

AXIAL MOBILITY EXERCISE PROGRAM

A HOME EXERCISE PROGRAM TO IMPROVE FUNCTIONAL ABILITY

PARTICIPANT'S MANUAL

Julie Chandler M.S., PT
Kathy Cotter Laub M.S., PT
Julie Keysor PT
Helga MacAller, PT
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Claude D. Pepper Older American's Independence Center at
Duke University

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Second Edition

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THE CLAUDE D. PEPPER OLDER AMERICANS INDEPENDENCE CENTER

The Claude D. Pepper Older Americans Independence Center (OAIC) was funded by the National Institute of Aging in October, 1993. This Center is designed to investigate interventions that assist older Americans to retain their independence under a variety of situations. The Center includes four clinical research trials of physical interventions. These intervention studies are based on the concept that improvements of axial mobility (mobility of the neck and back) should lead to improved ability to carry out daily functional activities. One of the intervention studies is designed for sedentary older persons and will compare an aerobic conditioning program with an aerobic plus axial mobility exercise program. The second study investigates the benefit of axial mobility exercises for individuals who are in early stages of

Parkinson's disease. The third study investigates the efficacy of exercise for women with osteoporosis who live in life care communities. And the fourth study investigates an exercise prescription based program for nursing home residents.

The exercises outlined in this manual were developed for use in the first two studies: Exercises for sedentary older individuals and for people in early stages of Parkinson's disease. The programs are being used as the exercise protocol for these two randomized clinical trials. Data from the Parkinson's disease intervention study will be analyzed in 1995. Data from the sedentary older individual study will be analyzed in 1997.

PREFACE

This manual contains a home exercise program which is an integral part of a therapist directed program entitled The Axial Mobility Exercise Program (Schenkman et. al., 1993).* The program is based on several principles which help to distinguish it from many other approaches to exercise and functional training. The first principle is the acknowledgment that loss of mobility of axial structures (i.e. the spine) has a tremendous impact on posture and function. The second principle is that by improving spinal, scapular and pelvic mobility, posture can be regained and movement can be made easier, smoother, and more efficient . A third principle is the relationship between relaxation and deep breathing. Relaxation helps to promote the efficient use of muscles and to increase range of motion, and deep breathing helps to facilitate relaxation. The fourth principle of the exercise program is that the participant learns to incorporate new movement patterns into daily functional activities.

The exercises in this manual are designed to complement the therapist directed program. The therapist and participant work together through the stages of the program, practicing and refining movements. After careful instruction by the therapist and practice by the participant, the therapist decides which exercises are most important for the participant, and assigns them in the home exercise manual. The participant should be independent in an individualized set of exercises, including practice of functional activities. The exercises and movement patterns learned in this program should become an integral part of each participant's lifestyle.

A manual for therapists is available. For more information call 1 (800) 672-4213

*Schenkman, Keysor, Chandler, Laub, and MacAller: Axial Mobility Exercise Program: An Exercise Program to Improve Functional Ability. Claude D. Pepper Older Americans Independence Center, Duke University, 1993.

INTRODUCTION

This home exercise program is divided into two segments. The first part is referred to as "floor exercises" which consists of a daily fifteen minute exercise session in which you will practice specific exercises that your therapist assigns you. The second part, labeled "dynamic activities", refers to normal everyday activities that you will practice using new movements. Once you learn the new movements, you will automatically perform the activity that way without having to concentrate on it. New "floor exercises" will be assigned each week as your fifteen minute daily homework assignment. In addition, you will be asked to concentrate on one new dynamic activity each week. You will try to practice this dynamic activity in the "new" way your therapist instructed you every time you ordinarily perform that activity during the day.

The goals of the exercises are to teach you to move in a relaxed manner, and to improve your flexibility, postural alignment and general mobility. Here are some key points which you should remember as you are learning and practicing the exercises:

- It is important to achieve relaxation first.
Only work to increase range of motion within a relaxed state.
This will allow you to achieve greater changes in your flexibility.
- Slow, deep, relaxed breaths are very important in helping your muscles relax.
- If you feel you are "fighting" your muscles, then you are stretching too hard or trying too hard.
You should decrease your efforts.
- The order of these exercises is important.
Please follow the exercises in the order in which your therapist instructed you.
- There is no precise number of repetitions for each exercise.
The exercises should be done until you feel you have reached optimal relaxation and range of motion.
Typically, 5 or 6 repetitions is adequate, but this may vary with each exercise.
- To enhance the effectiveness of the exercises, be sure to remember to take enough time to let your muscles relax.
Move at a relaxed pace with little effort.
- Occasionally, at the end of a movement, before reversing the direction, take a deep breath in.....then let it out.....and relax even more.

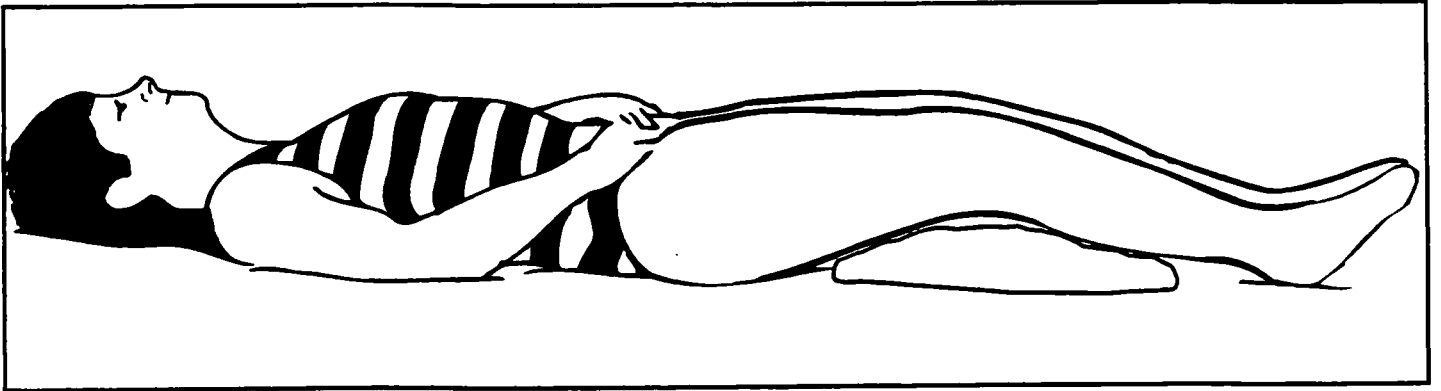
EXERCISES

STAGE I

I-1 Deep Breathing

Position: On your back (using pillows as needed).

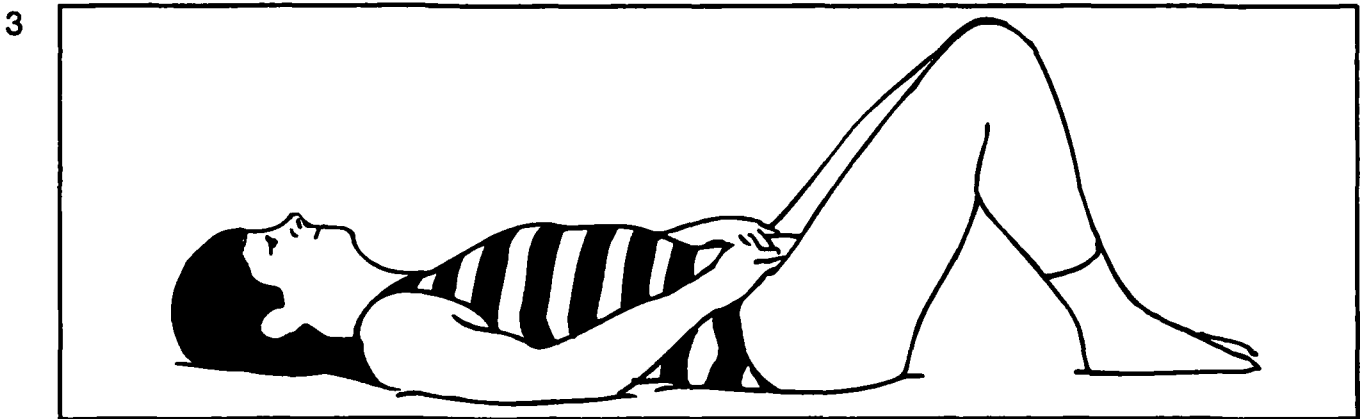
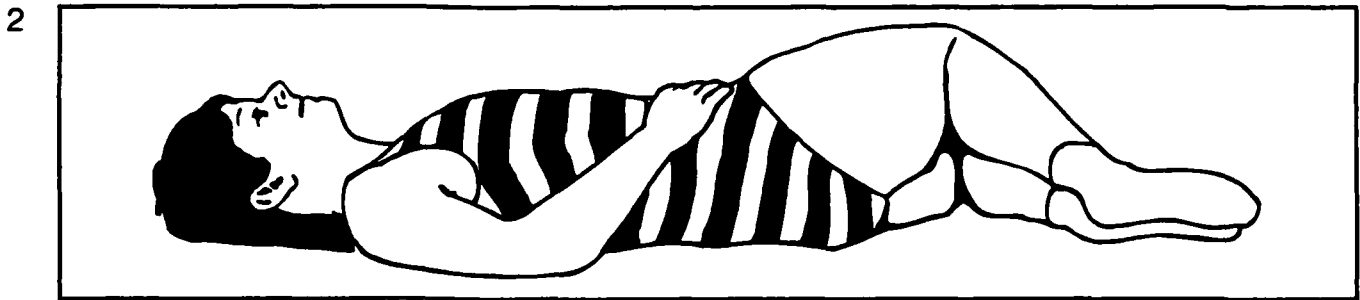
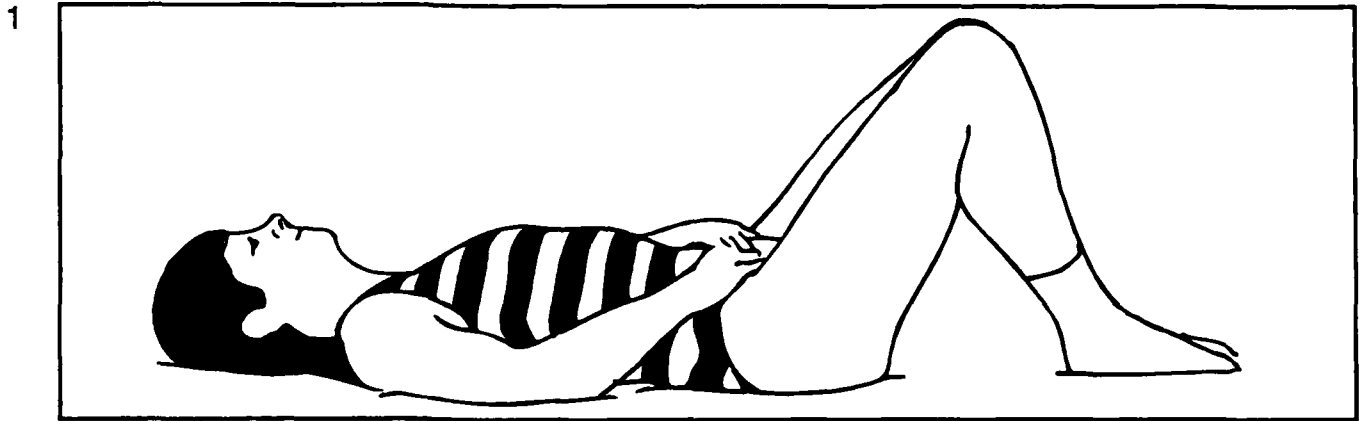
Action: Take slow, deep breaths and relax.



I-2 Double Hip Rotation

Position: On your back with knees bent.

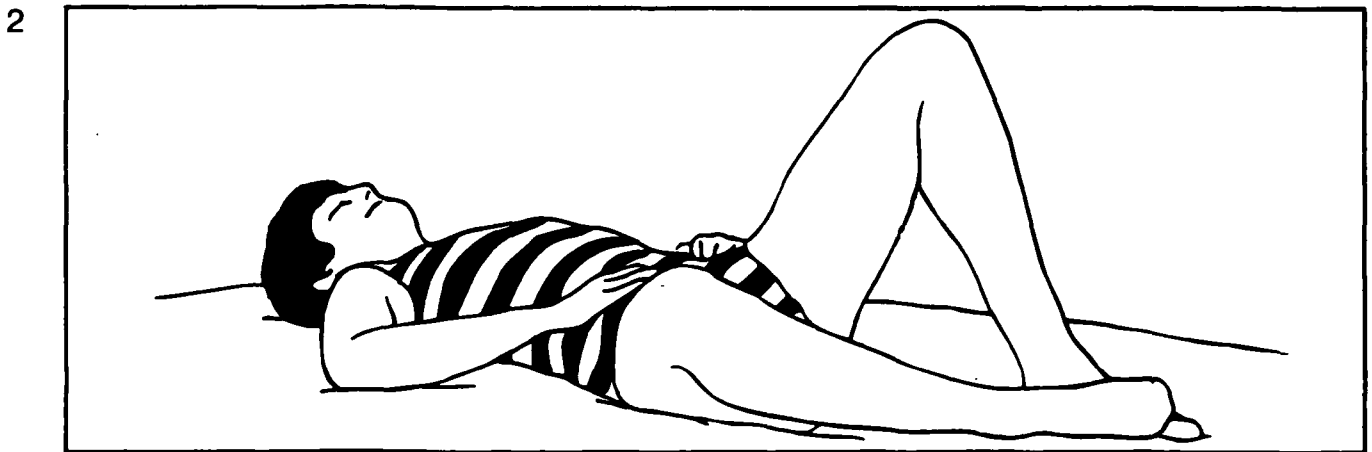
Action: Slowly let knees rock side to side as far as they can go without forcing them.



