

Practical Positioning for People with Disabilities

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My name is Olivia, and I am a third year physical therapy student at the University of North Carolina at Chapel Hill. I want to thank you for working so hard to take good care of your patients. I recognize that you know the patients and their needs best. I would like to work together as partners throughout this presentation so that we can provide the best care possible for them. When you finish this presentation, you should feel more confident to position your patients, and be able to show other health care providers and volunteers helpful ways to position your patients.

Do we have any nurses here? We are so excited to have you join us. You are the most important people who can help with positioning because you spend all day with the patients!

This presentation will be a mix of lecture and hands-on lab practice to ensure that you have a chance to practically apply material.

Objectives

Learners will...

1. Describe musculoskeletal, cardiopulmonary, and feeding benefits of proper positioning.
2. Describe proper pelvic, trunk, head and neck, upper extremity, and lower extremity positioning in sitting, supine, prone, side-lying, and standing positions.
3. Problem solve in groups to enhance positioning for a patient using readily available materials.
4. Collaborate to create a positioning checklist to be used in clinical practice.



Here you can read the objectives for this presentation.

Generally, there is fairly little research on positioning for people with disabilities, and most existing studies on this topic are of low quality. This presentation is designed to meet your needs here at Las Obras, and is informed by a synthesis of the best available research and clinical consensus.



I've noticed that you make sure that the patients here feel appreciated and are well cared for. Can you tell me more about your loving manner of care?

What are some common activities or routines that your patients do every day?

What activities can they do out of their chairs?

Activity



Now let's do a quick activity. Could I have two volunteers? What are your names?

I would like the first volunteer to lie on the mat, just like the child in this picture.

To the volunteer lying down – *Give toy. X*, imagine that you are a child and want to play with this toy.

To the volunteer standing up – *X*, imagine that you are the child's friend or clinician. Can you play with *X*?

It is difficult for both the child and clinician to interact when the child is in a position like this.

Now, *X*, I'd like you to lie more comfortably.

X and *X*, can you play with each other now?

As you know, it is much easier to participate in activities when the patient is in a more helpful position. Remember that good positioning promotes participation and allows the patient to socialize.



Why is positioning important?

- Makes activities of daily living like eating, drinking, playing, communicating easier¹
- Prevents/manages:^{1,2}
 - » Pressure wounds
 - » Contractures
 - » Deformities
 - » Difficulty breathing
 - » Aspiration

Why is positioning important?


Good positioning makes participation in activities of daily living easier, such as eating, drinking, playing, and communicating.

Good positioning also helps prevent problems or manage existing ones.

- When a patient spends all day in one position, pressure on the body's hard surfaces limits blood flow and can cause a **pressure wound** that is not easily reversible. It is important for patients to change positions throughout the day to prevent pressure wounds.
- Spending time in the same position or in poor positions can cause muscles and tendons to shorten. Over time, this can cause permanent muscle shortening, or **contractures**, which prevent joint movement and make it harder to play and move around. I recognize that many of your patients already had contractures before coming to Las Obras. The good news is that you can prevent these contractures from worsening through good positioning.
- Good positioning can prevent musculoskeletal **deformities** such as hip dislocation or scoliosis that cause pain and make it hard for patients to move around.
- When a patient is in a poor position, they may have a crooked chest space, which causes difficulty getting enough air through breathing. Good positioning can help

your patients breathe more easily.

- Finally, good positioning can promote safety during feeding by preventing aspiration.



Positioning: General Tips^{1,5}

- **Head and body:** straight as possible
 - » Head neutral
 - » Shoulders in line with hips
 - » Pelvis in line with trunk
- **Shoulders and arms:** forward, supported
- **Legs and feet:** legs uncrossed, supported

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Here are some general tips to consider for all positions for children and adults. The head and body should be positioned as straight as possible, with the head neutral, shoulders in line with hips, and pelvis in line with trunk. Shoulders and arms should be supported in front of the body. Legs should be uncrossed with the feet supported.



Imagine that you are working with a volunteer, and you see a patient positioned like this. How could this position be improved?

