



Exercise and Diabetes

What exercise should you
undertake?

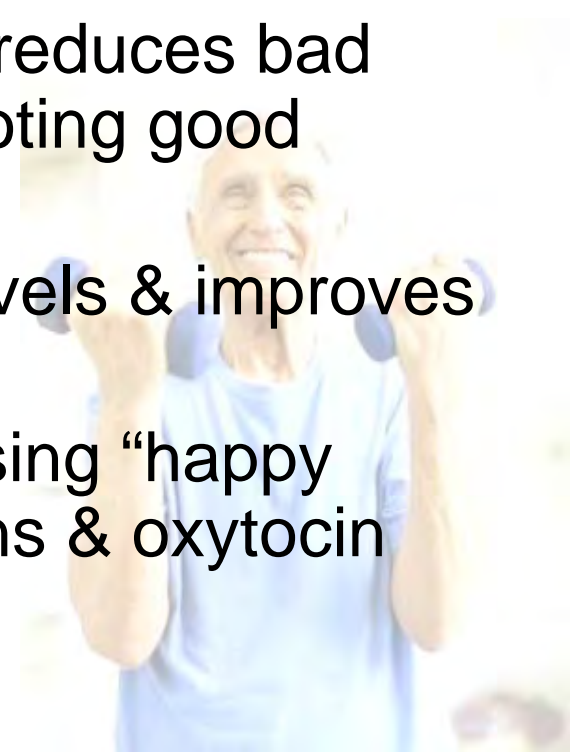
What are the risks & benefits?





Benefits of Regular Exercise

- Tones the body by building muscles
- Increased musculature leads to an increase in the amount of body fat burnt
- Decreases blood pressure & reduces bad cholesterol (LDL) while promoting good cholesterol (HDL)
- Increases fitness & energy levels & improves concentration
- Elevates your mood by releasing “happy hormones” such as endorphins & oxytocin





- Improves image & self-esteem
- Restores vitality & vigour, even though many believe it will sap them of energy
- Promotes restful sleep and causes you to fall asleep quicker
- Stronger & healthier bones
- Decreases risk of diabetic complications
 - Improves blood circulation
 - Increases insulin sensitivity
- May decrease amount of medication &/or insulin required





Types of Exercise

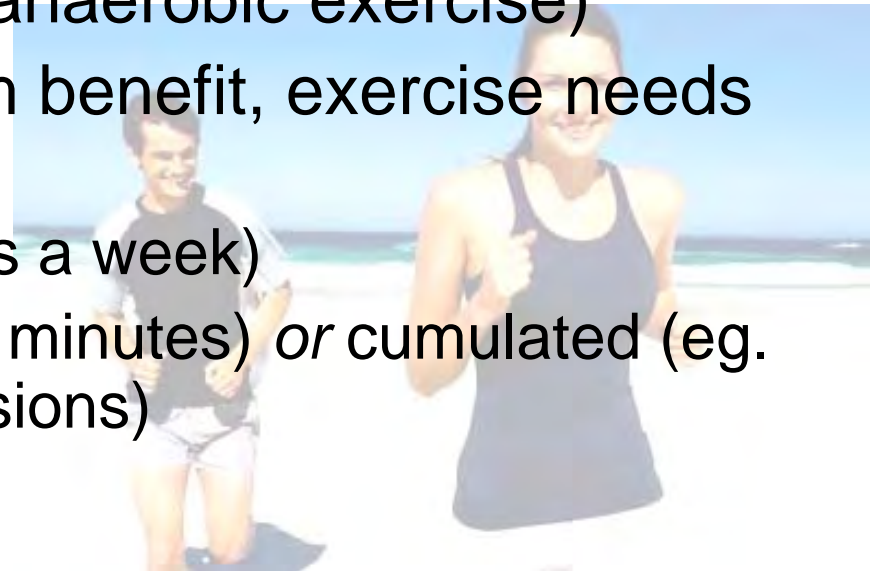
- **Aerobic / Cardiovascular**
- Strength
- Flexibility
- Incidental





Aerobic Exercise

- Exercise that elevates heart and breathing rates for an extended period of time
 - Eg. Bush walking, jogging, tennis, swimming
- Exercise that requires the body & the muscles to be continuously supplied with a flow of oxygen (vs anaerobic exercise)
- To obtain maximum benefit, exercise needs to be:
 - Regular (4-7 times a week)
 - Maintained (> 30 minutes) *or* cumulated (eg. 3 x 10-20min sessions)
 - Hard enough!





But How Hard?

