





Engaging Microbiology in Wound Care

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- ▶ The opinions expressed in this presentations are those of my own. They do not purport to reflect the opinions or views of my employers,

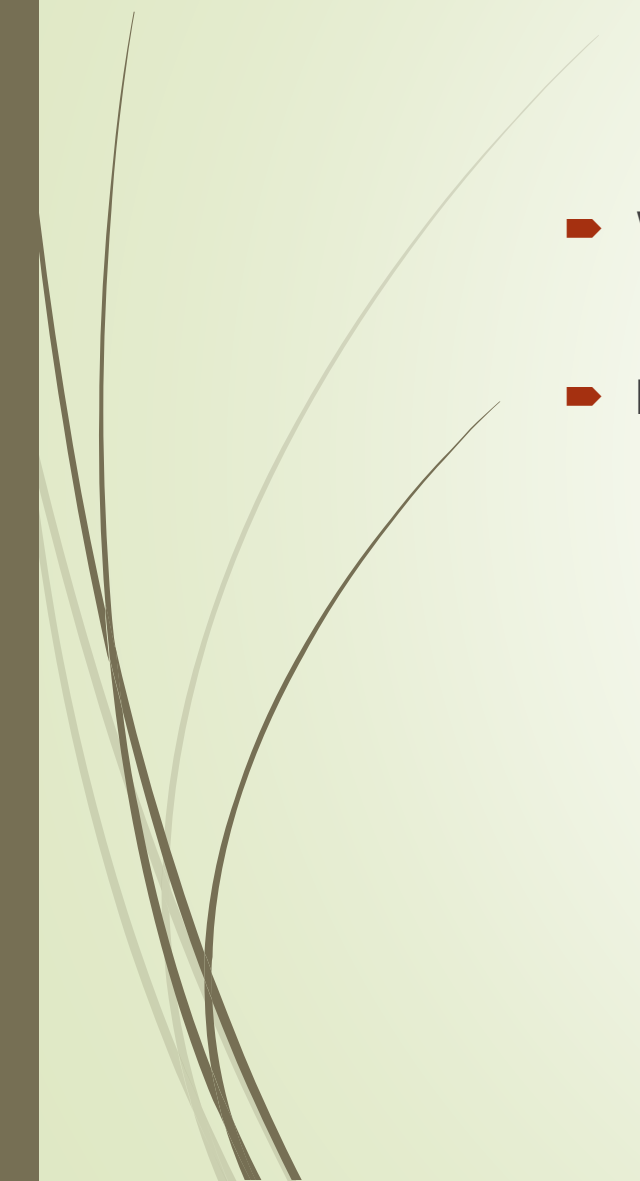


Overview

- Swab vs Biopsy
 - “Normal Skin Flora” – what does that mean?
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Swab vs Biopsy

- ▶ What is wound infection? This defines the gold standard.
 - ▶ Is a swab a good enough surrogate?
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Swab vs Biopsy

- ▶ Very few head-to-head studies:
 - ▶ “Wound swab biopsy” on Pubmed: only 251 results!
 - ▶ “Wound biopsy swab” on Pubmed: 441 results
 - ▶ “Swab Biopsy” on Pubmed: 3456 hits, and lots of irrelevant ones to wound infection
- ▶ Many different types of wounds
- ▶ Small study size
- ▶ Old swab types
- ▶ Culture vs molecular methods
- ▶ Conflicting results
- ▶ Extrapolation problem



