



In the Know's Inservice Club
presents

A Client Care Module:

Passive & Active Range of Motion Exercises

Instructions for the Learner

We hope you enjoy this Inservice, prepared especially for nursing assistants like you. You work very hard, and we appreciate the effort you make to complete these educational materials. It shows your desire to continue learning and growing in your profession!

After finishing this inservice, you will be able to:

- Define range of motion.
- Describe the parts of the musculoskeletal system and how they work together.
- Discuss the cause and prevention of contractures.
- Discuss the benefits of range of motion exercises.
- Describe the general guidelines for performing and/or assisting with range of motion exercises.

If you are studying the inservice on your own, please:

- Read through all the attached materials. You may find it useful to have a highlighting marker nearby as you read. Highlight any information that is new to you or that you feel is especially important.
- If you have questions about anything you read, please ask _____.
- Take the quiz. Think about each statement and fill in the best answer.
- Check with your supervisor for the right answers. You pass the quiz with at least eight correct answers! Print your name, write in the date, and then sign your name.
- Keep the inservice information for yourself, and turn in the quiz page to _____ no later than _____.
- Show your Inservice Club Membership Card to _____ so that it can be initialed.

THANK YOU!



Keep reading to learn more about:

- The musculoskeletal system.
- The relationship between exercise and healthy joints.
- Ways you can help your clients remain flexible.

Understanding Range of Motion

Can you imagine what life would be like if you had to:

- Eat without bending your arm at the elbow?
- Walk without bending your knees?
- Look behind you without turning your head?

There are hundreds of activities that we perform every day that would be difficult (or impossible) without range of motion.

Range of motion is defined as *the normal movements that a joint should be able to perform*. So, for example, the range of motion for the neck includes:

- Bending the head forward and backward.
- Tilting the head down toward each shoulder.
- Turning the head from side to side.

People who have full range of motion have the freedom to move in many different ways. Their joints are *flexible*—allowing them to reach the top shelf in the closet, bend down to tie their shoes or even do the splits!

You probably work with clients who aren't so flexible. Maybe they've had a stroke or they have severe arthritis. Some of their joints may be stiff and deformed. These clients need your help to keep their joints and muscles as healthy as possible.

One way that you may be asked to help is by assisting with **Range Of Motion (ROM)** exercises. These exercises involve moving the joints into a variety of positions and then gently stretching them. Keep reading to learn more about joints, muscles and range of motion!



The Musculoskeletal System

Time For a Laugh!

A young boy was looking through the family photo album and asked his mother, "Who's that guy with all the big muscles and curly hair standing on the beach with you?"



His mother answered, "Why, that's your father." Looking puzzled, the little boy asked, "Then who's that fat old bald-headed man who lives with us now?"

The *musculoskeletal* system is made up of many different parts, including:

- **Muscles** provide the force and strength necessary to move the body. (It takes over 200 muscles just to take one step!) There are about 650 different muscles in the body. The largest muscle is the "gluteus maximus" (or buttock). The smallest muscle is a tiny one inside the ear.
- **Bones** are made up of minerals like calcium. They are the hardest living tissues in the body. In fact, the human thigh bone is as strong as concrete! When two bones come together in a joint, they don't actually touch each other. (That would be very painful!) Instead, they are cushioned by cartilage, membranes and fluid.
- **Ligaments.** These strong elastic bands of tissue attach one bone to another and provide support to the joint.
- **Tendons.** Like ligaments, tendons are bands of tissue. However, instead of connecting bones to each other, they connect *muscles* to nearby bones. And, they are *not* elastic.
- **Cartilage.** This strong, smooth substance (sometimes called "gristle") covers the ends of bones to help reduce the friction between them. Over time, cartilage tends to wear off—especially in big joints like the knee and the hip—causing the bones to rub together painfully.

- A **Synovial Membrane** creates a thin lining around a joint and produces synovial fluid.



- **Synovial Fluid** is a clear, sticky fluid that is secreted around each joint to keep it lubricated and protected.
- **Bursa** are little sacs filled with fluid that create a cushion between bones and ligaments. (You've probably heard of bursitis. It is caused by an inflamed bursa, often in an *overused* joint.)

