

## The Skin You're In: An Overview of Maintaining Skin Integrity for Individuals with Spinal Cord Injury

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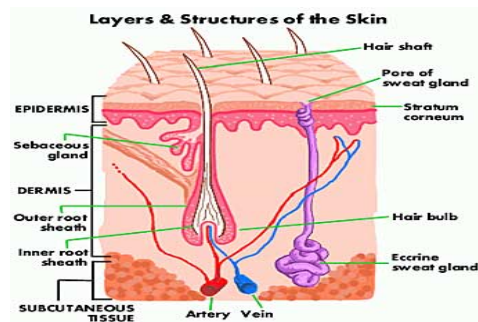
### Objectives

- Identify Skin Risk Factors and interventions for Skin Care in the Spinal Cord Injured Patient
- Identify treatments for impaired skin integrity and cost containment issues in the Spinal Cord Injured Patient

### Taking a look under

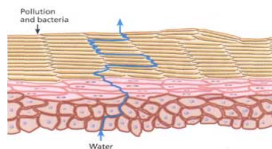


### Simple A/P of Skin ( the largest organ of the body)



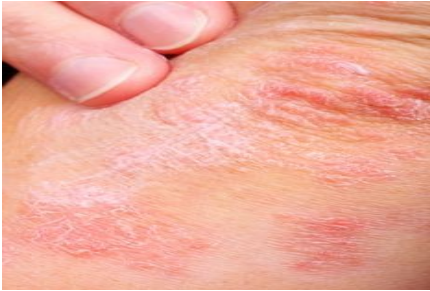
### Epidermis

- Outer Layer that contains 5 sub-layers. As the cells move into the higher layers, they flatten and eventually die.
- The top of the epidermis layer is made of dead flat skin cells.
- Its Constantly be rubbed, scrubbed and replaced with new skin cells every 2 weeks



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Too much "shedding" leads to over dryness



**Dermis**  
What makes your skin so sensitive



- It's the middle Layer that contains blood vessels, hair roots and sensitive nerve endings.
- Think of "hair standing on end" a blister or shaving nubs that pop up.



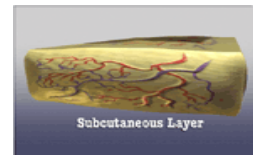
Peeling from a blister



**Subcutaneous**



- The inner layer that contains fat cells and sweat glands. This layer helps control body temperature and provides a way to rid the body of waste products

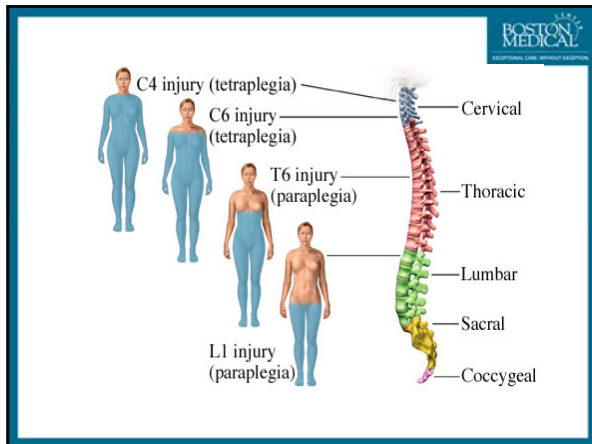


**Bruise**



Its all about the skin your in...





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**In a Spinal Cord Injured Patient Interruption of nerve pathways causes changes in sensation**

- Pressure, sharpness, hot or cold are felt differently or not at all (anesthetic skin)
- Spasticity creates shearing damage to the skin as it rubs up against clothing, bedding and wheelchair parts.
- The gradual sliding of gravity and wrinkling of the skin

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**...And the lack of dermatomes**

- "Dermatomes" are the skin's nerve endings which becomes eliminated below the SCI site which cause the absence of sensation.
- SCI also paralyzes sweating in dermatomes below the injury level.
- Autonomic hyperexcitability- Abnormal increase in sweating above the injury site, often the upper torso and face. Sometimes only on one side of the face and not the other.

