

# Foot Care Basics for the Geriatric Patient

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# COMMON PODIATRIC CONDITIONS!

- Nail deformities
- Skin conditions
- Hammer toes, Bunions
- The Diabetic foot

# NAIL DEFORMITIES

- Onychomycosis:
  - Trauma, Infection, circulation
  - T. Rubrum, Mentagrophytes
    - *Dermatophytes v. saprophytes (ie mold, yeast etc)*
  - Treatments:
    - Palliative
    - Oral v. Topical
    - Avulsion/excision nail & matrix



# Onychomycosis



# Onychomycosis



# Onychomycosis



- Oral:
  - Lamasil / Sporanox
- Topical Penlac
- Others:
  - Tea tree oil
  - 45% Urea
  - Compounding Rx's

# NAIL DEFORMITIES

## ■ Ingrown nails

- Trauma, infection, deformity, hygiene
- Poor cutting techniques
- Treatments:
  - Antibiotics--oral or topical
  - Avulsion or excision nail/matrix partial or complete

# Ingrown nail Sx

- What's needed
  - Tournicot
  - Hemostat
  - 61 beaver blade
    - Mini beaver handle
  - Phenol {*carbolic acid*}
    - C<sub>6</sub>H<sub>5</sub>OH
  - Cotton tip applicators
  - Alcohol





# Alcohol Phenol Nail Procedure

- Digital block
- Test anesthesia
- Tournicot
- Split offending nail margin longitudinally or complete avulsion of nail plate
- Curettage nail bed
- Apply phenol x 3 swabs x 20seconds each
- Flush with alcohol
- Bandage toe

# Tournicot



# Nail margin split



# Hemostat under nail margin



# Partial nail avulsed!



# Bunion

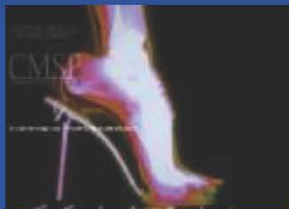
- Latin word for “turnip”
- Hallux Abducto Valgus (HAV)
- Hallux Valgus
- *Literature shows there are more surgical techniques for this than any other surgical Condition!*



# Etiology

## ■ Shoe gear?

- Higher incidence in females



- Literature unclear

## ■ Heredity and Genetics

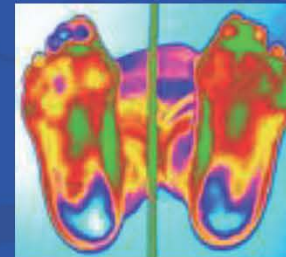
- >60% with family history (Shine et al., Glynn et al.)
- Ligamentous laxity

## ■ Trauma

## ■ Neuromuscular

## ■ Biomechanics and Foot type

- Hypermobile 1st ray
- Pes planus
- Forefoot varus
- Rearfoot varus
- Equinus



# Radiographic Evaluation





# Treatments

## ■ Conservative

- Padding
- Splinting
- Shoe gear modification
- NSAIDs / Injection – bursitis, neuritis
- Physical therapy—Ionto and Phono

