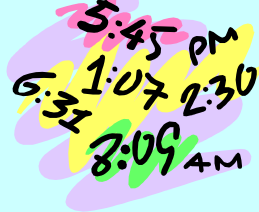


IWA Strength Training for Seniors

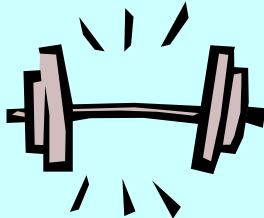
Age Myths & Stereotypes

- Age is just a number
- Older people are too frail for exercise



Why Train?

- Rate of muscle mass loss doubles after age 50.
 - Nelson et al. 1994
- Degenerative diseases with aging are related to loss of muscle mass & strength.
 - Evans & Rosenberg 1992
- In adults who do not exercise – 5-10% decrease in strength per decade.



Benefits of Strength Training

- Increased Strength
- Improved Body Comp
- Increased Metabolic Rate
- Increase Bone Density
- Improve GI mobility
- Decrease resting BP
- Improve blood lipids
- Improve post-coronary performance
- Enhanced self-confidence
- Relieve Depression
- Increased strength of connective tissue
- Decrease arthritic pain

IWA Strength Training for Seniors

Translation: Improved Function & Independence

Kalapothrarakos et al. Effects of resistance training on muscle function

- 33 subjects 60-70 yrs
 - 3 groups: control, high-intensity (80%1RM), low-intensity (60% 1RM)
 - 12 week study
 - Exercise sessions 3x/week
 - Significant improvements in both exercise groups
 - Most benefit in high intensity group
- Journal of Aging & Physical Activity 2004

Liu-Ambrose et al. Resistance training vs. agility training in reducing falls

- 98 women aged 75-85
 - 3 groups: resistance, agility, stretching (control)
 - 25 week study
 - Training 2x/week
 - Fall risk scores decreased in all groups – most dramatic in resistance group
 - Subjects improved most during last half of study
- Journal of the American Geriatric Society 2004

IWA Strength Training for Seniors

Villareal et al.

Addition of exercise to hormone replacement in elderly women

- 28 women aged 75-87
- 2 groups: home exercise for flexibility & supervised exercise 3x/week (flexibility, balance, & resistance exercises)
- 9 month study
- Bone mineral density increased 1.5% in home group 3.5% in exercise group

– Journal of the American Geriatric Society 2003

Fiatarone et al.

Strength training of the very old

- 9 frail institutionalized elderly (89-91 yrs)
- 8 weeks of training
- 1 muscle group trained
- Week 1: 50% 1RM
- Weeks 2-8: 80% 1RM
- Significant strength gains in all subjects
- Functional mobility improved
- 5 showed 48% increase in tandem gait test
- Deconditioning: 32% loss after 4 weeks

– JAMA 1990

Ades et al.

Effects of strength training on women with heart disease

- 42 women 65 and older with low self-reported physical function
- 6 month program
- 2 groups: control and resistance trained
- Resistance group showed significant improvement in strength, and physical performance (ADL's)

– Medicine & Science in Sports & Exercise 2003

IWA Strength Training for Seniors

Ades et al.

Weight training improves walking endurance in healthy elderly persons

- 24 community dwelling men & women 65 and over
- 2 groups: resistance trained and control
- Resistance group 3x/week x 12 weeks using Universal Gym. 50-80% 1RM used.
- Resistance group increased walking endurance by 9 min (38%)
- No change in control group

– Annals of Internal Medicine 1996

Suzetta et al.

Resistance training in the early postoperative phase reduces hospitalization and leads to muscle hypertrophy in elderly hip surgery patients

– Journal of the American Geriatrics Society 2004

Suzetta et al.

- 36 patients (60-86 yrs)
- 3 groups 12 week study
 - Home based standard rehab (1hr/day)SR
 - Unilateral e-stim (1hr/day)ES
 - Unilateral resistance training (3x/week)RT
- Testing: pre Sx, 5 & 12 weeks post Sx
 - Length of hospital stay
 - Muscle cross-sectional area
 - Isokinetic strength
 - Functional performance

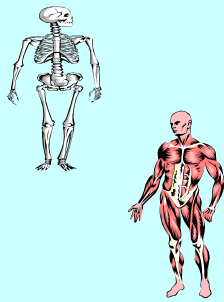
IWA Strength Training for Seniors

Results

- 37% shorter hospital stay for RT group vs. SR.
- No improvements in SR group from baseline
- RT increased max gait speed 30%. ES 19%.
- RT increased stair climb 28%. ES 19%
- Sit-stand improved 30% for RT. 21%ES.
- Quad muscle CSA: RT increased 12%. SR decreased 9%. ES increased 7%.

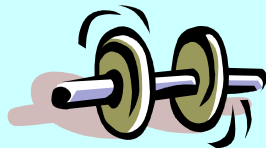
Physiological Changes

- Integumentary
- Skeletal
- Muscular
- Cardiovascular
- Respiratory
- Eyes and Ears
- Nervous



Principles of Strength Training

- Overload
- Specificity
- Progression
- Regression



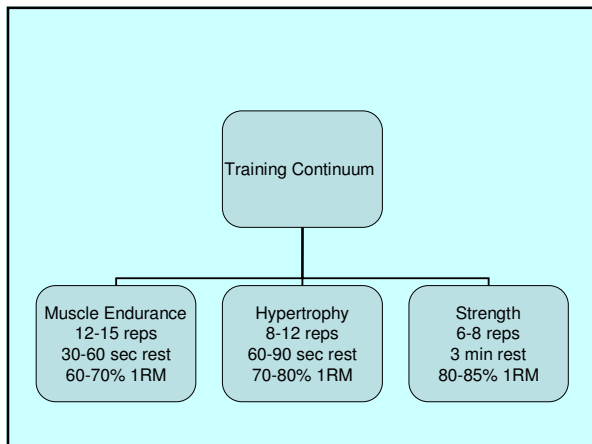
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Program Design Variables

- Exercise Selection
 - 1 exercise for each major muscle group
- Training Frequency
 - 2-3 sessions per week on non consecutive days
- Exercise Order
 - Large muscle groups before smaller
 - Trunk stabilization last
- Exercise Sets
 - Beginners: 1 set
 - Advanced: 2-3 sets

Training Design Variables cont.

