Faculty Disclosure Statement

• No conflicts relevant to this workshop!
• There is no more difficult art to acquire than the art of observation. Many look, but few see.
## Risk of Invasive Melanoma

<table>
<thead>
<tr>
<th>Year</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1930</td>
<td>1/1500</td>
</tr>
<tr>
<td>1950</td>
<td>1/600</td>
</tr>
<tr>
<td>1980</td>
<td>1/250</td>
</tr>
<tr>
<td>1985</td>
<td>1/150</td>
</tr>
<tr>
<td>1993</td>
<td>1/100</td>
</tr>
<tr>
<td>2000</td>
<td>1/74</td>
</tr>
<tr>
<td>2007</td>
<td>1/60</td>
</tr>
<tr>
<td>2010</td>
<td>1/56</td>
</tr>
<tr>
<td>2015</td>
<td>1/50   (projected)</td>
</tr>
</tbody>
</table>
Dermoscopy

- Dermatoscopy
- Epiluminescence microscopy (ELM)
- Surface microscopy
- Skin surface microscopy
- Magnified diascopy
- Oil immersion diascopy
Dermoscopy

- Render the superficial epidermal component transparent
- View deeper epidermis and dermis
- Oil + Magnification
- Polarized light + Magnification
- Polarized light superior in examination of pigmented lesions


- Almost ART! Semi-SCIENCE!
- Takes time and experience
- ADJUNCTIVE procedure, never replaces clinical judgment
Welch-Allyn Episcope
~$375-$500

Heine Deltascope
~$500

Oil-Based Dermoscopy
Dermoscopy: No Oil
Polarized Light

Dermlite DL100
3 GEN
10x magnification
Polarized light
877-694-9777
Dermlite.com

$375
Rechargeable (Lithium Ion)

$995

Switchable LED to polarizer

10x magnification
Lumio

2x magnification
LED + Polarizer
Replaceable batteries
Good for general skin exam or large areas
$495
Automated Analysis

- Digital magnified image to computer
- Lesion assessed by pre-set criteria
- Lesion “scored”
- Cancer probability
- Images saved
- MelaFind® MoleMax®
- SIAscope®, SolarScan®
Dermoscopy v. Computer

- Of note: computer assisted dermoscopy may have HIGHER false positive rate than hand held procedure!
- Up to false positive 26%
  
  *Br J Dermatol 143:1016, 2003*

- At best, it is equivalent to hand-held units with experienced clinicians
  

- There is still a role for the human being in diagnosis!
Dermoscopy v. Standard Total Body Photography

- 1067 patients
- Underwent total body photography
- Followed by comparison of in vivo skin to photographs versus dermoscopy
- Photographic follow had fewer biopsies & lower mole : melanoma ratio among lesions biopsied

*Derm Surg* 36:1087-98, 2010
DO YOU NEED DERMOSCOPY FOR EVERY PIGMENTED LESION?

- Of course not!
- Some lesions are OBVIOUS
- Helps to raise or lower index of suspicion with equivocal lesions
No Dermoscopy Needed!
Pick the Melanoma

A

B

C
Pick the Melanoma

A

B

C
Dermoscopy: Utility I

- **Does it REALLY help?**
  Increased diagnostic accuracy among family physicians by 40%

- **Are there FALSE POSITIVES?**
  Yes, but these are uncommon
  2.5-8% false positives
  *JEADV* 15:24, 2001

- **Are there FALSE NEGATIVES?**
  Yes, but these are very rare
Dermoscopy: Utility II

• When compared to naked eye examination of pigmented lesions, dermoscopy increases PROPER diagnosis of melanoma by up to 15x baseline, more so with more experience using technique

• *Br J Dermatol* 159:669, 2008 (Meta-analysis of all prior studies)
Dermoscopy Texts

Buy one. Any one. Read it. Re-read it.
Dermoscopy Texts

THE ENCYCLOPEDIA OF VISUAL MEDICINE SERIES

Atlas of DERMOSCOPY

Edited by Ashfaq A. Marghoob MD
Ralph P. Braun MD and
Alfred W. Kopf MD MD(mcmia)

