

---

---

---

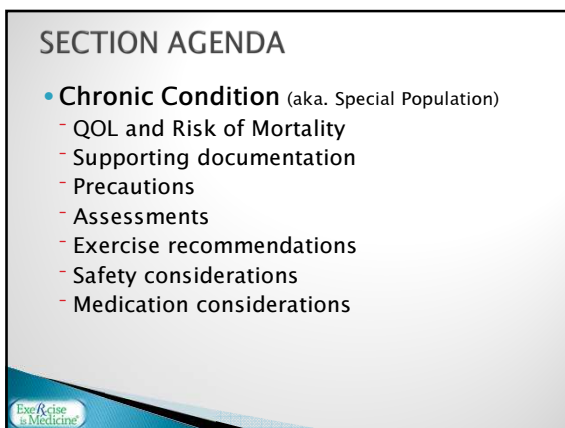
---

---

---

---

---



---

---

---

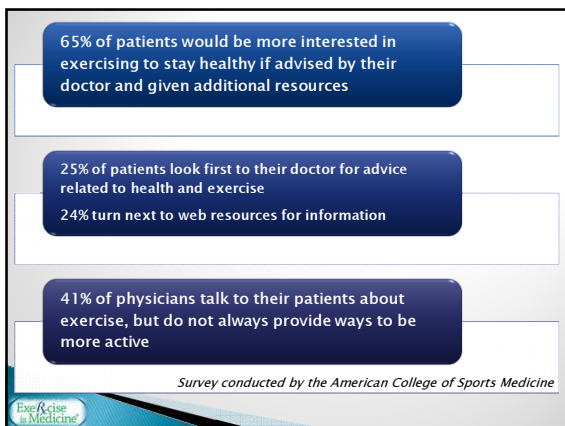
---

---

---

---

---



---

---

---

---

---


---

---

---

### Conditions Glossary

- ▶ QOL – Quality of Life
- ▶ ADL – Activities of Daily Living
- ▶ ROM – Range of Motion
- ▶ GXT – Graded Exercise Test
- ▶ RPE – Rating of Perceived Exertion (Borg Scale)
- ▶ BMI – Body Mass Index
- ▶ MET – Metabolic Equivalent
- ▶ RM – Repetition Maximum



---

---

---

---

---

---


---

---

### PHYSICAL EXERTION SCALE

6	
7	Very, Very Light
8	
9	Very Light
10	
11	Fairly Light
12	
13	Somewhat Hard
14	
15	Hard
16	
17	Very Hard
18	
19	Very, Very Hard
20	

BORG Subjective Rating of Perceived Exertion Scale



---

---

---

---

---

---


---

---


### Key References

- ▶ Use ACSM position stands (provided) as key references for developing exercise programs
- ▶ Exercise prescriptions are often modified starting with standard recommendations based on specific conditions and goals


ACSM position stands available at:  
(<http://www.acsm.org/access-public-information/position-stands>)



**Progression Models in Resistance Training for Healthy Adults**



**Quantity and Quality of Exercise for Developing and Maintaining and Maintaining Cardiorespiratory, Musculoskeletal, and Neuromotor Fitness in Apparently Healthy Adults: Guidance for Prescribing Exercise**



---

---

---

---

---

---

---

---



## Mental health, depression

» Exercise is Medicine™



Exercise is Medicine™

---

---

---

---

---

---

---

## Mental Health & Depression

### QOL & Risk of Mortality

- ▶ CAD patients with depression may have accelerated cognitive decline
- ▶ Long-term depression can decrease functional outcomes & increase mortality
- ▶ Has impact on self-esteem, motivation, relationships, & ability to function in everyday life
- ▶ Stress management & good physical health associated with good mental health
- ▶ Resiliency of client may help determine mental health

Exercise is Medicine™

---

---

---

---

---

---

---

## Mental Health & Depression

### Precautions

- ▶ Careful in how approach client you believe has mental health issue(s)
- ▶ Be aware of substance abuse signs - common in mentally ill clients
- ▶ Know positive coping skills & identify those with and without - those without at greater risk of depression

Exercise is Medicine™

---

---

---

---

---


---

---

## Mental Health & Depression

**Assessments**

- ▶ Need to monitor mental health/depression over period of time to ensure improvement or stability
- ▶ Monitor to know when to refer to health care provider
- ▶ Can use various measures to assess:
  - SF-36 (Quality of Life measure)
  - Beck Depression Index
  - Geriatric Depression Scale



