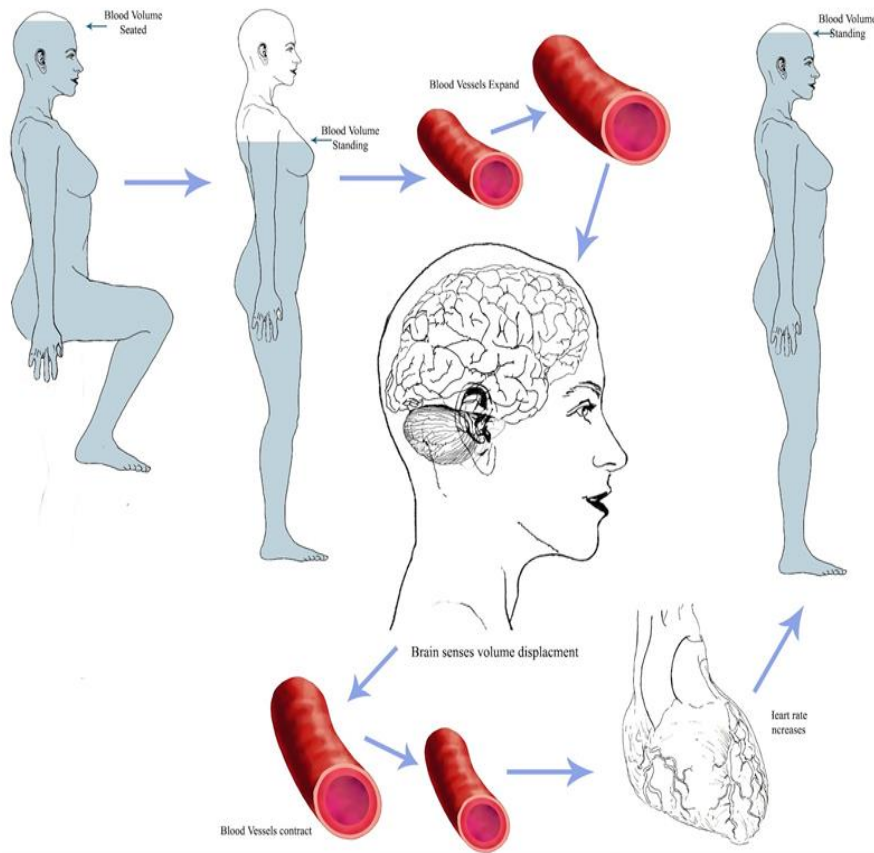


# The Importance of Exercise in the Treatment of POTS

MANDANA FISHER, PT, DPT

JULY 18<sup>TH</sup>, 2015

# Why is exercise important?



In order to decrease the severity of symptoms (*exercises intolerance, lightheadedness, extreme fatigue, headache and mental clouding*<sup>2)</sup>, exercise is encouraged to promote blood flow and strengthen muscles to assist in blood flow circulation<sup>2,3</sup>.

# Why is exercise important?

Sedentary lifestyles and poor functioning, or worsening symptoms, have been linked.

Cardiovascular training however, has been linked to:

- improvements in the physical work capacity
- decreased severity of symptoms
- decreased heart rates at given workloads
- increased blood volume and
- increase in stroke volume (amount of blood pumped by ventricle in each beat).<sup>5,6,7</sup>

# Physical Therapy Recommendations:

- Increase water and salt intake
- Raise the head of your bed and get out of bed
- Cardiovascular aerobic exercises 3-5 times per week
- Strength training 2 times per week with focus on legs and abdomen

*Disclaimer: Consult your doctor before starting this or any new exercise program.*

# BEFORE getting out of bed

Leg pumping exercises to increase circulation prior to getting out of bed in the morning. Start at the foot and work up your leg to increase blood flow towards your head and heart.

1. Ankle pumps
2. Heel slides
3. Straight Leg Raise
4. Abdominal Draw In

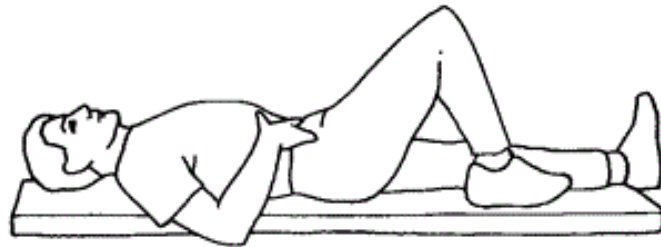
# Pumping Exercises: Ankle Pumps

Bend and straighten your ankles 15-20 reps



# Pumping Exercises: Heel Slides

Slowly bend and straighten one leg sliding your heel along the bed. Repeat 15-20 reps on each side.



