BACKWORDS

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SPORTS THERAPY & ARTHRITIS REHABILITATION

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INTRODUCTION

Low back pain has been blamed for being the second leading cause of missed working days in the United States. It has been estimated that eight in every ten people will at some time in their life suffer from low back pain. Of this 80% of our population, 90% of them will recover within a three month peroid. There will be an estimated 4% of these people who will be afflicted with pain longer than six months, and of them only 50% will be able to return to work. It has also been estimated that a person who has suffered from back pain is ten times more likely to suffer from it again than someone who has never had it.

One of the best proven ways to avoid the recurrence of back injuries is through prevention and education. Education of the person who has, or is at risk of getting back pain is therefore one of our best weapons against solving this enormous health problem.

With this concept in mind we have developed this manual. Our goal is to effectively help people understand their spines and give them a sound scientific basis from which to work in solving their present or future spinal disorders.

ANATOMY

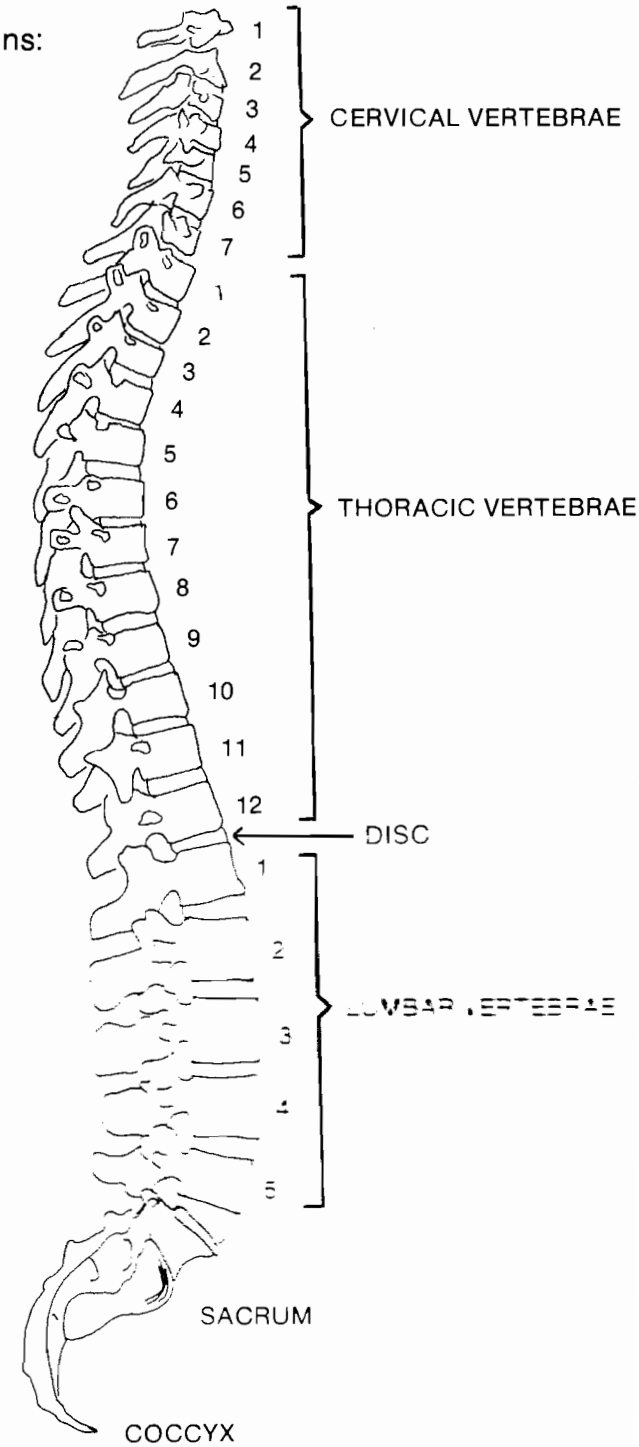
The spinal column contains 24 vertebrae supported by a wedge shaped bone called the ***sacrum***. The sacrum contains 5 naturally fused vertebrae.

Below the sacrum is a small bone called the ***coccyx*** containing 3 to 5 fused veterbrae. The sacrum and coccyx are commonly known as the tail bone.

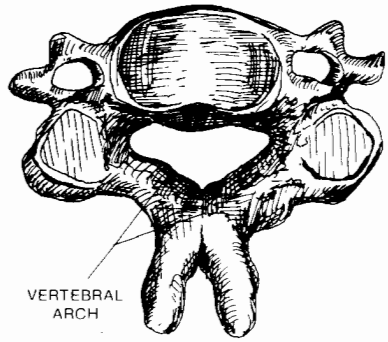
The spinal column is divided into 3 separate regions:

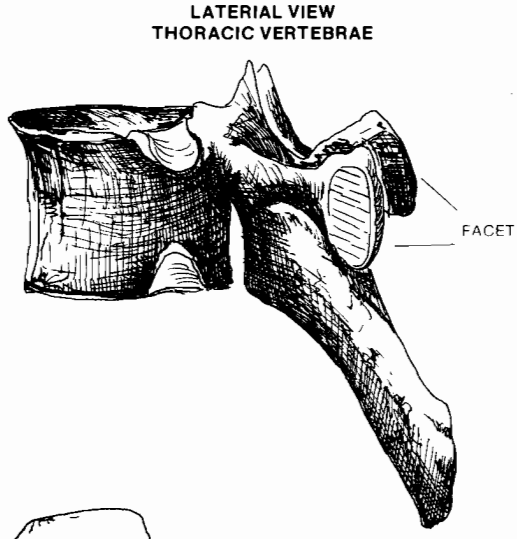
Cervical	The top 7 vertebrae make up the neck or ***cervical spine***.
Thoracic	The next 12 vertebrae make up the mid back or the ***thoracic spine***. This region is special in that each vertebrae has ribs attached to it.
Lumbar	The last 5 moveable vertebrae make up the low back or the ***lumbar spine***.

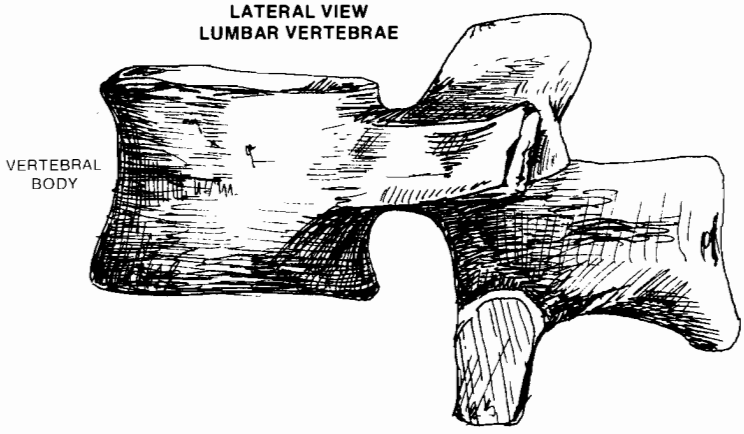
Each vertebrae is separated from each other by a ***disc***. There are discs between all vertebrae, including the sacrum and coccyx, except the first two cervical vertebrae. The coccyx and sacral discs are ossified or turned into bone early in normal development.

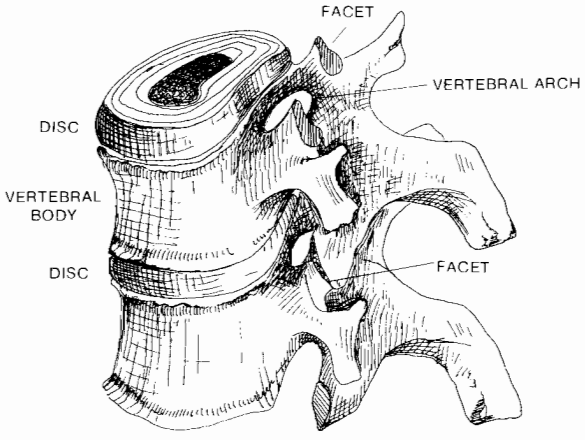


Vertebrae have similar characteristics throughout the entire spine, but slight variations in these characteristics exist between vertebrae in the different regions of the spine.





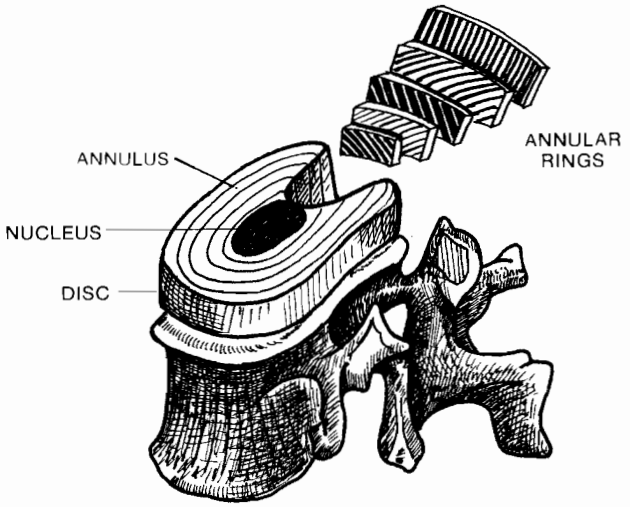




The front or anterior portion of a vertebrae is called the ***vertebral body.*** It is basically rounded and bears the majority of weight that is put on the spine. The vertebral body is also where discs attach to connect one vertebrae to another. The connection is so strong that it is impossible to remove the disc without destroying it. For this reason it is impossible to have a disc "slip out."

The back or posterior portion of a vertebrae is known as the ***vertebral arch.*** In this portion of the vertebrae, bony extensions protrude from the main frame of the bony arch known as processes. The central portion of the arch is what actually houses the spinal cord. The bony protrusions from the arch act as attachment sites for the muscles and ligaments of the vertebral column.

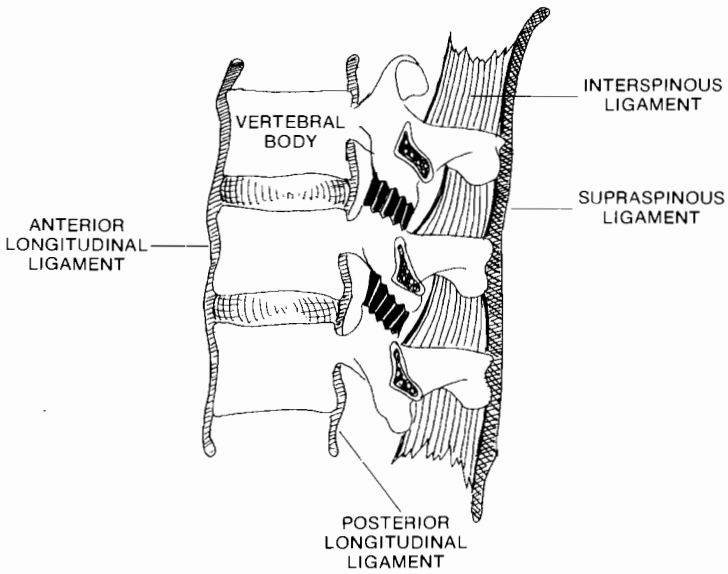
Vertebrae connect with each other posteriorly by means of joints called facet joints. There are 2 joints connecting each vertebrae with the vertebrae above it and 2 joints connecting this same vertebrae with the vertebrae below it. In essence then, each vertebrae has 4 joints associated with itself.



The discs that separate vertebrae are unique structures. Acting primarily as shock absorbing units in the spine, they are made up of hard canvas like rings. These rings are laid one aside the other to form an inseparable unit called the ***annulus.*** In the center of the disc is a jelly like material called the ***nucleus.***

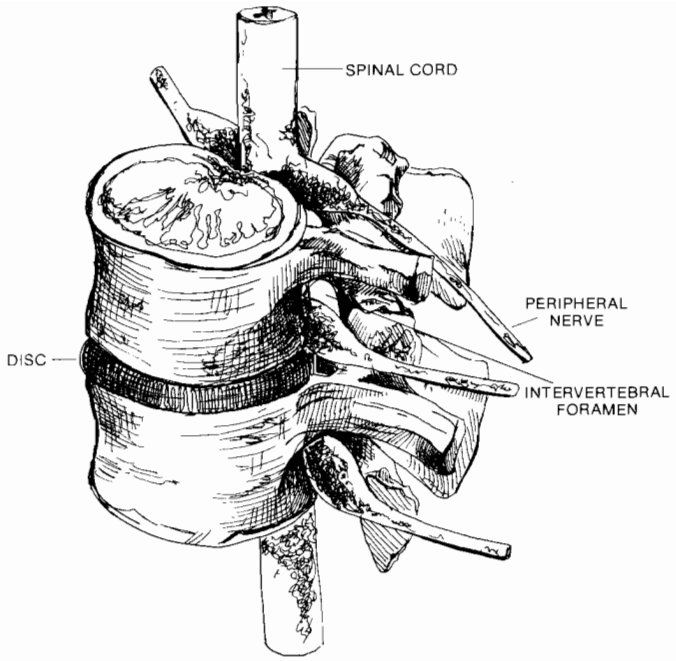
Discs are pliable enough to allow motion between vertebrae and tough enough to take large loads and act as shock absorbers.