All the parts of the musculoskeletal system *connect* together. That's why they're called "connective tissue". The connective tissue in the body works together to create smooth and rhythmic range of motion.

Remember:

Bones FORM a joint.

Muscles MOVE a joint.

Ligaments and tendons STABILIZE a joint.

Cartilage, synovial fluid and bursa CUSHION a joint.



Information About Joints

What Does It Mean to Be Double-Jointed?

Do you know people who can bend a finger or an arm in an unusual way? Or maybe they seem to be able to bend their bodies in half—the wrong way? These people may be double-jointed. Does that mean that they have extra joints? No. It means that they have very long, stretchy ligaments, allowing their joints to move farther than normal.



A joint is a place in the body where two or more bones come together. They provide a flexible connection between bones—allowing our bodies to move in many different ways. *There are many different kinds of joints in the body, including:*

- **Hinge.** A hinge joint works like the hinge on a door. Hinge joints allow body parts to bend and straighten. The elbow, knee, ankle and fingers are all examples of hinge joints.
- **Gliding.** A joint that allows two flat bones to slide over each other are called gliding joints. You can find these joints in the foot and the wrist.

- **Ball & Socket.** In a ball and socket joint, one bone has a big rounded head (the ball) and the other bone has a cupped area (the socket). These joints allow body parts to twist and turn. Examples of a ball and socket joint are the shoulder, the hip and the base of the thumb.



- **Pivot.** A pivot joint allows body parts to swivel around each other—like when you turn your head to the side.

Interesting Facts About Bones!

- When babies are born, their bones are like rubber! Even if they knew how to stand up, their legs wouldn't be able to support them.
- The body has 212 bones in it. The largest bone is the thigh bone. The smallest bone is in the ear.
- Over half the bones in the body are in the hands and feet!
- Every bone in the body connects to a joint except the hyoid bone in the throat.



- The shoulder is the most flexible joint in the body. It can move in any direction—sort of like a shower head!
- Bones are alive and can repair themselves if necessary.
- Bones are not solid. If they were, they'd be heavy as rocks!
- The inside of a bone is a spongy, fatty substance called bone marrow. The bone marrow is where new blood cells develop.
- Like any other living tissue, bones bleed when they are injured.

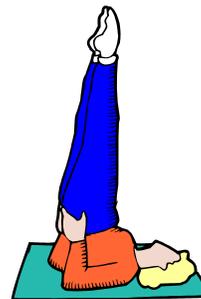
More About Hip Joints

Silly Quotes About Exercise!

- I joined a health club last year, and have spent about \$400. But, I haven't lost a pound. Apparently, you have to show up.
- I have to exercise early in the morning before my brain figures out what I am doing.
- I don't exercise at all. If God meant for us to touch our toes, he would have put them further up our bodies.

- The hip joint is located at the top of the thigh—where the thigh bone connects to the pelvis.
- Surrounding the hip are the biggest ligaments and muscles in the body. They help the hip survive all the walking, running and jumping that people do every day.

- For some people, this repetitive stress causes stiffness to develop in the hip joint. They may begin to lose their normal range of motion.
- Gentle exercises, such as walking and stretching, are great treatments for minor hip stiffness.



More About Knee Joints

- The knee is one of the most complex joints in the body...and *it's the one most likely to be injured.*
- Four bones are part of the knee joint: the thigh bone, two lower leg bones and the knee cap (also called the patella).



- The knee joint allows the leg to bend, straighten and even rotate a little bit.
- Regular exercise may prevent some knee problems from developing.
- People who are overweight may be able to prevent or eliminate knee problems by losing weight.

What About Joint Replacement Surgery?

- Joint replacement surgery involves removing a diseased or damaged joint and replacing it with an artificial joint. The new joint is made of metal and/or plastic. With proper care, most artificial joints last about 20 years.
- The most common reason for joint replacement surgery is osteoarthritis (which causes wear and tear on joints, especially the hips and knees).
- Joint replacements have been performed for about 30 years. Today, they are fairly common. For example, over 150,000 hip replacement operations are performed every year, mostly on women over age 65.