Some reasons why this position could be improved include:

- The child's head is pushing back, and she is sliding out of the chair
- The child's hips are too straight and stiff
- Her shoulders are not supported
- She is leaning sideways and is not stable

Now let's do another activity. I'd like everyone to get into groups of three.

Now that we're in groups, I'd like one group member to sit in their chair, imitating the position of the child in the picture. Try to act as much like one of your patients as possible. As you know, people with physical disabilities may find it difficult to stay in a helpful position. A clinician can assist a patient back into a more helpful position, but if he is able to correct his own position, the clinician should encourage him to do this by himself, or with as little help as possible.¹

Now let's have the other group members help the person improve their position using whatever materials you have available, like pillows or rolled towels.

Give a few minutes, then switch to next slide as groups finish up

Sitting: Helpful Positions¹



- **Head and body:** straight, not leaning back, forward, or side
- **Shoulders and arms:** supported in front of body
- **Legs and feet:** hips, knees, and ankles at 90 degrees, fully supported, legs not crossing
- Encourage the patient to correct the position by himself

As you work on the activity, here are some helpful tips for sitting positions.

When a patient is sitting, their head and body should be straight; not leaning back, forward, or to one side.

Their shoulders and arms should be supported and in front of their body so that they can use them.

The person's natural lumbar curve should be maintained as best as possible. This might be difficult if the patient is wearing a large diaper that forces them into a posterior pelvic tilt. What materials could you use to facilitate neutral pelvic alignment?

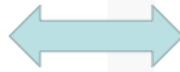
- A lumbar roll made out of a towel can help the person maintain the natural curvature of the lumbar spine.

Their hips, knees, and ankles should be in 90 degrees of flexion, with the legs uncrossed. This might be difficult if the person has a wheelchair with a soft sling seat instead of a firmer seat with a cushion. What materials could you use to keep their legs uncrossed and in a good position? Which patients might benefit from a sling seat the most?

- Cushion, block between knees

Are there any changes that you would make in the way you repositioned your patient

after learning this?



Many people with disabilities will present like the child in the photo on the left. We know that the position of the child on the right is ideal, but ideal positioning is not possible for some children. When you can't help get a patient into a position that we know is best, what are intermediate steps we can take to work towards best positioning?

Keep this concept in mind for all of the positions we'll talk about. It is worthwhile to work towards the best position possible.

Sitting for Feeding^{1,6}



Now let's do an activity about positioning for feeding.

I'm going to give each group a cup of water.

In each group, please choose one person to act as the patient, and one person to act as the clinician.

I'd like the patient to sit with their head flopped forwards, backwards, or to the side.

Next, I'd like the clinician to quickly feed the water to the patient. Don't change the person's head position or wait for the patient to be ready.

Sitting for Feeding: Helpful Positions¹



- Same tips as general sitting
- Most important: body and head upright, back of neck long



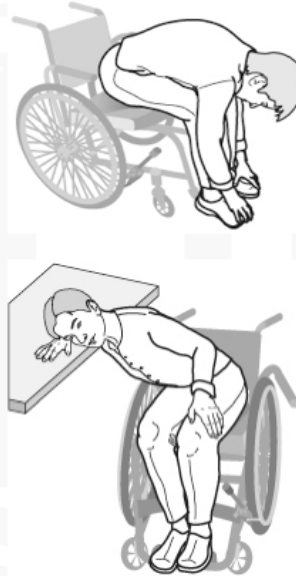
It can be helpful to keep the patient's head and neck straight, and allow them to take their time when feeding.

Now try to feed the patient water using this approach, with the head and neck upright. What are some differences you notice between the first and second approach?

I understand that many of your patients have difficulty swallowing and keeping their heads up on their own. I recognize that you have limited time and many patients to feed, and it is not so simple to feed them according to these recommendations. What are some barriers you face to using these feeding position tips in clinical practice? Do you think it could be feasible for you, your students, and your volunteers to use some of these tips for feeding?

Position Changes

- Prevents pressure wounds⁷
- Recommendation: change position every 30 minutes¹
- Pressure relief in wheelchair⁷
 - » Lean forward ≥ 45 degrees or side ≥ 15 degrees
 - » 2 minutes
 - » Caution for excessive ischial tuberosity displacement



Before we discuss this slide, let's try an activity all together. Get in your best PT posture. Now...freeze! I'd like you to stay in that position for the rest of the presentation. You can tell on your neighbor if you see them move!

