
Back Care and Lifting



A cooperative project by the
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Speech, Language and Early Intervention Program,
and Sunny Hill Hospital for Children, 1992

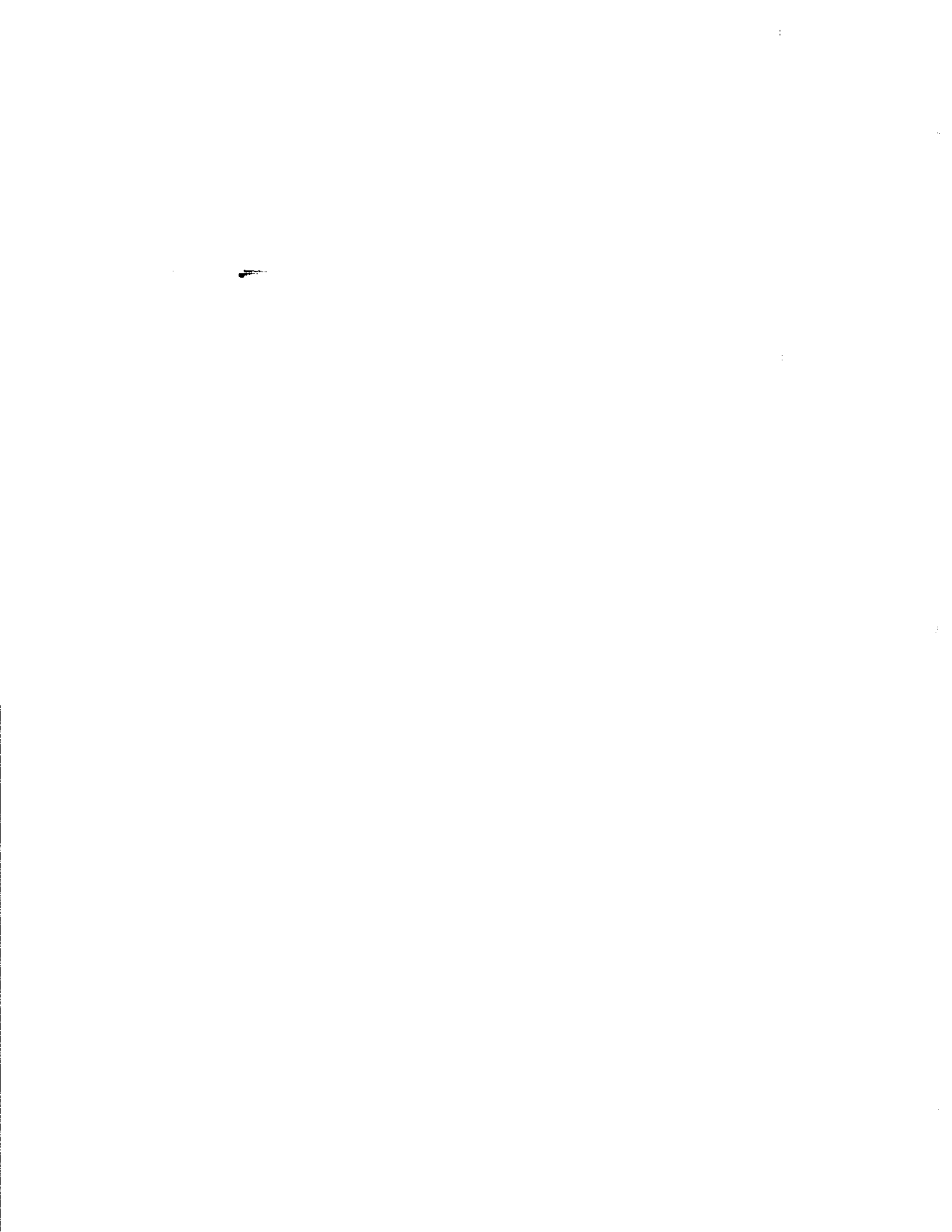


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Introduction

This module introduces you to the theoretical principles of caring for your back and describes practical techniques for lifting and transferring students with special needs. The information is designed to be a review for therapists and to be used for in-service teaching in a school setting.

