Exercise in Chronic Pain

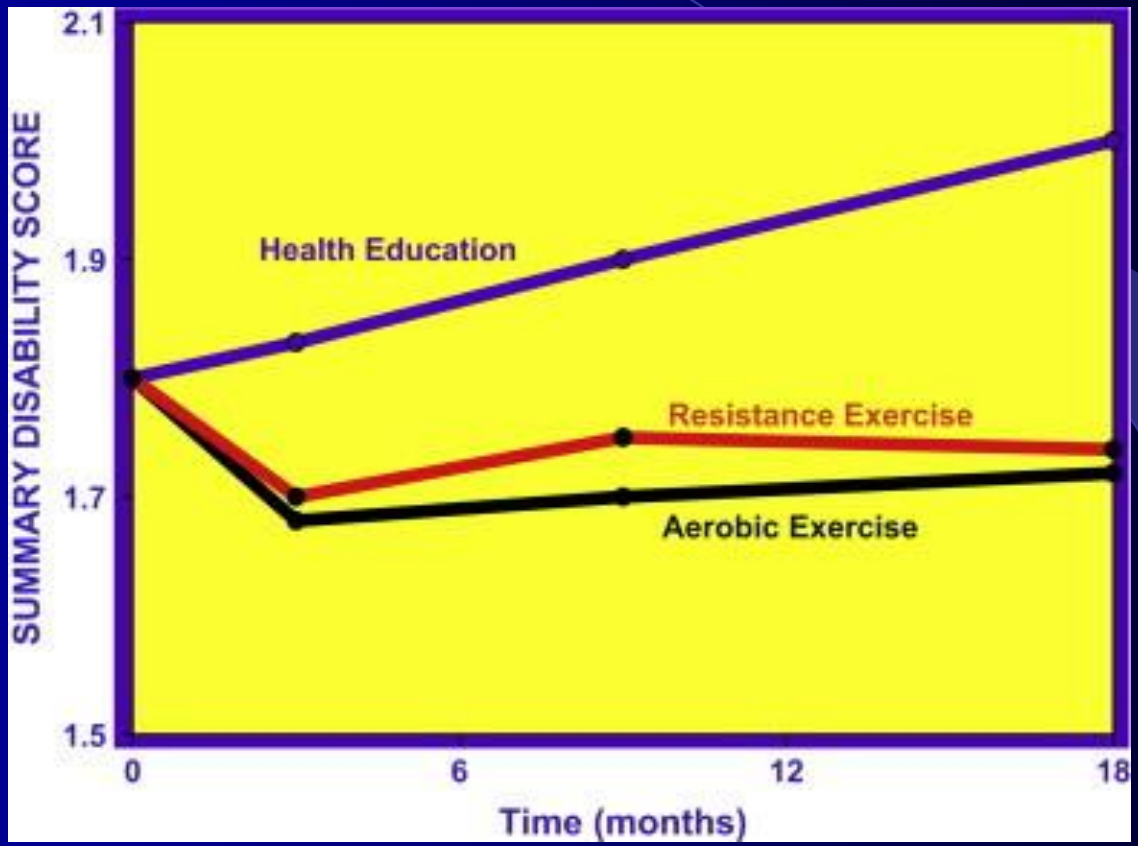
Pros

Cons

Why Exercise?

- Decrease pain
  - Elevation in pain thresholds. not directly related to plasma endorphin levels.Med Sci Sports Exerc. 1991 Mar;23(3):334-42
  - Decrease inflammation (next slide)
- Increase ability to participate in life
  - systematic increases in both exercise levels and expectancies of capability while reducing worry and concern about exercising. Pain. 1986 Mar;24(3):365-72

Arthritis in Seniors



The Fitness Arthritis and Seniors Trial (FAST). JAMA 1997;277(1):29

Anti-inflammatory Benefits of Exercise

- Most significant drop in CRP is when sedentary adults move from sedentary lifestyle to regular, low to moderate intensity exercise program.

- As exercise intensity, frequency, and duration increase, the CRP continues to drop.
- Anaerobic high intensity training (interval training) may elevate CRP temporarily.

Colbert LH et al: *J Am Geriatr Soc*. 2004 Jul;52(7):1098-104.

Tomaszewski M et al: *Arterioscler Thromb Vasc Biol*. 2003 Sep 1;23(9):1640-4.

Which Conditions Benefit?

- Osteoarthritis
- Low Back Pain
- Rheumatoid Arthritis
- Fibromyalgia
- Etc.

Osteoarthritis

- "Wear and tear" arthritis is not benefited by resting the joints completely
  - Osteoarthritis of the knee -improvements in disability, physical performance, and pain from participating in either an aerobic or a resistance exercise program. JAMA. 1997 Jan 1;277(1):25-31.
  - At 24 months, highly significant reductions in knee pain in exercise groups compared with the non-exercise groups BMJ. 2002 October 5; 325(7367): 752

Low Back Pain

- "**A**fter one month patients in the exercise groups had significant improvement in:
  - Pain scores – 52%!
  - Frequency of pain
  - Levels of activity

Two months after the active intervention, however, most patients had discontinued the exercises, and the initial improvements were gone." N Engl J Med. 1990 Jun 7;322(23):1627-34

Low Back Pain

- Specific training of muscles surrounding the spine (deep abdominal muscles and lumbar multifidus) Spine. 1997 Dec 15;22(24):2959-67

- Intensive, specific exercise using firm pelvic stabilization to isolate and rehabilitate the lumbar spine musculature
  - Seventy-six percent of patients completing the program had excellent or good results. At 1-year follow up 94% of patients with good or excellent results reported maintaining their improvement. Orthopedics. 1995 Oct;18(10):971-81.