# Pumping Exercises: Straight Leg Raise

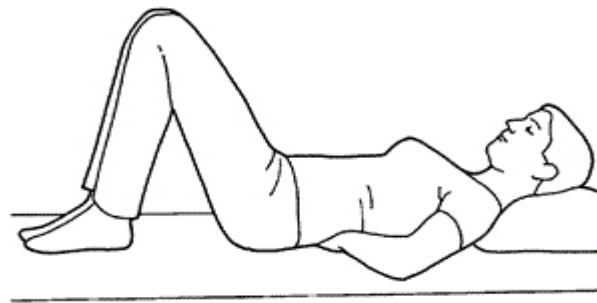
Lay on your back with one knee bent and one knee straight. Lift the straight leg up towards the ceiling and return. Perform 15-20 reps on each leg.





# Pumping Exercises: Abdominal Draw In

Lay on your back with knees bent. Put your hand under the small of your back. Let the weight of your low back press on your hands pulling your belly button towards your back. Hold 3-5 seconds and perform 15-20 reps.



# Getting Out of Bed

- First, transition from your back or stomach to your side facing the edge of your bed
- Lying on your side, move feet over the edge of the bed. With the upper hand press down on the bed while straightening the lower arm to a seated position.
- Transitions should be done SLOWLY and in SEQUENCE to allow your body to acclimate to the new position BEFORE moving on.

# Getting Out of Bed



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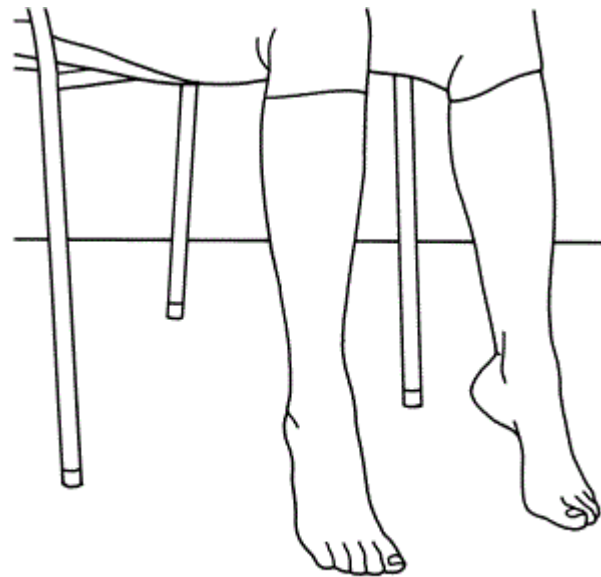
# Seated Exercises BEFORE Standing

Leg pumping exercise to be performed while sitting prior to standing up throughout the day to increase blood flow towards head.

1. Ankle pumps
2. Short Arc Quad
3. Seated Marching
4. Seated Abdominal Draw In

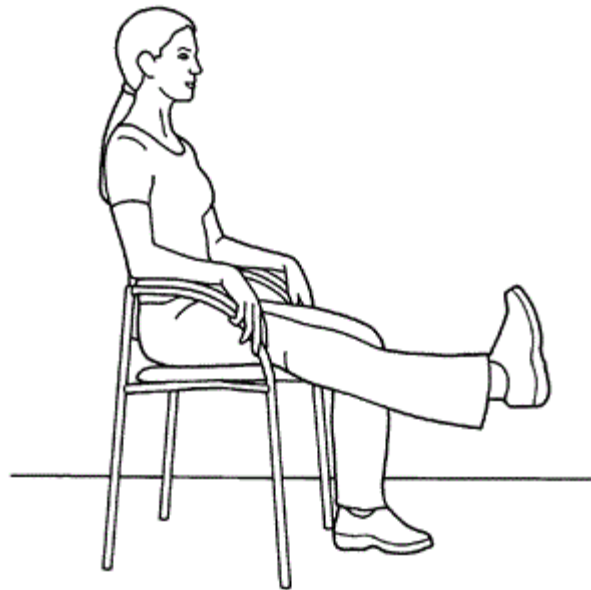
# Seated Exercises Before Standing: Ankle Pumps

Bend and straighten your ankles 15-20 reps each side.



