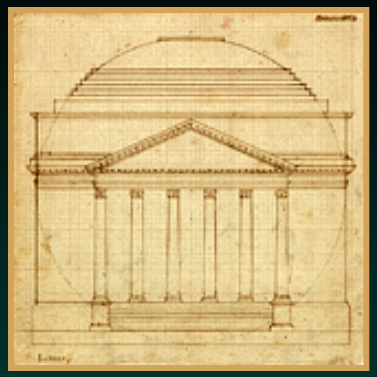

Incontinence Associated Dermatitis: Update 2013

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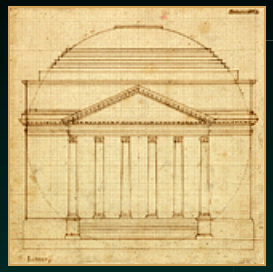
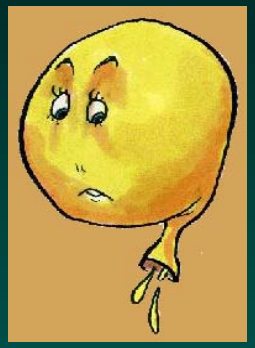
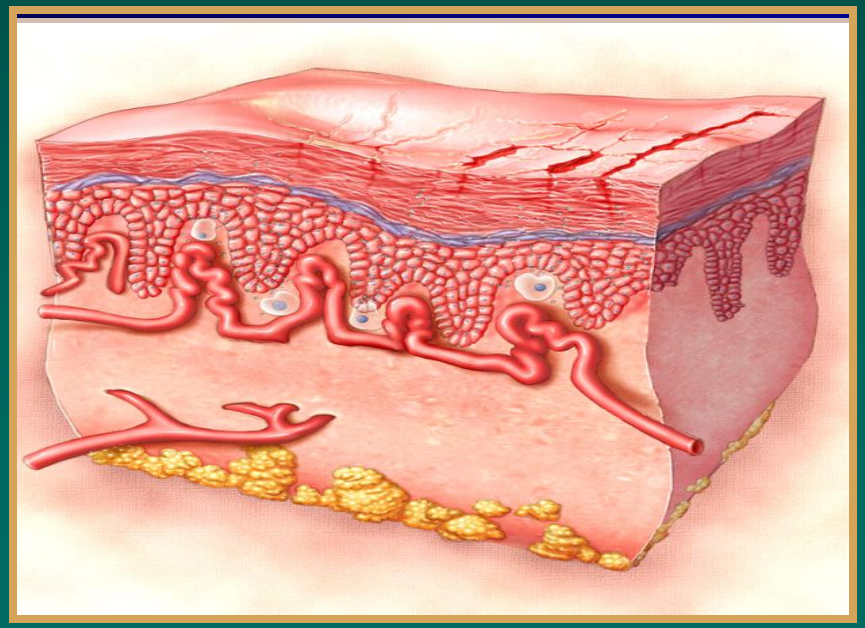
University of Virginia Department of Urology

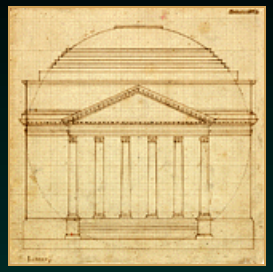


Objectives





- Review etiology, epidemiology, pathophysiology of IAD
- Discuss differential diagnosis
- Define IAD and its relationship to pressure ulcer risk
- Outline options for prevention and treatment



Faculty disclosure: none

Functions of the Skin

- Thermoregulation
- Sensory organ/ communication
- Immune functions; acts as a first line of defense
- Vitamin D metabolism
- ***Barrier against toxins in external environment and against fluid & electrolyte loss from internal environment***

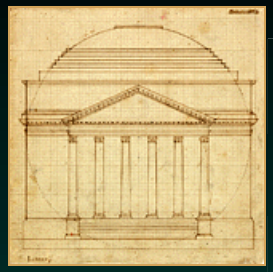
Burns T et al. Textbook of Dermatology, 2004. Mass: Blackwell Science.

