



**Precision Outreach Intervention, Surveillance and
Exercise for Fall Prevention Prince William**

Welcome to POISED

Falls in Elderly Population

- The older adult is often faced with a myriad of health related issues with the likelihood of suffering a fall being one major concern. The outcomes of a fall are many, extending from short-term health problems to long-term consequences. In 2010, the CDC reported that 2.3 million older adults were treated in emergency departments for non-fatal fall-related injuries.
- Furthermore, falls and any fall-related consequences have been reported to be the leading cause of injury-related death and hospitalization in older adults over 65 years of age, with a staggering one-third of persons this age likely to suffer a fall within a given year. Across the residents of Prince William County (PWC), this represents over 32,250 older adults could fall *each year*. Recently, a total of 5,840 PW residents suffered a fall with an associated direct and indirect health care cost of \$133,338,066.
- Up to 30% of people who fall suffer a traumatic injury (e.g., hip fractures, brain injury). In addition, victims of falls often develop a fear of falling, which frequently results in sedentary lifestyles that begin a vicious spiral toward reduced mobility, physical fitness, as well as the risk of early death.

Precision Outreach Intervention, Surveillance and Exercise for Fall Prevention Prince William (POISED)

- The project's goal is to implement evidence based intervention programs to prevent falls in individuals identified with fall risk and to provide community outreach via educational sessions with the aim of disseminating information on fall prevention, home safety and evidence based prevention opportunities to individuals in Prince William County.
- Community outreach goals:
 1. Educational workshops
 - 8 educational workshops will be offered to provide comprehensive information about falls risk that will be delivered via educational sessions, safety checklist, and literature and online to grab as many people as possible.
 2. Access to home modification exercises
 3. 10 week intervention
 - Eight 10-week Fitness Programs (3 times/week), using the Stay Active and Independent for Life (SAIL) Program, will be used to help develop the strength, coordination, agility and balance required to reduce and minimize the occurrence of falls for older adults. Programs will be offered at various locations in Prince William County.



Contact Us:

George Mason University
Attn: Amanda Estep/Jessica Pope
Bull Run Hall
10900 University Blvd. MS 4E5
Manassas, VA 20110

(703) 993-4714

smartlab@gmu.edu

poised.gmu.edu



Community Fall Risk Screening:

CDC Growing Stronger

Exercise Program

Introduction



If you're interested in feeling stronger, healthier, and more vital, this program is for you. This strength-training program was developed by experts at Tufts University and the Centers for Disease Control and Prevention (CDC).

Growing Stronger is an exercise program based upon sound scientific research involving strengthening exercises—exercises that have been shown to increase the strength of your muscles, maintain the integrity of your bones, and improve your balance, coordination, and mobility, all of which help to prevent falls. In addition, strength training can help reduce the signs and symptoms of many chronic diseases, including arthritis.

Most people should check with their doctor before they start becoming more physically active. Experts advise that if you have a chronic disease, such as a heart condition, arthritis, diabetes, or high blood pressure, or symptoms that could be due to a chronic disease, it's important that you're under the care of a doctor and talk to him or her about the types and amounts of physical activity that are appropriate for you.

Benefits of Strength Training

Arthritis Relief

Tufts University recently completed a strength-training program with older men and women with moderate to severe knee osteoarthritis. The results of this sixteen-week program showed that strength training decreased pain by 43%, increased muscle strength and general physical performance, improved the clinical signs and symptoms of the disease, and decreased disability. The effectiveness of strength training to ease the pain of osteoarthritis was just as potent, if not more potent, as medications. Similar effects of strength training have been seen in patients with rheumatoid arthritis.

Restoration of Balance and Reduction of Falls

As people age, poor balance and flexibility contribute to falls and broken bones. These fractures can result in significant disability and, in some cases, fatal complications. Strengthening exercises, when done properly and through the full range of motion, increase a person's flexibility and balance, which decrease the likelihood and severity of falls. One study in New Zealand in women 80 years of age and older showed a 40% reduction in falls with simple strength and balance training.

Strengthening of Bone

Post-menopausal women can lose 1-2% of their bone mass annually. Results from a study conducted at Tufts University, which were published in the *Journal of the American Medical Association* in 1994, showed that strength training increases bone density and reduces the risk for fractures among women aged 50-70.

