

WOUND HEALING: A NEW ERA FOR AN OLD DISEASE

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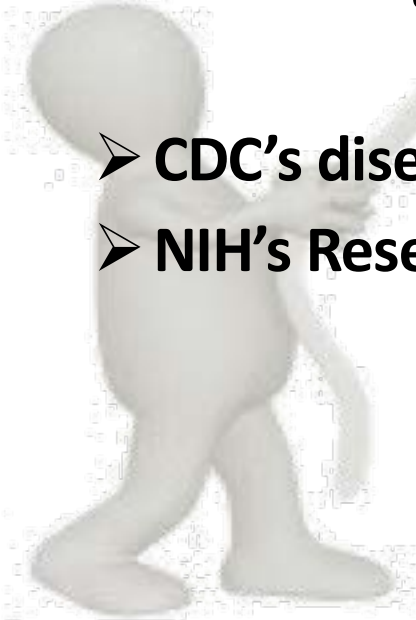
DISCLOSURE

Nilufer Norsworthy, MD

- No relevant financial relationship reported

Is A Chronic Skin Ulcer A Disease?

- **What is a disease?**
- **Not recognized by the policy makers**
 - **CDC's diseases and conditions index**
 - **NIH's Research Portfolio Online Reporting Tool (RePORT)**



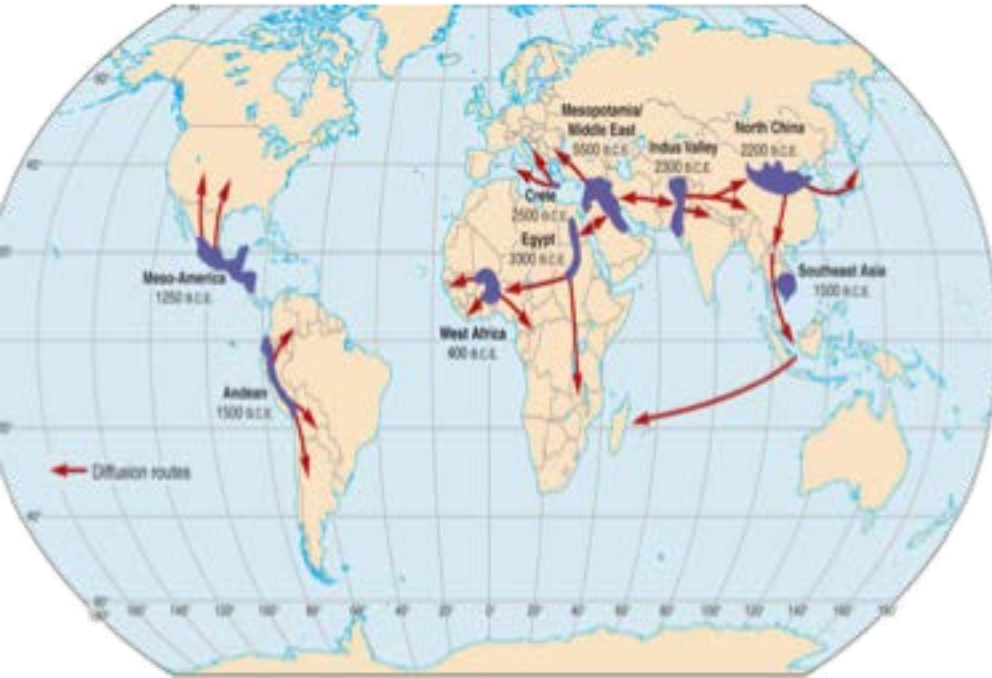
Why Is It Important To know What a Disease Is?



- 1. Only if we know there is a problem will we decide to tackle it.**
- 2. It becomes a responsibility.**
- 3. It is necessary for sensible healthcare planning and distribution of healthcare resources.**

A Silent Epidemic: Chronic Wounds

- Estimated prevalence of chronic wounds 3-7 per 1000 \approx **990,000** to **2,310,000** people
- Estimated cost is 2-4% of healthcare expenses \approx **\$64** to **\$128 Billion direct cost**