Figure: Verdier-Sevrain S, Bonte F. Journal of Cosmetic Dermatology 2007; 6:75.

Definition: Incontinence Associated Dermatitis (IAD)

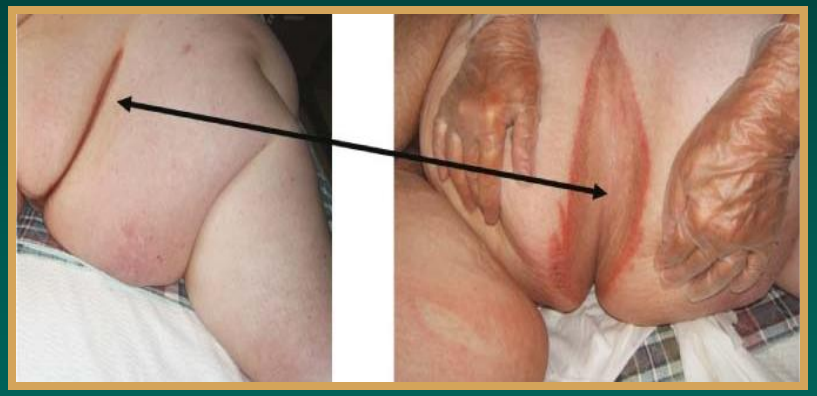
- Irritation and inflammation associated with exposure to stool or urine
- Often accompanied by erosion of the skin
- Sometimes accompanied by secondary cutaneous infection (ie: candidiasis)
- Distinct etiology and pathophysiology

Photograph courtesy Linda Bohacek



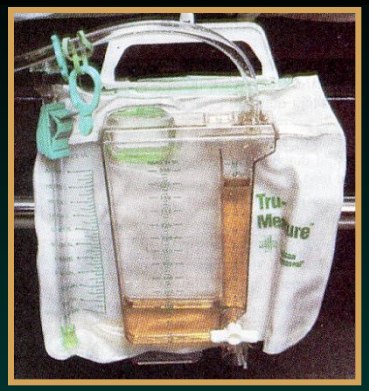
IAD: One Form of Moisture Associated Skin Damage (MASD)

- Definition: inflammation, erosion ± secondary infection associated with excessive exposure to body's effluents including perspiration, urine, stool, exudate, effluent from ostomy or fistula
- Common Manifestations:
  - Incontinence Associated Dermatitis[1]
  - Intertriginous dermatitis[2]
  - Periwound Maceration[3]
  - Peristomal moisture dermatitis[4]



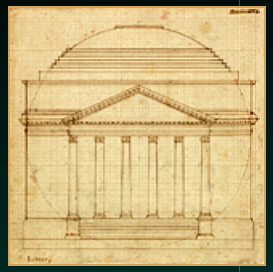
1. Gray M et al. Journal of Wound, Ostomy and Continence Nursing 2011; 38(3): 233-42.
2. Black JM et al. Journal of Wound, Ostomy and Continence Nursing 2011; 38(4): 359-70.
3. Colwell JC et al. Journal of Wound, Ostomy and Continence Nursing 2011; 38(5): 541-53.

Etiologic Factors: Urine

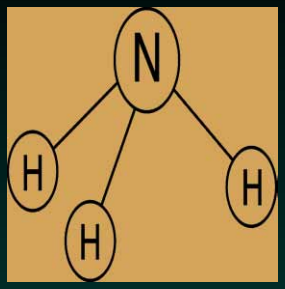


- Water in urine
  - ↓ skin hardness, rendering it more susceptible to friction and erosion[1-3]
  - Compromises barrier function of skin[4]
    - ↑ permeability to pathogenic species
    - ↑ permeability to irritants in urine or stool
  - Effects exacerbated by presence of occlusive device such as warp around incontinence brief

1. Berg W et al. Pediatric Dermatology 1986; 3: 102.
2. Leyden JJ et al. Archives of Dermatology 1977; 113: 1678.
3. Gray M. Journal of WOC Nursing 2004; 31(1 Suppl):S2-9.
4. Zimmerer RE et al. Pediatric Dermatology 1986; 3: 95.

