The Dynamic Physical Therapy Back School

Getting rid of the back pain is generally the easy part – the goal is to keep it away!

The program is organized into 7 main sections:

1) A basic spine anatomy and physiology section and the natural changes that occur over time.
2) Common back problems that we see here at Dynamic Physical Therapy.
3) Safe posture alternatives for our most common activities of daily living.
4) Safety in sports activities.
5) Safe lifting alternatives.
6) How to manage sudden back injuries correctly when they do occur. This section offers a plan to minimize the severe symptoms that can accompany an injury.
7) The Home Exercise Program.

1a. Anatomy and Physiology of the Spine.

There are 4 areas of the spine: 7 **cervical** bones or vertebrae, 12 **thoracic** vertebrae which help support the rib cage, 5 **lumbar** vertebrae, and 1 solid bone called the **sacrum.** The normal spine is not straight. It is made up of 4 continuous curves which allows for strength, flexibility and also helps for shock absorption. In some people, these natural curves may be either flattened or excessive, making them more susceptible to injury. In other people, there may be an extra curve in the spine, called **scoliosis**. There are many different causes for scoliosis and as long as the curve is not too severe, the person can lead a normal, painless life but they must be extra careful in their activities.

The **intervertebral disc** sits between each **vertebra** (spinal bones) and is 80% water. The discs allow for normal flexibility in the spine and also work as a shock absorber for the spine when we walk, jog or lift objects. The disc also acts as a very important spacer between the vertebrae, providing the necessary room for the nerves to exit the spinal cord and make their way out to the muscles throughout the body. The middle section of each disc contains a jelly-like substance, called the **nucleus.** It is surrounded by a series of rings of tough rubber-like bands, called the **annulus**. The **vertebrae** of the spine are not a solid blocks of bone, but contain a series of canals that allow blood flow throughout the bone and disc. A right and left **facet joint**, found at each level of the spine, determine what movements will occur at that section of the spine.

1. b. Natural Chronological Changes In The Spine

As we age, natural changes will occur in the spine. The disc will become less moist, less soft and begin to thin. The space between the vertebrae becomes narrower and the space for the nerves to pass from the spinal cord to the muscles also becomes narrower. The disc no longer absorbs the shock and the vertebral bones are forced to pick up the extra burden. As a result, the softer vertebral bones begin to deform and flatten. An individual can lose 3 inches in overall height due to these changes. Arthritis develops in the vertebral bones and the facet joints. Stiffness and pain may also develop in the spine as a result of these changes.

These changes occur in all of us to a certain degree but the age at which it occurs and the severity of the changes is different for each individual. Genetic predisposition and medical issues such as diabetes, osteoporosis, obesity, poor nutrition habits, tobacco smoking, poor physical fitness levels and emotional stress will lead to early changes in the spine. The shape of the spine will also play a role. If the natural curves are straighter or excessive they will alter the balance of the spine. Contact sports, car accidents, falls, strenuous labor, poor posture habits and faulty biomechanics will also speed up these changes.

Dehydration will directly affect spine health.

Most people do not drink enough water on a daily basis and force their body to operate on "drought management". Our bodies consist of 90% water, and water is essential for all bodily processes that occur throughout the entire day. Water is necessary to help regulate body temperature, essential for breathing/respiration, crucial for muscle activity/work, provides cushioning properties for the cartilage in our joints and discs, and assists our internal organs in all of their daily functions. Water is vital for system repair after an injury or illness. The body will "steal from Peter to pay Paul". Many structures, including the disc, will be deprived of water on a daily basis and it will shrink in size, become brittle, and lose its cushioning properties prematurely. Soft drinks, coffee and tea do not replace water.

An individual can check their hydration levels throughout the course of the day by monitoring the color of their urine. It should be clear or a light tint of yellow. Yellow, dark yellow and orange will indicate the worsening degrees of dehydration. The correct amount of water per day will depend on the size and activity level of the individual. Sipping at least four 8 ounce glasses of water over the course of the day should get the average person going in the right direction.

About Glucosomine Supplements. Glucosomine Sulfate or Chondroitin is found naturally in our discs and joint cartilage. One of the properties of glucosomine is to keep our discs and cartilage moist and healthy by binding water molecules to the fibers and not allow them to be easily swiped and used for other bodily functions. As we age, for reasons yet unknown, the natural levels of glucosomine in our discs and joint cartilage plummets. There are glucosomine supplements available which do seem to help some people, but so far the only conclusion reached by the studies conducted is that the supplements do not seem to have any harmful side effects. The patient should get direction from their physician on this matter.

2. Common Back Problems

Muscle Strain / Sprain: The muscles or tendons of the spine are irritated or injured from prolonged activity or heavier work. This injury can occur after any new activity such as shoveling snow or raking leaves for the first time of the season, or lifting a heavier object incorrectly one time. Symptoms include pain, muscle spasms and stiffness.

Facet Syndrome / Facet Joint Entrapment: The thin, protective lining around the spinal joints becomes pinched between the two bones causing swelling, stiffness and pain. This injury can occur by bending over to pick up a pencil or other light object from the floor, or during any other activity that involves more extreme bending motions of the trunk. The facet joints open to their maximum ROM and the surrounding structures, joint capsule, nerves and muscles are stretched tightly against the joint. When the person attempts to straighten up again, one or more of these structures may be pinched between the joint causing severe pain, inflammation and muscle spasms.

Disc Herniation /Disc Bulging: The nucleus is able to push through the surrounding annulus and come to rest in a space where it doesn't belong. The herniated nucleus will often press on the nerve as it passes from the spinal cord out to the muscles causing swelling in the nerve, pain locally and anywhere along the course of the nerve. In severe cases, weakness in the muscles innervated by the nerve will also occur.
The cause of this injury is usually cumulative. Poor posture habits, improper lifting mechanics, and decreased fitness levels can cause weak areas in the disc over long periods of time.

Sciatica: A general term that describes the symptoms of an irritation somewhere along the sciatic nerve. The most common causes of a sciatic nerve irritation are disc herniation, arthritis, physical fitness issues and poor posture and lifting habits.

Muscle Guarding / Muscle Spasms: This is a natural reaction by the body in response to any number of injuries. The muscles around the injury "splint" or immobilize the area to prevent further injury. Prolonged muscle spasm may become very painful but it is not necessarily a sign of a serious problem.

Postural Strains and Sprains: This is also natural response by the body to prolonged stress. Sitting at the computer for extended periods of time in a less than perfect posture, holding the phone to your ear with a shoulder, standing with most of the body weight on one leg habitually will place unusual strain on individual muscles, joints and ligaments and they will complain.

Spondylosis: Another term for osteoarthritis of the spine. This includes disc narrowing, wear and tear of the facet joints and deformities in the vertebral bodies.

Spondylolisthesis: This term describes a situation where one vertebra is not in line with the vertebra below it. The reasons for this can be several, including extreme ligament laxity, degenerative disc disease and disc narrowing, and the shape and orientation of the facet joints will also determine how much anterior – posterior movement will occur.
A fracture in the posterior section of the vertebra will also allow a spondylolisthesis to occur.
Spondylolisthesis is graded from I to III depending on the amount of movement which has occurred. A grade I is 25% or less of the diameter of the vertebral body. Grade II is 50% or less and Grade III is 50% or more. As one vertebra moves forward or backward (retrolisthesis) on the vertebra beneath it, the central and lateral vertebral foramen, the canals that

allow for the spinal cord and peripheral nerves to pass through are narrowed. A grade I can usually be remedied with sound body mechanics and a fitness regimen. Grade II and Grade III are generally remedied with fusion surgery.

Lateral Stenosis: a narrowing of the lateral neural foramen. This canal allows the peripheral nerve to pass between two vertebrae. This canal is formed by the natural shape of the pedicles or lamina of each vertebra, as well as the thickness of the disc and the integrity of the vertebral body. A narrowing of the lateral canal is somewhat natural and can be managed with sound biomechanics and a fitness program.

Central Stenosis: A narrowing of the central neural foramen. This canal allows the spinal nerves to pass between each vertebra. The natural diameter of this opening varies between individuals and also varies between each vertebra in the spine. Factors that may compromise this canal further, include spondlolisthesis, disc herniation, osteoarthritis, late stage osteoporisis. Severe conditions of central stenosis are much more difficult to manage conservatively.

Compression Fractures: This term generally describes a crushing of the soft vertebral body as it absorbs the compressive force of a fall or the compressive force during a lifting activity. This condition can usually be managed well with rest, sound biomechanics and a fitness regimen.

3. Practical Alternatives For Activities of Daily Living

The main goal of this section is to review some of the activities we do day after day, week after week for decades, including sleeping, dressing, sitting, standing, bending and lifting tasks that take their toll on our spine and extremities. By applying the main principles of biomechanics, we can often soften the impact of these activities on our bodies. We need not perform the task perfectly, but we should strive for the safest postures we can. It is equally important to recognize that some tasks cannot be completed safely without assistance from another person or machinery and having the discipline to wait. By now with many of these activities, we have formed 'habits', some good and some not so good. Changing an old habit is never easy but it can be done by everyone with a little patience, persistence and a will to promote health and well-being. The rewards of a healthier habit will be noticed within a few weeks as aches and pains begin to disappear without medicine.

Sleep Postures: alternating right and left side-lying is best. Use a correct fitting pillow for the neck and a second pillow between the knees for someone with larger hips and/or back pain. Sleeping on the back is fine, but this position will promote snoring. Place a correct fitting pillow under the neck and a second pillow under the knees. Belly sleeping can be done carefully but this position requires a rotation in the neck that can cause headaches and other cervical issues in middle-aged or older persons. A pillow is placed under the belly and hip on one side to de-rotate the neck. We recommend no pillow for under the head. During any of the sleep positions, it is important to avoid placing arms with the elbow raised above shoulder height. This position may pinch nerves, blood vessels or muscles in the shoulder.

Sleep cycles: There are generally 3 different sleep cycles that a person will drift through during the night. REM cycle (rapid eye movement) is the deepest of the three and lasts for approx 45 minutes at a time. During this period, the sleeper is oblivious to just about everything. The other two cycles are longer and the person is in a semi-conscious state. They will hear noises in the house, recognize bladder urge, and feel discomfort in muscles or joints that are in an uncomfortable position. If a person awakes in an incorrect position, they simply correct it during these 2 phases, so at least the majority of the night is spent in a preferred position. Changing sleep patterns can be done easily with patience and persistence over 4 to 6 weeks.

The bed: An older bed (10 years) generally will begin to sag in the middle. This can be easily checked by kneeling and looking diagonally across corner to corner. Turning the mattress or flipping the mattress every 6 months is always a good idea. Firming an older or softer mattress can be done easily by placing a sheet of ¾" plywood between the mattress and box spring. New beds costing $1000 or more are all generally pretty good. Tempurpedic beds are becoming popular but are about $2000. Sleep EZ in Kingston stocks Tempurpedic beds for trial. Saugerties Furniture stocks several name brands. Choosing a bed for 2 people of different physical builds is a task. The bed should be firm enough to support their weight, yet soft enough to allow their hips to sink into the mattress a little bit. Women generally have larger hips, so they frequently need a little softer mattress. There are pillow-tops to soften a firmer mattress. There are beds available that allow individual firmness control with air pressure. When shopping for a bed: take a book with you and plan on laying around for a while.

The pillow: A correct fitting pillow is much like a correct fitting shoe. A correct pillow will help control the position of the spine during the deeper sleep cycles. There are physical measurements to help a person choose the right pillow thickness. These measurements will be quite different when sleeping on the back versus sleeping on your side so try to pick a pillow that works in both positions. Special cervical pillows are two-pillows-in-one and offer correct support for both postures by simply turning the pillow. Choosing a correct fitting pillow can be trying, but is generally well worth the effort.

Getting up from Bed: Turn your trunk and both legs carefully and uniformly to one side. Bend both knees and bring both legs carefully out over the side of the bed and hold them up with your muscles. Allow the legs to work as a counterweight while you help to lift your trunk up from the bed with your arms. It is very important to keep the abdominal muscles "ON" during this task.

Standing Posture: The force of gravity places an enormous strain on our body all day long. If we stand incorrectly, this force is not absorbed evenly and joints begin to complain and break down prematurely. Try to stand tall, in fact try to stand a 'half-inch taller' than you are. This can be done easily by bringing the sternum up and pulling your shoulder blades closer together. Keep your abdominal muscles active and test them throughout the day with the "two-finger tap". Keep the chin tucked slightly. Knees should be straight but "soft" and not locked backward. Try to distribute your body weight evenly on both feet and don't squish your arches. Avoid standing on one leg. If you must stand for longer periods, walk around or walk in place for 30 seconds every now and then to pump the blood back up out of the feet and lower legs. If you can, lean up against a wall or other safe object to deflect some of the weight from the back and legs.

Sitting: Sitting activities subject the body to gravity's forces so correct sitting postures must be applied. A correct fitting chair is similar to a correct fitting shoe. If either will be used for a few minutes, the correct fit is not critical. However, if the shoe will be worn on a 3 hour hike, or the chair will be used for a 3 hour task – the fit becomes very critical.