Learning objectives

On completion of this module you will be able to:

- Describe the biomechanics of the back and how they relate to the prevention of back injury.
- Demonstrate the basic principles of lifting.
- Choose and perform transfer techniques appropriate to the student's school environment.

Terminology

All the relevant terminology is explained in this text.

Background

Low-back pain is the single greatest cause of lost work hours due to occupational injury. (Liemohn, 1988) Working with disabled students, you are required to lift and move them daily and you are particularly at risk. However, studies have shown that back injury can be prevented by understanding and by using good biomechanical principles in lifting. (Andersson, Ortengren and Nachemson, 1976)



Understanding the back

The normal curves

The normal back has three distinct curves:

- The neck is curved forward.
- The chest is curved backward.
- The low back is curved forward.

These curves are shown in Figure 1.

These curves balance the spine so that it can support the trunk and head while allowing the body to move. If these curves are not maintained, then the ligaments, muscles and joints will have to work much harder, and injury is more likely.

This is why it is so important to understand good posture.

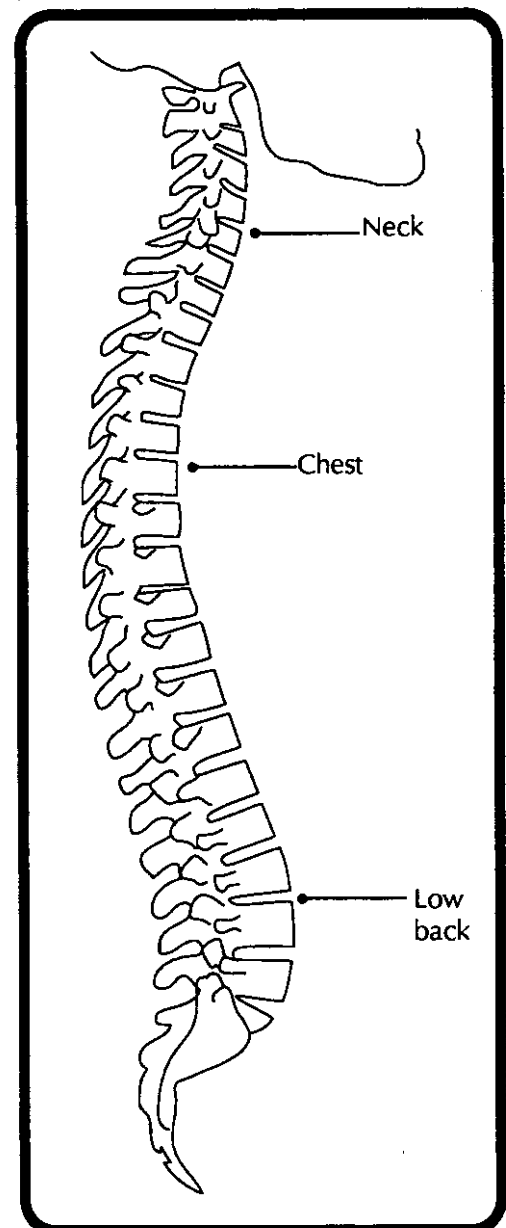


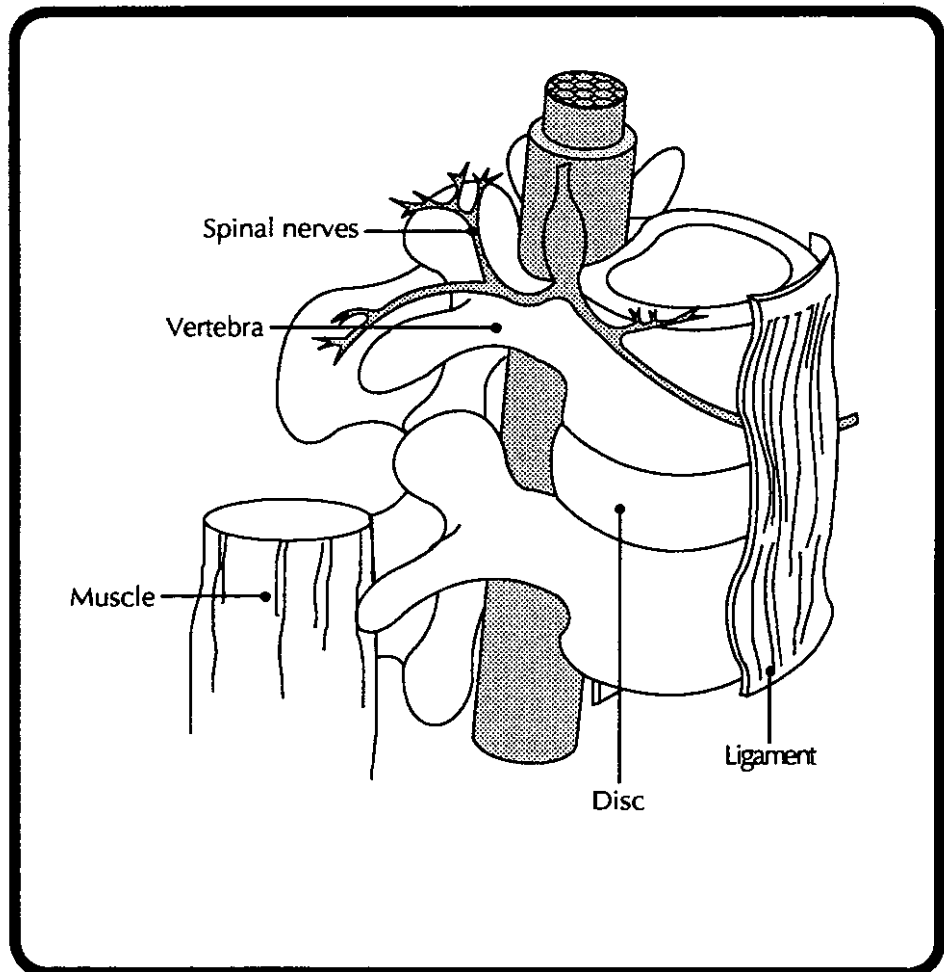
Figure 1
*Diagram of the spine
showing normal curves*

Spinal column parts

As shown in Figure 2, the spine is composed of

- **muscles:** these huge bands of muscles in the back and in the trunk support the spine
- **vertebrae:** these are the bones of the spine
- **discs:** these shock-absorbing cushions sit between vertebrae
- **spinal nerves:** these nerves exit from the spinal cord and come out between the vertebrae to innervate the arms and legs
- **ligaments:** these thick tissues join the vertebrae to prevent excessive movement.

Figure 2
The parts of the spinal column



Good posture