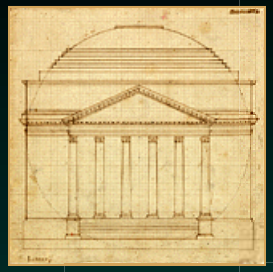


Adverse Effects of Urine on Skin



- Urinary pH and ammonia content
  - Limited evidence suggests alkaline urine more damaging to skin than urine with lower pH[1,2]
  - Ammonia inherent in urine and produced by conversion of urea in presence of Corynebacterium and fungal species such as candida albicans[1-3]
  - No direct evidence ammonia damages intact skin; probably aggravates already compromised skin[1]
  - Digestive enzymes active in more alkaline environment; may explain increased damae with double FI and UI

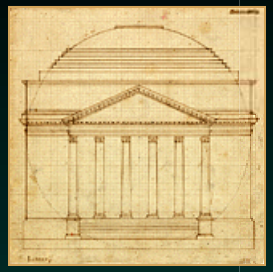
1. Leyden JJ et al. Archives of Dermatology 1977; 113: 1678.
2. Atherton DJ Eur Academy Dermatology Venerology 2001; 15 (Supp1): 1.
3. Berg W et al. Pediatric Dermatology 1986; 3: 102.



Adverse Effects of Stool on Skin

- Fecal enzymes
  - Protease & lipase potentially break down both principal elements of moisture barrier[1,2]
  - In vivo evidence shows that exposure to digestive enzymes in human skin led to[3]
    - ↑ TEWL
    - ↑ pH
    - ***Visible damage only when occlusion present***
    - Evidence of damage present after 12 days

1. Atherton DJ Eur Academy Dermatology Venerology 2001; 15 (Supp1): 1.
2. Gray M. Journal of WOC Nursing 2004; 31(1 Suppl):S2-9.
3. Anderson PH et al. Contact Dermatitis 1994; 30(3): 152.



Associated Factors: Occlusion

- Use of absorptive containment devices
  - Exacerbate overhydration by promoting perspiration & retaining urine and stool; ***with padding alone***:
    - TEWL increases 3-4 fold within days
    - CO_2 emission increases > 4 fold
    - pH increases from 4.4 to 7.1 (***without*** incontinence)

1. Grove GL et al. Clinical Problems in Dermatology 1998; 26:183
2. Zimmerer RE et al. Pediatric Dermatology 1986; 3: 95.
3. Zhai H et al. Skin Research & Technology 2002; 8:13.