Use your **SIT BONES** correctly! If you have a backrest-lock them in!

The chair. The height of the chair should allow the feet to reach comfortably and firmly to the floor. There should be an even amount of pressure on the legs from the buttocks to the knees. If the chair is too high, more pressure is placed on the sciatic nerve near the knee. If the chair is too low, more pressure is placed on the sciatic nerve in the buttocks. The length of the chair seat should support the entire thigh and extend to within a few fingers width of the calf muscle. The back of the chair should support the entire lumbar and thoracic spine and preserve the natural curves. The angle of the backrest should be slightly back (95 to 100 degrees) to allow some of forces of gravity to be absorbed in the backrest rather than the lower back. In addition, arm rests will help by relieving the weight of the upper extremities (20 – 30 lbs.). The armrests should not push the shoulders upward, only support them from moving downward.

Sitting in gravity for longer periods is very difficult for the discs in the lumbar spine and sitting postures should be interrupted every 45 minutes or so to restore circulation and give the discs a break. Walking around for a few minutes, and completing some backward bending and side bending stretches will make this task much safer.

Beware of "TRAPS". If a chair causes back symptoms whenever you sit for more than a few minutes, consider it a trap. Modify it somehow so it doesn't provoke symptoms or chose another chair. Generally, school bleachers and collapsible beach chairs are 'traps', but even ill-fitting expensive office furniture may pose a threat.

Couch: Couches tend to be soft 'traps' and lack sufficient support for the spine. Corrective measures can be as simple as placing a throw-pillow behind the lower back and using your SIT BONES correctly. The TV should be directly in front so the neck is not kept in a rotated position for longer periods.

Computer: Apply all the sound principles mentioned above. Lock in the SIT BONES, sit up tall, pull the shoulder blades together and tuck the chin. Use the "Two- Finger Tap"to insure the abdominals are active. In addition, the monitor should be at arms length, with the top of the screen at eye level to avoid backward bending of the neck. Armrests should support the arms and place the wrists at keyboard level. If you wear bi-focal glasses, you may need to adjust the set up slightly to avoid the more harmful neck postures. If you spend many hours on the computer, it may be worthwhile to purchase a second pair of 'computer-work' glasses. There are many types of affordable ergonomic accessories to make this activity safer, including ergonomic desks, ergonomic chairs, and ergonomic mouse and mouse-pad alternatives to choose from depending on individual requirements.

Reading: Apply all sound biomechanics. SIT BONES, chin tuck, shoulder blades together, abdominals on, etc. Avoid prolonged forward head and neck postures by holding the article up in front of your face, or by placing the article on a pillow or some other object to raise it up. Break the rules here and you set yourself up for headaches.

Car: Lock your SIT BONES in, sit up tall, sternum up, shoulder blades back, chin tuck, abdominals on. Adjust the backrest angle to approximately 100◦ and slide the seat forward enough to reach the floor pedals firmly without straightening out the knees. Hands should be placed at the 8 and 4 positions to decrease strain on the rotator cuff, as well as for safety in the event of an airbag deployment. Now, adjust the rear-view and side-view mirrors and then adjust your posture if the view in the mirror shifts. On longer trips, pull over every few hours and walk around, do some back bending and side bending stretches before getting back in the seat. Some automobiles offer seats with lumbar supports. For those that don't, a 'customized' lumbar support will almost always be helpful. Lumbar supports can be made from rolled up towels or sweaters, or can be purchased and then modified to a custom fit. There are hundreds of seat support options ranging from $15 to $150 so it can be confusing. Dynamic Physical Therapy keeps a few support options on hand that you can try out.

Don't Allow Your Chin to Slip Forward: This generally occurs when you relax the muscles on the front of the neck and allow the head the make a very subtle backward nod. Many people do it routinely while standing, sitting at the computer, driving the car and while watching TV. This tiny motion allows the vertebrae in the neck to press into nerves and blood vessels that lead up into the head causing the most common headaches we see in the clinic. To avoid this, keep the muscles on the front side of the neck mildly tense causing a **chin-tuck.** This habit takes only a few weeks to master.

Dressing Sit on a chair or the side of the bed. Avoid standing on one leg while dressing, especially first thing in the morning. The forces imposed on the hip and the spine during this activity are incredibly high and risky. When putting on socks and shoes, sit on a chair with your back supported. When lacing up, avoid bending forward with the feet on the floor as this causes the back to move way out of the safe zone and poses a threat for injury. The best alternative is to place one calf on top of the other knee or another option is to place your foot on the seat while standing. The main safety goal is to avoid <u>full</u> forward bending at the lower back.

The Sink: Washing dishes, peeling potatoes or brushing teeth while standing and leaning over the sink can place an enormous strain on the lower back. To help ease the strain on your back, place one foot fore and one foot after and lean your waist up against the sink firmly and try to stand up straight. Keep the abdominal muscles "on". This will decrease the forces on the lower back. Another helpful alternative is placing one foot on a small step or on a shelf inside the cabinet. In many older homes, the height of the sink is just too low to do any task for longer periods. Raise them up to a safer level when the opportunity arrives.

Vacuuming: Make sure the vacuum tube is the correct length for your height. Most of them are too short and promote the very worst movements for the spine. By adding an additional <u>12 inch extension tube</u> (available at the hardware store or the place of purchase) to the handle, forces on the lower back are decreased significantly. Try to keep the spine (belly button) in line with the vacuum cleaner tube. Try to keep the spine quiet during this activity. Avoid stooping, twisting and reaching repetitively. Remember to keep the abdominal muscles "ON", bend at the knees and perform small lunge steps while vacuuming. Try to alternate postures during the activity by switching your grip from right to left sides during the task to spread the strain over both sides of the body. Vacuuming under furniture can only be done safely by kneeling and supporting the upper spine by placing one hand on the floor or the furniture itself. Remember, stay out of the danger zone. Don't reach too far!

Laundry: Laundry duty can be heavy and awkward on the spine. Applying safe postures is essential. Top loaders are more difficult to load and unload safely. Keep the abdominal muscles "ON", keep one leg fore and one leg after, bend at the knees and support your upper body weight by placing one hand firmly on the top of the machine and then pull the heavier items out carefully with the other hand. Front loaders are safer but pose threats of there own. They are usually lower to the ground. Use the **tripod position** by kneeling on one knee, or the **strong position** with one leg fore and one leg after, knees bent and the back pretty straight. Avoid stooping and reaching too far especially for wet and heavier items. The laundry baskets should fit under the washer and dryer opening for easy loading and unloading and should never be overloaded or too heavy to lift. Wheeled laundry baskets are available and work great. Ergonomic platforms are also available to lift the front loaders up off the floor for safety.

Folding laundry should be done on the correct surface height to avoid repetitive bending and twisting. The dining room table is usually at a better height than the bed or couch. Place the pile of laundry at the same or similar working height. Remember to apply sound biomechanics throughout this task: soft knees, Ab's "ON", etc.

Work/Hobby Station: The desk height or work station height should be appropriate for the individual performing the sitting or standing tasks. Rubber mats placed on the concrete floor are very helpful. Avoid repetitive bending and twisting. Break any sustained postures up with walking and stretching exercises. Identify flaws in the work station and modify them before they become a source of irritation.

Traveling (car, planes, luggage) It's always a good idea to vary postures thoughout the day. Whether traveling by car, plane or train- get up and stretch out, walk around for a few minutes before returning to your seat again. Avoid picking up heavy luggage directly after sitting and traveling for several hours. The spine is very vulnerable at this time. Stretch out, walk around a few minutes and take extreme precautions while handling luggage. Better yet – let a professional handle your luggage whenever possible.

Groceries: With many of the grocery stores using plastic bags, we can easily wrap a bag around each finger and carry tons of groceries. Avoid this trap. Use a cart to bring the groceries to the car and make several trips from the car to the house when you get home. Grab one of the lighter bags on your first trip so you can manage the door knob.

Shoveling Snow: This is a very dangerous task for the spine, the shoulders and the heart. In fact, the Emergency Room will treat more people with back injuries, rotator cuff tears and heart attacks than any other time of the year. Prepare by warming up the entire body first with stretches and a light cardio routine. Drink water throughout the exercise. Use the strong position, one leg fore and one leg after, back pretty straight and knees bent. Keep the spine in line and quiet throughout the task. Do not twist the spine when throwing the snow to one side. Keep the abdominal muscles "ON" and bend the knees to scoop the snow. Don't reach for the snow – the target snow is just off the front foot. Alternate shovel grip from right to left sides after every ten shovel repetitions, and take the time to catch your breath and drink water between sets. An ergonomic snow shovel is very helpful. A snow-blower or plow is better yet!

School Backpacks: School backpacks should weigh LESS than 15% of the child's body weight. 10% is safer yet. Backpacks should be the correct size for the child, should be worn high on the back above the beltline, shoulder straps should be wide enough to distribute the weight evenly over the shoulder. If you have younger children, please ask for our separate backpack handout.

Child Car Seats: This is a very difficult activity. It often involves lifting, bending and twisting. A 25 pound toddler can cause forces upwards of 250 pounds on the lower back during this exercise. Some alternatives include: letting the child (1 year and older) climb in and out of the seat on their own while the parent provides safety. Toddlers are natural climbers and can be taught this maneuver in minutes. If the parent must lift the child, they should try to place one knee on the back seat to take some strain off the spine. Try to keep the back straighter and the abdominal muscles very tense. Don't stoop, twist or reach with the weight of the child on the back or the shoulder muscles. If you travel longer distances, stretch out a few minutes before attempting to remove the toddler from the back seat.

Back Supports: Back supports are generally very helpful. They encourage proper spine support and seem to remind the individual to apply sound biomechanics principles. Back supports should be worn loosely when not performing more stressful tasks and comfortably firm during the task. The abdominal aorta artery passes superficially near the belly-button and there is some fear that wearing the support too tightly for extended periods of time may obstruct the flow.

The Phone: Avoid holding the phone to the ear with your shoulder. This common tactic can cause nerve and muscle irritation, headaches and numbness and tingling in the arms.Instead, use the speaker phone accessory or invest in a headset.

Shoes: A correct shoe can make a big difference. Running shoes, walking shoes, standing shoes all offer different support systems for the feet. If you walk a few miles everyday, it pays to wear a walking shoe. If you jog, wear a running shoe. If you spend most of the day standing around or walking around the home or office, wear a sturdier, standing shoe. Higher Heels can be worn safely for shorter periods only. Walking around in higher heels places the ankles in plantar flexion and changes the gait pattern. The higher the heel, the more affect on the legs and the lower back. Today, shoe manufacturers do offer safer alternatives. Flip-flops can be worn safely for shorter periods only. Flip flops generally offer

little support for the feet. In addition, walking in a flip-flop requires the person to flex their toes during the swing phase to keep the flop from falling off. This is the opposite of a normal gait pattern.

4. Sports Activities.

Cycling. Several adjustments can be made to the bicycle to reduce the strain on the lower back. Road and touring bicycles generally place the rider in a forward bent posture that will challenge the spine after a short while. Newer bicycles offer adjustable handlebar stems to decrease the trunk angle and allow the rider to enjoy longer rides without lower back complaints. The bike shops will often stock replacement stems for the older bicycles. Of course, it is always recommended to get off the bike at safe intervals and straighten up the spine for a few minutes.

Jogging.
Yoga
Weight Lifting
Pilates
Basketball
Soccer
Volleyball
Judo and Martial Arts

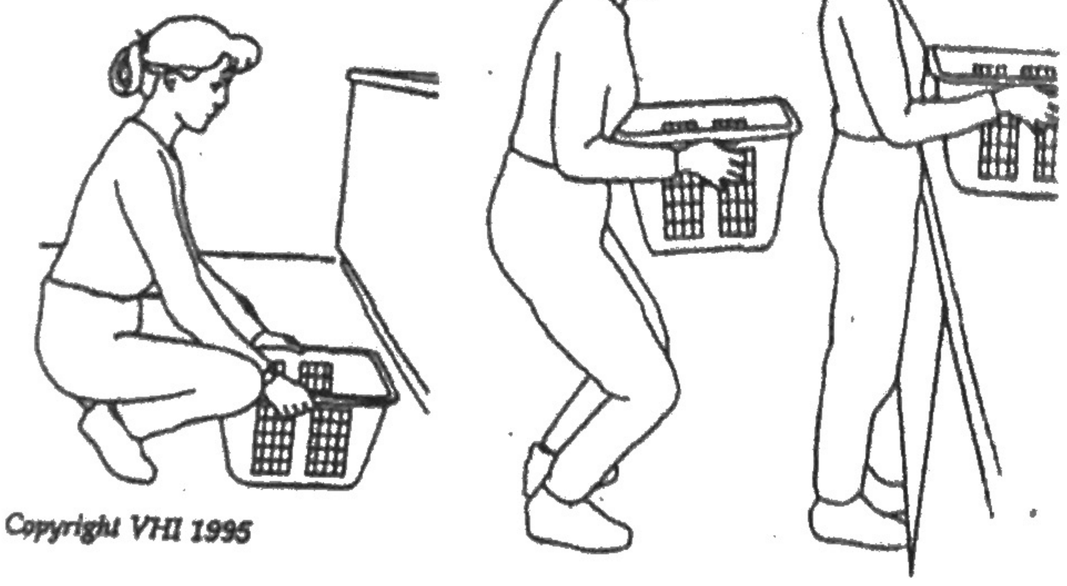
ADL - 16
Laundry - Unloading Dryer

Squat down
to reach into clothes dryer.

