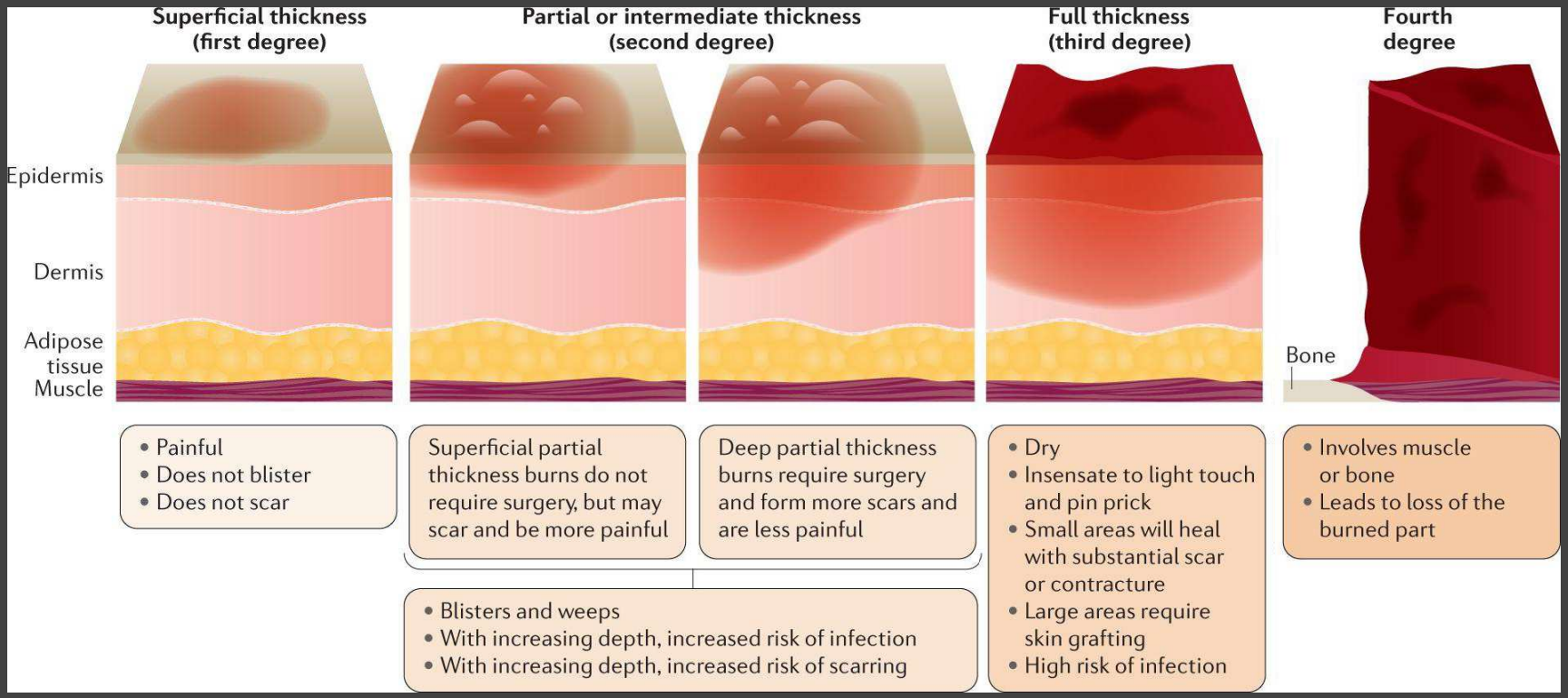
Clinical Dermatology

Annie Morrison, MD, FAWM
Recovering Dermatopathologist
Montana Academy of Family Physicians Annual Summer Meeting
June 21, 2024