## ■ Surgical

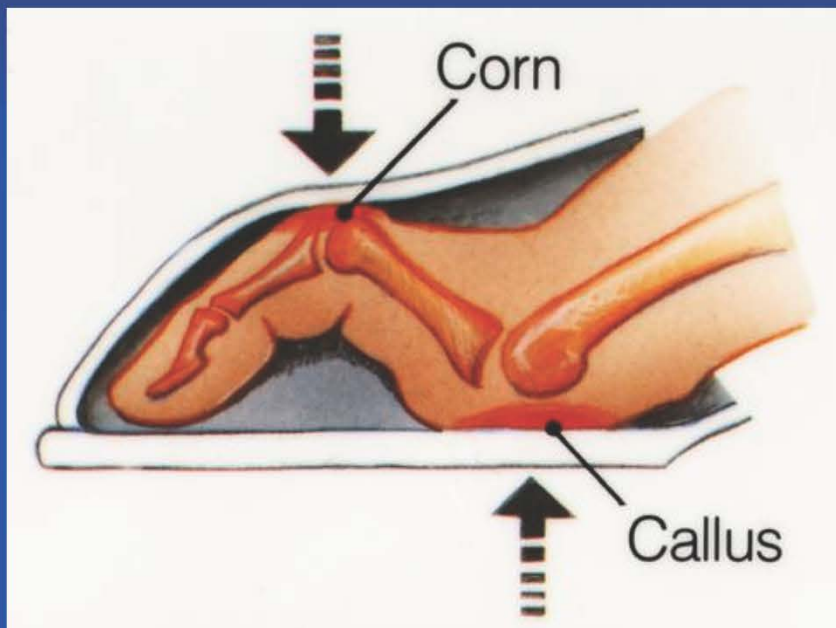
# Bunionectomy Procedure



# Hammertoe Deformity

- Contracted or abnormal position of the toes, which may be flexible or rigid in nature.
- Usually caused by weakened muscles of the foot.
- May cause pain due to irritation from other toes. The pain may be exasperated by tight fitting shoes.
- Hammertoes are often accompanied by a corn or callous.

# Hammer Toes



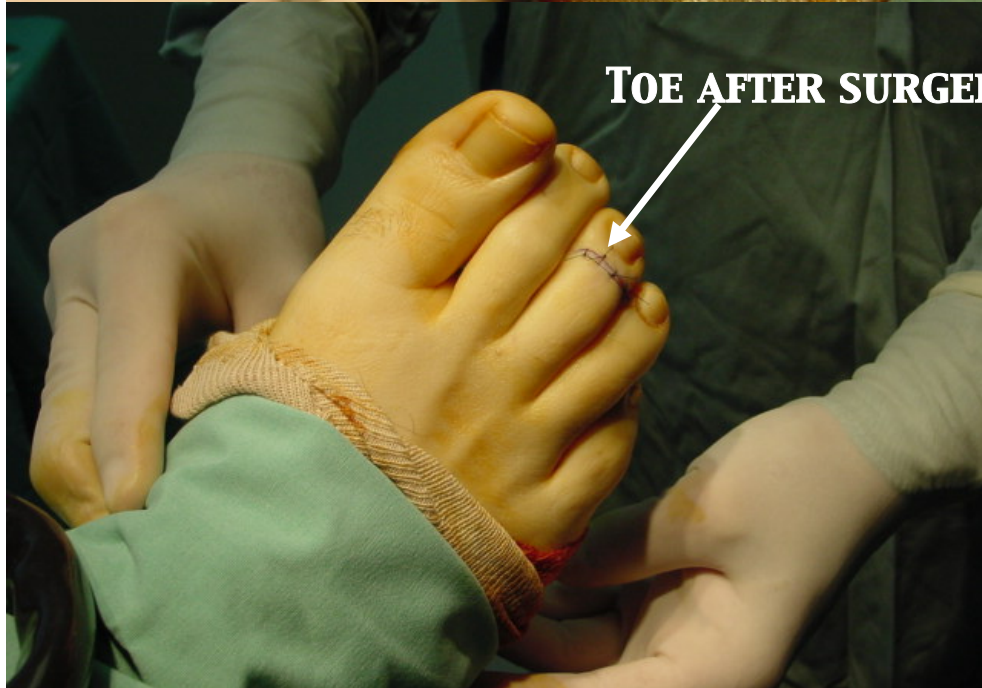


# HAMMERTOES DEFORMITY





**TOE PRIOR TO SURGERY**



**TOE AFTER SURGERY**

# **MALLET TOE DEFORMITY**

# Shoe gear modification/splints



# Hammer toe Surgery





# *Plantar Wart*

- Human papilloma virus infection in the feet.
- Warts are obtained by barefoot exposure to the virus.
- Warts are often spread in showers, gyms, or other areas where barefoot walking is common.
- May be treated with any number of methods but recurrence ranges between 18-22%.
  - Topical formaldehyde
  - Liquid nitrogen
  - Dermal curettement
  - Candida injection



