...visiting the iniquity of the fathers upon the children unto the third and fourth generation...
Exodus chapter 20 verse 5
Conflict of interest...
156,000 Chaos and Clues posters to every hospital, doctor and dentist in Poland

Conflicts of Interest — Presenter
(honorarium/expenses)

Skin Cancer College Australasia
Healthcare International
Leo Pharma P/L
3Gin Inc.
University of California (Davis campus)
Dermatology Associates of Wisconsin (Kohler, Wisconsin USA)
Sonic Health Care
Sullivan Nicolaides Pathology
Douglas Hanly Mole Pathology
Cosmetic Surgery Forum (Las Vegas, USA)
Derma Medical (MoleMax, DermLite)
EquipMed (MoleMax, DermLite)
Canfield Scientific Inc.
Hotspots Hawaii
Wilcox Hospital Kauai Hawaii
International Dermoscopy Society
Melanoma Patients Australia
What is dermatoscopy?

- A non-invasive diagnostic technique for skin lesions
- A low powered microscope designed for visualisation of pigmentation and vessels by reducing the amount of light reflected off the skin surface by either
  - Contact fluid immersion
  - Polarising filters
Clinical examination looks at lesions in the horizontal plane.

In contrast, conventional microscopy looks at lesions in the vertical plane.

Because melanin appears as different colours at different depths in the skin, dermatoscopy provides information in both the horizontal and vertical planes. It provides a 3-dimensional view.

Why use dermatoscopy?
Routine examination

Dermlite Pro (HR)

Heine Delta 20

Photography- most images in this presentation

Dermlite Fluid

DermLite DL3
Polarised vs Non-Polarised
**Chaos and Clues**

- All pigmented lesions
- Detects malignancy ANY type
- No need to decide whether melanocytic
- Can be applied at examination speed
- Efficacy similar to the other algorithms
Understanding colours in Dermatoscopy
The Tyndall Effect
Why is the sky blue?
The chaos factor...
Natural laws favour symmetry

- Gravity
- Electrical and magnetic fields
- Surface tension
- Biologic Feed-back mechanisms that evolved
**Revised Pattern Analysis**

Pattern + Colours + Clues = Diagnosis

---

**Chaos & Clues**

Pattern + Colours + Clues(9) = Malignancy

---

**Chaos & Clues**

Pattern + Colours + Clues(9) = Malignancy

Chaos + Clues(9) = Malignancy
CHAOS

Asymmetry of Structure and/or colour

CHAOS: Structure; Colour; Border

Acknowledging prior work...

- 1987 – Pehamberger – Classic Pattern Analysis
- 1989 – First hand-held dermatoscope – consensus meeting – metaphoric terminology
- 1994 – Stolz – ABCD rule
- 1995 – Menzies’ method
- 1998 – Argenziano – 7 point checklist
- 1998 The Ugly Duckling Sign
- 1998 The Little Red Riding Hood sign
- 2000 – Soyer/Argenziano – 3 point checklist
- 2007 – CASH (colour, architecture, symmetry, and homogeneity) version of pattern Analysis
- 2007 The beauty and the beast sign
Multiple Pigmented or non-pigmented?

What structures/patterns?
CHAOS?

Chaos

No chaos

Judge on pattern and colour, not on outline

CHAOS?
CLUES

GET BLACK LOLLIPOPS
Gray or blue structures
Eccentric structureless area
Thick lines reticular
Black dots or dotts peripheral
Lines radial or pseudopods, segmental
Lines white
Lines parallel ridges (palms or soles) or chaotic (nails)
Polymorphous vessels
Polygons
Geometric Cutaneous Melanoma: A Helpful Clinical Sign of Malignancy?

Andrew D. Morris, MB, BCH, MRCP, Bruce C. Gee, MB, BCH, MRCP, and
Lawrie G. Muckle, MB, FRCP
Department of Dermatology, Queen's Medical Centre, University Hospital, Nottingham, United Kingdom

CHAOS? Structure; Colour; Border
Melanoma in situ

DETECTION ALGORITHM

CLUES
1. Any or blue structures
2. Elliptical or elongated
3. Thick lines or dots, penumbra
4. Lines radiating or pseudopods, segmental
5. Lines white
6. Lines parallel, ridge (acral)
7. Peau d’orange
8. Polymorphous sores
9. Polysynaps

EXCEPTIONS
1. Changing lesions on adults
2. Lesions or small lesions with any clue
3. Head/neck, pigmented (acral) or dermatoscopy grey
4. Anal - Papillae - ridge pattern

Melanoma in situ
CHAOS: Structure; Colour; Border

DECISION ALGORITHM
CLUES
1. Grey or blue structures
2. Cosmetic telangiectasia
3. Thick lines, reticular or branched
4. Black dots or clods, peripherally
5. Linne radial or pseudoangiograph, segmental
6. Uneven white
7. Uneven parallel, ridge (acral)
8. Creased vessels
9. Polypoid