# Seated Exercises Before Standing: Short Arc Quad

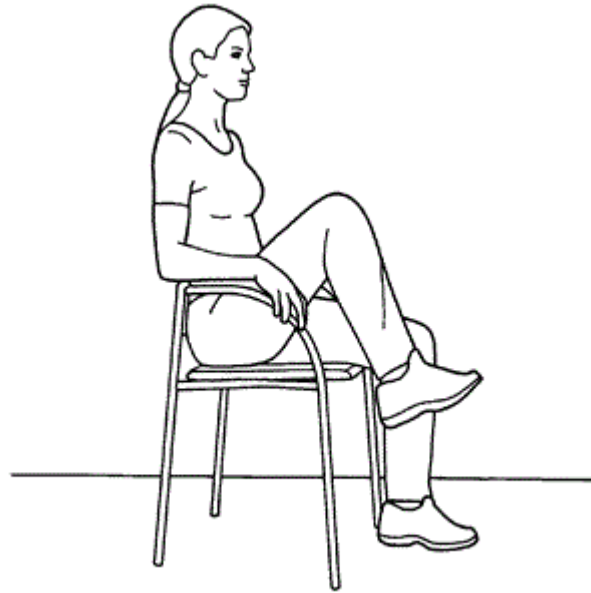
Pull your toes up, tighten your thigh muscle, and straighten your knee. Hold 5 seconds and slowly relax your leg. Repeat 15-20 reps on each side.



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# Seated Exercises Before Standing: Seated Marching

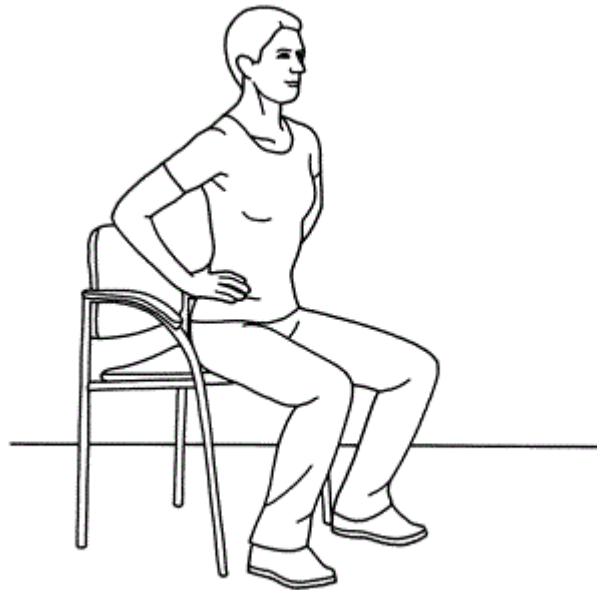
Lift your leg up off the seat keeping the knees bent. Return to starting position and perform 15-20 reps on each leg.



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# Seated Exercises Before Standing: Abdominal Draw In

Sit with your hands on your waist. Contract your stomach muscles to draw belly button towards your back, stabilizing your lower trunk while breathing normally. Repeat 15-20 reps.



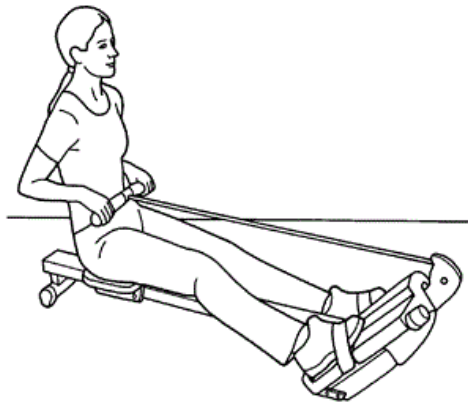
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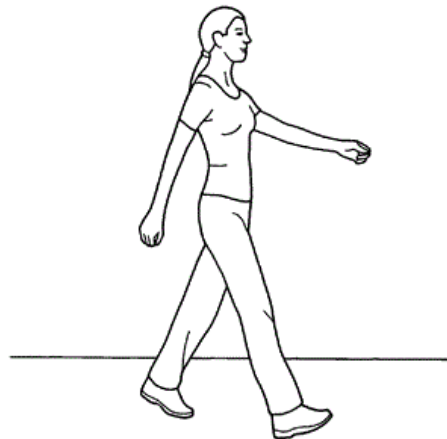
# Cardiovascular aerobic exercises

## 3-5 times per week

- **Exercise will be a lifelong therapy!**
- You should start with exercise equipment that is seated or horizontal (*recumbent bike, rowing machine, aquatic therapy*) and gradually work towards upright positioning (*elliptical, treadmill*).