Proper Weight Maintenance

Strength training is crucial to weight control, because individuals who have more muscle mass have a higher metabolic rate. Muscle is active tissue that consumes calories while stored fat uses very little energy. Strength training can provide up to a 15% increase in metabolic rate, which is enormously helpful for weight loss and long-term weight control.

Improved Glucose Control

More than 14 million Americans have type II diabetes—a staggering three-hundred percent increase over the past forty years—and the numbers are steadily climbing. In addition to being at greater risk for heart and renal disease, diabetes is also the leading cause of blindness in older adults. Fortunately, studies now show that lifestyle changes such as strength training have a profound impact on helping older adults manage their diabetes. In a recent study of Hispanic men and women, 16 weeks of strength training produced dramatic improvements in glucose control that are comparable to taking diabetes medication. Additionally, the study volunteers were stronger, gained muscle, lost body fat, had less depression, and felt much more self-confident.

Healthy State of Mind

Strength training provides similar improvements in depression as anti-depressant medications. Currently, it is not known if this is because people feel better when they are stronger or if strength training produces a helpful biochemical change in the brain. It is most likely a combination of the two. When older adults participate in strength training programs, their self-confidence and self-esteem improve, which has a strong impact on their overall quality of life.

Sleep Improvement

People who exercise regularly enjoy improved sleep quality. They fall asleep more quickly, sleep more deeply, awaken less often, and sleep longer. As with depression, the sleep benefits obtained as a result of strength training are comparable to treatment with medication but without the side effects or the expense.

Healthy Heart Tissue

Strength training is important for cardiac health because heart disease risk is lower when the body is leaner. One study found that cardiac patients gained not only strength and flexibility but also aerobic capacity when they did strength training three times a week as part of their rehabilitation program. This and other studies have prompted the American Heart Association to recommend strength training as a way to reduce risk of heart disease and as a therapy for patients in cardiac rehabilitation programs.

Preparation: How Fit Are You?

These questions will help you determine your current level of strength and independence. Try returning to them again, after you have been strength training for three months, six months, and twelve months. This will help you gauge how useful the program has been to you. Keep in mind that if you have not been able to sustain the program for any reason—say, illness or injury—your score will likely remain the same or even decrease. Don't be discouraged—just try to get back on track.

Scoring:

- Rarely (1 point)
- Usually (3 points)
- Sometimes (2 points)
- Always (4 points)

Mobility and Daily Activities	Start	3 Months	6 Months	9 Months	12 Months
1. I find it easy to walk up or down two or more flights of stairs.					
2. I have no trouble taking out the trash.					
3. I easily do such chores as vacuuming and dusting.					
4. I can do other sorts of housework on my own without difficulty.					
5. I don't need help from family or friends with daily activities.					
6. I have little trouble reaching into high cupboards or reaching down to pick up something from the floor.					
Mood, Energy Level, and Mental Health					
1. I feel younger than my age.					
2. I feel independent.					
3. I feel energetic.					
4. I live an active life.					
5. I feel strong.					
6. My arms and legs work as well as they used to.					
7. I am as active as other people my age.					
TOTAL					

Evaluating your score

- 15-24 points: Indicates a low fitness level, with significant room for improvement in mobility, ability to complete daily activities, and mood and mental health.
- 25-34 points: Indicates a low-to-moderate fitness level, with room for improvement in most of the areas described above.
- 35-44 points: Indicates a moderate fitness level, with room for improvement in some of the areas described above.
- 45 and above: Indicates an advanced level of fitness; strength training will improve and maintain fitness.

How to Progress

After the first week or so of strength training, you should start doing each exercise with weights that you can lift at least ten times with only moderate difficulty. (If a given exercise seems too difficult—if you cannot do at least eight repetitions—then the weight you are using is too heavy and you need to scale back.)

After two weeks of strength training, you should reassess the difficulty of each exercise with your current level of weights. You may start doing the overhead press with one-pound dumbbells, for example. By the end of the second week, the exercise may feel too easy—that is, you can easily lift the one-pound dumbbell through the full range of motion and in proper form more than twelve times. You should now step up your weights to two- or three-pound dumbbells and see how the exercise feels at the new weight level.