Small items can be placed in a large zippered mesh bag and pulled out using a reacher.

ADL - 15
Laundry Basket

Squat down and hold basket close to stand. Use leg muscles to do the work.



ADL - 17
Housework - Sweeping

Use long-handled equipment to avoid stooping.

ADL - 16
Laundry - Unloading Dryer

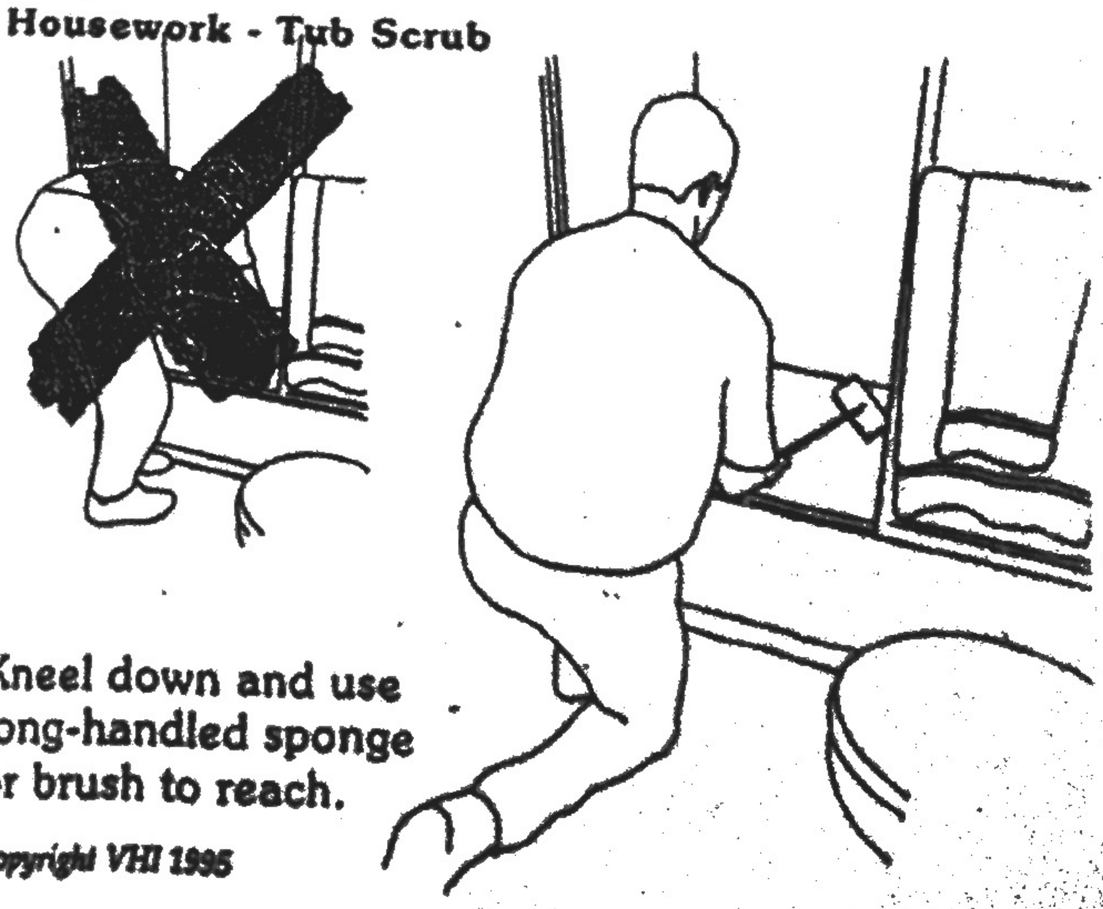
Squat down
to reach into clothes dryer.

Small items can be placed in a large zippered mesh bag and pulled out using a reacher.

ADL - 19
Housework - Vacuuming

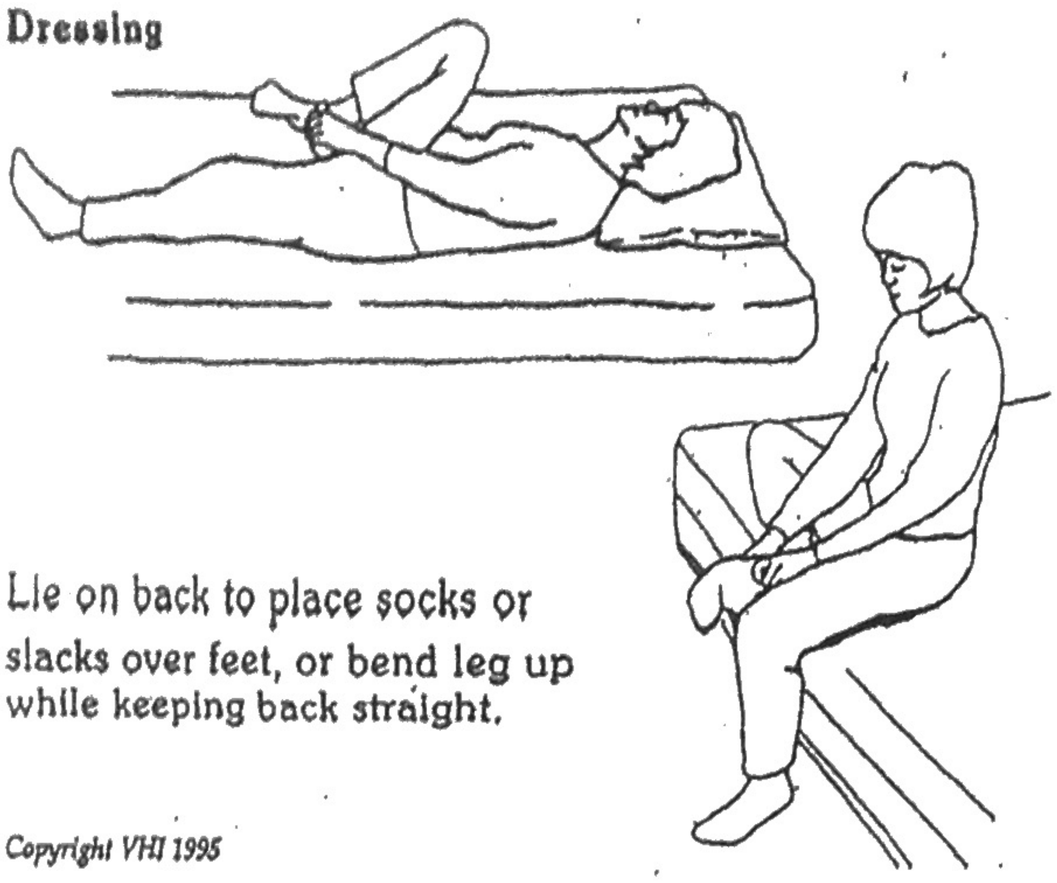
Hold the vacuum
with arm held at side.
Step back and forth to move it,
keeping head up. Avoid twisting.

ADL - 18
Housework - Tub Scrub



Kneel down and use
long-handled sponge
or brush to reach.

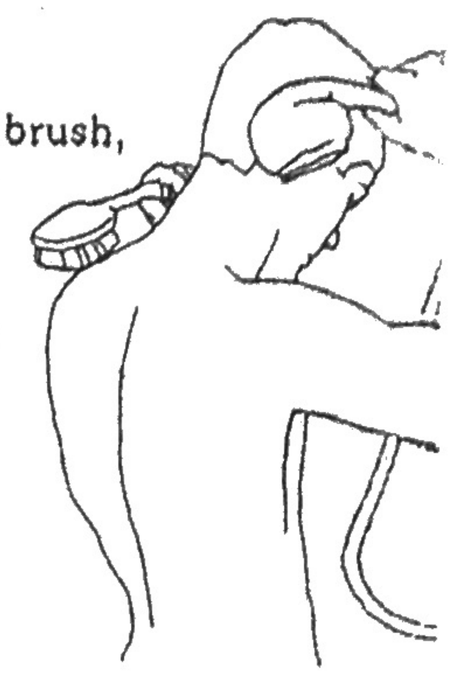
ADL - 2
Dressing



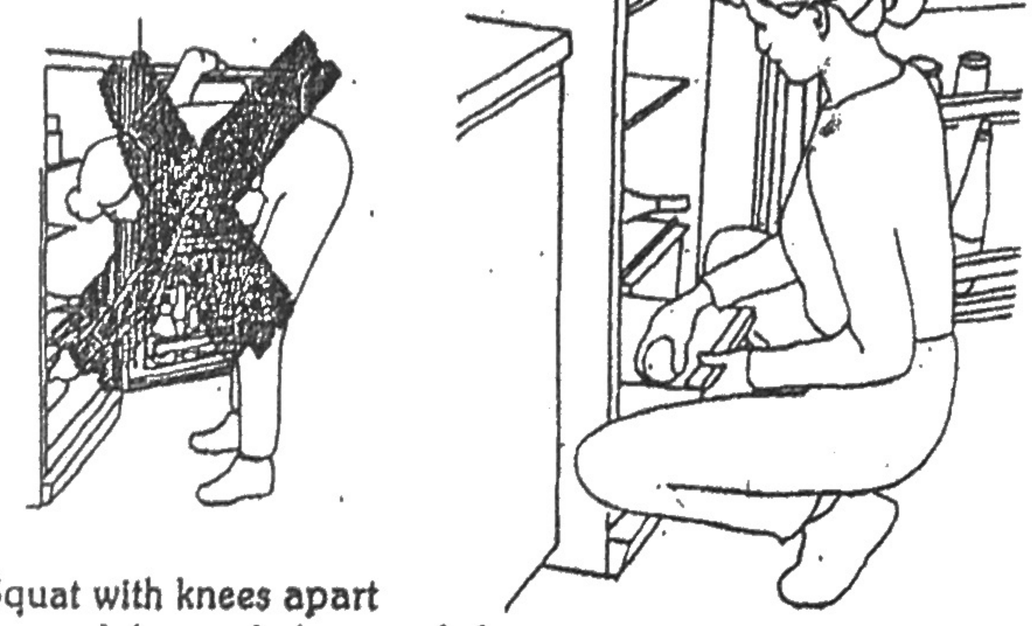
Lie on back to place socks or slacks over feet, or bend leg up while keeping back straight.

ADL - 1
Showering

Standing to shower is preferable to sitting in a tub. A long-handled bath brush, hand-held shower, and rack to hold toiletries prevent stooping and twisting movements. Use a rubber mat to prevent slipping.



ADL - 6
Refrigerator

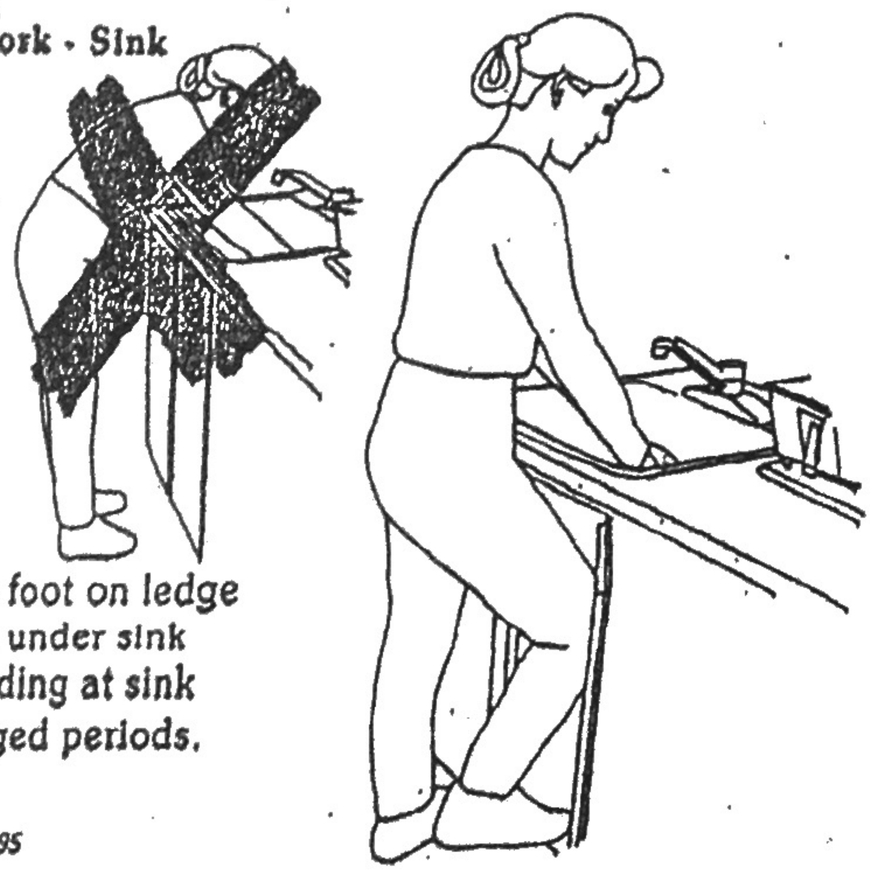


Squat with knees apart to reach lower shelves and drawers.

