





- Shear is a **stress** causing deformation
- **Shear strain** is the amount of distortion/deformation
- 2 main factors in shear strain
  - Pressure
  - Co-efficient of friction
- Can't **eliminate** pressure on the buttocks if someone is sitting



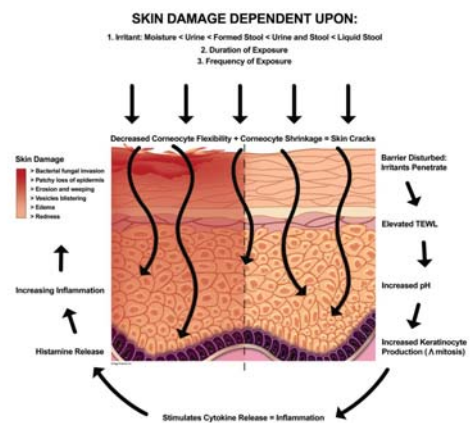
Courtesy of Mark Payette, CO ATP  
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## Moisture Associated Skin Damage (MASD)

- Inflammation and erosion of the skin caused by prolonged exposure to various sources of moisture<sup>1</sup>
  - urine, bowel effluent, perspiration, wound exudate, mucus/saliva
- Types of MASD
  - Incontinence Associated Dermatitis (IAD)
  - Intertriginous Dermatitis (ITD)<sup>1</sup>
- Moisture injured skin has impaired intolerance to friction<sup>1</sup>
- MASD often coexists with pressure ulcers<sup>1,2</sup>
- If the patient is not incontinent, there is no IAD<sup>2</sup>
- IAD **does not** lead to full thickness ulceration<sup>2</sup>

1. Gray M, Black JM, Baharestani MM, Bliss DZ, Colwell JC, Goldberg M, Kennedy-Evans KL, Logan S, Ratliff CR. Moisture associated skin damage: Overview and pathology. Journal of Wound Ostomy Continence Nursing. 2011;38(3):233-241.

2. Beekman D et al. Proceedings of the Global IAD Expert Panel. Incontinence Associated dermatitis: moving prevention forward. Wounds International 2015. [www.woundsinternational.com](http://www.woundsinternational.com)



Courtesy of SAGE® products

Factors	IAD	Pressure Ulcer (Stage I or II)	Friction Skin Injury
Cause/exposure	Urine or stool	Pressure, shear forces	Friction, moisture, sliding
Location	Lower torso skin folds, convex surfaces in extreme cases	Usually over bony prominences or under medical devices	Convex, fleshy surfaces of the buttocks and posterior thighs
Shape	Blotchy, not uniform, irregular	Usually round, single lesion	Irregular, multiple or single lesions. Hypertrophic skin changes, lichenification
Depth	None or shallow, not full thickness	None or shallow, not full thickness	None, partial and full thickness skin loss
Edges	Irregular, diffuse; very shallow	Well demarcated if ulcer present	Irregular with palpable changes including thickening, ridging and hyperkeratosis
Wound tissue presentation	Shiny, red, glistening; no slough in wound bed	Shiny, pink or red open wound bed; no slough in wound bed	Often dry with slough and/or fibrin depending on depth. May be deeper red if deeper injury or ulcer (shallow subcutaneous tissue). Not a deep crater but may cover a large surface area.
Color of periwound skin	Red or white (depending on maceration), irritated, edematous; erythema usually blanchable	Non-blanchable erythema of intact skin	Blanchable erythema of intact skin or chronic discoloration/hyperchromia, irritated/inflamed, edematous. Tissue very friable and fragile in appearance. May beed easily. Lichenification and scaling. Skin ridging and thickening palpable in advanced cases.

Berke, CT. (2015). Pathology and Clinical Presentation of Friction Injuries: Case Series and Literature Review. *Journal of Wound, Ostomy and Continence Nursing* 42(1), 47-61.



## Friction Injuries (Fci)

Published cases: 45 (now over 100)

30-90 y/o,

BMI 19-61 (47% obese)

78% sensory impaired

98% impaired mobility

36% non ambulatory

60% used a mobility device

69% incontinent

56% recliner "nest"

20% HOB elevation

Berke, CT. (2015). Pathology and Clinical Presentation of Friction Injuries: Case Series and Literature Review. *Journal of Wound, Ostomy and Continence Nursing* 42(1), 47-61.