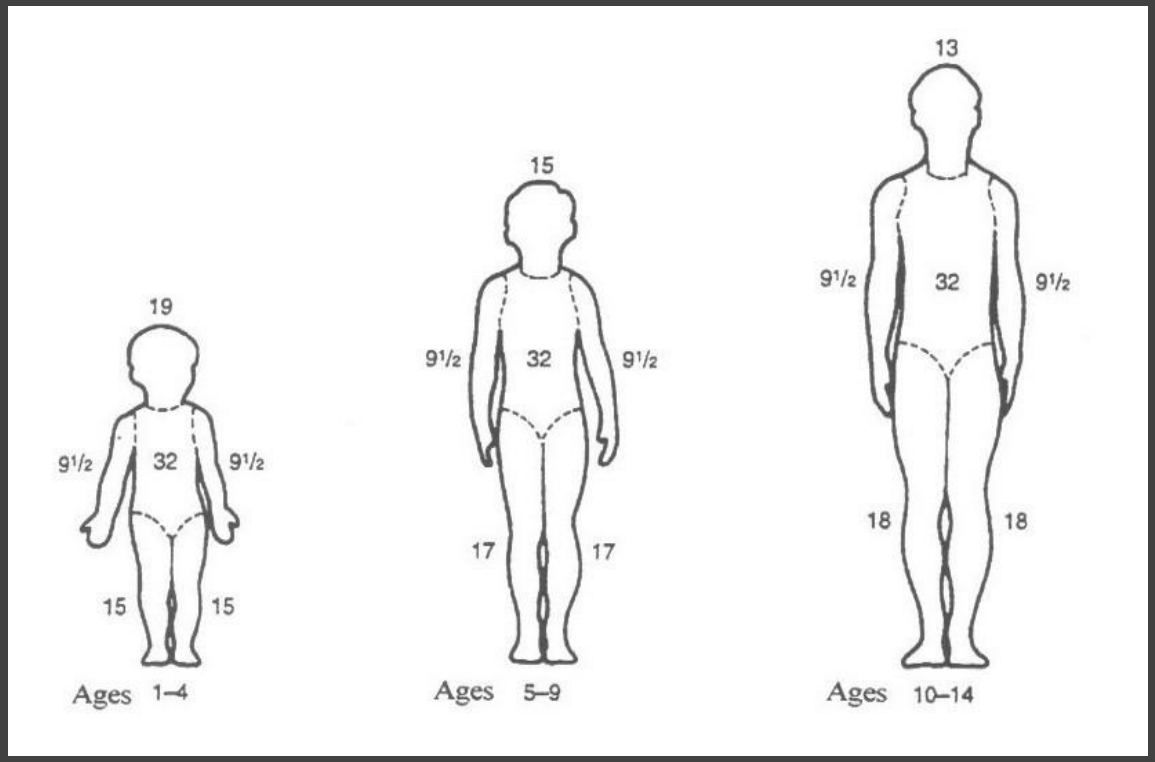
Overview

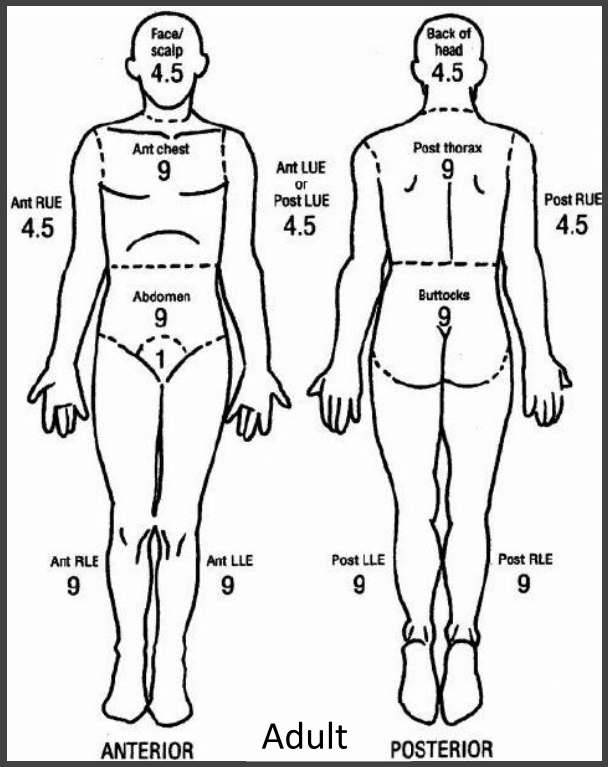
- Burn Classification and Treatment
  - Special topic: sunburns
- Pigmented lesion overview
- How to read/interpret pathology reports from pigmented lesions
- How melanoma (pathological) staging dictates biopsies and excisions
- Documentation for biopsy specimens