- Target Heart Rate
- Rating of Perceived Exertion (RPE)
- Talk Test





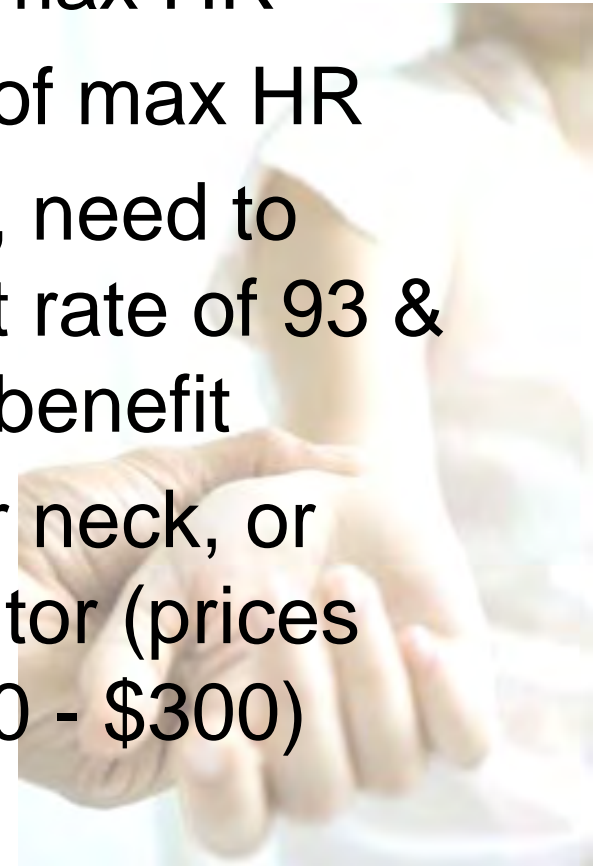
Target Heart Rate

- 60-85% of your maximum heart rate
- Maximum HR = $220 - \text{age}$
- Max HR $\times 0.6 = 60\%$ of max. HR
- Max HR $\times 0.85 = 85\%$ of max. HR





- What is the target heart rate of someone who is 65 years old?
- $220 - 65 = 155$
- $155 \times 0.6 = 93 = 60\%$ of max HR
- $155 \times 0.85 = 132 = 85\%$ of max HR
- For a 65 year old person, need to exercise between a heart rate of 93 & 132 for a cardiovascular benefit
- Measure pulse at wrist or neck, or purchase heart rate monitor (prices vary greatly, between \$40 - \$300)





Rating of Perceived Exertion

- Rating based on breathlessness and soreness in your muscles
- Scale of 0 - 10





Rating

Description

0

Nothing at all

0.5

Very, very weak

1

Very weak

2

Weak

3

Moderate

4

Somewhat strong

5

Strong

6

7

Very strong

8

9

Very, very strong

10

Maximal



Talk Test

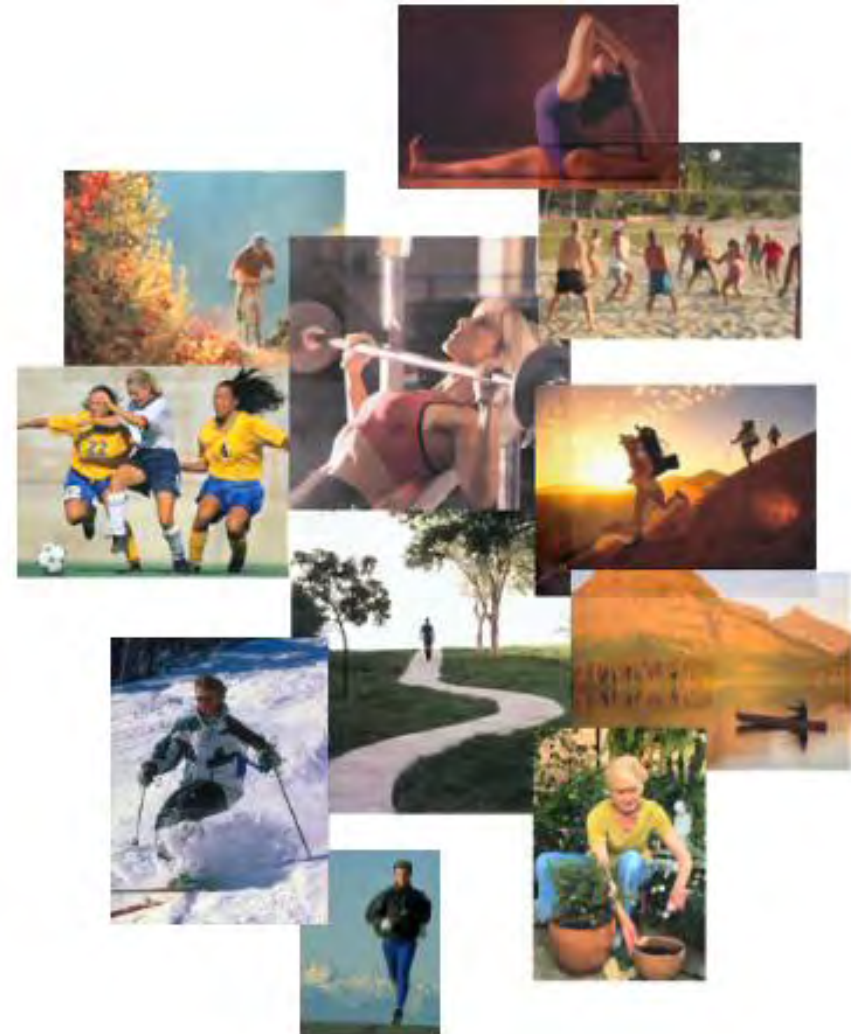
- Simple test, great to use when first starting out
- Can't talk due to breathlessness
= working too hard
- Can whistle a tune when exercising
= not working hard enough





