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Section 1: Back Injury Prevention

About This Course / Learning Objectives

Talk show host Brett: In our special report tonight: Americans spend more than \$100 billion each year on this problem – and you’re probably contributing to it without even realizing it! What is it? Back injuries. They’re painful, they’re physically limiting, and they can be enormously expensive.

Good evening, I’m Brett Donovan, host of “Health Spotlight.”

Over 80% of people will suffer a back injury in their lifetime. That’s four out of every five people!

So – are you at **risk for back injury**? Do you know the **proper ways to lift, carry, and set down an object**? Later we’ll discuss those in depth and I’ll tell you how to keep those injuries and costs to a minimum – but first, we have orthopedic surgeon Dr. Chloe Anderson here to explain a little about the **anatomy of the back**. Thanks for being here with us, Dr. Anderson.

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Section 2: The Anatomy of the Back

Dr. Anderson: Thanks for having me on the show.

Brett: So what can you tell us about the back?

Dr. A: Your back is made up of bones, discs, nerves, muscles, and ligaments. If all of these work properly, your body will move smoothly. But if any part is overworked, other parts will suffer.

Your spine is made up of 33 irregularly-shaped bones – called vertebrae – that are stacked on top of one another. The vertebrae are naturally curved and divided into sections: cervical, thoracic, lumbar, sacrum, and coccyx.

Your vertebrae are separated by soft discs of cartilage that act as cushions to prevent them from rubbing against each other. They help to maintain your spine's flexibility and protect the spinal nerves.

The discs have a very strong exterior and contain a soft, jelly-like substance, but unhealthy spinal discs can weaken, lose their shape, rupture, or move from their original position between two vertebrae! When this happens, it can result in degenerated discs, pinched nerves, herniated discs, and a myriad of other back problems.

Brett: That sounds painful. I've had a herniated disc before. It's not fun, Dr. Anderson. Not fun at all.

Dr. A: Right. They can be excruciatingly painful. The damage generally begins long before the pain is experienced. Improperly lifting something or lifting something that is too heavy, will result in damage to the spine. It's a gradual and cumulative process.

Signs and Symptoms of Back Injury

Many serious back injuries result from smaller ones that happen over long periods of time. With each small injury, the damage progressively becomes worse. You might experience:

- Aching
- Dull or sharp pain
- A hot, inflamed feeling in your muscles
- Numbness or tingling
- Unusual muscle tightness, weakness, or fatigue

These can range from mild to severe – however, you can't always count on the presence of one of these to indicate injury. Even if you don't experience an issue, you

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could still be contributing to the back damage.

If the symptoms develop, the earlier you recognize them, the quicker you can respond. Tell your doctor all the details about the job tasks and activities you must do on a regular basis. Ask your doctor for clear instructions about any tasks you shouldn't perform.

Are You at Risk for Developing a Back Injury?

Brett: So, are certain people more at-risk for developing a back injury?

Dr. A.: Sure. Knowing the personal risk factors that can cause back injuries is an important step toward preventing them. These factors include:

- **Age** - Spinal tissues lose its strength and ability to function as you age. Because of this, people between the ages of 30 and 60 are at higher risk for disc-related disorders. People over 60 are more likely to experience back pain due to osteoarthritis.
Brett: Looks like I'm in the high risk range.
- **Prior back pain** - If you have a history of back pain or injury, you have a higher risk of experiencing back pain again. Keeping past back problems in mind will help you take appropriate measures to prevent future injury.
- **Lack of exercise** - Weak muscles provide little support, and your back is more likely to be injured when stressed. Keeping your back and abdominal muscles strong is important for keeping your back flexible and healthy.
- **Poor posture** - Standing, sitting, or lying down incorrectly, especially over long periods of time, places strain on your spine. Your spine operates best when it is in a natural "S" shape. Bending this natural "S" out of position for long periods of time can often lead to muscle fatigue and back pain. Always sit up and stand up straight.
(Brett clears his throat and adjusts his posture.)
- **Repetition and duration** - Doing the same task can cause fatigue and strain. Monitor your work habits and rotate the types of duties you perform so that you are using different muscles constantly.
- **And finally, inadequate recovery time** - Recovery time is the amount of time your body needs to rest after performing a repetitive task or being in an awkward position. Allow your body to rest between repetitive tasks and after any task that requires you to hold an awkward position for more than a minute or two.

Commercial

Brett: We need to take a quick commercial break. Dr. Anderson, would you mind sticking around?

Dr. Anderson: Sure!

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Brett: Coming up in our next segment, we'll tell you what you can do to help protect your back.

PSA – Investigator Bradley, PI

Bradley: Back problems: a true cause for concern. As an investigator, my goal is to systematically uncover the evidence, and establish the truth. My analytical nature doesn't end there though. Oh no. Problems exist well beyond my typical scope of work.