Ligaments in the spine are bands of hard connective tissue which hold joints and bones together. Ligaments exist between the spinal processes, around joints, and along the length of spinal column in front and in the back of vertebral bodies. Ligaments provide support for motion between vertebrae.



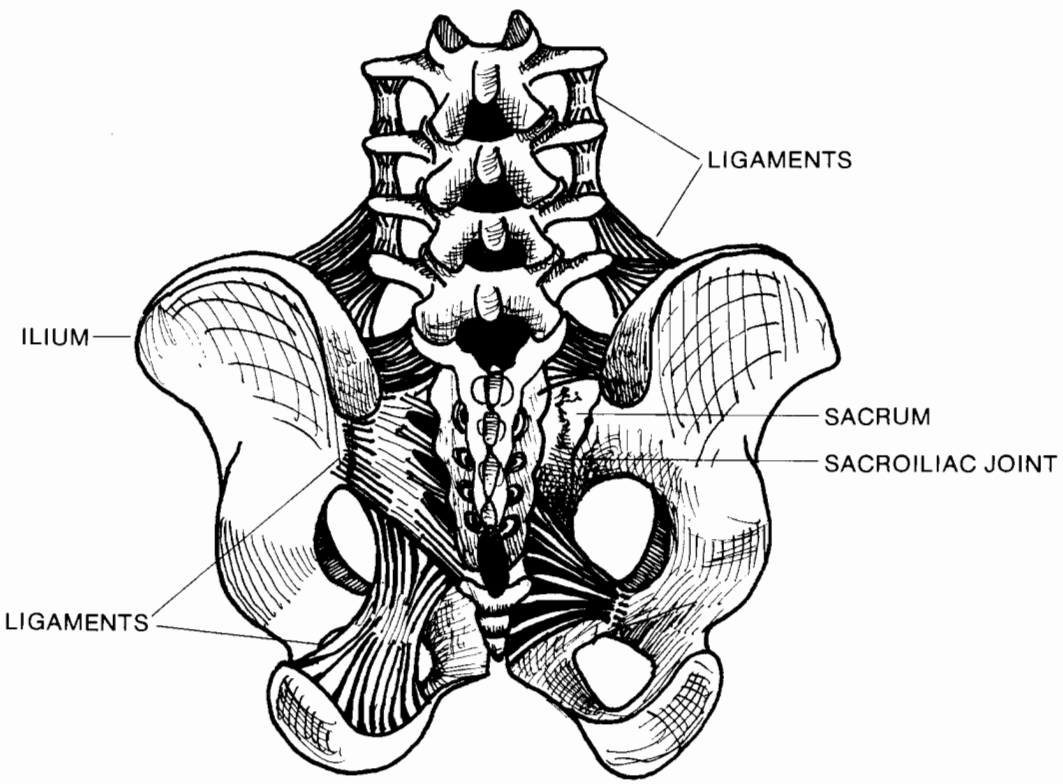
There are many ***muscles*** that make up the spine with various functions. The contraction of muscles causes motion by pulling the vertebrae closer together. There are muscles which virtually span the length of the spine to create motion between regions of the spine, and there are muscles which only span between two vertebrae to cause motion between them.

In addition, abdominal, shoulder, and hip muscles provide the spine with a support system as well as produce dynamic function.



The spinal cord exists within the tunnel made from the posterior arches of the vertebrae. The spinal cord nerves enter and exit the spinal column through holes between vertebrae called ***intervertebral foramen***. These nerves, called ***nerve roots***, converge outside the spinal column to form peripheral nerves. (An example of a peripheral nerve is the Sciatic nerve.) The vertebral foramen are the portals which allow information to be passed from the spinal cord to the different body parts by means of peripheral nerves. Information leaving the spinal column is primarily messages from the brain regarding muscle function. Information about sensation, joint position, and pain is picked up through the peripheral nerves and sent to the spinal cord, then ultimately to the brain. This system must pass through the portals of the spinal column, the intervertebral foramen.

Attached to each side of the sacrum are the hip bones or ***ilia***. The connection between the ilia and the sacrum is a joint called the ***sacroiliac joint.*** These large joints are held together by a very strong ligamentous complex both from the front of the joint and the back. There are also ligaments which connect the ilia to the spinal column which provide additional support for these joints.

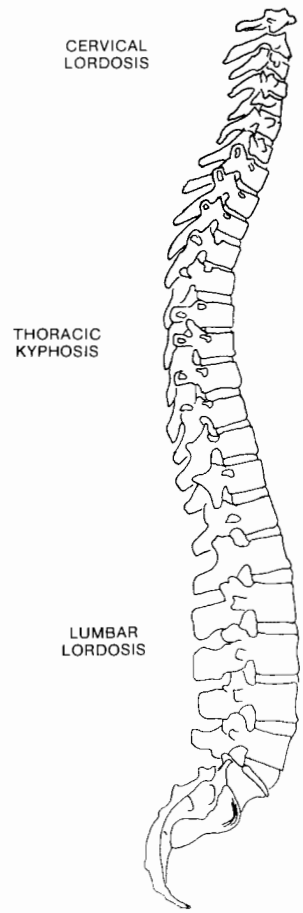


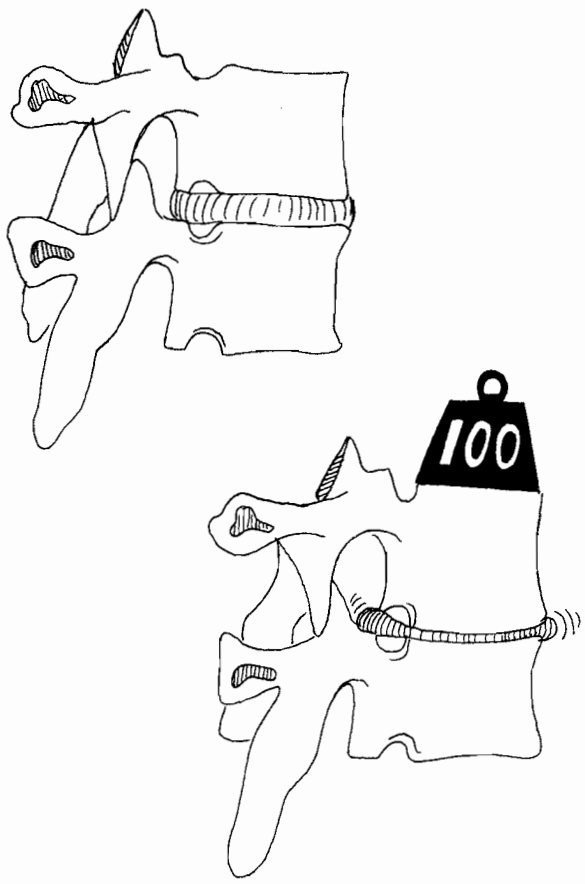
BASIC BIOMECHANICS OF THE SPINE

The spinal column has two major functions. The first is to provide a strong bony case for the delicate spinal cord. Secondly, it is a complex mechanical system which adds mobility for normal body function.

The spine is capable of moving in many directions: forward, backwards, sideways, and rotation. These motions are permitted by structures such as ligaments and discs. The direction of the spinal motion is dictated by the facet joints. Mobility of a single joint is minimal but when they move together the motion is great.

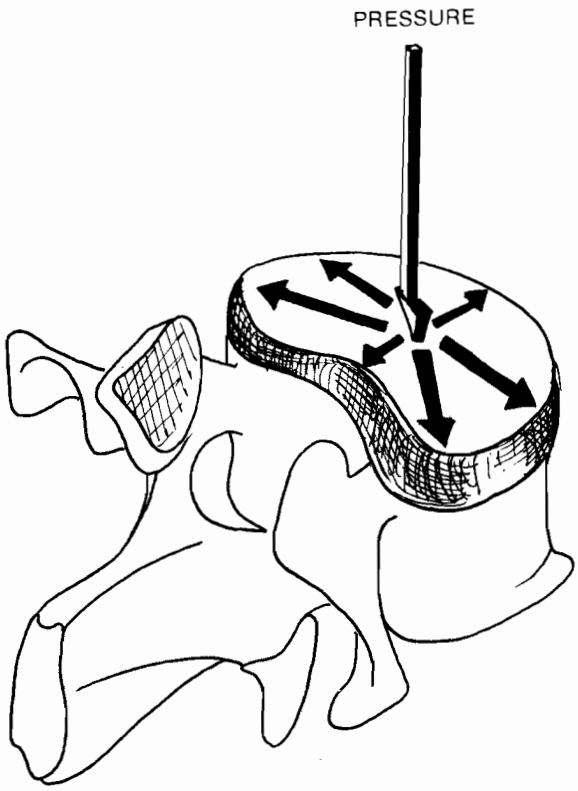
In looking at the spine from a side or lateral view there are three major curves. The ***cervical*** and ***lumbar*** regions have an inward curve called a lordosis while the ***thoracic*** region has an outward curve called a kyphosis. These curves mechanically act to help absorb shock much like a spring does.



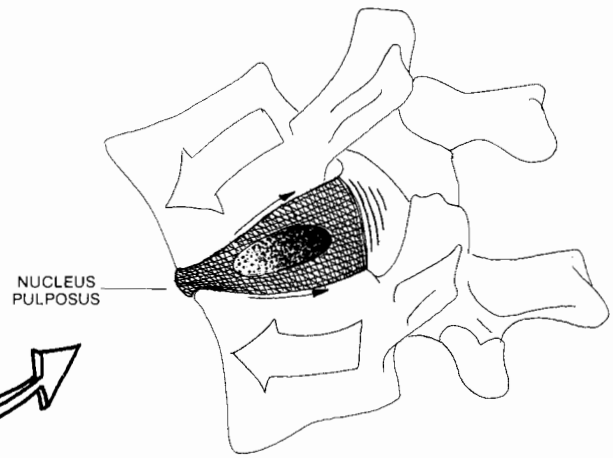


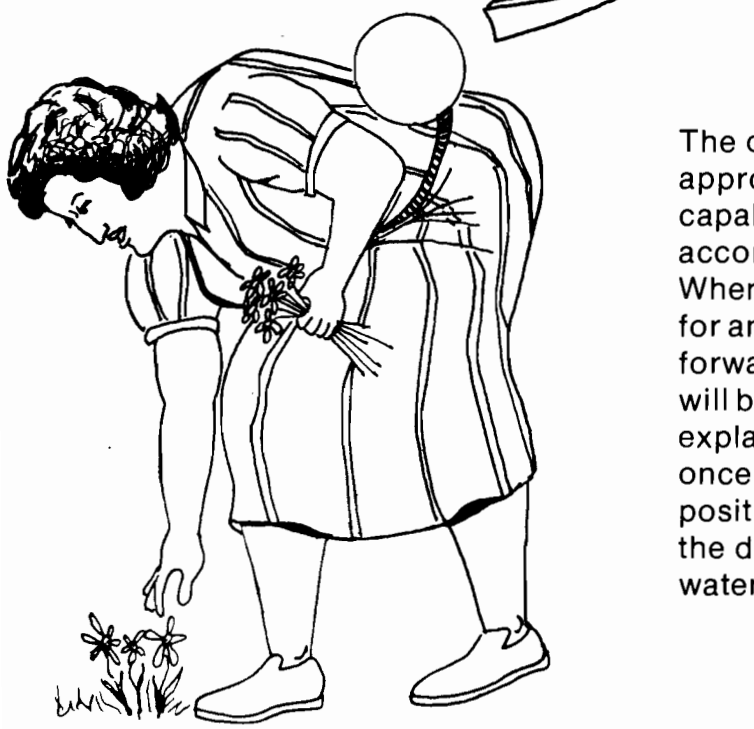
Forces transmitted from the ground through the legs and up to the spine, as well as gravitational forces transmitted down from the head, travel through the spine most efficiently when the force is traveling mainly through the anterior portion of the spine. This is because the vertebral bodies and the discs are designed to absorb and transmit forces.

Strong spinal muscles as well as strong supportive muscle groups such as the abdominals and the hip extensors provide support for the spinal column at rest. They also allow for safe normal spinal movements and other dynamic functions while the spine is in motion.