EXCEPTIONS
1. Changing lesions on adults
2. Inflamed or small lesion with any clue
3. Lesions at foot or hand
4. Dermoscopic grey
5. Acral: Parallel ridge pattern

DECISION ALGORITHM
CLUES
1. Grey or blue structures
2. Cosmetic telangiectasia
3. Thick lines, reticular or branched
4. Black dots or clods, peripherally
5. Linne radial or pseudoangiograph, segmental
6. Uneven white
7. Uneven parallel, ridge (acral)
8. Creased vessels
9. Polypoid

EXCEPTIONS
1. Changing lesions on adults
2. Inflamed or small lesion with any clue
3. Lesions at foot or hand
4. Dermoscopic grey
5. Acral: Parallel ridge pattern
Pigmented SCC in-situ/Solar lentigo collision
Pigmented or non-pigmented?

Melanocytic or non-melanocytic?
**Melanoma Invasive**

<table>
<thead>
<tr>
<th>Generalized skin</th>
<th>Ulceration or white crust Present</th>
<th>Consider Biopsy (include melanogranules)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ulceration or white crust not present</td>
<td>Needle biopsy (exclude melanogranules)</td>
<td>All other patterns must be assessed for malignancy</td>
</tr>
</tbody>
</table>

*White Crust*:
- White lesion, or in the case of a raised lesion, white crusts, white structures, debris or surface Kotostick

**Melanotic**

<table>
<thead>
<tr>
<th>Generalized skin</th>
<th>Ulceration or white crust Present</th>
<th>Consider Biopsy (include melanogranules)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ulceration or white crust not present</td>
<td>Needle biopsy (exclude melanogranules)</td>
<td>All other patterns must be assessed for malignancy</td>
</tr>
</tbody>
</table>

*Melanotic*:
- Melanotic lesion, or in the case of a raised lesion, melanotic crusts, melanotic structures, debris or surface Kotostick

**Not Melanocytic**

<table>
<thead>
<tr>
<th>Generalized skin</th>
<th>Ulceration or white crust Present</th>
<th>Consider Biopsy (include melanogranules)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ulceration or white crust not present</td>
<td>Needle biopsy (exclude melanogranules)</td>
<td>All other patterns must be assessed for malignancy</td>
</tr>
</tbody>
</table>

*Amelanotic*:
- Amelanotic lesion, or in the case of a raised lesion, amelanotic crusts, amelanotic structures, debris or surface Kotostick
The so-called MELANOCYTIC criteria are not melanocytic at all. They are MELANOTIC criteria.
DECISION ALGORITHM

CLUES
1. Grey or blue structure
2. Coarse structureless area
3. Thick, irregular or branching
4. Black dots or dabs, punctate
5. Linear radial or pseudopods, segmental
6. Unercyle
7. Unercyle, ridge (acral)
8. Polypoid or verruca
9. Polyploid

EXCEPTIONS
1. Changing lesions on adults
2. Lesion or small lesion with any clue
3. Nasal/medial or lateral cheek or conchal or auricle
4. Nasal/medial or lateral cheek or conchal or auricle
5. Nasal/medial or lateral cheek or conchal or auricle
6. Nasal/medial or lateral cheek or conchal or auricle
7. Nasal/medial or lateral cheek or conchal or auricle
8. Nasal/medial or lateral cheek or conchal or auricle
9. Nasal/medial or lateral cheek or conchal or auricle

Melanoma in situ
Pigmented or non-pigmented?

If you cannot make a definitive clinical diagnosis of melanoma, nonmelanoma skin cancer, or vascular lesion, the lesion should be biopsied or excised for histologic evaluation.

**Prediction without Pigment - Short Version**

1. Ulceration or white disc present → Consider biopsy (include pigmentation).
2. Ulceration or white disc not present → Apply most patient's dermoscopy.
3. A lesion with non-pigmented or barely pigmented areas is strongly suspicious for melanoma.
4. All other patients must be assessed for integrality.

*A white disc pattern must have no nests within the nonpigmented area, a vascular pattern must have nests within a pigmented area.*
Not circles
Pattern of lines reticular interrupted by follicular openings in a solar lentigo

Circles
Pattern of circles in an in-situ melanoma on the ear lobe
CHAOS?

CHAOS: Structure; Colour; Border

DECISION ALGORITHM

CLUES
1. Grey or blue structures
2. Eccentric structureless area
3. Thick lines, reticulate or branched
4. Black dots or chalk, peripherally
5. Linear radial or pseudopolypoid, segmental
6. Lines wavy
7. Lines smooth, ridges [beak]
8. In chaotic sectors
9. Polynopsis

EXCEPTIONS
1. Cephalic or oral submucosa with any color
2. Nodule or small tumor with any color
3. Meatal/incision pigmentation on dermoepidermal gray
4. Acral: Parallel ridge pattern
Pigmented or non-pigmented?

