



# Basics of Skin Biopsy Techniques



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# Conflicts of Interest

- None to disclose

- Will refer to biopsy throughout to mean skin biopsy

# Objectives

- Review general principals of skin biopsy
- Review indications for skin biopsy
- Examine different methods of skin biopsy
- Discuss how to choose appropriate biopsy method and site
- Review how to avoid common pitfalls

# Indications For Biopsy

- Inflammatory dermatoses of unclear etiology
- Inflammatory dermatoses not responsive to typical treatment
- Concern for presence of malignancy
- Confirmation of suspected etiology



<http://resolver.ebscohost.com.ezproxy.pcom.edu:2048/openurl?sid=Entrez%3aPubMed&id=pmid%3a26853178&site=ftf-live>



<http://www.dermatologycharleston.com/skin-cancer/basal-cell-carcinoma/>

# PRE-PROCEDURE PREPARATION

# Informed Consent

- As important for biopsy as any other procedure
- Why the biopsy is being performed
- What the procedure entails
- Potential complications of biopsy



<https://www.fda.gov/forpatients/clinicaltrials/informedconsent/default.htm>

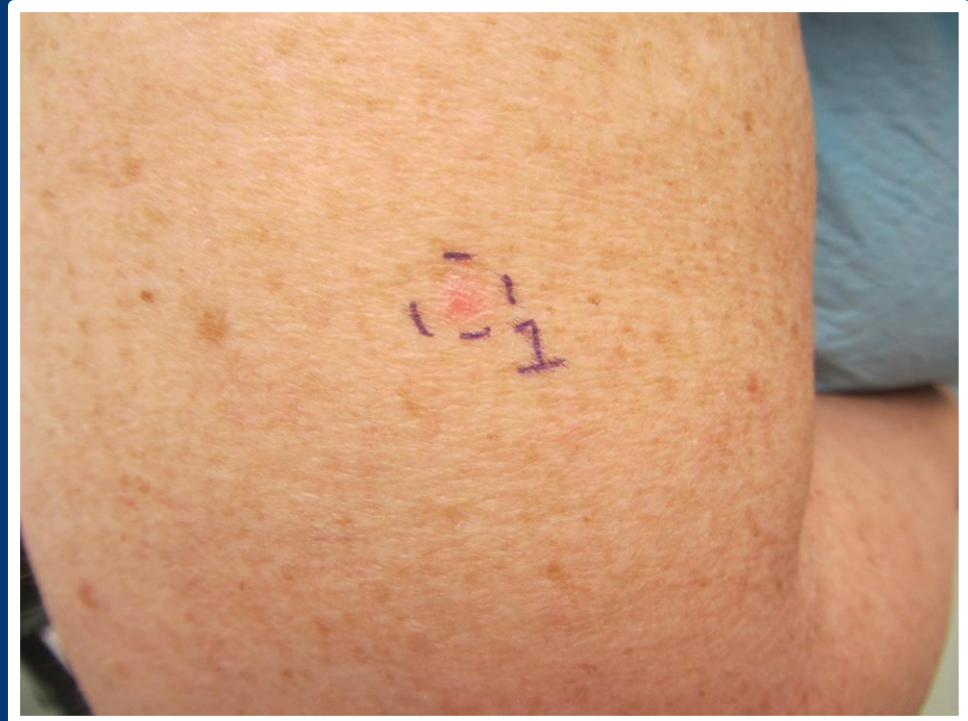
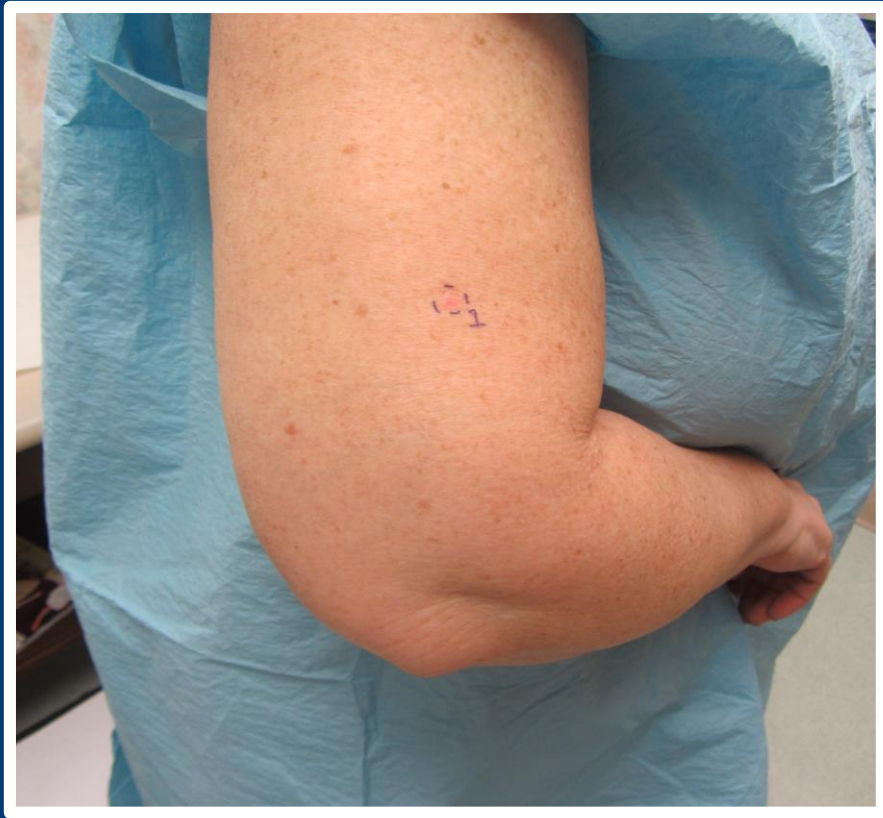
# Complications Of Biopsy