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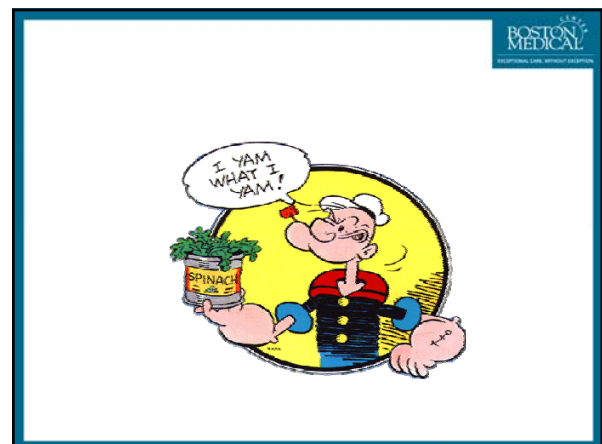
**What's below the injured skin is not the same as the skin above**

- Decreases amino acid concentration
- Decrease the proportion of Type 1 to Type 2 collagen
- Decrease blood flow >Abnormal vascular reactions
- Decrease PO<sub>2</sub>-5X less then the innervated skin
- Abnormal vascular reactions (postural hypotension)

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**Honest Facts that cause skin break down**

- Poor nutrition
- Dehydration
- Excess moisture due to sweating, bowel and bladder accidents
- Decrease blood supply to skin
- Excessive exposure to heat, cold, chemicals
- Excessive pressure over bony areas



**Knowing your body shape and size can help determine the skins needs**

The image shows two rows of human silhouettes. The top row is labeled 'Female' and contains seven silhouettes representing different body types, with labels T1, T2, T3, T4, T5, T6, and T7 below them. The bottom row is labeled 'Male' and contains seven silhouettes representing different body types, with labels M1, M2, M3, M4, M5, M6, and M7 below them. The silhouettes vary in height, weight, and body shape to illustrate diversity in skin care needs.

**Incidence of Skin breakdown in SCI Patients**

- Incidence of SCI continues to be 80% male, 20% female
- Substantial physiological differences exist between genders
- Increase incidence with as the SCI person ages

**Law of Gravity**  
What goes up, must come down

The illustration shows a hand lifting a leg from the floor. Red arrows point downwards from the leg, indicating the force of gravity pulling it back down to the ground.

**Shearing**

The diagram shows a cross-section of skin with a red arrow pointing to the right above the surface. Below the surface, the skin layers are being pulled in opposite directions, illustrating the mechanical stress of shearing.

**Friction**

The diagram shows a cross-section of skin with red arrows pointing in various directions across the surface, representing the rubbing or friction forces that can damage the skin.

**Moisture**

The diagram shows a cross-section of skin with blue water droplets falling onto the surface, representing moisture exposure.

**Pressure**

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**Typical "set up" for a pressure ulcer**

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**Bone over skin that can causes an ulcer**

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**Most Problematic area for shearing**

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**Too much rubbing**

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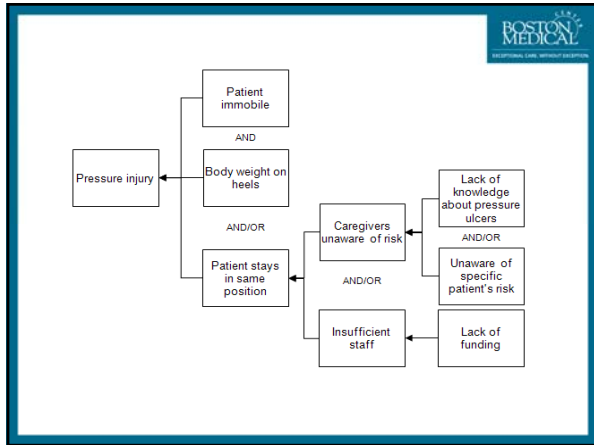
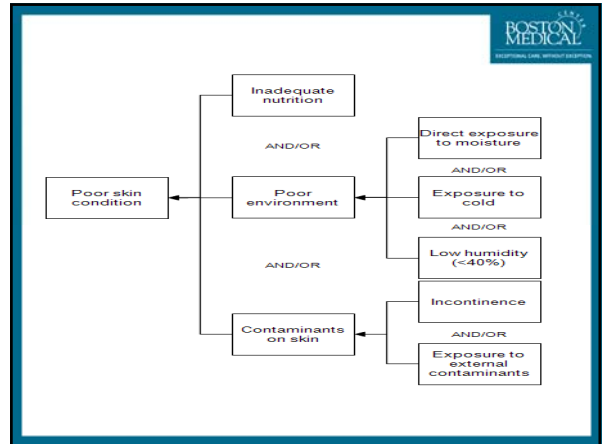
**Shear and Friction**