Staying on Track

It's important to stick to your strength-training program as much as you can. You may find that you make a few false starts before you succeed at making this program a regular part of your life. There may be times when interruptions such as vacation, illness, family, or work demands prevent you from doing your exercises for a week or two — or even longer. Try not to feel guilty or disappointed in yourself. Just restart your routine as quickly as you can. You may not be able to pick up exactly where you left off — you may need to decrease your weights a bit. But stay with it, and you will regain lost ground.

If you have trouble getting back into the swing of things, start back into the program slowly. Remember why you picked up this book in the first place and why you chose your goals. It may help to reassess your goals and make new ones because your motivations may change as time passes. Most important, remember how your past successes made you feel: healthy, strong, independent, and empowered!

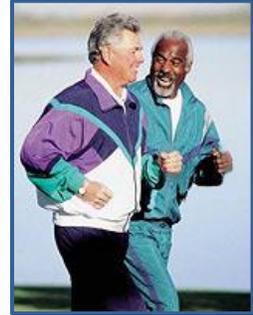
Exercise Program

Warmup: 5-Minute Walk

To get your muscles warm and loose for strength training, walk for five to ten minutes outside if weather permits, or inside around the house or on a treadmill if you have one. Walking will help direct needed blood flow to your muscles and prepare your body for exercise.

Warming up is important for preventing injury as well as gaining maximal benefit from the exercise, because loose, warm muscles will respond better to the challenge of lifting weights.

If you have another piece of aerobic exercise equipment available to you, such as a bike, rowing machine, or stair stepper, this will serve as an adequate warm up as well.



Stage 1: Squats, Toe Stands, Wall Pushups, Finger Marching

The following four exercises comprise Stage 1 of the Growing Stronger Program. When you've been doing the exercises of this stage for at least two weeks, OR if you are fairly fit right now, you can add the exercises in Stage 2. Remember to always do the Warm-up and Cool-down as part of each exercise session.

Squats

A great exercise for strengthening hips, thighs, and buttocks. Before long, you'll find that walking, jogging, and climbing stairs are a snap!



Make sure you:

- Don't sit down too quickly.
- Don't lean your weight too far forward or onto your toes when standing up

Instructions:

1. In front of a sturdy, armless chair, stand with feet slightly more than shoulder-width apart. Extend your arms out so they are parallel to the ground and lean forward a little at the hips.
2. Making sure that your knees NEVER come forward past your toes, lower yourself in a slow, controlled motion, to a count of four, until you reach a near-sitting position.
3. Pause. Then, to a count of two, slowly rise back up to a standing position. Keep your knees over your ankles and your back straight.

4. Repeat 10 times for one set. Rest for one to two minutes. Then complete a second set of 10 repetitions.

Note 1: If this exercise is too difficult, start off by using your hands for assistance. If you are unable to go all the way down, place a couple of pillows on the chair or only squat down four to six inches.

Note 2: Placing your weight more on your heels than on the balls or toes of your feet can help keep your knees from moving forward past your toes. It will also help to use the muscles of your hips more during the rise to a standing position.

Toe Stands

If a walk in the park no longer seems easy or enjoyable, the "toe stand" exercise is for you! A good way to strengthen your calves and ankles and restore stability and balance, it will help make that stroll in the park fun and relaxing.

Make sure you:

- Don't lean on the counter or chair—use them for balance only.
- Breathe regularly throughout the exercise.

Instructions:



1. Stand near counter or sturdy chair with feet shoulder-width apart. Use the chair or counter for balance.
2. For a count of four, lift your heels up off the ground, onto the balls of your feet. Hold for two to four seconds.
3. For a count of four, slowly lower your heels back to the floor.
4. Repeat 10 times for one set. Rest for one to two minutes. Then complete a second set of 10 repetitions.

Wall Pushups

This exercise is a modified version of the push-up you may have done years ago in physical education classes. It is less challenging than a classic push-up and won't require you to get down on the floor—but it will help to strengthen your arms, shoulders, and chest.

Make sure you:

- Don't round or arch your back.



Instructions:

1. Find a wall that is clear of any objects—wall hangings, windows, etc. Stand a little farther than arm's length from the wall.
2. Facing the wall, lean your body forward and place your palms flat against the wall at about shoulder height and shoulder-width apart.
3. To a count of four, bend your elbows as you lower your upper body toward the wall in a slow, controlled motion, keeping your feet planted.
4. Pause. Then, to a count of two, slowly push yourself back until your arms are straight—but don't lock your elbows.
5. Repeat 10 times for one set. Rest for one to two minutes. Then complete a second set of 10 repetitions.

