest Edit.)

Based on guidelines established by the ACSM (1995) and on input from medical consultants

People who should not take the test without physician approval are those who:

- Have a medical condition in which their physician advised them not to exercise
- Are currently experiencing exertional angina, chest pains, or dizziness (pressure, pain, heaviness, tightness of the chest) during exercise
- Have had congestive heart failure
- Have high, uncontrolled blood pressure (greater than 160/100)

A 5- to 10 - minute warm-up and general stretching routine is recommended prior to testing for all clients

1. **Chair Stand Test:** The number of full stands from a seated position that can be completed in 30 seconds with arms folded across the chest
 - Place chair against wall for safety
 - Use gait belt if mobility is unknown
 - Assess ability to maintain balance in standing
 - Demonstrate test slowly to show proper form, than at a faster pace to show that object of test is to do best can within safety limits
 - Have practice 1-2 stands to ensure proper form
 - Instruct person to cross arms over chest if possible
 - On instruction to "Go," rise to standing and sit again as many times as possible in either: 30 seconds - If more than ½ way up at the end of the 30 seconds, it counts as a chair rise
 - If unable to perform even 1 stand without using hands, allow patient/client to push off their legs or the chair or use a cane or walker if necessary
 - If an adaptation is needed, describe on score card – score is "0" for the test and then indicate adapted score
 - Describe any adaptations (chair height, any assistance needed, task performance)
2. **Arm Curl Test:** The number of biceps curls that can be completed in 30 seconds holding a dumbbell (5# for women, 8# for men)
 - Have patient/client sit upright with back against backrest of armless chair
 - Do not allow forward bend of trunk
 - Use a 5 lb dumbbell for women and an 8 lb dumbbell for men held in the dominant hand
 - Hold the weight in a handshake grip (hammer curl position) with arm fully extended to side of chair
 - Perform a biceps curl by flexing elbow while supinating hand using good form throughout the entire range and lower back to starting position
 - Determine the number of biceps curls that can be completed in 30 seconds holding the dumbbell - If arm is more than ½ way up at the end of the 30 seconds, it counts as a curl

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- If cannot do weight with correct form, may substitute a lighter weight - record both the official score ("0") and the adapted score
 - Note the adaptation
3. **6-Minute Walk Test:** The number of yards that can be walked in 6 minutes around a 50-yard course
- A 50 yard (45.72m) rectangular area (dimensions 45 x 5 yards), with cones placed at regular intervals to indicate distance walked
 - Aim of this test is to walk as quickly as possible for six minutes to cover as much ground as possible
 - Subjects are set their own pace (a preliminary trail is useful to practice pacing), and are able to stop for a rest if they desire
 - Measure the distance walked in 6 minutes to the nearest meter
4. **2-Minute Step Test:** The number of full steps completed in 2 minutes, raising each knee to a point midway between the patella and the iliac crest. The score is the number of times the right knee reaches the required height
- Measure HR, BP, and RR prior to beginning test
 - Have individual stand next to wall - measure height of iliac crest and patella and mark on wall – then place mark on wall $\frac{1}{2}$ the distance between the two
 - Have the individual raise each knee to that point midway between the patella and the iliac crest in 2 minutes
 - Resting is allowed, and holding onto the wall or a stable chair is allowed
 - The score is the number of times the right knee reaches the required height
 - Measure HR, BP, and RR immediately upon completion of test
5. **Chair Sit-And-Reach Test:** From a sitting position at the front of a chair, with one leg extended and hands reaching toward the toes, the distance between the extended fingers and the tip of the toe (NOTE: not to be done if suspected or known low bone mineral density, osteoporosis, or history of spine fractures)
- Demonstrate the test first
 - Individual sits at the front of a chair, with one foot flat on the floor (knee bent to 90 degrees) and with other leg extended (knee completely straight), with foot dorsiflexed, and both hands (one on top of other) reaching toward the toes of extended leg
 - Note the distance from fingertips to tip of toes
 - Reverse sides and repeat above
 - Determine best side and continue testing on that side
 - Allow 2 practice trials
 - Do 2 test trials for measurement
 - If knee starts to bend, patient/client should be told to sit back so knee is straight and that is where recording should take place
 - Using a ruler, measure the distance in inches between the tips of the extended middle fingers and the tip of the toes
 - If reach the toes, score is 0; if reach past the toes, score is +; if can't reach the toes, score is –