What Happens As People Get Older?



It's True!

You've probably heard the saying, "Use it or lose it." When it comes to muscles and joints, it's true. People who *don't* exercise lose strength and flexibility—and tend to age faster than people who do exercise. However, the following is also true: "It's never too late!" People can enjoy the benefits of exercise at any age—even if they haven't exercised in years.

A number of common changes in the musculoskeletal system happen as people get older, such as:

- The body tends to lose calcium, causing the bones to become weak, brittle and easily broken. It's common to see older people with fractures of the wrist, hip and back.
- Joints begin to wear down. Many people develop *arthritis* (inflammation of the joints). Arthritis may cause the joints to become stiff, painful to move and deformed.
- Muscles begin to decrease in size and strength—starting slowly at the age of 20!
- The disks between the bones of the spine become thinner—causing people to "shrink" a little in height.

- With age, some people walk and move more slowly. They may lose their balance more easily—putting them at risk for falls.

Getting older doesn't sound like much fun, does it? Well, the good news is that all these age-related changes can be slowed down by making these healthy choices:

- Exercising regularly.
- Eating a well-balanced diet.
- Avoiding cigarettes and alcohol.

- And, for women only, taking a hormone replacement after menopause.



Musculoskeletal Problems

- Injuries and diseases of the musculoskeletal system are the number one reason that people visit their doctors.
- One out of seven Americans has some kind of musculoskeletal problem.
- Problems with muscles, bones and joints cause U.S. workers to miss 147 million work days—and cost \$215 billion—every year.
- Some common musculoskeletal problems include:
 - **Bursitis** (inflammation of the bursa).
 - **Arthritis** (inflammation of the joint).
 - **Tendonitis** (inflammation of the tendons).
 - **Fractures** (broken bones).
 - **Herniated disks** ("slipped" disks in the spinal column).

The Facts About Bed Rest

What is Disuse Syndrome?

- Disuse syndrome is a group of problems that develop when people don't move around enough.
- People on bed rest are at high risk for developing disuse syndrome.
- Keep in mind that the health problems caused by disuse syndrome can be much worse than whatever caused the person to stay in bed in the first place!

Imagine this: John is a healthy, athletic young man, aged 22. An injury forces him to stay in bed for three weeks. When he's allowed to get out of bed after three weeks, John:



- Gets dizzy every time he stands up and has trouble keeping his balance.
- Has lost half of his overall muscle strength.
- Has lost bone strength at a rate *50 times* faster than normal.
- Seems confused and mentally slow at times.

It will take John about 4 to 6 weeks of working out to reverse the effects of just three weeks of bed rest!

Now, imagine what happens when frail, elderly people have to stay in bed. They'll have all the problems that John experienced—and probably more. And, the problems will develop faster and take longer to go away!

Remember, it's better to:

- Sit than to lie down.
- Stand than to sit.
- Walk than to stand.

The Difference Between PT & OT

Both types of therapists may develop exercise programs (including range of motion) for your clients.

Physical Therapists:

- Work to get people back to the same physical level they used to be...*or* help people accept and live with a disability.
- Help their clients improve joint motion, strengthen their muscles and learn how to manage transfers and ambulation without injury.
- Tend to work with the large muscle groups, helping their clients *move* safely through their environment.

Occupational Therapists:

- Focus on helping clients function in everyday life. This means helping them learn new or better ways to perform the activities necessary for home and/or work.
- Work to help clients regain, recover or maintain their daily living skills.
- Provide assistive devices—such as splints or special cookware—to make these daily tasks easier.
- Tend to work with smaller muscle groups, helping their clients *function* safely in their daily lives.

What Is a Contracture?

The best treatment for contractures is to prevent them! How?

Try these tips:

- Help your clients reposition themselves frequently. Joints get stiff (and muscles get short) when held in the same position for too long.
- Encourage your clients to participate in regular personal care activities such as brushing hair or getting dressed.
- Assist with range of motion exercises as ordered.