ADL - 5
Telephone

Avoid leaning phone on shoulder. Take time to assume proper position.

ADL - 8
Housework - Sink

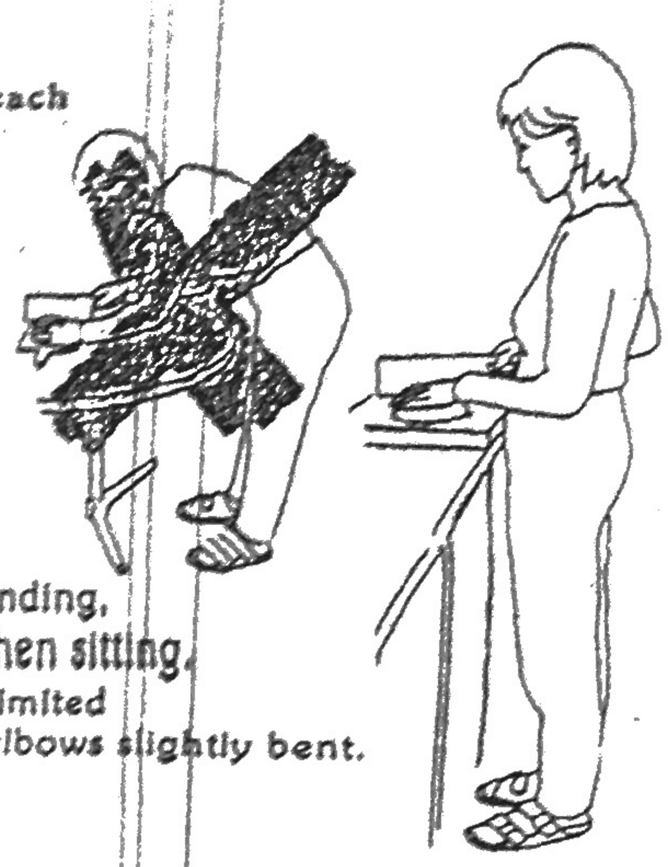


Place one foot on ledge of cabinet under sink when standing at sink for prolonged periods.

ADL - 7
Housework - Dishwasher

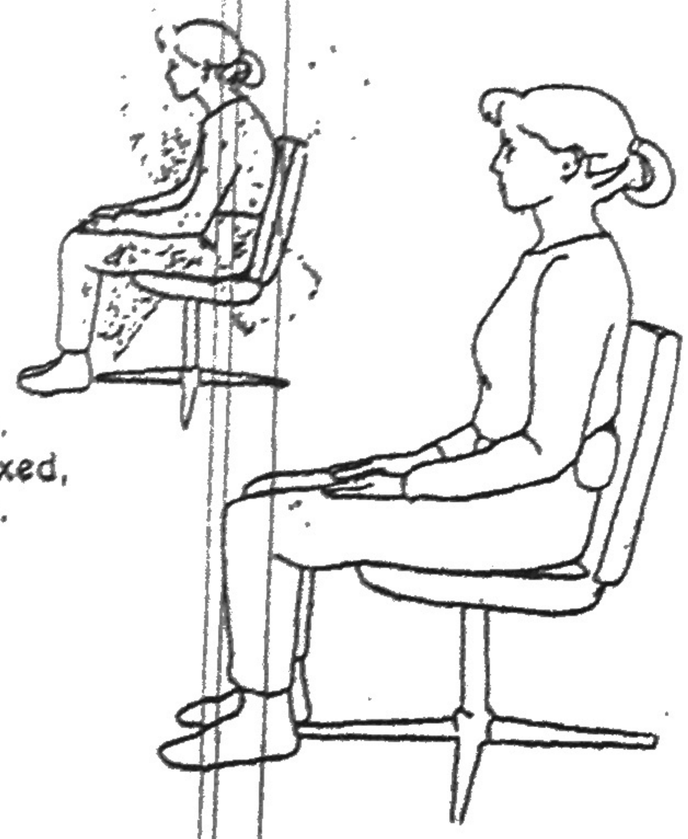
Kneel or squat to one side of dishwasher to load and unload.

POSITIONING - 10
Work Height and Reach



Ideal work height
is no more than
2 to 4 inches below
elbow level when standing,
and at elbow level when sitting.
Reaching should be limited
to arm's length with elbows slightly bent.

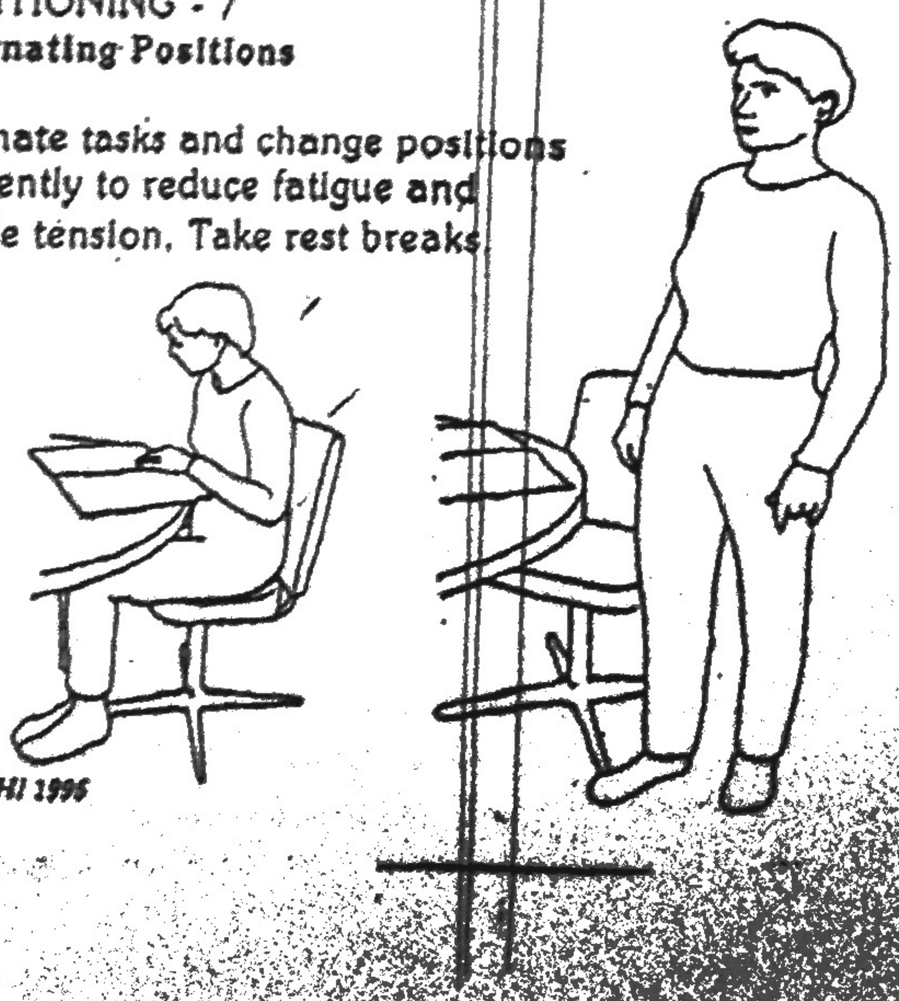
POSITIONING - 6
Posture - Sitting



Sit upright,
head facing
forward.
Try using a roll
to support low back.
Keep shoulders relaxed,
avoid rounded back.
Keep hips level
with knees.
Avoid crossing legs
for long periods.

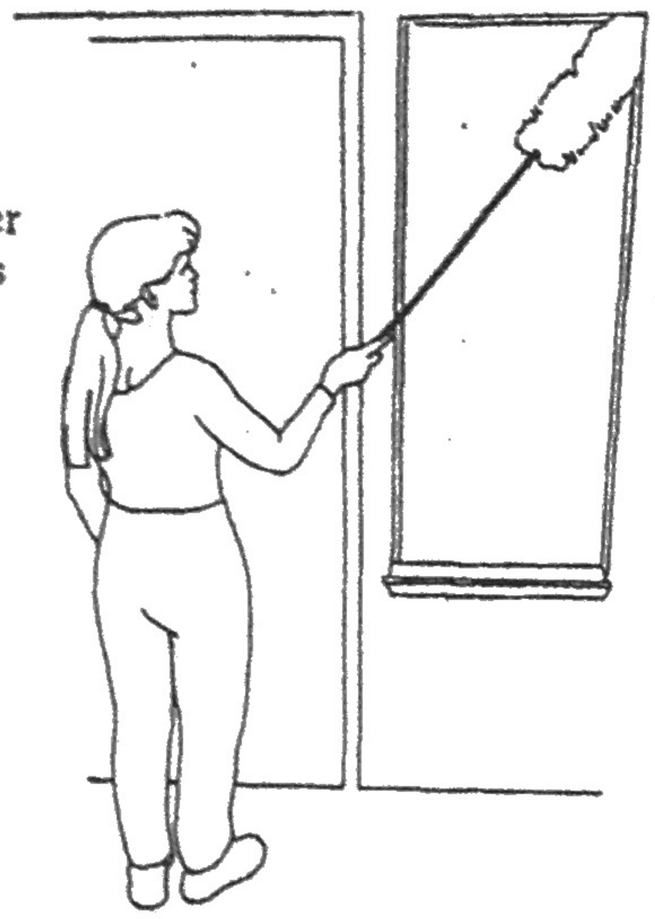
POSITIONING - 7
Alternating Positions

Alternate tasks and change positions
frequently to reduce fatigue and
muscle tension. Take rest breaks.



ADL - 21

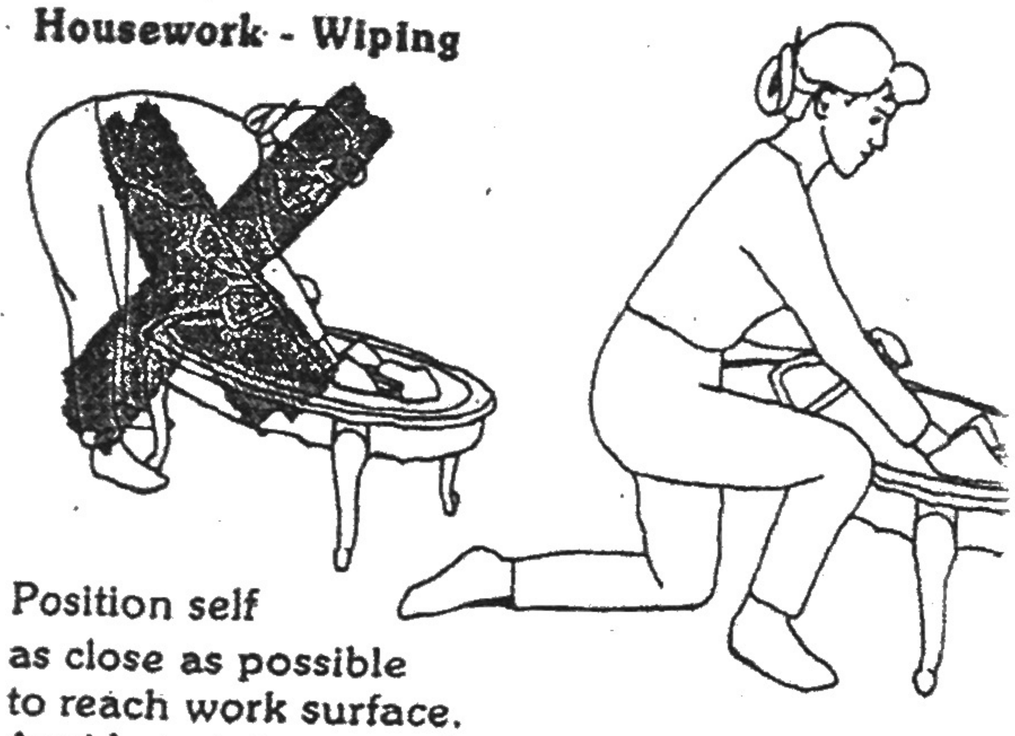
Housework - Dusting



Use long-handled duster for hard to reach places to avoid straining.