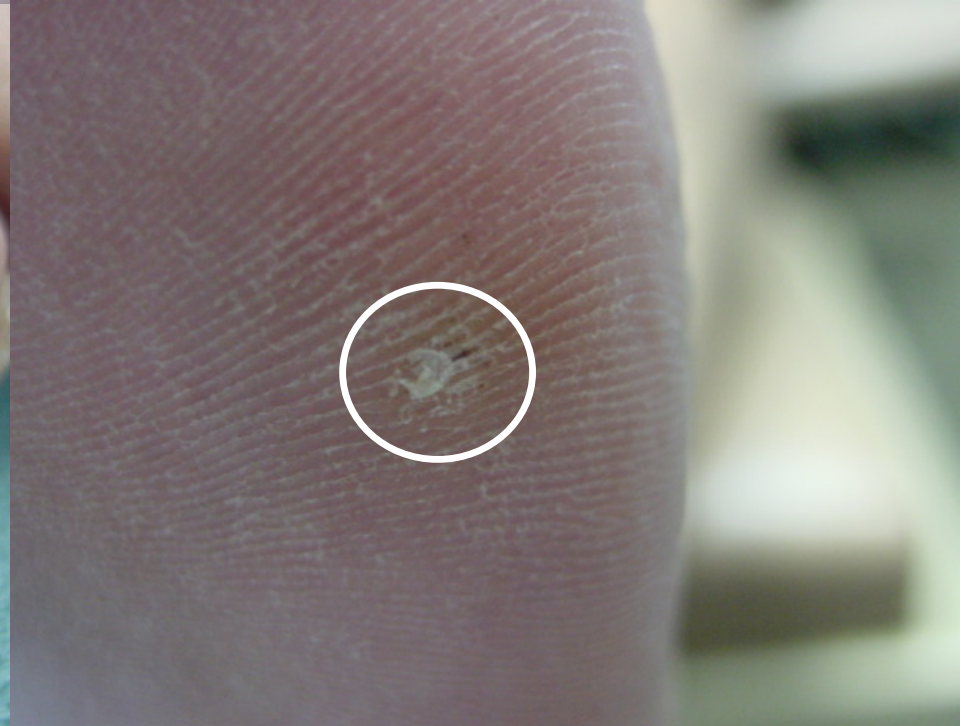
# PLANTAR WARTS



# *Callous / Corn*

- Thickened area of skin caused by chronic rubbing or irritation of a bony prominence by the ground or shoe gear.
- Very high areas of pressure within a callous can develop a painful central core.
- Lesions reoccur because the cause of the lesion is often from bone.

**CALLOUS/  
CORN/  
POROKERATOS**



# Athletes Foot

- A fungal infection typically caused by fungus found in soil (Dermatophyte).
- Picked up by contact with the fungus usually walking barefoot (Gym, hotel, pool, etc.).
- May occur anywhere on the foot and may burn and / or itch.
- The affected areas of skin will often peel or may have small blisters.



# ATHLETES FOOT

# Heel Fissuring / Cracking

- Thickening of the heel with associated cracking which causes pain.
- Thickening may arise from pressure, a buildup of skin or dermatological condition.
- May be chronic in nature.
  - Urea 40% with or w/o salicylic acid

# HEEL FISSURING WITH HYPERKERATOSIS





# THE DIABETIC FOOT

## Four Key Strategies To Prevention

- Patient Education
- Tight Glucose Control
- Vascular Assessment
- Podiatrist Intervention



**“The Most Important Thing we can do As Physicians To Prevent Amputation”**

# Diabetic Foot Exam



- Gross foot examination
- Pedal Pulses
- Capillary fill time
- Gross Neuro
  - DTR
- Protective sensation
  - Semmes-Weinstein

# Semmes-Weinstein Monofilament

- A simple effective and inexpensive screening device for identifying “*at risk*” diabetic patients for neuropathy and ulceration.



# Thermography

- Hand held infrared digital thermometer
  - Any increase in skin temperature greater than 2 degrees Celsius significant for possible charcot or pre-ulcerative inflammation