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## The "Soreness" around Pressure Ulcers

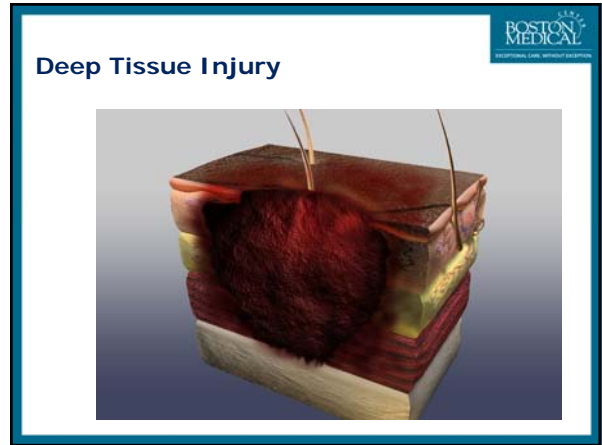
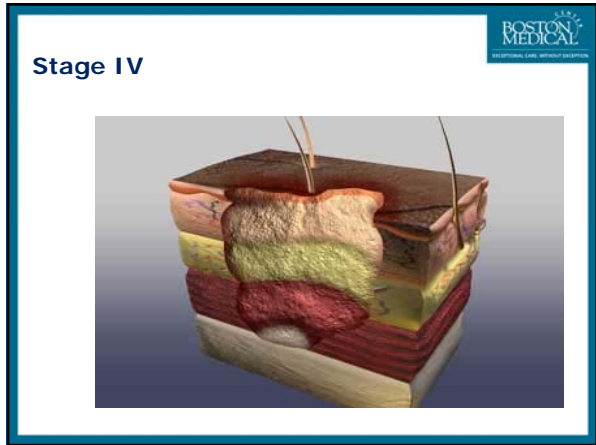
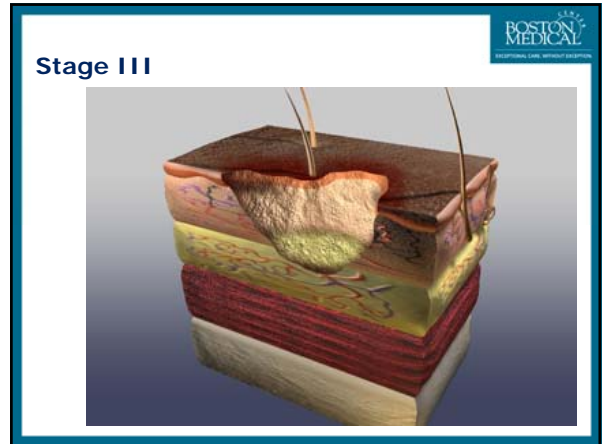
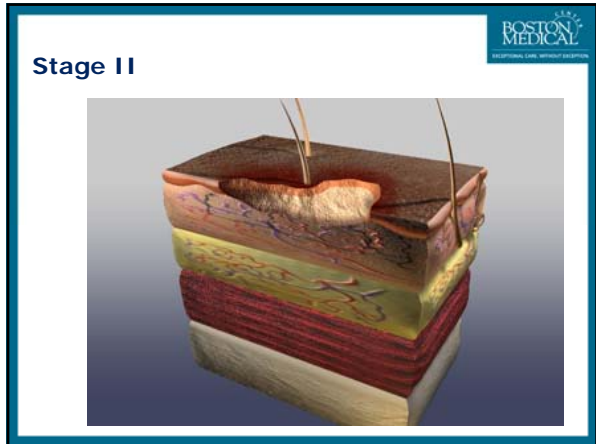
Quick review on Staging Pressure Ulcers

## Why so "sore"?

**Elevated Head of Bed**  
Lying with the backrest at a 45° angle causes a high combination of shear stress and pressure at the buttocks and sacral area.<sup>19</sup>  
i.e. patients with respiratory compromise





**Pressure**

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**Pressure Points**

Heels • Buttocks • Sacrum • Hip Bone • Elbows • Head

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**Reclining Pressure Points**

90 degrees

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**Sitting Pressure Points**

Shoulder Blades  
Sacrum  
Buttocks  
Knees  
Heels

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**Its time build on your knowledge**

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**Got damaged skin? How do you fix it?**

Failed attempt to get "under the world" on the wingtip

Trapped oil and debris  
Blocks pores in the pores

Blurred vision

Red itchy (Allerg)

Friction from  
your intense  
hand-to-hand motion

Wounded in action during tennis  
I didn't even touch the ball.