ADL - 20

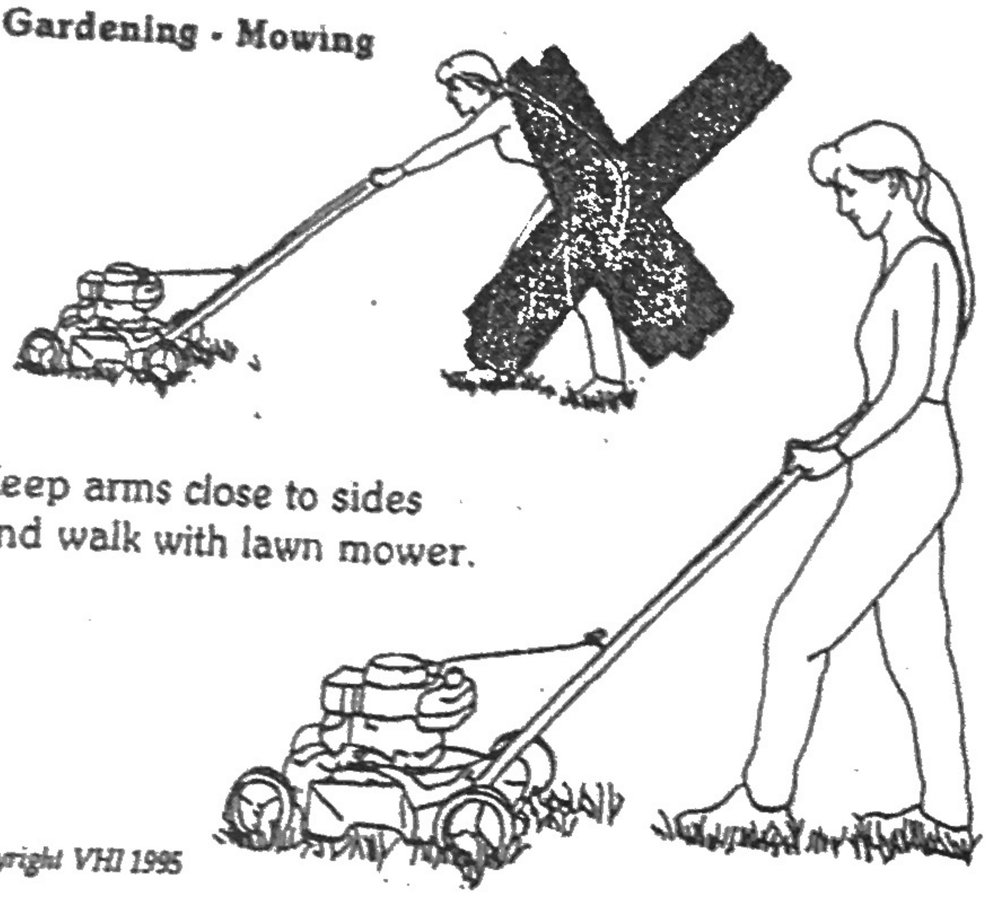
Housework - Wiping



Position self as close as possible to reach work surface. Avoid straining your back.

ADL - 23

Gardening - Mowing



Keep arms close to sides and walk with lawn mower.

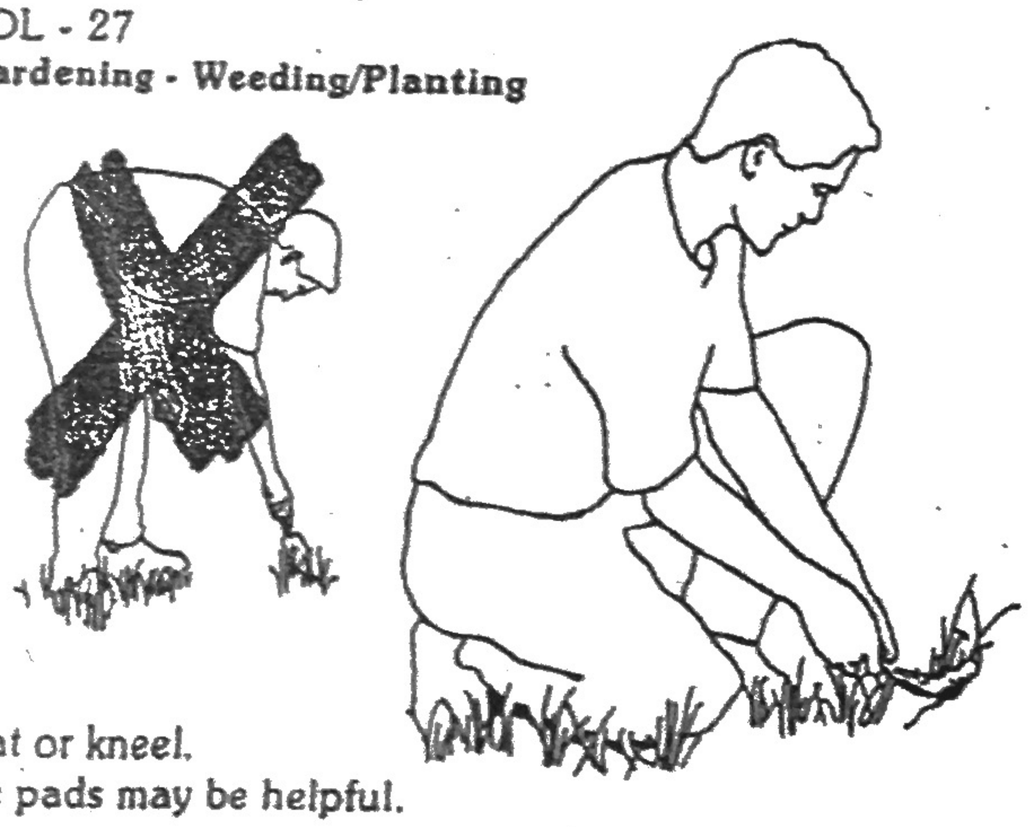
ADL - 22

Housework - Cleaning

Raise self on stool to reduce overhead reach.

ADL - 27

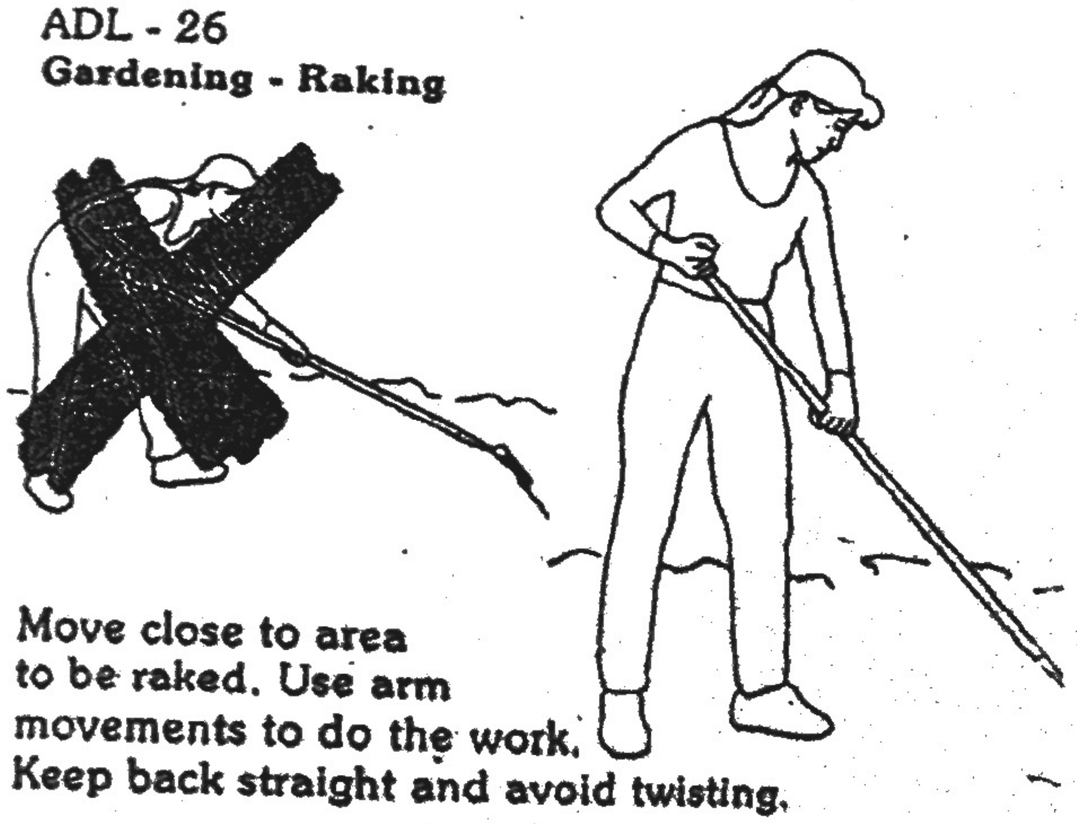
Gardening - Weeding/Planting



Squat or kneel.
Knee pads may be helpful.

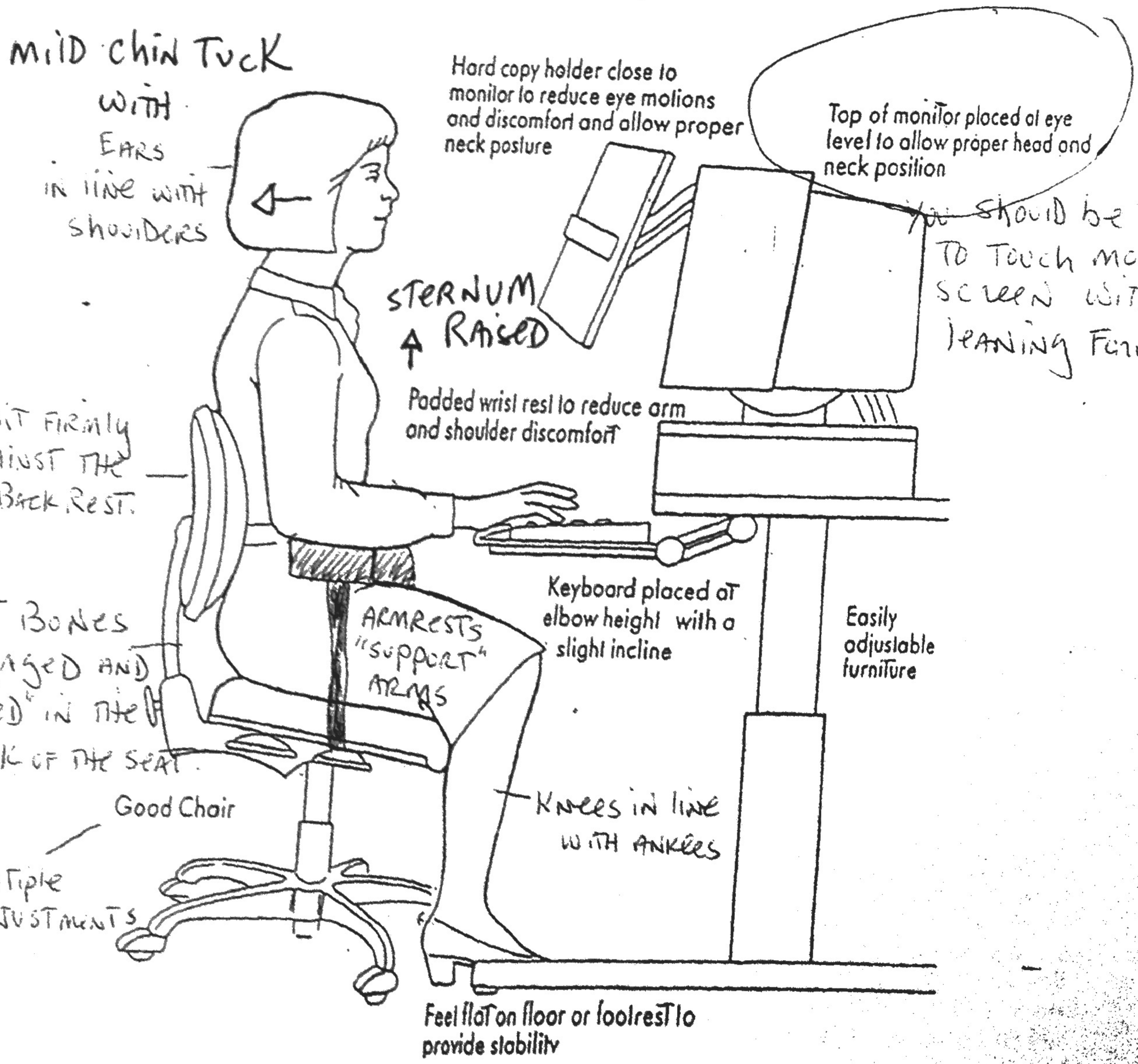
ADL - 26

Gardening - Raking



Move close to area to be raked. Use arm movements to do the work. Keep back straight and avoid twisting.