Melanocytic or non-melanocytic?

CHAOS?

CHAOS: Structure; Colour; Border
Trichilemmoma/BCC
CHAOS?

CHAOS: Structure; Colour; Border

DECISION ALGORITHM

CLUES
1. Dry or blue structures
2. Eccrine sweat glands
3. Thick skin, reticular or branched
4. Dark areas or checks, papillomatous
5. Linear radial or pseudopods, angulated
6. Linear structure
7. Linear parallel, ridges (linear)
8. Exudative (mostly)
9. Polychromatous networks

EXCEPTIONS
1. Chewing in men on adults
2. Cerebrovascular accident with any clue
3. Head/neck: Pigmented (caucasian)
4. None: High risk, angulated grey
5. Axial: Parallel ridges pattern
Pigmented or non-pigmented?
CHAOS: Structure; Colour; Border

DECISION ALGORITHM

CLUES
1. Irregular or blue structures
2. Cosmetically noteworthy area
3. Thick lines, reticular or brachial
4. Waxy, smooth or shiny, thickened
5. Uneven or radial, pseudopods, segmental
6. Lines white
7. Lines parallel, ridges (acral)
8. Polysymptomatic vessels
9. Polymorphs

EXCEPTIONS
1. Changing lesions on adults
2. Infiltration or superficial invasion with any clue
3. Infiltration or superficial invasion with any clue
4. Acral: Parallel ridge pattern

DECISION ALGORITHM

CLUES
1. Irregular or blue structures
2. Cosmetically noteworthy area
3. Thick lines, reticular or brachial
4. Waxy, smooth or shiny, thickened
5. Uneven or radial, pseudopods, segmental
6. Lines white
7. Lines parallel, ridges (acral)
8. Polysymptomatic vessels
9. Polymorphs

EXCEPTIONS
1. Changing lesions on adults
2. Infiltration or superficial invasion with any clue
3. Head/Neck: Pigmented (includes or
4. Acral: Parallel ridge pattern
DECISION ALGORITHM CLUES

1. Gray or blue structures
2. Eccentric, expansive area
3. Thick, velvety or branching
4. Dark spots or dots, peripheral
5. Linear radial or pseudopods, segmented
6. Linear ulcer
7. Liner papules, nodules (elevated)
8. Exudate, crusts
9. Polypoid

EXCEPTIONS
1. Changing moles on adults
2. Moles on children with any clue
3. Moles that have changed over time
4. Atypical: Painless, increased size, changing color

BCC

Harry
CHAOS?

Not excised

DECISION ALGORITHM

CLUES
1. Irritated or bluish structures
2. Cosmotic structures
3. Thick lines, net-like or branched
4. Marked areas or checks, pseudoepithelial
5. Lines radial or pseudopapules, segmental
6. Lines white
7. Lines parallel, ridged (acral)
or elastic (Eucl)
8. Polymorphous vessels
9. Polygons

EXCEPTIONS
1. Changing lesions on adults
2. Invisible or small lesions with any clue
3. Marked or small areas on palms or soles
4. Acral: Papular ridge pattern

Not excised
Melanoma in situ

Image courtesy Richard Williamson
CHAOS?

CHAOS: Structure; Colour; Border
Melanoma invasive arising in a nevus.
CHAOS?

DECISION ALGORITHM

CLUES
1. Grey or blue structures
2. Cohesive structureless area
3. Thick lines, reticular or branched
4. Black dots or cloaks, peripherial
5. Lines radial or pseudoglandular, segmental
6. Lines white
7. Lines parallel, ridges (local) or chaotic (global)
8. Polymorphic vessels
9. Polypores

EXCEPTIONS
1. Changing lesions on adult
2. Insoluble or small lesions with any clue
3. Headcanck: Pigmented ridges or dermatomograph grey
4. Axial: Parallel ridge pattern
Rete ridges with various width and melanin density produce lines of varying width, interval and colour.

1 Poster + 1 smart kid = 1 rare in-situ melanoma

Nail matrix melanoma: consecutive cases in a general practice

Cliff Issacs MB BS, Allen Car神州 MB BS, David Wilson MB BS, Paul Brent, FACD.
Richard Wallis MB BS, FRACP, Ronald Wood, MD.
Pattern breaker?

Pigmented or non-pigmented?
CHAOS?