- A contracture is a chronic tightening or shortening of muscles. It causes the involved joint to become stiff.



- Contractures can develop in small joints such as fingers and in large joints such as hips or knees.
- A finger with a contracture will probably be curled in toward the palm. A contracted knee will probably be bent back, unable to completely straighten.
- Any illness or injury that causes decreased mobility can lead to contractures. When a muscle moves less, it shrinks—tightening itself around the joint.

- The most common condition leading to contractures is a stroke. Your clients with multiple sclerosis, dementia, cerebral palsy, head trauma and burns are also at risk—as is any client on bed rest.
- Contractures make it very painful to move a joint. Since it hurts, people with contractures stop trying to move the affected joint. Of course, this makes the situation worse since the muscles around the stiffened joint get less and less exercise!



Preventing Contractures

There are a number of ways to treat a contracture, including:

Physical therapy. This might include either passive or active range of motion exercises.

Orthotics. These are devices such as splints and braces that help keep joints and muscles stretched.



Massage. A therapist may also perform regular massage of the affected muscles. This helps keep them “loose”.

Medication. A doctor might prescribe certain medications such as muscle relaxants.

Surgery. An operation may be needed if the contracture is severe or is causing constant pain.

Types of Exercise

Here's a Chuckle or Two!

My grandma started walking 5 miles a day when she was 60. She is 97 now and we have no idea where she is!



Q: Why do witches have stiff joints?

A: It's because of their broomatism!

There are four basic types of exercises that are important for people who want to age in good health.

- **Flexibility.** This includes range of motion exercises (see below).
- **Endurance.** These are activities that increase your breathing and heart rate—such as walking or jogging. They improve the health of the heart, lungs, and circulatory system—and help prevent many diseases including diabetes and strokes.

- **Strength.** These activities—such as weight lifting—build muscles and strength. Studies suggest that strength exercises may also help prevent osteoporosis.
- **Balance.** Activities such as yoga improve balance and help prevent falls—a common problem in older adults.



The Benefits of ROM Exercises

One obvious benefit of range of motion exercises is that the joints remain flexible. However, there are other benefits to these gentle stretching exercises, including:



- Increased physical fitness
- Relaxation
- Body awareness
- Lubrication of tendons and ligaments
- Decreased risk of injury to joints, muscles and tendons
- Decreased muscle soreness and tension
- Reduced pain
- Improved posture and balance

If your clients need more motivation to perform their range of motion exercises, share this information with them:

- Studies have shown that many people—*age 90 and older*—who have become physically frail from inactivity can more than double their strength through simple exercises in a fairly short time.
- For some, that means being able to get up from a chair by themselves instead of having to wait until someone is available to help them.
- In one study, some 80 year olds were able to progress from using walkers to using canes after doing simple muscle-building exercises for just 10 weeks!



Range of Motion Exercises

Did You Know?

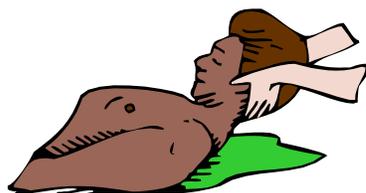
Therapists use a special tool—a *goniometer*—to measure the range of motion of specific joints. A goniometer has two arms that are joined at a protractor that measures the angle of joint mobility.



For example, a healthy elbow joint should be able to flex to a 150 degree angle (from straight out until it touches the upper arm).

The goal of range of motion exercises is to improve the movement and flexibility of specific joints.

- Some clients are unable to perform range of motion exercises by themselves. They need someone else—like a therapist, family member or you—to guide their muscles and joints through the exercises. These exercises are called **passive** range of motion because the client is not doing the work. Instead, he or she concentrates on being completely relaxed.