THE COMPUTER STATION



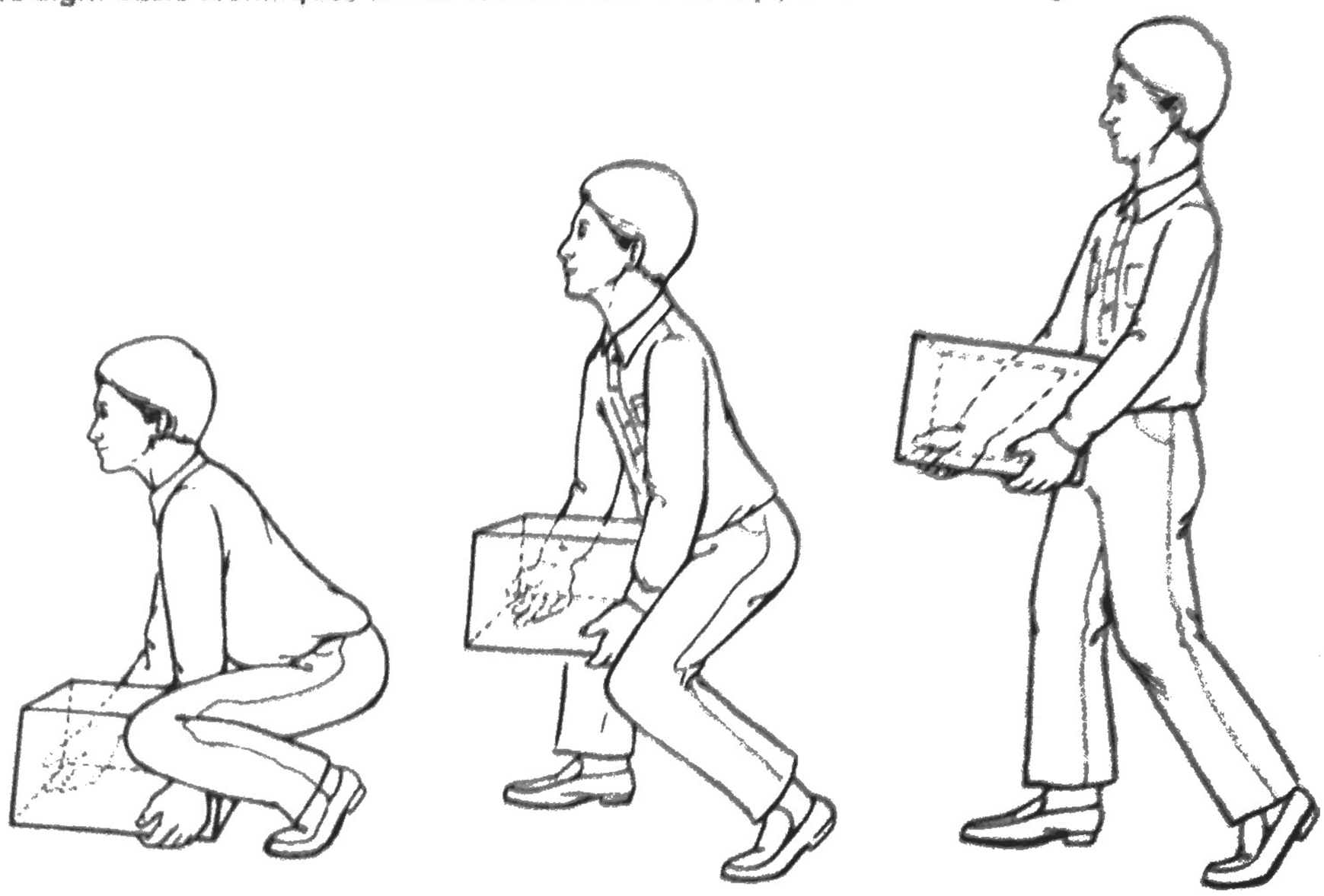
5. BODY MECHANICS AND LIFTING TECHNIQUES

SAUNDERS Grp

Lifting Techniques

Lifting is one of the most stressful work activities, especially if the correct body mechanics are not used. As discussed in the previous section, there are a number of steps in performing a safe lift. Additionally, there are a number of techniques which can be used when lifting. The weight and size of the object, location or distance of the move, strength and flexibility of the individual, as well as other factors will dictate the method of lift which is most appropriate. In the following section eight techniques for lifting are discussed. Supervisors should practice these methods with employees to ensure they can perform each technique. Some employees may not be able to complete each movement due to lack of strength or flexibility. If this is the case, the supervisor should encourage modification of the lift to utilize the best body mechanics for each individual.

There are eight basic techniques which can be used to safely perform most lifting tasks.

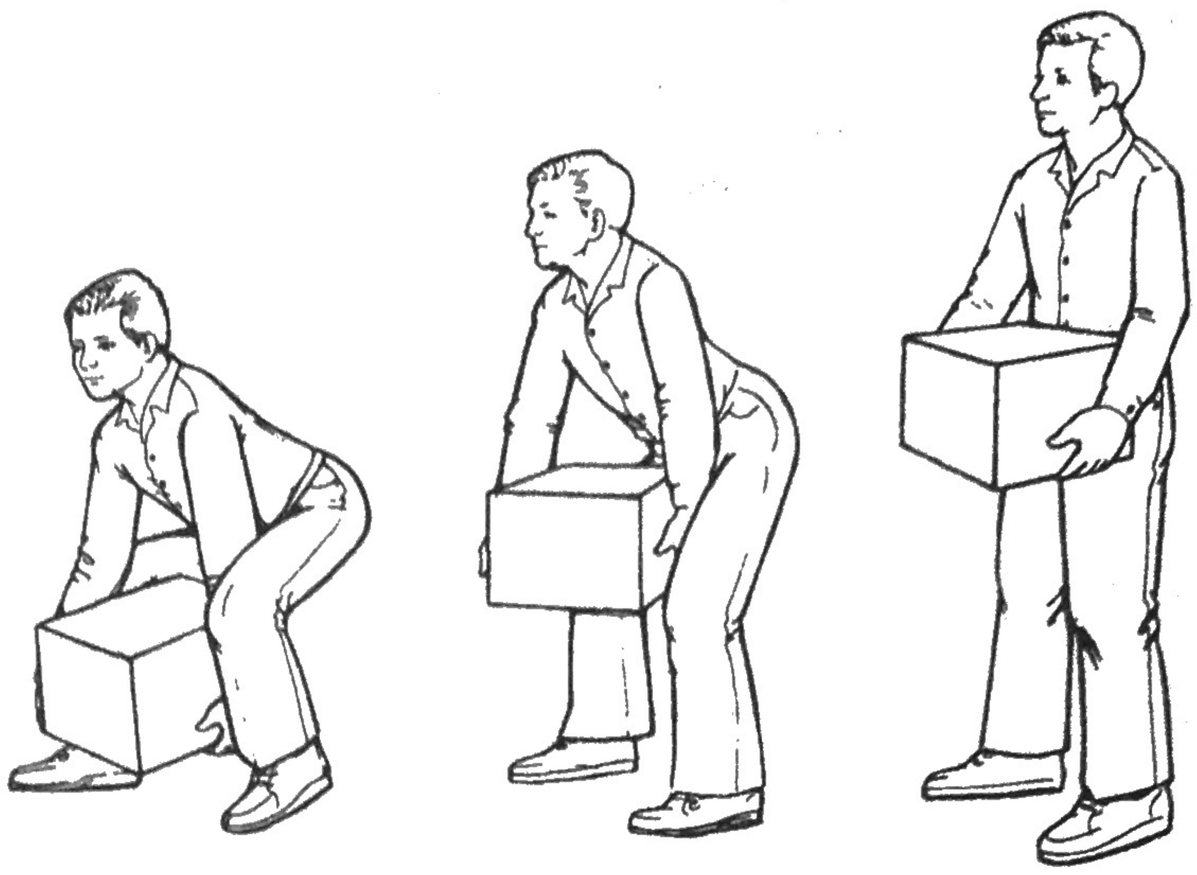


1. Diagonal Lift:

This is the most common method for lifting and allows for full use of good body mechanics principles. To perform the diagonal lift the employee should establish a wide base of support and straddle the object with one foot slightly ahead of the other (on a diagonal). As the body is lowered by bending at the knees and hips, the worker should firmly grasp the far outer corner of the object with the hand which is on the side of the forward foot and then grasp the opposite side with the other hand. Establishing a good grip is especially important because if the item slipped while lifting, the jerking movement could severely damage the low back structures. The object should then be moved as close to the body as possible. Keeping the head and shoulders up while maintaining the normal arch in the lower back, the employee should straighten the knees and hips as he comes to a standing position. In a proper lift, the head will rise first, with no movement in the back. In an improper lift, the hips will rise first, requiring the back to bend forward while the lift is performed. The key to this technique is keeping the back arched and using the strength of the legs to lift.

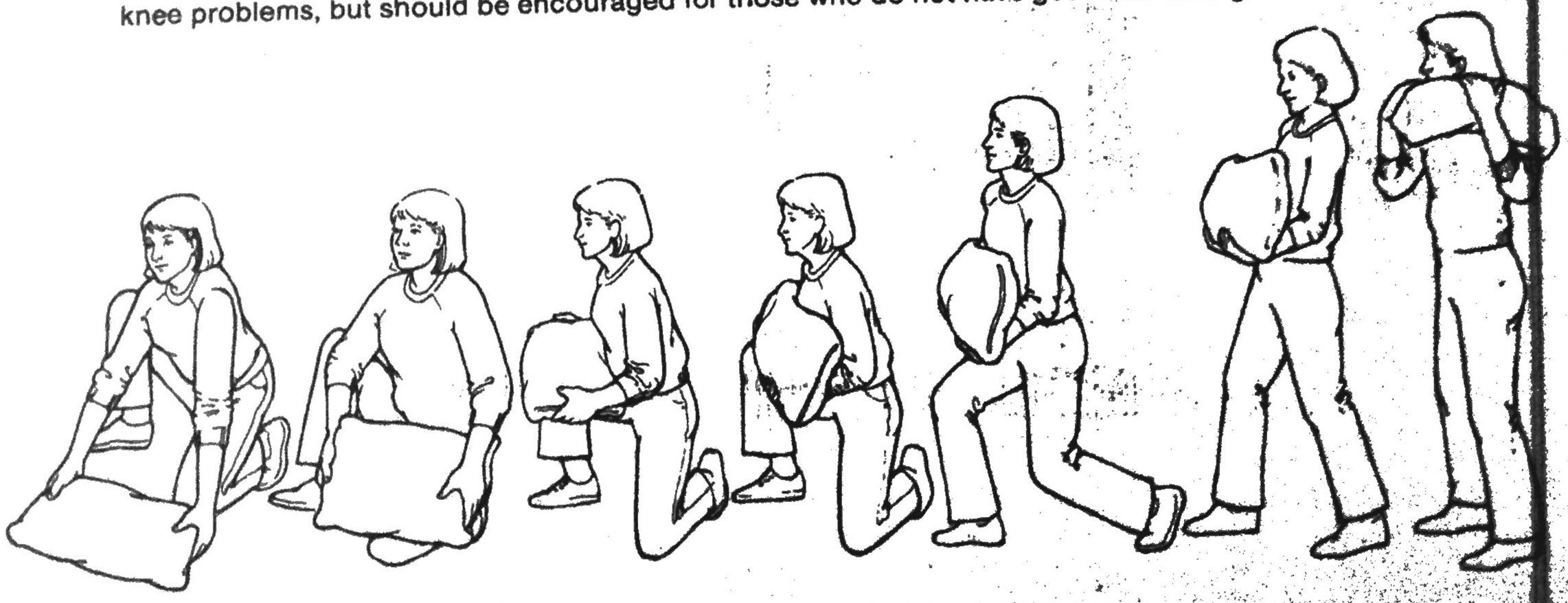
2. Power Lift

The power lift allows the lifting of bulky or heavier loads with minimal stress. The employee should establish a wide, solid base with one foot positioned in front of the other. The body should be slightly over the load with the knees bent in a half squatting position (similar to a defensive position in basketball). While bending at the hips, the object should be grasped firmly. No bending at the waist should take place. With the head and shoulders up, the hips and knees are then straightened to complete the lift. In beginning the lift, it is important that the first movement is with the head, followed by the straightening of the legs. Once the item begins to move, it can be pulled close to the waist as the hips straighten out.