---

---

---

---

---

---

---

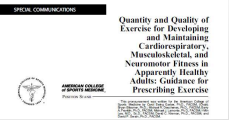
---

## Mental Health & Depression


**Exercise Recommendations - Aerobic**

- ▶ Follow ACSM/AHA Guidelines for healthy adults
- ▶ 30-60 minutes, 40-85% intensity, 5+ times per week

**FOCUS:** All modes acceptable - enjoyment is critical; group exercise good way to increase mental health while exercising



Quantity and Quality of Exercise for Developing and Maintaining Cardiorespiratory, Musculoskeletal, and Neuromotor Fitness in Apparently Healthy Adults: Guidance for Prescribing Exercise



<http://www.acsm.org/access-public-information/position-stands>

---

---

---

---

---

---

---

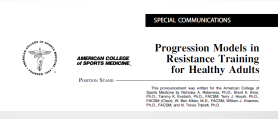
---

## Mental Health & Depression


**Exercise Recommendations - Resistance**

- ▶ Follow ACSM Resistance Training Guidelines

**FOCUS:** Start with low weight, high reps to decrease muscle soreness - pain is not a "friend" of those who are depressed or in poor mental health



Progression Models in Resistance Training for Healthy Adults



<http://www.acsm.org/access-public-information/position-stands>

---

---

---

---

---

---


---

---

## Mental Health

**Safety considerations**

- ▶ If you suspect illicit drug use or alcohol abuse, refer to proper health care professional
- ▶ Too much too soon can discourage client from returning for next session.
- ▶ Educate client on need to not push too hard at start of program.



---

---

---

---

---

---


---

---

## Mental Health

**Medication Considerations**

- Anti-depressants may cause drowsiness and should be monitored - no effect on exercise response



---

---

---

---

---

---

---

---

## Rheumatoid arthritis, low back pain, chronic pain

» Exercise is Medicine®



---

---

---

---

---

---


---

---

## Rheumatoid Arthritis

### QOL & Risk of Mortality

- Exercise has significant effects on joint function and mobility in RA patients leading to improved QOL and completion of ADL's
- Loss of flexibility and joint mobility as a result of inactivity due to movement-induced pain are significantly reduced with exercise
- Improvements in function, strength, and pain tolerance through ROM are often associated with a regular exercise and physical activity program



---

---

---

---

---

---


---

---

## Rheumatoid Arthritis

### Precautions

- Joint instability may be common in spine, foot/ankle, hip, and knee joints
- Pain tolerance may vary depending on patient, time of day, and previous exercise experience
- Exercise testing is indicated if necessary based on traditional risk stratification



---

---

---

---

---

---


---

---

## Rheumatoid Arthritis

### Assessments

- Timed chair rise
- Timed get up & go
- Symptom-limited GXT
- 6 minute walk test
- Functional ROM assessment / symmetry assessment
- Berg balance test
- Additional field assessments based on client history and function may be used effectively



---

---

---

---

---

---

---

---


## Rheumatoid Arthritis

### Exercise Recommendations – Aerobic

- 3–5 days/week of aerobic exercise
- 60–80% peak HR; subjective RPE 11–16/20
- Avoid high–impact exercises to reduce joint stress

**FOCUS:** large–muscle movements/ activities

- Emphasize progression of duration rather than intensity
- Increase warm–up duration



---

---

---

---

---

---


---

---

## Rheumatoid Arthritis

### Exercise Recommendations

- Avoid impact exercise and train within pain tolerance
- Exercise in early morning may be difficult due to joint stiffness
- Utilize a prolonged, progressive warm–up with a low/non impact modality (recumbent bike, recumbent stepper, etc.)



---

---

---

---

---

---

---

---

## Rheumatoid Arthritis


### Exercise Recommendations – Resistance

- Dynamic exercise may illicit pain
- Resistance training below pain threshold & through ROM without pain
- Isometric exercise may be indicated (contract and hold position for 6 seconds, repeat 2–6 repetitions)

**FOCUS:** functional exercises to help improve ADL's

- Encourage daily flexibility training

**Isometric exercise is often prescribed to minimize inflammatory response**



---

---

---

---

---

---

---


---



## Rheumatoid Arthritis

### Safety Considerations

- Avoid overstretching unstable joints
- Avoid excessive medial/lateral forces on affected joints
- Cervical spine subluxation due to instability, compression, and chronic nerve degeneration may increase difficulty of some exercise positions (i.e. supine)
- Joint pain/instability may cause loss of grip strength; important during lifting and moving objects



---

---

---

---

---

---


---

---

## Rheumatoid Arthritis

### Medication Considerations

- Commonly prescribed medications for RA are NSAIDs (nonsteroidal anti-inflammatory drugs) and disease modifying drugs as indicated by pain and disease progression
- No significant effects on exercise response, tolerance, or commonly monitored parameters including HR, BP, etc.