I-3 Single Hip Rotation

Position: On your Back with knees bent.

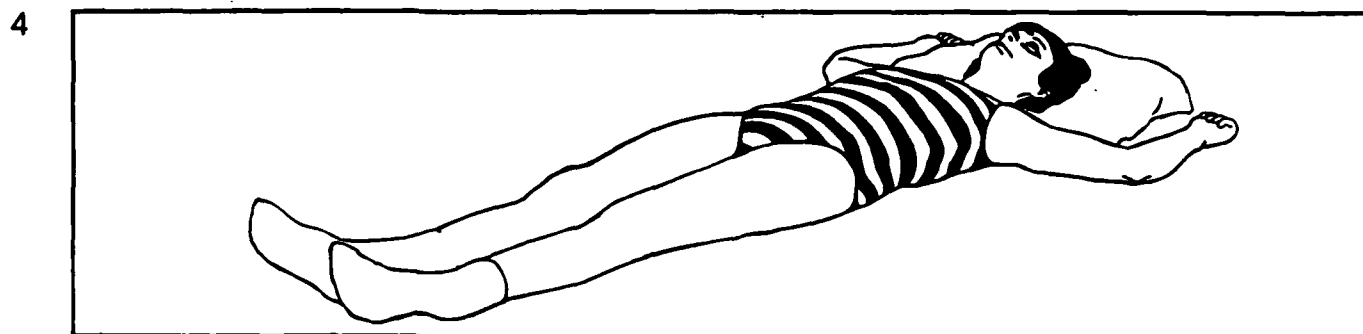
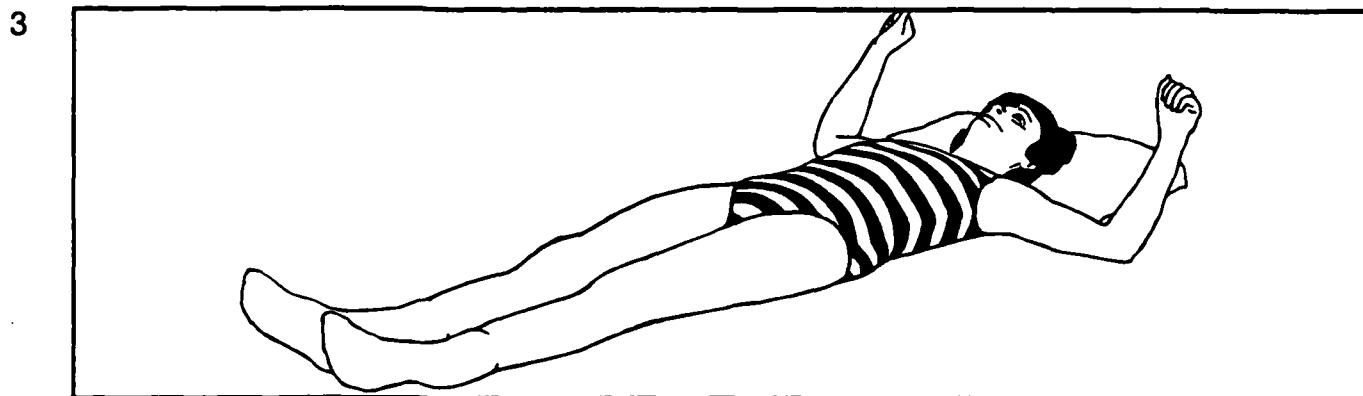
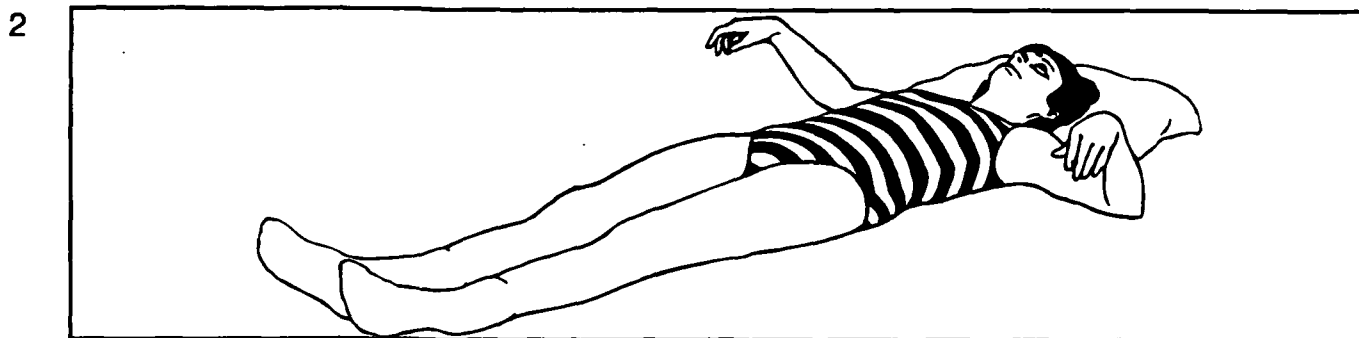
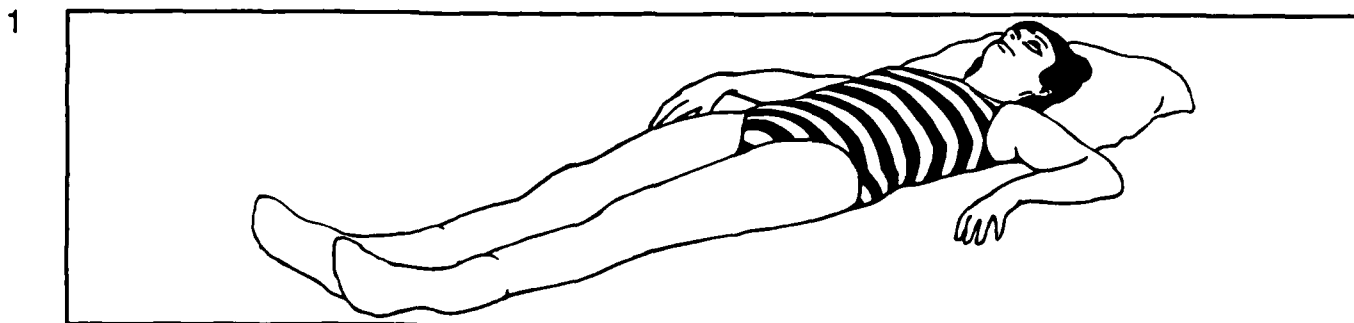
Action: Slowly let one knee drop to the side, then bring it back up. Keep your pelvis and other leg still. Repeat with other side.



I-4 Shoulder Rotation

Position: On your back, arms out to side, elbows bent to 90 degrees.

Action: Slowly let arms relax back toward your head, then reverse direction and bring them toward your hips. Do not allow shoulders to "pop up" as your arms go forward. Practice also with arms moving in opposite directions.

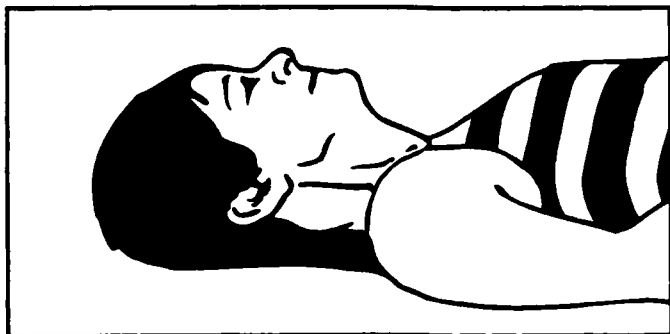


I-5 Neck Rotation

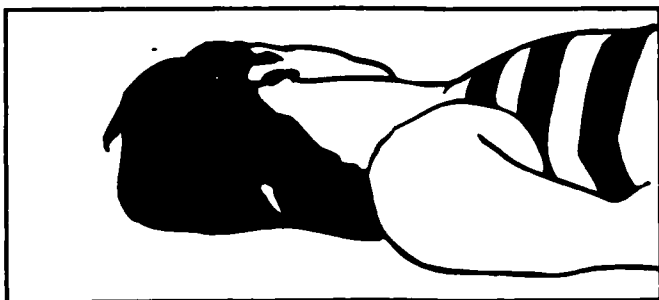
Position: On your back (your head and neck should feel comfortable, not tilted forward or back).

Action: Slowly turn your head from side to side.

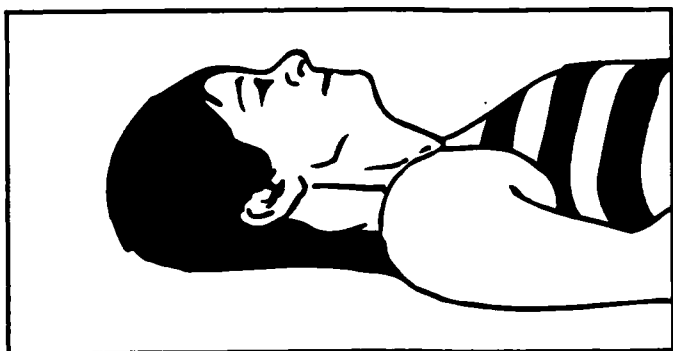
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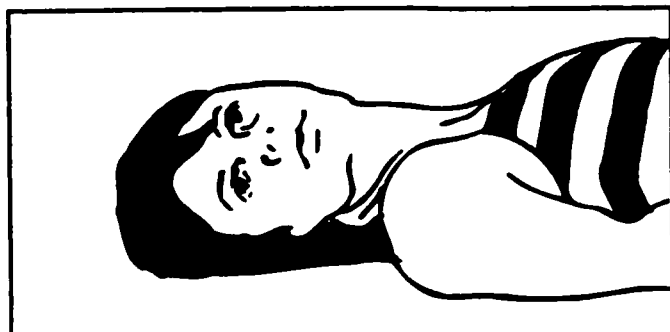
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I-6 Combined Movements

Position: On your back, knees bent, arms out to the side with elbows bent.

Action: Practice the exercises you have just done in various combinations.
For example:

- 1) Perform shoulder rotation while performing double hip rotation, as shown below.
- 2) Perform shoulder rotation with hands moving slowly in opposite directions while turning your head side to side.
- 3) Turn head slowly in one direction as knees move in the opposite direction.
- 4) Turn your head while you perform shoulder rotation in opposite directions and double hip rotation. Move your head and knees in opposite directions.

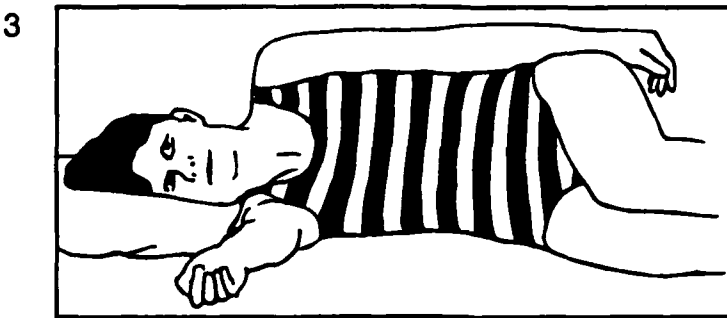


STAGE II

II-1 Upper Trunk Rotation

Position: On your side, knees and hips bent, top arm resting on your side.

