



Exercise:

To do or not to do that is the question

What is exercise?

- “To perform an activity to improve one’s health”
- “Bodily or mental exertion, especially for the sake of training or improvement of health.”

Exercise = energy
expenditure



Breaking it down

Exercise

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graph TD; A[Exercise] --- B[Aerobic]; A --- C[Resisted/strengthening]; A --- D[Range of motion/Flexibility]
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Aerobic

Resisted/strengthening

Range of motion/
Flexibility

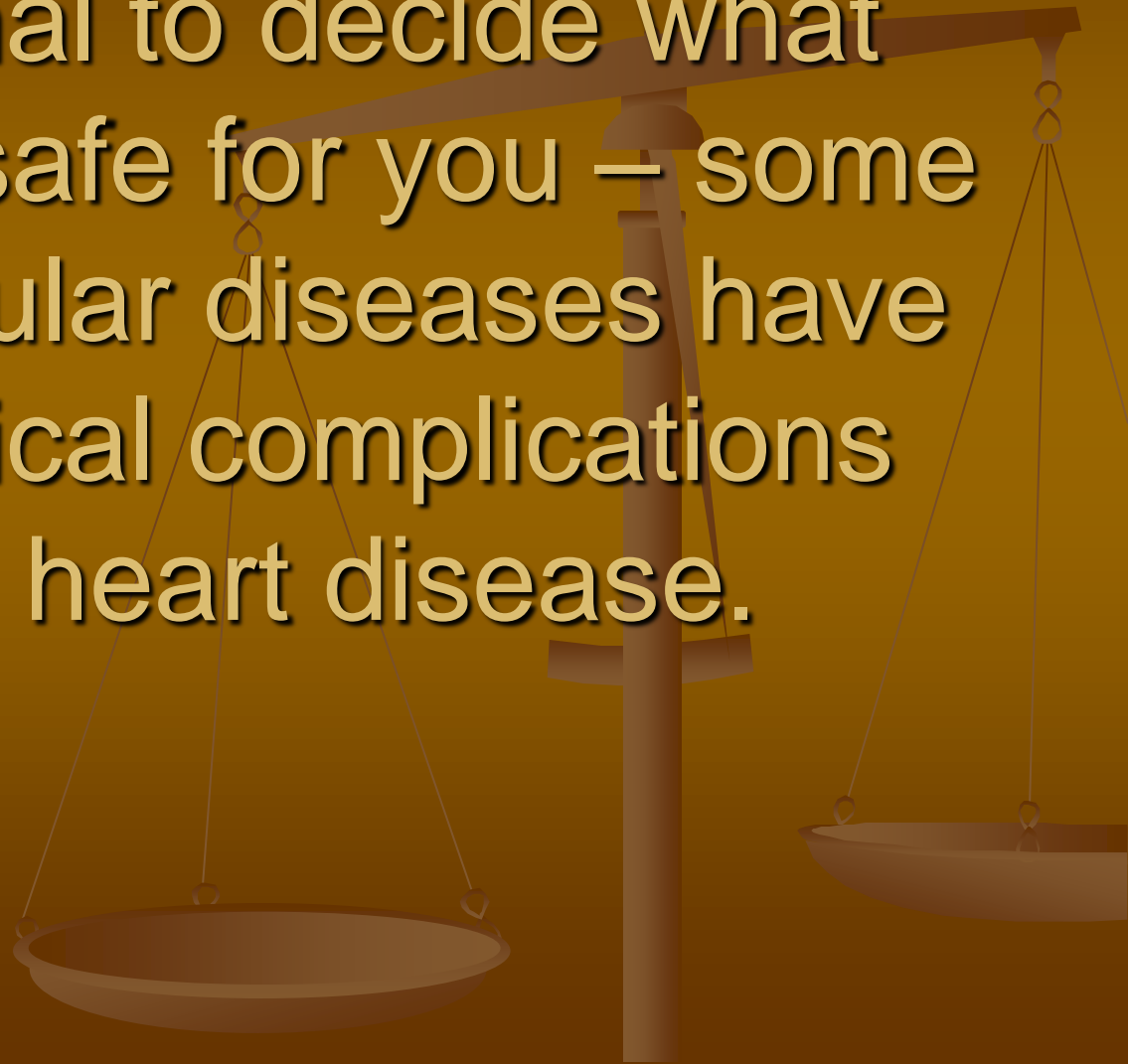
Benefits of exercise can include:

- Strengthening
- Flexibility
- Bone density
- Mood elevation
- Weight management
- Cardio/pulmonary
- GI mobility
- Pain reduction
- Memory



“Some diseases severely limit the ability of muscles to increase mass or force because they limit the regenerative capacity of muscle tissue.”