Frisk single gym accident

Really, really useful to use  
"I Don't Even Know"

For all of life's little disasters.  
**BAND-AID**

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### Take the preventative approach! Promoting healthy skin



- Good diet and fluid intake
- Hygiene
- Selecting proper clothing
- Awareness of temperature extremes
- Pressure relief strategies, weight shifts and positioning
- Managing Stressors

### You Are What You Eat!



### Nutrition Pay attention to your intake



- Proteins (lean meats, soy, dairy)
- Vit. A and C (building blocks for tissue)
- Minerals- copper, zinc and iron
- A minimum of two liters of fluid a day  
avoid fluids that act as diuretics which can cause  
excess fluid loss (coffee, tea, beer)

### Long Term Nutritional needs



- **Calcium**- Can prevent Osteoporosis, improve muscle and nerve functioning. It's also necessary for blood clotting.
- **Fiber**- "Invaluable" in maintaining healthy bowel function, as patients who have SCI are prone to constipation due to immobility. Fiber can be found in vegetables, fruits and starches.
- **Protein**- Essential for healthy muscle, skin and immune system. Avoid diets that are high in protein and low in carbs; this may contribute to kidney problems
- **Salt (Sodium)**- It regulates fluid balance, contraction of muscles, conduction of nerve muscles. Too much sodium can cause water retention, heart and kidney disease, and stroke.
- **Water**- Regulates the body temperature, adds in the digestion of food, prevents urinary tract infections and kidney stones. "Water is the key to bowel management". A aSCI patient to strive to drink at least 8 glasses of water a day!

### You don't always need to make a fashion statement!



### Just make good choices!



- Dress for the weather! (Wear breathable clothing like wools and cotton blends.)
- Wear socks with shoes. Shoe size should be one size larger than prior to injury.
- Avoid sitting on seams and back pockets. (Watch out where you place your cell phone!)
- Too loose- Loose clothing can form wrinkles that can cause pressure on your skin.
- Too tight- Overly tight clothing can hinder circulation.

### Other skin and clothing tips

- **Heat-** Avoid sunburn by using sun-blocks all over including feet. Check Vinyl seats before you sit on them to make sure they aren't too hot. When camping, keep feet a safe distance from the campfire.
- **Cold-** Be sure to dress warmly to prevent frostbite, if out in the cold for long periods of time. Dressing in layers of clothing will provide extra warmth. Avoid putting frozen foods or bags of ice on your lap.

### Can someone please explain....



### Overall good skin care

- Avoid using "antibacterial" soaps. These reduce the skin's acidity which helps protect from infection.
- Skin fold, creases, and "other nooks and crannies" need washing more frequently- twice daily is the best. Clean up soiled skin immediately to prevent skin breakdown.
- Avoid talc powders, they can actually promote yeast growth! Do not over use moisturizing creams over bony areas since they may soften skin and promote skin breakdown.
- Finger and toe nail care is a must! See a podiatrist for any toe nail deformities (especially if you have Diabetes). Cut nails straight across to avoid ingrown nails.

### Look familiar



### Common skin problem from not keeping skin clean



### No Pressure Here!



**Tried and true pressure relief techniques**

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**Less obvious techniques (subtle movements count)**

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**Pressure Redistribution Support Surfaces- Medicare Coverage Criteria**

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**Group 1 Pressure Redistribution Support Surface Products**

- Foam mattress overlays –foam height 2" or greater
- Gels
- Must be durable, waterproof
- Can be directly placed on a hospital bed frame

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**Group 1 Support Surfaces**

- Completely immobile-patient cannot make changes in body position without assistance.
- Limited mobility-patient cannot independently makes changes in body position significantly enough to alleviate pressure
- Any Stage Pressure Ulcer on the trunk or pelvis

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**Group 2 Support Surfaces**

- Multiple Stage II pressure ulcers located on the trunk or pelvis. The patient has been on a comprehensive ulcer treatment program for at least one month and also using a Group 1 support surface
- The ulcers have worsen or remained the same for at least one month.
- Large or multiple Stage III or IV pressure ulcer on trunk or pelvis
- Myocutaneous flap or skin graft for a pressure ulcer on the trunk or pelvis within the past 60 days of surgery
- The patient has been on a group 2 or group 3 support surface prior to a recent discharge from a hospital or nursing facility within the past 30 days.