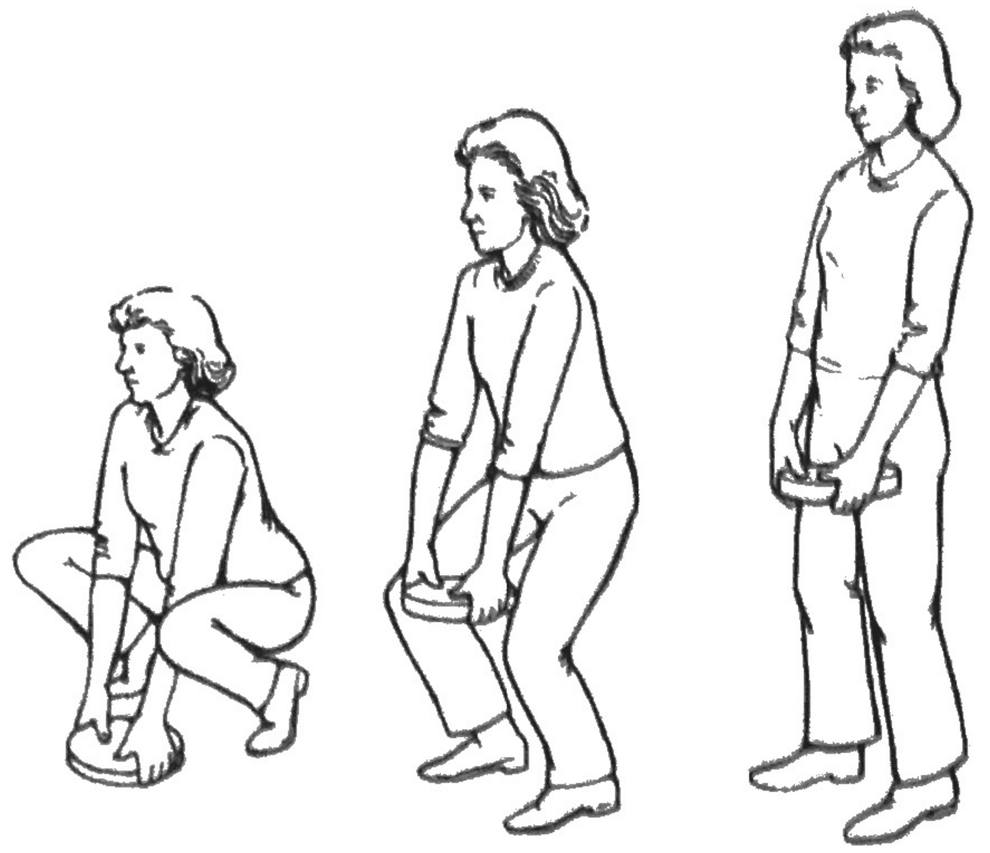
3. Tripod Lift

This technique allows the employee to conveniently bring the item close to the body before completing the lift. The worker should place one foot beside the front portion of the object, and drop slowly to the other knee. Gripping the object firmly at both near and far corners with the head and shoulders up and the lower back arched, he should then lift or roll the object onto the top of the thigh. Maintaining the same posture, the worker can then stand with the object cradled. This lift should be avoided by employees with knee problems, but should be encouraged for those who do not have good arm strength.



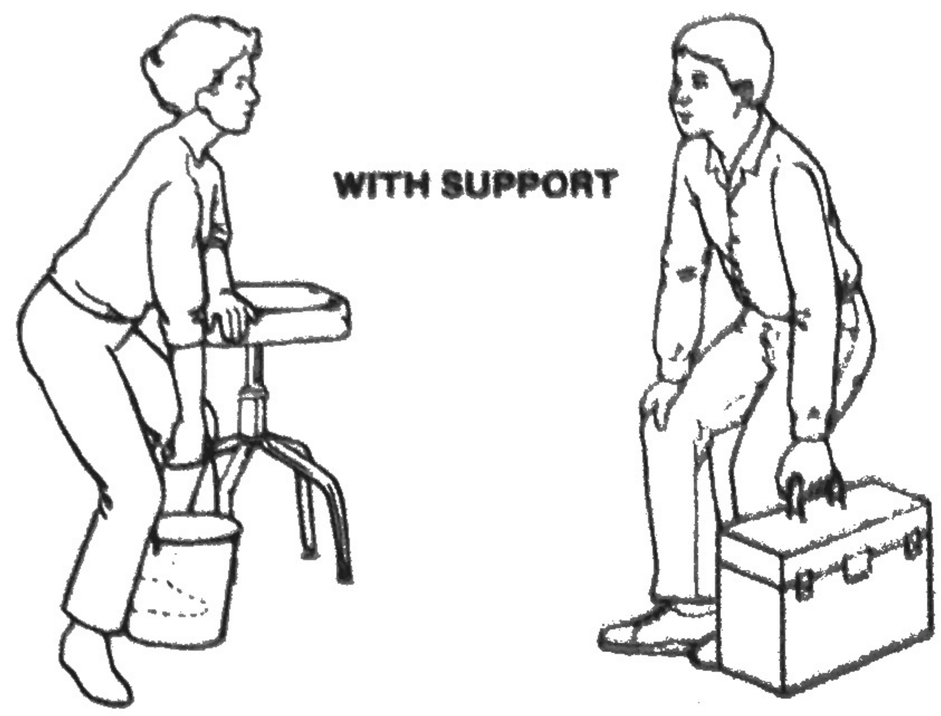
4. Deep Squat Lift:

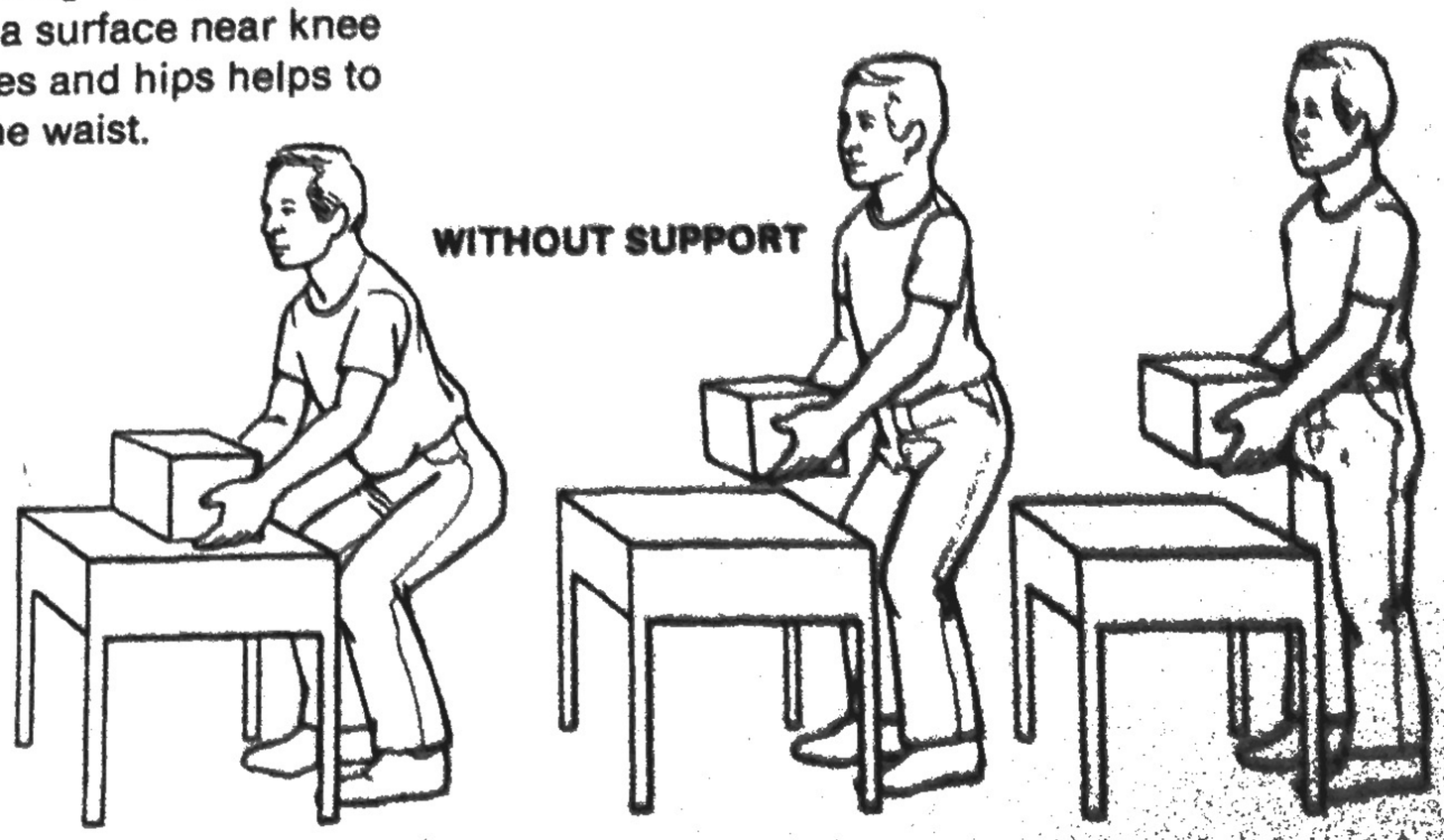
This technique is similar to the diagonal lift, except that instead of straddling the object, the employee squats in front of it with the feet and knees approximately shoulder width apart. This lift should only be used when lifting small, light items or when insufficient space is provided to straddle the object. The worker should lower himself into a full squat with knees bent and the lower back arched. The item should then be lifted with the arms and cradled close to the body. With the head and shoulders up, the legs should be used to complete the lift. For added balance and assistance the employee should be encouraged to hold the object in one arm, if possible, and complete the lift with the free hand on a fixed object such as a chair or counter. This lift should be avoided by employees with knee problems.



5. Partial Squat Lift With And Without Support:

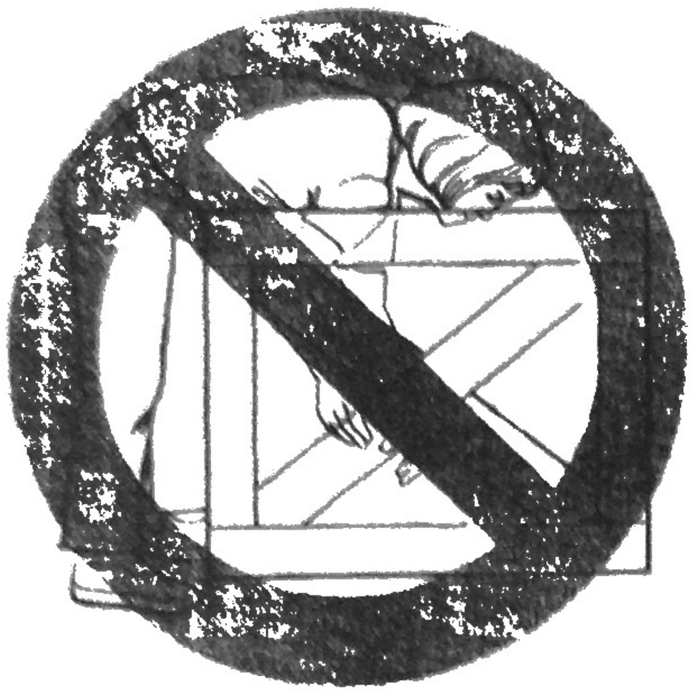
This lifting or stooping technique reduces the stress on both the back and the knees. For both techniques the feet should be positioned shoulder width apart with one foot slightly in front of the other if possible. For the partial squat with support, one hand should be placed on the forward thigh or a fixed object as the knees and hips are bent and the employee lowers himself to pick up the item. Keeping the lower back arched and the head and shoulders erect, the lift is completed by pulling the object close and pushing off with the supporting hand as the employee stands up. The partial squat lift without support is helpful for lifting heavy or bulky items which are placed on a surface near knee height. Bending at the knees and hips helps to avoid forward bending at the waist.

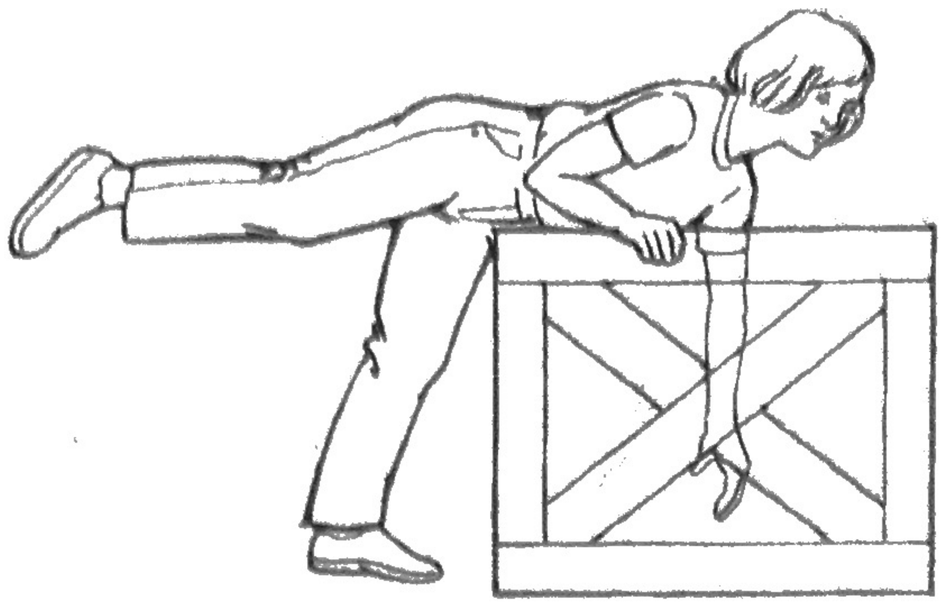




6. The Golfer's Lift:

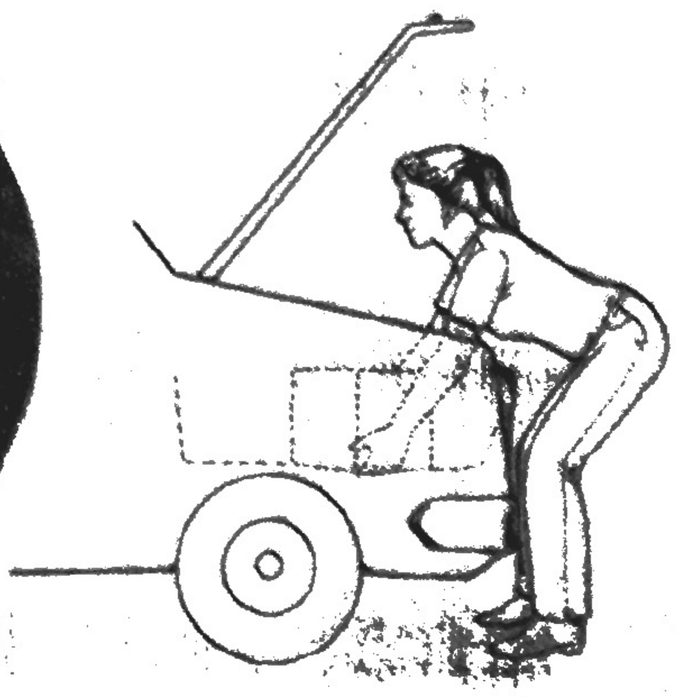
This lift is often used by individuals who have knee problems, have decreased leg strength or must lift where there is a barrier in front of the item (such as a railing or deep storage container). With this technique, one hand should be placed on a table or other fixed object to support the upper body. The employee should arch the back, bend at the hips and raise one leg behind him. By raising one leg, the upper body weight is counterbalanced and forward bending of the low back is reduced. To pick up the item the individual should look up, push off with the free hand and lower the raised leg.