Here are some recommendations on position changes.

Changing position can prevent or manage complications like pressure wounds.

Although there is no clear consensus on how often a person who uses a wheelchair should change positions, it is generally recommended to change position every 30 minutes.

I understand that it may be unrealistic to expect every patient to move out of their wheelchair every 30 minutes. Here is an idea for relieving pressure in a wheelchair.

Leaning forward at least 45 degrees or to the side at least 15 degrees has been shown to decrease pressure at the ischial tuberosities and sacrum in people who use wheelchairs. In order to restore tissue oxygenation at these bony prominences, the person should lean for at least 2 minutes.

Because the ischial tuberosities can shift during this activity, it is helpful to check skin integrity and reposition appropriately after pressure relief.

How could you see yourself helping with pressure relief and position changes? How can therapists, nurses, and volunteers work together to help make this happen?

One idea is that when you walk by a patient and talk to them, you could help them relieve pressure by helping them tilt or move them out of a poor position.

You can instruct patients on how to perform pressure relief independently.

For those who cannot perform pressure relief independently, you could give them a timer that goes off every 30 minutes.

Which patients might need pressure relief the most? (Patients with limited sensation, patients who already have pressure wounds)

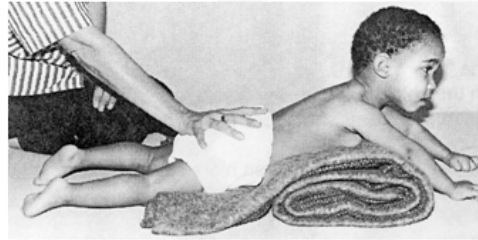
Before we finish this slide, how did it feel to sit in one good position for that long? Did you want to shift positions?

I hope that this activity can show how important it is to help patients relieve pressure and move through different helpful positions during the day. Even a helpful position can lead to discomfort or deformity if the child is left for hours in that position.¹

Now I will present some positions other than seated in a chair. Remember, even a helpful seated position in the wheelchair can lead to problems if the person is left there for long periods of time.

http://sci.washington.edu/info/pamphlets/msktc-pressure_relief.asp

Lying on Stomach: Helpful Positions¹



- Strengthens back and neck muscles, encourages weight bearing through arms
- **Head and body:** straight, looking forward
- **Shoulders and arms:** in line with or in front of shoulders, open hands
- **Legs and feet:** straight

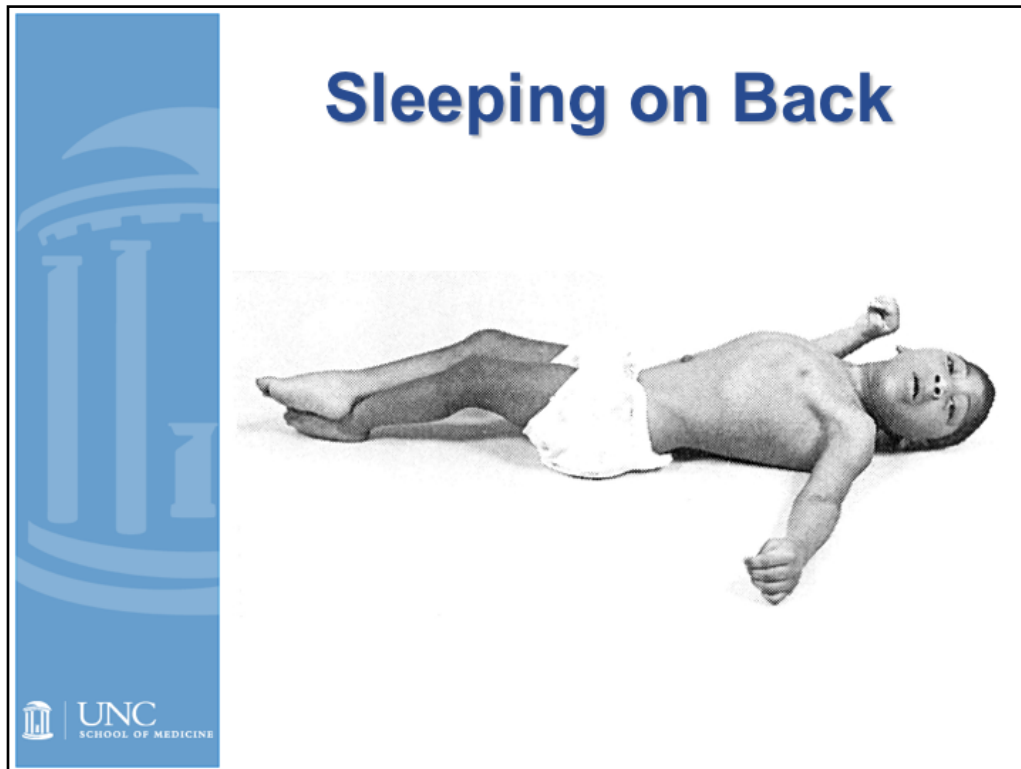
Here is one position that you could use with your patients to help them change positions throughout the day. I know that the therapists use this position frequently in physical therapy.