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6. **Back Scratch Test:** With one hand reaching over the shoulder and one up the middle of the back, the number of inches between the extended middle fingers
 - Individual stands and reaches one hand over the same shoulder with the palm down and with the fingers extended and reaches as far down the back as able
 - Individual then places the other arm around the waist into the low back with the palm up, fingers extended, reaching up the middle of the back as far as possible
 - Individual tries to touch or overlap the middle fingers
 - Individual reverses arms to test which position generates the best result
 - Be sure Individual breathes
 - Once determined, Individual practices the test twice
 - Make sure the middle fingers are pointed toward each other as able and move them into the position of best alignment without moving the patient's/client's hands
 - Do not allow the patient/client to grab the fingers and pull to increase the range of motion
 - Perform two practice trials in preferred position, then two test trials
 - Measure the distance between the tips of the middle fingers to the nearest half inch, regardless of alignment behind the back
 - Indicate a minus if the fingers do not reach and a plus if the middle fingers overlap
 - Record the better of the two trials

7. **8-Foot Up-And-Go Test:** Number of seconds required to get up from a seated position, walk 8 feet, turn, and return to a seated position
 - Place the chair next to a wall (for safety) and the marker 8 feet in front of the chair
 - Clear the path between the chair and the marker
 - Subject starts fully seated, hands resting on the knees and feet flat on the ground
 - On the command, "Go," timing is started and the subject stands and walks (no running) as quickly as possible (and safely) to and around the cone, returning to the chair to sit down
 - Timing stops as they sit down
 - Perform two trials

8. **Height and Weight:** Measuring height and weight and determining body mass index

Administer the tests in the following order (Note: the 6-minute walk should be tested on a separate day to avoid undue fatigue)

Chair stand
 Arm curl
 2-minute step
 Chair sit and reach
 Back scratch
 8-foot up and go
 6-minute walk test

Test Age	60-64	65-69	70-74	75-79	80-84	85-89	90-94

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Chair Stands (#)							
Women	12-17	11-16	10-15	10-15	9-14	8-13	4-11
Men	14-19	12-18	12-17	11-17	10-15	8-14	7-12
Arm Curls (#)							
Women	13-19	12-18	12-17	11-17	10-16	10-15	8-13
Men	16-22	15-21	14-21	13-19	13-19	11-17	10-14
6-Minute Walk (yds)							
Women	545-660	500-635	480-615	435-585	385-540	340-510	275-440
Men	610-735	560-700	545-680	470-640	445-605	380-570	305-500
2-Minute Steps (#)							
Women	75-107	73-107	68-101	68-100	60-90	55-85	44-72
Men	87-115	86-116	80-110	73-109	71-103	59-91	52-86
Chair Sit-Reach (in.)	60-64	60-64	60-64	60-64	60-64	60-64	60-64
Women	-0.5 ± 5.0	-0.5 ± 4.5	-1.0 ± 4.0	-1.5 ± 3.5	-2.0 ± 3.0	-2.5 ± 2.5	-4.5 ± 1.0
Men	-2.5 ± 4.0	-3.0 ± 3.0	-3.0 ± 3.0	-4.0 ± 2.0	-5.5 ± 1.5	-5.5 ± 0.5	-6.5 ± 0.5
Back Scratch (in.)							
Women	-3.0 ± 1.5	-3.5 ± 1.5	-4.0 ± 1.0	-5.0 ± 0.5	-5.5 ± 0.0	-7.0 ± 1.0	-8.0 ± 1.0
Men	-6.5 ± 0.0	-7.5 ± 1.0	-8.0 ± 1.0	-9.0 ± 2.0	-9.5 ± 2.0	-9.5 ± 3.0	-10.5 ± 4.0
8 Foot Up and Go (sec.)							
Women	6.0-4.4	6.4-4.8	7.1-4.9	7.4-5.2	8.7-5.7	9.6-6.2	11.5-7.3
Men	5.6-3.8	5.9-4.3	6.2-4.4	7.2-4.6	7.6-5.2	8.9-5.5	10.0-6.2
BMI							
Women	26.3	26.5	26.1	25.4	24.7	24.3	24.1

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Men	27.4	27.5	26.6	26.4	26.1	24.9	24.9

FITNESSGRAM® TEST-Presidential Youth Fitness Program

(To order the *FITNESSGRAM* software and related resources, call Human Kinetics at 800-747-4457, or order online at www.HumanKinetics.com.)