## Friction Injuries (Fci)

### Distinguishing characteristics:

Location

Shape

Tissue involvement

Tissue changes:

Lichenification &/or Skin scaling

Hypertrophy of the skin (callus) &/or Skin ridging growth in

direction of sliding

Ulcers: shallow, does *not usually* include fascia or muscle

but can involve subcutaneous layers

Tissue Discoloration

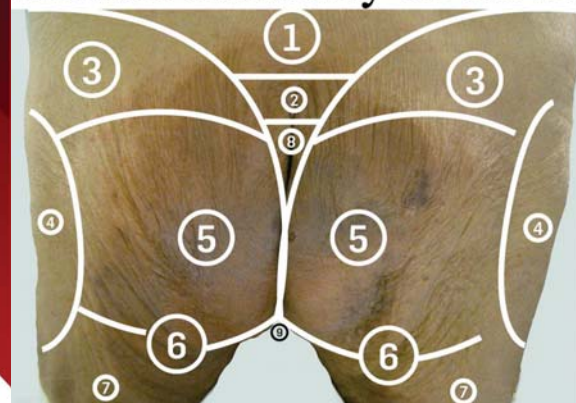
Post Inflammatory Hyperpigmentation vs. Deep Tissue Injury?

Venous congestion vs. arterial ischemia?

Berke, CT. (2015). Pathology and Clinical Presentation of Friction Injuries: Case Series and Literature Review. *Journal of Wound, Ostomy and Continence Nursing* 42(1), 47-61.



## Surface Anatomy of the Buttocks



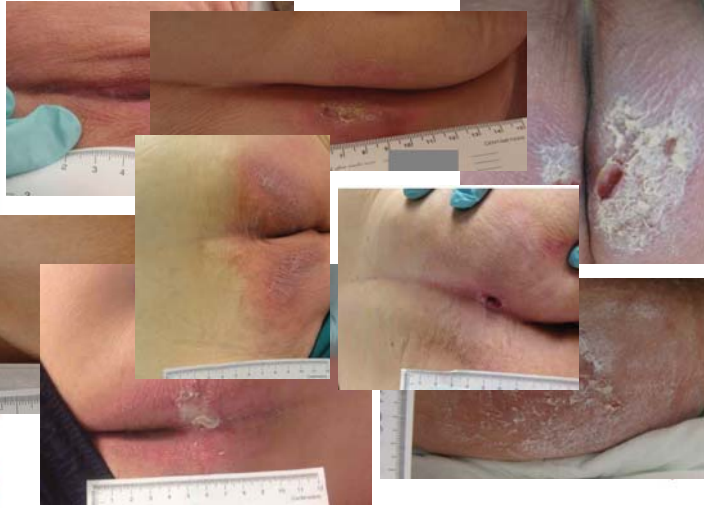
1. Sacrum
2. Coccyx
3. Posterior Iliac Crest
4. Trochanter
5. Gluteal Region
6. Ischium
7. Posterior Thigh
8. Gluteal Cleft
9. Perineal Area

Berke/Morris 2015 ©

Berke, CT. (2016). Visual Guide for Accurately Designating the Anatomic Location of Buttocks Lesions. *Journal of Wound Ostomy and Continence Nursing* 43(2), 148-49.



**Lichenification & Scaling**



**Skin Hypertrophy & Tissue Ridging (Callus & Deformation)**



**Ulcers**



**Tissue Discoloration**



**Pressure Injury**

How to differentiate:

- Location
- Skin changes
- Depth of tissue involvement
- Evolution & Resolution
- Shape(s) of ulcers
- Wound edge presentation
- Activity and Mobility of the patient

**DTI**



**MASD**



Pressure Injury: a disease of Immobility.  
 Friction Injury: a disease of impaired movement/mobility.  
 Neuropathic ulcer: a disease of impaired sensation.