CHAOS: Structure; Colour; Border

DECISION ALGORITHM

CLUES
1. Pure or blue structures
2. Haemorrhagic structures
3. Thin licks, reticular or branched
4. Sharply demarcated, polygonal
5. Linear radial or pseudopods, segmental
6. Linear whorls
7. Linear parallel, ridges (snail) or ebullient (hail)
8. Polyozygous

EXCEPTIONS
1. Changin lesions on amput
2. Multiple in small lesions with any clue
3. Head/facet: Pigmented/circles or arrow/segmental
4. Axial: Parallel ridge pattern

6/30/2015
A geometric polygonal shape complete or incomplete, bounded by straight lines, or by a straight pigment interface, meeting at angles and larger than the holes caused by individual follicles and larger by far than the holes bounded by reticular lines.
DEdEPONe ALGORITHMN

CLUES
1. Grey or blue structures
2. Eosinophilic structures/area
3. Thick lines, reticular or branched
4. Black dots or结s, punctiform
5. Lenses radial or pseudopapillary, segmental
6. Lenses tactile
7. Lenses parallel, reticulated (pecten)
8. Polychromatophilic vessels
9. Polypoids

EXCEPTIONS
1. Changing lesions on adults
2. Nevus in elderly
3. Pigmented moles on dermoscope grey
4. Anom.: neural ridge/ossicles

DEdEPONe ALGORITHNM

CLUES
1. Grey or blue structures
2. Eosinophilic structures/area
3. Thick lines, reticular or branched
4. Black dots or 结s, punctiform
5. Lenses radial or pseudopapillary, segmental
6. Lenses tactile
7. Lenses parallel, reticulated (pecten)
8. Polychromatophilic vessels
9. Polypoids

EXCEPTIONS
1. Changing lesions on adults
2. Nevus in elderly
3. Pigmented moles on dermoscope grey
4. Anom.: neural ridge/ossicles

DEdEPONe ALGORITHNM

CLUES
1. Grey or blue structures
2. Eosinophilic structures/area
3. Thick lines, reticular or branched
4. Black dots or 结s, punctiform
5. Lenses radial or pseudopapillary, segmental
6. Lenses tactile
7. Lenses parallel, reticulated (pecten)
8. Polychromatophilic vessels
9. Polypoids

EXCEPTIONS
1. Changing lesions on adults
2. Nevus in elderly
3. Pigmented moles on dermoscope grey
4. Anom.: neural ridge/ossicles

Melanoma nodular Breslow 0.9
Bruce

Pigmented or non-pigmented?
Excluding seborrhoeic keratoses

- Multiple orange or yellow clods
- Multiple white clods
- Thick curved lines
- Well demarcated border
- Multiple grouped similar lesions

_Malignant conditions can have individual criteria_

Weigh the clues to arrive at a diagnosis

_If in doubt at all - BIOPSY_
CHAOS?

CHAOS: Structure; Colour; Border
Do you need dermatoscopy?
**Clues to Melanoma**

<table>
<thead>
<tr>
<th>Clue</th>
<th>RR</th>
<th>PPV%</th>
<th>NPV%</th>
<th>Sensitivity%</th>
<th>Specificity%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pigmented circles</td>
<td>3.7</td>
<td>25</td>
<td>95.50</td>
<td>70.83</td>
<td>76.39</td>
</tr>
<tr>
<td>Grey circles</td>
<td>4.6</td>
<td>26.5</td>
<td>94.2</td>
<td>54.2</td>
<td>83.3</td>
</tr>
<tr>
<td>Incomplete circles</td>
<td>3.0</td>
<td>18.4</td>
<td>93.9</td>
<td>58.3</td>
<td>71.3</td>
</tr>
<tr>
<td>Grey colour</td>
<td>8.9</td>
<td>13.3</td>
<td>98.5</td>
<td>95.8</td>
<td>30.6</td>
</tr>
<tr>
<td>Dot vessels</td>
<td>3.5</td>
<td>33.3</td>
<td>90.6</td>
<td>8.3</td>
<td>98.1</td>
</tr>
</tbody>
</table>

95.8% of flat facial melanomas have grey colour but it is only 30.6% specific.  
Pigmented circles are not as common (sensitivity 70.83%) but they are 76.39% specific for melanoma.
Hi Cliff,
...
This guy was worried about a seb K on his arm. I advised a full skin check and found this ...

All the best,
Finbar McGrady
"LOST MY MELANOMA VIRGINITY!"

Hi Cliff,

... Its a bit weird I’m so excited about this but I found my first melanoma! Clark Level 2, Breslow 0.38mm.

... All the best,
Finbar McGrady

References
2. Kittler H, Rosendahl C, Cameron A, Tschandl P. Dermatoscopy www Facultas, Austria
3. Canfield Scientific Inc
6. Ashfaq A, Marghoob, Ralph Braun, Proposal for a Revised 2-Step Algorithm for the Classification of Lesions of the Skin Using Dermoscopy ARCH DERMATOLOGY VOL 146 (NO. 4), APR 2010


24. Rosendahl C, McGrady F. Patients dressed to kill. Medical Observer, St Leonards, NSW, Australia. 2013 July 26; page 28