MUSCULAR STRENGTH, ENDURANCE, AND FLEXIBILITY

Abdominal Strength and Endurance

- Partner A performs the curl-ups while partner B counts and watches for form errors
- Partner A lies in a supine position on the mat, knees bent at an angle of approximately 140°, feet flat on the floor, legs slightly apart, arms straight and parallel to the trunk with palms of hands resting on the mat
- The fingers are stretched out and the head is in contact with the mat. Make sure have extended their feet as far as possible from the buttocks while still allowing feet to remain flat on floor; the closer the feet are positioned in relation to the buttocks, the more difficult the movement
- After partner A has assumed the correct position on the mat, partner B places a measuring strip on the mat under partner A's legs so that partner A's fingertips are just resting on the nearest edge of the measuring strip
- Partner B then kneels down at partner A's head in a position to count curl-ups and watch for form breaks
- Partner B places a piece of paper under partner A's head; the paper will assist partner B in judging if partner A's head touches down on each repetition
- Before beginning the curl-up, it is a good practice for partner B to pull on partner A's hands to ensure that the shoulders are relaxed and in a normal resting position; if partner A is allowed to hunch the shoulders before beginning the test, he or she may be able to get the fingertips to the other side of the testing strip by merely moving the arms and shoulders up and down
- Keeping heels in contact with the mat, partner A curls up slowly, sliding fingers across the measuring strip until fingertips reach the other side; then partner A curls back down until his or her head touches the piece of paper on the mat
- Movement should be slow and gauged to the specified cadence of about 20 curl-ups per minute (1 curl every 3 seconds)
- Someone should call a cadence or use a prerecorded cadence; a recorded cadence should be used to ensure accurate testing for students
- Partner A continues without pausing until he or she can no longer continue or has completed 75 curl-ups.
- NOTE:
 - o Heels must remain in contact with the mat
 - o Head must return to the mat on each repetition
 - o Pauses and rest periods are not allowed. Movement should be continuous and with the cadence
 - o Fingertips must touch the far side of the measuring strip

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Trunk Extensor Strength and Endurance

- The student being tested lies on the mat in a prone position
- Toes are pointed and hands are placed under the thighs
- Place a coin or other marker on the floor in line with the student's eyes - during the movement, the student's focus should not move from the coin or marker
- Student lifts the upper body off the floor, in a very slow and controlled manner, to a maximum height of 12 inches; head should be maintained in a neutral (straight) alignment with the spine
- Position is held long enough to allow the tester to place the ruler on the floor in front of the student and determine the distance from the floor to the student's chin; ruler should be placed at least an inch to the front of the student's chin and not directly under the chin
- Once the measurement has been made, student returns to the starting position in a controlled manner
- Allow two trials, recording the highest score.
- NOTE:
 - o Do not allow students to do ballistic, bouncing movements
 - o Do not encourage students to raise higher than 12 inches; the Healthy Fitness Zone ends at 12 inches, and scores beyond 12 inches will not be accepted by the computer; excessive arching of the back may cause compression of the spinal discs
 - o Maintaining focus on the spot on the floor should assist in maintaining the head in a neutral position

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- o Partner B should make the reading at eye level and, therefore, should assume a squat or lying down position



Upper Body Strength and Endurance

90° Push-Up (Preferred)