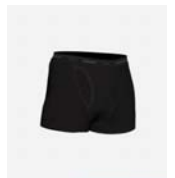
**Treatment Focus**

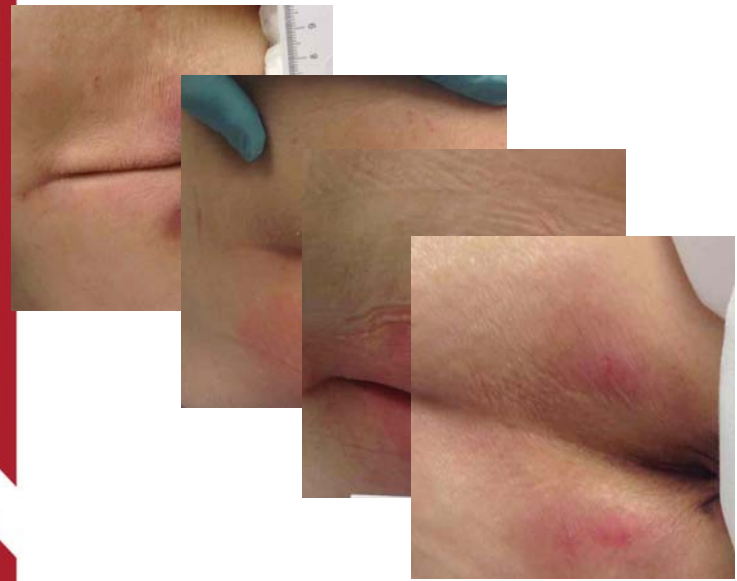
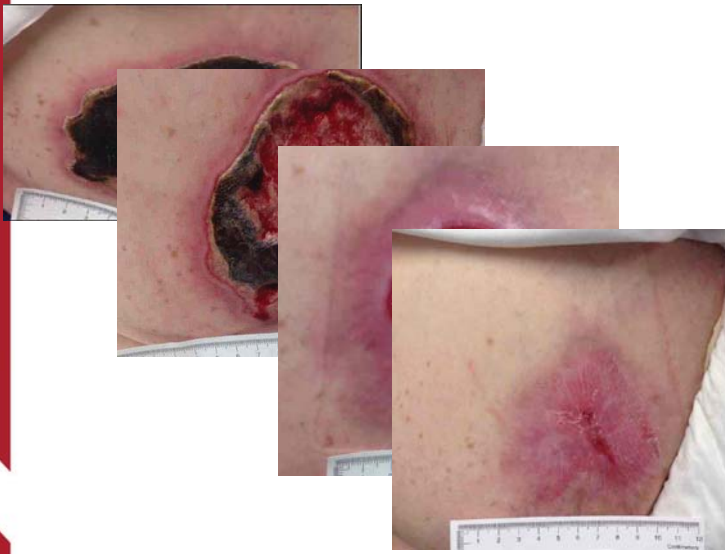


1. Stop Sliding – **E**ducate the patient/family
2. No sleeping sitting up or semi-recumbent
3. No sitting in bed, discuss recliner chairs
4. Evaluate mobility, transfers, repositioning
5. Evaluate limb strength
6. Use of physical supports &/or aides



7. Evaluate seating and foot support
8. Slick surfaces (underwear, thin air filled seat cushions)
9. Referral to PT/OT– be specific what you want them to do
10. Moisturize dry skin
11. Manage moisture
12. Wound Care





## Focus for the Future

1. Continue to discuss and expand the knowledge base of friction damage (abrasion) to human skin and subcutaneous tissues.
2. Continue to recognize and define what friction lesions and related skin changes look like.
3. Identify the prevalence of friction damage in acute, long term and out-patient/home care settings.
4. Identify risk factors for friction related skin and subcutaneous tissue damage.
5. Differentiate acute and chronic skin/tissue changes related to friction damage.
6. Identify how friction damage is prevented and treated.



7. Identify the long term outcomes of friction damage.
8. Differentiate ulcerations caused by pressure, friction and moisture damage.  
*Top down versus Bottom up tissue/skin damage*
9. Discuss/identify if and/or when moisture causes skin ulcers  
Partial versus Full thickness
10. Identify/discuss the etiology of stage 2 pressure injuries in relation to friction, especially heels.



## References & Resources

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