- Bleeding
- Infection
- Scar formation
- Recurrence
- Need for further intervention
- Nerve damage



# Photographs

- Important for biopsies of suspected skin cancers
- Need two pictures
  - Distant enough from the lesion to capture position of patient
  - Close up enough to characterize lesion of interest
- Photos have been associated with reduced rates of postponed surgeries and decreased wrong-site surgeries



# Anesthesia

- Depends upon site
  - Infiltration
  - Ring block
  - Nerve block
  - Topical
    - 5mm depth after 2 hours



<http://www.podiatrytoday.com/guide-biopsy-techniques>

# Amides vs Esters

TABLE 2. Local anesthetics

| AMIDE GROUP | ESTER GROUP   |
|-------------|---------------|
| Lidocaine   | Cocaine       |
| Mepivacaine | Procaine      |
| Bupivacaine | Chlorprocaine |
| Etidocaine  | Tetracaine    |
| Prilocaine  |               |

# Site Selection

- Choose a lesion with classic clinical appearance
  - Papules: Central portion
  - Annular lesions: Active border
  - Blistering diseases:
    - Intact vesicle/bulla with a shave procedure
    - If cannot obtain intact, biopsy at bulla edge keeping roof attached
- Avoid old lesions with secondary changes
  - Crusts, excoriations, erosions

# Considerations In Biopsy

- Choosing appropriate method
  - Size of lesion
  - Suspected clinical diagnosis
  - Site of lesion
  - Clinical setting (outpatient vs inpatient)

# PROCEDURE

# Methods Of Biopsy

- Shave biopsy
- Punch biopsy
- Excisional biopsy
  - Saucerization
- Curettage
- Tangential cut with scissors
- Narrow incisional biopsy