- Students should be paired; one will perform the test while the other counts 90° push-ups and watches to see that the student being tested bends the elbow to 90° with the upper arm parallel to the floor
- Student being tested assumes a prone position on the mat with hands placed under or slightly wider than the shoulders, fingers stretched out, legs straight and slightly apart, and toes tucked under
- Student pushes up off the mat with the arms until arms are straight, keeping the legs and back straight; back should be kept in a straight line from head to toes throughout the test
- Student then lowers the body using the arms until the elbows bend at a 90° angle and the upper arms are parallel to the floor
- Movement is repeated as many times as possible
- Student should push up and continue the movement until the arms are straight on each repetition
- Rhythm should be approximately 20 90° push-ups per minute or 1 90° push-up every 3 seconds
- Students is stopped when the second form correction (mistake) is made; only one form correction is allowed

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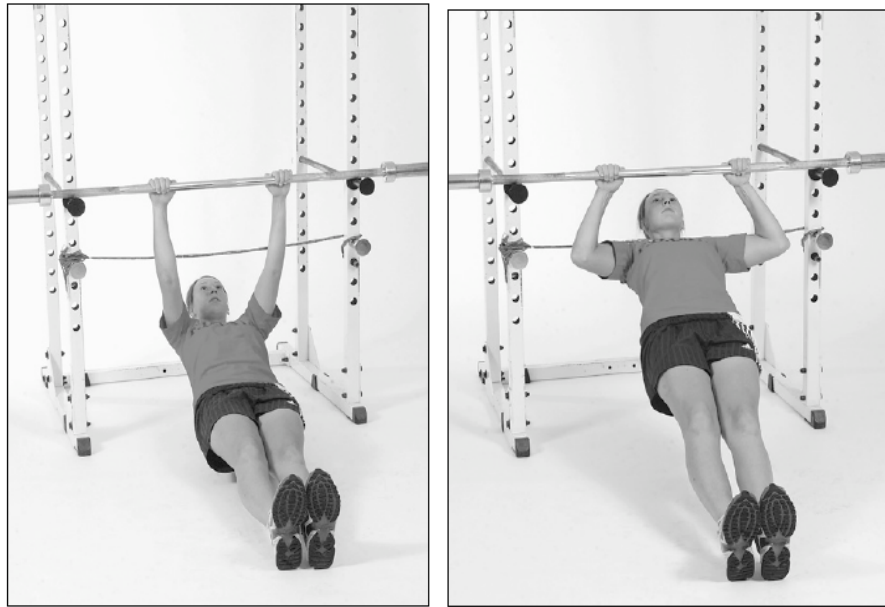
- Score is the number of 90° push-ups performed. For ease in administration, it is permissible to count the first incorrect 90° push-up.
- NOTE: Correct form if
 - o Stopping to rest or not maintaining a rhythmic pace
 - o Not achieving a 90° angle with the elbow on each repetition
 - o Not maintaining correct body position with a straight back
 - o Not extending arms fully



Modified Pull-Up (Alternative)

- Position student on back with shoulders directly under a bar that has been set 1 to 2 inches above student's reach
- Place an elastic band 7 to 8 inches below and parallel to the bar
- Student grasps the bar with an overhand grip (palms away from body)
- Pull-up begins in this "down" position with arms and legs straight, buttocks off the floor, and only the heels touching the floor
- Student then pulls up until the chin is above the elastic band and then lowers the body to the "down" position
- Movement continues in a rhythmic manner
- Student is stopped when the second form correction is made
- No time limit, but movement should be rhythmical and continuous
- Student should not stop and rest
- NOTE: Correct form if
 - o Stopping to rest or not maintaining a rhythmic pace
 - o Not lifting the chin above the elastic band
 - o Not maintaining straight body position with only heels in contact with the floor
 - o Not fully extending arms in the down position

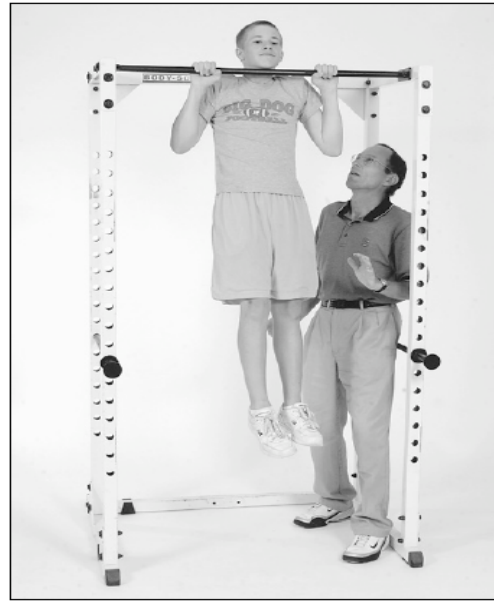
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Flexed Arm Hang (Alternative)