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## Group 2 Support Surfaces

- An air pump or blower which provides either sequential inflation and deflation of air cells or a low interface pressure throughout the mattress
- Inflated cell height which air is circulating at 5 inches or greater. Air pressure provides adequate patient lift, reduces pressure and prevents bottoming out
- A surface deigned to reduce friction and shear and that can be placed directly on a hospital bed frame.

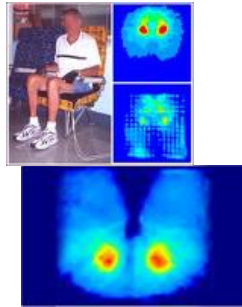
## Wheelchair cushions

- Always use a skin protection seat cushion
- Any skin issues qualify for a wheelchair cushion
- Any absent or impaired sensation in the pelvic area qualifies for a positioning seat cushion ie "scoop" sacral ischium seats.
- Don't use a extra pillows over wheelchair cushions
- Needs to be evaluated by PT/OT
- Should have pressure mapping done if new skin breakdowns occur
- New cushion every 2-3yrs depending on the cushion



## Pressure Mapping

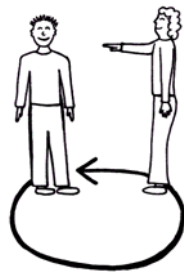
- Used to assess distribution of various anatomic locations.
- A pressure mapping device that pinpoints areas of concern are more helpful vs visualizing whole body pressure.
- NPUAP is in process of developing standardized testing methodology for pressure redistribution surfaces to accurately compare products.



## Support Surfaces can ONLY Redistribute Pressure!



## It's your turn now



## Personal Story

"Mike" is a para, injured over 10 years ago. He was in an acute care hospital during the winter because of a respiratory infection. While there, he developed a pressure ulcer on his buttocks and one heel. He admits to not checking his skin while there but expected the staff would do so and thought he would have the right kind of bed to prevent this. He had not had a pressure ulcer in about 8 years

### A great Question!

What do acute care hospitals have in place to help prevent this from happening? Will mentioning a sore in his medical records be enough of a red flag for future care?

### CMS changes on October 1,2008

Stage III and Stage IV pressure ulcers were added to the list of preventable hospital acquired conditions.

Payment to these hospitals is denied if these conditions develop.

### Agency for Healthcare Research and Quality (AHRQ) Guidelines and Interventions

- All patients skin inspected daily
- Use positioning techniques
- Moisturize skin
- Incontinence management
- Written turning schedule
- Written care plan for prevention interventions
- Nutrition evaluation
- Teaching patient and family

### Reporting System for Pressure Ulcers at BMC

- If any skin breakdown occurs after 24 hours of admission (if within 24 hours, can modify admission assessment)
- To be completed with hospital acquired alteration in skin integrity(can be related to trauma-skin tear, device, tape or pressure, allergic reaction, etc.)
- Admitted stage III & IV or unstageable pressure ulcers, from an outside facility.

### Risk Assessment Tool Braden Scale (Most common)

**More than a number; it involves identifying the risk factors that contributed to the score and minimizing those specific deficits**

- Sensory perception
- Moisture
- Mobility
- Nutrition
- Friction & Shear

\*\*Patient is considered at risk for skin break down with a Braden Scale of 18 or less.\*\*

### So why so important?

- A Stage 3 or 4 hospital acquired pressure ulcer is considered a serious reportable event (SRE).
- DPH mandates that we report an SRE within 7 days and conduct a root cause analysis within 30 days.
- A root cause analysis is a confidential review, coordinated by the Risk Management Dept.
- The purpose is to identify problems and correct to prevent future occurrences.
- New CMS regulations, not reimbursable.