Swab vs Biopsy selected literature

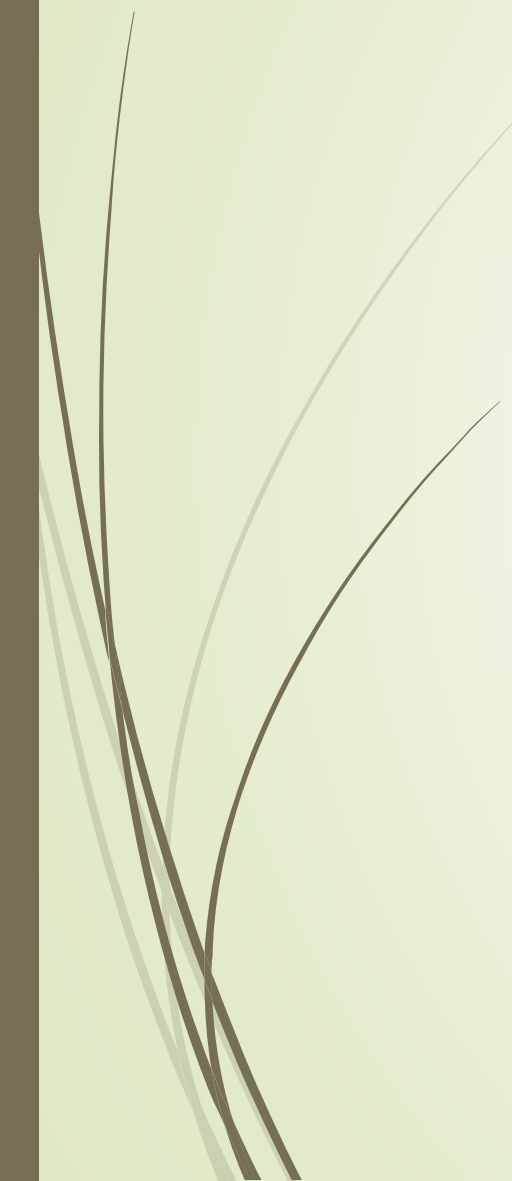
- ▶ Rondas et al 2013 review: Levine swab technique recommended, though best sampling technique still unknown.
- ▶ Demetriou et al 2013: Diabetic foot infection: Good sensitivity and NPV
- ▶ Nelson et al 2017: Diabetic foot infection: Tissue better, tissue reported more pathogens c.f. wound swab in 36.7%, while swab reported more pathogens in 8.1%
- ▶ Senneville et al 2023 review: Tissue better for Diabetic Foot Ulcer
- ▶ Haalboom et al 2018: Levine Swab identified all organisms cultured from biopsies in 72.8%
- ▶ Huang et al 2016: Swabs – Biopsy correlation depends on wound grade. At beyond grade 3 poor correlation. Also less correlation for Gram negatives.



“Normal Skin Flora”

How are specimens processed in the lab?

- ▶ Different set up for different specimens
 - ▶ To support fastidious organisms
 - ▶ To suppress fast growing mixed organisms
- ▶ If no clinical notes, “routine” set up
- ▶ More information on request slip, better tailored set up
 - ▶ Location!!
 - ▶ What is it?
 - ▶ Brief history
- ▶ Tissues usually get more media set up than swabs



History Examples	Actions in lab
Breast	Add special lipophilic plate, chase Corynebacterium
Diabetes + Trauma + Tissue	Special care for specimen to look for Zygomycetes (less cutting) – need microbiologist consult
Post op wound + Tissue	Anaerobic culture
Pilonidal/Perianal/other dirty sites	Special plates to suppress overgrowth



“Normal Skin Flora”

How are results released in laboratory?

- ▶ Specimen cultures are viewed by bench scientists.
- ▶ Colonies of interest (based on colony morphology etc) have confirmatory identification (which requires additional tests).
- ▶ Not all colonies have confirmatory identification.
- ▶ If scientists have issues, clinical microbiologists are consulted.
- ▶ Results are authorized by microbiologists for release, but depending on the laboratory, not all results are viewed by clinical microbiologists.

- ▶ Many human factors involved, thus variability.

- ▶ “Normal skin flora” – what is it??



Summary: Thinking about Microbiology

- ▶ The Art and Science of Growing little things on little plates.
- ▶ Wound microbiology is severely under researched.
- ▶ Colonization and Infection may not be clear cut.
- ▶ Engage your microbiology service for best results:
 - ▶ Request slip as referrals
 - ▶ Call the laboratory for difficult cases prior to sending specimens
 - ▶ Talk to the Clinical microbiologists for more information/interpretation
 - ▶ “Normal skin flora”? Confirm if it doubt.
 - ▶ Further specimens



References



- ▶ Ronda A et al 2013. Swab Versus Biopsy for the Diagnosis of Chronic Infected Wounds [10.1097/01.ASW.0000428984.58483.a](https://doi.org/10.1097/01.ASW.0000428984.58483.a)
- ▶ Demetriou M et al 2013. Tissue and Swab Culture in Diabetic Foot Infections: Neuropathic Versus Neuroischemic Ulcers. [10.1177/1534734613481975](https://doi.org/10.1177/1534734613481975)
- ▶ Nelson A et al 2018. CODIFI (Concordance in Diabetic Foot Ulcer Infection): a cross-sectional study of wound swab versus tissue sampling in infected diabetic foot ulcers in England. [10.1136/bmjopen-2017-019437](https://doi.org/10.1136/bmjopen-2017-019437)
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- ▶ Haalboom M et al 2018. Wound swab and wound biopsy yield similar culture results. [10.1111/wrr.12629](https://doi.org/10.1111/wrr.12629)
- ▶ Huang Y et al 2016. A Comparison of Tissue versus Swab Culturing of Infected Diabetic Foot Wounds. [10.1155/2016/8198714](https://doi.org/10.1155/2016/8198714)