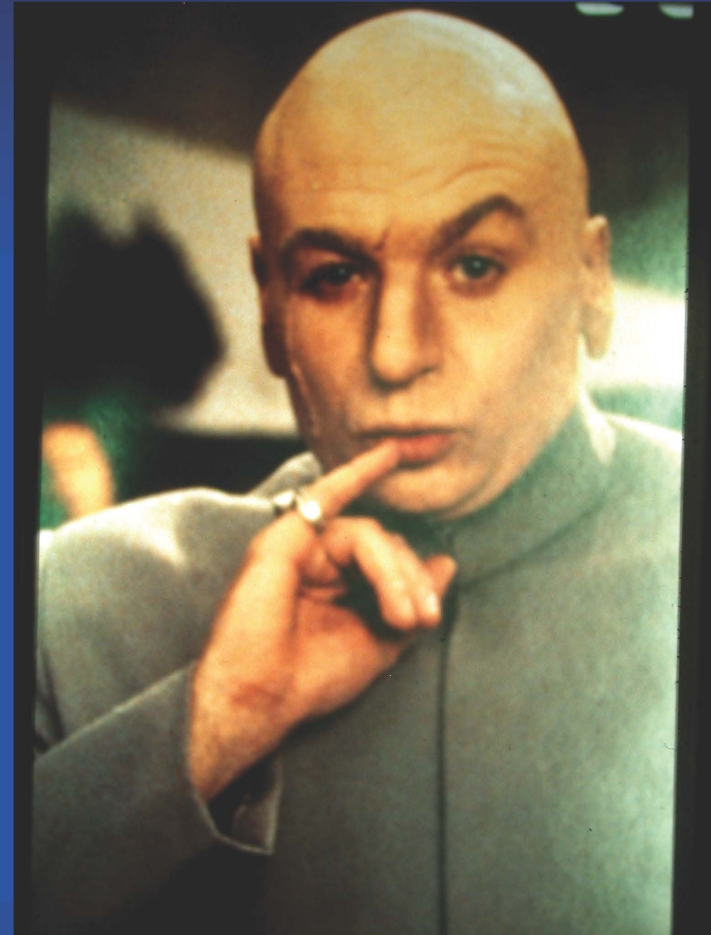
Armstrong,  
Lavery. Diabetic  
Care 1997