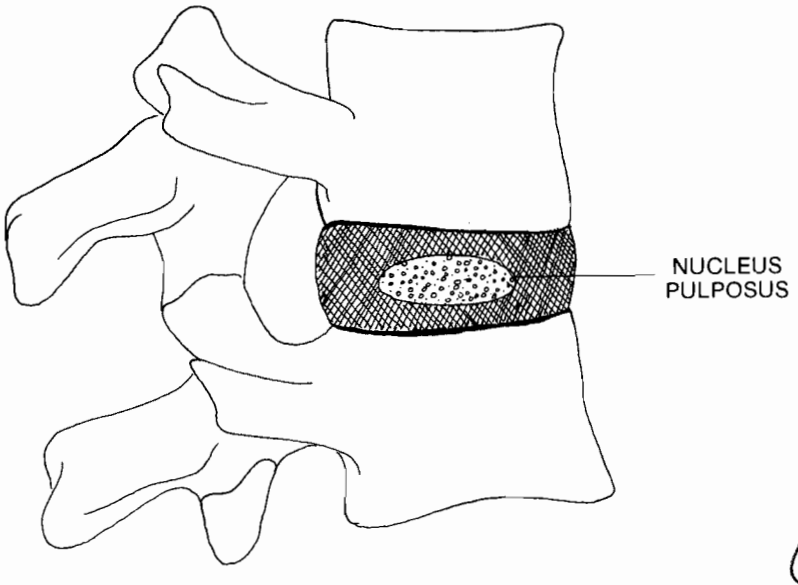
The discs have mechanics which need to be considered. A disc is always under a certain amount of pressure. Some positions can increase this pressure while others can decrease it. The pressure in a disc, much like the pressure in a balloon full of air, is trying to dissipate. Disc positions will alter the direction of the pressure dissipation. For example, when the disc is squeezed anteriorly the direction of the pressure will be posteriorly. These changes in pressure direction do not, however, cause any portion of the disc material to actually move. Disc material motion occurs only in pathological conditions.





The disc's ***nucleus pulposus*** is composed of approximately 70 to 80% water. This water is capable of being shifted around the nucleus according to pressures exerted on the water. When a person maintains a certain position for any extended period of time, such as bent forward at the waist, the disc's water content will be forced posteriorly within the disc. This explains why your back is so hard to move once you stand up from that bent forward position. Not until the change of pressure on the disc water has occurred will the areas of water migrate back to original positions.

You naturally accomplish this by putting your hands on the small of your back and extend your back over them.

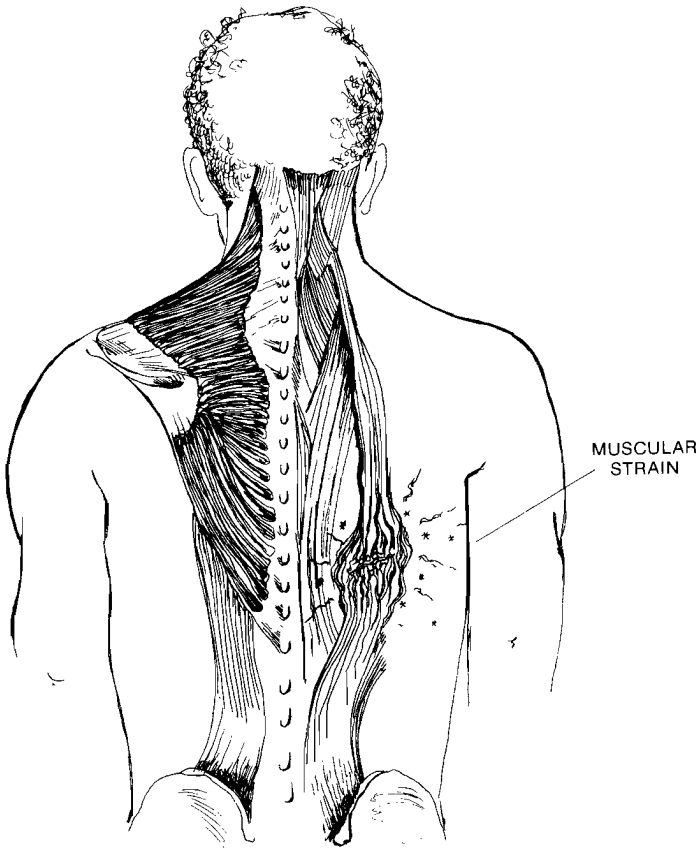


PATHOLOGIES OF THE SPINE

MUSCLE STRAINS, GUARDING AND SPASMS

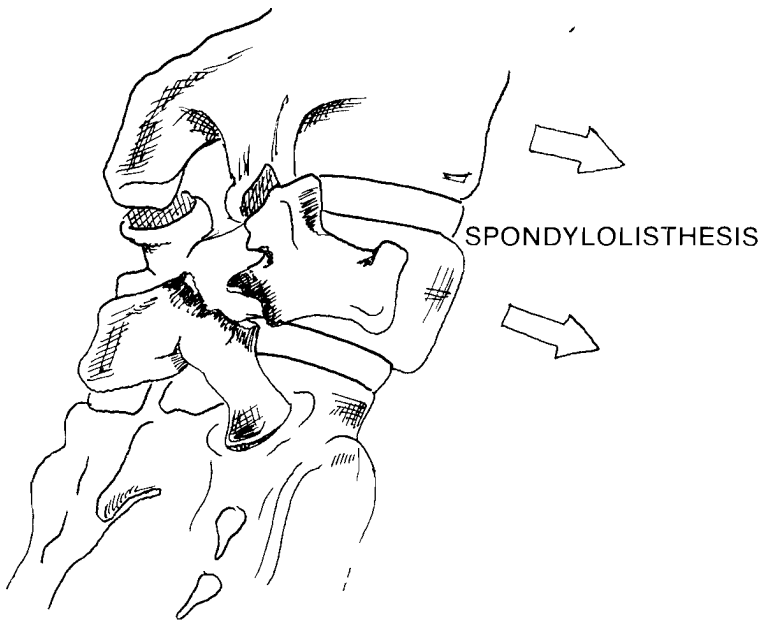
When someone injures their back, the muscles of the spine around the injury commonly stiffen in a protective effort to prevent motion around the injured area. This is called muscle guarding. When muscle guarding intensifies to very strong muscle contractions it is identified as muscle spasms.

This phenomenon also occurs when a muscle itself is injured or damaged. When a muscle tears or over stretches it is termed as a ***muscle strain.*** Muscle guarding and muscle spasms can be very painful.



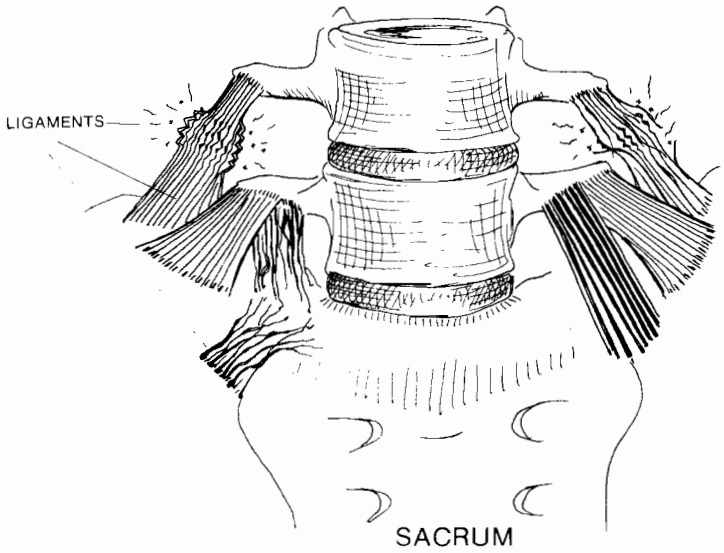
SPONDYLOLISTHESIS

The forward slippage of one vertebrae over another is termed ***spondylolisthesis***. This occurs when there is a break somewhere in the posterior arch of the vertebrae which allows this type of motion. The fracture usually occurs where the pedicle and the lamina come together—an area called the ***pars articularis***.



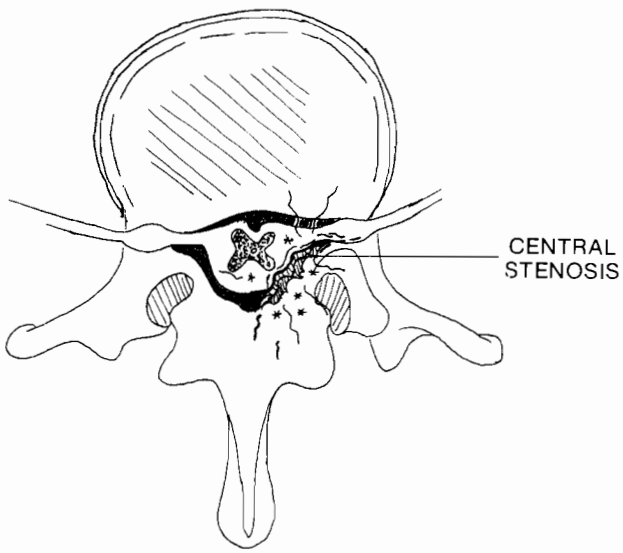
LIGAMENT SPRAINS

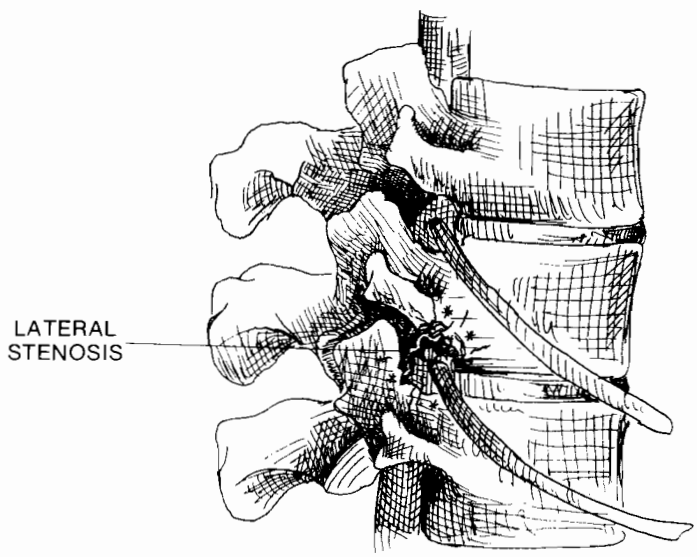
An over stretched or torn ligament around a joint or between a vertebrae is identified as a ***sprain.*** A sprain usually produces an irritating inflammation around the injured area and becomes a source of back pain.



SPINAL STENOSIS

Stenosis is the medical term for narrowing. When the narrowing is in the spine we call it ***spinal stenosis***. The narrowing is usually caused by a build up of bone either within the intervertebral foramen or the central canal where the spinal cord exists. This narrowing diminishes the area where nerves and other vessels exist and can create compression on these structures.





DISC BULGING AND HERNIATIONS

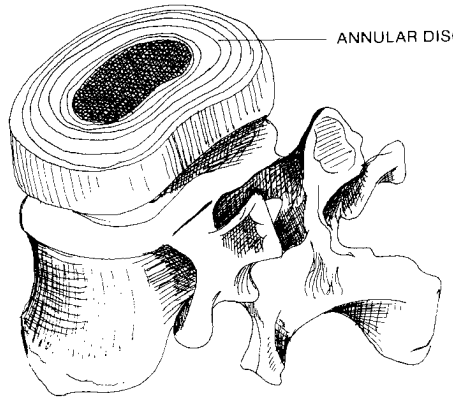
With repeated stress on the outer fibers of the disc, it becomes possible to overstretch and damage the annulus. This weakened portion of the annulus, being unable to withstand the pressure from the inner disc material, can then ***bulge*** out. With time this process can advance until a point when the disc bulge begins to impinge on other structures in the spine and create dysfunction.

If the stresses to the annulus are too great, it then becomes possible to completely rupture the annular fibers. This is called a ***disc herniation.*** Since portions of the central part of the disc, the nucleus, seep out through the annulus, this has also been termed a ***herniated nucleus pulposus*** (HNP) or a ***ruptured disc.***

Because the annular fiber connections to the vertebral bodies are so strong, herniations or bulging usually occur between the vertebrae at the middle of the annular ring fibers. For this reason, it becomes apparent that an entire disc is unable to slip out of place.