- Student grasps the bar with an overhand grip (palms facing away)
- With assistance of one or more spotters, student raises the body off the floor to a position in which the chin is above the bar, elbows are flexed, and the chest is close to the bar
- Stopwatch is started as soon as the student takes this position and position is held as long as possible
- Watch is stopped when one of the following occurs: a) student's chin touches the bar; b) student tilts head back to keep the chin above the bar; or c) student's chin falls below the bar
- Score is the number of seconds for which the student is able to maintain the correct hanging position.
- NOTE:
 - o The body must not swing during the test; if the student starts to swing, assistant should hold an extended arm across the front of the thighs to prevent the swinging motion
 - o Only one trial is permitted unless the tester believes that the student has not had a fair opportunity to perform

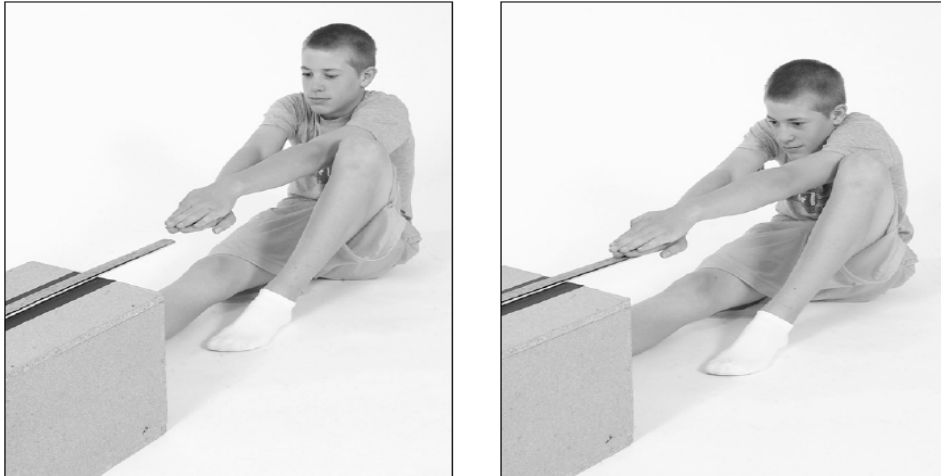
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Flexibility – Back-Saver Sit And Reach

- Student removes shoes and sits down at the test apparatus
- One leg is fully extended with the foot flat against the face of the box
- Other knee is bent with the sole of the foot flat on the floor; instep is placed in line with, and 2 to 3 inches to the side of, the straight knee
- Arms are extended forward over the measuring scale with the hands placed one on top of the other
- With palms down, student reaches directly forward (keeping back straight and the head up) with both hands along the scale four times and holds the position of the fourth reach for at least 1 second
- After one side has been measured, switch the position of the legs and reach again
- Student may allow the bent knee to move to the side as the body moves forward if necessary, but the sole of the foot must remain on the floor
- Record number of inches on each side to the nearest 1/2 inch reached, to a maximum score of 12 inches
- Performance is limited to discourage hypermobility; to be in the Healthy Fitness Zone, the student should meet the standard on both the right and the left sides.
- NOTE: Suggestions
 - o The bent knee moves to the side, allowing the body to move past it, but the sole of the foot must remain on the floor
 - o Keep the back straight and the head up during the forward flexion movement
 - o The knee of the extended leg should remain straight; tester may place one hand above student's knee to help keep knee straight
 - o Hands should reach forward evenly
 - o The trial should be repeated if the hands reach unevenly or the knee bends
 - o Hips must remain square to the box. Do not allow student to turn the hip away from the box while reaching