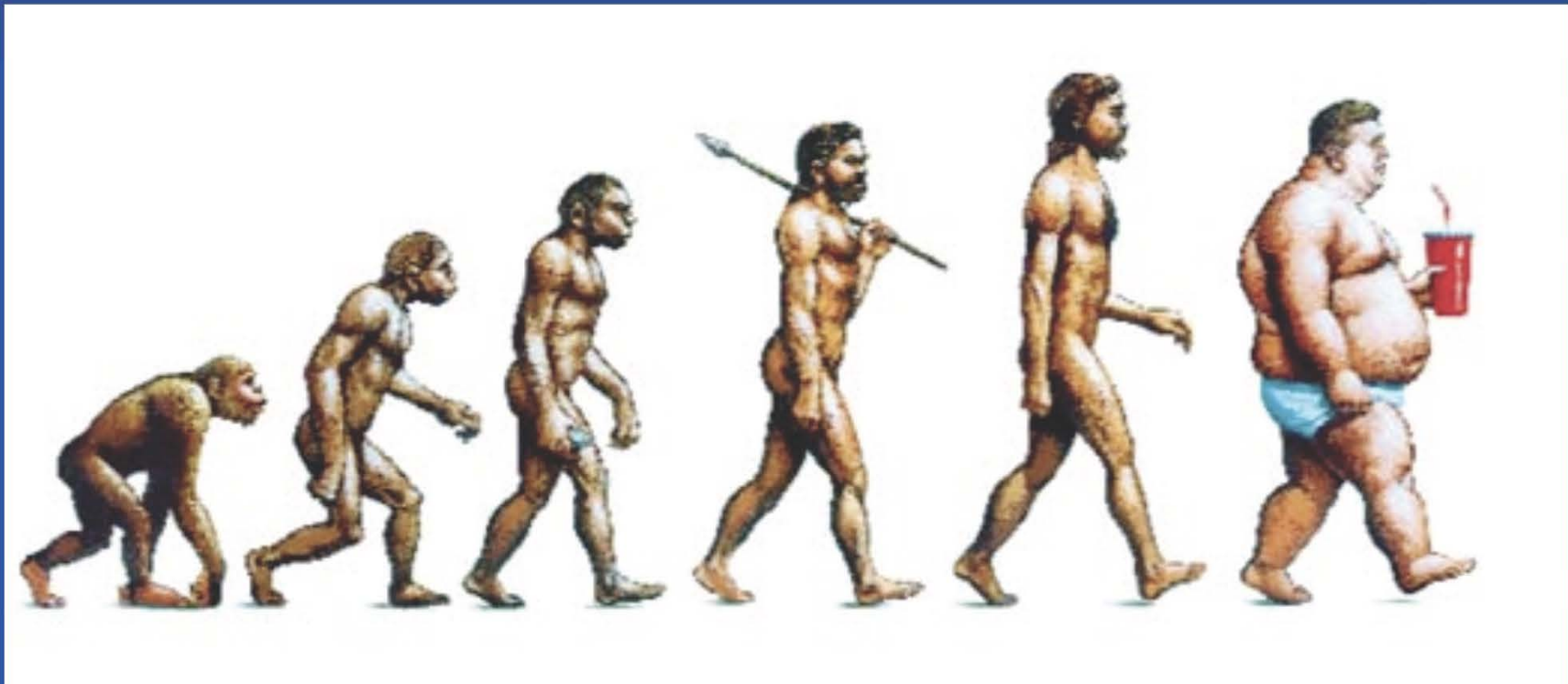
# Diabetic Neuropathy or PVD

## Confusing Presentations

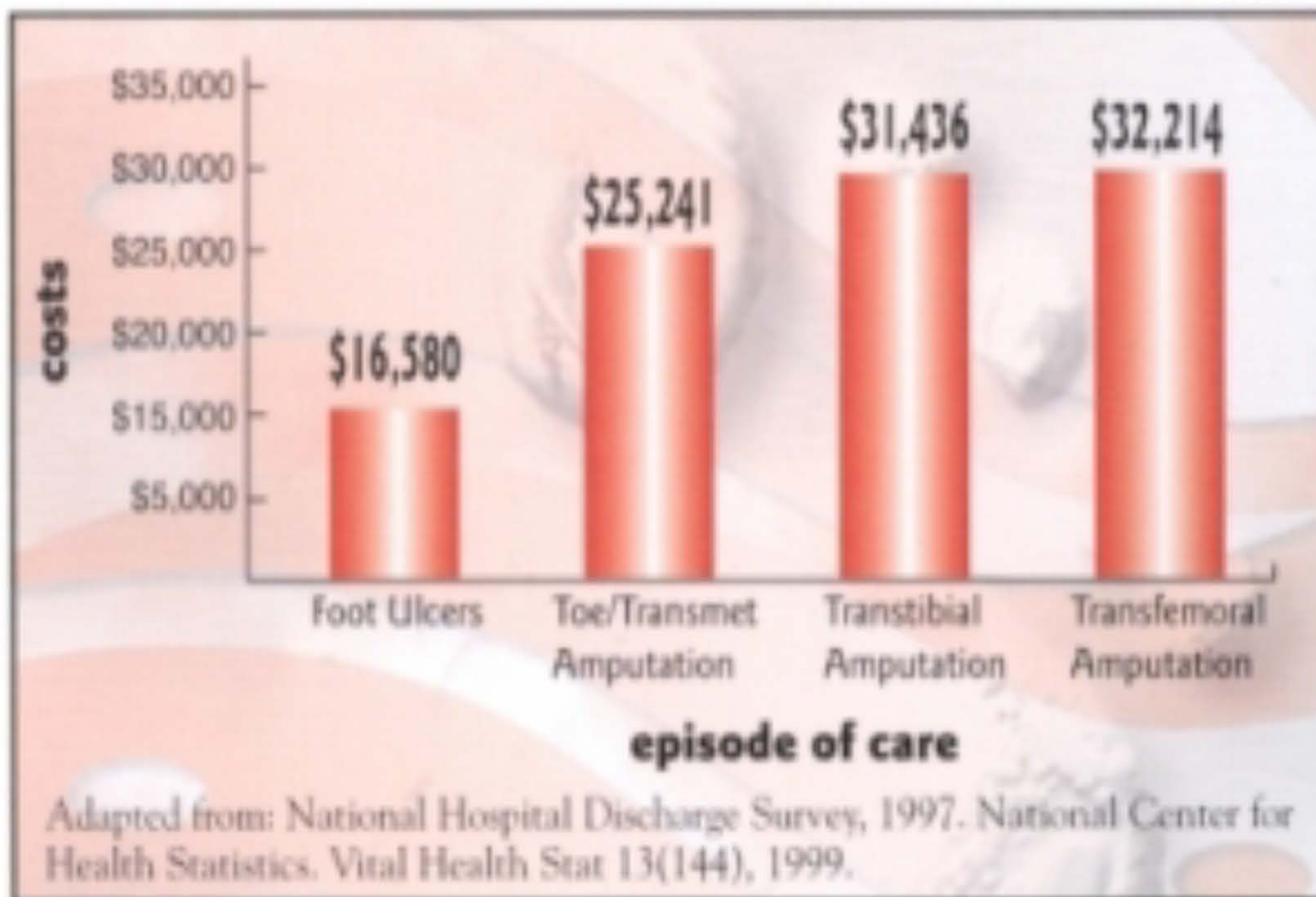
- Hyperesthesia
- Hypoesthesia
- Diminished protective sensation
- Can affect sensation of:
  - Pain, temperature, touch
- Symptoms:
  - Burning, tingling, numbness, throbbing, shooting, etc