Take Kimberly, for example (*Bradley removes the cigarette from Kimberly's mouth and stomps it out*). Kimberly doesn't know that cigarettes reduce blood flow, are linked to faster degeneration of the spinal disks, and lead to osteoporosis. (*Bradley then walks to Nathan – who is slouching in his chair*)

And Nathan here slouches. (*Bradley gently grabs Nathan by the shoulders and straightens his posture*) While he works the day away, he's unaware that he's stretching the ligaments in his back out of shape, and causing his back muscles to work harder.

Brian has made time for a weight loss and exercise resolution – but it stayed just that: a resolution. This makes him a prime candidate for back injury. Like with most people, Brian's weight has settled around his abdomen and hips. His back has to work harder to support itself, leading to an exaggerated curve in the lower spine.

You see, seemingly insignificant behaviors can result in big problems down the road. Understanding how your back works and awareness of the risk factors are the first step to preventing back pain. It is in your best interest to maintain the strength and health of your back – it's the only one you get!

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Brett: Welcome back to Health Spotlight! We're here with orthopedic surgeon, Dr. Anderson.

Dr. Anderson: Brett, I often find that patients injure their backs, but they don't even realize what factors produced the injury. I've brought along a series of pictures and questions to help illustrate what contributes to back pain, and how to prevent it.

What causes the most back injuries?

- Poor posture (Feedback: Not quite. That's a cause for many people, but the most common cause is improper lifting)
- Improper lifting (Feedback: You got it!)
- Aging (Feedback: Not quite. That's a cause for many people, but the most common cause is improper lifting)
- Strenuous exercise (Feedback: Not quite. That's a cause for many people, but the most common cause is improper lifting)

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If you must lift the object, use a device to assist. However, if a device is not available, learning a few basic rules about lifting, posture, and proper exercise can help keep your back in good shape.

Assessing the Lift

The easiest way to avoid back injury is through careful planning and communication. Before lifting and carrying a heavy object, take a few moments to ask yourself the following questions:

- How far will I have to carry the load?
- Is the way clear of clutter, cords, slippery or uneven surfaces, overhangs, stairs, or curbs?
- Will there be a closed door? If so, can someone hold the door open, or can I place a wedge under the door to hold it open?
- Once I lift the load, will I be able to see over it, or will it block my view?
- Can I take the load apart, carry it in pieces to the final destination, and then put it back together?

What Do You Think?

After you have answered these questions, you should take a few moments to test the heaviness of the load by pushing it with your feet or hands.

- True (Feedback: Right! Doing this will help you assess how heavy the object is. It's important to remember that you can't simply judge the weight of something by its size. A small size does not always equal a light load!)
- False (Feedback: It's actually important to assess how heavy the object is before you attempt to lift it. It's important to remember that you can't simply judge the weight of something by its size. A small size does not always equal a light load!)

People often overestimate how much they can safely lift. As a general rule, you should never lift more than 50 pounds by yourself if you're not using an assistive device.

Proper Lifting

Okay – you've assessed the load by pushing it with your foot, and you decide that it's not too heavy to pick up. Begin lifting by putting your feet close to the object. How should you lift it?

- Keep your feet far apart and bend at the waist to reach and lift. (Feedback: Oooh – Bending at the waist like that is a guaranteed way to cause injury.)
- Keep your legs straight with your feet together and bend at the waist to pick it up. (Feedback: Oooh – Bending at the waist like that is a guaranteed way to cause injury.)
- Keep your feet together, bend at the knees, and squat until you are level with the object. (Feedback: Not quite. Your feet should be shoulder-width apart –

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this will help provide stability.)

- Keep your feet shoulder-width apart, bend at the knees and squat until you are level with the object. (Feedback: Exactly!)

The key to lifting safely is keeping your back straight or slightly arched. With your feet shoulder-width apart, you should bend at the knees and then use your leg muscles to raise yourself up. Never use your back to lift!

How should you hold a heavy object?

- Close to your body (Feedback: Correct!)
- Several inches away from your body (Feedback: Holding it away from your body puts significantly more pressure on your back and spine.)
- With your arm outstretched in front of you (Feedback: Holding it away from your body puts significantly more pressure on your back and spine.)

You should hold the object as close as possible to your body.

When lifting and carrying a box, hold it at opposing corners – the top and bottom. Finally, pull in and tighten your stomach muscles. Lift straight up smoothly. Keep your head up, and look straight ahead, not down.

Proper Carrying

Avoid lifting the load over your shoulder height or below your knees. This puts additional stress on your back and lower body.

If you become tired at any point while carrying the load, set it down and rest. It seems obvious, but when you're hurrying to accomplish something, you might push yourself in order to save time. Even if you're following all of the correct procedures, if you're straining your body during the process, you're eventually going to hurt yourself.