Is there any time, other when kids come to therapy, when they could be in this position? (Group activities, etc.)

This prone position strengthens the child's back and neck muscles, and encourages use of his arms. You can use a rolled towel or pillow under the patient's chest or put pressure on their bottom to help them push up.

The child's arms should be positioned directly under or in front of their shoulders, and they should have open hands if possible. His legs should be positioned straight behind him.

While this position is helpful for many children, this is not the best position for a patient who pushes back strongly with their head because it will not help them learn to control their head or use their arms.



Here is a picture of a child lying on their back before they go to sleep. How could this position be improved?

Some reasons why this position could be improved include:

- The child's head is pushing back and turned to one side
- The child's hips are turned in and legs are crossed
- The child can't use his hands because his arms are positioned away from the body with hands fisted

Let's get back into our small groups for a quick lab activity. I'd like one group member to lay on the table, imitating the position of the child in the picture. Now let's have the other group members help the person improve their position using whatever materials you have available, like pillows or rolled towels.

Sleeping on Back: Helpful Positions¹

- **Head and body:** straight, can support with towel rolls
- **Shoulders and arms:** forward and supported
- **Legs and feet:**
 - » Hips slightly bent with support under knees
 - » Legs abducted to 20 degrees and uncrossed, use pillow if needed



As you work on the activity, here are some helpful tips for positioning patients on their back for sleeping.

To keep the head and trunk straight, you can use towel rolls on both sides of the body to support the head and spine.

The shoulders and arms should be forward and supported, allowing the person to use their hands if they want to.

The hips should be slightly flexed with support under the knees, which can help release tension in patient's low back.

The legs should be uncrossed and positioned to 20 degrees of hip abduction. There is low-level evidence that suggests that this amount of hip abduction can decrease hip dislocation in children with cerebral palsy. To keep the legs uncrossed, you can place a pillow between the legs if needed.

Sleeping on Side



We saw this side lying position demonstrated at the beginning of this presentation. We discussed how it is difficult for the child to socialize when he can't use his arms or see his peers. This position could also be improved because his legs are crossed and his trunk is twisted.

Again, let's get into our small groups, with one person acting as the patient. I'd like the other group members to help the patient change their position to make it better for resting or sleeping. Remember that you can use the materials around you. Patients – please act as realistic as possible!

Sleeping on Side: Helpful Positions¹



- **Head and body:** head and back supported
- **Shoulders and arms:** arms forward
- **Legs and feet:** bottom leg straight, top supported with pillow

As you complete the activity, here are some helpful tips for positioning patients on their side. This position can be helpful for sleeping or resting.

The head should be supported on a pillow, and the back should be supported from behind to keep the spine straight.

The bottom leg should be mostly straight, with the top leg bent and supported to prevent hip adduction.

The shoulders and arms should be positioned forward so that the patient can use them if they want to.

*I saw “_____” sleeping like this earlier, and his positioning looked so good!



Let's talk about standing positions. Here is a picture of a young child with cerebral palsy standing with their caregiver.

What are some good things about this picture?