DERMOSCOPY
AN ATLAS

DERMOSCOPY
The Essentials

Handbook of Dermoscopy

Menzies

Malvehy

Buy one. Any one. Read it. Re-read it.
Dermoscopy

• GENERAL CHARACTERISTICS
  • Homogeneous v. Heterogeneous
  • Symmetrical v. Asymmetrical

• SPECIFIC FEATURES
  • Consensus Conference 1990 identified 22 distinct features
  • These have been condensed into various checklists
Dermoscopy

Heterogeneous  Homogeneous
Dermoscopy

Asymmetrical

Symmetrical
Dermoscopy

Asymmetrical

Symmetrical
Dermoscopy

- Regular pigment net
- Irregular pigment net
- Prominent pigment net
- Discrete pigment net
- Wide pigment net
- Narrow pigment net
- Broad pigment net
- Delicate pigment net
- Pseudopod
- Radial streaming
- White veil

- Black dots
- Brown globules
- White scar-like area
- Blue-grey area
- Hypopigmentation
- Reticular depigment
- Milia-like cyst
- Comedo-like opening
- Telangiectasia
- Red-blue areas
- Maple-leaf areas
Dermoscopy: Algorithms

- **ABCD rules**

- **Menzies scoring method**
  Menzies: *Arch Dermatol* 132:1178, 1996

- **CASH Algorithm**

- **7-point checklist system**
  Argenziano: *Arch Dermatol* 134:1563, 1998

All systems perform equally! *Arch Derm* 141:1008, 2005
The first three are cumbersome.
The 7-point checklist is predominant method.
Dermoscopy: Algorithms

- ABCD rules 77.5%
- Menzies scoring method 84.6%
- CASH Algorithm 68.4%
- 7-point checklist system 89.4%

Relative sensitivity in the hands of a NON-expert

Arch Dermatol 141:1008, 2005
7 Point Checklist

**MAJOR CRITERIA (2 points)**
- Atypical pigment network
- Blue-white veil
- Atypical vascular pattern

**MINOR CRITERIA (1 point)**
- Irregular streaks (streaming, pseudopods)
- Irregular pigmentation
- Irregular dots or globules
- Regression structures

**Total score ≥ 3 highly suspect MM**
7 Point Checklist

• **MAJOR CRITERIA (2 points)**
  Atypical pigment network
  Blue-white veil
  
  *Atypical vascular pattern*

• **MINOR CRITERIA (1 point)**
  Irregular streaks *(streaming, pseudopods)*
  Irregular pigmentation
  Irregular dots or globules
  Regression structures

• **Total score \( \geq 3 \) highly suspect MM**
Pigment Network

- Fundamental structure
- Grid of connected pigmented lines
- Due to: pigmented rete ridges in the lower epidermis
Pigment Network
Irregular Pigment Network
Irregular Pigment Network

Not symmetric and Not homogeneous
Irregular Pigment Network
Irregular (Atypical) Network

Specificity 80-86%
Sensitivity 30-35%
Dots and Globules

- Fundamental structure
- Large to small spot-like pigment
- Due to: nests of pigment-laden cells at DEJ or in upper dermis
Dots and Globules
Dots and Globules
Irregular Dots and Globules

Specificity 80%
Sensitivity 50%
Irregular Pigmentation

- Irregular shape
- Irregular distribution
- Multiple colors
- Due to: very random pigment throughout epidermis and dermis

Specificity 46%
Sensitivity approaches 100%
Irregular Pigmentation
Irregular Streaks

- At lesional edge
- Well defined structures
- Should NOT be there
- **Radial streaming**
  - Finger-like extensions
- **Pseudopods**
  - Bulbous extensions
- Due to peripheral expansion along DEJ
Radial Streaming
Radial Streaming
Radial Streaming

96% specificity
18% sensitivity
Pseudopods (types)

A
B
C
D
E

F-I
Pseudopods
Blue-White Veil

• Whitish-colored film overlying amorphous blue to blue-grey
• White: thickened epidermis
• Blue: heavily pigmented dermal melanocytes
• Should not be there in normal nevocellular or other growths
• Relatively specific for melanoma
Blue-White Veil
Blue-White Veil