Types of Exercise

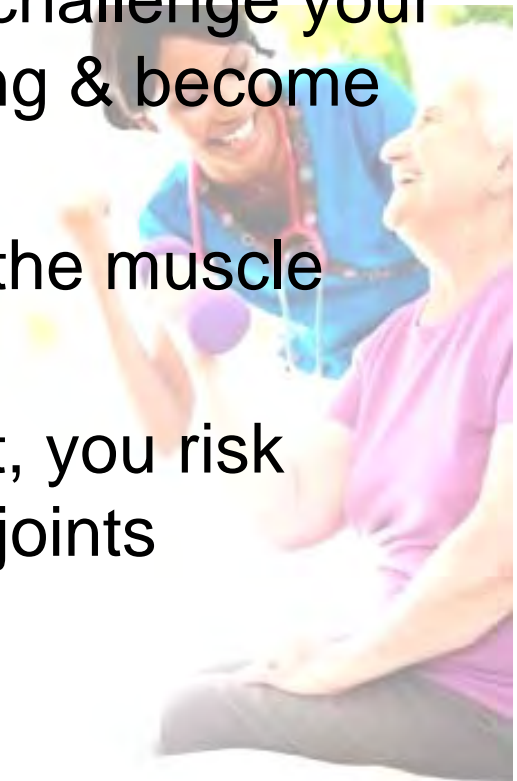
- Aerobic / Cardiovascular
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Strengthening Exercise

- Results in increased muscular tone/bulk & tightens up those flabby areas!
- Key to improving strength is to challenge your muscles to adapt to extra loading & become stronger.
- If the load is not great enough, the muscle does not respond & strengthen
- However, if the load is too great, you risk injuring the muscle, ligament & joints



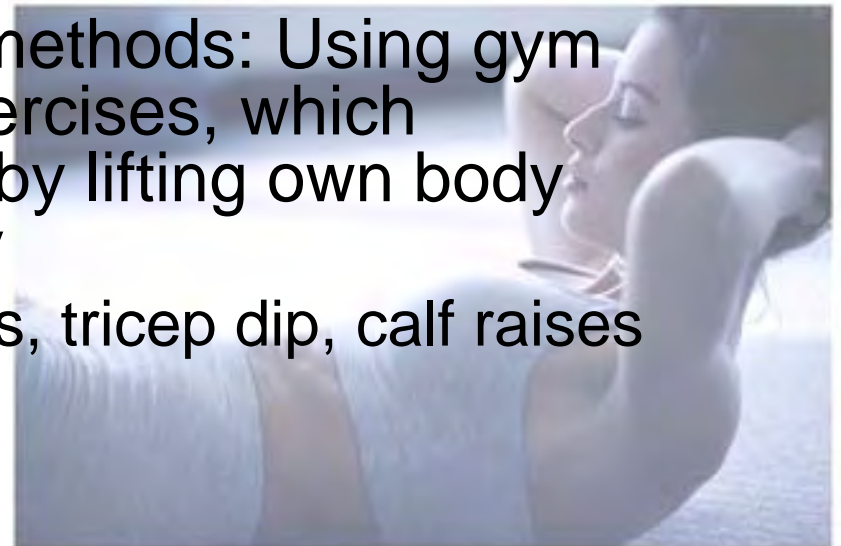


- Free weights or elastic exercise bands can be used.
- Start with light weights and high repetitions:
 - A weight that can be lifted comfortably 15 times in a row, rest, then repeat this 2-3 times
- Progress by increasing the weight and decreasing the repetitions:
 - A heavier weight that you can lift between 8-12 times and feel that you've reached your limit after you're done. Rest then repeat 3 times (sets)
- General rule of thumb:
 - > 15 repetitions for muscular endurance
 - < 15 repetitions for muscular strength