It is encouraging that this parent is taking time to help their child stand with support. Like we just discussed, this is an intermediate progression towards best positioning.

How could this position be improved?

This position could be improved because the child is standing with his legs crossed, which may increase risk for hip dislocation in children with cerebral palsy.

Also, his feet are not flat on the floor, which would make it difficult for the child to balance or try to take steps.

Benefits of Standing

- Range of motion/contractures^{1,8}
- Pulmonary function⁸
- Bowel and bladder function⁸
- Bone health^{9,10}
- Muscle tone⁸
- Pressure relief⁸
- Quality of life⁸
- Independence⁸



Standing programs may have many benefits for people who cannot stand or walk on their own.

Standing stretches leg muscles and tendons to prevent/minimize contractures.^{1,8}

It can improve pulmonary function, leading to fewer respiratory complications.⁸

Standing can also improve bowel motility, bladder emptying, reduce number of urinary tract infections, and improve voluntary sphincter control.⁸

It can increase low bone mineral density in areas like the femur and spine, which may decrease risk for fractures.^{9,10}

Standing programs may improve spasticity in children with cerebral palsy and developmental disabilities.

The standing position reduces pressure on bony surfaces like the ischial tuberosities and sacrum, which may help prevent pressure wounds.⁸

Standing programs can improve social and educational opportunities for children.⁸

Additionally, the standing position allows improved vertical and forward reach, which can improve ability to complete activities of daily living.⁸

Standing: Helpful Positions¹

- **Head and body:** back straight, hips forward, skin covered
- **Shoulders and arms:** forward, free to play
- **Legs and feet:** firm on ground, toes forward
 - » Orthotics as needed
 - » Wooden block/book for leg length discrepancies



For patients who cannot stand up or walk on their own, supported standing or using standing frames can help promote good standing position.

In standing, the patient's back should be upright and straight, with the hips facing forward. If it is difficult to keep the body straight, you can use materials like a towel or block to improve position. The skin should be covered to prevent abrasions to the skin.

The shoulders and arms should be positioned in front of the patient so they are free to play or do an activity.

The legs and feet should be planted firmly on the ground, with toes facing forward. The patient should bear weight through their feet, and the feet should not be easily moved.

If the patient has a contracture, you can use appropriately fitting orthotics to keep their feet on the ground. If the patient has a leg length discrepancy, you could use materials like a wooden block or a book to ensure that the legs are positioned equally.

Standing Frame Indications

- Start around 12 months; still beneficial if start later^{8,11}
- **Supine stander**
 - » Poor head control, poor trunk control, contractures - properly fitting AFOs may be helpful¹¹
- **Upright stander**
 - » Good core activation, fair postural control against gravity¹¹



Standing frames should be used with patients who cannot stand up or walk on their own. It is generally recommended to start daily standing programs for children around 12 months of age, when a typically developing child would start to stand. However, standing programs are still beneficial even if they are started at a later age.^{8,11}

Are there patients that you could think of that would benefit from time in a stander?

I know that you have two types of standers here at Las Obras.

Supine standers, when the patient stands with support behind their back, can be helpful when the patient cannot hold their head up by themselves, if they have poor trunk control, or if they have contractures that would make it difficult to be positioned in a traditional standing position. Properly fitting AFOs may be helpful to manage lower extremity contractures. If you have questions about AFO fit with your patients, Cathy here is an expert and can help you.

Upright standers, when the patient stands vertically, can be useful for patients who have good head control, good core activation and fairly good ability to hold their body up against gravity.

http://www.freedomdesigns.com/Literature/Sunny_Hill_Abduction_Poster.pdf



Standing Frame Contraindications/Precautions

- **Contraindications**
 - » Current fracture¹¹
 - » Severe pain: hip dislocation or subluxation, excessive soft tissue stretch, excessive pressure¹¹
- **Precautions**
 - » Low bone mineral density at risk for fracture: gradual tilt⁸
 - » Orthostatic hypotension: monitor blood pressure, dizziness⁸

When determining which patients would benefit from standing frames, it is important to consider different conditions to maximize safety.

Patients should not use standers if they have a current fracture or if they experience severe pain from the stander, which could result from hip dislocation or subluxation, excessive stretch of muscles and tendons, or excessive pressure.