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# Cardiovascular aerobic exercises

## 3-5 times per week

- It is important to always start with a 10 minute warm up and end with a 10 minute cool down.
- You should also gradually increase the length of time for cardio as your body acclimates to prevent additional over-fatigue.
- Make sure to keep your heart rate within the recommended zones and take frequent rest breaks!
  - You may have to change your mode (type of cardio exercise) or intensity (how hard you are working) of exercise to prevent your heart rate being too low or too high.

# Heart Rate Monitoring

It is recommended that you use a Heart Rate Monitor during all exercise. If you do not have one, you can take your pulse manually.



# Heart Rate Monitoring

## To find your pulse in your wrist:

Hold your hand in front of you with your thumb up in the air and your palm facing you (*left hand in picture*). Place your index and middle fingers of your opposite hand along the top of your inner wrist (*right hand in picture*). Gently feel for your pulse.



# Heart Rate Monitoring

- When you have located a steady beat, count the number of beats in 15 seconds while looking at clock or stop watch. Multiply that number by 4 to obtain your heart rate (HR) in beats per minute (bpm).
- You can also count the number of beats in 30 seconds and multiply by 2, or count the beats per minute for 60 seconds total.
- You should take this heart rate **BEFORE** to get a resting HR, **DURING** every 10-15 mins to ensure you are taking in your target HR range, and **AFTER** exercise to make sure your HR returns to resting baseline.

# Calculating Your Target Heart Rate

1. Max Heart Rate (HRmax) = 220 - your age
2. Resting Heart Rate = Heart Rate after 10 mins of laying on your back
3. Heart Rate Reserve (HRR) = HRmax – resting HR
4. Mid Maximal Steady State (MSS) = resting HR + 75% HRR
5. MSS Training Zone = 5 beats above and below mid MSS
6. **Base Pace Training Zone = 20 beats below MSS**

# Calculating Your Target Heart Rate

*Example: Katie is a 16 year old female with POTS and resting HR of 70 bpm. Her target HR would be 145-155bpm.*

Max Heart Rate (HRmax) = 220 - your age = 220-16 = 204

Heart Rate Reserve (HRR) = HRmax – resting HR = 204 – 70 = 134 bpm

Mid Maximal Steady State (MSS) = resting HR + 75% HRR = 70 + 100.5 = 170.5 bpm

MSS Training Zone = 5 beats above and below mid MS = 165-175 bpm

**Recommended Base Pace Training Zone = 20 beats below MSS = 145-155 bpm**



# Strength Training 2 times per week

Strengthening the muscles in your legs and stomach can help the blood vessels pump the blood back towards the heart. Start with 5-10 reps for each exercise and work towards performing 2 sets of 10 reps.





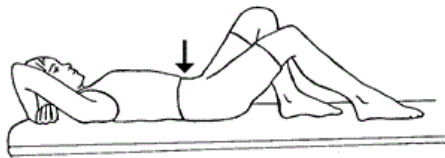
# Strength Training Exercises

- While lying down
  1. Abdominal Draw In Progression
  2. Sit ups
  3. Trunk Extension
  4. Front and Side Planks
  5. Glut Set and Bridging
  6. Hip Extension, Hip Abduction, Hip Adduction
- Seated
  1. Shoulder Retraction
  2. Glut Trunk Lean
  3. Reverse Push Up
  4. Leg Pumping Exercises
- Standing
  1. Squat and Lounge
  2. Standing Hip 4-way
- Equipment

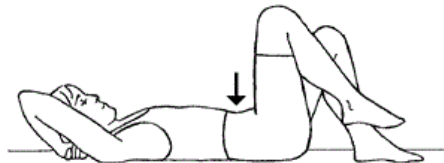
# Lying Down Strengthening Exercises

Abdominal Draw In Progression - Lay on your back with knees bent. Let the weight of your low back press to mat pulling your belly button towards your back. To make this exercise more challenging, you can add leg movements including:

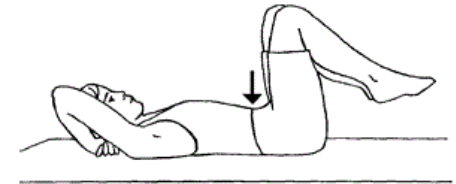
1. Heel Slide
2. Alternate Knee Lift
3. Double Knee Lift



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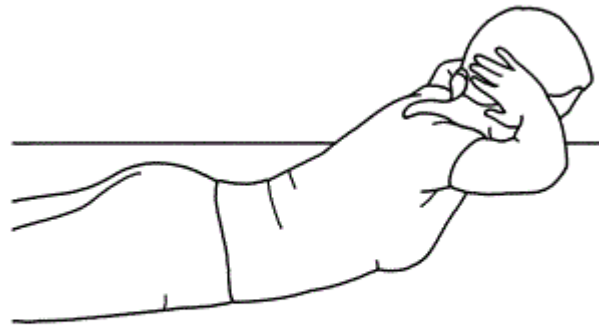
# Lying Down Strengthening Exercises

Sit Up - Lying on your back with arms cross over your chest, tighten your stomach muscles and lift your head and shoulders off the surface.



# Lying Down Strengthening Exercises

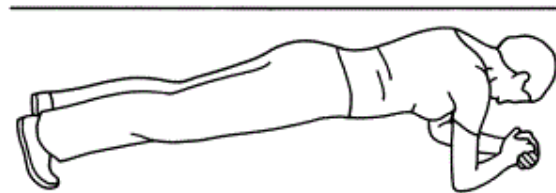
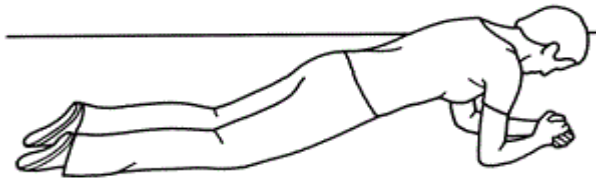
Trunk Extension - Lie face down with your hands behind your head. Lift the upper trunk, making sure to keep arms on surface or behind your head.



# Lying Down Strengthening Exercises

Planks - Lying face down, support your body weight on your forearms and knees. Tighten your stomach and keep your neck and back straight. Hold 5-10 seconds (as you are able) working up towards 10-20 reps.

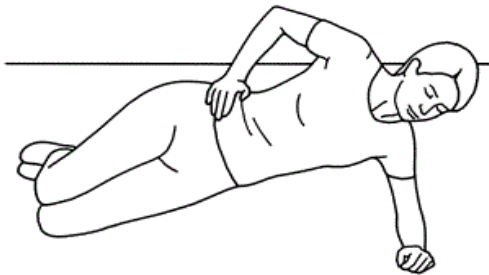
- You can progress difficulty by changing your leg position.



# Lying Down Strengthening Exercises

Side plank - Lie on your side with your knees bent. Support your body weight on your forearm and knees. Tighten your stomach while keeping your neck and back straight. Hold 5-10 seconds (as you are able) working up towards 10-20 reps.

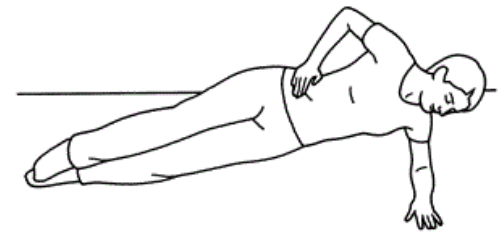
- You can progress difficulty by changing your leg position.



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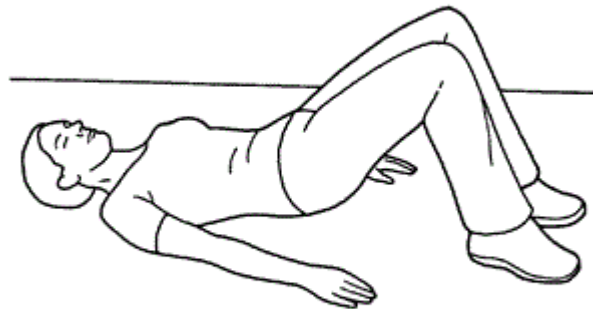
# Lying Down Strengthening Exercises

Glut set - Laying on your back, squeeze your bottom muscles together. Hold 5 seconds each.