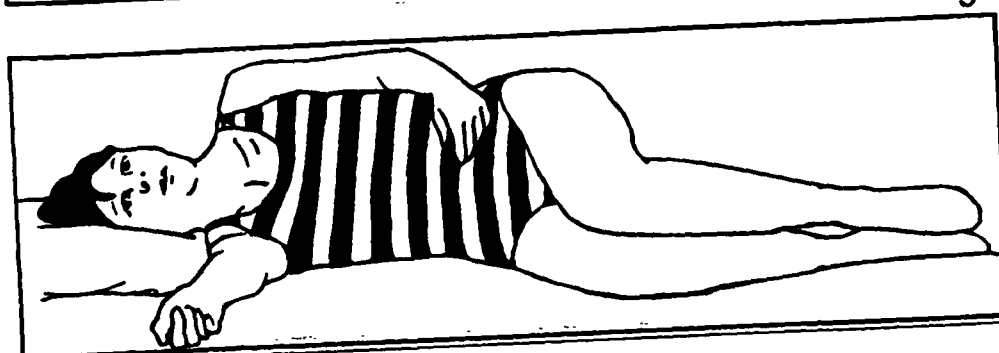
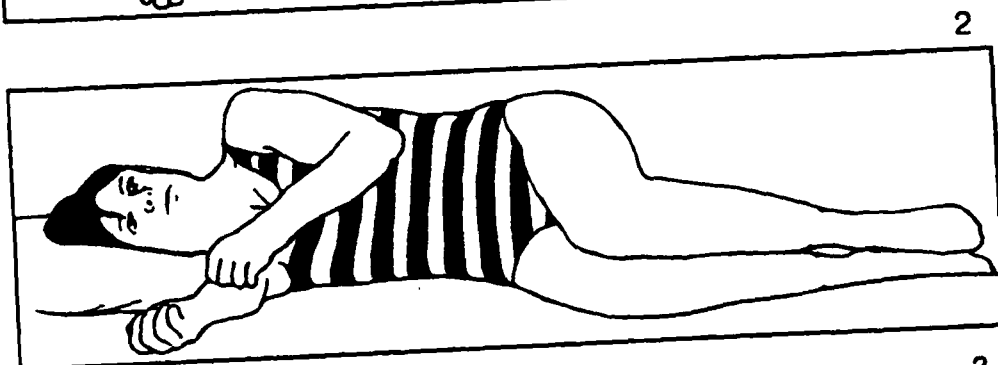
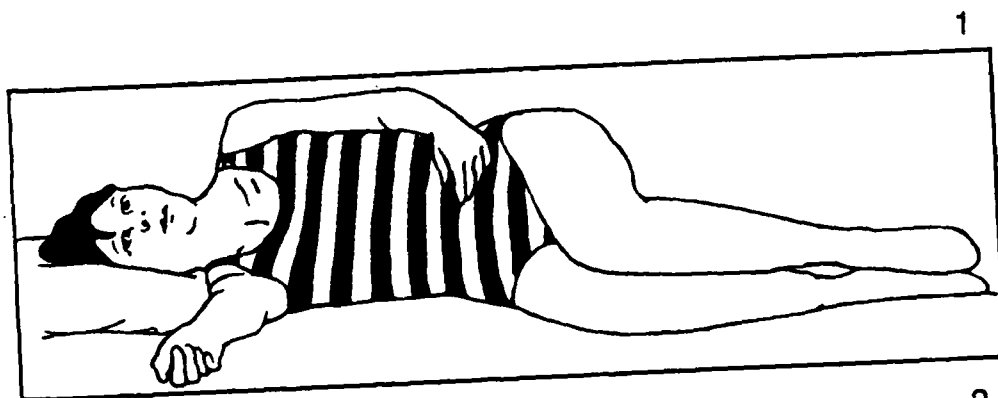
Action: Slowly rotate chest forward and then backward. Keep arm at your side and hips still.



II-2 Arm Reach

Position: On your side, hips and knees bent.

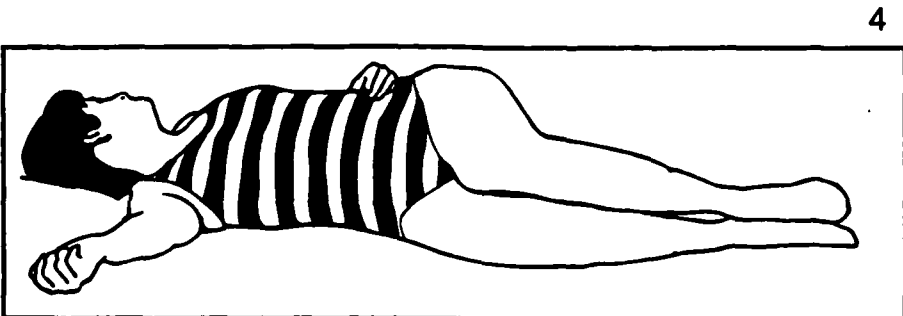
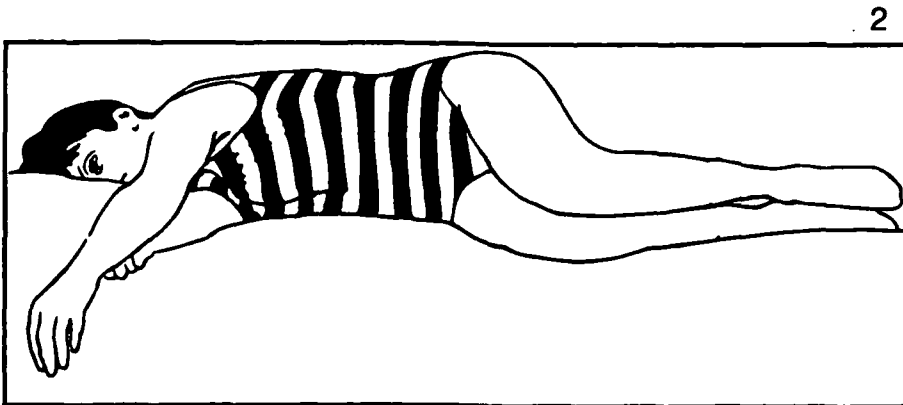
Action: Reach forward and backward with your arm. Let your elbow bend as you go back, and straighten as you go forward. Feel your shoulder blade slide forward and backward. Keep your upper body still.



II-3 Combined Reach and Roll

Position: On your side, hips and knees bent.

Action: Slowly reach forward and backward as far as you can. Let your trunk roll forward and backward as you reach. Keep hips still.



II-4 Rolling

Position: On your back, knees bent.

Action: Let knees relax to one side, then roll with your arm and upper body to the same side. To roll back, let your arm and upper body relax back, followed by your hips and knees. Repeat to other side.

Functional Activity - Rolling

Whenever you roll in bed, concentrate on rolling your knees and hips separately from your shoulders as in exercise II-4.

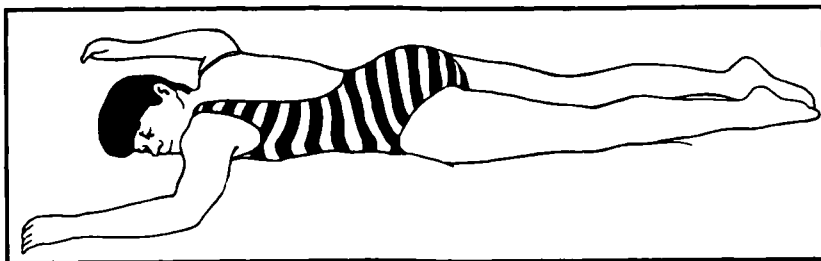
STAGE III

III-1 Wiggle

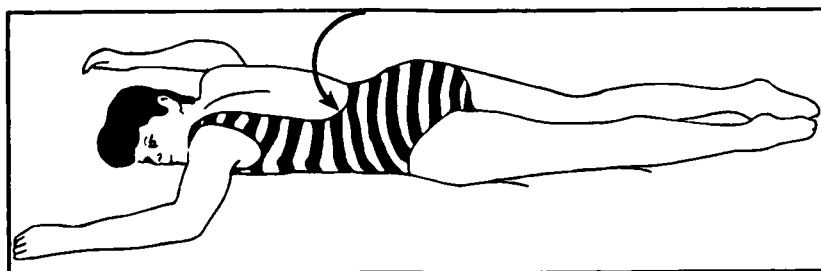
Position: On your stomach, pillows as needed.

Action: Gently rock hips side to side.

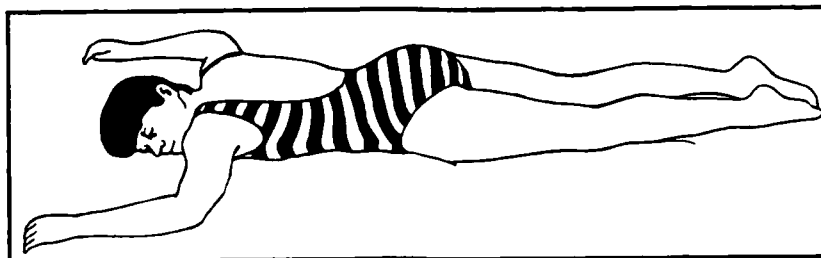
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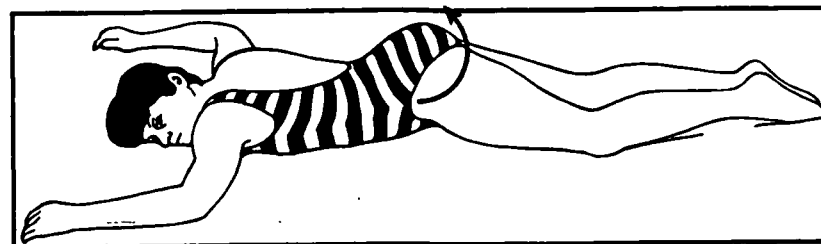
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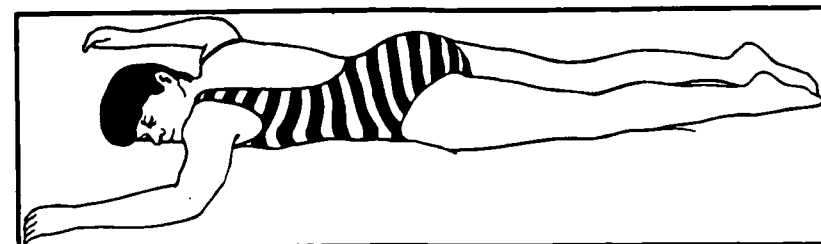
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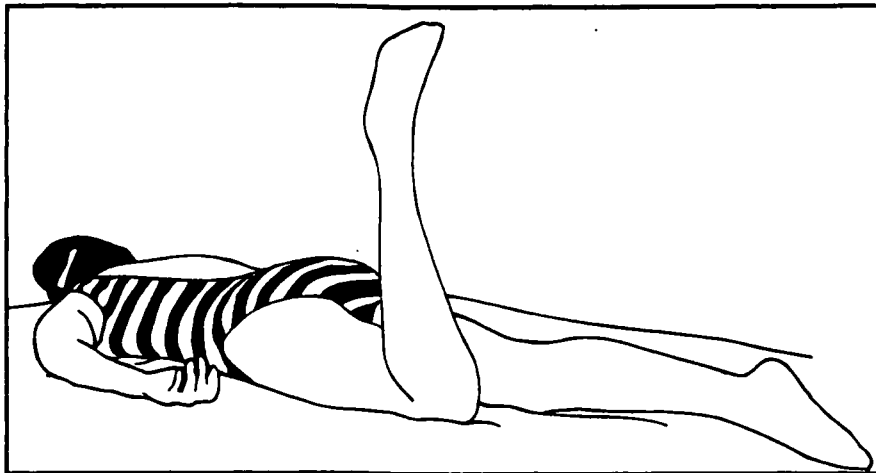
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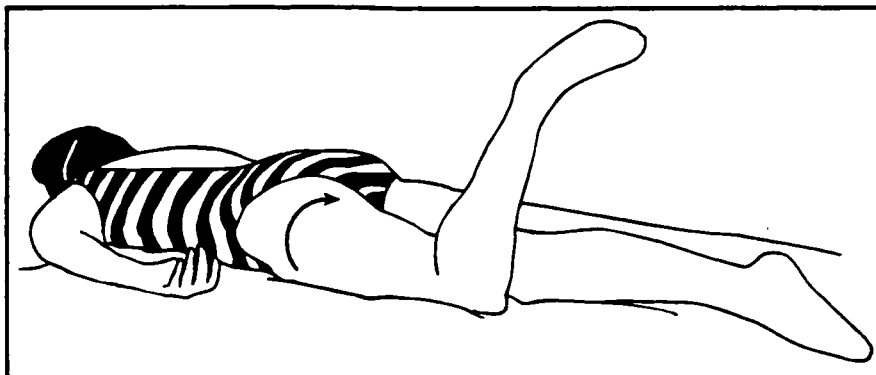


III-2 Prone Hip Rotation

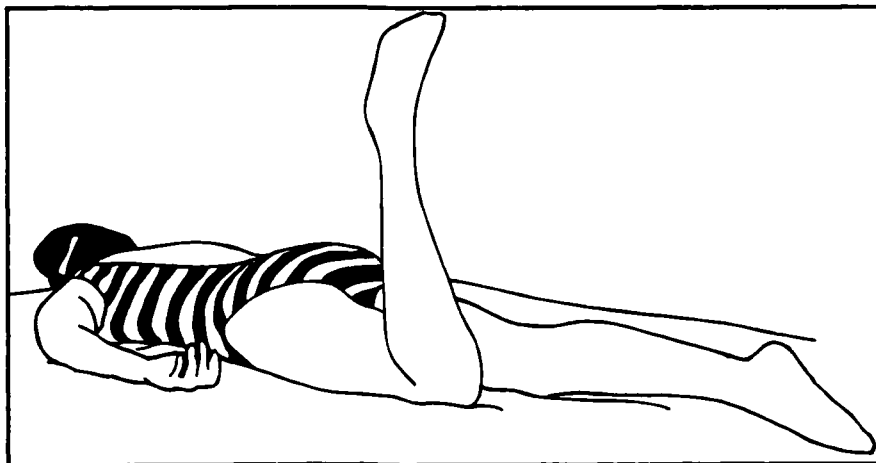
Position: On your stomach, one knee bent so foot points to ceiling.