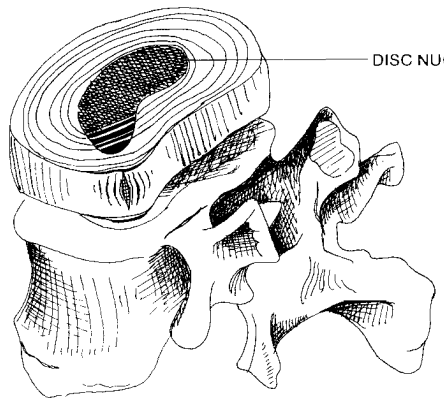
NORMAL DISC

1. ANNULAR DISC RINGS



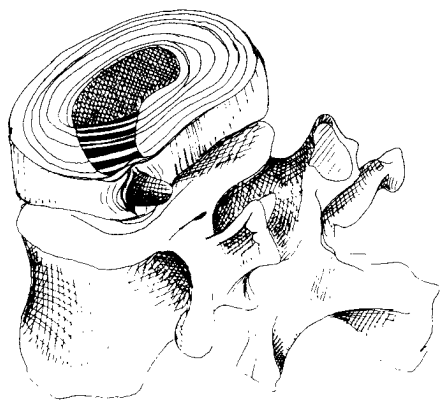
BULGING DISC

2. DISC NUCLEUS



RUPTURED OR HERNIATED DISC (HNP)

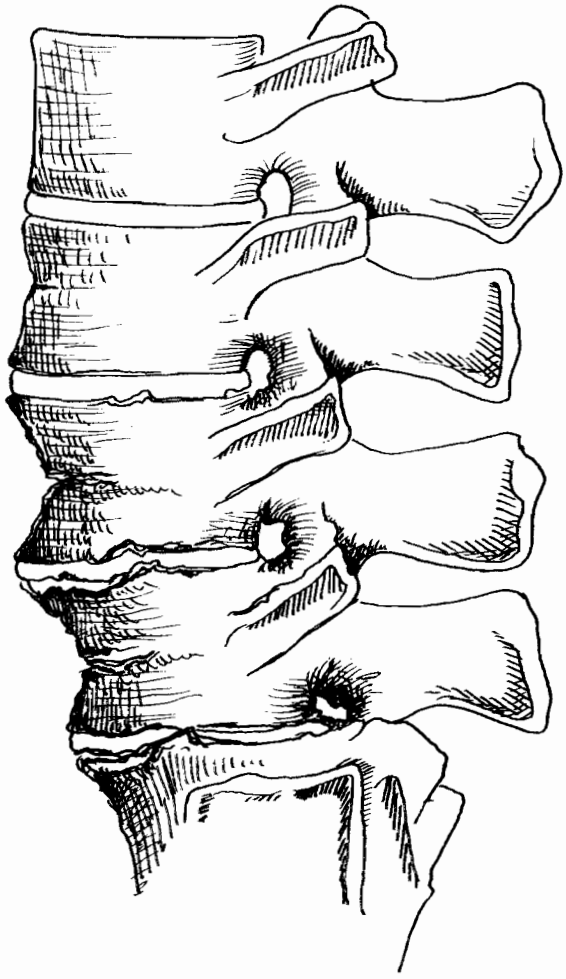
3.

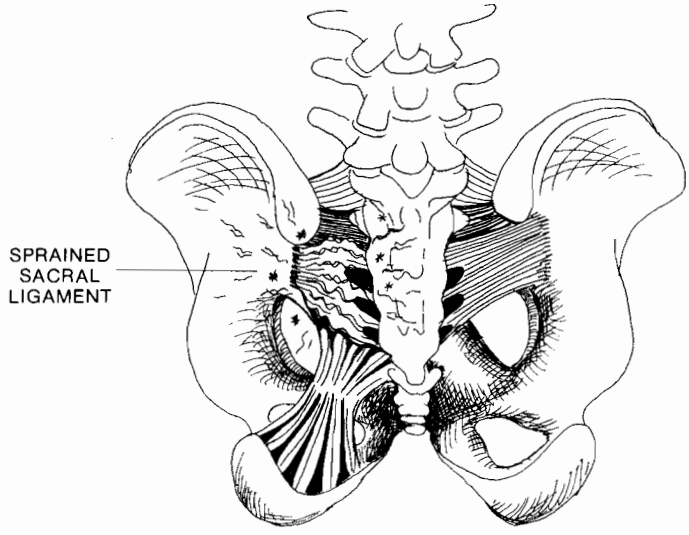


ARTHRITIS

The term arthritis literally means joint inflammation. The Arthritis Foundation recognizes over 100 different types of arthritis. A common type of arthritis which can affect the spine is called degenerative arthritis. Other names for this same type of arthritis include degenerative joint disease and osteoarthritis. This type of arthritis is a normal wearing out of bone and joints. As joints wear out, they become inflamed and irritated. This process can produce pain and stiffness in the spine.

Most people do not get symptoms from their arthritis before the age of 40 unless they have injured their back, have excessively over used, or have improperly used the joints in their spine.





SACROILIAC JOINT SPRAIN

The ligaments of the sacroiliac joint can be over stretched, much like the ligaments of the spine, and cause a sacroiliac joint sprain. This over stretching causes an inflammatory response which causes irritation and consequently produces pain.

OTHER LESS COMMON BACK INJURIES

FRACTURES — Fractures or breaks of the bones around the joints or compression fractures of the vertebral bodies can cause back pain and dysfunction.

CANCER — Abnormal tissue growths, known as tumors, are a rare source of back pain.

DISEASE — Certain types of diseases of the prostate, kidney, large blood vessels from the heart, uterus,or bladder can cause back pain without there being an organic problem with your back.

ACUTE CARE FOR YOUR BACK

A back injury can occur at almost any time. If you do happen to hurt your back there are certain precautions and actions you should take to assure that you do not reinjure your back or make the injury worse.

Immediate Care:

1) Ice — Ice wrapped in a towel should be placed over the injured area for a 20 minute time period five times a day to help control inflammation, decrease pain, and decrease spasm.

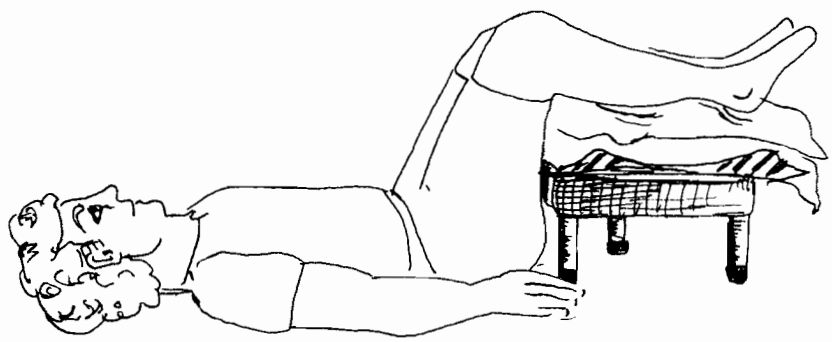
2) Rest — You should rest your back to allow it to begin healing and to prevent further injury.

3) Relaxation — You should attempt to relax your muscles to ease spasms and guarding as well as to relieve tension from the injury.

4) Cooperation — Follow your doctor's instructions regarding back care and taking medications.

You should call your doctor if:

1) There is no decrease in pain in 24 hours.
2) The pain keeps you awake at night.
3) You have bladder or bowel changes.
4) You perceive numbness in your legs or arms.
5) You perceive weakness in your arms or legs.
6) The way you obtained your injury was by means of physical trauma such as a car accident or a fall.



DIAGNOSING YOUR INJURY

In most instances, your medical doctor will diagnose what your specific back injury is. The doctor has a large array of tests and equipment at his disposal to accurately diagnose your particular spinal dysfunction.

Some of the most common tests and procedures your doctor may perform or order could include:

TAKING A HISTORY This involves taking information from you about several aspects of your life and your injury. Information such as the signs and symptoms of your injury, your past medical history, your family history and previous similar injuries are inquired about.

X-RAYS X-rays may be taken of your spine from several different views. Only bones can be seen on x-ray pictures but your medical doctor can often predict the condition of other tissues in the spine by evaluating the condition of the bones in your spine.

CAT SCAN Your doctor may also order a CAT scan or C-T scan. This machine takes three dimensional x-ray pictures of your body. With this type of imaging, most tissues in the body can be seen.

ELECTROMYOGRAM An electromyogram or EMG is a procedure which tests the status of your muscles. Since muscles are activated by nerves which come from nerve roots in your spinal column, the condition of muscles often indicate the condition of specific spinal nerve roots.

MRI Magnetic ressonance imaging or an MRI is another type of machine which is capable of producing three dimensional pictures of your body.

MYELOGRAM With this test, an x-ray sensitive dye is injected into your spine. Then x-rays are taken of your spine from several different views. Where the dye goes in your spine can tell a doctor the condition of spinal structures.

CHECK REFLEXES AND SENSATION Since the nerve roots from your spine ultimately end up in your extremities, your doctor will test your reflexes and the sensation in your extremities to determine the status of your spinal nerves.

The difference between some of these tests and procedures is that each one has specific tissues which they can isolate best. It is your doctor's responsibility to determine which test is best for you.

Once your doctor has determined the status of your back, he may order certain things which will help speed up recovery or correct the problem. Common prescriptions include:

MEDICATIONS Anti-inflammatories, muscle relaxants, and pain relievers may be ordered for you.

BED REST When the doctor feels it appropriate, he may order bed rest for a limited number of days.

PHYSICAL THERAPY In physical therapy, the therapist may perform treatments such as exercises, heat, cold, electrical stimulation, traction, and spinal joint mobilizations.

SURGERY On certain occasions it may become necessary to perform surgery on your back to relieve pressure on nerves or to correct dangerous spinal conditions.

COMMON CAUSES OF BACK DISORDERS

1. Postural Neglect

Poor body posture can certainly lead to back injuries. When standing still, if the spine's curves are exaggerated or decreased from what is normal, then we consider this poor spinal posture. These compensatory changes in spinal curves can leave certain tissues such as ligaments, muscles, discs, and joints in vulnerable or stressful positions.

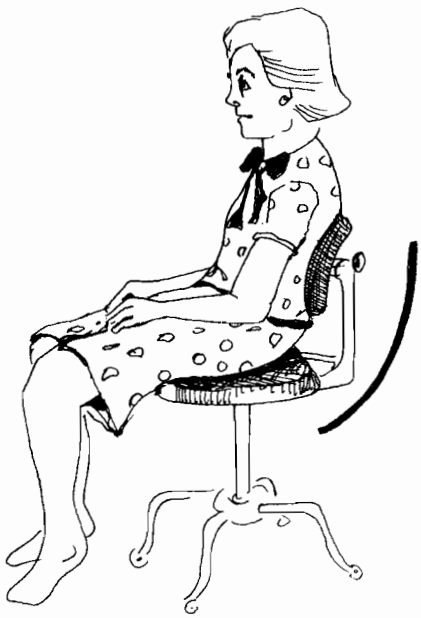
A typical poor standing posture can exhibit:

forward head
hunched shoulders
sway back

— OR —

forward head
flat thoracic spine
flat low back

A typical poor sitting posture can exhibit:



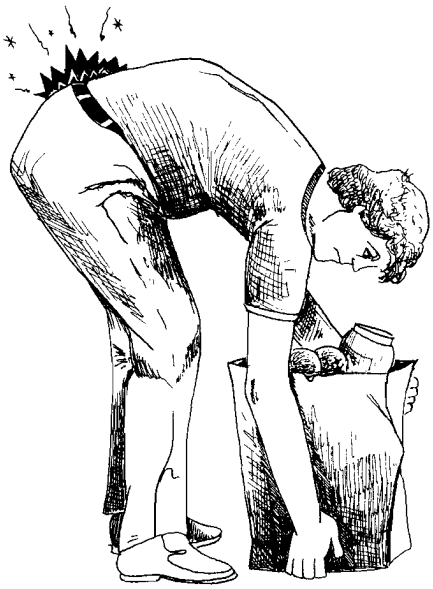
forward head
rounded thoracic spine
rounded low back

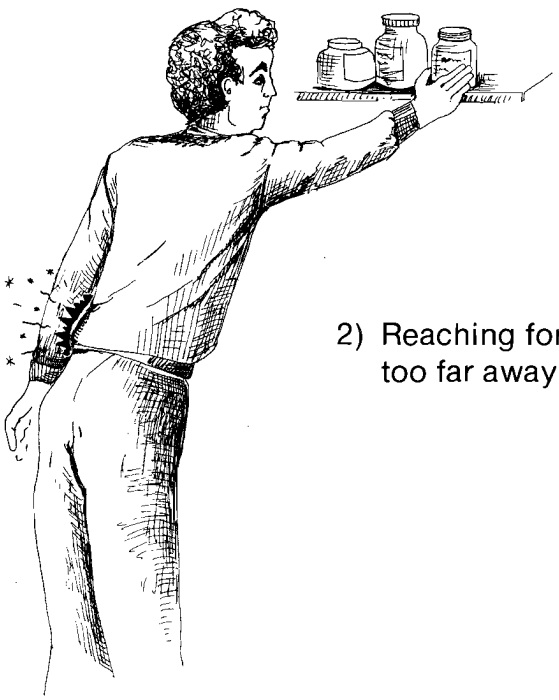
II. Faulty Body Mechanics

Faulty body mechanics is a leading cause of back injuries. When the spine is continuously put at a mechanical disadvantage with forces repeatedly applied to it, eventually some structure will give way.