7. Straight Leg Lift:

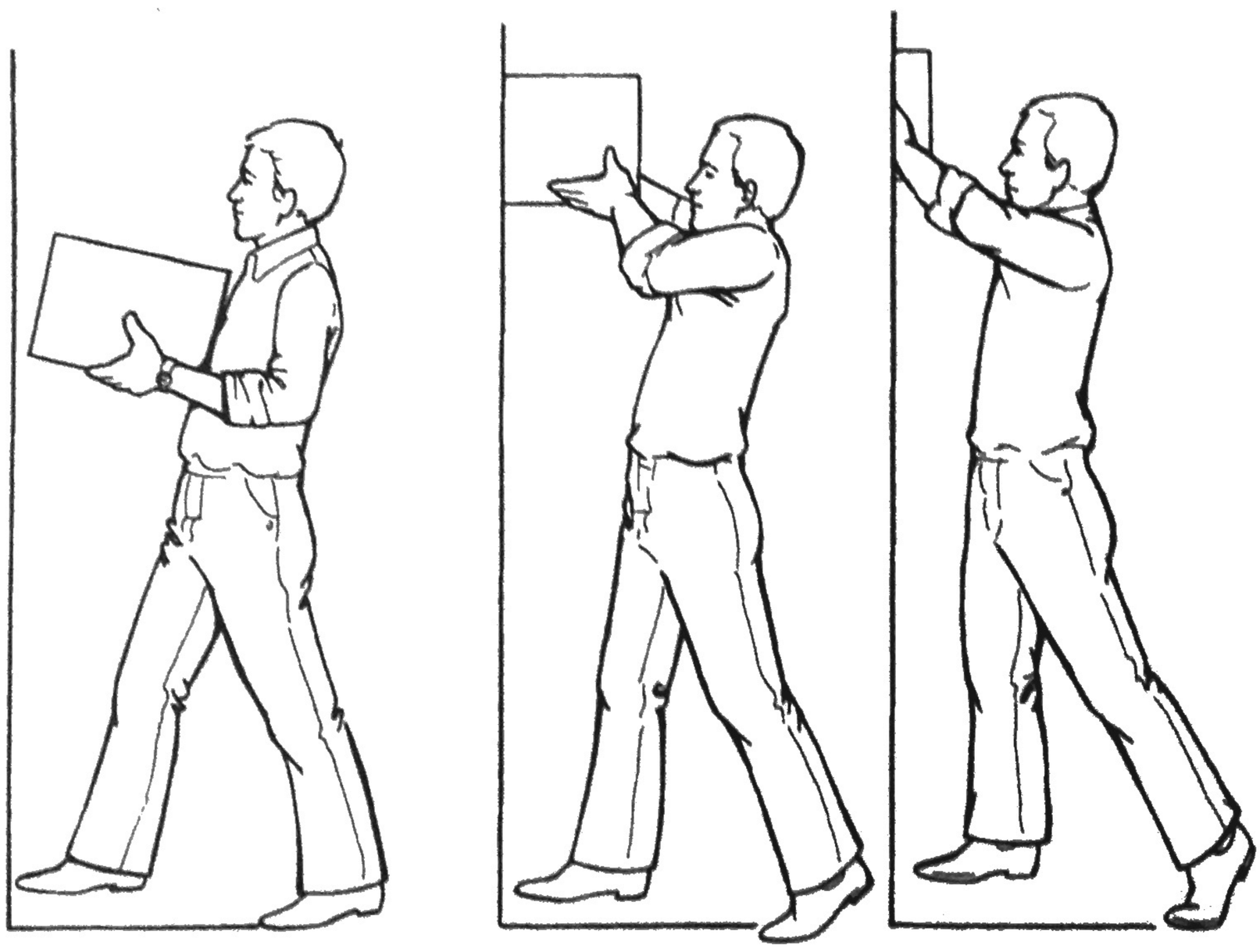
The straight leg lift is used when the knees and hips cannot be bent. There are times that items must be lifted over railings, from containers, or from a bed or table; these situations do not allow for the use of any of the other safer lifting methods. Special care must be exercised to minimize the potential for strain when workers perform this lift. To begin, the employee should position himself as close to the object as possible, with the knees slightly bent. If the employee is reaching over something into a lower work area, have him press his legs forward against the railing or object over which he is reaching. While bending slowly at the hips, not the waist, the employee should firmly grasp the item and bring it closer if necessary. With the low back arched and the head up, the lift is completed by rotating the hips backward into a full standing position.



When performing this lift correctly, the muscles in the back of the legs will pull back on the hips and control the lifting movement. Employees who have tight hamstring muscles or lack hip flexibility will have difficulty with this method since they will be unable to bend sufficiently at the hips.

8. Overhead Lift:

Employees should use extreme care when moving objects overhead. With the arms lifted it is difficult to maintain balance and the potential for low back and shoulder strain increases. To lift an object overhead, the employee should hold it close to the body and establish a comfortable stance with one foot ahead of the other and at shoulder width apart. The employee should use the arm and shoulder muscles to raise the load while balancing his weight between the front and back feet. This will keep the load close to the center of gravity and allow the worker to keep the normal arch in the lower back. As the weight is lifted overhead and toward the shelf, the employee should shift his weight forward onto the front foot, keeping the stomach muscles taut and the low back immobile. Once in contact with the shelf, the weight is pushed into place. To remove the item the procedure should be reversed and the weight should be shifted onto the back foot as the weight is lowered. This technique will feel awkward unless the weight is held very close to the worker's body.



Additional Lifting Hints:

It is important to remember that when lifting heavy or bulky items it may be necessary to use an assistive device or team lift. If this is not possible, the employee should be provided sufficient time to plan and complete any difficult lift. The diagonal and modified diagonal lifts are especially recommended for heavy or awkward loads.

Daily situations often require employees to lift items in a variety of positions. Making a lift totally risk-free is nearly impossible. The goal is to perform a particular lift in the "best way possible". If workers learn to review the brief "mental checklist" and incorporate as many of those components into the lift as possible they will be actively assuming responsibility for their own back care.

6. How to Manage a Sudden Severe Back Injury.

Lower back injuries are very common and can occur in anyone at any time. In some cases, the injury is obvious and occurs during or immediately following some long or strenuous task. In other cases, the injury occurs after bending to pick up a pencil from the floor. The symptoms may appear many hours later, or even the following morning. For those persons that have never experienced a significant lower back injury, the pain is severe and surprisingly debilitating. Every activity of daily living is affected, including sleeping, dressing, walking, sitting, driving, working, sneezing or even laughing. The lower back pain and muscle spasms can be cruel.

Fortunately, the worst symptoms resolve relatively quickly if correct measures are taken.

Day 1: Rest and Cold Packs. The first day will be the worst day. Every movement may result in excruciating pain and muscle spasms.

• **Bed rest is generally best.** Find a position that is least painful. Some alternatives include:
Lay on your stomach. Tuck one pillow under your stomach and another under both feet so your back does not arch and knees are slightly bent.
Lay on your back with a pillow or two placed under the knees.
Lay on your side with a pillow or two between your legs.

WARNING: If a position or posture causes increased pain, numbness or tingling into the buttocks or legs than change your position.
If you experience difficulty with bowel or bladder control, or numbness in the 'saddle' area contact your physician immediately. This may be an emergency situation.

• **Use assistive devices** such as crutches, a walker, or a cane can make trips to the restroom safer and more comfortable. A corset or support may also provide some help with upright positions and coughing or sneezing.

• **Use cold packs (*not heat)* every three or four hours.** A cold pack tucked in a pillow case should be applied on the back for approximately 25 minutes and repeated every 3 - 4 hours. The cold pack should feel *very cold*, but tolerable.
Most people describe three distinct stages of a therapeutic cold pack application:

1) *"very cold"*, occurs during the initial 5 – 10 minutes,
2) *"pins and needles"* or a *"a burning sensation"* at the skin level, occurs after 10 – 15 minutes,
3) *"numbness"* in the area of the cold pack, usually occurs after 15 – 20 minutes.

WORTH NOTING: Most people prefer heat packs over cold packs, but cold packs are much more effective during the acute stages of an injury. If cold packs are applied correctly, they help control swelling, provide muscle relaxation and pain relief. The spine injury is generally several inches below the skin so the packs must have enough time to reach the appropriate level to be effective.

Commercial cold packs work best. An 8" wide by 10" length will cover the entire injury site and costs approximately $25. Every household should have a cold pack ready for any number of emergencies.
Ice can be used but is generally harsher. Care must be taken to crush the ice cubes, use a towel rather a pillow case, and move the ice around the injury site every few minutes to avoid any one cold spot.

WARNING: Persons that are especially sensitive to cold, or have been diagnosed with Raynaud's Disease may want to apply a second layer of towel between the cold pack and skin, or skip the cold therapy altogether if it causes more irritation than relief. Do not choose heat packs at this time. Instead, consult your physician for an anti-inflammatory medicine.

Day 2: Bed Rest, Cold Packs and Begin Walking. The second day may begin with the severe symptoms but generally improves throughout the day.

• **Continue to rest in bed** in the most comfortable positions.
• **Continue to apply cold packs every three or four hours.**
• **Walk five to ten minutes every hour or so if you can.** This is a very important step. Use assistive devices if necessary. Crutches, canes or walkers will make this exercise safer and less painful. A corset or lumbar support may also be helpful. Generally, the first few steps are painful and stiff but improve with repetition. Avoid the temptation to walk faster or for longer periods at this time. Level surfaces are more comfortable. Avoid stairs and hills if possible.

• **Return to bed rest.**

WORTH NOTING: Putting on shoes and socks requires nearly full range of movement in the lumbar spine. Muscle guarding and swelling will not allow more than a few degrees of motion at this stage, so it is beneficial to accept help with this task.

Day 3 – 4: Walking, Gentle Back Exercises, Hot Packs and Cold Packs. The intensity level of the morning stiffness and pain should start to decrease. If possible, resist the urge to return to regular activities or work. The swelling in the back will not allow for any prolonged or strenuous tasks and may just reverse the healing that has occurred.

• **Walk ten minutes every hour or so.** Discontinue the use of assistive devices, crutches, canes, etc. if you can, but the back support may still be helpful.

• **Bed rest as necessary for 10 minutes after the walking exercise.** Mix sitting, standing, walking and resting to tolerance throughout the remainder of the day. Don't do the laundry, dishwasher or any other task that involves bending, lifting or twisting.

• **Begin some gentle range of motion exercises.** At this stage, the goal of the exercises is to relieve stiffness and restore some of the range of motion in the lumbar spine. The exercises should be done in bed and include: lumbar rotations while lying on your back, single knee to shoulder stretches, and lying on your stomach and propping your upper body up on your elbows (#1, #2, and #10 in the home exercise program).

• **Begin applying heat for 25 minutes for the milder aches and pains** every three or four hours, unless the heat causes an increase in the symptoms.

• **Apply the cold pack for 25 minutes about an hour before bedtime to relieve the more intense pain, but it is usually** no longer necessary to repeat cold therapy every 4 hours.

• **Avoid the urge to resume any activities that include lifting, bending or sitting for long periods.**

Worth noting: If the lower back does not seem to be recovering correctly by the second week, contact your physician and visit your physical therapist. In some cases, the physician can prescribe special medicine to reduce the swelling and the physical therapist can provide special exercises to help initiate the healing process.