Action: Slowly let your leg roll out to the side and back. Do not let your body rock from side to side, just your leg.

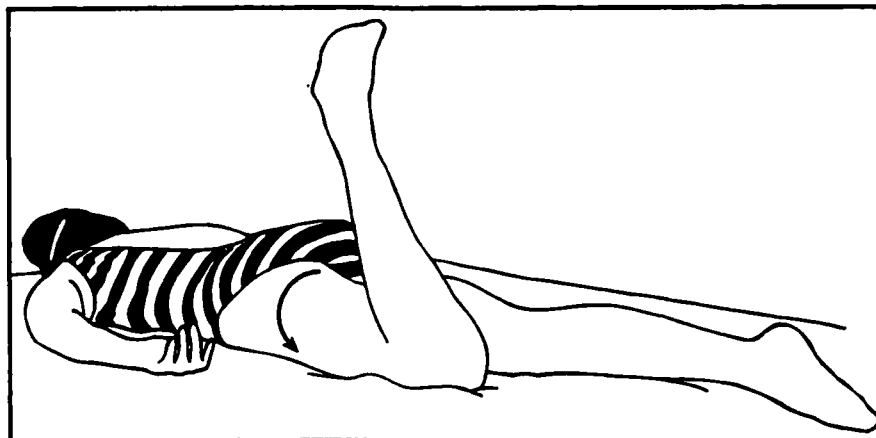
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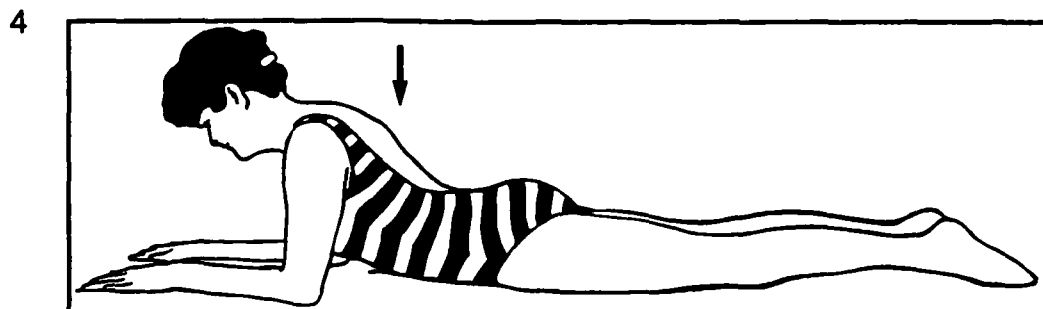
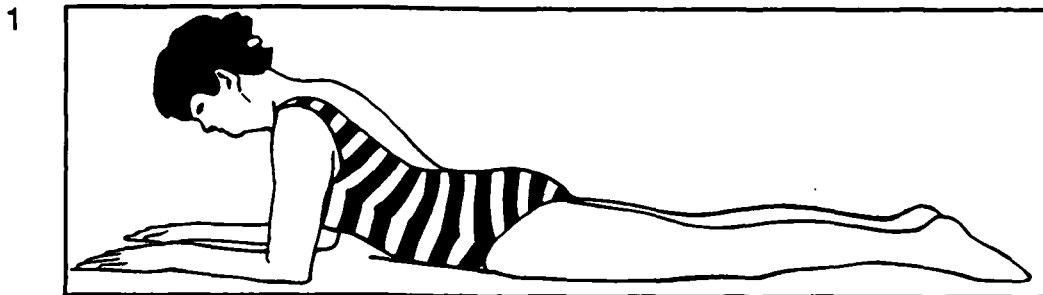
III-3 Prone Prop

Position: On your stomach, propped up on elbows.

Action: Relax in this position, letting your back sag. Practice taking deep breaths in and out as you relax.

Functional Activity - Rolling from back to stomach

Start on your back and roll to your side as described in exercise II-4, and then continue rolling over to your stomach. Practice relaxing flat on your stomach, then propping up on elbows for a few minutes at a time.

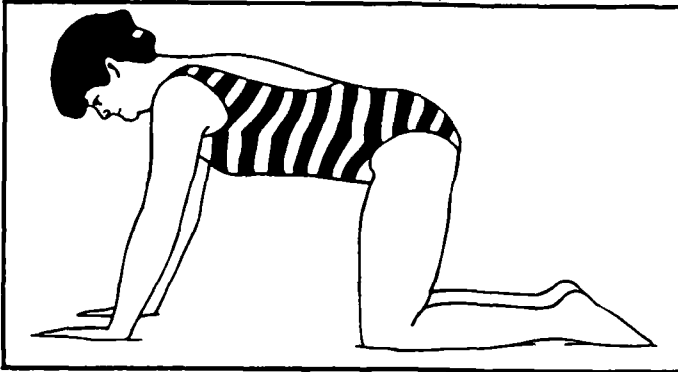


STAGE IV

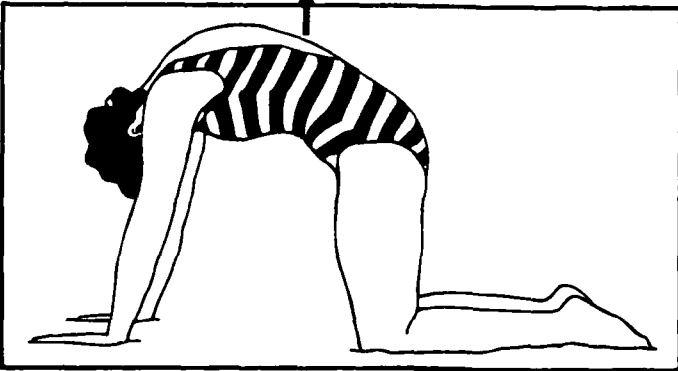
IV - 1 Cat/Camel

Position: Hands and Knees.

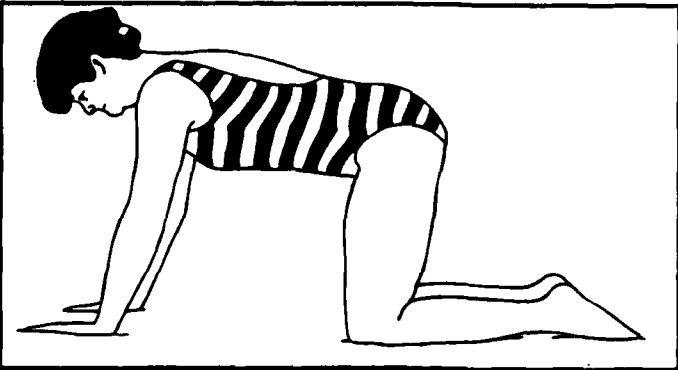
Action: Round your back up like a cat, then let it sag down. Keep your arms straight.



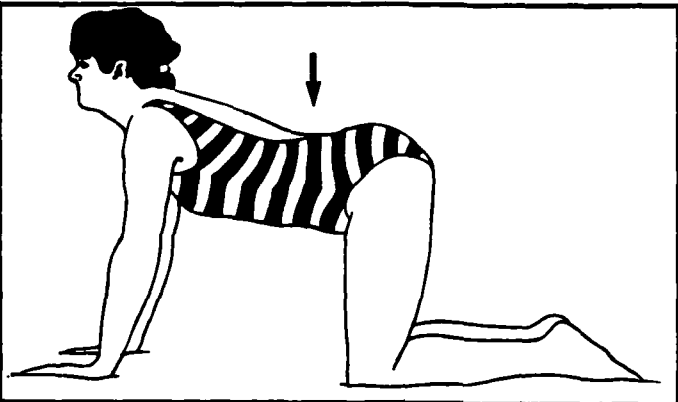
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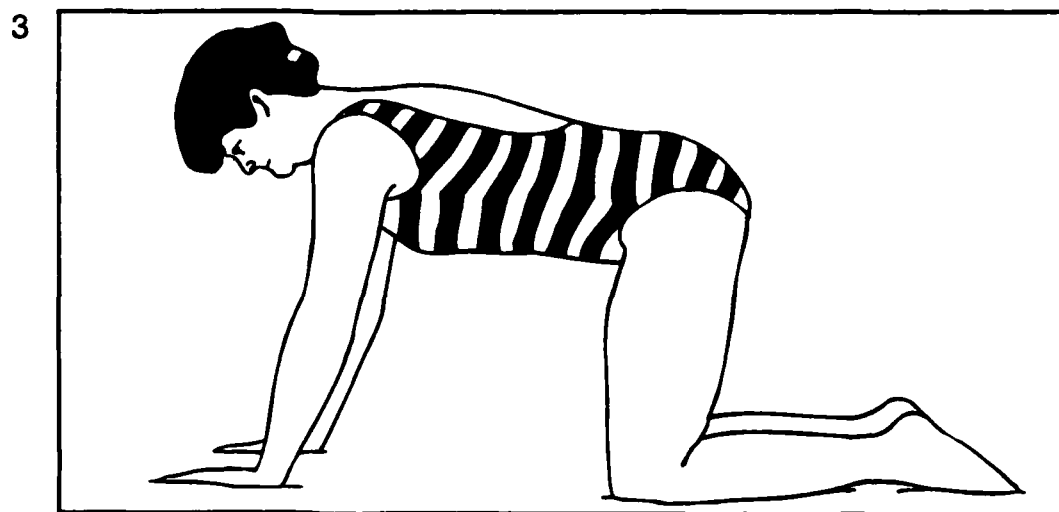
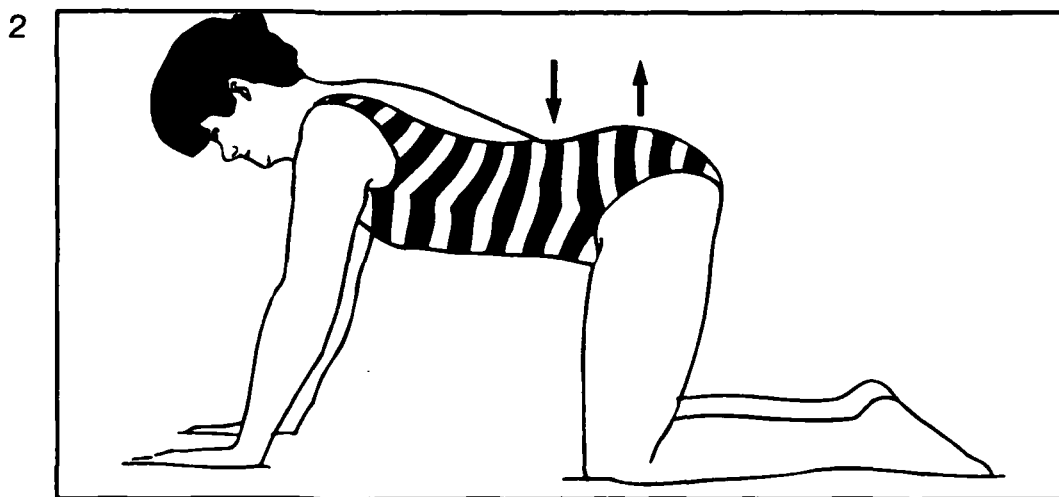
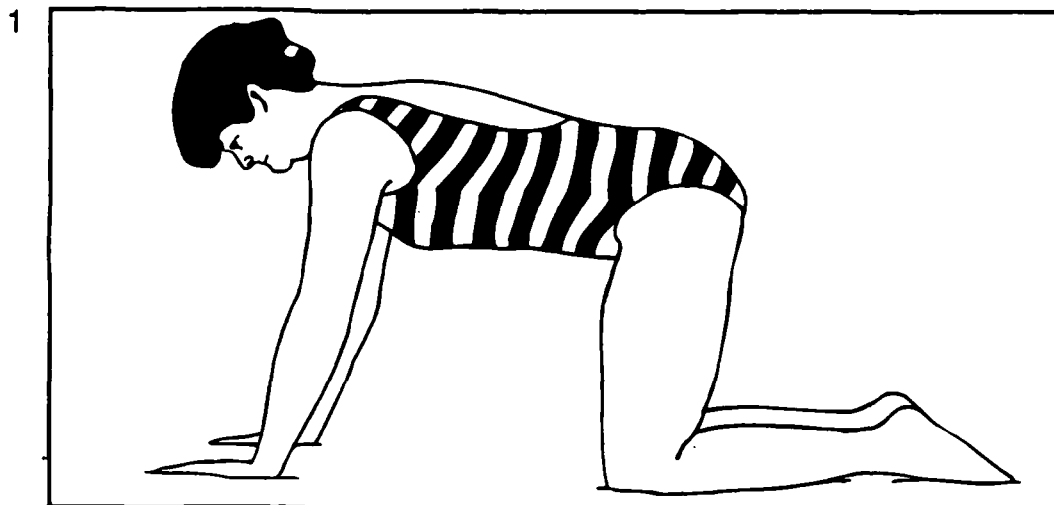