---

---

---

---

---

---


---

---

## Low Back Pain (LBP)

### QOL & Risk of Mortality

- Benefits of exercise are largely dependent on pain etiology, nature, and tolerance of pain with and without exercise
- Episodic LBP may not require treatment, but may be minimized with chronic exercise training
- QOL may be significantly improved if patients are encouraged to continue exercise and perception of painful behaviors is diminished or reduced



---

---

---

---

---

---


---

---

### Low Back Pain

**Precautions**

- LBP may be exacerbated by certain exercise positions that are not well tolerated
- Seated and standing exercise positions may increase pain and should be modified to a recumbent or non-load bearing position or modality (i.e. water exercise)
- Fear of pain and injury may be a significant limiting factor with LBP clients
- Exercises performed in a "neutral spine" position may limit pain exacerbations



---

---

---

---

---

---


---

---

### Low Back Pain

**Assessments**

- Most effectively used to determine limiting factors for exercise and estimating aerobic capacity
- GXT only indicated based on traditional risk factor stratification - not specific to LBP
- Functional strength testing
- Trunk flexibility testing - standard sit & reach as tolerated



---

---

---

---

---

---


---

---

### Low Back Pain

**Exercise Recommendations – Aerobic**

- 3-5 days per week
- 60 - 80% peak HR; 11-16/20 subjective RPE
- Avoid high-impact exercises
- Avoid awkward body postures and positions
- Focus on duration rather than intensity
- Prolonged warm up with stretching to improve functional performance



---

---

---

---

---

---

---

---


### Low Back Pain

**Exercise Recommendations – Resistance**

FOCUS: abdominal and back extensor strength and flexibility

FOCUS: trunk and hip flexor/extensor ROM

- Instruct proper lifting technique
- Increase repetitions and decrease weight for elderly or those with significant pain
- Exercise below pain threshold
- Repeat exercises 2-3 days/week



---

---

---

---

---

---


---

---

### Low Back Pain

**Medication Considerations**

- NSAID's are commonly prescribed – no effect on exercise response
- Anti-depressants and muscle relaxants may cause drowsiness and should be monitored – no effect on exercise response



---

---

---

---

---

---


---

---

### Chronic Pain

**QOL & Risk of Mortality**

- Improvements in chronic pain and QOL are highly dependent on site, etiology, duration, and tolerance of the pain response
- Significant improvements in pain symptomatology may be noted with regular rehabilitative exercise
- No specific exercise program has been determined to be superior for managing chronic pain



---

---

---

---

---

---

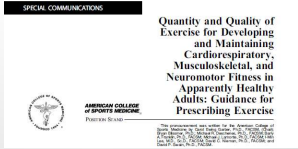
---

---

## Chronic Pain

### Precautions

- Programming based on ACSM guidelines for apparently healthy adults



http://www.acsm.org/access-public-information/position-stands

---

---

---

---

---

---

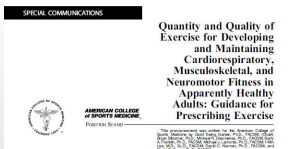
---

---

## Chronic Pain

### Exercise Recommendations

- Based on general guidelines for exercise prescription
- Modifications made based on specific pain site, tolerance, and positional considerations



http://www.acsm.org/access-public-information/position-stands

---

---

---

---

---

---


---

---

## Chronic Pain

### Medication Considerations

- NSAID's are commonly prescribed - no effect on exercise response
- Anti-depressants and muscle relaxants may cause drowsiness and should be monitored - no effect on exercise response



---

---

---

---

---



---

---

---

# Osteoporosis, osteoarthritis

» Exercise is Medicine™


---

---

---

---

---

---


---

---

## Osteoporosis

### QOL & Risk of Mortality

- Regular weight-bearing & resistance exercise training has been shown to improve and/or suspend bone mineral density declines
- Decreased risk of fracture is associated with participation in a regular exercise program
- Critical for decreased fracture risk in elderly to prevent complications associated with fractures, infection, and internal bleeding




