Is It All About Pressure? Clinical Decision Making in Determining the Cause of Pressure Ulcers

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RESNA 2010, Las Vegas
June 26 – 30, 2010

Objectives

- Define the four etiological causes, based upon current best evidence, of pressure ulcers.
- Discuss the differences between three extrinsic and intrinsic factors causing pressure ulcers.
- Explain how to apply three clinical decision-making strategies in determining the cause and management of pressure ulcers.

The Reality of Pressure Ulcers

- A global health care concern
- Extends to the entire health care team
- Responsible for prevention and treatment of pressure ulcers
- Preferred term is pressure ulcer

Scope of the Problem

- More than 1 million PU develop per year
- **60,000** people per year die from pressure ulcers
- In 2003 approximately 455,000 acute hospital stays which pressure ulcers were noted – 63% increase since 1993
- Patients 65 years and older accounted for 72.3 percent of all acute hospitalizations where PU were noted
- Average acute hospitalization primarily for PU treatment was 13 days

Russo, April 2006

Financial Impact

- In 2003 mean charge for hospital stays principally for pressure ulcers was $37,800
- In 2003 government payers billed 90% of hospitalization
- DO THE MATH!

  455,000 X $37,800 X .90 =

  $15 BILLION the government spent on PU treatment in 2003.

Russo, April 2006

Financial Impact Due to Litigation

- According to Voss from 1984 to 1999, when a LTC was sued due to pressure ulcers, 87% of the cases received a financial award
- From 1984-1999 the highest yearly payout across all LTC facilities was $312 million in damages
- The highest single award was $92 million
- Follow-up study from 1999-2002 – 91% of cases realized some recovery against the LTC facility

What Is New?

- CMS changes
- Hospital Acquired Conditions (HACs)
- Present on Admission (POA)
- ". . .beginning October 1, 2008, Medicare will no longer pay hospitals at a higher rate for the increased costs of care that result when a patient is harmed by one of the listed conditions if it was hospital-acquired."
- Stage III & IV Pressure ulcers

Deficit Reduction act of 2005

NPUAP Defines Pressure Ulcers As:

. . . A localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction. *A number of contributing or confounding factors are also associated with pressure ulcers; the significance of these factors is yet to be elucidated.*

Etiology of Pressure Ulcers

Is it all about pressure?

What is the REAL cause of a pressure ulcer?

Etiology – Reviewing the Evidence

- Localized ischemia due to extrinsic forces
  (Kosiak, 1961, Dinsdale, 1974,Daniel, 1981)
- Reperfusion injury
  (Bader 1990,1988, Houwing, 2000)
- Impaired interstitial fluid flow & lymphatic drainage
  (Reddy, 1981, Miller, 1981, Krouskop, 1983)
- Sustained cell deformation w/ increased loads
  (Ryan, 1990, Bouten, 2003, Stekelenburg, 2007)

Reperfusion Injury

- Concept originally investigated with cardiac patients
- Reperfusion after a period of ischemia results in cellular damage of tissue
- Thought that increased force would prevent blood flow and then when the force is reduced increased return of blood flow may actually disrupt the capillaries
- Also an increase in oxygen free radicals

(Bader 1990,1988, Houwing, 2000)

Impaired Interstitial Fluid Flow & Lymphatic Drainage

- The increased force may impair interstitial fluid flow & lymphatic drainage
- This impairment of flow may disturb the metabolic waste equilibrium in and around the cells
- This metabolic waste could cause cellular and resulting tissue death

(Reddy, 1981, Miller, 1981, Krouskop, 1983)

Sustained Cell Deformation With Increased Loads

- Maybe pressure does cause pressure ulcers?
- High compressive loading not only caused ischemia but also distorted the cells and caused tissue "strain" (damage)
- Stekelenburg in 2007 concluded:
  - "2 hours of compressive loading lead to irreversible damage whereas ischemic loading results in reversible tissue changes"
  - "Large deformation, in conjunction with ischemia, provides the main trigger for irreversible muscle damage."

(Ryan, 1990, Bouten, 2003, Stekelenburg, 2007)

Localized Ischemia

(Kosiak, 1961, Dinsdale, 1974,Daniel, 1981)

Prolonged occlusion or deformation of capillaries

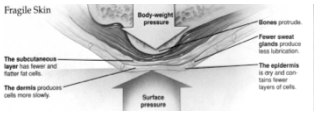
Limited blood flow – Decrease O_2 and nutrients

Ischemia to cells

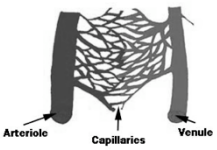
Tissue necrosis

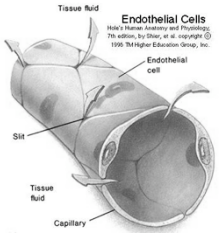
What Extrinsic Forces May Cause Capillary Deformation?