Most back injuries are caused by over-stretching of the muscles or the ligaments. To put the least amount of stress on your back, it is important to adopt positions that let your back relax.

Sitting:

Sitting is harder on your back than standing or walking. Therefore, it is important to get up every so often and stretch. When sitting, allow your back to relax by using a chair that supports your back. Place your feet on the floor so that your knees are higher than your hips.

Standing:

The most important thing to remember is not to stand still for too long. Instead, move your feet or shift your weight from side to side.

Sleeping:

If you sleep lying on your back, place a pillow under your knees to take some of the pressure off your low back. If you sleep on your side bend both knees and place a pillow between your knees.

Lifting:

When lifting, it is important to tighten your abdominal muscles and buttock muscles. This serves to flatten your lumbar curve and put your back in a position of strength for lifting. This is called *adopting a pelvic tilt*.

General factors predisposing you to back injury

- fatigue and stress
- tense muscles
- poor posture and poor body mechanics
- inadequate muscle strength and flexibility
- moving too quickly
- overestimating your own strength or ability
- poor planning
- lack of fitness or poor weight control

Self test 1

True or false?

1. To maintain good posture, you should keep your back straight all the time.
2. When lifting, the best way to protect your back is to tighten your abdominal muscles and buttock muscles.
3. If your back is sore, the best way to rest it is to sit down.
4. When lying down, you can protect your back by keeping a pillow under your knees.

Answers

1. False

The back is made up of three important curves. These curves balance the back. If they are not maintained or are exaggerated, then the ligaments and muscles of the back are forced to do extra work. This can cause injury. Often, poor posture is the result of exaggerated curves.