Faulty mechanics include:

1) Lifting a load with the back flexed.





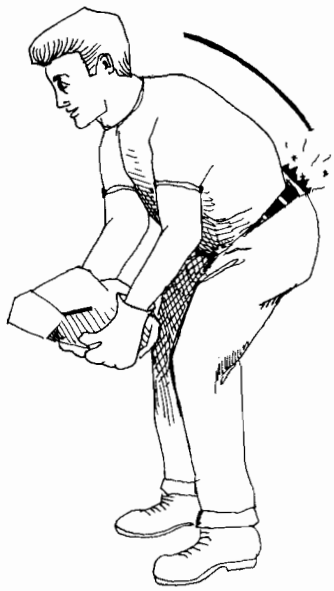
2) Reaching for loads too far away from the body.

3) Twisting the trunk with a load.

III. Poor Working Habits

Most people spend a lot of time at work. To perform daily tasks required on the job can often times stress the spine. Some of the more common positions, or actions, which may lead to back disorders include:

1) Unsafe mechanics during lifting tasks.



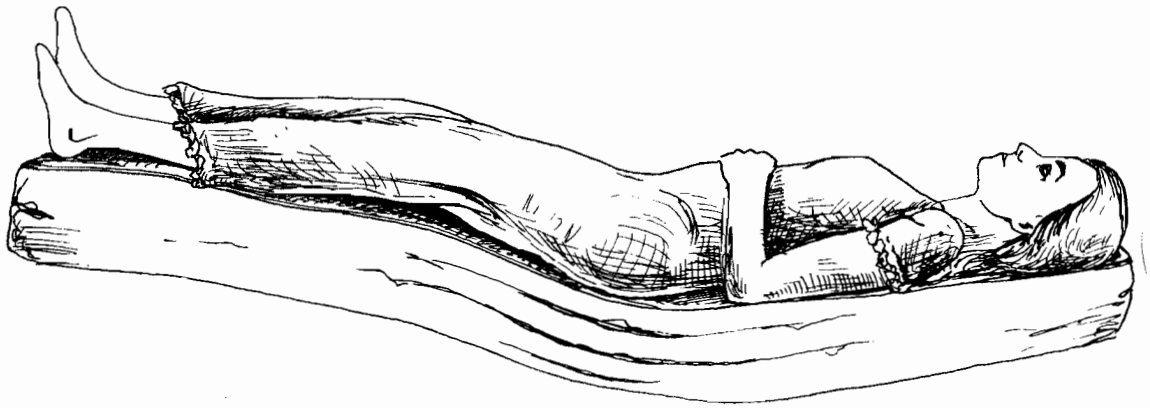
2) Poor sitting postures.

3) Poor standing postures.

IV. Poor Sleeping Postures

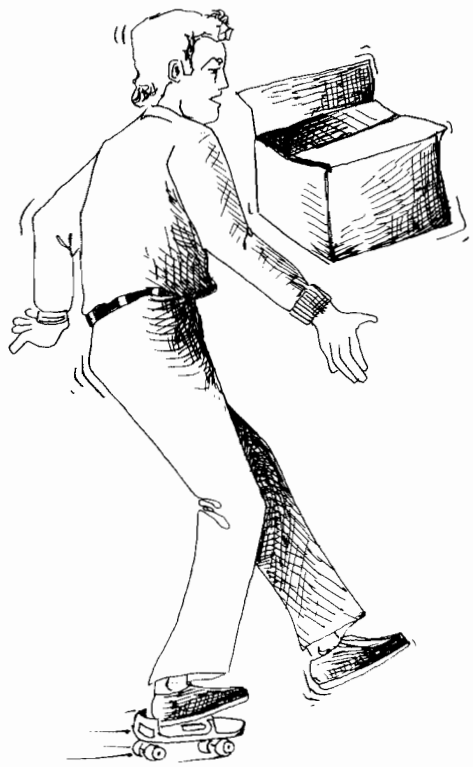
It is important to have a mattress which supports your spine while you sleep. A mattress that is too firm will not provide support for the spinal curves in the balanced position. A soft mattress will be too accommodative to the heavier parts of the body and will not provide any spinal support.

It is important to have good sleeping posture during these hours when you are trying to rest. Most people spend one third of the day sleeping, or at least in bed. For this reason it should be performed in such a manner so that the spine is allowed to rest rather than be stressed.



V. Accidents

Accidents will occur in almost any situation. With proper use of lifting techniques and knowledge of what is correct and incorrect positioning, the severity of an injury or perhaps the avoidance of one is possible.



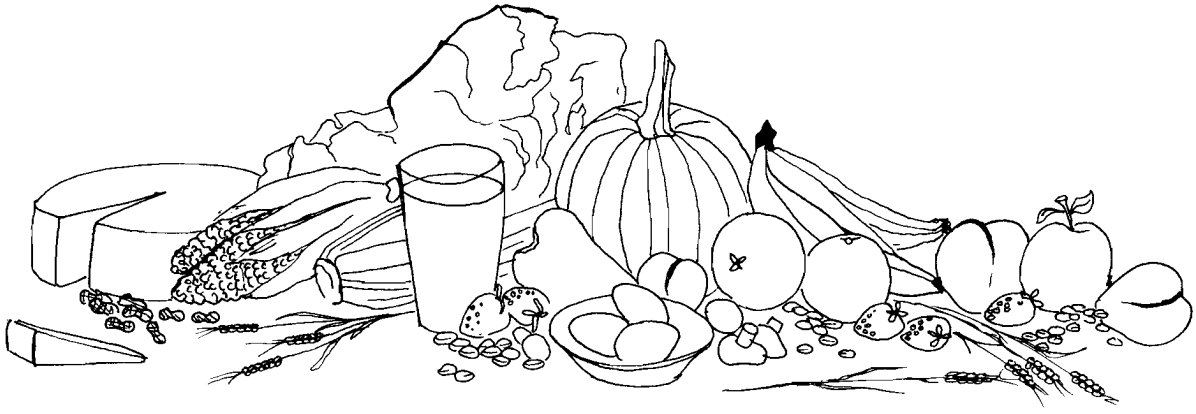
VI. Poor Physical Conditioning

It has been shown that people who are in poor physical condition are more apt to injure themselves than those who are in good shape. How much a person can lift (strength) does not measure the level of his or her fitness.

VII. Poor Flexibility

A loss of flexibility decreases the range in which your body can safely maneuver. This means that to perform a task which would normally fall within a normal range would now be at the limits of range for the individual joints, ligaments, muscles, and other soft tissues. This places these tissues in a vulnerable position and increases the potential to injure these tissues.

NUTRITION



A person with a back injury usually has to decrease their level of activity because of pain and dysfunction. Often times, however, this person's food intake stays the same or increases. This creates a problem, if it is not already present, of being overweight.

"Obesity is America's number one malnutrition problem." Normal body composition is when 18% of the body weight is composed of fat in a man, and 22% in a woman. Water makes up 55-60% of the body weight, lean body tissues (organs, muscles, etc.) make up 10-20% of the body weight, and bones and minerals compose 6-8% of the body weight.

The amount of bone and muscle will vary from person to person and, therefore, there really is no ideal body weight for someone. It is possible, however, to calculate a person's weight range by considering height, sex, age, and body shape.

When a person is 10% over their desired body weight, it is then said that they are overweight. A person who is 20% or above this desired weight is said to be obese.

It is estimated that 15% of the people in the U.S. under the age of 30 are said to be obese. It has also been estimated that one third of all males and one half of all females are obese among older people.

One can clearly see how being overweight can increase the load a spine must bear. A spine also compensates for being overweight by changing the curves of the different spinal regions. A typical example is having excess lumbar lordosis(or a sway back) to compensate for a weak and over extended abdomen.

TARGET WEIGHT RANGES FOR MEN AGES 25 TO 59*

Height (in shoes)	Small frame	Medium frame	Large frame
5-2	128-134	131-141	138-150
5-3	130-136	133-143	140-153
5-4	132-138	135-145	142-156
5-5	134-140	137-148	144-160
5-6	136-142	139-151	146-164
5-7	138-145	142-154	149-168
5-8	140-148	145-157	152-172
5-9	142-151	148-160	155-176
5-10	144-154	151-163	158-180
5-11	146-157	154-166	161-184
6-0	149-160	157-170	164-188
6-1	152-164	160-174	168-192
6-2	155-168	164-178	172-197
6-3	158-172	167-182	176-202
6-4	162-176	171-187	181-207

*Weight in pounds according to frame (in indoor clothing). For nude weight, deduct 5 to 7 lbs

TARGET WEIGHT RANGES FOR WOMEN AGES 25 TO 59*

Height (in shoes)	Small frame	Medium frame	Large frame
4-10	102-111	109-121	118-131
4-11	103-113	111-123	120-134
5-0	104-115	113-126	122-137
5-1	106-118	115-129	125-140
5-2	108-121	118-132	128-143
5-3	111-124	121-135	131-147
5-4	114-127	124-138	134-151
5-5	117-130	127-141	137-155
5-6	120-133	130-144	140-159
5-7	123-136	133-147	143-163
5-8	126-139	136-150	146-167
5-9	129-142	139-153	149-170
5-10	132-145	142-156	152-173
5-11	135-148	145-159	155-176
6-0	138-151	148-162	158-179

*Weight in pounds according to frame (in indoor clothing). For nude weight, deduct 2 to 4 lbs

Therefore, it is recommended that not only should there be a balance in spinal motion, muscular strength, and endurance, but also that proper body weights be maintained or attained.

DIETING

The best diet is a simple one. You must increase your level of activity and/or decrease the intake of calories. There are 3500 calories in one pound of fat. That means that to lose one pound of fat you must expend 3500 calories of energy or decrease your food intake by 3500 calories.

There are no specific food groups which should be avoided, nor should there be any one food type that should be taken in excess amounts. Many gimmick diets like the grapefruit diets, pill diets, and the body wraps cause excess loss of body water. Since the body is made up of approximately 60% water this is not a difficult task. What these "diets" take advantage of is the fact that a pound of fat and a pound of water obviously weigh the same, and both would show up as a pound lost on the scale. Unfortunately, what can also occur is dangerous. Excessive water loss can lead to body dehydration which may contribute to multiple health hazards.

The general idea is to lose body fat, not water. The safest and most effective way to do this is by increasing your activity level and decreasing your calorie intake.

SPINAL CARE

POSTURES

I. Standing

The basis of good standing posture can be remembered and practiced by imagining a straight line falling through your ear, shoulder, hip, knee, and ankle from the side view. To achieve this posture you need to tuck in your chin, pull in your stomach, and roll your pelvis forward by tightening your buttocks musculature. This standing posture can reduce fatigue and stress and, therefore, reduce back pain.

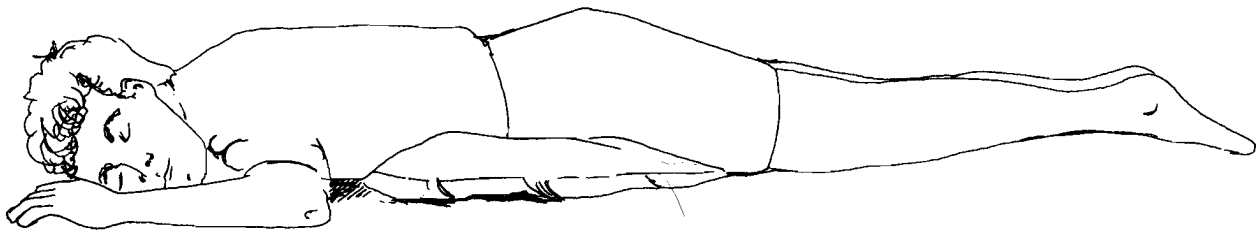
When standing for extended periods of time, shift body weight from one leg to the other. When you need to stand in one place for awhile, keeping a foot stool at your feet is suggested. Alternately placing one foot on the foot stool will help reduce stress to your back.