Burn Classification

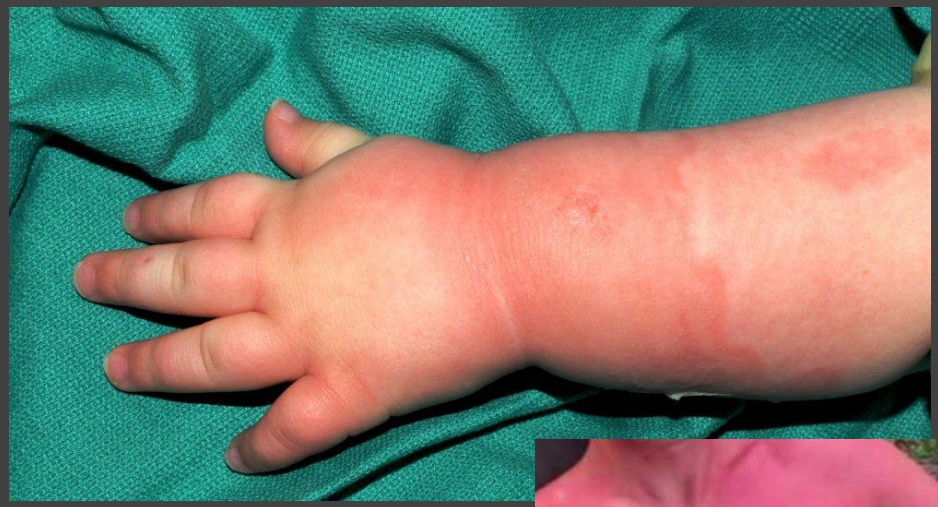


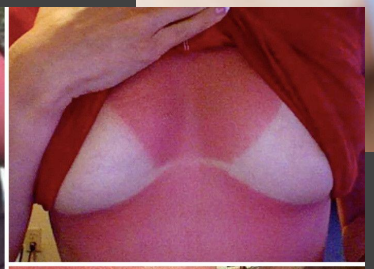
Body Surface Area

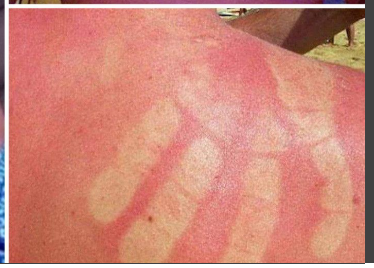




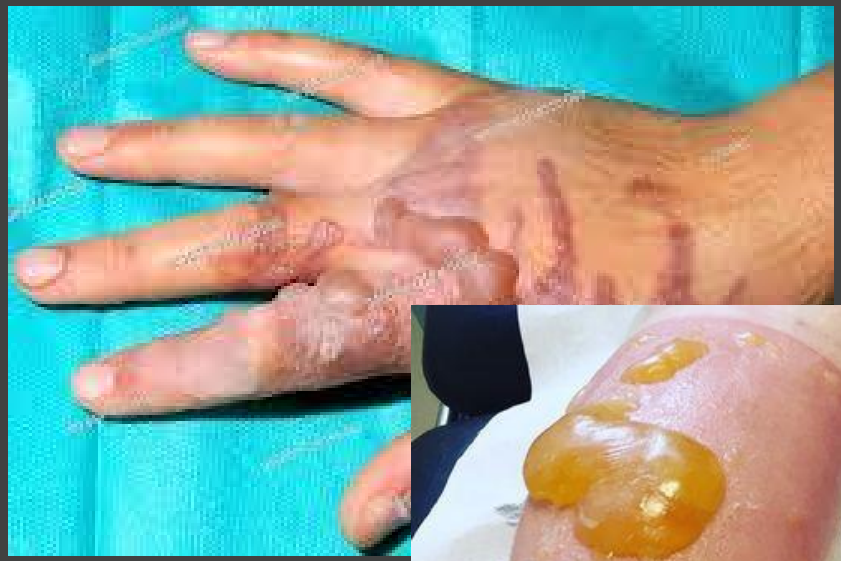
Superficial Thickness (first degree) Burn