2. True

By tightening your abdominal and buttock muscles into a pelvic tilt you are ensuring that your low back is in a flattened position which is its position of strength.

3. False

Sitting is a difficult position for your back and if your back is sore, sitting should be kept to a minimum. The best position for a sore back is either lying on your back with a pillow under your knees or lying on your side with a pillow between your knees.

4. True

Using a pillow puts your back in a relaxed position.

Lifting principles

To properly protect your back when you lift, remember the following important principles:

1. Plan ahead

First, think through exactly how you want to do the lift.

2. Keep the load close

Ensure that the load is kept as close to your centre of gravity as possible.

3. Never twist

The back is not designed to take loads when twisting.

4. Use your legs

Use your legs rather than your back to take the load, because your legs are designed to take loads.

5. Never lift higher than your chest height

Lifting too high will make your back arch backwards—a very vulnerable position.

6. Check your posture (see Figure 3 on the next page.)

6. Posture continued

Feet: place them wide apart for good solid base of support.

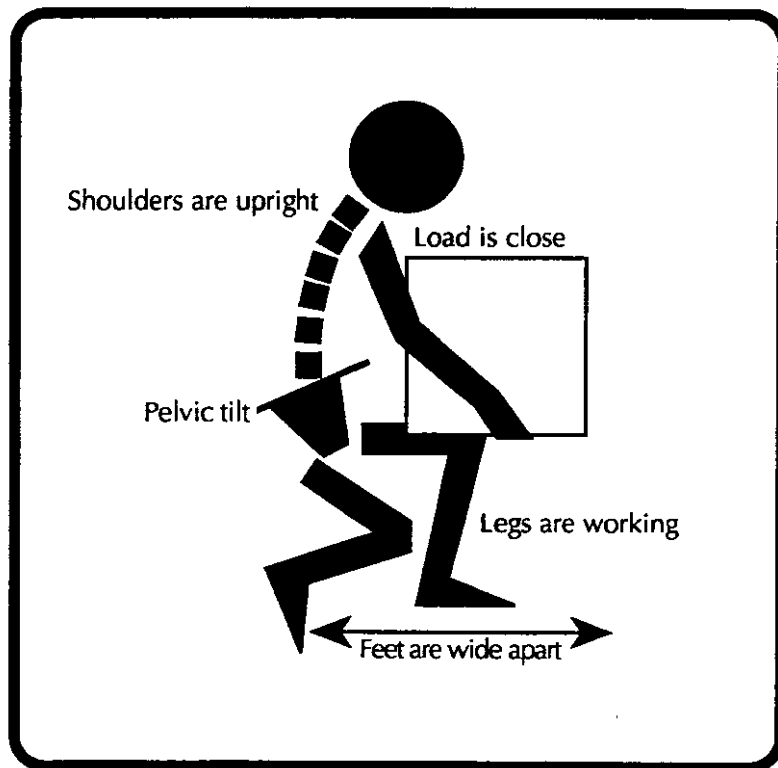
Knees: ensure they are bent so that you will use your thigh muscles for lifting instead of your back.

Back: keep your low back in a pelvic tilt by tightening your abdominal muscles and your buttock muscles.

Head and shoulders: keep them upright.

Abdomen: keep stomach muscles tight because this takes pressure off your back.

Figure 3
Good posture



Self test 2

True or false?

1. Always ensure that the student is close to you before lifting.
2. Sometimes you may need to twist from your back to get the right momentum when lifting.
3. Always lift with your thigh muscles by bending your knees.
4. If you are lifting something above your chest height, do so quickly to avoid strain.

Answers

1. True
This helps to ensure that you keep your back in a good position.
2. False.
Never twist as this is an extremely common cause of back injury. You may have to do the lift in stages or have some assistance.
3. True
Bending your knees helps to ensure that your legs are doing the work, rather than your back.
4. False.
Never lift above your chest height as this puts your back in a very vulnerable position. Use a stool or, if the object is heavy, get help.

Transfers

In the course of a normal day, a disabled student must be transferred back and forth between a wheelchair and regular chair, the floor, change table or a commode and you must consider many factors.