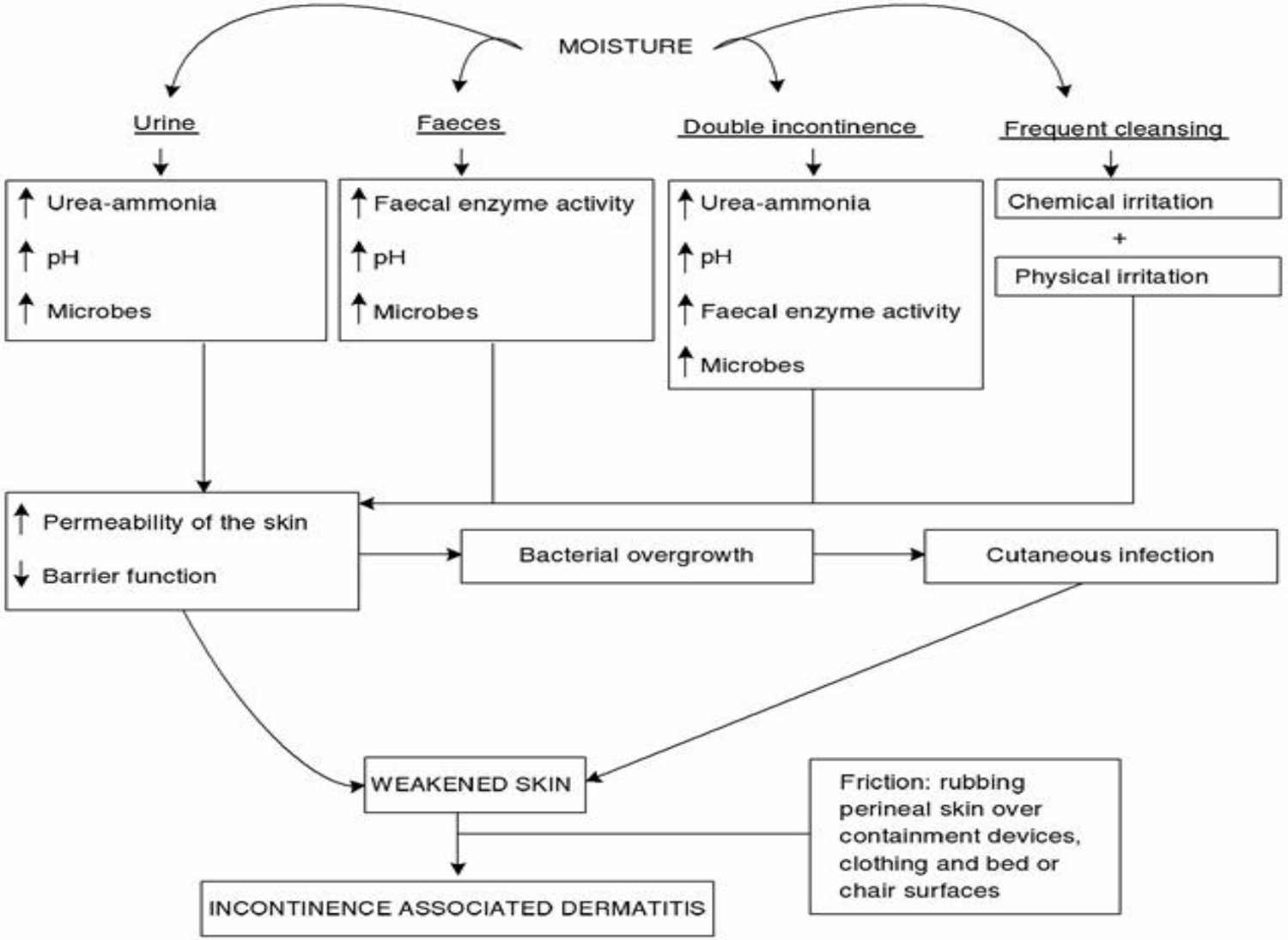
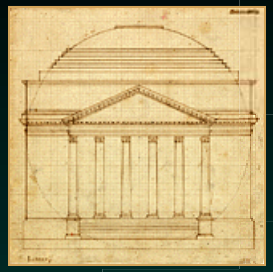


Figure 1 Aetiology of incontinence-associated dermatitis (based on Jeter & Lutz 1996 and Newman *et al.* 2007).

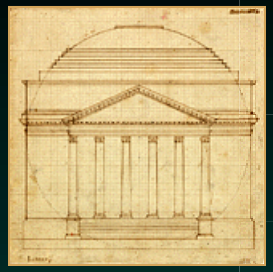
Beekman D et al. Journal of Advanced Nursing 2009; 65(6): 1141.