# Ford's Theory: The Evolution of the Diabetic Patient



## Total US Average Hospital Charges – 1997



# Costs of lower extremity ulcers among patients with diabetes



- 2,253 patients
- Mean age= 68
  - 59% males
- Average duration
  - 87.3 days
- Diabetes Care

Sept 2004

Stocki, Tafesse, Chang,  
Vanderplas



Continued.....

# Costs of lower extremity ulcers among patients with diabetes

- Costs: \$ 13,179 per episode
- *Patients with inadequate vascular supply compared to vascular stable patients* \$23,373 vs \$5,218



# Diabetic Foot Infections

- Limb-threatening infection with deep ulcer or possible osteomyelitis
  - Staphylococci- 64%
    - MRSA???????
  - Streptococci- 30%
  - Enterococci- 26%
  - Enterobacter- 36%
  - Bacteroides - 18%

3 or more isolates in 80% of patients



# Diabetic Foot Infections

## Non-limb threatening infections w/o ulcer or superficial ulceration

- Staphylococcus Aureus: 54%
  - MRSA?????????
- Coagulase negative staph aureus: 42%
- Streptococci: 31%
- Gram negative bacilli: 23%
- Various anaerobes: 13%
  - isolates in 31% of the patients!

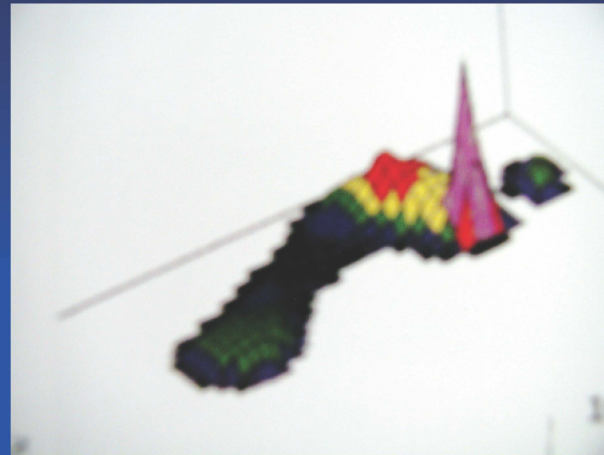


# LEAP PROGRAM

Lower Extremity Amputation Prevention

- ANNUAL FOOT SCREENING
- PATIENT EDUCATION
- APPROPRIATE FOOT WEAR
- DAILY FOOT INSPECTION
- MANAGEMENT OF SIMPLE FOOT PROBLEMS
  - Dry skin, trimming nails/callus etc.

# Plantar Pressures



Excessive repetitive pressures cause:

- Anoxia to tissues
- Mechanical stress to tissues
  - Leading to tissue breakdown!

# Benefits of Healing a Diabetic Foot Ulcer



- Control Infection
- Maintain health Status
- Prevent Amputation
- Improve function and Quality of Life
- Reduce cost
  - Diabetes Care ADA 1999

# Wagner Classification

- Grade 0 = cellulitis/erythema
- Grade 1 = Superficial ulcer, partial thickness
- Grade 2 = Deep ulcer, full thickness--tendon capsule, fascia, or bone maybe exposed
- Grade 3 = Osteomyelitis or deep abscess
- Grade 4 = Partial gangrene of the foot
- Grade 5 = Total gangrene of the foot

# Ulceration Treatment



- Evaluation
- Culture????
- DEBRIDEMENT
- Weight bearing effect
- Metabolic control
- Circulation
- Topical agents
- Biologicals
- Antibiotics
  - *Can never replace adequate debridement*



# Failure to Off-Load High Plantar Foot Pressures



- Ongoing mechanical tissue trauma
- Increased shear force
- Biomechanical dysfunction
- Neuropathy-induced muscle imbalance
- High foot pressures
  - Greater than  $6\text{kg}/\text{cm}^2$