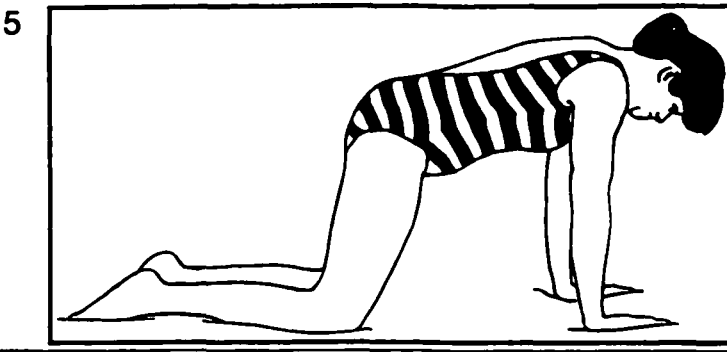
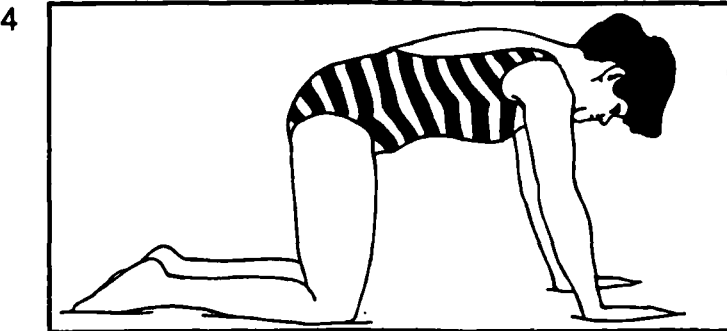
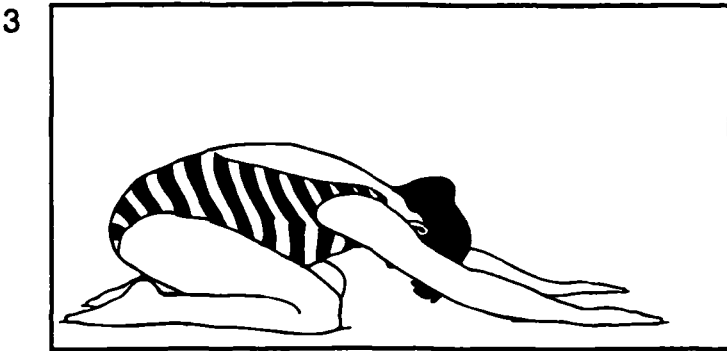
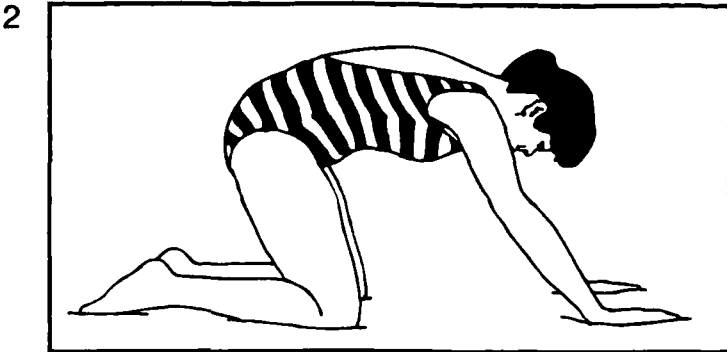
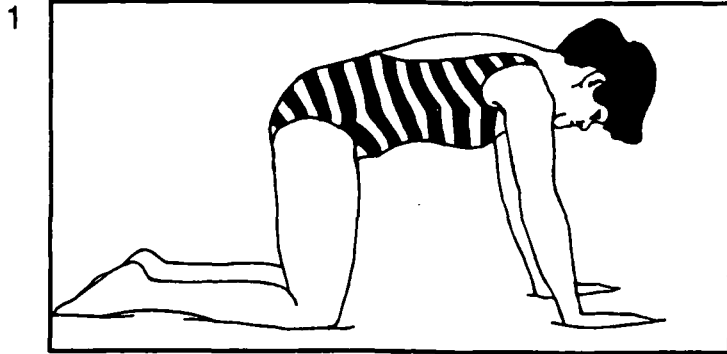
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IV - 2 Isolated Lower Back Movement

Position: Hands and Knees.

Action: Keep upper back still and try to let lower back sag, then round it back up.





IV - 3 Hands and Knees Rock

Position: Hands and Knees.

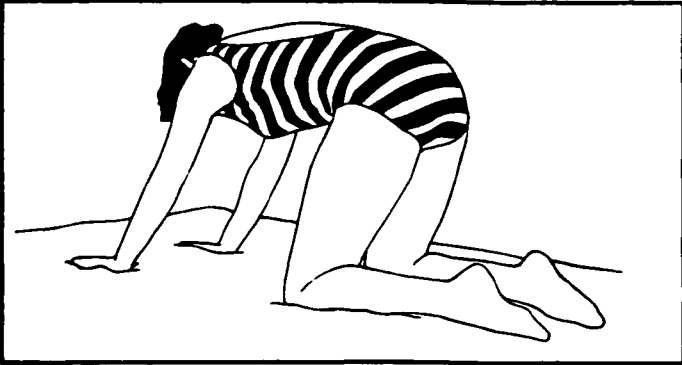
Action: Sit back on heels, keeping arms stretched out in front. Slowly come forward, keeping upper back flat as you bring your weight forward onto your arms. Rock slowly back to the starting position.

IV - 4 Hands and Knees Diagonal Rock

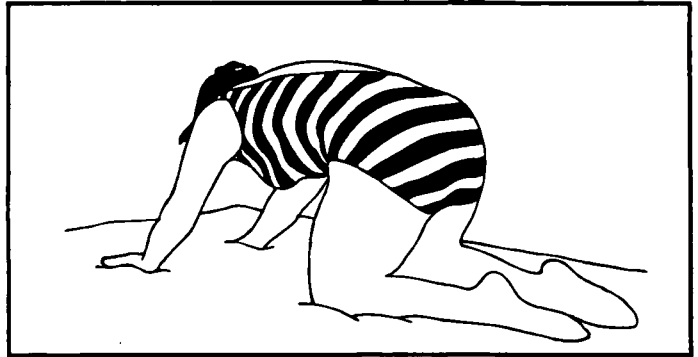
Position: Hands and Knees.

Action: Shift weight back over your left hip, come back to the middle, and then back over your right hip.

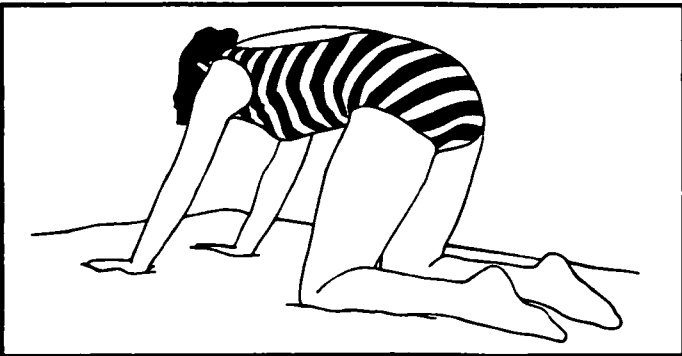
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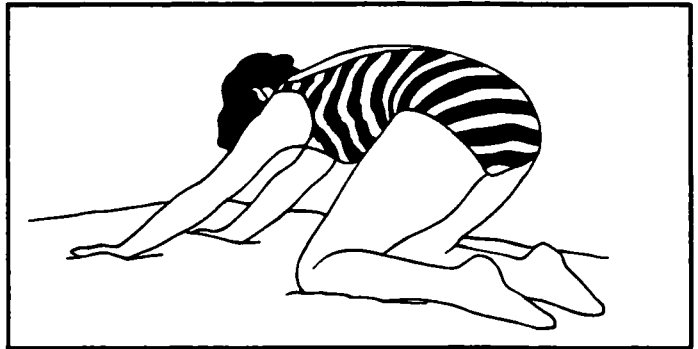
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4



Functional Activity - Getting up from the floor

- 1) Start on hands and knees.
- 2) Bring one foot forward and straighten your trunk, so you are resting on one foot and one knee.
- 3) Keep head up and back straight.
- 4) Lean forward over your knee and come to a standing position, using arms to push up as needed.

STAGE V

V-1 Pelvic Tilt

Position: Sitting on a firm chair, with back straight, feet on floor.

Action: 1) Tilt pelvis forward so there is an arch in your low back.
2) Then tilt pelvis back so that your low back slumps.



V-2 Forward Lean

Position: Sitting on a firm chair with back straight, feet on floor.

Action: Tilt pelvis forward as in exercise V-1, then lean forward over legs. Make sure you keep the "arch" in your low back, and your head up.



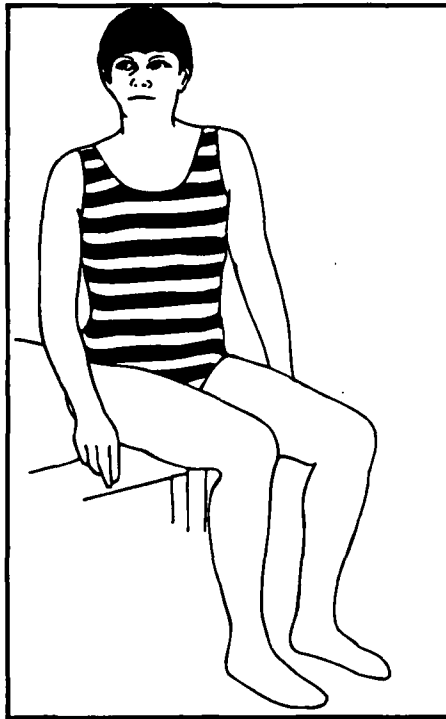
V-3 Diagonal Lean

Position: Sitting on a firm chair with back straight, feet on floor

- Action:** 1) Tilt pelvis forward as in V-1.
2) Rotate trunk to the right, so that shoulders face right knee.
3) Lean forward over right knee, keeping back straight and head up as in V-2.
4) Repeat to left side.



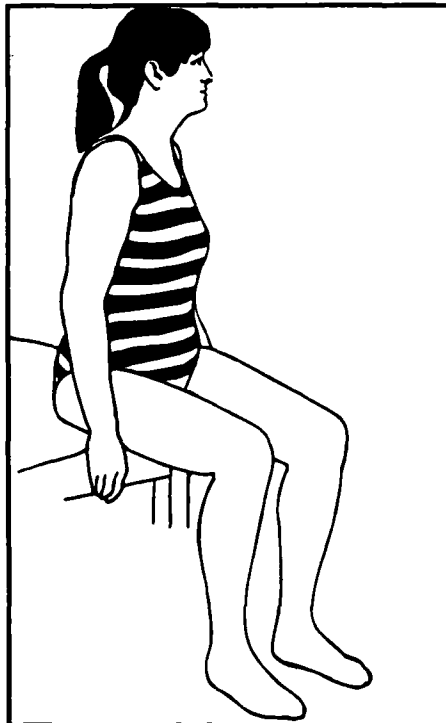
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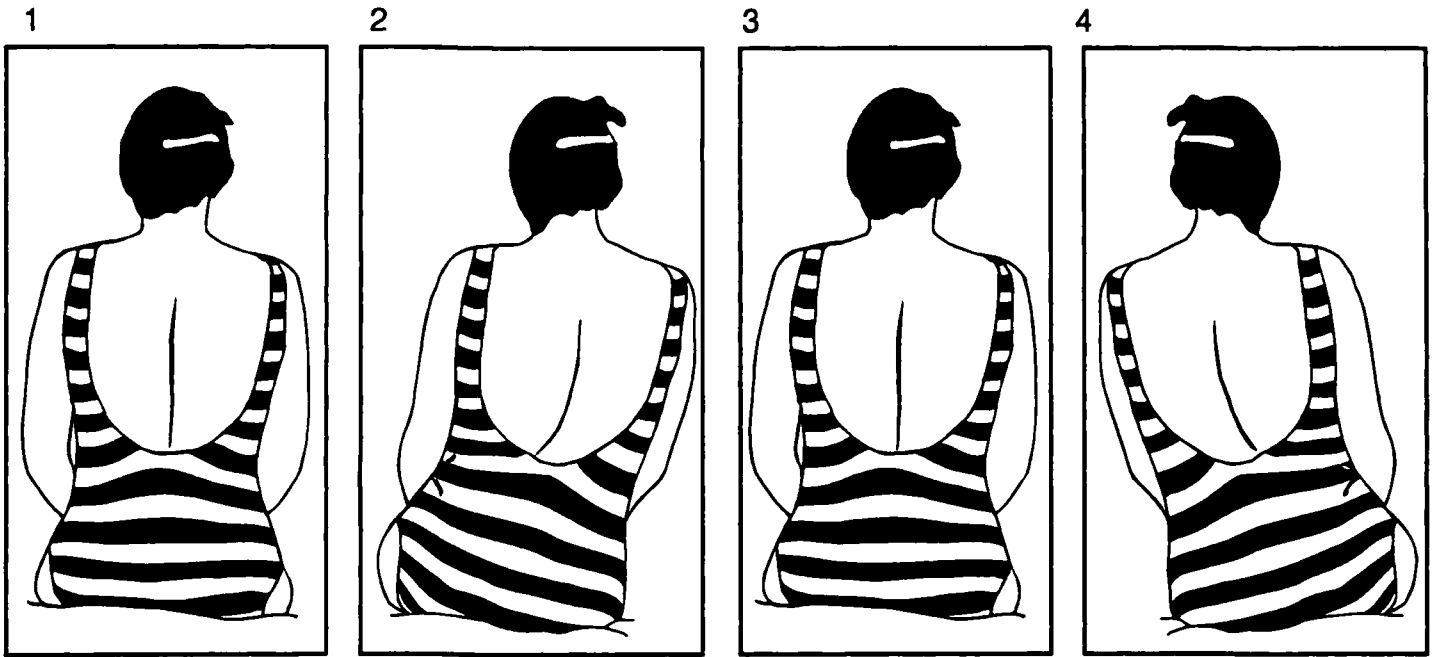
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V-4 Side Tilt

Position: Sitting on a firm chair with back straight, feet on floor.