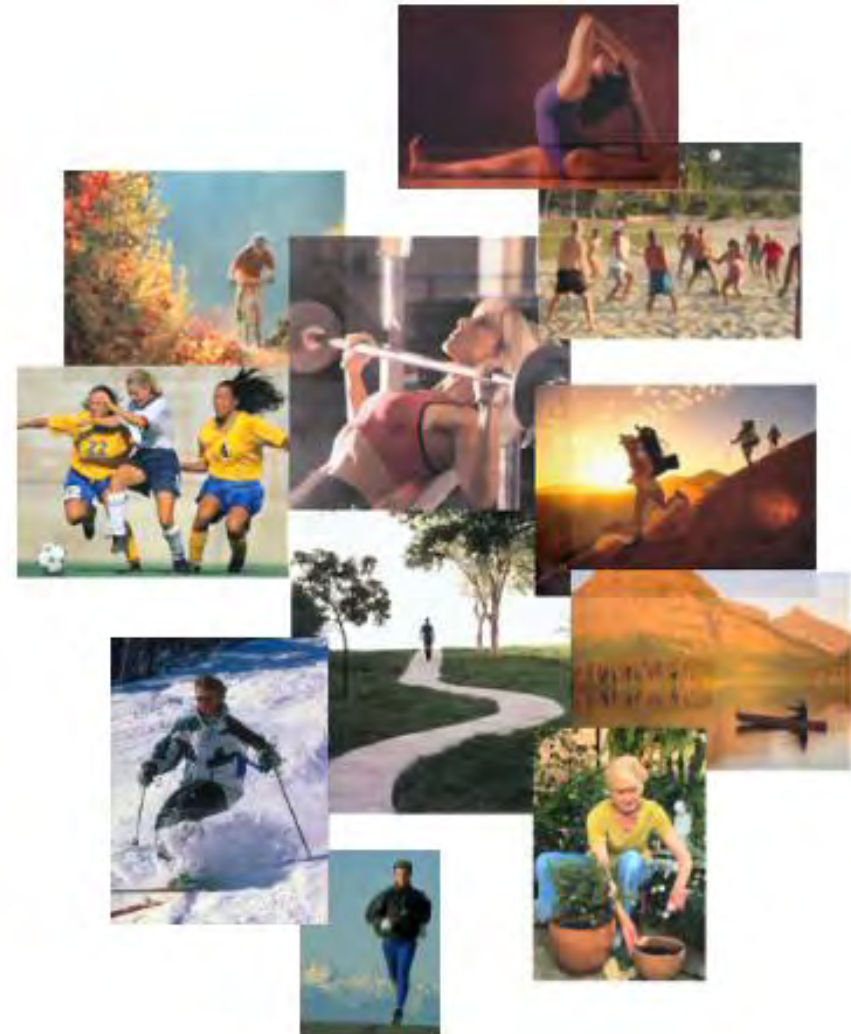
- Rest between sets to prevent a dangerous increase in blood pressure
- Never hold your breath
 - Breathe out as you exert, breathe in as you relax
- Holding your breath increases blood pressure and reduces blood flow to muscles. This results in a decrease in muscular power.
- Other strengthening methods: Using gym balls, floor & chair exercises, which strengthens muscles by lifting own body weight against gravity
 - Eg. Sit ups, push ups, tricep dip, calf raises





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Flexibility (Stretching) Exercises

- Optimum flexibility increases efficiency of your movement and ensures full movement at the joint
- Also decreases stress and tension in the muscle, improves posture, provide relief from muscle cramps and soreness and decreases the risk of low back injury & pain
- Stretch before and after exercising
- Most injuries to muscles & ligaments occur when the body has not been adequately prepared for the stress of the exercise





Guidelines for Stretching

- Need to stretch beyond your comfortable range of movement
 - Stretch till it is uncomfortable but never stretch to pain
- Hold the stretch for 15-30 seconds
 - Start at 15 seconds and work up to 30 secs as you progress
 - Don't bounce your stretches as this increases risk of overstretching





Hamstring Stretch

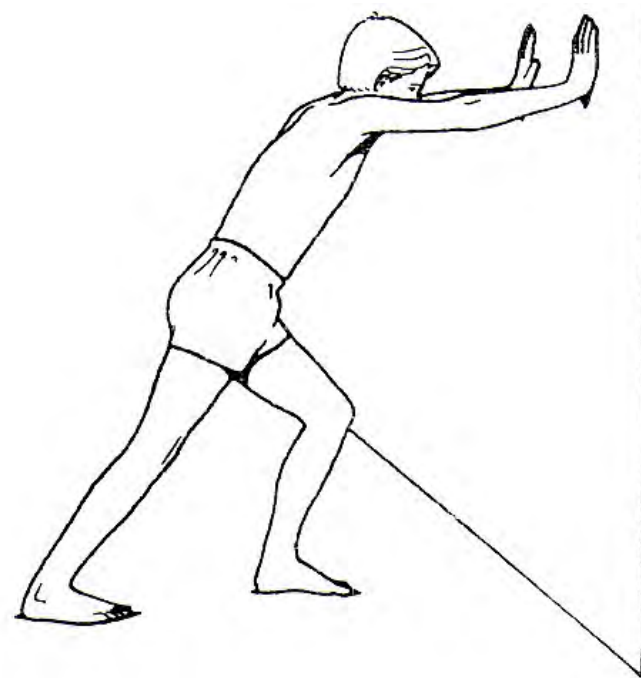
- Place foot on stool. Slowly lean forward reaching down shin until a stretch is felt in back of thigh
- Hold 15-30 secs
- Repeat 2-3 times
- Do before & after exercise