---

---

---

---

---

---


---

---

## Osteoporosis

### Supporting documentation

SPECIAL COMMUNICATIONS



**AMERICAN COLLEGE  
OF SPORTS MEDICINE**

POSITION STAND

**Physical Activity and  
Bone Health**

This international position stand for the International College of Sports Medicine by Wendy M. Kohrt, Ph.D., FACSM, DPM,†; Heidi A. Hawton, Ph.D., FACSM, Nutrition, D., Life, FACSM; Maria C. Nelson, Ph.D., FACSM; and Vanessa R. Tringali, Ph.D.

**SUMMARY**

Weight-bearing physical activity has beneficial effects on bone health across the life span. Physical activity for the general elderly, high intensity walking for at least 30 minutes, 3-5 times per week, and high intensity resistance training for at least 2 times per week, 2-3 times per week, are associated with increased bone mineral density, improved bone quality, and decreased risk of fracture. Physical activity also improves balance and fall risk, and is associated with improved quality of life. However, evidence from multiple well-controlled, clinical trials suggests that the following exercise prescription will improve bone mineral density in elderly and adolescents:

**Mode:** Impact activities, such as jumping, plyometrics, and

may be indicated even for those postmenopausal women who are initially physically active. Given the current state of knowledge, these walking and resistance training recommendations are based on the best available evidence. Additional research is recommended to help persons from health care providers, researchers, and the general public.


**Mode:** Weight-bearing activities include static standing, walking, or low-impact aerobically demanding activities that involve jumping, resistance, and/or resistance training.

**Intensity:** Moderate to high intensity, or moderate to high intensity.

**Frequency:** Weight-bearing activities 3-5 days per week, resistance training 2-3 times per week.

**Duration:** 30-60 minutes of weight-bearing activities activities, including the aerobic training, and resistance training that begins at least weekly.

<http://www.acsm.org/access-public-information/pos/10n-stands>




---

---

---

---

---

---


---

---

## Osteoporosis

### Precautions

- High impact exercise should be avoided
- Avoid transverse plane exercises if spinal osteoporosis is present
- Careful monitoring of posture and positioning is necessary during exercise (particularly resistance training) to prevent fracture and pain
- Balance and functional training should be incorporated with caution



---

---

---

---

---

---


---

---

## Osteoporosis

### Assessments

- Symptom limited GXT as indicated based on traditional risk stratification
- 10 RM (repetition maximum) strength testing
- Dynamometer testing
- Gait analysis
- Balance testing
- Fall risk assessments
- Functional field testing
- 6 min walk



---

---

---

---

---

---

---

---


## Osteoporosis

### Exercise Recommendations - Aerobic

- 40 - 70% peak HR
- 3-5 days/week; 30 - 60 min aerobic sessions

**FOCUS:** avoid high-impact exercise; promote weight bearing exercise with minimal fall risk

- Increase duration rather than intensity
- Avoid uneven surfaces during exercise training



---

---

---

---

---

---

---


---

## Osteoporosis

### Exercise Recommendations – Resistance

- Resistance training to promote bone mineral density improvement and remodeling
- All modalities are indicated at modest resistance levels (~ 75% 1 RM)
- 2 sets, 8-10 repetitions, 2-3 days/week, all major muscle groups

**FOCUS:** improve trunk, hip flexors/extensors, lower extremity, back and abdominal muscle strength and flexibility



---

---

---

---

---

---


---

---

## Osteoporosis

### Safety Considerations

- Avoid sudden movement that may compromise balance
- Avoid high-impact exercise and contact activities
- Close attention paid to posture and movement patterns to prevent injury



---

---

---

---

---

---


---

---

## Osteoporosis

### Medication Considerations

- Osteoporosis medications often include estrogen receptor modulators or other antiresorptive medications, hormone replacement therapies (HRT), or a combination of them
- No known effect on exercise responses or tolerance



---

---

---

---

---



---

---

---

# Obesity

» Exercise is Medicine®



---

---

---

---

---

---


---

---

# Obesity

## QOL & Risk of Mortality

- Obesity (BMI > 30kg/m<sup>2</sup>) is an independent risk factor of cardiovascular disease
- Exercise decreases risk of mortality in overweight and obese clients by improving overall risk factor profile and improving metabolic health and fitness
- Independent of BMI, improved fitness decreases mortality by approximately 10 - 18% per MET increase in fitness
- Lowering body weight by 10% has significant impacts on joint health, mobility, overall function, and risk of other chronic disease (heart disease, diabetes)