If a patient has low bone mineral density or osteoporosis, they could be at risk for fracture. Therefore, you should be cautious and gradual when implementing standing programs with these patients. You can determine their standing tolerance using a trial of gradual standing with the supine stander, and progressively increase duration.

You should also be cautious for sudden drops in blood pressure upon standing, or orthostatic hypotension, which is present in an estimated 30% of people with disabilities. To ensure safety, you should check blood pressure and dizziness when transitioning to a standing position, especially when using a stander for the first time with a patient.⁸

Standing Dosage

- No clear dose, but generally more is better⁹
- Gradually progress to 60 minutes per day, 5 days per week¹¹
- Check skin integrity¹¹
- Hip abduction 30-60 degrees may minimize hip dislocation in children with CP¹²
- Another standing option: body weight supported treadmill training

When designing a standing program, you should consider length of time needed to ensure benefits. There is no clear dosage of time for standing, but research generally supports that 60 minutes per day, 5 days per week improves bone mineral density.⁹ Patients who have low standing tolerance can start with less time and gradually progress daily time in the stander until they reach the 60 minute target. One randomized controlled trial showed that increasing daily time in standing frames by 40% increased vertebral bone mineral density by 6% in non-ambulatory children with cerebral palsy, suggesting that more time in the stander is better.⁹ To prevent skin breakdown, you should check the patient's skin integrity in areas of higher pressure after standing.¹¹

There is also low-quality evidence that suggests that hip abduction in standing programs can minimize hip migration and dislocation in children with cerebral palsy.¹² The specific degree of abduction recommended in research varies, but has been recommended to 30-60 degrees bilaterally.¹²

I know that it's not possible for you to use the standers for 60 minutes per day with every patient here who cannot stand by themselves. Right now, are there certain patients who use the standers more than others? Who could be seen more often? Would making a schedule be helpful?

Another option for you to increase standing time for the patients is by using body

weight supported treadmill training, which some therapists here are already using here! Because patients' legs move quickly during treadmill training, you should be careful to not harm a body part.



Positioning Checklist

- Head and body
✓
- Shoulders and arms
✓
- Legs and feet
✓



As we finish up, partner up and think about one position that we discussed. Talk with your partner about how you could make it a part of your daily routine as a clinician. (Give time)

We talked about several positions in this presentation that could be helpful for patients. Let's make a summary checklist together using your ideas for you to help teach volunteers and students about positioning.

What are some ideas that you discussed how you could make positioning part of your daily routine?

In general, how should a patient's head and body be positioned? (As straight a line as possible)

What about shoulders and arms? (Forward, with hands able to touch in the middle)

Legs and feet? (Legs uncrossed, legs and feet supported)

What are important positions from this presentation for your patients when they are awake during the day? (Sitting, standing, prone)

What are important positions for when patients are sleeping? (Supine,

sidelying)

Standing

How many minutes is generally recommended for standing? (60 minutes per day, 5 days per week)

How should you position the legs of a child who has cerebral palsy to prevent hip migration and dislocation? (30-60 degrees)

Sitting

At what angle should the hips, knees, and ankles be positioned when sitting in a wheelchair? (90 degrees)

What is the recommended head position for feeding? (Head up and neck straight)

How can a patient relieve pressure when they are sitting in a wheelchair? (Move out of chair into other helpful positions, lean forward 45 degrees or lean to side 15 degrees for 2 minutes)

How often should a patient perform pressure relief in a wheelchair? (Every 15 to 30 minutes)

Prone

How can you position a patient's arms when they're on their stomach? (Under or in front of the shoulders)

What can you use to make this position easier? (Wedge, rolled towel, pressure on bottom, prone on elbows)

Sleeping on back

How can you keep a child's spine centered and straight when they are lying on their back? (Towel rolls on either side)

How should the legs be positioned? (Hips slightly flexed, legs uncrossed)

Sleeping on side

How can you keep a child's spine in good position when they are lying on their side? (Support behind back)

How should the patient's legs be positioned when they are lying on their side? (Pillow under top leg)

Thank you!

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- Photos: Cerebral Palsy Association Eastern Cape



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