Never twist your back while lifting or carrying something. If you need to change directions, do so with your feet. Twisting while carrying a load is one of the worst things you can do.

When setting down the load, make sure it's secure before releasing your grip. Insecure drops can land on your foot or injure someone who's helping you.

If possible, place the load at waist level. Not only will it be easier to pick up, it will be easier to set down.

Back Safety in the Workplace

If the load is an odd shape or too heavy, stop before you lift! Take a little extra time to use a hand truck, pushcart, or other device.

Be aware of any equipment your organization provides to perform certain tasks. Use

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any available assistive devices that make it easier to transfer an object or person from one place to another. Always refer to the equipment manufacturer's guidelines and your organization's policy for guidance on proper use.

One last photo comparison.

Photo 1: Man is pulling a hand truck or pushcart. (Feedback: Incorrect)

Photo 2: Man is pushing a hand truck or pushcart. (Feedback: Correct.)

It is easier and safer to push a hand truck or pushcart than to pull it.

When using a hand truck or pushcart, you should also remember the following:

- Use both hands to control the hand truck or pushcart.
- Stay close to the load.
- Secure the load with tie-down straps, if necessary.

I can't stress enough the importance of asking for help or using an assistive device. It's better to take time to do this than to risk permanently injuring yourself.

If you have any signs of a back strain or sprain, report the injury to your supervisor immediately. If the incident happened at work, you will likely need to complete an incident report. Reporting any incident not only helps you, but also helps your supervisor evaluate the situation to prevent future injuries. Recognizing and knowing about safety hazards can greatly reduce the chance of serious injury.

See a doctor right away at the first signs of back injury, strain, or sprain.

What Can You Do?

Brett: Preventing a back injury is much easier than repairing one. You are most likely to injure a back muscle due to sudden, unexpected, or unfamiliar movements. You are also more likely to injure yourself if the muscle is weak, if you have not stretched it before use, or if it is tired from constant use.

You can minimize back problems by doing exercises that tone your back, hip, and thigh muscles. Keeping your back strong, flexible, and healthy can help prevent injuries. In addition, you can recover from an injury more quickly when your muscles are strong and flexible.

Exercise regularly, at least every other day. Warm up slowly before exercising. Going for a brisk walk is a good way to warm up.

Everyone's body is different. Do not do any exercise that causes pain or becomes more difficult to do over time. Before beginning any exercise program, check with your doctor.

Let's go to our field reporter to show you some good exercises and stretches you can do to strengthen your back!

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Back and Core Exercises

Brett, as you mentioned, performing simple exercises and stretches daily can help you improve and support your back and core. Earlier today, I visited a local fitness facility and captured a few of these techniques.

First, let's take a look at the back and core exercises.

Wall slides: Stand with your back against a wall, and your feet shoulder-width apart. Keeping your back against the wall, slide down until your knees are bent at a 90 degree angle. Count to 5 and slide back up the wall. *Repeat 5 times.*

Leg raises: Lie on your stomach. Tighten the muscles in one leg and raise the leg from floor. Hold for count of 10, and return the leg to the floor. Do the same with your other leg. *Repeat five times with each leg.*

Reverse leg raises: Roll over onto your back, and repeat the steps. *Repeat five times with each leg.*

Partial sit-up: Lie on back, knees bent and feet flat on floor. Slowly raise head and shoulders off floor and reach both hands toward your knees. Count to 10, and *repeat 5 times.*

Leg raises while seated: Find a chair and sit upright. With your legs bent at the knee, raise one leg until your foot is several inches off of the floor. Slowly return to the floor. Do the same with the other leg. *Repeat this 5 times.*

Back Stretches

And now for the stretches.

Sphinx: This is one of my favorite stretches – I do this every morning. Lie on your stomach and prop your torso up on your forearms. Using your hands, push up to raise the top half of your body as high as possible. Keep hips and legs on the floor. *Hold for 1-3 minutes.*

Two-knee twist: Lie on your back, bend your knees, and bring your arms out as if making a T. As you exhale, lower your knees to ground on the right. Make sure you keep both shoulders pressed down firmly. Hold for 1-2 minutes, then return to the starting position. Do this for both sides.

Stretching and exercising can reduce your chances of a back injury on the job, but only if you also take the proper precautions at work. Even the most athletic and well-conditioned employees may be injured if they do not perform their jobs safely!

Back to you, Brett.

Posture, Posture, Posture

Improving your posture is another step you can take to protect your back.

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If you must stand for long periods, shift your weight from side to side or alternately elevate one foot on a stool to reduce the pressure on your back. Bend at the knees and crouch periodically.

Always stand and sit up straight; slouching causes the back ligaments to stretch out of shape, creating more work for your back muscles.