Finger Marching

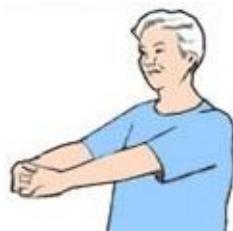
In this exercise you'll let your fingers, hands, and arms do the walking. This will help strengthen your upper body and your grip, and increase the flexibility of your arms, back, and shoulders.

Stand, or sit forward in an armless chair, feet on the floor, shoulder-width apart.



Movement 1: Imagine there is a wall directly in front of you. Slowly walk your fingers up the wall until your arms are above your head. Hold them overhead while wiggling your fingers for about 10 seconds and then slowly walk them back down.

Movement 2: Next, try to touch your two hands behind your back. If you can, reach for the opposite elbow with each hand—or get as close as you can. Hold the position for about 10 seconds, feeling a stretch in the back, arms, and chest.



Movement 3: Release your arms and finger-weave your hands in front of your body. Raise your arms so that they're parallel to the ground, with your palms facing the imaginary wall. Sit or stand up straight, but curl your shoulders forward. You should feel the stretch in your wrist and upper back. Hold the position for about 10 seconds.

Repeat this three-part exercise three times.

Stage 2: Biceps Curl, Step Ups, Overhead Press, Hip Abduction

When you've been doing the exercises from Stage 1 for at least two weeks, OR if you are fairly fit right now, you can add these Stage 2 exercises. When you've been doing the exercises from Stages 1 and 2 for at least six weeks, you can add the exercises in Stage 3. Remember to always do the Warm-up and Cool-down as part of each exercise session.

Biceps Curl

Does a gallon of milk feel a lot heavier than it used to? After a few weeks of doing the biceps curl, lifting that eight-pound jug will seem a cinch!



Make sure you:

- Don't let your elbows move away from the sides of your body.
- Keep your wrists straight.

Instructions:

1. With a dumbbell in each hand stand, or sit in an armless chair, with feet shoulder-width apart, arms at your sides, and palms facing your thighs.
2. To a count of two, slowly lift up the weights so that your forearms rotate and palms face in toward your shoulders, while keeping your upper arms and elbows close to your side—as if you had a newspaper tucked beneath your arm. Keep your wrists straight and dumbbells parallel to the floor.
3. Pause. Then, to a count of four, slowly lower the dumbbells back toward your thighs, rotating your forearms so that your arms are again at your sides, with palms facing your thighs.
4. Repeat 10 times for one set. Rest for one to two minutes. Then complete a second set of 10 repetitions.

Step Ups

This is a great strengthening exercise that requires only a set of stairs. But don't let its simplicity fool you. Step-ups will improve your balance and build strength in your legs, hips, and buttocks.



Make sure you:

- Don't let your back leg do the work.
- Don't let momentum do the work.
- Press your weight through the heel rather than ball or toes of your front leg as you lift.

Instructions:

1. Stand alongside the handrail at the bottom of a staircase. With your feet flat and toes facing forward, put your right foot on the first step.

2. Holding the handrail for balance, to a count of two, straighten your right leg to lift up your left leg slowly until it reaches the first step. As you're lifting yourself up, make sure that your right knee stays straight and does not move forward past your ankle. Let your left foot tap the first step near your right foot.
3. Pause. Then, using your right leg to support your weight, to a count of four, slowly lower your left foot back to the floor.
4. Repeat 10 times with the right leg and 10 times with the left leg for one set. Rest for one to two minutes. Then complete a second set of 10 repetitions with each leg.

Overhead Press

This useful exercise targets several muscles in the arms, upper back, and shoulders. It can also help firm the back of your upper arms and make reaching for objects in high cupboards easier.

Make sure you:

- Keep your wrists straight.
- Don't lock your elbows.
- Don't let the dumbbells move too far in front of your body or behind it.
- Breathe throughout the exercise.



Instructions:

1. Stand or sit in an armless chair with feet shoulder-width apart. With a dumbbell in each hand, raise your hands, palms facing forward, until the dumbbells are level with your shoulders and parallel to the floor.
2. To a count of two, slowly push the dumbbells up over your head until your arms are fully extended—but don't lock your elbows.
3. Pause. Then, to a count of four, slowly lower the dumbbells back to shoulder level, bringing your elbows down close to your sides.
4. Repeat 10 times for one set. Rest for one to two minutes. Then complete a second set of 10 repetitions.