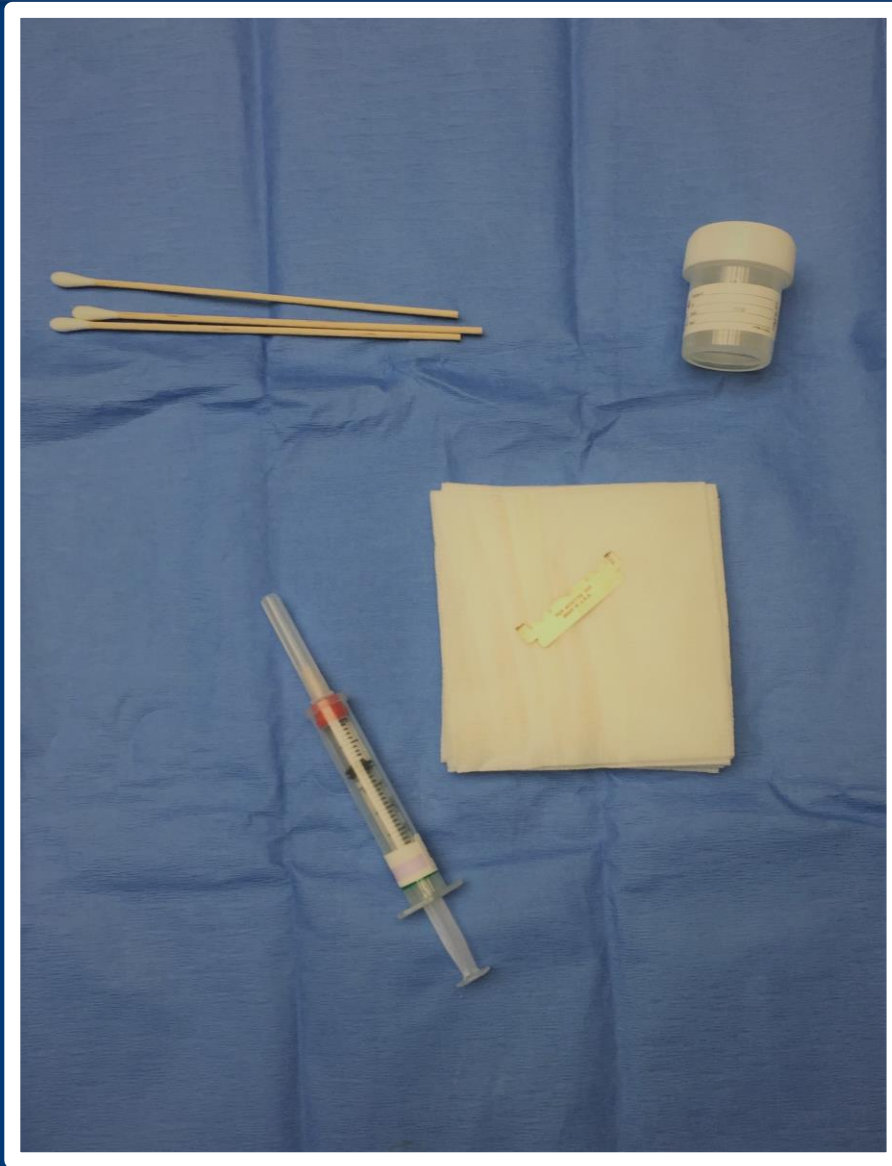


# Indications By Biopsy Type

| Biopsy Type       | Indications (non-comprehensive)   |
|-------------------|---|
| Shave biopsy      | <ul style="list-style-type: none"><li>• Raised lesions<ul style="list-style-type: none"><li>- Dermal nevi, benign appearing tumors</li></ul></li><li>• Superficial lesions (seborrheic keratoses)</li><li>• Non-melanocytic malignant tumors</li><li>• Bullous diseases</li></ul> |
| Punch biopsy      | <ul style="list-style-type: none"><li>• Superficial inflammatory dermatoses</li><li>• Papulosquamous disorders</li><li>• Connective tissue diseases</li><li>• Granulomatous diseases</li><li>• Benign appearing tumors</li><li>• Bullous diseases</li><li>• Vasculitis</li></ul>  |
| Excisional biopsy | <ul style="list-style-type: none"><li>• Malignant melanoma</li><li>• Atypical pigmented lesions</li><li>• Subcutaneous tumors</li></ul>   |

# Shave Biopsy

- Do not require sutures for closure
- Ideal for superficial lesions that are above the level of the surrounding skin
- Lesions where the pathology should be in the outer layers of the skin
- Not used for pigmented lesions

