Preventing Friction and Shear

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Every day we monitor and protect skin by keeping it clean, dry, and moisturized. Sometimes, skin breaks down anyway. Despite everything we do, there are more pressure injuries now than ever. Millions of new sores develop every year. These cause terrible suffering to everyone involved, from the patient's pain to the increased burden on the caregiver. They are also expensive. Patients win about 87% of lawsuits involving pressures sores, with an average amount of $250,000 paid out (the highest known was $312 million) (Portoghese et al, 2024).

Three major forces contribute to skin breakdown: pressure, friction, and shear. Most caregivers know to watch out for pressure. Pressure is anything that pushes on the body. It can be gentle or firm, harmful or not. Beds, chairs, glasses, oxygen tubing, catheters, and anything else that "squishes" the tissues cause pressure. Figure 1 shows the most common pressure-risk areas.

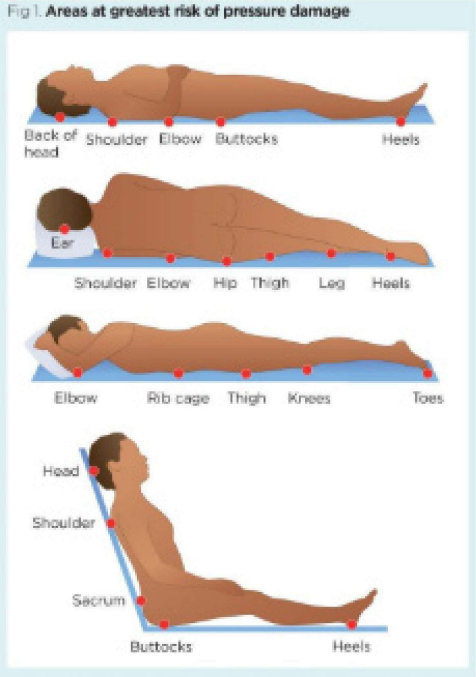

Figure 1. (Nursing times, 2020)

Friction is how the surface of one thing slides parallel across another. It can be good or bad depending on what we need at the time. A sheet of ice is perfect for a skate's thin blades to glide across. It is terrible for walking a dog. Walking shoes get great traction on a dry sidewalk, but ice skates stop in their tracks. When talking about skin (especially moist skin), the rubbing of friction can cause damage. Friction is a common cause of shallow wounds such as blisters from incontinence products and footwear (Portoghese, et al, 2024)

We would think that the best way to prevent friction is to keep all surfaces slippery so that the person can slide without rubbing the skin. If we spent the money to put the resident in all silk pajamas with silk sheets, they might slide straight out of bed onto the floor. The answer depends on the person. First, we reduce friction with slick material under fragile areas. Second, we use friction by putting regular material under the body parts (arms, legs, etc) that help the person hold themselves in position (Portoghese, et al, 2024).

To do this, we use the trick that caregivers have been using for years to keep beds clean: the draw sheet (or a slippery slide sheet). Some caregivers use two layers; however, best practice is to use one. This allows for good air flow because heat and moisture increase friction by themselves. Moisture makes the skin weaker at the same time it makes the skin stick to surfaces, then the layers erode faster (Morecroft & Lewis, 2023). If someone's skin is so fragile that they are at risk for friction to their arms and legs, your case manager also provides protective sleeves.

Shear is less well known and more complicated than friction. It moves in the same direction as friction and happens when the skeleton moves, but the skin stays in the same place. Shear has two special challenges. First, shear is a concern even when the resident is not moving (Portoghese, et al). Second, caregivers cannot predict shear by looking at how strong or fragile the outside of the skin is. The skeleton damages the body on the inside (Hess, 2004). Once the caregiver finds the area of concern, the skin and deeper tissues are already damaged.

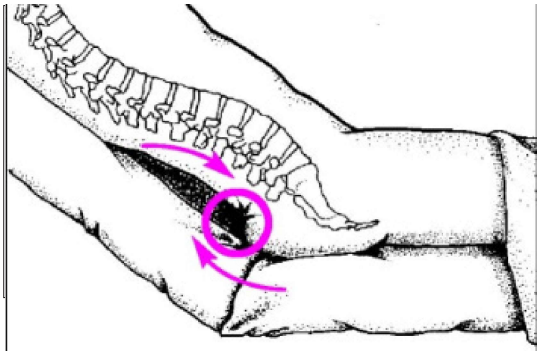

Figure 2 (Hess, 2004)

Imagine a person who has trouble repositioning themselves lying in a hospital bed. The weight of their skeleton pulls them down toward the foot of the bed. The skin, especially if it is loose, stays stuck in the same place on the bed. This causes the normal padding of the buttocks to stretch and bunch up toward the lower back (see figure 2). If the caregiver pulls the person up in bed, their bones drag back over the skin and bunch it up the other direction.

One of the first things we think of with fragile skin is what type of bed or chair cushion they use. The best support surfaces should wrap around the person a little. The surface should support them and let them sink in a bit. (Portoghese et al, 2024) Their body should not hit the bottom of any support surface.

Positioning also plays a role in preventing friction and shear. The best way to avoid shear is to lie completely flat (Portoghese et al, 2024). Many people cannot do this. Even if they could, the lack of mobility and pressure on the same spots would cause other problems. Also, any activity a person can do to keep themself strong will help them maintain their own position. People who are too weak to move slide down in bed more easily and cannot adjust themselves back up. To prevent sliding down, it is best to keep the head of the bed less than 30 degrees (one-third up from flat) if they can tolerate it (Portoghese et al, 2024). If they must have the head of the bed higher than 45 degrees (midway between flat and straight up) for shortness of breath or aspiration precautions, then we should bend their knees to keep them from sliding. We support the knees by adjusting the hospital bed or using pillows. While bending the knees helps with the force of shear, it increases pressure to the tailbone. It is best to put the head of the bed down to less than 30 degrees as soon as possible (Portoghese et al, 2024) and possibly to be repositioned off the tailbone to give it a break.

Lifting techniques are a challenge for caregivers that must work alone. Due to cost, time, and staffing, it used to be common to hook an arm under someone's armpit and drag them up in bed. Best practice now protects both the person's skin and the caregiver's back. We now use the two-person lift with a draw or slide sheet. If the resident has a hospital bed, and it is safe for their medical conditions, lowering the head of the bed lets gravity help (See figure 3).

If someone needs a two-person boost in bed, they may need a mechanical lift for transfers. Regardless of how they are repositioned or transferred, there is a last step that helps prevent shear. Whenever we see bunched or stretched skin that is stuck to a surface, we push down on the surface to release the skin. This lets the tissues shrink back to where they are supposed to be (Portoghese et al, 2024)

Figure 3. (Fragala, 2011)

We must manage pressure, friction, and shear because they directly cause skin breakdown. The more forces we add to the skin, the worse the damage is. Cells and tissues stretch, flatten, and cannot get the oxygen and nutrition they need. The cells that suffer most are the ones that need the most food and oxygen, such as the skin and muscles. Caregivers' careful monitoring, care, and reporting are the most important prevention for skin breakdown (Portoghese et al, 2024).

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