Hip Abduction

By targeting the muscles of the hips, thighs, and buttocks, this exercise makes your lower body shapelier and strengthens your hipbones, which may be especially vulnerable to fracture as you age.

Make sure you:

- Don't lock your knee on the supporting leg.
- Keep your toes facing forward throughout the move.
- Don't lean to the side when you lift your leg.



** To increase the difficulty of this exercise, you may add ankle weights.*

Instructions:

1. Stand behind a sturdy chair, with feet slightly apart and toes facing forward. Keep your legs straight, but do not lock your knees.
2. To a count of two, slowly lift your right leg out to the side. Keep your left leg straight—but again, do not lock your knee.
3. Pause. Then, to a count of four, slowly lower your right foot back to the ground.
4. Repeat 10 times with the right leg and 10 times with the left leg for one set. Rest for one to two minutes. Then complete a second set of 10 repetitions with each leg.

Stage 3: Knee Extension, Knee Curl, Pelvic Tilt, Floor Back Extension

When you've been doing the exercises from Stage 1 and Stage 2 for at least six weeks, you can add these Stage 3 exercises. Remember to always do the Warm-up and Cool-down as part of each exercise session

Knee Extension



By targeting the quadriceps muscles in the front of the thigh (which play a primary role in bending and straightening the leg), this exercise strengthens weak knees and reduces the symptoms of arthritis of the knee. It is important to do this exercise in conjunction with Exercise 10, the "knee curl," as the muscles targeted in these two exercises—the front thigh muscles and the hamstrings—work together when you walk, stand, and climb.

Make sure you:

- Keep your ankle flexed throughout the move.

Instructions:

1. Put on your ankle weights.
2. In a sturdy, chair without armrests, sit all the way back, so that your feet barely touch the ground; this will allow for easier movement throughout the exercise. If your chair is too low, add a rolled-up towel under your knees. Your feet should be shoulder-width apart, and your arms should rest at your sides or on your thighs.
3. With your toes pointing forward and your foot flexed, to a count of two slowly lift your right leg, extending your leg until your knee is straight.
4. Pause. Then, to a count of four, slowly lower your foot back to the ground.
5. Repeat 10 times with the right leg and 10 times with the left leg for one set. Rest for a minute or two. Then complete a second set of 10 repetitions with each leg.

Knee Curl

This is an excellent exercise for strengthening the muscles of the back of the upper leg, known as the hamstrings. When done in conjunction with the knee extension, it makes walking and climbing easier.

Make sure you:

- Keep the thigh of the bending leg in line with the supporting leg at all times.
- Keep the foot on the bending leg flexed throughout the move.

Instructions:

1. Put on your ankle weights.
2. Stand behind a sturdy chair, with feet shoulder-width apart and facing forward.
3. Keeping your foot flexed, to a count of two slowly bend your right leg, bringing your heel up toward your buttocks.
4. Pause. Then, to a count of four, slowly lower your foot back to the ground.
5. Repeat 10 times with your right leg and 10 times with your left leg for one set. Rest for a minute or two. Then complete a second set of 10 repetitions with each leg.



Pelvic Tilt



This exercise improves posture and tightens the muscles in your abdomen and buttocks. Do this exercise in conjunction with the floor back extension to strengthen your midsection. (You should not have the ankle weights on during this exercise.)

Make sure you:

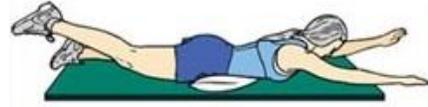
- Breathe throughout the exercise.
- Don't lift your upper back or shoulders off the ground.

Instructions:

1. On the floor or on a firm mattress, lie flat on your back with your knees bent, feet flat, and arms at your sides, palms facing the ground.
2. To a count of two, slowly roll your pelvis so that your hips and lower back are off the floor, while your upper back and shoulders remain in place.
3. Pause. Then, to a count of four, slowly lower your pelvis all the way down.
4. Repeat 10 times for one set. Rest for a minute or two. Then complete a second set of 10 repetitions.

Floor Back Extension

If you suffer from lower back pain, weak abdominal muscles may be to blame. The floor back extension, done in conjunction with the pelvic tilt, will strengthen these muscles and ease back pain.