# Lying Down Strengthening Exercises

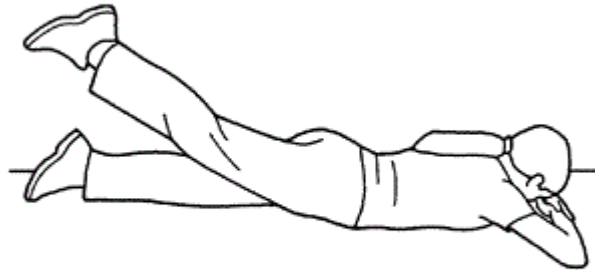
Bridge - Lay on back and bend both knees keeping feet flat on surface. Lift hips towards ceiling.





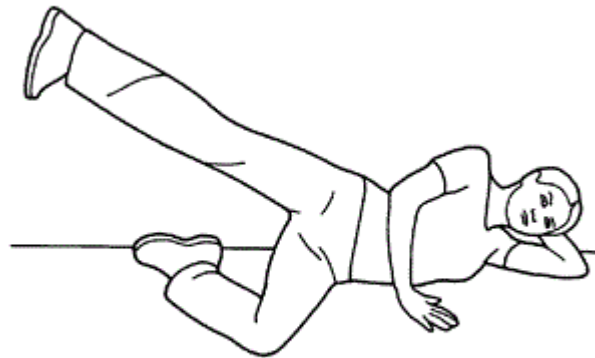
# Lying Down Strengthening Exercises

Hip Extension: Laying on stomach, keep knee straight and lift foot towards ceiling. Slowly return to starting position.



# Lying Down Strengthening Exercises

Hip Abduction: Laying on side, slowly lift top leg to ceiling making sure to stay on your side. Slowly return to starting position.



# Lying Down Strengthening Exercises

Hip Adduction: Laying on side, slowly lift bottom leg to ceiling making sure to stay on your side. Slowly return to starting position.



# Seated Strengthening Exercises

Scapular Retraction: Sitting up tall, squeeze shoulder blades down and back. Hold 3-5 seconds each.



# Seated Strengthening Exercises

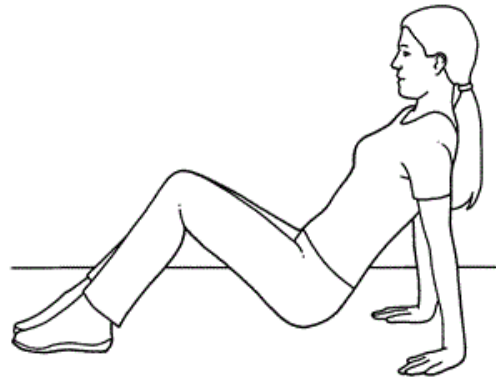
Glut Trunk Lean: Kneel and squeeze your buttocks firmly together, lean backwards keeping your back straight. Return to starting position.



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# Seated Strengthening Exercises

- Reverse Push Up: Sit with your knees bent. Put the palms of your hands on the floor with fingers pointing forwards. Lift your bottom off the floor. Bend your elbows lowering your bottom until it nearly touches the floor. Then straighten your elbows.

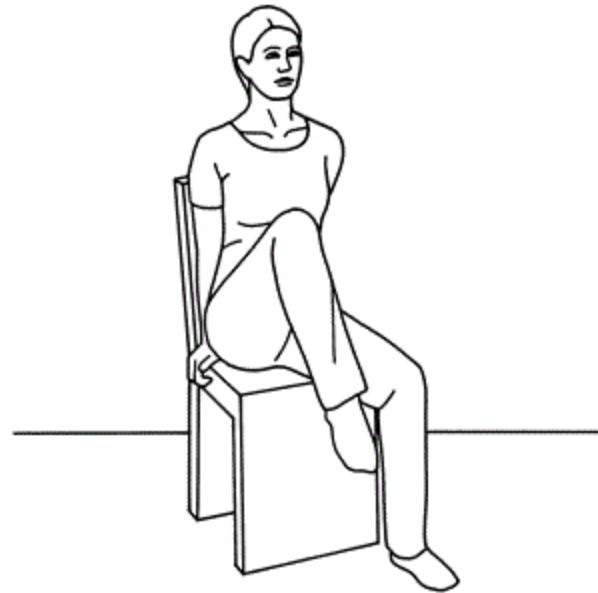


# Seated Strengthening Exercises

- Seated leg pumping exercises (previously reviewed)



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# Standing Strengthening Exercises

- Squats - Stand behind a chair and support yourself with both hands. Slowly bend your hips and knees, trying to push your bottom back. Stand up tightening your buttock muscles.
- Lunges - Take a step forward and bend your knees. Return to the starting position.