- Rest Periods
 - Depends on resistance used
- Training Progression
 - Increase by 5% or less when target repetitions are completed with good form on 2 consecutive workouts
- Exercise Load & Repetitions
 - Beginners: 12-15 reps
 - Advanced: 6-12 reps

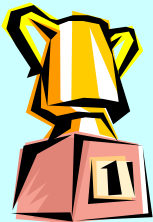


IWA Strength Training for Seniors

Warm up Cool Down

- Transition from resting state to active
- 5 - 10 minutes
- Give indication of exercise tolerance
- Good time for education, discuss goals, etc
- Transition to a more restful state
- 5 -10 minutes
- Important for the CV system

Success! Teaching Strategies



- Proper breathing
- Proper Technique
- Full movement range
- Controlled speed
- Proper stabilization
- Watch Grip

Barriers

- Time
- Cost
- Transportation
- Pain
- Fear
- Effort
- Do not see benefit



IWA Strength Training for Seniors

Overcoming barriers

- FUN
- Convenient scheduling
- Good instruction
- Input in goals
- Expectations
- Activity = Benefit



Types of Equipment

- Free weights
- Machines
- Swiss balls
- Cuff Weights
- Balance Boards
- T-bands
- Sports cord
- Body Resistance



Guidelines for Exercises Appropriate Modifications

- Group Work / Lab



IWA Strength Training for Seniors

Beginner Program

- Divided into 5 2-week segments
- Starts with 5 exercises utilizing major muscle groups
- New exercises added every 2 weeks
- Start with 12-15 rep range & increase to 8-12 (trunk curl 15-30 reps)
- Advance weight when client able to perform 15 reps with good form on 2 consecutive workouts
- Increase weight by about 5%

Split programs

- Advantages
 - Can workout on consecutive days
 - Spread workout over 4 days to decrease time to complete workout
- Disadvantages
 - Must add an extra day of training per week

Alternative Programs

- Body Weight Exercises
- Therabands
- Sports cords
- Walking Program



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Monitoring Progress

- Objective data
 - Strength testing
 - MMT/dynamometer
 - Activities of daily living
 - Range of Motion
 - Flexibility
 - Balance Assessments
 - Functional Assessment
- Subjective data

Special Populations

- Obesity
- Diabetes
- Cardiovascular
- Osteoporosis
- Lower back pain
- Arthritis
- Depression
- Visual/Auditory Impairments
- General Frailty

Obesity

- Exercises to support body weight
- Nutritional counseling
- Breathing Exercises

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Diabetes

- Counter possibility of acute low blood sugar resulting from exercise + insulin supplementation
- Keep fruit juice / sugared foods handy
- Nutritional counseling
- Type 1 diabetics on beta blockers at risk for hypoglycemia
- Proper footwear / watch sensitivity

Cardiovascular Disease

- Post coronary patients 40% 1RM
- Proper breathing and grip
- Avoid isometrics
- Proper warm up & cool down
- Monitor HR / perceived exertion
- Avoid overhead activities initially
- Energy conservation

Osteoporosis

- Avoid spinal flexion exercises
- Avoid hip adduction/abduction against resistance machines
- For best results start with 50-60% 1RM and increase to 70-80% 1RM
- Tennis, golfing, and bowling should be avoided

IWA Strength Training for Seniors

Low Back Pain

- Include trunk flexion & extension exercises
- Include education on posture. Lifting, body mechanics
- Find cause of pain / Proper diagnosis

Arthritis

- Avoid exercises that increase joint pain
- Brief sessions
- Decrease variables during exacerbations
- Wrists in neutral
- Avoid overhead lifts with resistance
- Pool programs beneficial
- Avoid overtraining / Stress Flexibility

Depression

- Start with beginner workout
- Higher intensities shown to be more effective than lower intensity.

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Visual Impairments

- Proper lighting
- Large pictures for handouts
- Be aware of spacing and trip hazards in environment

Auditory Impairments

- Good acoustics
- Not overcrowded
- Face clients when speaking
- Demonstrations may be beneficial vs. verbal explanation
- Speak slowly

General Frailty

- Start with a single set
- Longer rest periods
- Lighter workloads
- Fewer exercises
- Progress gradually

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Nutrition

- Relationship of weight to disease
- Food pyramid
- Finding balance
- Adequate hydration (10-12 8oz glasses on exercise days)



Education is key



- Benefits of training on body comp & metabolic rate
- General label reading
- Drug interactions


Common Side Effects of Drugs

- Fatigue & Weakness (Beta-blockers, diuretics, vasodilators)
- Dizziness (antihypertensives, sedatives, Analgesics / NSAIDs)
- Postural Hypotension (anti-depressants, antiparkinsonians, antiarrhythmics, beta blockers, diuretics, CA channel blockers)

IWA Strength Training for Seniors

Additional Resources

- Web Sites



GOOD LUCK!