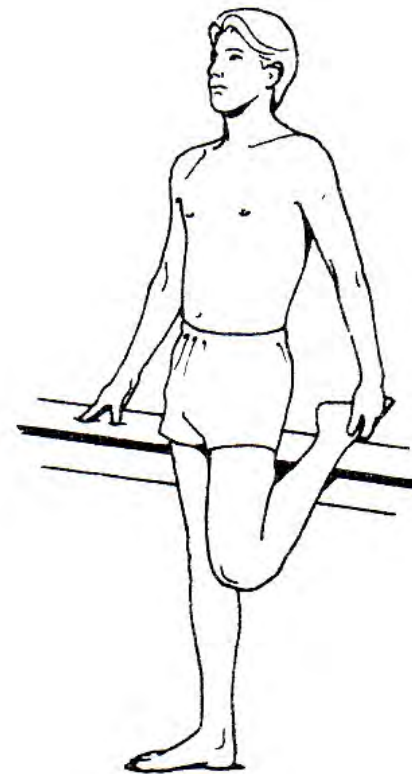
Calf Stretch

- Keep back leg straight, feet pointing forward, and heels on the floor, lean into wall until a stretch is felt in the calf
- Hold 15-30 secs
- Repeat 2-3 times
- Do before & after exercise



Quadriceps Stretch

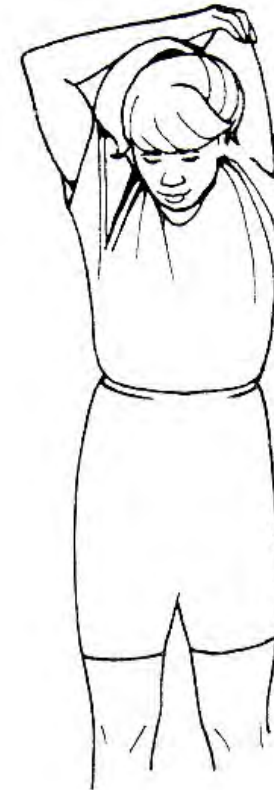
- Pull heel toward buttock until a stretch is felt in front of the thigh
- Hold 15-30 secs
- Repeat 2-3 times
- Do before & after exercise





Shoulder Stretch

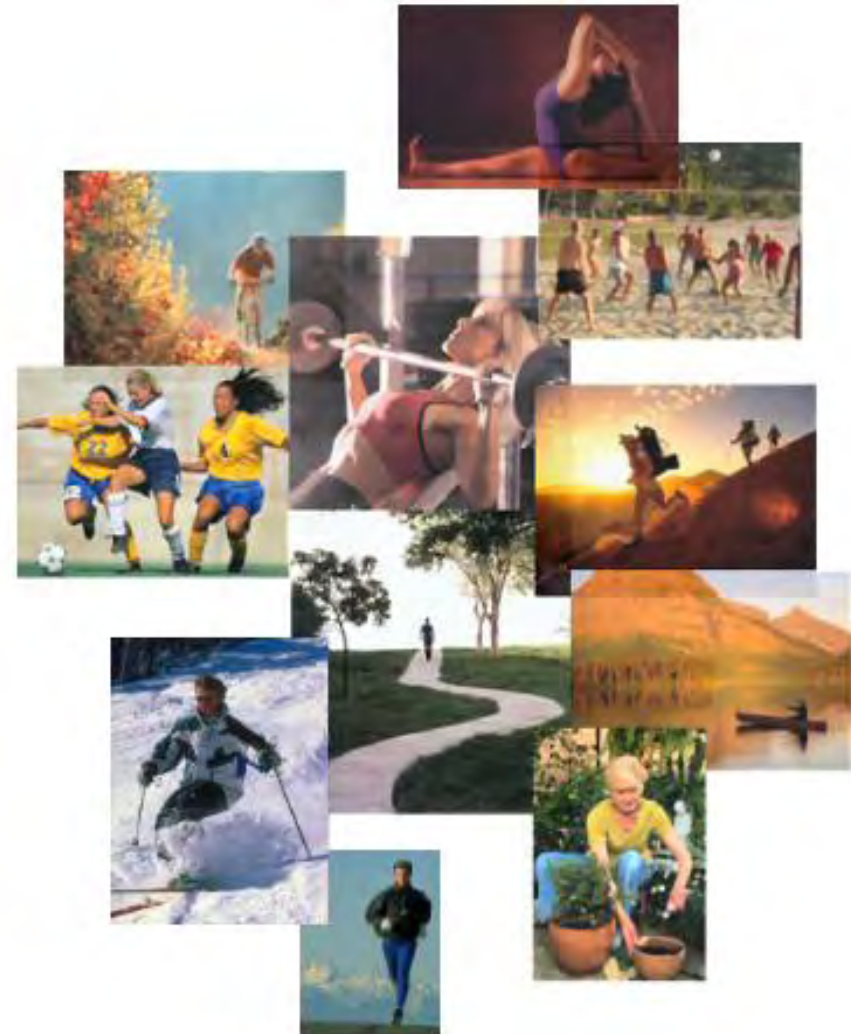
- Place hand behind neck and gently pull on elbow with the other hand until a stretch is felt in the shoulder
- Hold 15-30 secs
- Repeat 2-3 times
- Do before & after exercise