“Freeze” in your current sitting position. What is your posture like right now? Where are your shoulders in relation to your hips? Are they forward, or are you sitting straight, shoulders and hips aligned? Is the screen at eye level, or are you tilting your head up or down to read it?

Sitting creates a strain on your back that can actually be worse than standing! As recommended for standing, do not slouch; instead, sit straight. Consider using a towel or a pillow for support of your lower back if you have to sit for long periods of time.

Your chair should fit you, so select one that is right for you. Ensure that when you do sit, you sit upright and that your weight is supported. Your knees should be slightly higher than your hips.

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Summary

Let’s recap what we’ve discussed today.

- Stretching and strengthening your core muscles will help protect your back.
- Before lifting and carrying a heavy object, size up the load and plan how you will lift it.
- If you must lift the object, use a device to assist. It is safer than trying to lift a heavy object yourself.

When lifting something manually:

- Face the object.
- Keep your back straight or slightly arched.
- Your legs should do the lifting, not your back.
- Grasp the load securely with your hands, and pull it close to you.

Thank you again for being here today, Dr. Anderson. *(turns to look at camera)* And thank you for tuning into Health Spotlight!

Congratulations!

You have finished reviewing the course content.

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Course Contributor

Merl Miller, ATC, CIE, CPE, has over 20 years of injury prevention experience. He has worked with companies in numerous industries and has held a variety of health and safety-related positions, including positions in occupational health, employee wellness, and risk management. He is a leading expert in the field and holds the distinguished Certified Professional Ergonomist (CPE) credential.

References

Back Facts: A training workbook to prevent back injuries in nursing homes. SEIU Education and Support Fund Washington, D.C.

<http://www.osha.gov/SLTC/healthcarefacilities/training/index.html>.

Back Talk: A Owner's Manual for Backs. Workers' Compensation Board of British Columbia, 2010.

Http://www.worksafebc.com/publications/health_and_safety/by_topic/assets/pdf/back_talk.pdf.

Bureau of Labor Statistics. Number and percent distribution of nonfatal occupational injuries and illnesses involving days away from work(1) by industry and number of days away from work, 2007. <Http://stats.bls.gov/iif/oshwc/osh/case/ostb2007.txt>.

Heal your lower back pain with these five yoga poses

<http://breakingmuscle.com/yoga/heal-your-lower-back-pain-with-these-5-yoga-poses?page=0.1>

The Illustrated Guide to Safe Patient Handling and Movement (2009). *Kathleen Motacki, Audrey L Nelson, Dr Nancy Menzel. Springer Publishing*

www.springerpub.com

Handbook of Human Factors and Ergonomics in Health Care and Patient Safety 2nd Edition (2012). Edited by Pascale Carayon. Lawrence Erlbaum Associate

Safe lifting and movement of nursing home residents. Collins JW, Nelson A, and Sublet [2006]. DHHS (NIOSH) Publication No. 2006-117. Cincinnati, OH: National Institute for Occupational Safety and Health. <http://www.cdc.gov/niosh/docs/2006-117/>

Safe Patient Handling and Movement: A Practical Guide For Health Care Professionals (2006). Audrey Nelson Editor. Springer Publishing

<http://www.springerpub.com/>

Waters, TR. When is it safe to manually lift a patient. *American Journal of Nursing*. 2007;107(8):53-58

Waters, TR, et al. Revised NIOSH equation for the design and evaluation of manual lifting tasks. *Ergonomics* 1993; 36(7):749-76

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Exam

Your spine is made up of 33 irregularly-shaped bones, called _____, that are stacked on top of one another.

Vertebrae
Nerves
Lumbar
Discs

Which of these is not a personal risk factor that can cause back injuries?

Prior back pain
Lack of exercise
Smoking
Being underweight

People between the ages of _____ are at higher risk for disc-related disorders.

13 and 21
21 and 30
30 and 60
60 and 80

What causes the most back injuries?

Poor posture
Improper lifting
Aging
Strenuous exercise

When lifting something, you should _____.

Keep your feet far apart and bend at the waist to reach and lift.
Keep your legs straight with your feet together and bend at the waist to pick it up.
Keep your feet together, bend at the knees and squat until you are level with the object.
Keep your feet shoulder-width apart, bend at the knees and squat until you are level with the object.

It is easier and safer to pull a hand truck or pushcart than to push it.

True
False

You can minimize back problems by doing exercises that tone your back, hip, and thigh muscles.

True
False

When sitting in front of a computer, you should do all of the following EXCEPT:

Sit up straight.
Sit with your shoulders and hips aligned.
Position the computer screen between 12 and 24 inches below eye level.

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Position your knees slightly higher than your hips.

The key to lifting safely is keeping _____.

Your back straight or slightly arched

Your back significantly arched

Your legs straight

Your head down

How should you carry a heavy object?

Close to your body

Several inches away from your body

Above your shoulders

Below your knees