Make sure you:

- Keep your head, neck, and back in a straight line.

Instructions:

1. Lie on the floor facedown, with two pillows under your hips. Extend your arms straight overhead on the floor.
2. To a count of two, slowly lift your right arm and left leg off the floor, keeping them at the same level.
3. Pause. Then, to a count of four, slowly lower your arm and leg back to the floor.
4. Repeat 10 times for one set, and then switch to left arm with right leg for another 10 repetitions.
5. Rest for a minute or two. Then complete a second set of 10 repetitions.

Cool-down: Quadriceps Stretch, Chest/Arm Stretch, Hamstring/Calf Stretch, Neck/Upper Back/Shoulder Stretch

Quadriceps Stretch



This excellent stretch should be a regular part of your cool down. Strength training exercises such as squats, step-ups, and knee extensions focus on strengthening the quadriceps muscles. This stretch will help these muscles relax and make them more flexible.

Make sure you:

- Breathe throughout the stretch, concentrating on relaxing.
- Stand up straight and look straight ahead.
- Don't lock your supporting knee.

Instructions:

1. Stand next to a counter or sturdy chair with your feet about shoulder-width apart and your knees straight, but not locked.
2. With your left hand, hold a chair or counter for balance. Bend your right leg back and grasp your right ankle in your right hand until your thigh is perpendicular to the ground. Make sure you stand up straight—don't lean forward. (If you can't grasp your ankle in your hand, just keep your leg as close to perpendicular as possible and hold the bend, or place your foot on the seat of a chair.) You should feel a stretch in the front of the thigh.

3. Hold the stretch for a slow count of 20 to 30 seconds, breathing throughout.
4. Release your right ankle and repeat with the other leg.

Chest and Arm Stretch

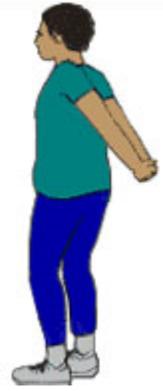
This simple reaching stretch will improve the flexibility in your arms and chest and in the front of your shoulders.

Make sure you:

- Breathe throughout the stretch.
- Keep your back straight and look straight ahead.

Instructions:

1. Stand with your arms at your sides and your feet about shoulder-width apart.
2. Extend both arms behind your back and clasp your hands together, if possible, retracting your shoulders.
3. Hold the stretch for a slow count of 20 to 30, breathing throughout.
4. Release the stretch and repeat.



Hamstring/Calf Stretch

If touching your toes with straight legs seems an impossible task, you're not alone. Many people have tight hamstring and calf muscles in the back of the leg. This stretch will give these muscles more flexibility and make it easier for you to bend over.



Make sure you:

- Breathe throughout the stretch, concentrating on relaxing.
- Keep your back straight and head lifted as you lean forward toward your toes.
- Don't push the stretch too far—it shouldn't be painful.

** You should feel the first part of this stretch in the back of the upper leg and the second part in the calf.*

Instructions:

1. Sit forward in a chair with your knees bent and feet flat on the floor.
2. Extend your right leg in front of you, placing your right heel on the floor, and keeping your ankle relaxed. Don't lock your knee. Slowly lean forward at the hips, bending toward your right toes, trying to keep your back straight.
3. Hold the stretch for a slow count of 20 to 30, breathing throughout.

4. Sit up straight again and flex your right ankle so that your toes are pointing up toward the ceiling. Again, lean forward at the hips, bending toward your right toes and hold the stretch for a slow count of 20 to 30, breathing throughout.
5. Release the stretch and repeat with your left leg.

Neck, Upper Back, and Shoulder Stretch

This easy stretch targets another group of muscles particularly vulnerable to tension and stress—the neck, back, and shoulders. Do it often—after strength training, and during any activity that makes you feel stiff, such as sitting at a desk or at a computer. You'll find it rejuvenating.



Make sure you:

- Breathe throughout the stretch.
- Don't curve your back or arch it.

Instructions:

1. Stand with your feet shoulder-width apart, your knees straight but not locked, and your hands clasped in front of you.
2. Rotate your hands so that your palms are facing the ground; then raise your arms to about chest height.
3. Gently press your palms away from your body. You should feel a stretch in your neck and upper back and along your shoulders.
4. Hold the stretch for a slow count of 20 to 30, breathing throughout.
5. Release the stretch and repeat.