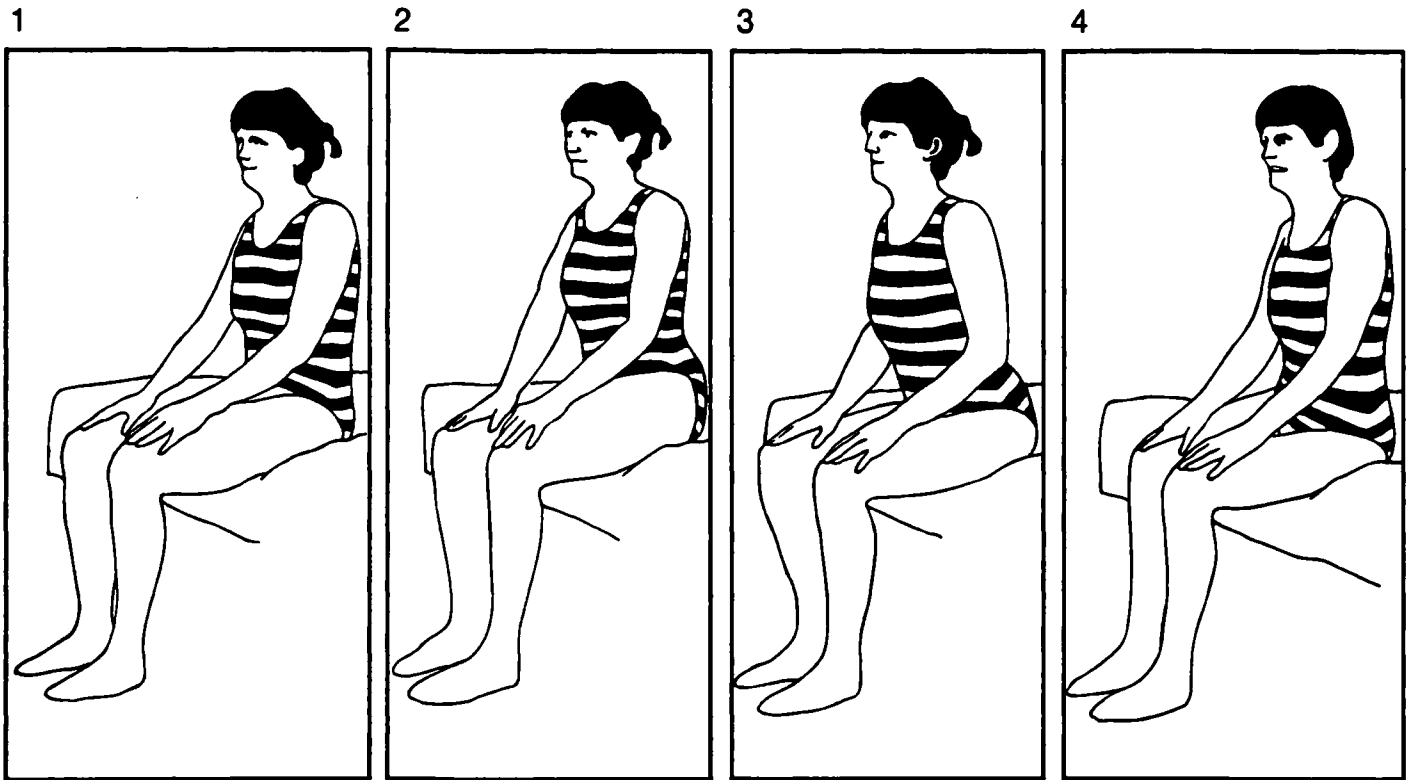
Action: Shift weight from one hip to the other, keeping arch in low back. You should feel one buttock rise from chair as you shift to the other side. Keep upper body still, only move hips and pelvis.



V-5 Pelvic Clock

Position: Sitting on a firm chair, back straight, feet flat on the floor.

Action: 1) Slump your low back.
2) Shift your weight to the right side.
3) Arch your low back.
4) Shift weight to the left.
5) Continue this sequence so you are making smooth circles with your pelvis like using a hula hoop. Try to keep your upper body still. Perform in clockwise and counterclockwise directions.



Functional Activity - Standing up from a chair

- 1) Scoot to the edge of the chair, bend knees so feet are slightly behind your knees.
- 2) Sit up straight.
- 3) Lean forward, keeping your back straight.
- 4) Stand up, using your arms as needed to push.

V-6 Neck Movements

Position: Sitting on a firm chair, back straight, feet flat on the floor.

Action: A) Chin Tucks

Glide head backwards so that ears are lined up with shoulders. Do not nod your head up and down. Eyes should stay level. The purpose is to align your head and neck in proper posture.



Poor Head Posture



Correct Head Posture

B) Side Tilts

Glide head backward as above in A). Then slowly tilt head to right, bringing ear toward shoulder. Repeat to left. Keep eyes forward.



C) Rotation

Glide head back as in A). Then turn head slowly from side to side.



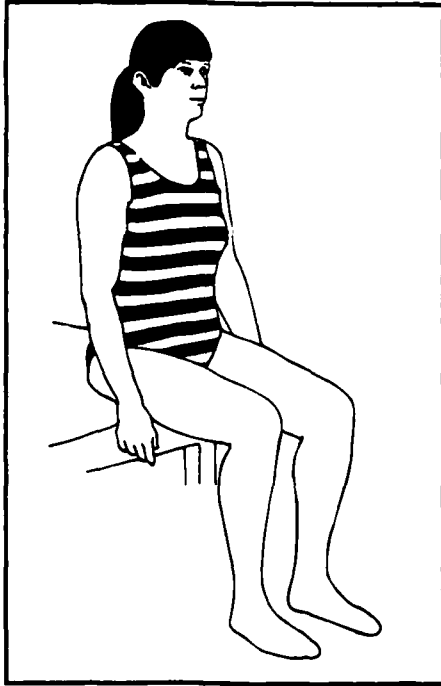
Stage VI

VI - 1 Trunk Rotation

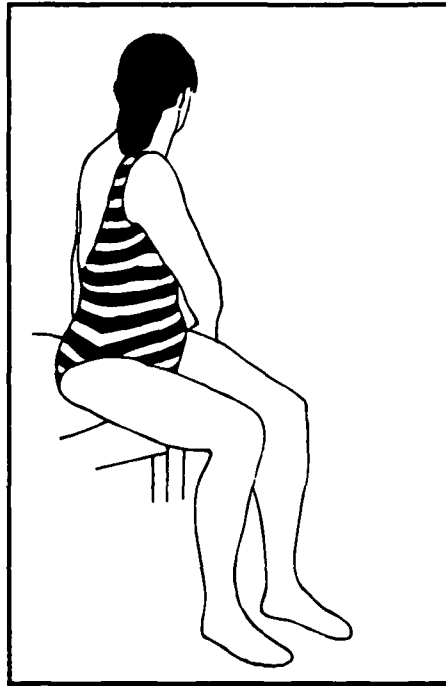
Position: Sitting on a firm surface, back straight.

Action: Turn body to the right as far as possible. Do not allow your back to slump. Repeat to the left.

1.



2.



3.



4.

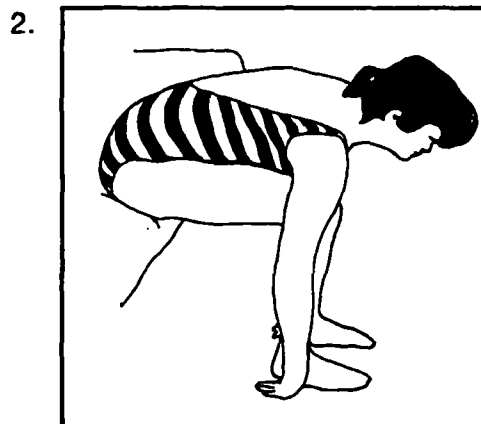
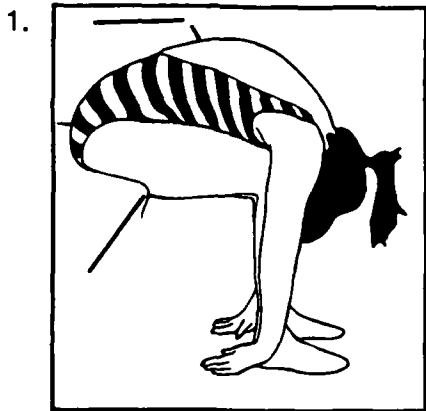


VI - 2 Back Extensions

Position: Sitting on a firm chair, trunk forward as far as possible over thighs. Let hands rest by feet.

Action: Sit back up this way:

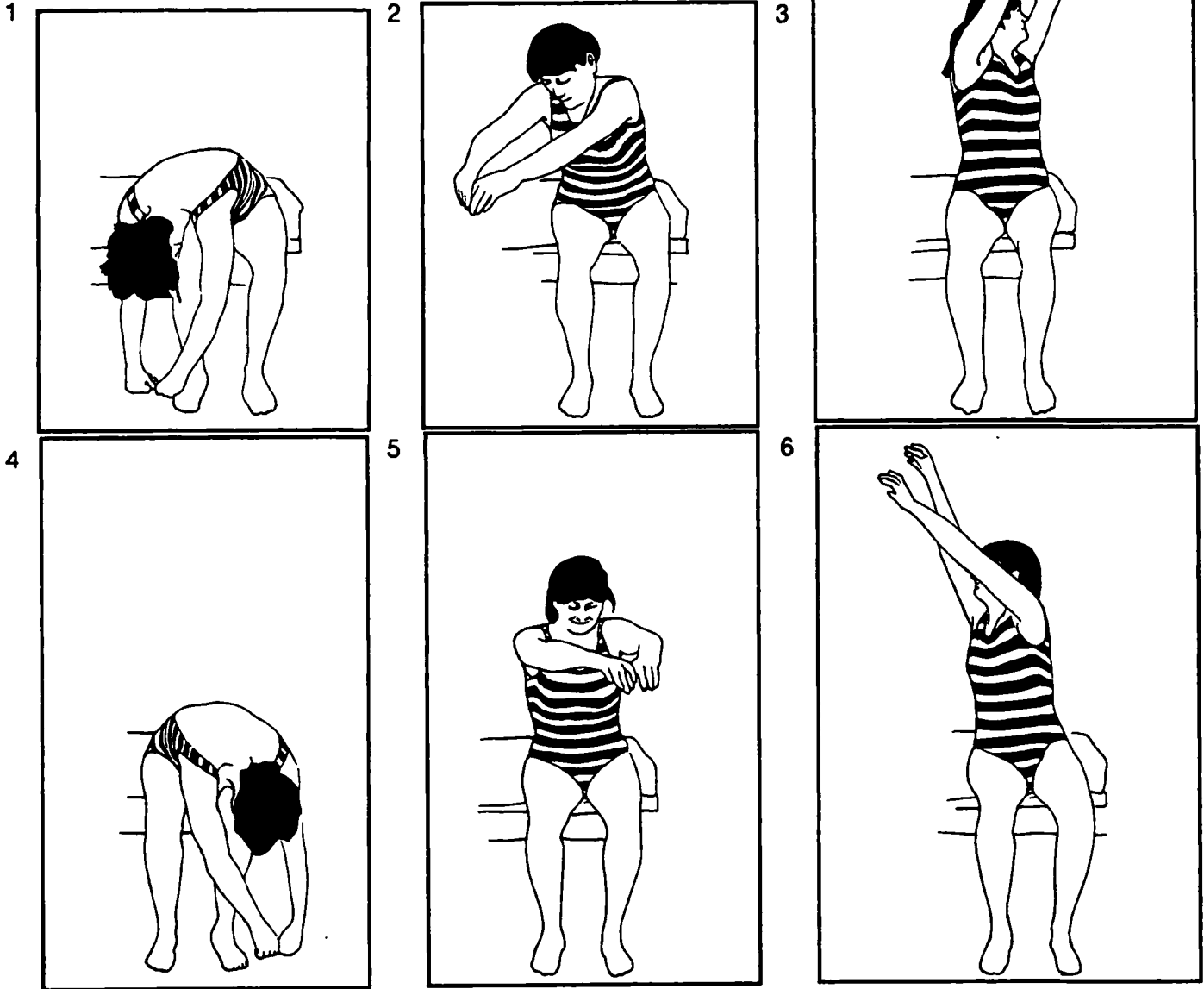
- 1) Lift head.
- 2) Squeeze shoulder blades together.
- 3) Straighten back and sit up.
- 4) Finish with an arch in your low back.