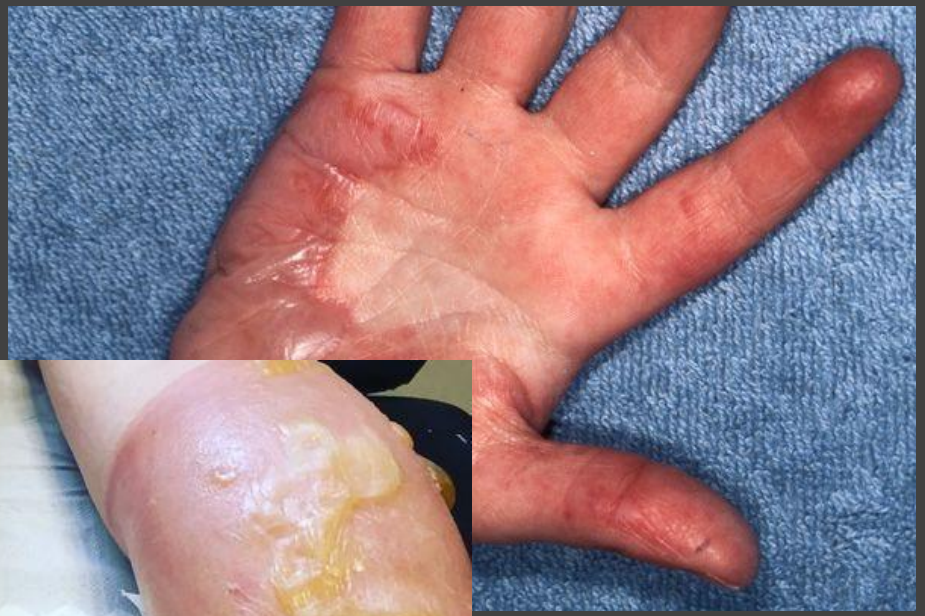


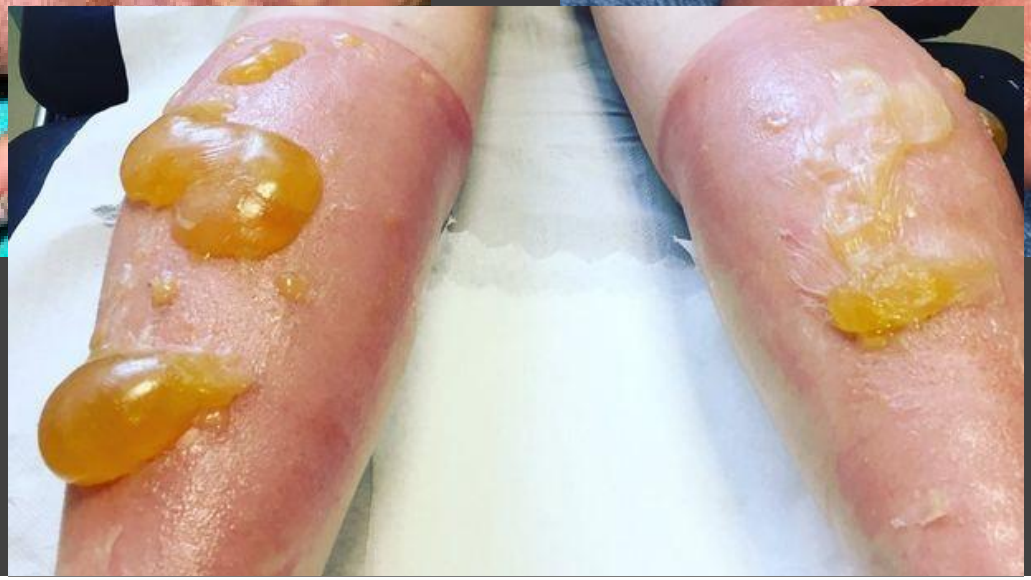




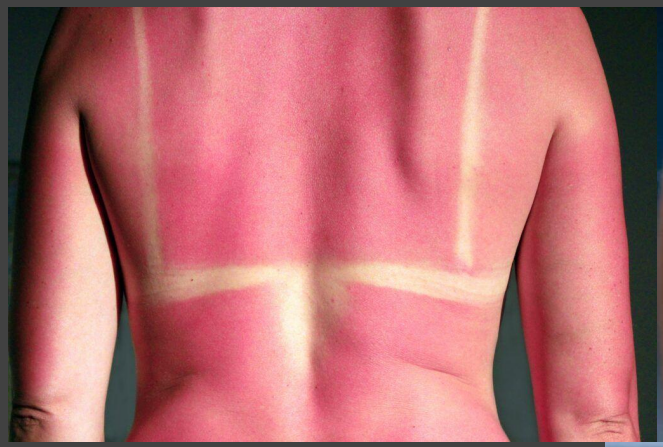
Patrial/Intermediate Thickness Burn (Second degree)