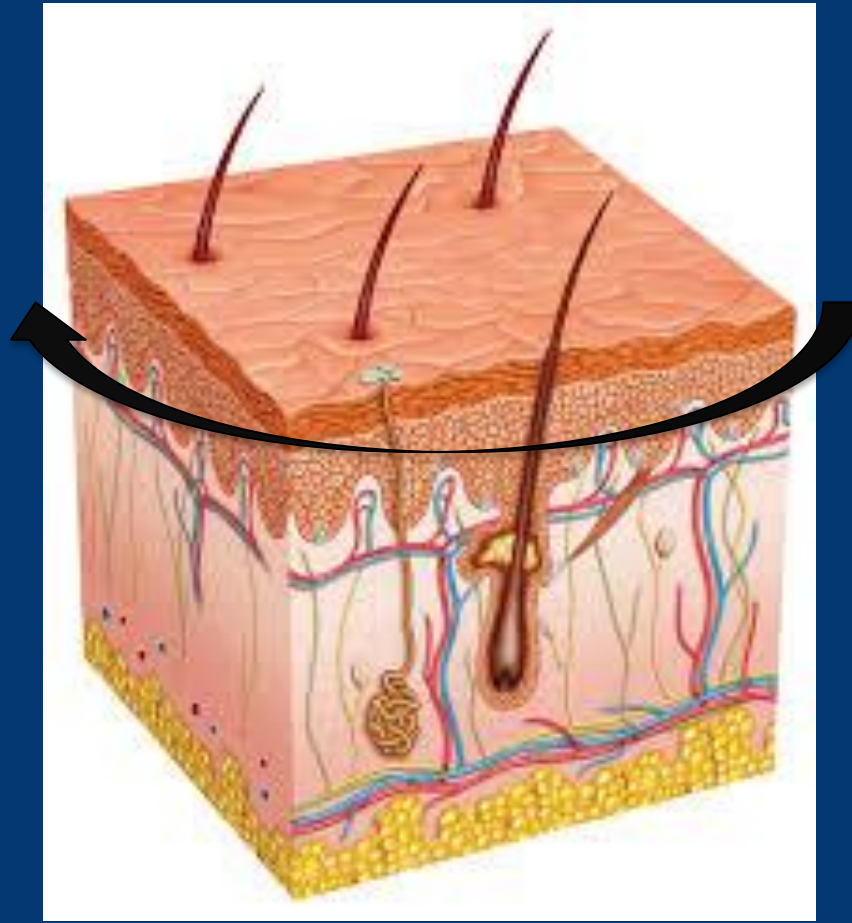


# Shave Biopsy

- Enter the skin tangentially and cut underneath the lesion parallel to the skin
- To the depth of the reticular dermis
- Brought through to the other side of the lesion
- Hemostasis with aluminum chloride or Monsel's solution
  - Monsel's solution may leave behind a pigment tattoo



# Shave Biopsy



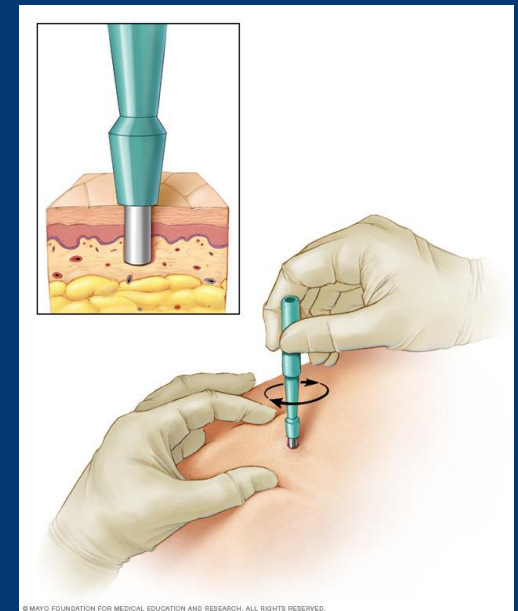
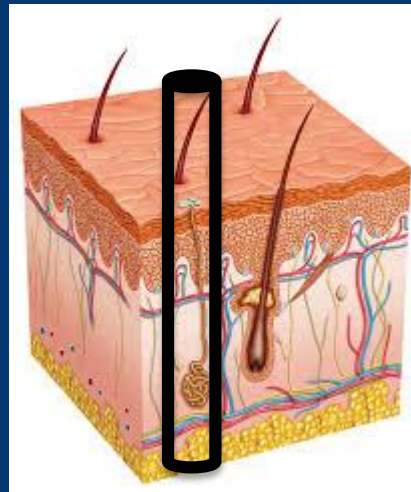
# Punch Biopsy

- Ideal for inflammatory dermatoses
  - Allows for evaluation of subcutaneous fat
- Punch biopsy tool cuts circularly to obtain a round plug of skin
- Tools vary in size from <1mm to 10mm in diameter
  - Ideal size for most punch biopsies is 4mm



# Punch Biopsy

- Skin is stretched perpendicular to the skin tension lines
- Punch tool is applied to skin and rotated