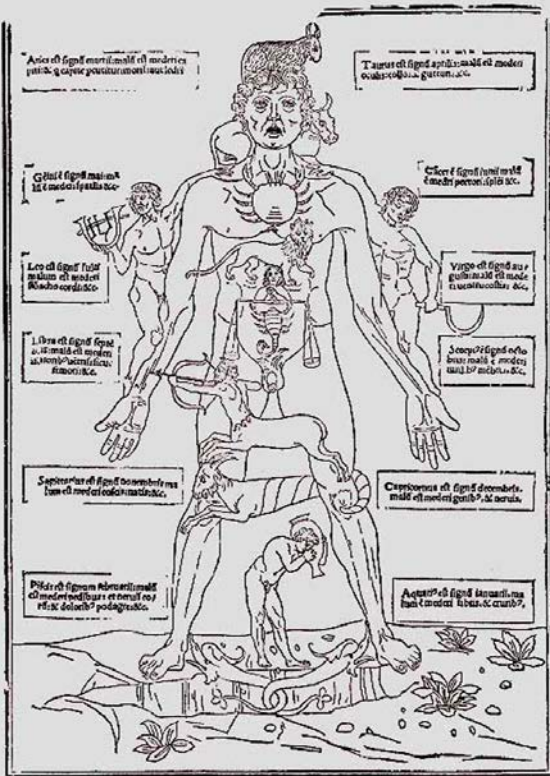
Pre-History & Greek Medicine

- **Hippocrates (460-377BC)**
 - “*vis medicatrix naturae*”
 - Humorism
 - Wound is a disease
 - Promotion of suppuration



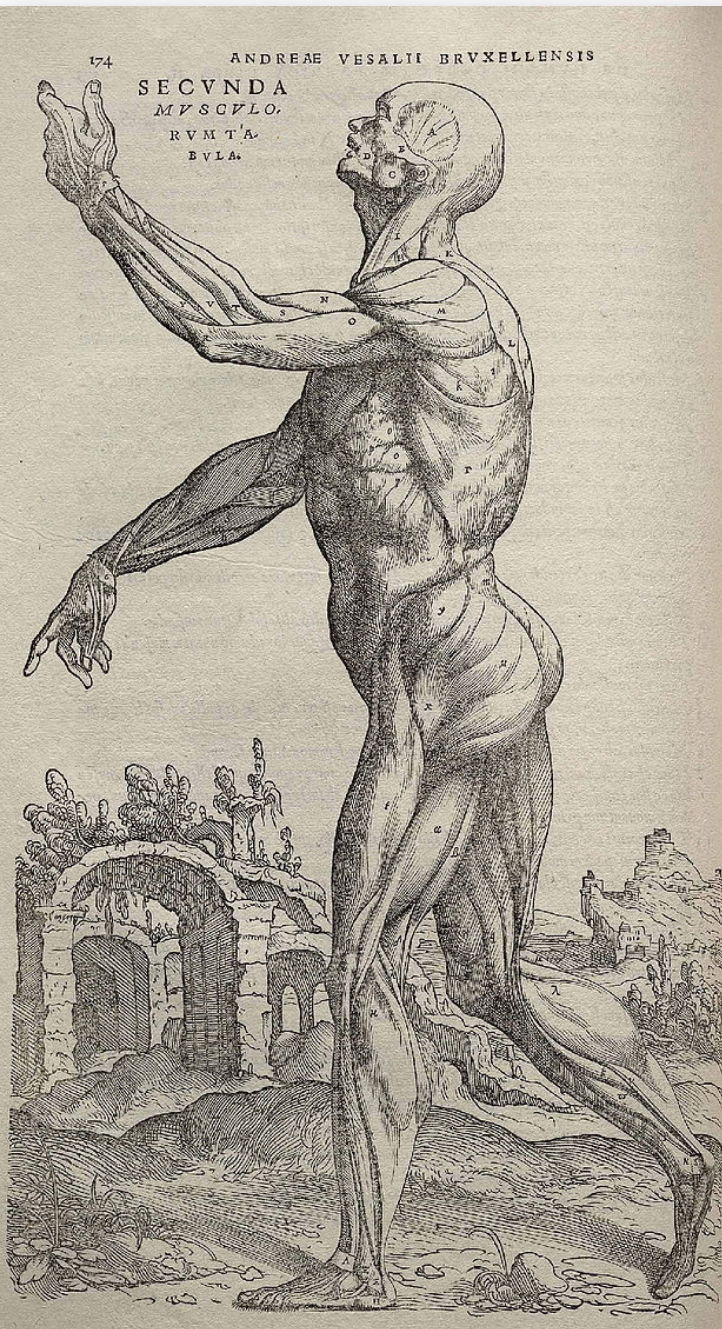
Roman Era & Middle Ages

- Three encyclopedias
- “De Medicina”, by Celsus (25 BC-50)
 - “rubor et tumor cum calore et dolore”
 - Acute vs. Chronic wounds