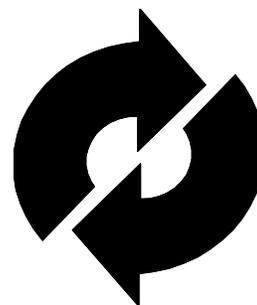
- There are also special machines that perform passive range of motion exercises by gently moving a joint through as normal a motion as possible.
- If your clients are able to perform range of motion exercises by themselves, the exercises are considered **active**. Your clients may need your assistance or encouragement, but basically, they are doing the work. (You might hear it called **active assisted** range of motion if your client needs a little help during the exercises.)
- It's important to know how to perform range of motion exercises properly. Generally, nursing assistants follow a specific exercise plan developed for a client by a physical or occupational therapist.

Joint Rotations

You may be asked to oversee or assist your clients with joint rotation exercises.

- These are slow circular movements, performed in both clockwise and counterclockwise directions.
- Joint rotations are performed to help warm and loosen up the joints. The circular movement of each rotation helps lubricate a joint with synovial fluid.

- This rotating motion is usually the best way to prepare for other forms of exercise—including range of motion and walking.



The Basic Procedure for ROM Exercises

Documenting Range of Motion Exercises

After helping a client with range of motion exercises, you might need to document the following:

- Vital signs (taken before and/or after the exercises).
- Any changes you noticed in the client's skin.
- The range of motion exercises that you performed, including which joints, how many times you did each exercise and how much the client was able to help.
- If the client seemed to experience any pain.

Be sure to follow your workplace policy for documenting client care.

Your workplace has its own policy and procedure for performing range of motion exercises. You may want to review it to be sure you know all the steps. However, it probably contains the following actions:

1. Review the client's care plan so that you know which joints should be exercised and how much the client is able to help.
2. Identify the client and explain what you are about to do.
3. Wash your hands before and after performing the exercises. (And, if necessary, wear gloves.)
4. Protect your client's privacy. Keep your client as covered up as possible by only exposing each body part as you are working with it.
5. Protect yourself from injury by paying attention to body mechanics. If possible, raise the client's bed to a comfortable working height. If the bed has wheels, make sure they are locked.
6. Ask the client to lie on his or her back, head on a pillow.
7. Follow the correct procedure for exercising each joint—as you have been shown by a therapist or your supervisor.
8. Leave the client in a safe, warm comfortable position and document your work.



In addition to these steps, be sure to remember these basic safety guidelines:

- You should use both hands to support a joint as you are exercising it. In general, one hand should be *above* the joint and one hand *below* it. (But, don't grab the "meat" of your client's arm or leg.)
- Each exercise should be done slowly and steadily—without bouncing. The goal is to make the exercises pleasant and relaxing.
- Be sure to stop if you feel resistance or tightness in the joint or if the client tells you it hurts. (Keep an eye out for *nonverbal* signs of pain such as grimacing.) Let your supervisor know if your client seems to be in pain.
- Every client is an individual—with his or her own level of fitness and tolerance. For some, you may be asked to repeat each exercise 10 times. For others, 2 or 3 times may be all they can handle.
- If you find that one or more of your client's joints are red, hot and swollen, tell your supervisor. Don't perform range of motion exercises on these joints unless your supervisor says it's okay.
- Your workplace may not allow you to perform range of motion exercises on a client's neck. If this is true at your workplace, let the therapist handle those exercises!



More About ROM Exercises

Remember!

- If they are done *improperly*, range of motion exercises can cause injury.
- You should never perform ROM exercises unless you have been instructed in the proper procedure by a therapist or nurse.
- Be cautious—and *very* gentle.
- Never move a joint past the point of resistance or pain!

There are a number of terms that you might hear when range of motion exercises are being discussed. They include:

- **Abduction** moves a body part *away* from the body.
- **Adduction** moves a body part *toward* the body.



Think of it like this:

The first part of a leg lift is abduction because you move your leg away from your body. The second part of a leg lift is adduction because you bring your leg back down to your body.

- **Extension** is the *straightening* of a body part.
- **Flexion** is the *bending* of a limb or body part.



Think of it like this:

It's considered extension when you straighten your arm to reach for a glass of water. But, it's flexion when you bend your arm to take a sip from your glass.

Hyperextension is when a joint is straightened *past the normal position*. This is done to give an extra stretch to the muscles and connective tissue. Hyperextension exercises must be done very carefully and are probably best handled by a therapist.