<http://www.mayoclinic.org/tests-procedures/skin-biopsy/details/what-you-can-expect/rec-20196374>



# Punch Biopsy

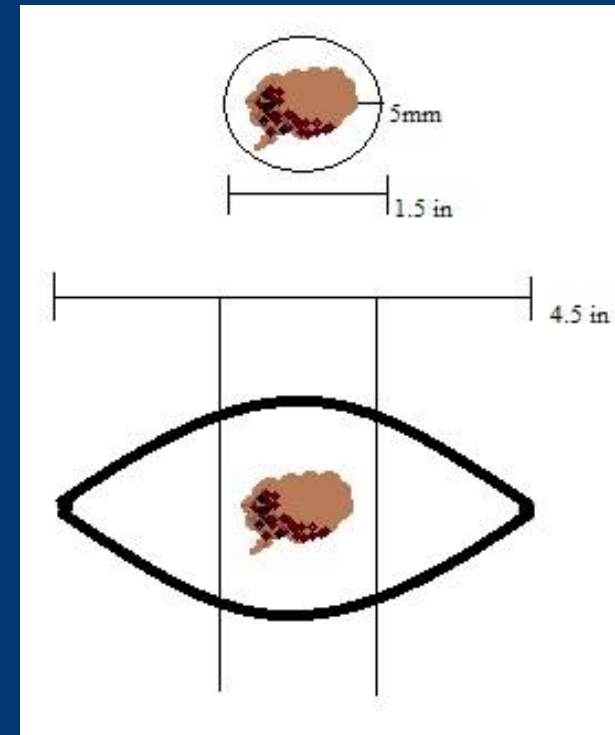
- Once depth has been achieved, punch tool removed
- Specimen lifted with forceps grasping the peripheral edge, and cut at base with scissors
- Defect can be closed with non-absorbable suture or filled with gel foam if small enough punch is used

# Excisional Biopsy

- Ideal for deep inflammatory processes and malignancies where entire depth should be evaluated (melanoma)
- Fusiform excision of a lesion with surrounding clinically normal margins
- Margins depend on lesion suspected
  - Basal cell carcinoma: 4mm for complete removal
  - Melanoma: 5-10mm for complete removal

# Excisional Biopsy

- Outline on the skin surface in the orientation of natural skin tension lines
- Length-to-width ratio 3:1
- Excision along outline to the depth of subcutis
- Edges approximated with deep and epidermal sutures