Fibromyalgia

- Exercise - aerobic, flexibility, and strength training - is helpful in the management of FM in the short term. J Rheumatol. 1996 Jun;23(6):1050-3.

- Aerobic exercise - overall most effective "despite being subject to the most skeptical patient attitude prior to the study." Scand J Rheumatol. 1996;25(2):77-86.

Other benefits of exercise. . .

Depression

- More than 1000 trials have examined the relationship between exercise and depression.
- As effective as psychotherapy
- As effective as zoloft, imipramine
- Long-term effective:
  - One study supervised x 10 weeks, then independent: as effective at 26 months as initially.

Cochrane Database Syst Rev. 2008;(4):CD004366.
BMJ. 2001;322(7289):763–767.
Clin Psychol Sci Pract. 2006;13(2):179–193
J Clin Psychol Med Settings. 2008;15(2):140–147.

Exercise and Cancer Risk

Site of Malignancy	Risk reduction in group with highest physical activity vs. those with lowest
Colon	20-25%
Breast	20%
Endometrial cancer	20-30% risk
Less convincing evidence	
Lung	20-40%*
Prostate	10-20%

*Most protective effect seen in smokers

Eur J Cancer. 2010 Sep;46(14):2593

Heart Disease and Death

- Low fitness was an independent risk factor
- As important as
  - Diabetes
  - Hypertension \
  - Smoking
- Each had RR of 3-5 in obese men, after controlling for other risk factors present.

- **Relationship Between Low Cardiorespiratory Fitness and Mortality in Normal-Weight, Overweight, and Obese Men** Ming Wei, MD, MPH; James B. Kampert, PhD; Carolyn E. Barlow, MS; Milton Z. Nichaman, MD, ScD; Larry W. Gibbons, MD, MPH;

Ralph S. Paffenbarger, Jr, MD, DrPH; Steven N. Blair, PED*JAMA.* 1999;282:1547-1553

But it hurts!

General Guidelines for Safe Exercise in People with Chronic Pain

- Stretch before and after exercise
  - Gentle stretches – no bouncing!
- Start Low, Go Slow
- Emphasize Concentric Exercise, avoid Eccentric Exercise

Emphasize Concentric Exercise, avoid Eccentric Exercise

- Concentric – muscle contraction as muscle is shortening
- Eccentric – muscle contraction as muscle is lengthening, such as slowing yourself down coming down a hill

Delayed Pain After Exercise

- Deconditioning
- Improper body mechanics

Post-Exertional Fatigue in CFS and Fibromyalgia

- Exacerbations of fatigue lasting a day or more after exercise may indicate:
  - Neurally Mediated Hypotension
  - Adrenal Insufficiency
  - Mitochondrial dysfunction
- If these conditions are treated, exercise tolerance will improve

Motivation and Adherence

- Solitary vs. Group vs. “Buddy”
- Keeping it interesting
  - Conversation
  - Books on tape
  - Moving meditation
  - Exercise equipment and television/VCR

Specific Forms of Exercise

- Water Exercise
- Walking
- Low-impact
  - Elliptical Trainers
  - Nordic Track
- Yoga and Tai chi/Chi Gong

Exercise: Land vs. Water

Table 4.
Visual Analog Scale (VAS) Scores for Pain Before and After the 50-foot (15.24-m) Walk Test (50FWT) in Participants With Osteoarthritis of the Knee at 0 Weeks (T0), 9 Weeks (T9), and 18 Weeks (T18) After Intervention

	Water-Based Exercise Group (n=32)	Land-Based Exercise Group (n=32)	*P* (Intergroup)
	Mean±SD (95% CI[a])	Mean±SD (95% CI)	
VAS for pain before 50FWT (mm)			
T0	39.6±23.4 (31.0–48.1)	53.0±24.4 (43.6–62.4)	.045[b]
T9	21.7±20.7 (13.0–30.5)	26.5±28.1 (16.9–36.1)	
T18	14.8±21.4 (5.4–24.2)	28.8±30.8 (18.5–39.1)	
P (intragroup)	<.001[b]	<.001[b]	
VAS for pain after 50FWT (mm)			
T0	48.2±25.6 (39.9–56.5)	61.1±19.6 (52.0–70.2)	.028[b]
T9	25.4±22.3 (16.3–34.6)	30.3±28.4 (20.4–40.3)	
T18	15.1±19.8 (5.8–24.4)	33.4±31.7 (23.2–43.6)	
P (intragroup)	<.001[b]	<.001[b]	

[a] CI=confidence interval.
[b] *P* value statistically significant.

Recommendation is to use water exercise to start, but transition to land-based exercise, which has been studied for long-term. Cochrane Database Syst Rev. 2007 Oct 17;(4):CD005523

Specific Forms of Exercise

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Chair Exercise

- Sit and Be Fit
- YouTube
  - Yoga for Seniors
  - Sit Stand and Move
  - Search Chair Exercise
- Ask for our Handout or for Exercise Bands

Guidelines for Walking

- Stretch before you begin your walk
- During the first three minutes, go about half the speed you will be walking
- Tell someone where you are going and when you expect to return
- Consider safety if you will be away from populated areas

Walking Guidelines Cont'd

- Wear at least one brightly colored article of clothing
- Always carry water with you
- Walk during daylight and check weather forecast before you start
- Carry a police whistle
- Breathe as normally as possible when you walk
- After your walk, stretch again