VI - 3 Diagonal Back Extensions

Position: Sitting on a firm chair, trunk bent forward as far as possible to the right. Hands resting on outside of right foot.

Action: Pretend to pick something up by your right foot with both hands. Then lift up and turn as if to place it on a shelf above your left shoulder. As you reach for the "shelf", sit as tall as you can.



Functional Activities:

- A) Putting on shoes and socks: Bend your trunk forward and to the right to reach your right foot. Do not let back slump as you bend, but try to lean forward while keeping your back straight as far as you can, as in exercise V-2.
- B) Sitting reach: Sit in front of a table with good posture (slight arch in low back, upper back straight). Reach forward across the table as if you were reaching for an object. Reach diagonally to the right and then diagonally to the left. Do not let your back slump, but keep it straight as in exercise V-2.

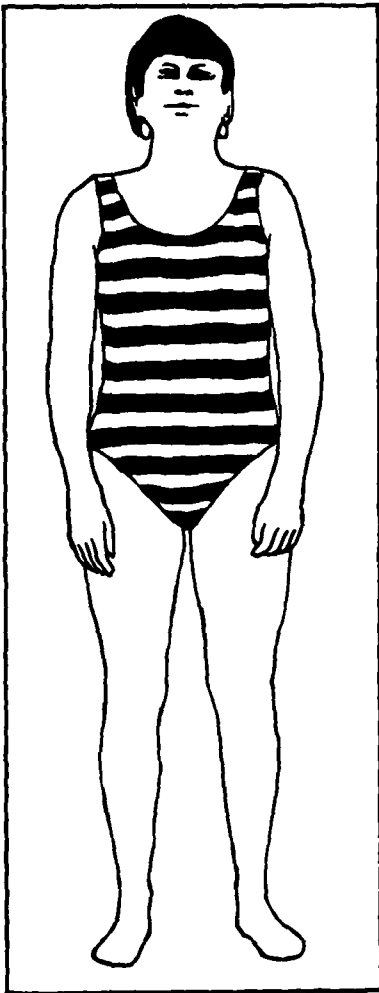
Stage VII

VII-1 Side Bends

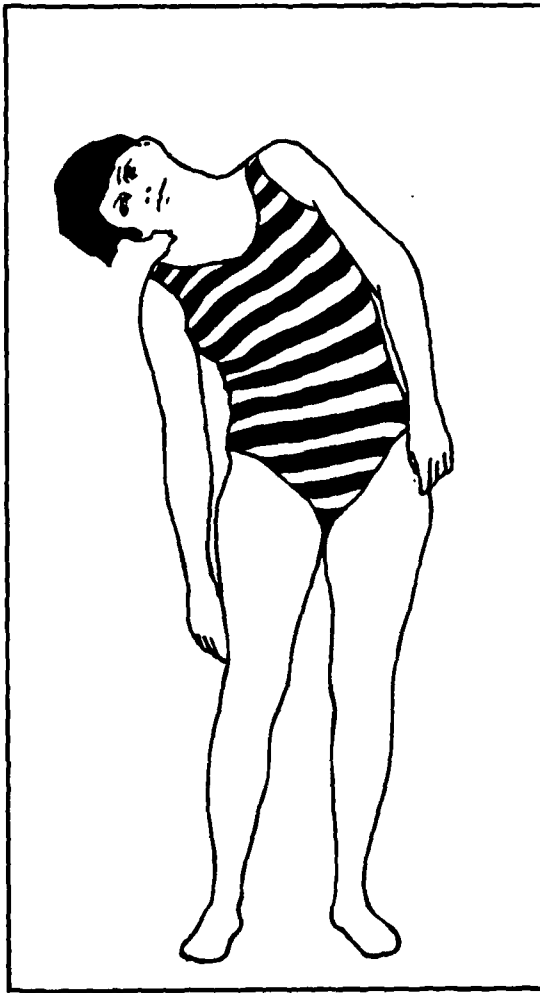
Position: Standing with good posture.

Action: Slowly let your head tilt to the side, bringing your right ear toward your right shoulder. Then bend upper body to the right and let your arm slide down outside of leg toward your knee. Repeat to other side.

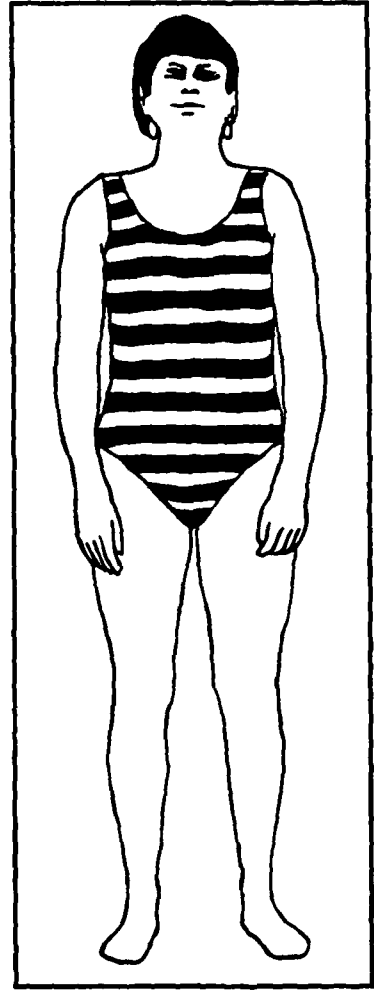
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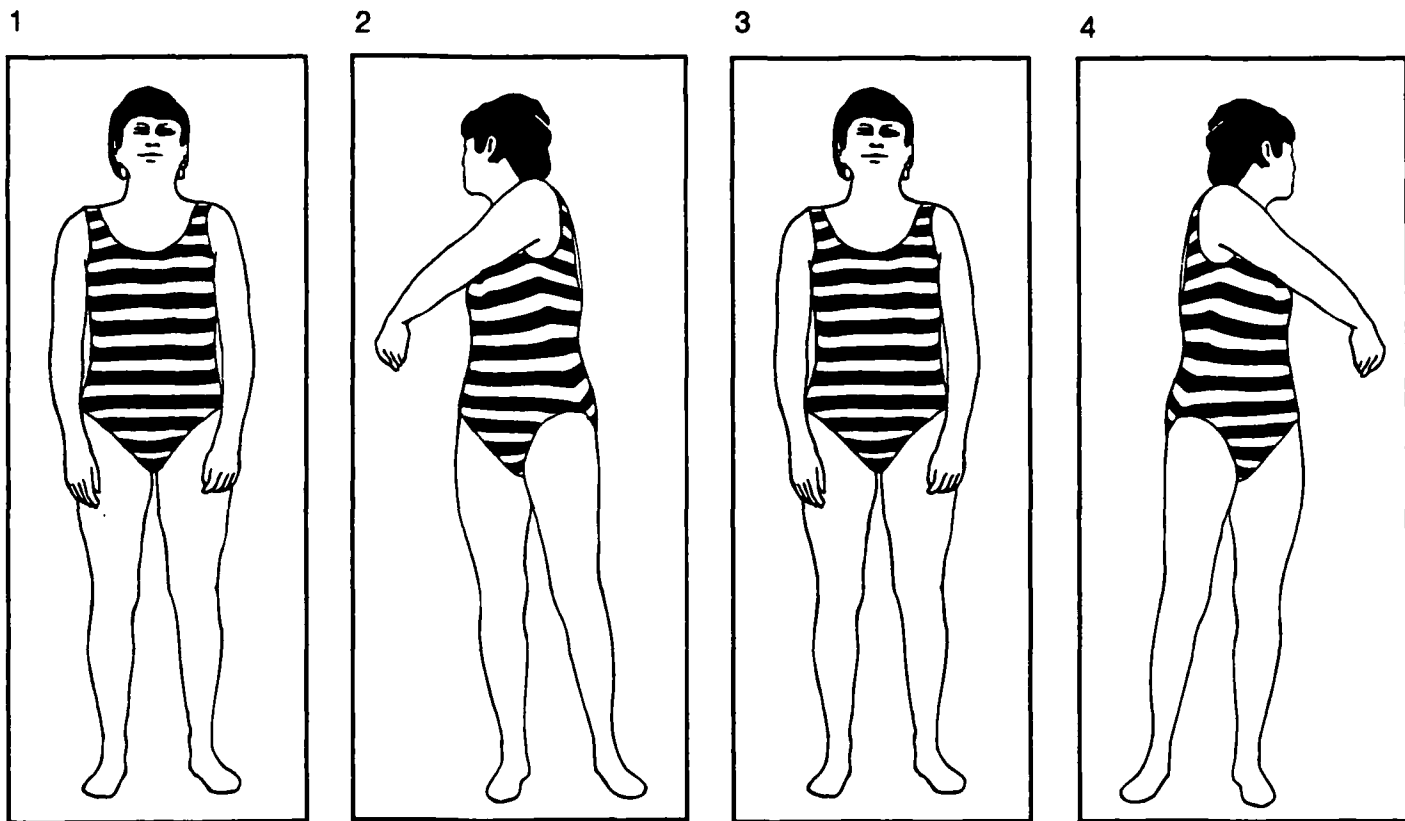
3



VII - 2 Body Twists

Position : Standing with good posture.

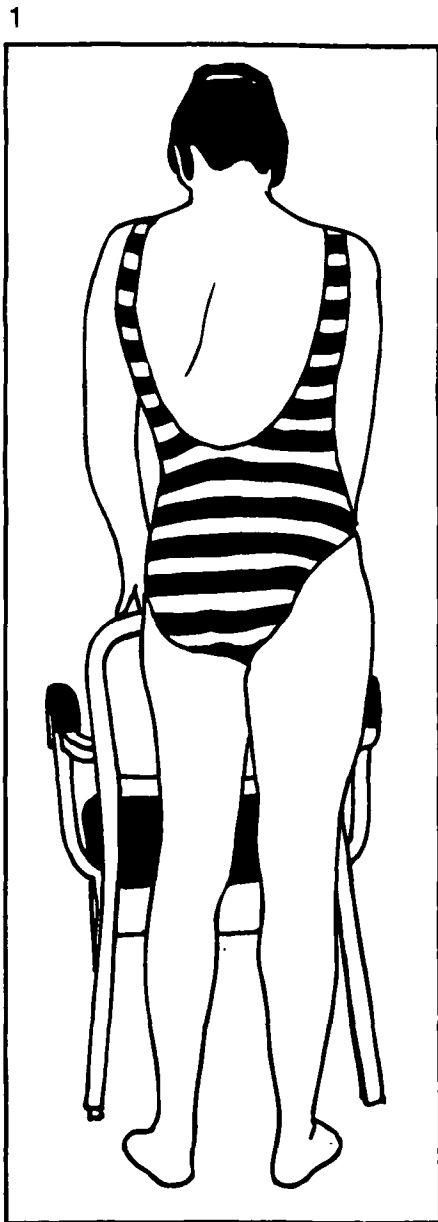
Action: Turn gently from side to side. Allow your arms to swing freely as you twist.



VII - 3 Lower Body Twist

Position: Stand with good posture. holding onto the back of a chair for support, feet comfortably apart.

Action: Let hips and pelvis turn gently from side to side. Keep upper body still and knees straight.