- **Pronation** is turning the joint down.
- **Supination** is turning the joint up.



Think of it like this:

Turning your hand so that the palm is face down is pronation. Turning your hand so the palm is face up is supination.

- **Rotation** is turning the joint in a *circular* motion.
- **Internal rotation** turns the joint *inward*—toward the center of the body.
- **External rotation** turns the joint *outward*—away from the center of the body.



Think of it like this:

When you swim and you turn your head to take a breath, you are externally rotating your neck. When you turn your head back into the water, you are internally rotating it.

Tips For Helping Your Clients Stay Flexible

It's A Fact!

- Girls tend to be more flexible than boys.
- People are more flexible until their teenage years. Then, they begin to gradually lose their flexibility.
- People who are inactive are less flexible than people who exercise.
- Most people are more flexible in the afternoon—from about 2:30 to 4:00 pm.
- It's easier to be flexible in warm weather than in cold weather.

- Keep in mind that the movement that occurs during daily activities helps keep joints flexible. For example, Mrs. Taylor uses her shoulder, elbow, wrist and finger joints to brush her hair every day. If your clients are independent and/or active in their personal care, they'll have a better chance of staying flexible.
- A fun way to exercise the wrist and finger joints is to have your clients make shadow puppets. (Remember how to do that? Make your hands into shapes that show up as shadows on the wall.)
- Another way to exercise hand and finger joints is to have your clients squeeze a washcloth or sponge while soaking their hands in a basin of warm water. This is especially good for people who have arthritis in their hands.
- Do your clients need more motivation to complete their range of motion exercises? Try strapping a small bell to an arm or leg so that it jingles every time they complete an exercise!
- If your clients are able to stand, encourage them to perform balance exercises, too. Have them hold on to you while standing on one foot at a time.



- Make sure your clients' feet are supported whenever they are seated. Dangling feet are more likely to develop contractures.
- If you notice your clients exercising their joints, encourage them to exercise both sides of their body. For example, it's best to exercise *both* knees or *both* shoulders rather than just one.
- Encourage your clients to use good body mechanics every day. For example, teach them to bend at the knees rather than at the waist and to stand and sit with good posture.
- Remember that it's normal to be stiffer some days than others. Don't let your clients get discouraged if they're not able to move as freely from one day to the next.
- Remind your clients to move their joints frequently. For example, if they are watching television, tell them to get up and move around every 30 minutes.
- Help your clients balance periods of exercise with periods of rest.
- Encourage your clients to exercise with friends or family members (or to join an exercise group at your facility). It's always more fun to exercise with other people than to go it alone. You might even want to join in—to keep your joints flexible!



Are You “In the Know” About Range of Motion Exercises?

Finish each statement with one of the words from the list below.

Then check your answers with your supervisor!

(Hint: You will not use every word on the list.)

**Bones
Ligaments
Tendons
Ball & Socket
Hinge
Knee**

**Muscles
Joint
Stabilize
Cushion
Shoulder
Contracture**

**Active
Exercise
Bed rest
Abduction
Adduction
Pain**

1. Range of motion is the normal movement that a _____ should be able to perform.
2. A bone is connected to another bone by one or more _____.
3. Cartilage is a smooth substance that covers the ends of bones and helps _____ them.
4. The hip is one example of a _____ joint.
5. The _____ is the joint in the body that’s most likely to be injured.
6. Regular _____ helps slow the effects that aging has on muscles and joints.
7. When muscles and joints aren’t used enough, a painful _____ might develop.
8. When people are able to perform their own range of motion exercises without assistance, it’s known as _____ range of motion.
9. When a body part is moved away from the body, it’s called _____.
10. Range of motion exercises should never be done past the point of _____.

EMPLOYEE NAME _____ DATE _____

I understand the information presented in this inservice. I have completed this inservice and answered at least eight of the test questions correctly.

Employee Signature _____ Inservice Credit: 1 hour
 Supervisor Signature _____ Self Study _____
 File completed test in employee’s personnel file. Group Study _____