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Flexibility – Shoulder Stretch (Optional)

- Allow students to select a partner; partner judges ability to complete the stretch
- To test the right shoulder, partner A reaches with the right hand over the right shoulder and down the back as if to pull up a zipper or scratch between the shoulder blades; at the same time partner A places the left hand behind the back and reaches up, trying to touch the fingers of the right hand
- Partner B observes whether the fingers touch
- To test the left shoulder, partner A reaches with the left hand over the left shoulder and down the back as if to pull up a zipper or scratch between the shoulder blades. At the same time partner A places the right hand behind the back and reaches up, trying to touch the fingers of the left hand
- Partner B notes whether the fingers touch; if student is able to touch fingers with the left hand over the shoulder, a “Y” is recorded for the left side; if not, an “N” is recorded; if student is able to touch the fingers with the right hand over the shoulder, a “Y” is recorded for the right side; otherwise an “N” is recorded
- To achieve the Healthy Fitness Zone, a “Y” must be recorded on both the right and left side

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PROGRESSIVE AEROBIC CARDIOVASCULAR ENDURANCE RUN

PACER (Preferred)

The PACER is a multistage fitness test adapted from the 20-meter shuttle run test published by Leger and Lambert (1982) and revised in 1988 (Leger et al.) The PACER is recommended for all ages, but its use is strongly recommended for participants in grades K-3.

- Requires a flat, non-slippery surface at least 20 meters long, CD or cassette player with adequate volume, CD or audiocassette, measuring tape, marker cones, pencil, and copies of score sheet A or B
- Students should wear shoes with nonslip soles
- Plan for each student to have a 40- to 60-inch-wide space for running
- May want to paint lines or draw chalk lines to assist students in running in a straight line
- Mark the 20-meter (21-yard, 32-inch) course with marker cones to divide lanes and a tape or chalk line at each end
- If using the audiotape, calibrate it by timing the 1-minute test interval at the beginning of the tape
- Make copies of score sheet A or B for each group of students to be tested
- Before test day, allow students to listen to several minutes of the tape so that they know what to expect
- Students should then be allowed at least two practice sessions
- Allow students to select a partner
- Have students who are being tested line up behind the start line
- The individual PACER CDs have two music versions, one with only the beeps, and one with the cadences for the pushup and curlup tests. Each version of the test will give a 5-second countdown and tell the students when to start
- Students should run across the 20-meter distance and touch the line with their foot by

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the time the beep sounds; at the sound of the beep, they turn around and run back to the other end; if some students get to the line before the beep, they must wait for the beep before running the other direction

- Students continue in this manner until they fail to reach the line before the beep for the second time
- A single beep will sound at the end of the time for each lap
- A triple beep sounds at the end of each minute; the triple beep serves the same function as the single beep and also alerts the runners that the pace will get faster
- Inform students that when the triple beep sounds they should not stop but should continue the test by turning and running toward the other end of the area.

When to stop

- The first time a student does not reach the line by the beep, the student stops where he or she is and reverses direction immediately, attempting to get back on pace
- Test is completed for a student the next time (second time) fails to reach the line by the beep (the two misses do not have to be consecutive; the test is over after two total misses)
- Students just completing the test should continue to walk and stretch in the designated cool-down area

Scoring

- Have the scorer record the lap number (crossing off each lap number) on a PACER score sheet

Suggestions for Test Administration

- Both PACER CDs contain 21 levels (1 level per minute for 21 minutes); during the first minute, the 20-meter version allows 9 seconds to run the distance; the 15-meter version allows 6.75 seconds; the lap time decreases by approximately one-half second at each successive level
- Make certain that students have practiced and understand that the speed will increase each minute
- A single beep indicates the end of a lap (one 20-meter distance); the students run from one end to the other between each beep; caution students not to begin too fast; the beginning speed is very slow; nine seconds is allowed for running each 20-meter lap during the first minute
- Triple beeps at the end of each minute indicate the end of a level and an increase in speed; students should be alerted that the speed will increase; when students hear the triple beeps they should turn around at the line and immediately continue running; some students have a tendency to hesitate when they hear the triple beeps
- A student who cannot reach the line when the beep sounds should be given one more chance to attempt to regain the pace; the second time a student cannot reach the line by the beep, his or her test is completed
- Groups of students may be tested at one time; adult volunteers may be asked to help record scores; students may record scores for each other or for younger students
- Each runner must be allowed a path 40 to 60 inches wide; it may work best to mark the course
- If using the audiotape, you may save time by using two tapes and two cassette players;