II. Walking

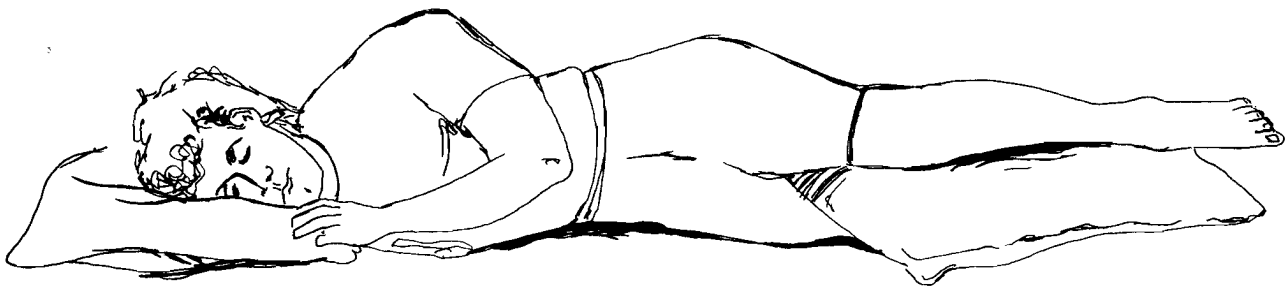
When walking with a handbag, carry it on your shoulder alternating shoulders periodically. Wear good supportive shoes.

III. Sleeping

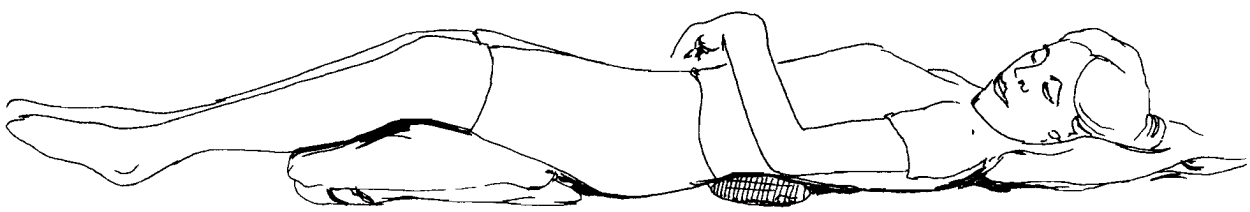
When sleeping on your stomach, place a pillow underneath it.



When sleeping on your side, bend your hips and knees. Also place a pillow between your knees. Use enough pillows to hold your head without your neck bending up or down.



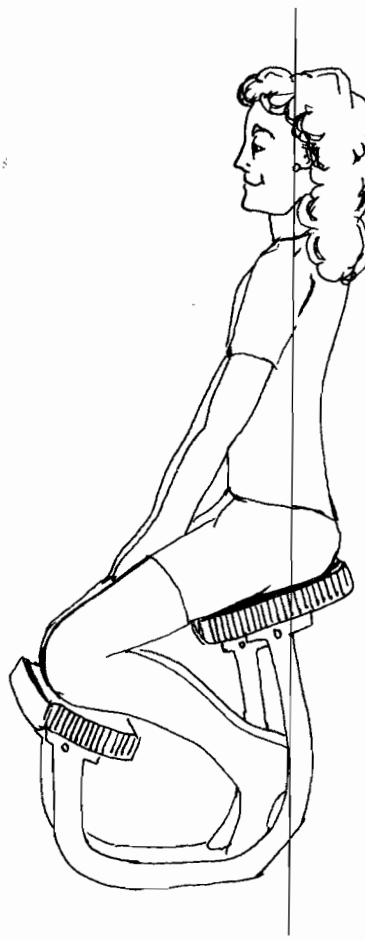
When sleeping on your back, good low back support is required. If your mattress does not provide this support, then place a rolled up towel or a lumbar support roll under your low back.



IV. Sitting and Driving

Most people who sit for an extended period of time sit with poor posture. Sitting poorly will increase the stresses on your back muscles and ligaments. This, in turn, increases the risk for injury.

When sitting, good posture includes maintaining the curves in your spine. Much like the standing posture, the imaginary plum line should fall through the ear, shoulder, and hip. Good lumbar support is a necessity in maintaining this posture. The legs should be bent 90 degrees at the knees and the hips.



When driving, the sitting posture guidelines should be followed. Additionally, the car seat should be pulled forward enough to avoid slumping at the shoulders. Good lumbar support can be provided by a lumbar roll or lumbar pillow. When driving on long trips (this includes long trips across town) you must change positions often. Stopping and getting out of the car to stretch your legs and back is also recommended.

CORRECT BODY MECHANICS

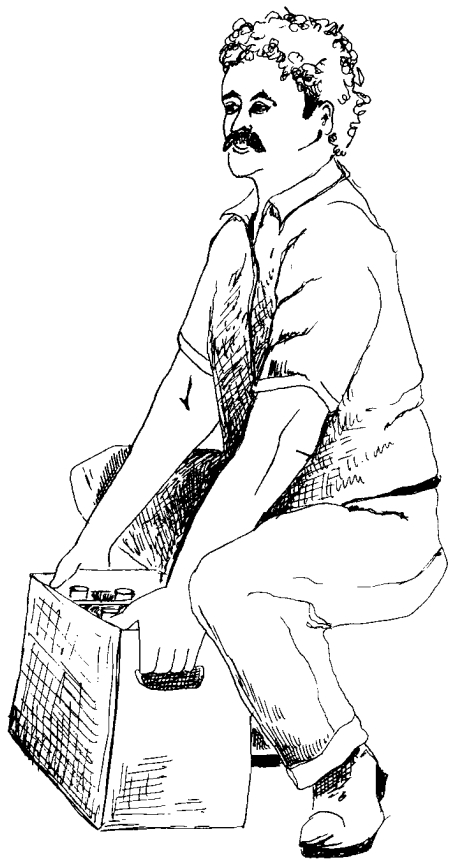
The majority of injuries are a consequence of repeated microtrauma to a specific tissue. It is through this repeated trauma that tissues slowly weaken and ultimately fatigue and give way. That is why it is not unusual to have someone injure their back not on the heaviest and toughest lift of the day but on the one that was previously considered a very easy lift. In actuality, it does not have to be a lift which causes a back injury. If poor body mechanics have been the common practice for someone, it could just simply be the wrong turn on the body or the bending forward to pick up a pencil that was blamed as the activity which brought on the pain and dysfunction.

It is primarily for this reason that we recommend that the proper body mechanics, which will be discussed, not only be used for those difficult tasks, but also for every activity and task you must perform.

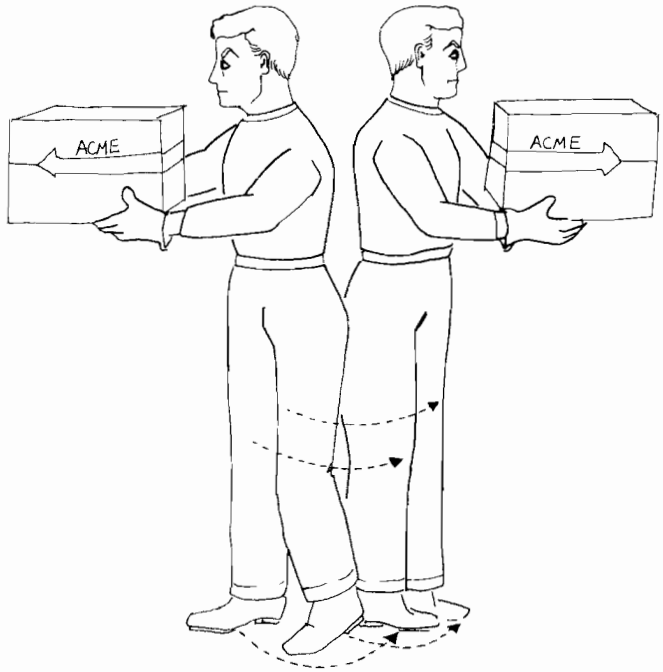
THE BASIC THREE

There are three rules involved in the lifting or picking up of objects from the floor or performing daily tasks:

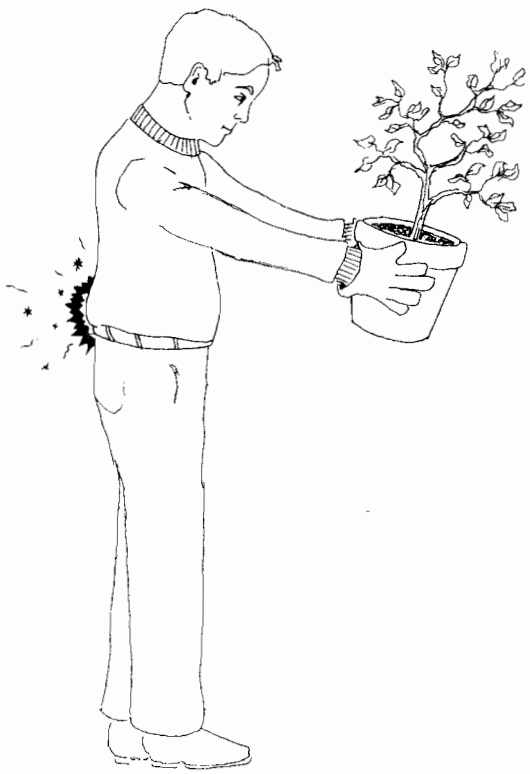
1) NEVER bend forward at the waist; instead, bend at the knees and keep your back straight.

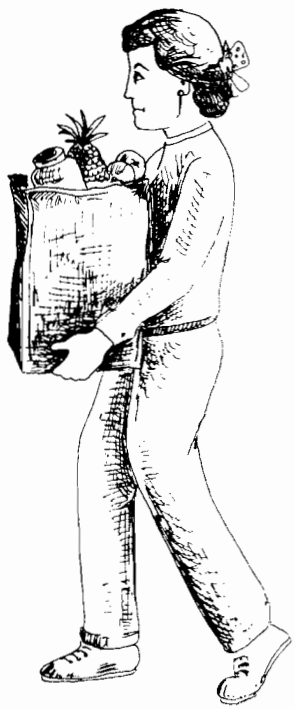


2) NEVER twist your trunk to reach for or pick up an object; instead, turn with your feet keeping your trunk straight.



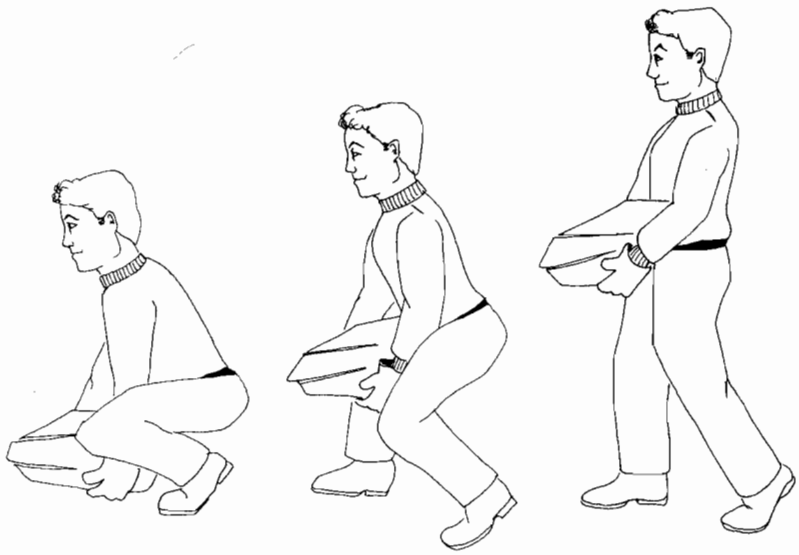
3) NEVER carry a load with your arms extended; instead, carry all loads as close to your body as possible.





There are some other helpful hints which make the carrying out of these three rules easier.

When bending at the knees to pick up an object from the floor, keep your feet spread apart to at least shoulder's width.



Placing one foot in front of the other when bending at the knees will decrease the amount of stress on the leg in front.

The right equipment for the job always helps.

Step stools will prevent you from over extending.

Swivel stools or chairs will prevent you from twisting at the waist.

Select proper clothing. This means that you should avoid tight jeans when you need to lift from the floor, and always wear supportive shoes for your task.

It is also wise to think before you act.

If the task appears too difficult, or an object too heavy to lift by yourself, GET HELP.

It is easier to push rather than pull an object. Remember to push with your legs and not your back.

Don't hurry a job. Take your time and do it with the correct body mechanics.

Change body positions often. If you have been working in a forward bent position, take time to stop and extend your back. If you have been doing overhead work, stop and flex your spine with a squat.

HOME EXERCISES

As a general rule, flexibility exercises should be performed before any of the strength exercises are done. The number of repetitions for each exercise as well as the specific exercise you should perform or avoid is dependent on several variables. Things such as your level of fitness, the specific back disorder you may have, how much flexibility your back has, and your age are a few of these variables which have to be considered before a specific and individualized program can be outlined for you.