# Off Loading the Diabetic



# Treatments



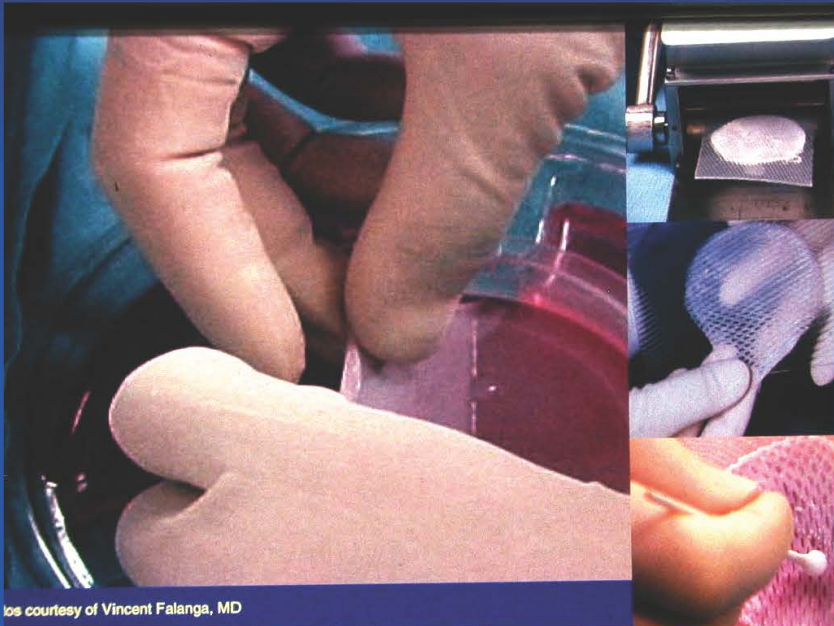
# Wound Care Products



## Hundreds of Products

- Most common:
  - Debriding enzymes
  - Ca+ alginates
  - Collagen alginates
  - Hydrocolloids
  - Silver
    - Alginates
  - Compounds:

# Biologicals in Ulcer care



- Apligraf
- Dermagraft
- Graft jacket
- Regranex
- Amnion ....and More

# Diabetes and Charcot

- Estimates of neuro-arthropathy
  - Reported ranges in literature from 0.08 to 7.5% of patients with diabetes
    - Upwards to 120,000 patients
  - 16 million diabetic patients in the US alone according to the ADA report in 1996.
- With improvements in diabetic care patients are living longer.
  - Charcot is a late effect of diabetes and its sequela therefore is a major orthopedic problem--- 9-35% with B/L involvement

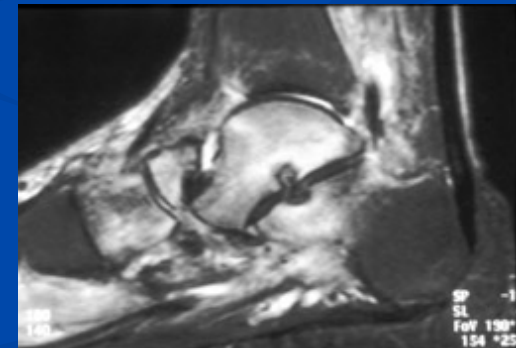
# Jean-Martin Charcot

- Jean-Martin Charcot
  - Demonstrating the nature of hysteria at the *Salpêtrière* [center for neurology] in Paris France. Circa, 1885
  - 1<sup>st</sup> to acknowledge the concept that different parts of the nervous system have different functions.



# The Charcot Foot

- Radiographic hallmarks:
  - Bony destruction and fragmentation
  - Joint destruction, subluxation and dislocation
  - Bony remodeling





# Goals of Treatment in Charcot

- Restore stability and align the foot/ankle to allow footwear or brace
- Prevent Amputation
- Prevent infection
- Prevent ulceration
- Improve patients quality of life

# Treatments

- Immobilization [Initially--acute]
  - Total contact casting
  - Others: CAM walker, Jones, Air cast etc
- Immobilization [post acute phase]
  - CROW [charcot restraint orthotic walker]
  - Patellar tendon-bearing brace
  - AFO
  - Custom molded shoes

# Foot-note” to Remember!

- *So complex is the human foot with its 26 bones, 33 joints and 107 ligaments that Leonardo da Vinci described it as “a masterpiece of engineering and a work of art.”*

# THANK YOU