Associated Factors: IAD & Pressure Ulcers

- Association between these conditions is undeniable; nature of relationship remains a mystery
- IAD vs Stage II PU may be a problem with differential diagnosis?
- IAD impairs skin's tolerance for pressure/ shear
- Ongoing debate & controversy about nature of relationship reflects difficulty differentiating based on visual inspection alone
- FI and double incontinence strongly associated with PU risk, mixed evidence concerning UI alone[2-6]

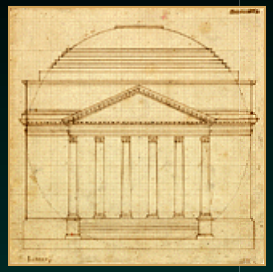
1. Bates-Jensen BB. Journal of Wound, Ostomy and Continence Nursing, 2009; 36 (3): 277-84.
2. Maklebust J & Magnan MA Advances in Wound Care 1994; 7(6): 25.
3. Gunninberg L. Journal of Wound Care 2004; 13(7): 286.
4. Fader M et al. Journal of Clinical Nursing 2003; 12(3):374.
5. Berlowitz DR et al. Journal of the American Geriatrics Society 2001; 49(7):866-71.
6. Narayan S et al. Journal of WOCN 2005; 32(3): 163.



Epidemiology: Prevalence of IAD

Reference	N	Health Care Setting	Incontinence Type	Method of Measurement	Prevalence, %
Junkin and associates[6]	976	Acute care	Urinary and fecal incontinence	Direct observation	27
Bliss and associates[4]	10,215	Long-term care	Urinary and fecal incontinence	Review of electronic database	5.7
Defloor and associates[5]	19,964	Long-term care	Urinary and fecal incontinence	Direct observation	5.7
Arnold-Long and Reed[10]	171	Long-term acute care	Urinary and fecal incontinence	Direct observation	22.8
Beeckman and associates[11]	141	Long-term care	Urinary and fecal incontinence	Direct observation	22.5
Junkin and Selekof[7]	608	Acute care	Urinary and fecal incontinence	Direct observation	20

Table from: Gray M et al. Journal of Wound, Ostomy and Continence Nursing 2012; 39(1): 61-74.