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rewind the first tape while the second group is running the tests, and so forth; using the CD is a much more efficient method for administering this test item

One-mile Run/Walk (Alternative)

- Measure resting heart rate
- The purpose of this test is to complete one mile in the fastest possible time
- After the purpose of the test and instructions are given, the participants begin running on the count "Ready? Go!"
- If they desire, walking may be interspersed with running, however, they should be encouraged to cover the distance in as short a time as possible
- For younger children a shorter test can be performed, using the same procedures: 1/4 mile for 6-7 years old, and 1/2 mile for 8-9 years old
- Scoring: the time in minutes and seconds, it took to complete the mile which can be compared to published norms for similar age groups
- Also check post activity heart rate

One mile Walk (Alternative)

- Target population - test is designed for ages 13 and older since it hasn't been validated with younger samples
- Measure resting heart rate
- The aim of this test is to complete a 1-mile course in the shortest possible time, while maintaining a constant walking pace the entire distance
- At the start, all participants are to line up behind the starting line
- On the command 'go,' begin walking at their own pace
- At the conclusion of walk, each person should measure a 15-second heart rate count
- The walking time and the heart rate are recorded; if using a heart rate monitor, the student can record their own time, and the last heart rate recorded during the walk is used for the walking heart rate score
- Scoring: the total time to complete the course in minutes and seconds
- Walk time and 15-second heart rate are entered in the FITNESSGRAM software
- Estimated VO_{2max} is calculated using the Rockport Fitness Walking Test equation

BODY COMPOSITION FOR CHILDREN

Body Mass Index

<http://apps.nccd.cdc.gov/dnpabmi/calculator.aspx>

- For children and teens, BMI is age- and sex-specific and is often referred to as BMI-for-age
- After BMI is calculated for children and teens, the BMI number is plotted on the CDC BMI-for-age growth charts (for either girls or boys) to obtain a percentile ranking
- Percentiles are the most commonly used indicator to assess the size and growth patterns of individual children in the United States
- The percentile indicates the relative position of the child's BMI number among children of the same sex and age. The growth charts show the weight status categories used with children and teens (underweight, healthy weight, overweight, and obese)

BMI-for-age weight status categories and the corresponding percentiles are shown below

Weight Status Category	Percentile Range
Underweight	Less than the 5th percentile
Healthy weight	5th percentile to less than the 85th percentile
Overweight	85th to less than the 95th percentile
Obese	Equal to or greater than the 95th percentile

Slaughter-Lohman 2-Site Children Skinfold Formula

- This description is specifically for the SKYINDEX SYSTEM I programed with the Slaughter-Lohman formula (Slaughter-Lohman is named after the authors of the original research study)
- Each formula was developed from the results of underwater weighing and skinfold data taken from several hundred individuals over a wide range of age, body structure, body composition and exercise habits
- Skinfold equations shown below are used to predict body fat in children 8-18 years of age
- Dial Position 1 on Slaughter-Lohman Skyndex I Caliper (OR 11 if multi-formula unit) Boys: % Body Fat = $0.735 (\text{Triceps} + \text{Calf}) + 1.0$
- Dial Position 2 on Slaughter-Lohman Skyndex I Caliper (OR 12 if multi-formula unit) Girls: % Body Fat = $0.610 (\text{Triceps} + \text{Calf}) + 5$
- Triceps - Measure vertically on back of arm midway between top of shoulder point (acromium process) and elbow (olecranon process)
- Calf – Measure inside (medial) of the right lower leg at the greatest calf girth