Specificity 97%
Sensitivity 51%
Blue-White Veil
Regression Structures

- Bone white areas
- Represent tumor “regression”
- ? Response to immune attack
- Due to: loss of melanin and/or fibrosis
Regression Structures
Regression Structures

Specificity 92-93%
Sensitivity 36-46%
Atypical Vascular Pattern

- Least common
- Hardest to show
- Linear or dotted blood vessels
- Due to: dermal neovascularization
- That is: tumor induces its own blood supply

Specificity 60-70%
Sensitivity 8%
Dermoscopy in Action

- Blue-White Veil 2
- Atypical Vascular 2
- Atypical Network 2
- Irregular pigment 1
- Irregular streak 1
- Irregular dots 1
- Regression 1
Dermoscopy in Action

• Blue-White Veil 2
• Atypical Vascular 2
• Atypical Network 2
• **Irregular pigment** 1
• Irregular streak 1
• Irregular dots 1
• **Regression ?** 1

TOTAL SCORE = 2

BIOPSY = DYSPLASTIC NEVUS
Dermoscopy in Action

- Blue-White Veil 2
- Atypical Vascular 2
- Atypical Network 2
- Irregular pigment 1
- Irregular streak 1
- Irregular dots 1
- Regression 1
Dermoscopy in Action

- **Blue-White Veil** 2
- Atypical Vascular 2
- Atypical Network 2
- **Irregular pigment** 1
- **Irregular streak** 1
- Irregular dots 1
- **Regression** 1

TOTAL SCORE = 5

BOPSY: SSMM 1.1mm
Dermoscopy in Action

- Blue-White Veil 2
- Atypical Vascular 2
- Atypical Network 2
- Irregular pigment 1
- Irregular streak 1
- Irregular dots 1
- Regression 1

TOTAL SCORE = 0
Dermoscopy in Action

- Blue-White Veil 2
- Atypical Vascular 2
- Atypical Network 2
- Irregular pigment 1
- Irregular streak 1
- Irregular dots 1
- Regression 1

TOTAL SCORE = 0
BIOPSY = JUNCT’L NEVUS
Dermoscopy in Action

- Blue-White Veil 2
- Atypical Vascular 2
- Atypical Network 2
- Irregular pigment 1
- Irregular streak 1
- Irregular dots 1
- Regression 1
Dermoscopy in Action

- Blue-White Veil  2
- Atypical Vascular  2
- Atypical Network  2
- Irregular pigment  1
- Irregular streak  1
- Irregular dots  1
- Regression  1

TOTAL SCORE = 5

BIOPSY = SSMM  0.33mm
Dermoscopy in Action

- Blue-White Veil 2
- Atypical Vascular 2
- Atypical Network 2
- Irregular pigment 1
- Irregular streak 1
- Irregular dots 1
- Regression 1
Dermoscopy in Action

- Blue-White Veil 2
- Atypical Vascular 2
- Atypical Network 2
- ?Irregular pigment 1
- Irregular streak 1
- Irregular dots 1
- Regression 1

TOTAL SCORE = 0-1

BIOPSY = JUNCT’L NEVUS
Seborrheic keratosis
Seborrheic Keratosis
Comedone-like Plugs
Milia-like Cysts
Seborrheic Keratoses & MM
Search Carefully!

Where is the dangerous lesion?
What is this lesion?
NOTE: Multiple red-blue globules
This is pathognomonic for hemangioma
What is this lesion?
Dermoscopy

Senile angioma
(Cherry angioma)
Basal Cell Carcinoma

- Arborizing vessels
- Crusts
- If pigment present, delicate leaf-like structures or individual small globules
Dermoscopy

- Easy to do and non-invasive
- Augments direct observation
- Careful scoring leads to reproducible results
- Helps distinguish lesions that must be removed or biopsied from those that can remain or be observed
Other New Techniques

- Multispectral imaging
- Confocal scanning laser microscopy
- Ultrasound
- Optical coherence tomography
- Magnetic resonance imaging

What is the most difficult thing of all? That which seems the easiest: to see with your eyes that which lies right before your eyes.