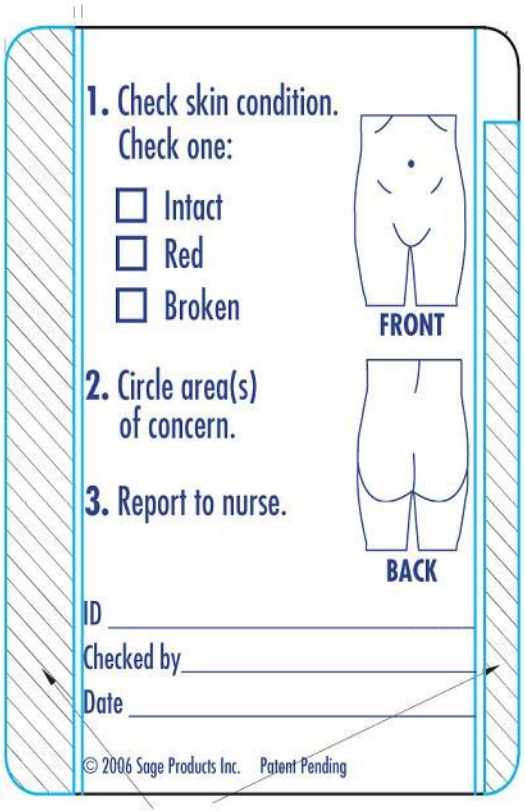
Epidemiology of IAD: Incidence

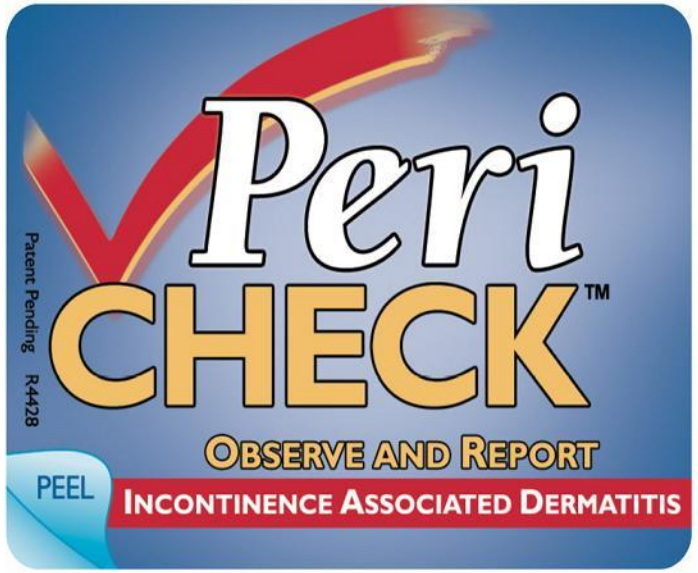
Reference	N	Health Care Setting	Incontinence Type	Method of Measurement	Period of Observation	Incidence, %
Bliss and associates[19]	981	Long-term care	Urinary and fecal incontinence	Direct observation	6 weeks	3.4
Bliss and associates[12]	45	Critical care	Fecal incontinence	Direct observation	Duration of stay in the critical care unit: median time to onset of 4 d	36
Driver[8]	Phase 1: n = 131	Critical care	Fecal incontinence	Direct observation	Phase 1: Duration of stay in critical care unit: <14 d	Phase 1: 50
	Phase 2: n = 177				Phase 2: Duration of stay in critical care unit: >14 d	Phase 2: 19[a]
Arnold-Long and Reed[10]	132	Long-term care	Urinary and fecal incontinence	Direct observation	Duration of stay: Median time to onset 13.5 d	7.6

[a]Researchers implemented defined skin care regimen, using 3-in-1 washcloth with skin cleanser, moisturizers, and dimethicone-based skin protectant during phase 2 of the study.

Table from: Gray M et al. Journal of Wound, Ostomy and Continence Nursing 2012; 39(1): 61-74.

IAD: Screening begins with CNA or other non-licensed care providers





IAD: Diagnosis

- Primarily based on visual inspection
  - Inflammation (bright red) in persons with lighter skin tones
  - Located in ***skin fold*** or ***underneath containment device***
  - Borders are poorly demarcated & irregular
  - Surface of skin may "glisten" owing to serous exudate

IAD: Diagnosis in persons with Darker Skin Tones

- Inflammation not readily apparent (ie: not bright red); often seen as areas of ***hyperpigmentation*** or ***variable*** red tones
- Hypopigmented areas with chronic inflammation
- Pattern of skin damage does not vary

IAD: Diagnosis

- Inspect Skin Folds
  - Opposing skin surfaces trap & harbor moisture
  - Warm moist environment encourages bacterial and fungal colonization, overgrowth and infection
  - Friction occurs as skin folds rub against one another

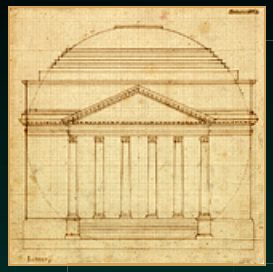
IAD: Diagnosis

- Assess for skin erosion
  - Partial thickness erosion occurs with IAD
  - Necrotic tissue: eschar or slough, full thickness damage indicates pressure ulceration

IAD: Diagnosis

- Look for secondary cutaneous infection, especially candidiasis
  - Opportunistic infection with *candida albicans*
  - Thrives in warm, moist environment & damages stratum corneum
  - Seen in 18% of one group of 976 acute care inpatients[1]

Junkin J, Selekof J. IAD prevalence in acute care. WOCN National Conference, June 2006 Minneapolis, MN.

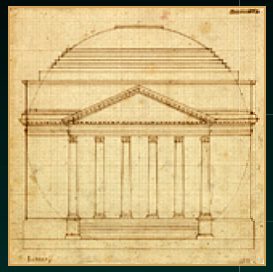


IAD: Diagnosis

- Suspect PU when wound is
  - Over bony prominence
  - Full thickness
  - Necrotic tissue is present
  - Skin is dark to purplish red