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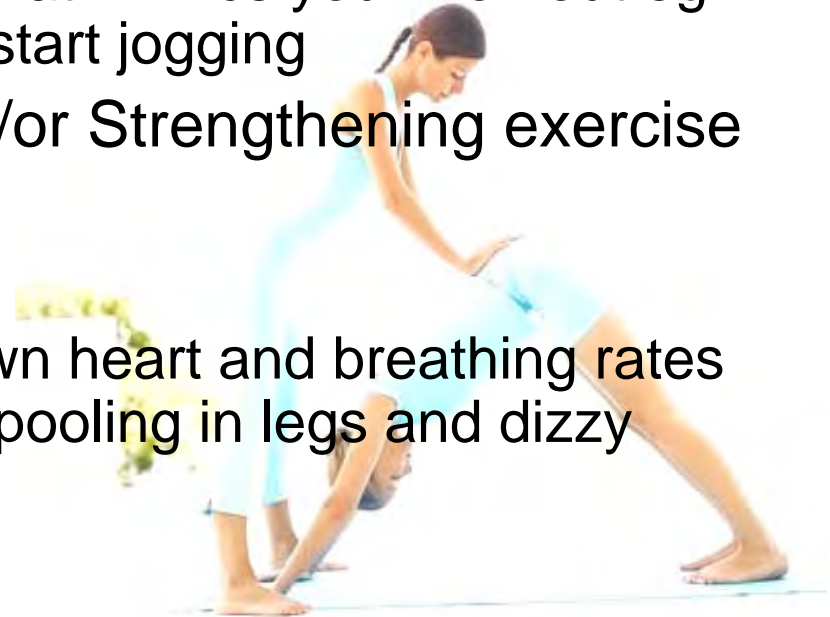
Incidental Exercise

- Exercise that you might be doing in the course of your everyday life
 - Eg. vacuuming, stairs, walking to/from the bus stop, carrying heavy shopping
- Incidental exercises should not be counted as part of your exercise program unless you are working out in your target heart rate



Tying it all In: The Exercise Program

- Stretch
- Warm Up (5 mins)
 - Gradually increases heart and breathing rate
 - Improves blood flow to muscles in preparation for exercise
 - Choose an activity that mimics your workout eg. walking before you start jogging
- Aerobic exercise and/or Strengthening exercise (minimum 30 mins)
- Cool Down (5 mins)
 - Gradually slows down heart and breathing rates which avoids blood pooling in legs and dizzy sensations
- Stretch





Special Considerations for Diabetics

What conditions do you need to
be aware of?

What type of exercise is best?

When should I stop my activity session?





Peripheral Neuropathy

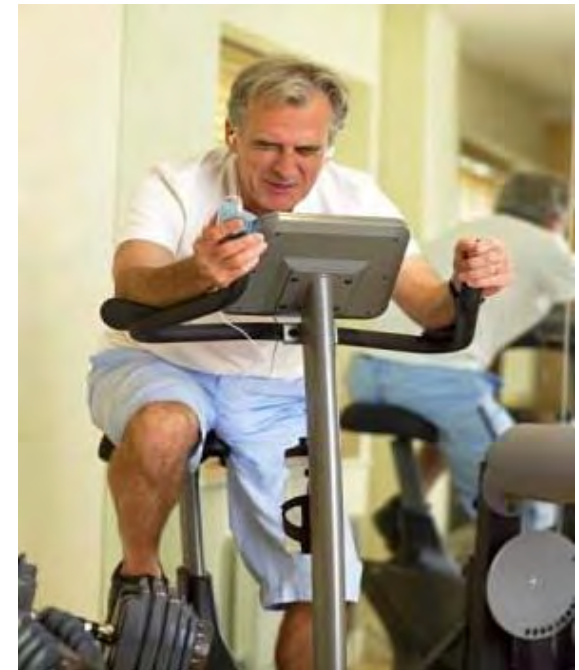
- Altered nerve supply to hands and feet
- Pins and needles / numbness and muscle weakness
- Requires rigorous foot-care and monitoring – painless! (contact podiatrist for advice)
- Opt for non-weight bearing activities
 - Eg. cycling, swimming, chair, floor & gym ball exercises





Peripheral Vascular Disease

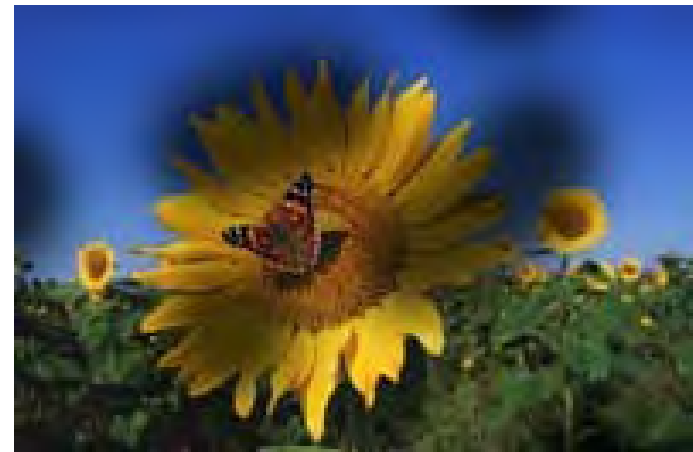
- Poor blood supply to peripheral muscles
- Claudication pain (i.e. deep, burning pain worsened with exercise) usually in the calf
- Rigorous foot-care and monitoring
- Modified exercise with lots of rests
 - Swimming, stationary bike, treadmill, chair exercises
- Never work harder than a moderate discomfort from which attention can be diverted