The safety and comfort of both the lifter(s) and the student are important. But, so is the independence of the student.

Selecting a technique

Sometimes we find it easiest to simply lift a student out of a chair ourselves. However, **it is important to allow the student to be as independent, and therefore as participative, as possible.**

You must assess the following:

- Can the student bear weight through his feet?
- Can the student help by using his arms?
- Does the student extend backwards uncontrollably?
- Is the student really floppy?
- Does the student have one side that works better than the other?

This information will allow you to select the most appropriate transfer technique as well as to be prepared for the student's strengths and weaknesses in assisting you throughout the procedure.

Preparing for a transfer

- **Always explain to the student** what you are going to do.
- Ensure that the wheelchair brakes are on.
- Ensure that the wheelchair is in a proper position in relation to where you are transferring the student.
- Remove footrests and armrests as necessary.
- Assess whether you need help.
- Undo all restraints.
- Ensure that the student is wearing footwear with no-slip soles.
- Ensure that all necessary assistive devices are ready.
- While you are moving the student, **always listen to the student and watch for facial expressions** which may indicate discomfort or pain.

Transfer aids

Ascertain how much assistance the student needs so as not to interfere with independence.

There are two options:

- A **transfer board** is a smooth sliding surface that allows the student to slide from wheelchair to chair. This encourages a great amount of independence.
- A **transfer belt** is a broad belt that fastens around the student's waist. It provides a place where you can get a good grip on the student. If you think that this would be beneficial, ask your therapist for one.

Some transfer techniques

Standing transfer

Use this transfer technique when

- the student is able to take weight through her feet
- the student can help to pivot
- you are able to manage without assistance.

Preparation

- 1 Remember to explain to the student what you are doing.
- 2 Ensure that the student has no-slip soles.
- 3 Place the wheelchair parallel to the chair or at 45° to it.
- 4 Ensure that wheelchair brakes are on.
- 5 Remove footrests and armrests as necessary.
- 6 Undo all restraints.
- 7 Before starting, run through the movement sequence in your mind.

Action—refer to Figure 4

- 1 Ensure that the student is sitting with her feet flat on the floor.
- 2 Position yourself directly in front of the student.
- 3 Place your feet wide apart and use your knees to grip the student's knees.
- 4 Bend your knees keeping the back in a pelvic tilt.
- 5 Have the student put her arms around your back or trunk but *not* your neck.
- 6 Count "1..2..3.." and on each count slowly rock back and forth gaining momentum.
- 7 On "3" straighten your legs to help the student stand.
- 8 Allow the student to gain her balance and then instruct her to pivot and sit.

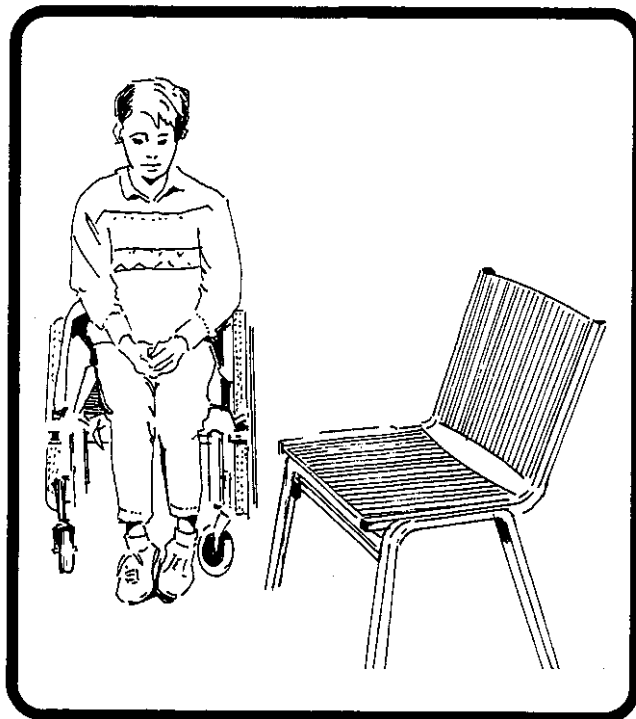


Figure 4
Step-by-step procedure for a standing transfer

Front-and-back, two-person transfer

Use this method when

- the student is unable to take his own weight
- you need assistance.