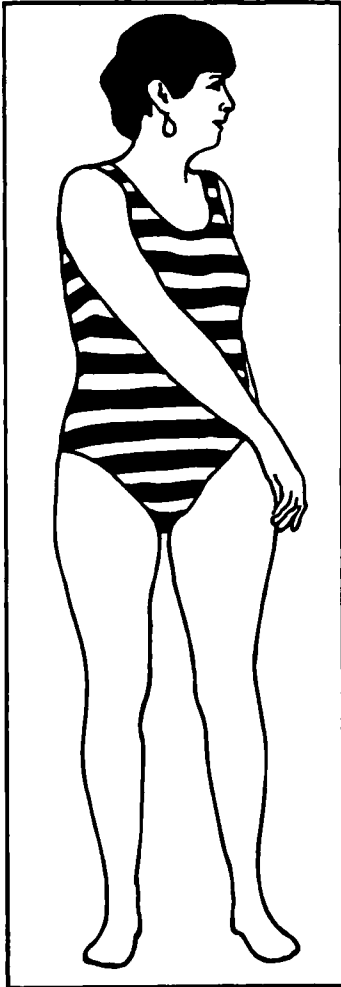


VII - 4 Upper Body Twist

Position: Standing with good posture.

Action: Let shoulders turn side to side. Keep hips and pelvis still.

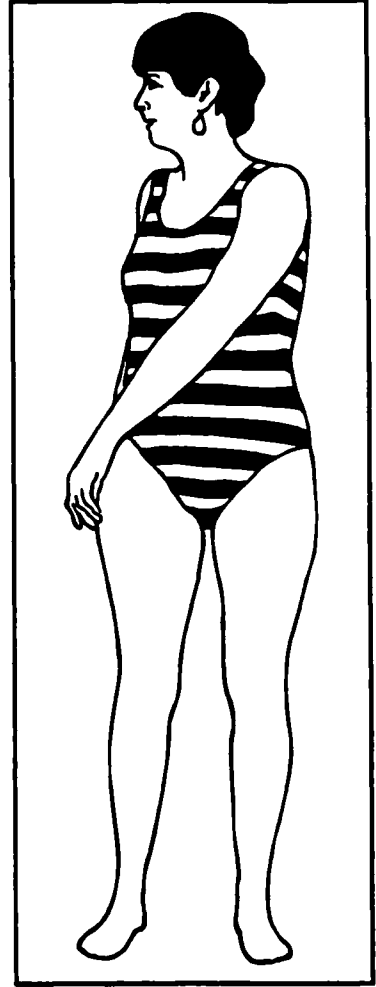
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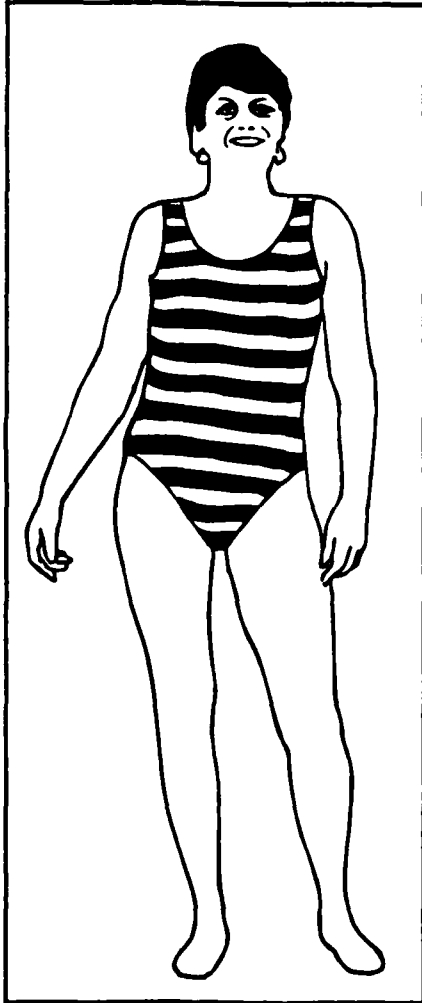


VII - 5 Hip Tilts

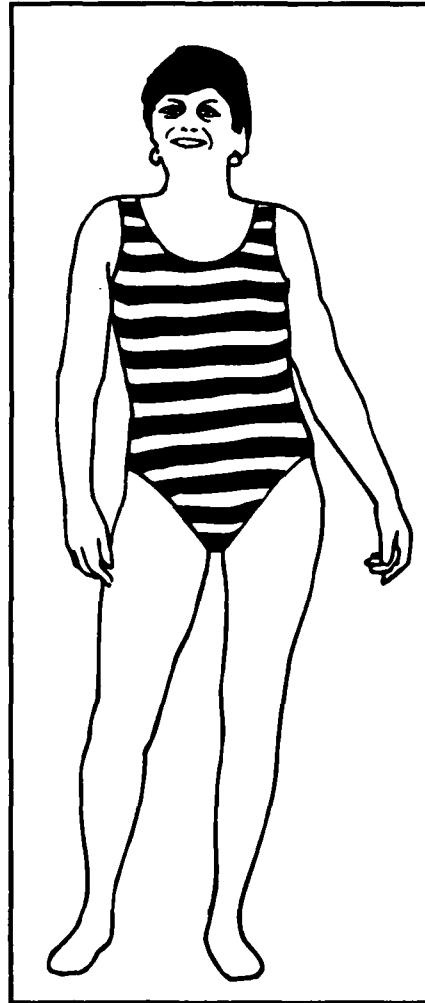
Position: Standing with good posture, holding onto back of a chair for stability if needed.

Action: Shift weight from one foot to the other. As you shift to the right, let your left knee bend and your left hip drop. Keep upper trunk still. Repeat to the left.

1



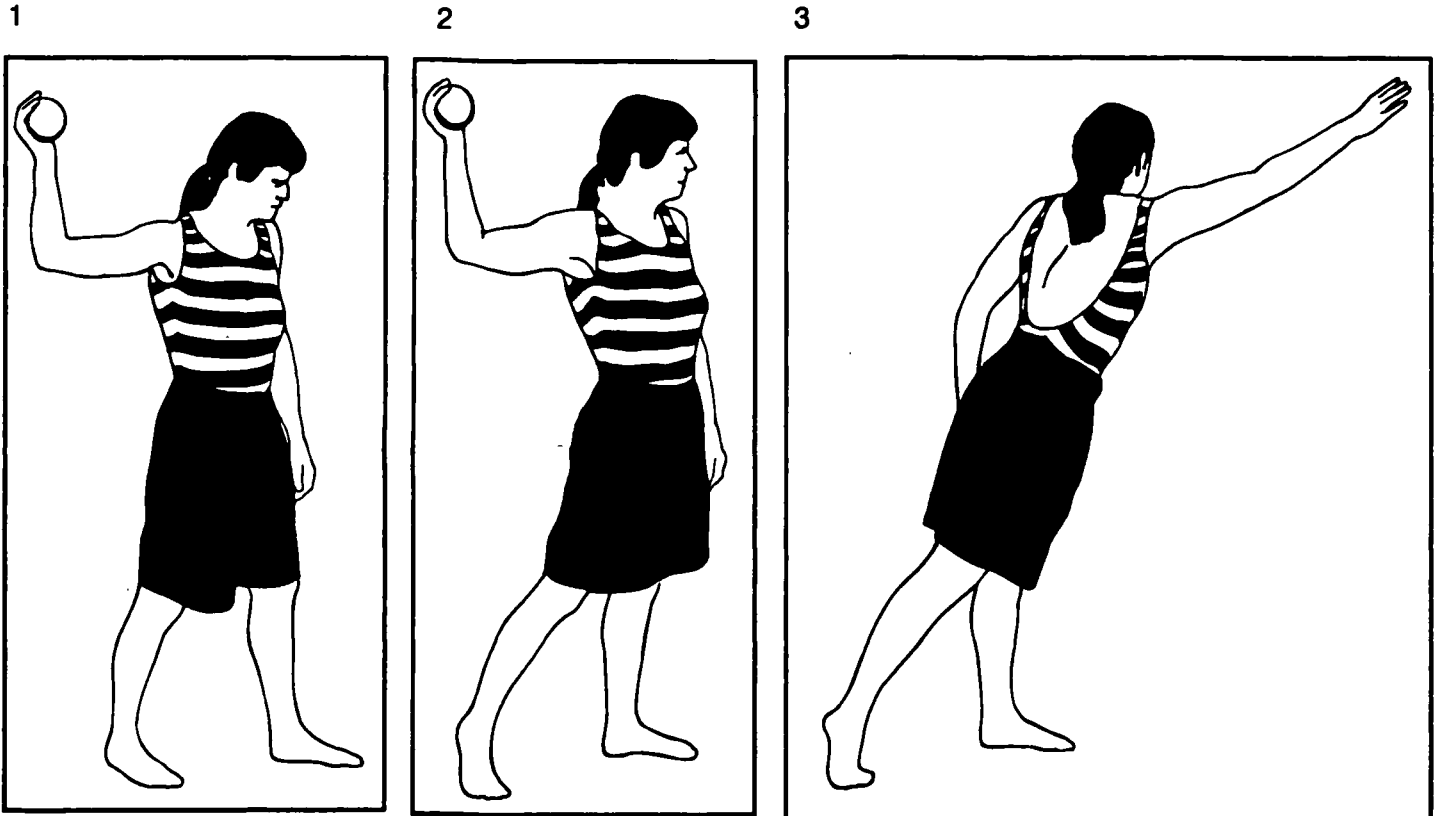
2



VII - 8 Recreational Movements

Position: Standing

Action: Swing a golf club, tennis racket or baseball bat, or throw a ball. Practice shifting your weight from one foot to the other, and twisting as you move.



Functional Activities:

1) Putting on a shirt or blouse

Practice putting on a shirt or blouse by turning your upper body as far to the right as possible as you put your arm in a sleeve. You should feel your weight shift to the left as you rotate to the right. Bending your trunk sideways can also help in getting your arm through the second sleeve.

2) Standing Reach

Practice reaching for an object on a shelf at shoulder level such as a glass or a book. Shift weight onto your front foot and turn your trunk slightly as you reach further.

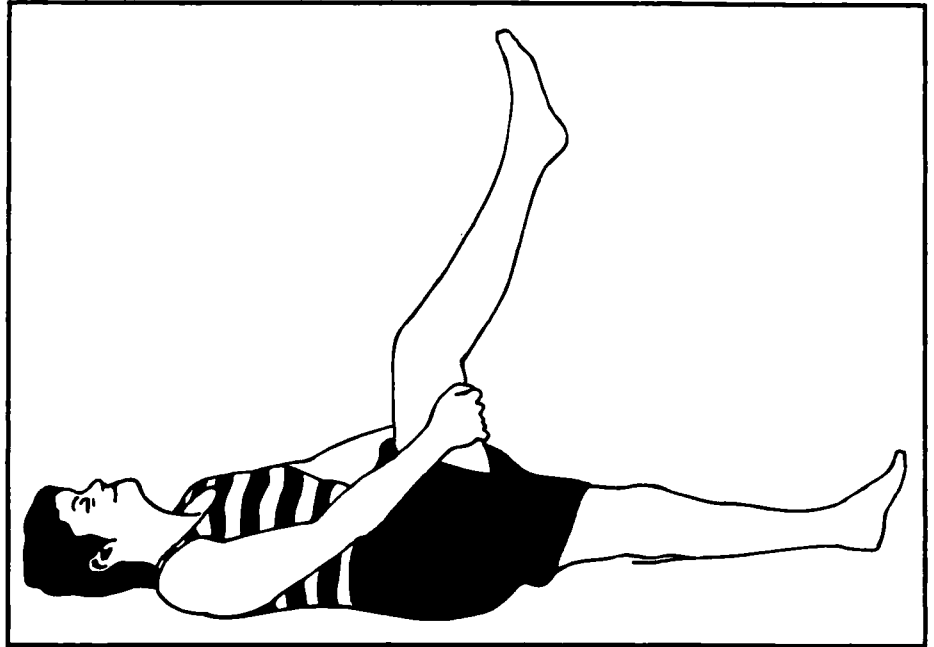
STRETCHES

1. Hamstrings

Method A

Position: On your back, one knee bent towards your chest, holding the back of your thigh with your hands.

Action: Raise your foot towards the ceiling until you feel a comfortable stretch behind your knee and thigh. Hold for 20 - 30 seconds and then relax. Repeat 3 times with each leg.



Method B

Position: Sitting up straight on the edge of a chair, one leg out straight, heel on the floor, or a low stool or book.

Action: By sitting up straight and keeping your knee straight, you will feel a stretch behind your knee and thigh. For more stretch, lean forward keeping your back straight. Hold for 20 - 30 seconds and then relax. Repeat 3 times with each leg.



2. Calf

Position: Standing with hands on wall about 6 - 12 inches away, both feet pointing straight ahead with one foot about 12 inches behind the other.

Action:

- A) Lean forward, keeping your back leg straight and heel on the ground. Feel a stretch in the calf of your back leg, hold for 20 - 30 seconds and then relax. Repeat 3 times with each leg.



- B) Bend both knees, keeping heels on the ground. Feel a stretch in the lower calf of the back leg. Hold for 20 - 30 seconds, repeat 3 times with each leg.