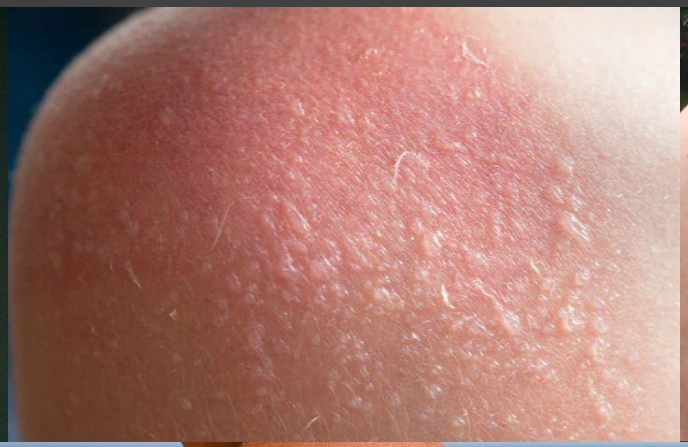


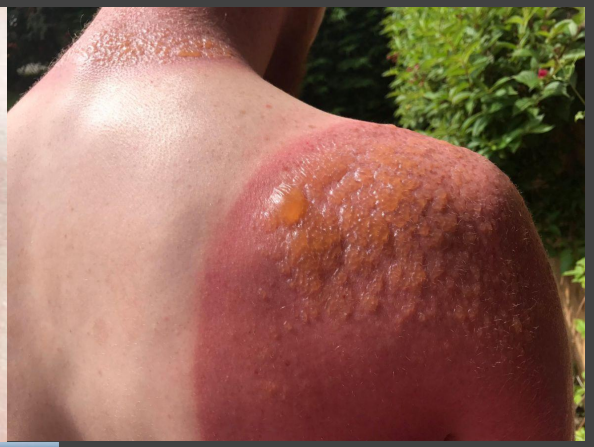




Sun Burn







UVA

- 100-fold more abundant than UVB
- 1000-fold less erythemogenic
- Penetrates more deeply into dermis than UVB
- Passes through window glass
- Augments sunburn, suntan, and skin cancer formation
- Principal cause of drug photosensitivity and photoaging

UVB

- Primarily responsible for sunburn and skin cancers
- Contributes to photoaging
- Maximal in summer, 10 am - 3 p.m.
- Blocked by plain window glass

Factors Affecting Sun Sensitivity

- Skin Type

- Iatrogenic
  - Thiazides
  - NSAIDs
  - Tetracyclines
  - Retinoids

- Underlying Medical Conditions
  - Solar urticaria, Porphyria Cutanea Tarda
  - PolyMorphic Light Eruption, SLE

- Environmental

Sunscreens

- Physical Blockers (Titanium dioxide, Zinc Oxide)
  - physically block and partially absorb UVA and UVB

- Chemicals
  - PABA, PABA-esters – absorb only UVB
  - Benzophenones – absorb UVB and lower wavelength UVA
  - Avobenzone – absorbs UVA (remains photostable when combined with other sunscreen agents)
  - Ecamsule (Mexoryl™ SX) – absorbs UVA (photo stable)

							
Coola Sport SPF 50	Coola Baby SPF 50	Eau Thermale Avene SPF 50	Aveeno Sensitive Skin SPF 50	Aveeno Protect + Hydrate SPF 60	Aveeno Protect + Hydrate SPF 30	ALL good Sport Sunscreen SPF 30	La Roche Posay Anthelios XL 60
Active Ingredients: Avobenzone 3% **Octinoxate 6.25%**	*Active Ingredients:* Titanium Dioxide 7.3% Zinc Oxide 4.3%	*Active Ingredients:* Avobenzone 3%, Homosalate 13%, Octisalate 5%, Octocrylene 10%	*Active Ingredients:* Zinc Oxide 21.6% **thicker formula**	*Active Ingredients:* Homosalate 15%, Octocrylene 10%, **Octobenzone 6%**, Octisalate 5%	*Active Ingredients:* Homosalate (8%), **Oxybenzone (5%),** Octisalate (4%), Octocrylene (4%), Avobenzone (3%).	*Active Ingredients:* Zinc Oxide 16% **Reef Safe!**	*Active Ingredients:* Homosalate 10%, Octocrylene 7%, Octisalate 5%, Avobenzone 4%, Mexoryl XL 2.5%, Mexoryl SX .5%
⚠	✓	MODERATE	✓	⚠	⚠	✓	MODERATE