Caution!

Do not use this lift if you have to arch your back to get the student back into his chair. Rather use the next lift described.

Preparation

- 1 Remember to explain to the student what you are doing.
- 2 Designate one lifter as the leader, who will be the only one to give instructions.
- 3 Position the wheelchair at 45° to the chair, and place it so that there is enough room for the lifters to move.
- 4 Ensure that wheelchair brakes are on.
- 5 Remove footrests and armrests as necessary.
- 6 Undo all restraints.
- 7 Before starting, run through the movement sequence in your mind and discuss it with your lifting partner.

Action—refer to Figure 5

- 1 Ensure that the student is in the sitting position with his arms crossed.
- 2 Position one lifter behind the student and the other lifter at the student's side.
- 3 The lifter who is behind should reach under the student's arms and grasp his forearms.
- 4 The lifter who is at the side should place her arms under the student's thighs and lower legs.
- 5 Remember to adopt pelvic tilts and use your legs when lifting.
- 6 The leader says "1..2..3.."
- 7 Exactly on "3", both lifters start to stand. Use your knees and protect your backs.
- 8 The lifters move sideways directing the student over the chair.
- 9 Slowly lower the student into his chair.

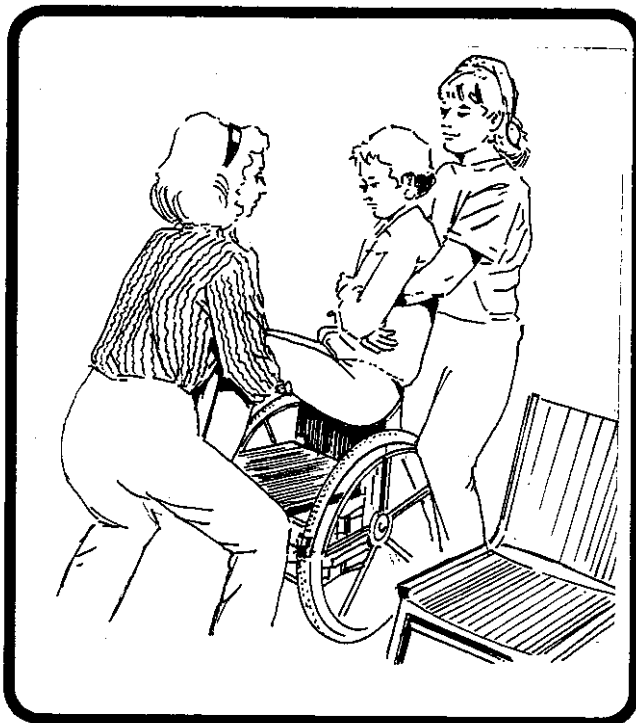
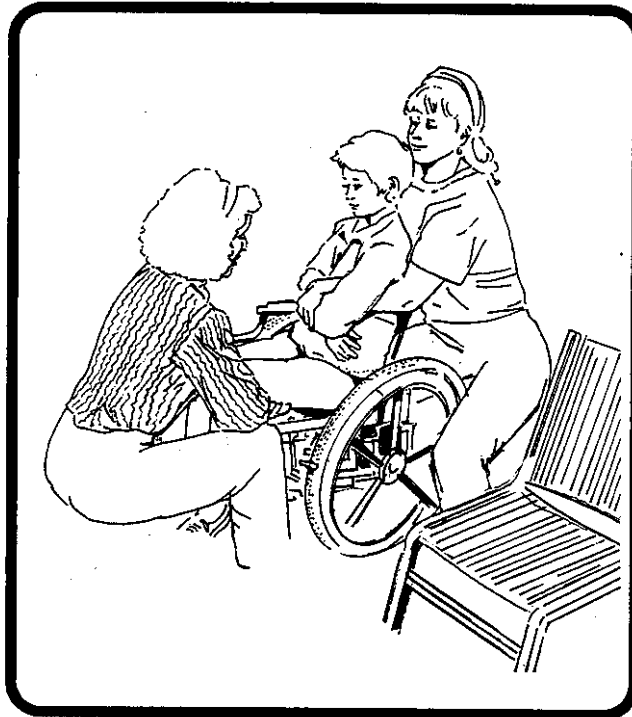


Figure 5
Step-by-step procedure for a front-and-back, two-person transfer

Side-to-side, two-person transfer

Use this method when the student is

- unable to assist you by weight-bearing
- too tall for the lifters to safely do the front-and-back transfer.