Important to talk to medical professional to decide what exercise is safe for you – some neuromuscular diseases have other medical complications such as heart disease.



Risks for Inflammatory diseases

- Active exercise during exacerbation can increase the inflammation
- ROM is safe, especially if it is passive or assistive
- When disease is not active – exercise can be slowly progressed to include aerobic and strengthening exercises

Results in article “Molecular effect of exercise in patients with inflammatory rheumatic disease”

- “ Impaired muscle performance and muscle atrophy are common features in patients with chronic rheumatic disorders
- Exercise training can improve performance without exacerbation of disease progress
- Exercise training can reduce systemic inflammation
- Exercise training might have beneficial effects on certain molecular processes in muscle tissue and cartilage that reduce inflammation and fibrosis and promote tissue repair.”

Warning signs to **STOP**

- Muscular

- Dark colored urine (immediate medical attention)
- Cramping in muscles
- Weakness of exercised muscles

- Cardio

- Shortness of breath
- Chest pain
- Significant elevations in heart rate with only moderate activity
- Weakness
- Nausea
- Sweating
- Gurgling sound in chest with breathing



Range of Motion

- Passive – non active movement of a joint
- Assistive – partial assistance of a joint through its range of motion
- Active – full muscle contraction to move a joint through its range of motion



Flexibility

- Stretching of a **muscle** through its full range of motion.



Aerobic Exercise/ Cardio

- “exercise that involves or improves oxygen utilization by requiring the heart and lungs to work harder. Aerobic exercises involve low to moderately intense activities performed for extended periods of time.”



Strengthening

- “form of exercise in which each effort is performed against a specific opposing force generated by resistance”



Strengthening

- Light resistance only – no more than 5-10 lbs
- If one repetition is easy – go ahead and add several pounds.
- Rest in-between repetitions

Exercise ideas for the hand



Using weights



Other useful tools



Your goals help decide your activity

- Joint range of motion
- Muscle flexibility/
balance
- Endurance
- Strengthening
- Low impact joint range of motion
- Yoga, Tai Chi, aquatic ROM class
- Swimming, treadmill, elliptical, bike, sports activities
- Lifting weights, using theraband



All exercise programs should be **submaximal**

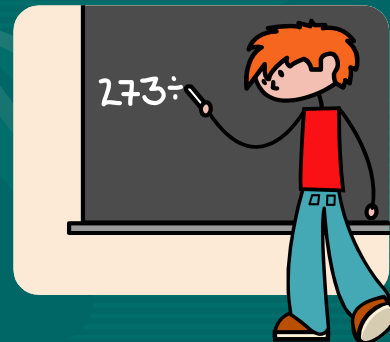
- What is submaximal?
 - When your heart rate is 65% or less of its maximum.

How do you figure that out

- Heart rate is 65% or less of its maximum.

- If you can't talk you are doing too much

Your Age – 220 X 0.65 =
submaximal heart rate
goal



Aquatic Therapy/Exercise

- This is the most recommended form of exercise for persons with neuromuscular disorder due to the safety effects of buoyancy.
- Why is Aquatic therapy unique – due to the properties of buoyancy, viscosity, turbulence/streamlining, and refraction

What is buoyancy?

- It is the upward thrust of the water that acts in the opposite direction to the force of gravity.
- Due to buoyancy muscles can accomplish greater activity with less energy than is possible out of water. The limb feels lighter and moves easier.



Viscosity

- Viscosity is the type of friction that occurs between the molecules or a liquid and causes resistance to the flow of liquid
- You are lighter in the water but there is more resistance to movement so you can strengthen without increased load on the joint.
- Higher speeds increase the amount of resistance



Turbulence/ streamlining

- The flow of water effects the amount of resistance



- Quicker the movement the greater the turbulence
- Switching directions increases resistance
- Another object placed in the wake will move easily
- Swimming is easier than walking due to streamlining

Refraction

- The bending of light as it moves from a more dense to a less dense medium.
- More important for safety
- Pool seems shallower
- Limbs appear distorted
- Visual feedback is distorted.



References

- Lundberg, IE, Nader GA. Molecular effects of exercise in patients with inflammatory rheumatic disease. *Rheumatology* 2008; October 7: 1-8.
- Exercising with a muscle disease. *Quest Magazine* 2009; April-June: Vol 16:2, 24-48.