- Claudius Galen (120-201)
 - Famed for treating wounds
 - Wrote >500 treatises
 - Galenism ruled for 1400 years





Renaissance

“Nature is the principal healer and by the physician as a servant”

- **Paré (1509-1590)**
 - Gentle wound care
 - Nutrition, pain and debridement as well as psychological counsel for persons with wounds
- **Magati (1577-1647)**
 - Giving the wound a rest
 - Air contamination on the wound



History of Diabetic Foot Ulcer (DFU) Care in the USA

- **Discovery of Insulin: 1921-1922, Canada.**
- **EP Joslin – Diabetic foot ulcer clinic 1928.**
- **PW Brand 1960s –translated his learning from leprosy to diabetic foot**
- **1981 –First annual diabetic foot conference**
- **LEAP (lower extremity amputation prevention program) – 1986**
- **Wagner-Meggitt, 1981 – Grading system**

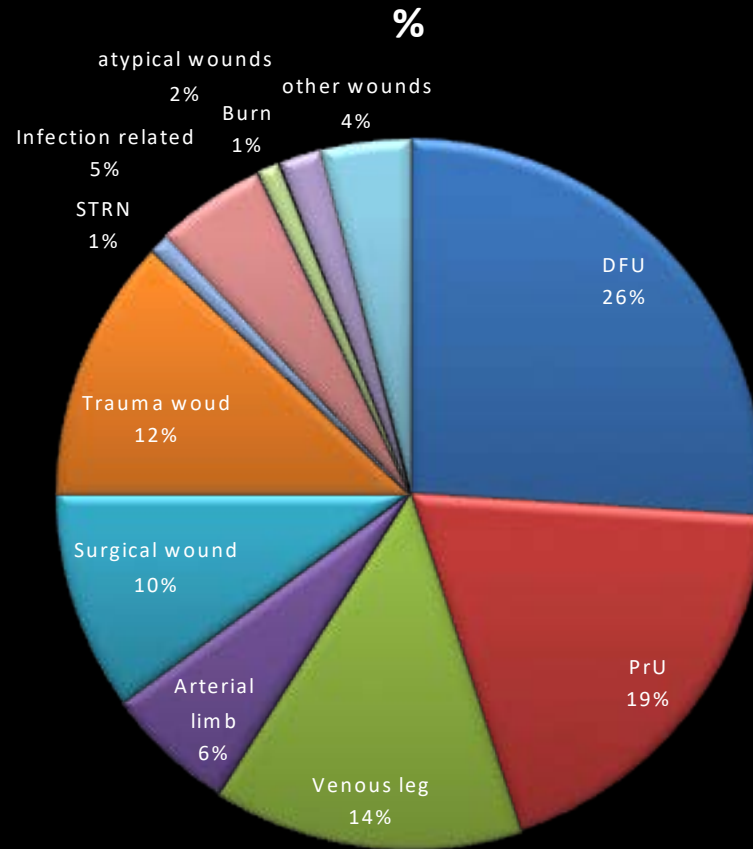
Current State of the Art...

- **Biophysical stimulation**
- **Vacuum assisted closure**
- **Hyperbaric oxygen therapy**
- **Advanced dressings**
- **Tissue engineering products**
- **Other bioactive materials**

Future Tools for Wound Healing

- **Vehicles for delivery of growth factors and other molecules**
- **Stem cells in wound repair**
- **Wound microenvironment sensors**

Etiologic Distribution of Wounds



Data from UW-NWH WCC 2016, n=1968

Highlights of Wound Care in the USA



- ✓ **The systems and resources have not been established to**
 - **Accurately measure wound prevalence and costs**
 - **Provide support and education to providers**
 - **Implement evidence-based clinical best practices**
 - **Monitor clinical outcomes**
- ✓ **Lack of trained staff**
- ✓ **Poor dedication amongst staff**
- ✓ **Disconnect with practice and research**

"I wish I could tell you time heals
all wounds but we both know the
more time you have, the longer the
list of wounds grows."