Preparation

- 1 Remember to explain to the student what you are doing.
- 2 Designate one lifter as the leader.
- 3 Place the wheelchair at right-angles to the chair and at least two feet away from it, leaving enough room for the lifters to move.
- 4 Ensure that the wheelchair brakes are on.
- 5 Remove footrests and armrests as necessary.
- 6 Undo all restraints.
- 7 Before starting, run through the movement sequence in your mind and discuss it with your lifting partner.

Action—refer to Figure 6

- 1 Place the student in a sitting position with a lifter on either side.
- 2 Place your arms under the thigh area and behind the student's back making a seat for the student.
- 3 The student should put her arms around the lifters' necks if possible.
- 4 The lifters slide the student forward on her chair.
- 5 The leader says "1..2..3.."
- 6 Exactly on "3", both lifters start lifting. Use your knees and protect your backs..
- 7 Move forward, turn, then back toward the chair so that there is one lifter on each side of the chair.
- 8 Ensure that you protect your backs as you slowly lower the student into the chair.



Figure 6
Step-by-step procedure for a side-to-side, two-person transfer

Mechanical lifts

Some students are too heavy to lift and must be lifted mechanically. There are a number of lifts on the market that are suitable for the school setting. One type of lift is shown in Figure 7.

Use this method when the student is too heavy to lift in the ways described above.



Caution!

You must be taught the proper way to use each type of mechanical lift by a dealer. They all fasten differently. Practise operating these devices before using them.

Preparation

- 1 Remember to explain to the student what you are doing.
- 2 Ensure that you are *very familiar* with the way the sling works.
- 3 Designate one lifter as leader.
- 4 Ensure that the chair is positioned where you need it and that it is facing the right direction.
- 5 Ensure that the wheelchair brakes are on.
- 6 Harness the sling system onto the student.
- 7 Run through the movement sequence in your mind and discuss it with your lifting partner before starting.

Action

- 1 The leader should elevate the student *slowly* while the other lifter guides the student towards the chair.
- 2 Once the student is properly lined up with the chair, slowly lower the student onto the chair.