Retinopathies (Eye conditions)

- Avoid high systolic blood pressures as this significantly increases the chance of developing retinopathies
- Avoid heaving weight training, high impact activities, straining, jarring and strenuous arm activities, bending where the head is lower than the waist

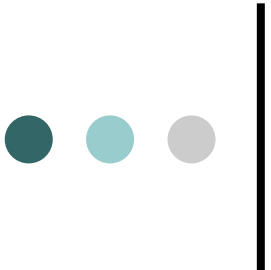
In the late stages of diabetic retinopathy, you may have blind spots and/or floaters.



Orthopaedic (Bone) Conditions

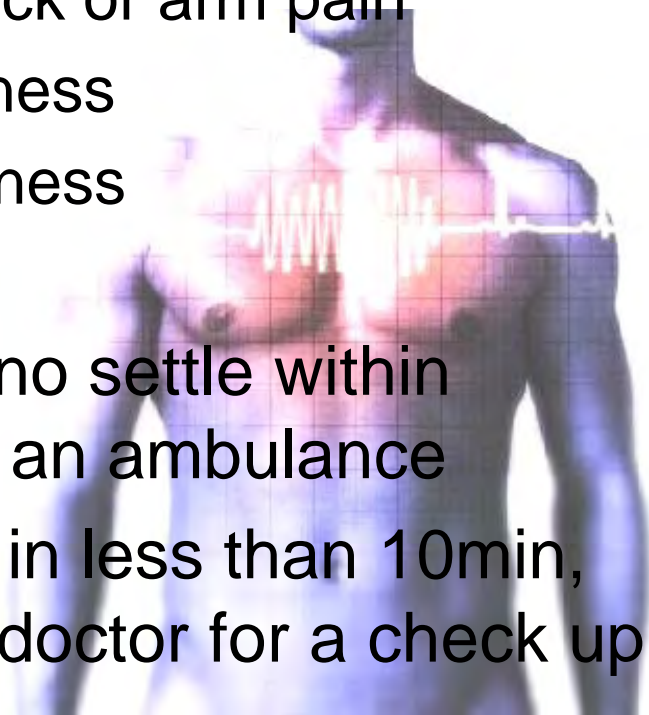
- Arthritic or painful joints
- Loss of joint range of motion
- Joint replacements
- Modify exercise to decrease weight bearing
eg. Swimming, stationary bike, chair
exercises





When should I stop my exercise session?

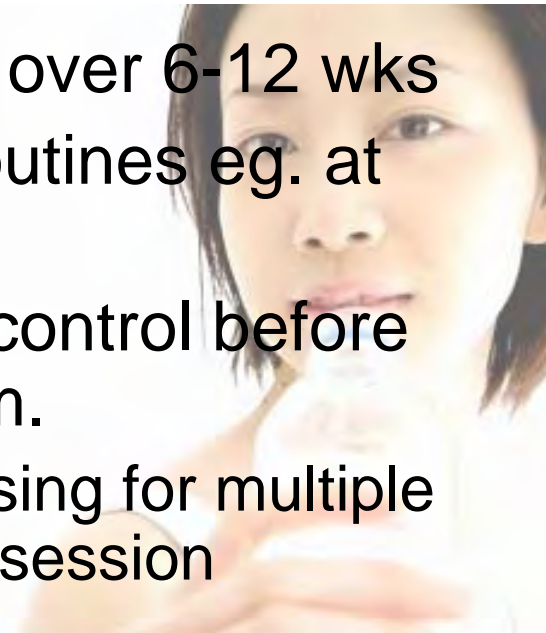
- Cease your exercise session if you experience symptoms such as :
 - Chest, abdominal, neck or arm pain
 - Faint or light headedness
 - Increased breathlessness
 - Chest tightness
- If these symptoms do not settle within 10min, you **MUST** call an ambulance
- If the symptoms settle in less than 10min, you should go to your doctor for a check up