SPF and UVB Absorption

SPF	UVB Absorption
8	87.5%
15	93.3%
29	96.6%
39	97.4%

**SPF over 15 unnecessary although it might last longer.

Classification of burns by depth of injury

Depth	Appearance	Sensation	Healing time
Superficial (epidermal)	Dry, red Blanches with pressure	Painful	3 to 6 days
Superficial partial-thickness	Blisters Moist, red, weeping Blanches with pressure	Painful to temperature and air and touch	7 to 21 days
Deep partial-thickness	Blisters (easily unroofed) Wet or waxy dry Variable color (patchy to cheesy white to red) Blanching with pressure may be sluggish	Painful to pressure only	>21 days, usually requires surgical treatment
Full-thickness	Waxy white to leathery gray to charred and black Dry and inelastic No blanching with pressure	Deep pressure only	Rare, unless surgically treated
Deeper injury (ie, fourth degree)	Extends into fascia and/or muscle	Deep pressure	Never, unless surgically treated

Treatment of Superficial and Superficial Partial Thickness Burns

- Symptomatic Treatment
  - Cool soaks
  - Emollients (petroleum based gel, aloe vera)
  - Topical anesthetics (lidocaine over small areas only)
  - NSAIDs and tylenol

- Avoid sun exposure

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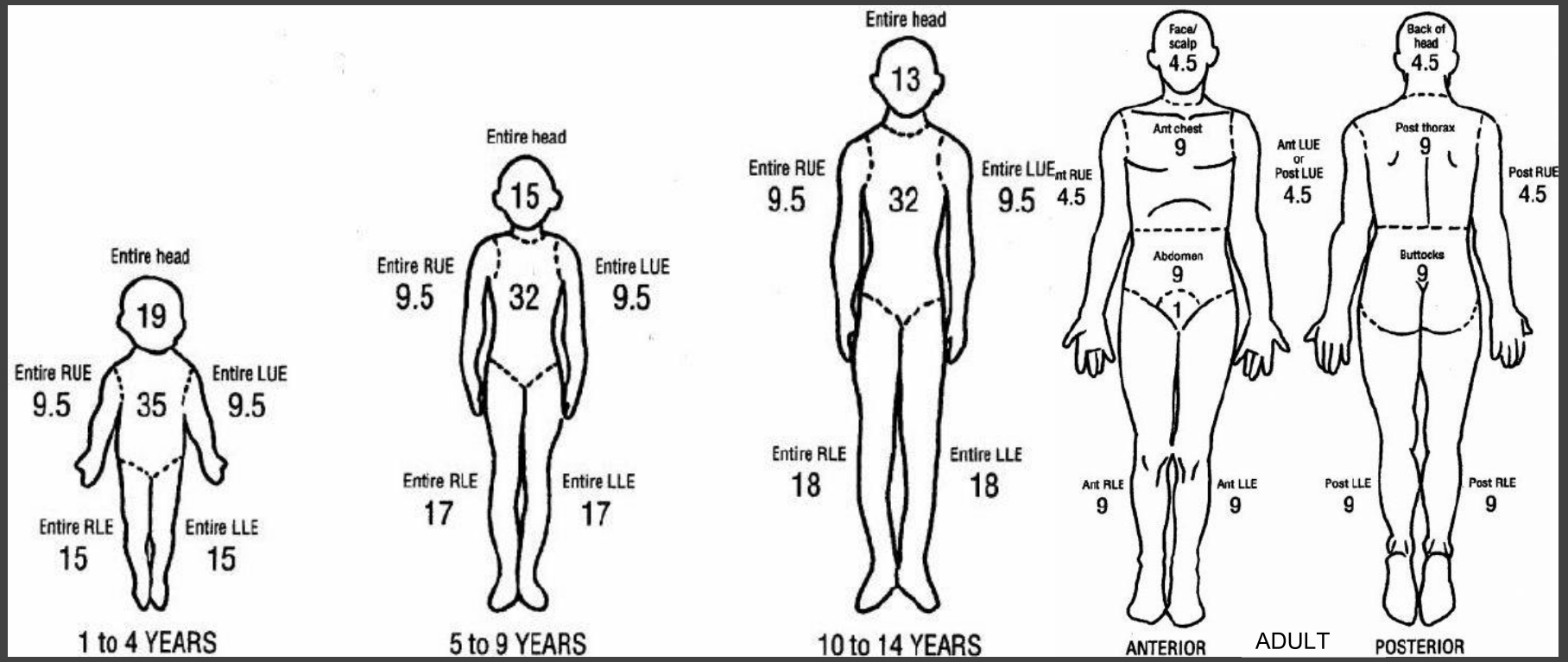
Treatment of Patrial Thickness Burns

- Body Surface area involved: Rule of 9's
- Depth of burn
- Location of burn (face, genital, across joint surfaces)
- Age of patient
- Involvement of airway
- Underlying social or medical conditions that would complicate healing
- Associated trauma that would complicate healing