Superman



Thank You!

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Treating All Complex Wounds in One Center



- **Ability to develop and use standardized treatment plans for different wounds**
- **Higher degree of continuity in treatment**
- **Optimal use of resources for diagnosis and treatment**
- **Continuous education of staff**
- **Ability to provide training for different types of healthcare personnel.**
- **Increased patient satisfaction**
- **Cost effectiveness.**

Chronic Wounds Responsible for...

- Pain
- Infection
- Malnutrition
- Psychological disturbances
- Loss of function
- Loss of mobility
- Worsening systemic health
- Financial cost
- Death



Philoctetes

How Is History Relevant to Chronic Wounds?

- ✓ **The history of wound care actually the history of “acute” wound care.**
- ✓ **The knowledge related to chronic wounds is new and growing.**
- ✓ **DFUs has been an important driver for the advancement of Wound Care as a discipline.**

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Effect of Air Exposure and Occlusion on Experimental Human Skin Wounds

CAMERON D. HINMAN & HOWARD MAIBACH

Division of Dermatology, University of California School of Medicine, San Francisco.

THE benefits of special dressings versus air exposure of cutaneous wounds has long been debated. Winter and Scales^{1,2} have recently added fresh insight into the problem. In the domestic pig they demonstrated that an occlusive dressing doubles the rate of wound re-epithelization when compared with wounds exposed to the air. In this communication we report parallel studies performed in man.

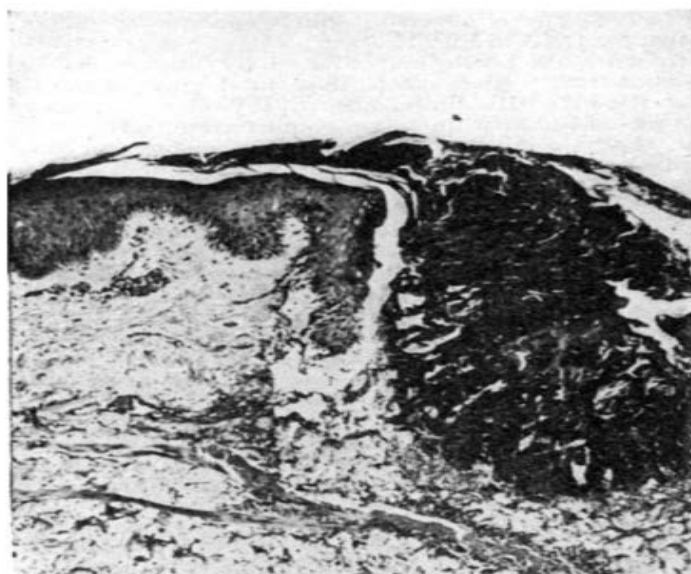


Fig. 1. Air exposed human cutaneous wound (control). Note the angle at which epithelium has grown beneath the eschar

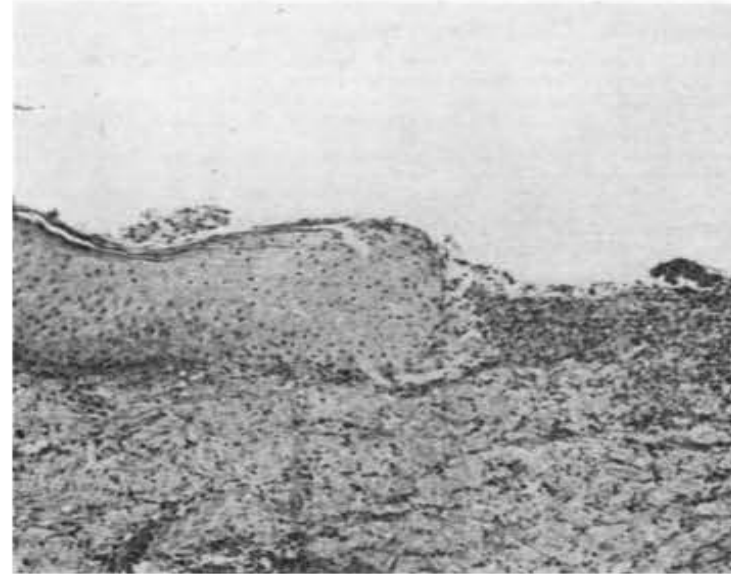


Fig. 2. Occluded experimental human cutaneous wound. Note lack of eschar and straight epithelial growth