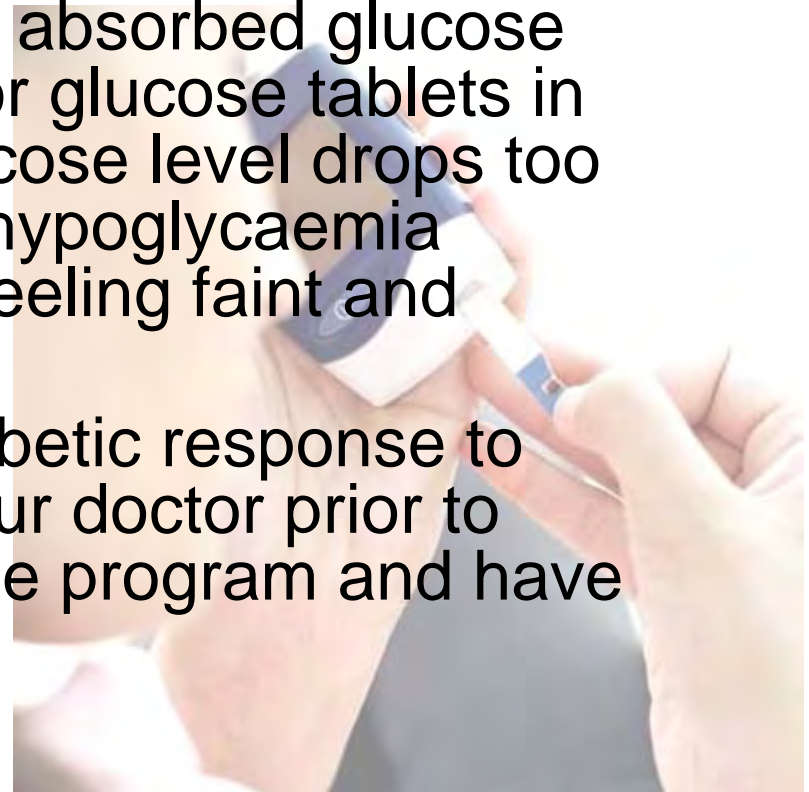
Remember...

- Avoid exercising in extreme temperatures
- Keep adequately hydrated during & after exercise
- Diligent foot care & monitoring at least once a day
- Start off gradually & progress over 6-12 wks
- Establish eating & exercise routines eg. at regular times on set days
- Establish good glucose level control before starting your exercise program.
 - If this is a problem, try exercising for multiple sessions instead of one long session





- Monitor blood glucose levels before and after exercise to establish your response to different exercise conditions
- Avoid hyper / hypoglycaemia by managing carbohydrate & insulin dosage
- If you are on diabetes tablets or insulin, always carry quickly absorbed glucose such as jellybeans or glucose tablets in case your blood glucose level drops too low. Early signs of hypoglycaemia includes sweating, feeling faint and weakness.
- If unsure of your diabetic response to exercise, consult your doctor prior to starting your exercise program and have regular check-ups



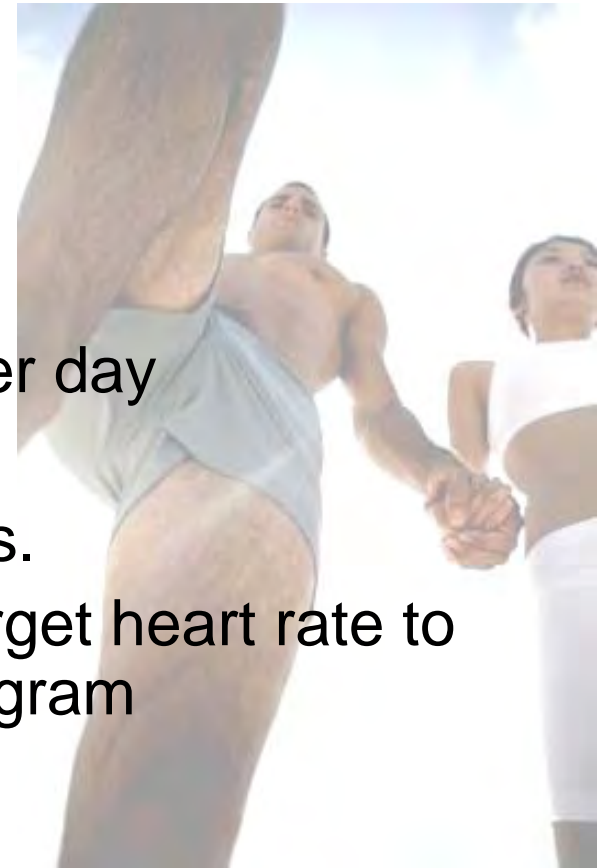
Handy Tips

- You are more likely to continue your exercises if you find one that you enjoy!
- Exercise with a friend or family members. You can help motivate each other and establish a sense of friendly competition
- Set realistic goals with your exercise program, then reward yourself once you've reached your goal with a movie, a new shirt or a low fat latte!
- Be flexible! Vary your program with different exercises





- Don't exercise if unwell, if you are short of breath, have chest pain or have a temperature.
- Keep an exercise diary to monitor progress
 - Exercise
 - Time
 - Medication
 - Blood Glucose levels
- Use a pedometer
 - Minimum of 10,000 steps per day (about 8km)
 - Excellent tool for weight loss.
 - Need to work within your target heart rate to be part of your exercise program





The End

Any questions/queries please contact

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