Burn Surface Area



Refer to a Burn Center if Any of the Following

Burn center referral criteria*
Partial-thickness burns greater than 10% of TBSA
Burns that involve the face, hands, feet, genitalia, perineum, or major joints
Third-degree burns in any age group
Electrical burns, including lightning injury
Chemical burns
Inhalation injury
Burn injury in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality
Any patient with burns and concomitant trauma (such as fractures) in which the burn injury poses the greatest risk for morbidity or mortality. In such cases, if the trauma poses the greater immediate risk, the patient may be stabilized initially in a trauma center before being transferred to a burn unit. Physician judgment will be necessary in such situations and should be in concert with the regional medical control plan and triage protocols.
Burned children in hospitals without qualified personnel or equipment for the care of children
Burn injury in patients who will require special social, emotional, or rehabilitative intervention

Regional Burn Centers

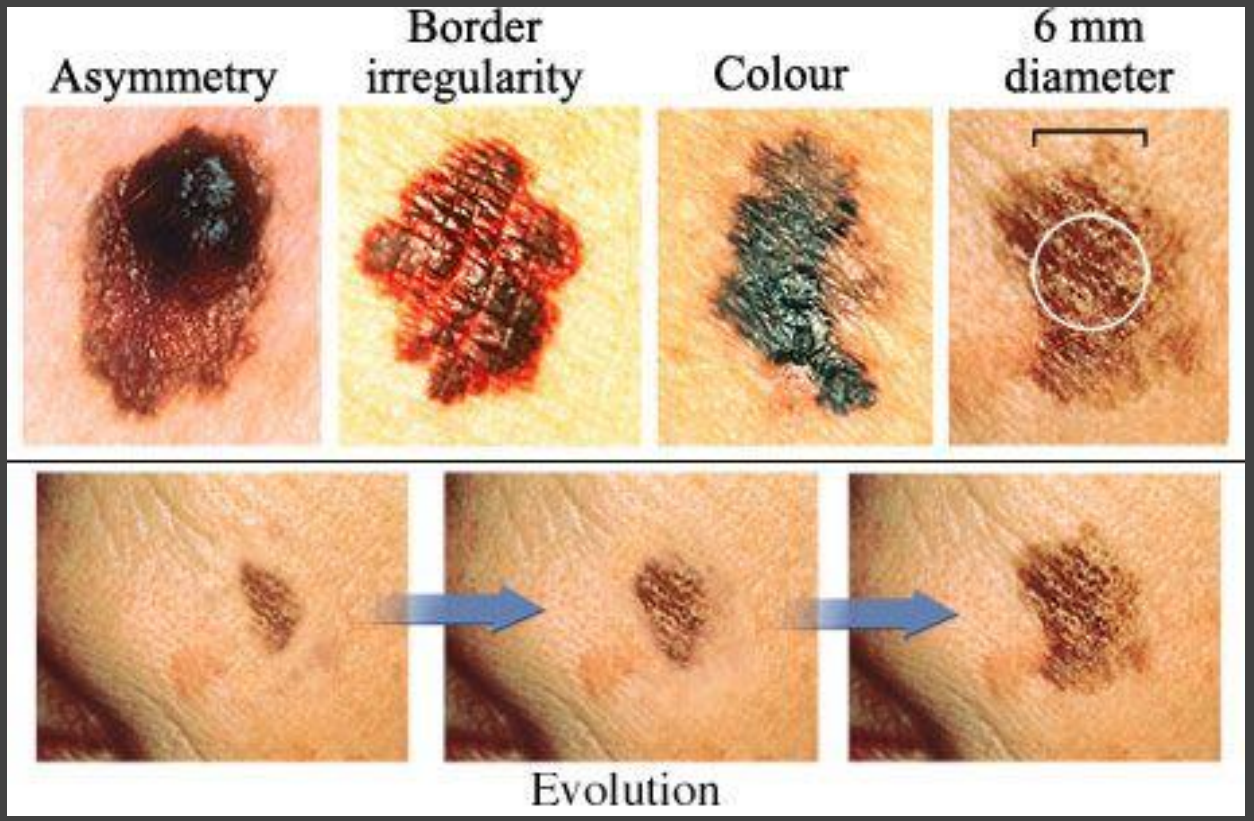
- Utah
  - University of Utah Hospital Burn Center (Salt Lake City)*
- Colorado
  - Children's Hospital Burn Center (Aurora)*
  - Swedish Medical Center Burn and Reconstructive Center (Denver) *
  - University of Colorado Anschutz Medical Campus Burn Center (Denver)
- Idaho
  - Eastern Idaho Regional Medical Center (Idaho Falls)*
- Washington
  - University of Washington Burn Center Harborview (Seattle)*