---

---

---

---

---


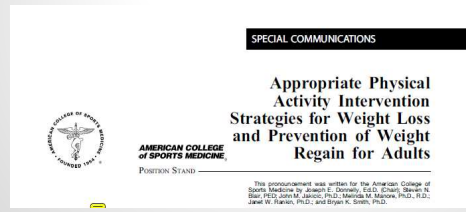
---

---

---

# Obesity

## Supporting Documentation



---

---

---

---

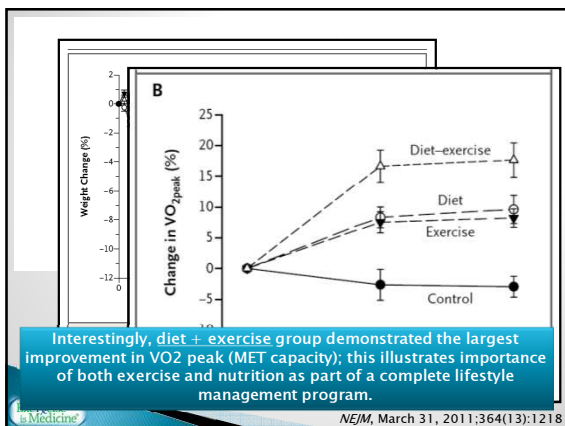
---

---

---

---






---

---

---

---

---

---

---

---

### Obesity

#### Precautions

- Exercise may cause overheating leading to dizziness, shortness of breath, and premature fatigue
- Hydration is very important during exercise
- Equipment size should be considered, particularly in the larger individuals; may compromise exercise effectiveness and personal comfort level
- Monitor for other co-morbidities (i.e. blood glucose) that may be affected by exercise

---

---

---

---

---

---

---

---

### Obesity

#### Assessments

- Clients are often at higher risk of cardiovascular disease; therefore, GXT may be indicated
- Protocols may require modification due to low exercise tolerance
- Circumference measurements for body comp
- Goniometry for ROM assessment
- Gait analysis
- Balance assessment to avoid falls

---

---

---

---

---

---

---


---

## Obesity

### Exercise Recommendations – Aerobic

- 40–60% peak HR; up to 75% if lower risk
- 5–7 days/week for 30–60 minutes total; may be separated into shorter sessions as tolerated

**FOCUS:** duration is significantly more important for weight management over intensity; encourage increasing duration and non-exercise physical activity on a daily basis



---

---

---

---

---

---

---

---


## Obesity

### Exercise Recommendations – Resistance

- Resistance training serves as a very valuable adjunct to aerobic exercise, however is often overlooked due to lower acute caloric expenditure

**FOCUS:** regular, consistent resistance training during weight loss can help preserve healthy lean body mass

- 40–50% RM (light-moderate weight)
- 2–3 days/week; 1–3 sets of 8–15 reps; all major muscle groups
- Increase sets and resistance as tolerated



---

---

---

---

---

---


---

---

## Obesity

### Safety Considerations

- Avoid high-impact exercises
- Joint pain is common during load-bearing exercises
- Postural changes may be difficult in this population (supine to prone, etc.)
- Machine size restrictions during exercise programming
- Consider seat positions on machines as high as possible to assist with mounting/dismounting
- Recommend 'dry-fit' clothing, particularly leg wear, to prevent chafing – very uncomfortable and potentially dangerous



---

---

---

---

---

---

---

---

## Obesity

### Medication Considerations

- Some appetite suppressants may increase blood pressure and cause an exaggerated response during exercise
- Be aware of medications used for co-morbidities that may effect exercise responses (see diabetes and cardiovascular disease sections)



---

---

---

---

---

---

---

## Obesity – Bariatric Surgery

### Special Considerations

- Rapid weight loss induced by bariatric procedures may accelerate lean muscle loss, which may lead to balance issues, weakness, and fatigue
- Endurance and exercise tolerance may be severely impaired ( $VO_2$  peak  $< 20$  ml/kg/min is not uncommon)

**FOCUS:** Exercise may be introduced slowly as tolerated shortly after surgery; short (5 min) intervals of exercise may be appropriate early in a program



---

---

---

---

---

---

---