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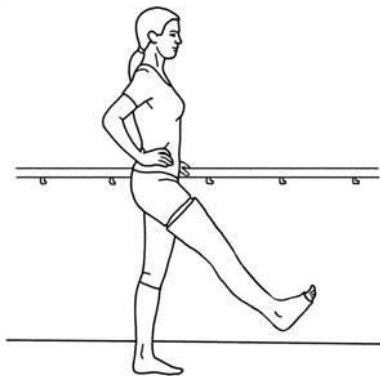


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# Standing Strengthening Exercises

- Standing Hip 4-way – Forward, back, out to the side, and in to the middle



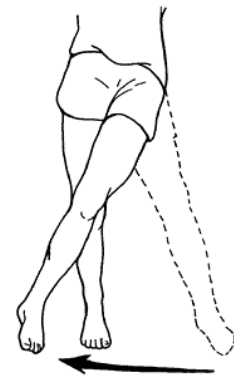
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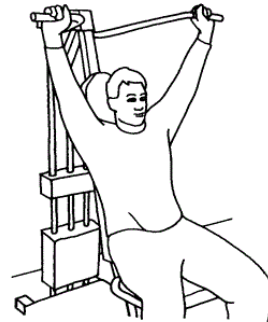
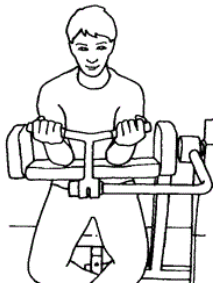
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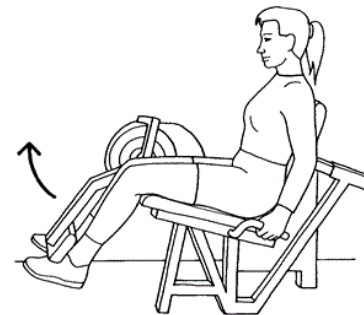
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# Gym Equipment

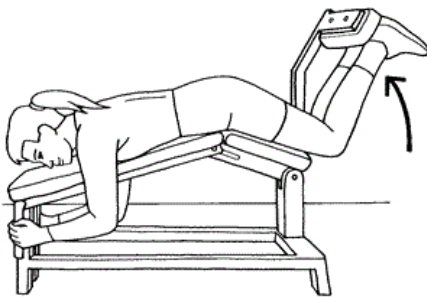
- ALWAYS talk to your doctor and get appropriate training before using gym lifting equipment!



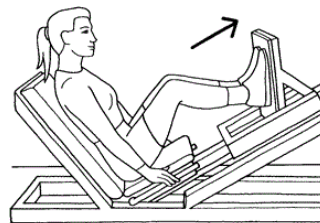
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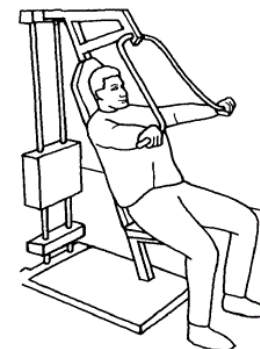
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# Mock Training Calendar

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Rest	5-10 min warm up 3 min base pace 2 min recovery 3 min base pace 5-10 min cool down	Strength Training	5-10 min warm up 3 min base pace 2 min recovery 3 min base pace 5-10 min cool down	Strength Training	5-10 min warm up 3 min base pace 2 min recovery 3 min base pace 5-10 min cool down	Rest
Rest	5-10 min warm up 4 min base pace 3 min recovery 4 min base pace 5-10 min cool down	Strength Training	5-10 min warm up 4 min base pace 3 min recovery 4 min base pace 5-10 min cool down	Strength Training	5-10 min warm up 4 min base pace 3 min recovery 4 min base pace 5-10 min cool down	Rest

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# Questions?



**Disclaimer: Consult your doctor before starting this or any new exercise program.**