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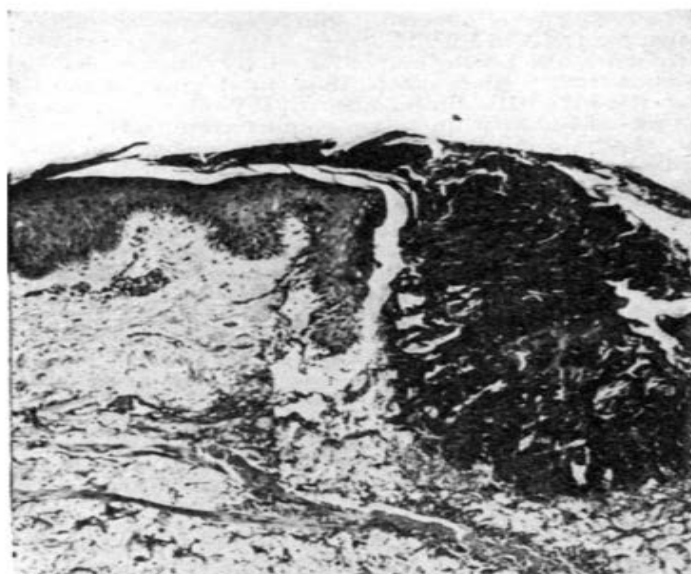


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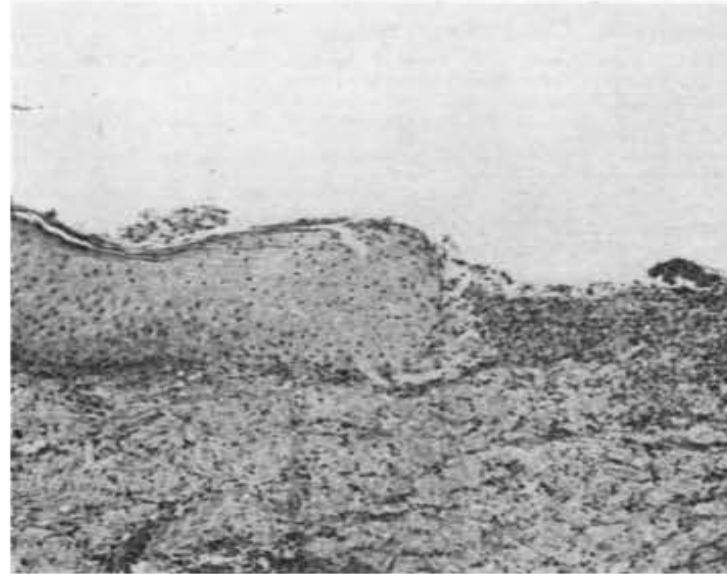
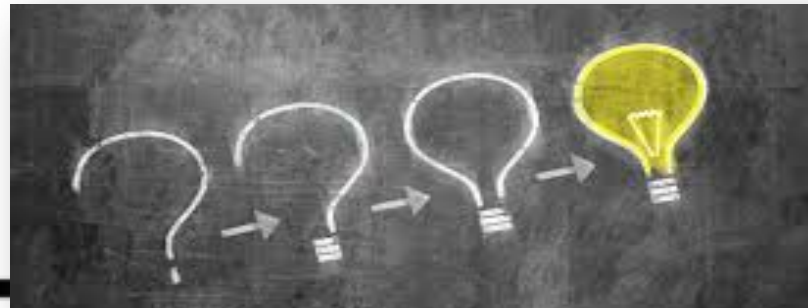


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**KNOWING
BETTER
WHAT TO
DO?**



**DOING
BETTER
WHAT WE
KNOW?**

- ✓ **Authorities to recognize the disease and its scale.**
- ✓ **Develop specialized centers with dedicated staff.**
- ✓ **Develop systems where relevant specialists can work together.**
- ✓ **Develop and apply standard of care protocols.**
- ✓ **Prioritize training and research.**