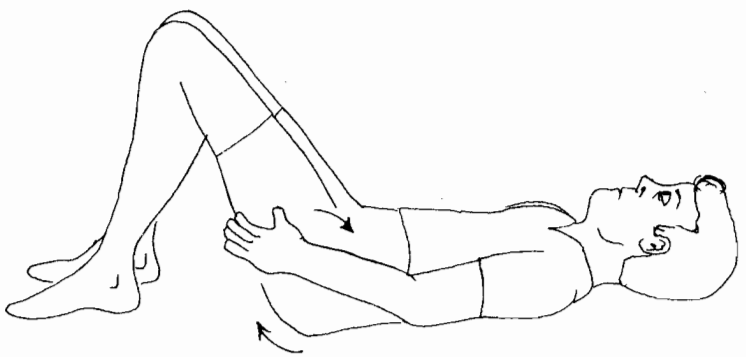
While performing these exercises it is important not to jerk or bounce. All of the exercises should be done slowly and deliberately, and there should not be any pain with them.

STRETCHES

All of these stretches should be done to the point where you begin to feel a pulling in the muscle; then hold that position for 10 to 15 seconds.

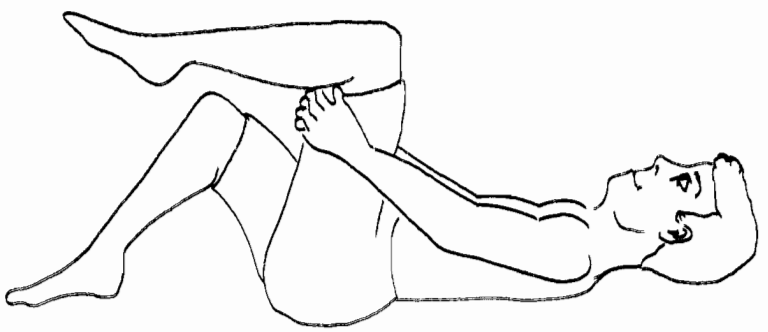
Pelvic tilt

While lying flat on your back with your knees bent, roll your pelvis upward. Do not allow your buttocks to leave the floor. This can be accomplished by tightening your abdominal and buttocks muscles simultaneously.



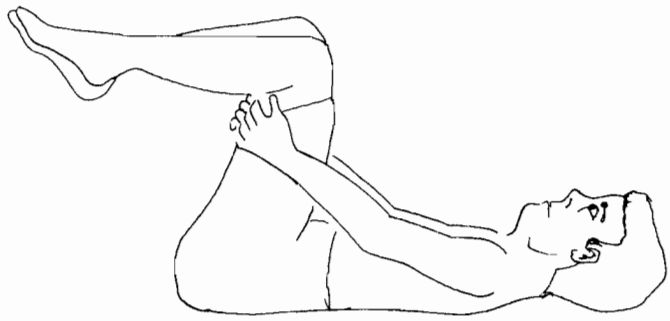
Single Knee to Chest

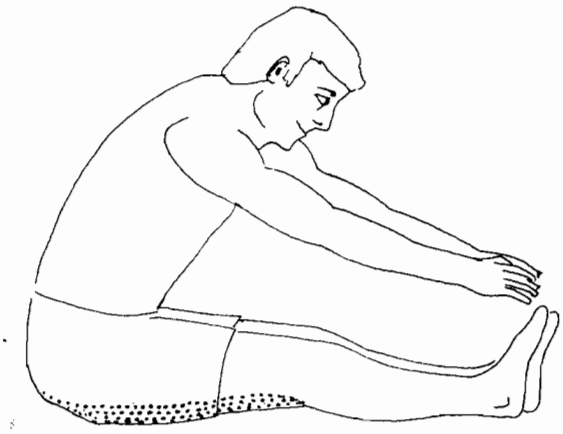
Perform a pelvic tilt, then grab one knee and pull it toward your chest. Repeat the same maneuver with the opposite knee.



Double Knees to chest

Perform a pelvic tilt and take both knees to your chest lifting first one knee and then the other.



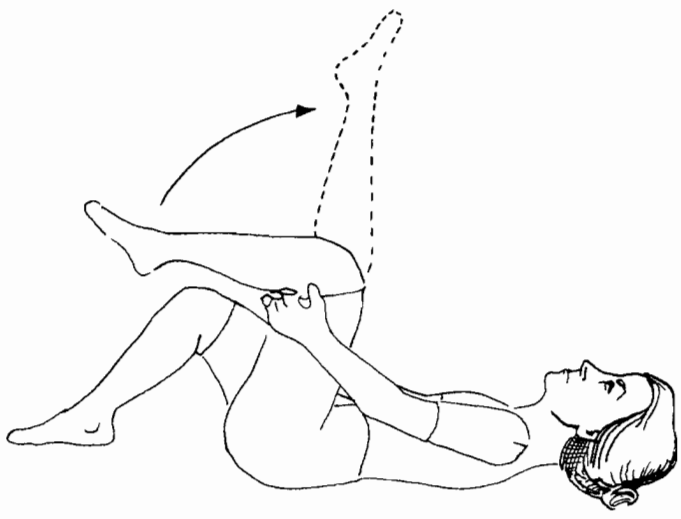


Hamstring Stretches

Sit with your legs straight out in front of you. Maintaining your back as straight as possible, reach down toward your toes.

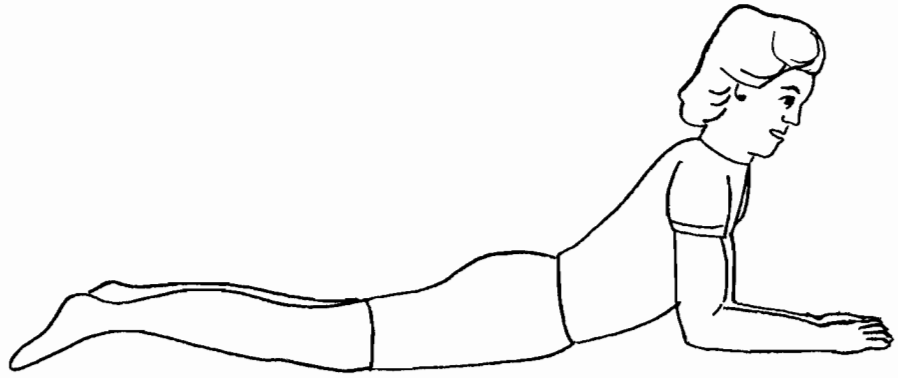
Alternate Hamstring Stretch

Lay flat on your back and hold your leg up from behind your knee with your knee bent. Next, straighten your leg at the knee.



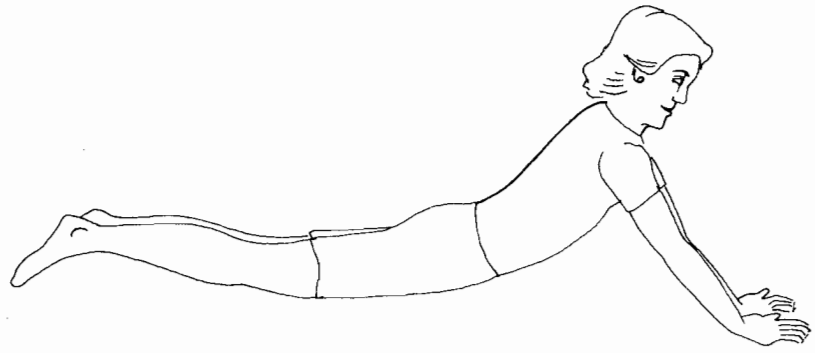
Prone on Elbows

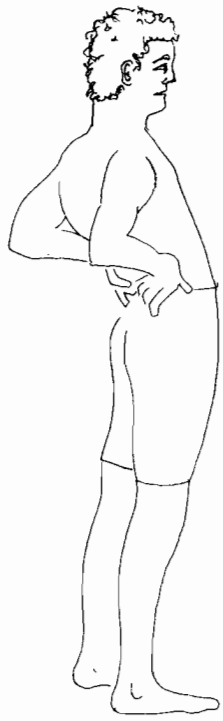
While lying flat on your stomach, push up onto your elbows without allowing your pelvis to lift off the floor.



Press Ups

While lying flat on your stomach, push up with your hands as though you were doing a push up, but do not allow your pelvis to lift off of the floor.



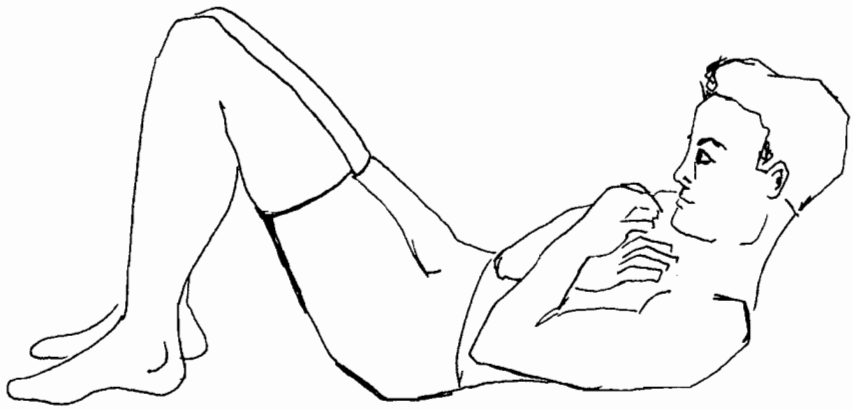


Standing Back Extensions

While standing, place your hands on the small of your back and extend your back over them.

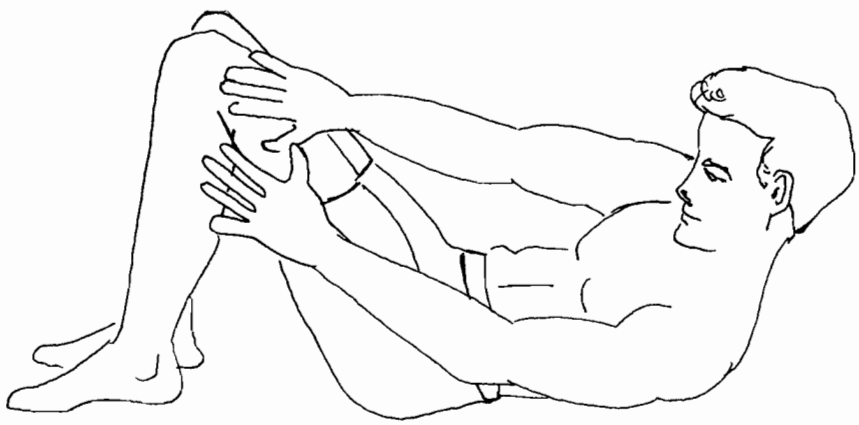
Curl Ups

Lay flat on your back with your knees bent and your arms crossed over your chest. Lift up your neck, then your back to your shoulder blades. Relax.



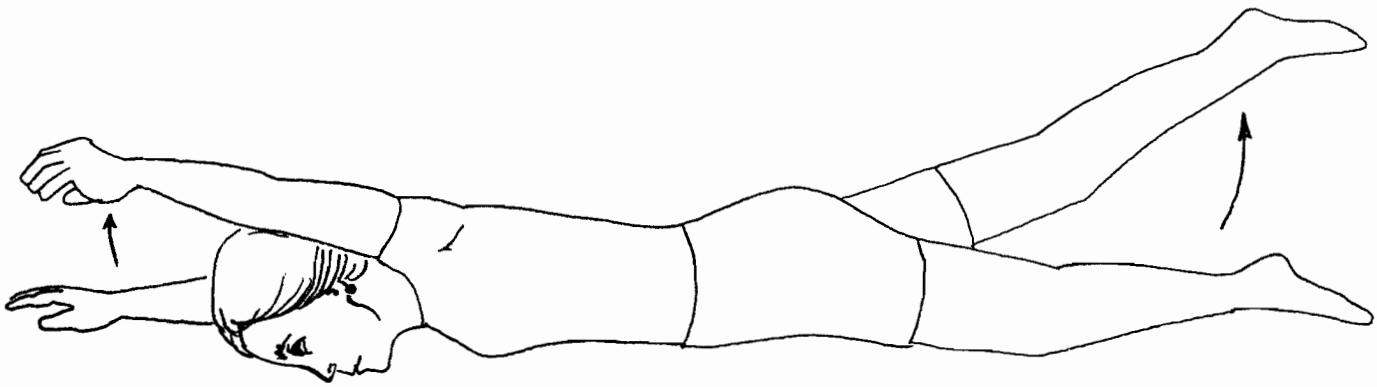
Curl Ups With Rotation

Perform a curl up. Rotate to your right, hold, then rotate to your left, hold, and relax.