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INSTITUTE OF MEDICINE

FOR NATIONAL YOUTH FITNESS SURVEYS

- To measure body composition, national surveys should include:
 - o body mass index (BMI) as an estimate of body weight in relation to height,
 - o skinfold thickness at the triceps and below the shoulder blade as indicators of underlying fat, and
 - o waist circumference as an indicator of abdominal fat.
- To measure cardiorespiratory endurance, national surveys should include a progressive shuttle run, such as the 20-meter shuttle run.* If physical space is limited, cycle ergometer or treadmill tests are valid and reliable alternatives.
- To measure musculoskeletal fitness, national surveys should include handgrip strength and standing long jump tests

FOR FITNESS TESTING IN SCHOOLS

- To measure body composition, BMI should be used.
- To measure cardiorespiratory endurance, schools should include a progressive shuttle run.
- To measure musculoskeletal fitness, schools should include handgrip strength and standing long jump tests.

For schools, additional test items that have not yet been shown to be related to health but that are valid, reliable, and feasible also may be considered as supplemental educational tools (such as distance or timed runs for cardiorespiratory endurance, the modified pull-up and push-up for measuring upper-body musculoskeletal strength, or the curl-up for measuring core strength). A measure of flexibility, such as the sit-and-reach test, also may be included.

HEALTH PROMOTION, WELLNESS, AND PREVENTION

Upon successful completion of the curriculum, the students will be expected to:

1. Analyze existing documents, models, etc of health, wellness, and prevention including:
 - a. Healthy People 2020
 - b. Guide to Physical Therapist Practice
 - i. Elements of patient/client management
 - c. World Health Organization's International Classification of Functioning, Disability and Health (ICF) disablement model
2. Describe the rationale for the inclusion and implementation of a focus on health promotion, wellness, and prevention for physical therapist practice
3. Define health, health promotion, wellness, and prevention
4. Analyze models of individual health behavior
 - a. Health Belief Model
 - b. The Transtheoretical Model/Stages of Change
5. Analyze, compare and contrast models of community health behavior
 - a. Precede-Proceed Model
 - b. Ecological Models
 - c. Dissemination of Innovations
 - d. Community Organization
 - e. Community Building
 - f. Media Frameworks
6. Analyze models of interpersonal health behavior
 - a. Social Cognitive Theory
 - b. Social Support and Social Networks
 - c. Stress and Coping
7. Describe examples of health promotion, wellness, and prevention literature based on each of the individual, interpersonal, and community health behavior models
8. Identify and describe administration of individual assessment tools/forms related to health promotion, wellness, and prevention across the lifespan
9. Analyze the basic components of selecting, implementing, and evaluating public health programs
10. Recognize behaviors that present threats to health promotion, wellness, and prevention
11. Identify sources of information and patient education materials related to health promotion, wellness, and prevention
12. Define and differentiate the terms 'chronic disease' and 'non-communicable disease'
13. Discuss the risk factors for developing common chronic diseases and analyze their personal lifestyles to determine how to minimize those risks
14. Understand the health risks associated with the risk factors associated with the 'non-communicable diseases' (tobacco use, harmful use of alcohol, unhealthy diet, insufficient physical activity, overweight/obesity, hypertension, elevated blood sugar, and raised cholesterol)
15. Discuss the rate of smoking in America and tobacco prevention/cessation programs
16. Demonstrate the ability to screen for the major non-communicable diseases (BMI, waist circumference, tobacco use, physical activity level – as outlined in the World Health Professions Alliance Health Improvement Card)
17. Describe interventions to address individual and community health promotion, wellness, and prevention needs
18. Identify and analyze outcome measures related to health promotion, wellness, and prevention
19. Discuss issues of motivation, compliance, and goal setting
20. Apply concepts of motivational interviewing to individuals to enhance healthy lifestyle behaviors
21. Analyze the impact of culture and health literacy on how communities receive and

ATTACHMENT 2

perceive healthcare

22. Describe modifications to assessments, education, and interventions related to health promotion, wellness, and prevention based on principles of cultural competency including:
 - a. Literacy
 - b. Health literacy
 - c. Language
 - d. Client's cultural values
 - e. Client's preferences
23. Analyze methods used to advocate for physical therapy services for prevention, health promotion, and wellness to individuals, groups and communities