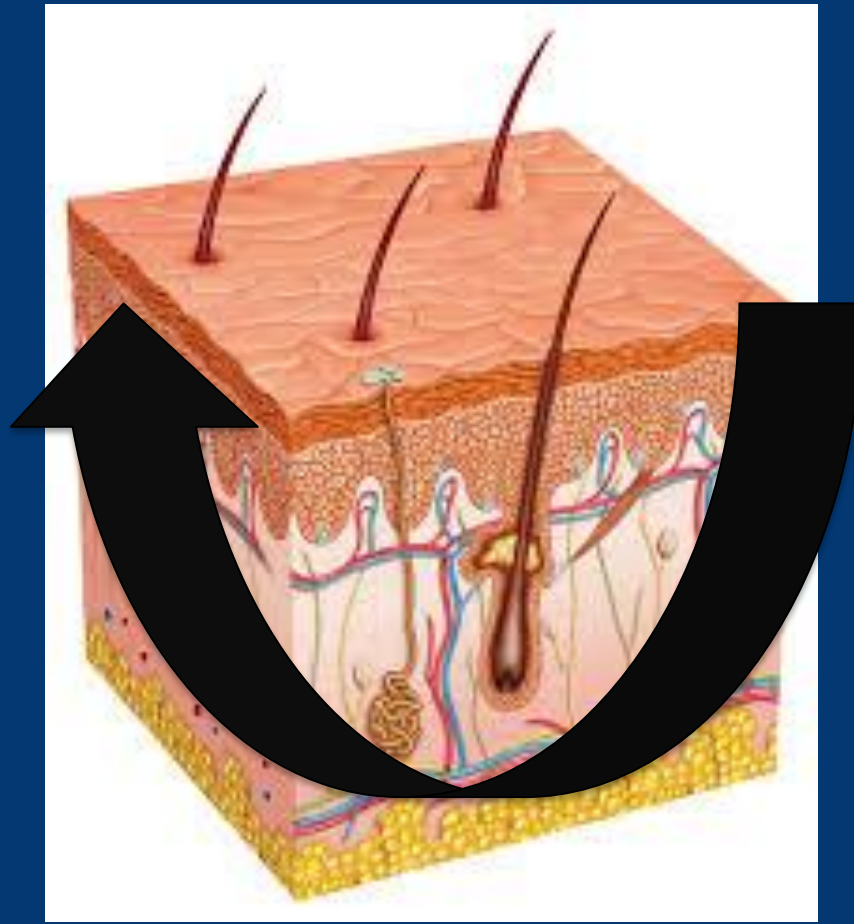
# Saucerization Biopsy

- Considered an excisional biopsy
- Ideal for broad pigmented lesions or anatomic locations poorly amenable to excision
- Less time consuming and invasive diagnostic modality than fusiform excision
- Can yield same amount of diagnostic information as excisional biopsy

# Saucerization Biopsy

- Shave blade used to enter skin tangentially
- Blade is bent to increase depth of biopsy
  - Reticular (deep) dermis or subcutaneous fat
- Brought through the skin to the other side

# Saucerization Biopsy



# POST PROCEDURE PROCESSING

# Biopsy Analysis

- Many inflammatory dermatoses
  - Routine permanent section (H&E)
  - Direct immunofluorescence (DIF)
- Direct immunofluorescence highlights pathogenic antibody deposition
  - Autoimmune bullous diseases, vasculitis, connective tissue diseases, scarring alopecias
- If concern for infectious etiology must send for tissue culture



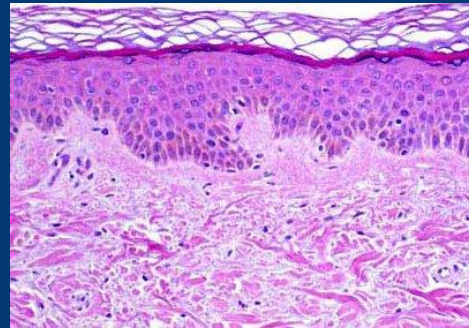


<http://multiple-sclerosis-research.blogspot.com/2017/06/clinicspeak-blistering-skin-disease-and.html>

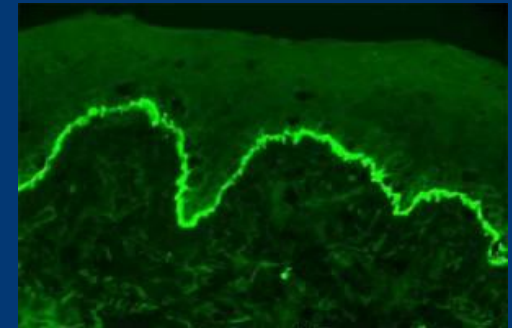
Usatine RP, Smith MA, Mayeaux EJ, Chumley HS: The Color Atlas of Family Medicine, Second edition: [www.accessmedicine.com](http://www.accessmedicine.com), The McGraw Hill Companies Inc.

# A Note on Fixative

- Inappropriate fixative compromises analysis
- Routine permanent section: 10% formalin
- Direct immunofluorescence: Michel's solution
- Tissue cultures (bacterial, fungal, acid fast bacilli), gauze with normal saline



<http://www.mrcophth.com/pathology/commonstains/stains.html>



<http://www.pcids.org.uk/clinical-guidance/bullous-pemphigoid1/>

# Clinical Information

- Provide dermatopathologist with clinical information
- Include previously rendered biopsy findings
- Be as detailed as time and space will allow
  - Age and sex
  - Biopsy site
  - Clinical presentation
  - Favored diagnosis

# Pitfalls

- Choosing wrong biopsy site
- Specimen too small
- Specimen with traumatic defects
  - Electrocoagulation
  - Forceps
- Tissue drying prior to placement in fixing solution
- Inappropriate fixative

# Conclusion

- Skin biopsy is a valuable bedside diagnostic tool
- Photographs are an important pre-procedure step
- Biopsy site selection should be intentional
- Determining the proper biopsy method depends on an understanding of the underlying pathology
- Specimens must be sent in appropriate fixative
- Clinical information must be provided to the dermatopathologist for optimal analysis

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# Thank You

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