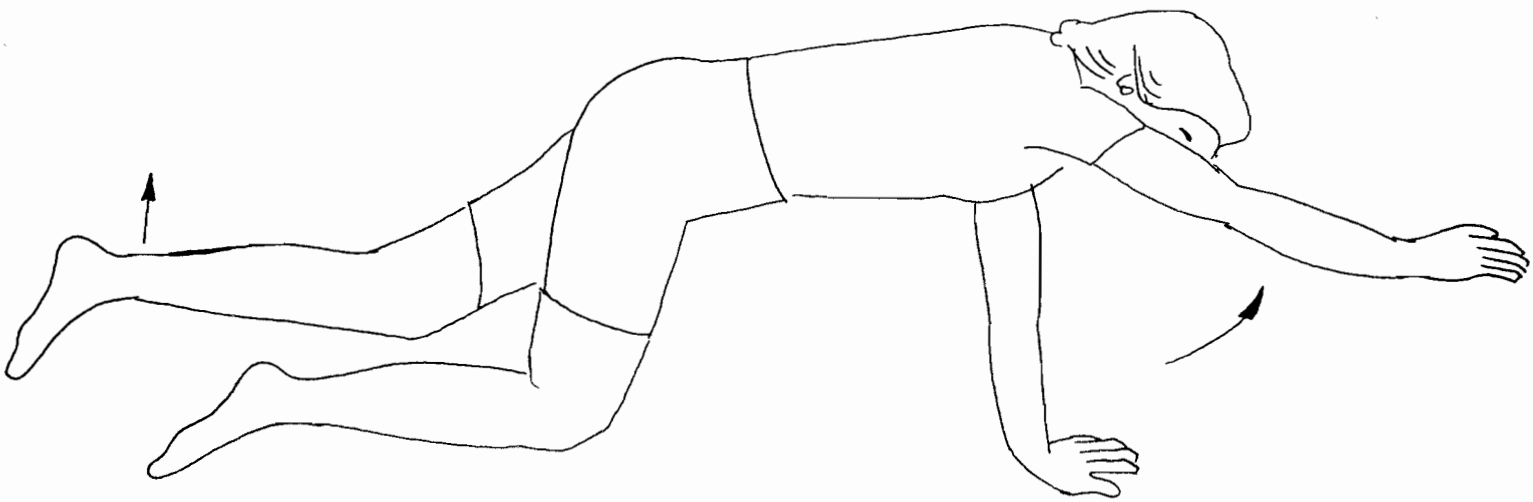
Prone Extensions

Lay flat on your stomach with your arms and legs extended. Lift one arm up from the floor and simultaneously lift the leg on the opposite side of the body. Repeat with the other two extremities.



Quadruped extensions

Perform the same maneuver as with prone extensions except the starting position is on all fours.



FITNESS

Physical fitness plays a very important role in the care of your back. Being in good physical condition helps reduce the risk of getting injured and may decrease the severity of an injury. Being fit provides you with the endurance, strength, and flexibility to meet the physical demands your back may need.

Any exercise like jogging, swimming, biking, and walking are good for the heart, the lungs, and the circulatory systems. To be beneficial, these activities must be performed non-stop at a level high enough to increase heart rate and the breathing rate for at least 20 to 30 minutes. There are guidelines for safely increasing your heart rate to effectively improve your level of fitness. Furthermore, the activity must be performed a minimum of 3 to 4 times a week. Additionally, specific stretching exercises should be performed to help increase the flexibility of your spine and limb musculature.

All programs should include a 5 minute warm up at the beginning and a 5 minute cool down period at the end.

It should be emphasized that any activity that creates pain should be stopped. Before starting any aggressive program on your own, it is wise to consult your physician. A physical therapist can also be of value in helping you plan a program and give you guidelines to assess progress and advance your routine.

RELAXATION EXERCISES

The purpose of this exercise is to help you isolate muscle tension, then relieve the tension. This particular technique should help you deal better with your discomfort and stress.

To begin, assume a comfortable position, either sitting or lying flat on your back.

If on your back, support your legs and head with pillows.

If sitting, rest your head against a wall and rest your arms on pillows placed on your lap. You may also rest your feet on a foot stool.

The entire technique requires you to use your "mind's eye" to visualize and project a special image.

1) Close your eyes and imagine yourself floating upright over a luke warm tub of water.

2) You then slowly lower yourself into the water, toes first, then ankles, then calves,and so on until your whole body is in the water.

3) As your individual body part makes contact with the water, that part which is immersed slowly begins to melt in the water.

4) As your body melts and blends into the water, it floats freely within the water in complete relaxation.

5) The entire technique should take at least five minutes to complete.

ACTIVITIES OF NIGHTLY LIVING

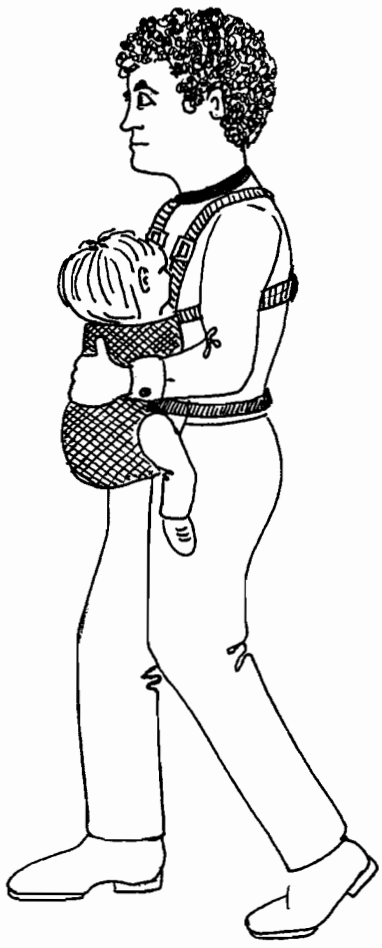
Back pain can be a limiting factor in many activities which can include recreation and sex. In order to obtain a positive outcome in a sexual experience, participants must be understanding and willing to make adaptations in their lovemaking. Because back pain can cause stress and inhibit sexual performance, honesty and openness must be the first step in communication to allow each partner to feel more at ease. When this is emphasized, it also tends to facilitate closeness between partners.

It is of the utmost importance for both partners to voice opinions, frustrations, and preferences. Remember, it is the gratification and comfort of both partners that should always be the primary goal.

Experimentation with positions of comfort is an integral part of modifications required to compensate for your low back pain. Your physical therapist can guide you in selecting the kinds of positions which would be the most comfortable for you. This, in addition to an open mind and comfortable attitudes, will enhance sensuality and satisfaction during sexual endeavors. Another option may include trying to plan time alone together to discuss and share in sexual activities. This process can be enhanced with soft music and soft lighting. A relaxing environment typically enables a more pleasurable experience.

Above all, couples should continue with sexual experiences and simply incorporate patience into this experience so that lovemaking is not rushed. This approach can minimize disappointment and frustrations. A relaxing and comfortable encounter will surely allow the sexual interaction to be an enjoyable experience for both partners.

PREGNANCY AND BACK PAIN



We often see an increase in stress from mothers and fathers during parenting activities that can put significant strains on the low back region. Someone that is suffering from low back pain who has children can have enormous emotional strain along with physical strain. A mother or father trying to heal an injured back may find it hard or almost impossible to keep pace with the active pace of children which will also add to the frustration and guilt of having low back pain. It is often too late before parents realize the importance of a strong and painfree back.

Often recommended treatments can include an anti-inflammatory medication to reduce swelling once the back is injured and rest. As we know, rest is a difficult thing to accomplish when you have children. It has been proven that physical therapy, with a specific stretching and strengthening program, used in conjunction with modalities can optimize the healing process.

The best way to treat low back injuries is prevention. To help diminish low back pain episodes you need to learn appropriate body mechanics and have an individually tailored exercise program for handling children.

New mothers appear to be particularly prone to low back injuries. This is due to a hormone which is released during pregnancy called relaxin. Relaxin is released to allow the pelvic structures to stretch during the birth process. The hormone is not discriminative. It is released throughout the body which then affects all connective tissue, including the pelvis and the low back. This can weaken the outer most structure of the disc, the annular rings, which may lead to a herniated disc or disc bulge. The increase in body weight and the change of the center of gravity that is normally experienced with a pregnancy can also put excessive stress on the tissues of the lumbar spine. It has also been noted that once the baby is born, the mother has weakened stomach muscles which also makes her vulnerable to injuries of the low back region. The timing could not be worse, in the post-partum state, the mother must lift and tote not only her ever growing infant but other baby gear such as diaper bags, toys, and car seats. Even the simplest action such as nursing a baby, with enough repetition, can bring on back pain. These motions and positions are continued as the baby grows in size and weight.

Here are some special Backwords Ergonomic Tips:

- When lifting a child from a crib, make sure you always lower the side of the crib or playpen before lifting your child out. Do not try to twist or rotate with a child in hand especially if the child is away from your body.

- Always steady your feet and if the child is old enough, have the child stand up and walk towards the rail before lifting him.

- When choosing a changing table, always look for a table high enough to avoid bending at the waist. It is also helpful to place one foot on a footstool or phone book to relieve low back strain. Alternating feet will help decrease low back pain. Avoid changing the baby on your bed. If you must, keel down and change the baby. Do not stand over the baby bent over at the waist.

- Putting a child in a car seat is probably one of the most difficult and stressful positions you can put on your back. Never lift your child into the car seat with both feet on the pavement. If the child is old enough, have the child climb into the car seat himself. Instead of putting both feet on the pavement, place one foot on the car floor. Get as close to the car seat as possible and bend with your knees and hips. Some car seat manufacturers have learned the difficulty in this task and have made swivel bases which makes this procedure much easier to perform. If you are planning to buy a new family car, consider purchasing a 4-door model. Also consider having child proof safety locks installed in the rear doors.

Another area where we often see lower back pain stresses is when bathing a child. It is recommended that the child should be bathed in a sink, when small enough, to help prevent bending at the waist. This waist high surface will help prevent back pain and keep you from bending over a tub. When lifting the child in or out of the tub, bend your knees, lean at your hips and hug the child as best as possible. Try to get as close to the tub as possible and have the child come to the side of the tub.

Try not to consistently carry the child on one hip. Alternate hips periodically to help decrease any habit forming poor postures. If you must hold the child on your hip, try to stay upright and avoid twisting at the waist.

If possible, try to allow your child to crawl or walk on his own as much as possible. Not only will this help with his developmental process, it will help you with your lower back and prevent injuries. If the child needs consoling, bending down on one knee is much more beneficial for your lower back than automatically picking him up.

BREAST OR BOTTLE FEEDING

We often see mothers breast or bottle feeding in awkward positions. These awkward positions can cause micro-trauma to the lower back or upper back region which can later lead to lower back discomfort. All too often, we see the mother in a hunched posture when nursing a child. To avoid this position, the mother should try to breast feed while sitting in proper posture and holding the child's body as close to her as possible.

Mothers who bottle feed are also at risk. Alternating the position is recommended. For example, lying down on one side with the child cradled in your arms, may be an alternative. Tucking some pillows under the mother's arm when holding the child while either breast or bottle feeding will also decrease stress on the upper and lower back regions.

LIFTING PROCEDURES

Lifting children can produce lower pack pain. When the child must be lifted by the mother or father, they should stand as close to the child as possible, bend at the knees rather than the waist. Bending at the waist not only puts stress on muscles and ligaments but also puts stress on the annular rings of the discs. Parents should hug the child as close to themselves as possible when lifting, allow the legs to do most of the lifting work. To avoid back strain when lifting a child from a playpen or floor, first lift your child while holding child close to you and walk to the spot where they should be placed. Try not to lift, turn and place all in the same motion. Remember the three rules to lifting, that are explained throughout this booklet.

IMPROVING POSTURE

One of the most important ways to reduce back strain is to use good posture. Good posture helps keep undue stress off tissues which respond poorly to stress. Always try to stand and sit straight. Always sit with a lumbar roll.

STRESS

Stress is at a very high level during this period of life when we are rearing children. Children's demanding emotional and physical needs create stressful environments for us. It has been documented that stress can increase lower back pain. That is why it is important that we find ways to relieve stress. Relaxation exercises, reading, listening to music, going for walks by yourself, and providing a network of people who can provide emotional and physical support are important useful tools. Low back pain can drastically effect and change your family life. This can add to your stress levels and exacerbate your condition. In prior chapters, there are relaxation techniques we often suggest to our patients that you may want to try.

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