- Pressure
- Shearing
- Friction
- Trauma
- Microclimate



Capillary Cell Wall





Pressure – Is It All Bad?

- **PRESSURE = <u>FORCE</u>**
  AREA
- Pressure is used therapeutically
- Peak pressures are the issue!
- Need to "redistribute" pressure over larger area to decrease peak pressures in one specific area

Shear and Friction

- Causes are usually gravity and movement
- Increased by:

  - Moisture
  - Pressure
  - Inappropriate handling and movement skills
  - Repetitive movements
  - "Shear may be 10 times more destructive to the tissues than pressure" (Fontaine 1998)

Microclimate & Moisture

- Removes oils from the skin- increases friability
- Maceration causes decreased strength of connective tissues
- Alters resiliency of epidermis to external forces
- Incontinence of urine and stool increases pH, increases permeability of skin, increases irritation

Microclimate & Moisture

- "The severity of the resultant tissue injuries correlated with an increase in applied temperature" Kokate, 1995
- ". . .build-up of moisture increases friction between the skin and the surface materials, resulting in increased shear stresses in the tissue." Lachenbruch, 1999, 2005

Pressure, Shear, Friction or Microclimate

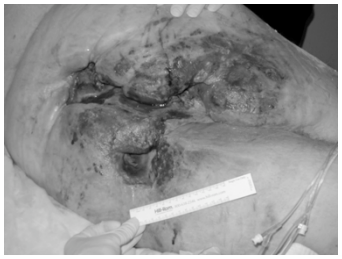
Friction

Pressure, Shear, Friction or Microclimate

Shear

Pressure, Shear, Friction or Microclimate

Moisture / Microclimate



Pressure, Shear, Friction or Microclimate

Pressure

Intrinsic Risk Factors

- Age
- Psychosocial
- Smoking
- Infection
- Immunocompromised states
- Obesity
- Nutrition
- Co-morbidities
- Medication

Bottom Line . . .

Blood flow, blood flow, blood flow

Pressure Ulcer Prevention and Management

- Collaborative approach with multidisciplinary team a MUST!
- Must determine the exact cause of the pressure ulcer!
- Diagnostic studies are sometimes required
- Common sense is always required!

Critical Inquiry

- Has this ever happened?

A patient presents with a stage III pressure ulcer in the area of the Ischial Tuberosity and immediately the therapist is called to get a new cushion

- Why do we commonly look for equipment problems and solutions without first investigating the possible cause(s)?

Pressure Ulcer Prevention and Management

- Inspection
- Proper skin care
- Proper positioning
- Use of support surfaces
- Wound cleansing
- Managing infection
- Wound debridement
- Dressings
- Nutrition
- Managing Incontinence
- Pain control
- Adjunctive therapies
- Minimize recurrence – education!!

So How do We Investigate ALL Possible Factors

It is Not a Day in the Park

Importance of Good Clinical Decision Making

Consider the Challenge. . .

- In order to improve client outcomes, we must first do a better job of investigating the cause and all of the possible extrinsic AND intrinsic factors which may have caused the pressure ulcer

Research vs. Ritual

Evidence Based Practice

Rappolt, 2003

- Research Evidence
- Professional Expertise
- Client Evidence
- Integration
- Clinical Decision Making

Clinical Decision Making

- Address cause
- Address contributing systemic factors
- Assessment and local management
- Patient education
- Disease management

Clinical Decision Making

- Does the person know how they got the pressure ulcer?
- Where is the location of the wound?
  - Sacral versus IT versus Greater Trochanter
- What is the shape of the wound
  - Round versus diffuse versus tracking
- Is the dressing saturated?
  - With what? Drainage or urine (feces)
- Is there maceration around the wound edge?
- Is the wound infected?

Clinical Decision Making

- Does the person get out of bed?
- How does the person transfer?
  - Independent or with assistance
- Do they complete the transfer safe?
- Is a hoyer lift or transfer board being used?
  - Do they leave the sling under them?
- Does the person have a good cushion?
- Do they know how to use the cushion?
- Is the cushion set up appropriately in the wheelchair?

Clinical Decision Making

- Where is the current individual residing?
  - rehab vs. acute vs. LTC
- What is the nutritional status of the individual?
- How long can the individual tolerate sitting?
- What is the staffing issue at the facility?

Summary

- Pressure ulcer etiology and management is multi-factorial
- Good investigation into the actual cause will improve outcomes and prevent future breakdown
- Remember. . .

  Treat the whole patient. . .and not just the hole IN the patient!

Thank You For Coming!

Questions?
Topics for discussion?

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