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**BRADEN RISK ASSESSMENT SCALE**

					SCORE	
<b>SENSORY PERCEPTION</b> Ability to respond meaningfully to pressure-related discomfort	1. <b>Completely Limited:</b> Unresponsive (does not wince, flinch, or grasp) to painful stimuli, due to diminished level of consciousness or sedation. OR limited ability to feel pain over most of body surface.	2. <b>Very Limited:</b> Responds only to painful stimuli. Cannot communicate discomfort except by moaning.	3. <b>Slightly Limited:</b> Responds to verbal commands, but cannot always communicate discomfort or need to be turned. OR has some sensory impairment that limits ability to feel pain or discomfort in <u>1 or 2 extremities</u> .	4. <b>No impairment:</b> Responds to verbal commands. Has no sensory deficit which would limit ability to feel or voice pain or discomfort.		
<b>MOISTURE</b> Degree to which skin is exposed to moisture	1. <b>Constantly Moist:</b> Skin is kept moist almost constantly by perspiration, urine, etc. Dampness is detected every time patient is moved or turned.	2. <b>Very Moist:</b> Skin is often, but not always moist. Linen must be changed at least once a shift.	3. <b>Occasionally Moist:</b> Skin is occasionally moist, requiring an extra linen change approximately once a day.	4. <b>Rarely Moist:</b> Skin is usually dry, linen only requires changing at routine intervals.		
<b>ACTIVITY</b> Degree of physician activity	1. <b>Bedfast:</b> Confined to bed.	2. <b>Chairfast:</b> Ability to walk severely limited or non-existent. Cannot bear own weight and/or must be assisted into chair or wheelchair.	3. <b>Walks Occasionally:</b> Walks occasionally during day, but for very short distances with or without assistance. Spends majority of each shift in bed or chair.	4. <b>Walks Frequently:</b> Walks outside the room at least twice a day and inside room at least once every 2 hours during waking hours.		

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<b>MOBILITY</b> Ability to change and control body position	1. <b>Completely Immobile:</b> Does not make every slight changes in body or extremity position without assistance.	2. <b>Very Limited:</b> Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently.	3. <b>Slightly Limited:</b> Makes frequent through slight changes in body or extremity position independently.	4. <b>No Limitation:</b> Turns most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation.	
<b>NUTRITION</b> Usual food intake pattern	1. <b>Very Poor:</b> Never eats a complete meal. Rarely eats more than _____ of any food offered. Eats 1-2 servings or less of protein (meat or dairy products) per day. Takes fluids freely. Does not take a liquid dietary supplement. OR is NPO and/or maintained on clear liquids of IVs for more than 3 days.	2. <b>Probably Inadequate:</b> Rarely eats a complete meal and generally eats only 1/2 of any food offered. Protein intake includes only 1 serving of meat or dairy products per day. Occasionally will take a dietary supplement OR receives less than optimum amount of liquid diet or tube feedings.	3. <b>Adequate:</b> Eats over half of most meals. Eats a total of 4-6 servings of protein (meat, dairy products) each day. Occasionally will refuse a meal, but will usually take a supplement if offered. OR is on a tube feeding or TPN regimen which probably meets most of <u>nutritional needs</u> .		
<b>FRICTION AND SHEAR</b>	1. <b>Problem:</b> Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spasticity, contractures or agitation lead to almost constant friction.	2. <b>Potential Problem:</b> Moves freely or requires minimum assistance. During a move skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains good relatively good position in chair or bed most of the time but occasionally slides down.	3. <b>No Apparent Problem:</b> Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during moves. Maintains good position in bed or chair at all times.		
<b>SCORE</b>				TOTAL	

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**A word about wound care products**




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**Just remember, ask a Professional Health Care person! Don't rely on product gimmicks, or magic remedies**



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**Some other Product Guidelines**




You don't have to go there alone, there are so many SCI resources you can contact!



Ok folks, that's a wrap!



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"Okay, folks, that's a wrap!"

Any Questions?



"... Any questions?"

Links to wheelchair clothing websites:

<http://www.disaboom.com/entertainment-general/wheelchair-clothes-where-to-shop-for-adapted-fashion>

<http://www.bewheelchairfashionable.com/wheelchair-clothing.html>

<http://www.adaptive-apparel.com/>

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

Group 2, wheelchair links for reimbursement:

<http://www.tmhp.com/HTMLmanuals/TMPPM/2010/2010TMPPM-27-062.html>

[medicare.gov](http://www.medicare.gov)