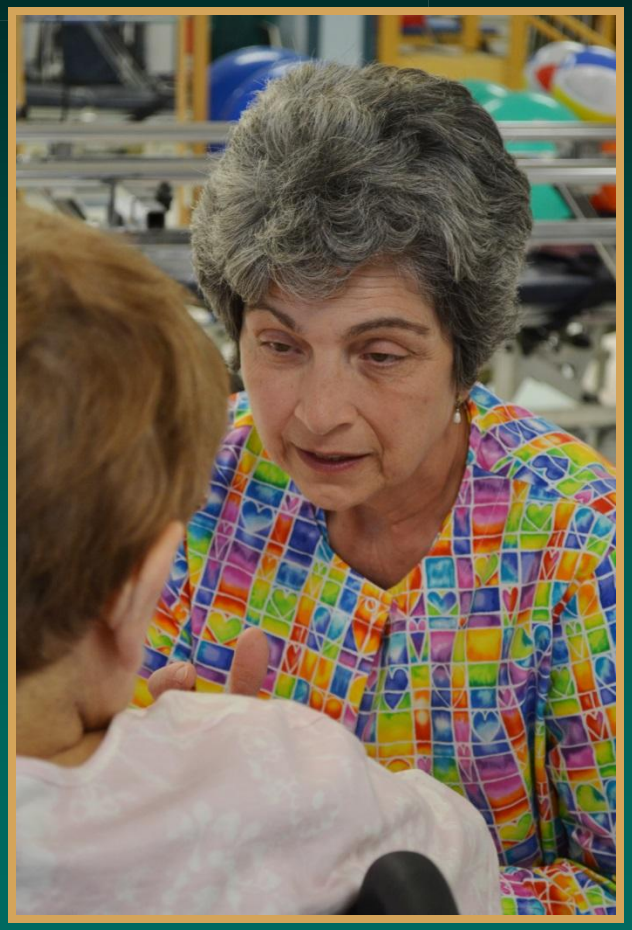
Images: http://www.snjourney.com/ClinicalInfo/Systems/Intrgum/newstagepu.htm

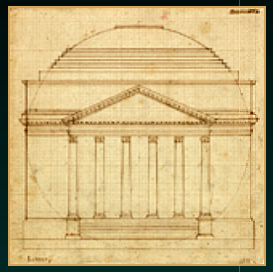
http://www.lhsc.on.ca/wound/p_chart.htm



IAD Diagnosis: Do not Forget the History

- Emerging evidence reminds us that isolated photographs are insufficient
- The biggest aid in this case is a thorough history





IAD vs Pressure Ulcer: Differential Diagnosis

Factors	IAD	Stage I Pressure Ulcers	Stage II Pressure Ulcers
History of condition	Exposure to urine or stool	Exposure to pressure, shear, and/or microclimate from immobility or inactivity	Exposure to pressure, shear, and/or microclimate from immobility or inactivity
Location of affected skin	Skin folds in areas where urine or stool can accumulate	Skin usually over bony prominences or exposed to other external pressure (eg, medical device)	Skin usually over bony prominences or exposed to other external pressure (eg, medical device)
Color of wound bed	Shiny, red, glistening, no slough in wound bed	Nonblanchable erythema of intact skin	Shiny, pink, or red open wound, no slough in wound bed
Color of periwound tissue	Red, irritated, edematous	Normal for race/ethnicity, edema may be palpable	Normal for race/ethnicity, edema may be palpable
Characteristics of involved area	Blotchy, not uniform in appearance	Tend to be single areas of erythema	Tend to be single ulcers with distinct ulcer wound margin
Pain	Burning, itching, and tingling	Sharp pain, usually no itching; pain may intensify when patient is initially moved off of injured areas	Sharp pain, usually no itching; pain may intensify when patient is initially moved off of injured areas
Odor	Urine, fecal odor	None	None unless infected and then may have odor of infecting organism
Other	Candidiasis common (seen as satellite lesions)	Redness tends to resolve with offloading or repositioning of device	Ulcer bed is shallow and heals through epithelialization

Abbreviation: IAD, incontinence-associated dermatitis.

Black JM et al. Journal of Wound, Ostomy and Continence Nursing 2011; 38(4): 359-70.