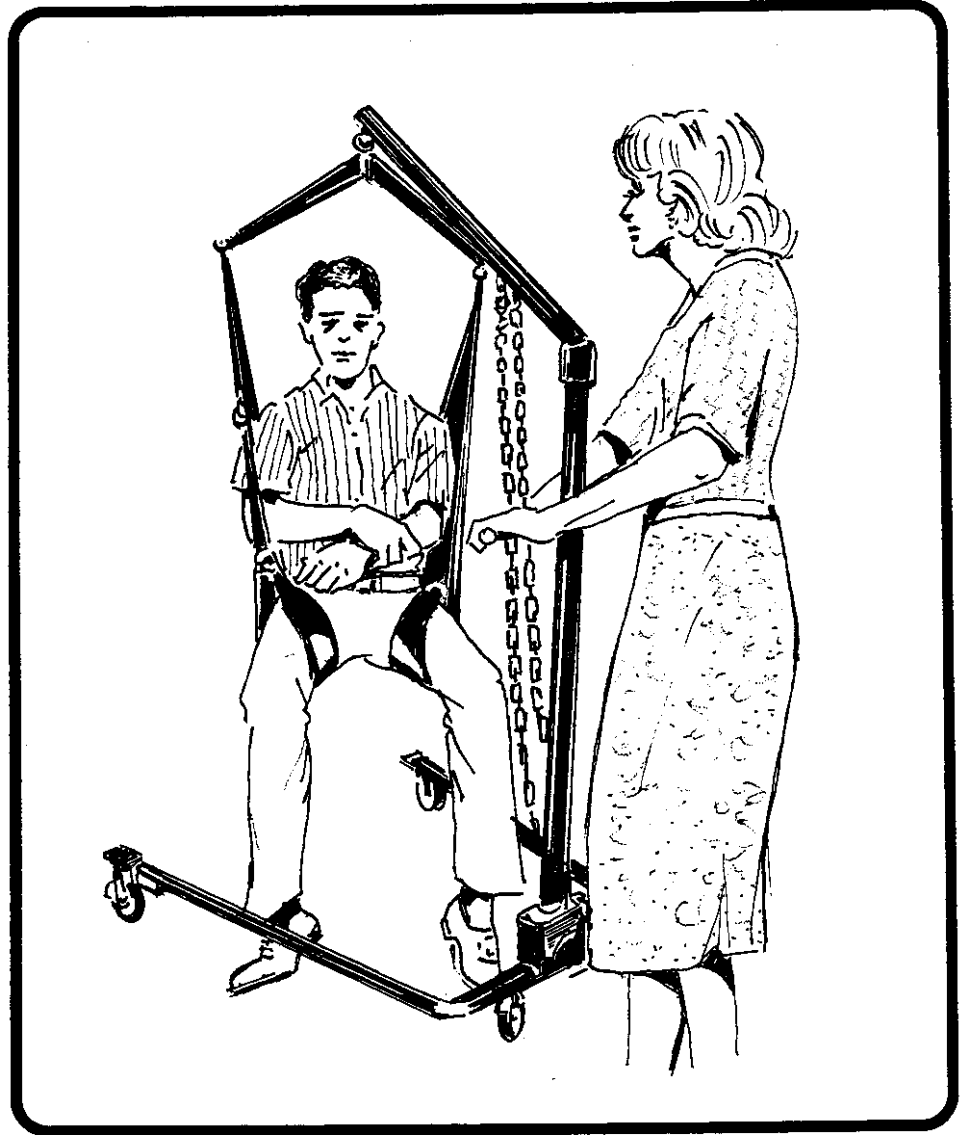


Figure 7
A mechanical sling system used to transfer a student

Resources

Books

1-2-3- Lift Transfer and Lifting Techniques for Extended Care.
To order copies send cheque or money order for \$6.00 to
Transfer Manual, P.O. Box 1341, Postal Station A, Vancouver,
B. C., Canada V6C 2T2.

Back Talk

Published by the Worker's Compensation Board of British Columbia.

Save Your Back —

A Body Mechanics and Patient Transfer Manual for Health Providers
Educational Opportunities, 7413 Washington Ave. SO., Edina,
Minnesota 55435. Phone: 1-800-654-8357.

Transferring and Lifting Children and Adolescents

Order through Therapy Skill Builders 3830 E. Bellevue,
P.O. Box 42050, Tucson, Arizona 85733. Phone: 602-323-7500.

The Back Doctor

by Hamilton Hall (1988) Berkley Publishing Group,
available through your local bookstore or library.

Audio-visual materials

How Do I lift Thee, Let Me Count the Ways.

Acute Care Unit, UBC Health Science Centre Hospital and Biomedical Communications, University of British Columbia, 1981.

Lifting and Transfer (General version, 25 minutes)

This video starts with a short skit on what can happen if patients are not properly assessed and the appropriate transfer is not used. It then demonstrates many lifts and transfers.

Wilendy Productions 1454 Delia Road Port Coquitlam, BC.
Phone: 604-942-9997

Lift and Transfer Techniques (9.32 minutes)

Description of one-person, two-person pivot and long lift,
by Anne Earthy, R.N., B.N., Nursing Staff Development
Vancouver General Hospital, 855 West 12th Avenue, Vancouver, BC
V5Z 1M9

You Can't Put People in Boxes (36 minutes)

Victoria Hospital Box 5375 London, Ontario N6A 4G5.
Phone: 519-667-6502

Spine Owners Guide (Parts 1 and 2, 22 minutes)

c/o David Chittick, Education Coordinator Media Services, Calgary
District Hospital Group 2210 2nd Street SW Calgary, Alberta,
T2S 1S6. Fax : 403-244-4149

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