- Takes pediatric patients

Follow Up Burn Treatment

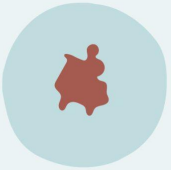
- Wound Care
- Gen Surg
- Physical therapy
- Occupational Therapy
- Psychologist/psychiatrist/counselor

ABCDE’s of pigmented lesions



ABCDE RULE

for Skin Cancer and Concerning Skin Lesions

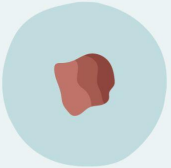


A is for Asymmetry

One half of the spot is unlike the other half.

B is for Border

The spot has an irregular, scalloped, or poorly defined border.

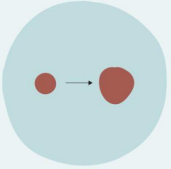


C is for Color

The spot has varying colors from one area to the next, such as shades of tan, brown or black, or areas of white, red, or blue.

D is for Diameter

While melanomas are usually greater than 6 millimeters, or about the size of a pencil eraser, when diagnosed, they can be smaller.

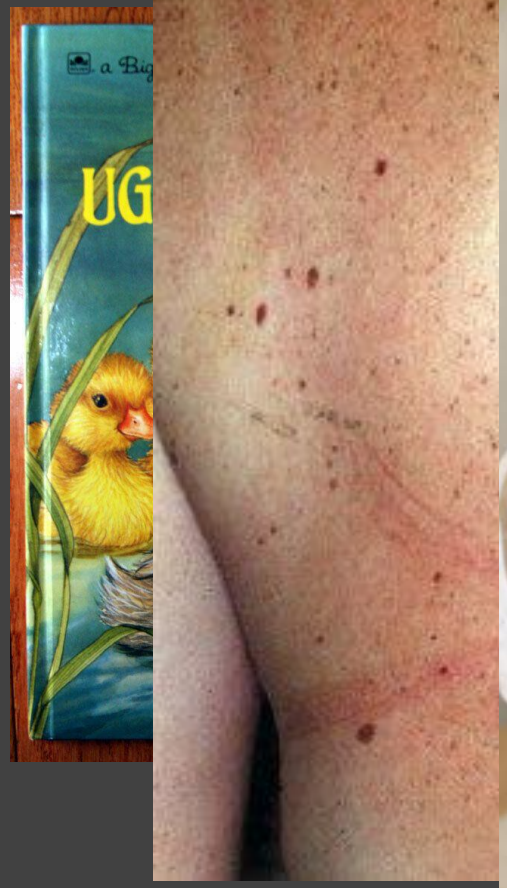


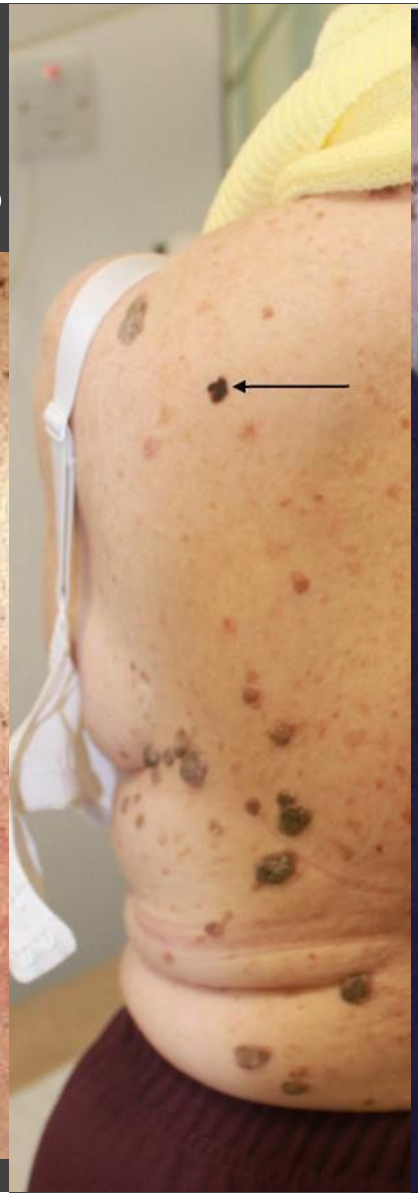
E is for Evolving

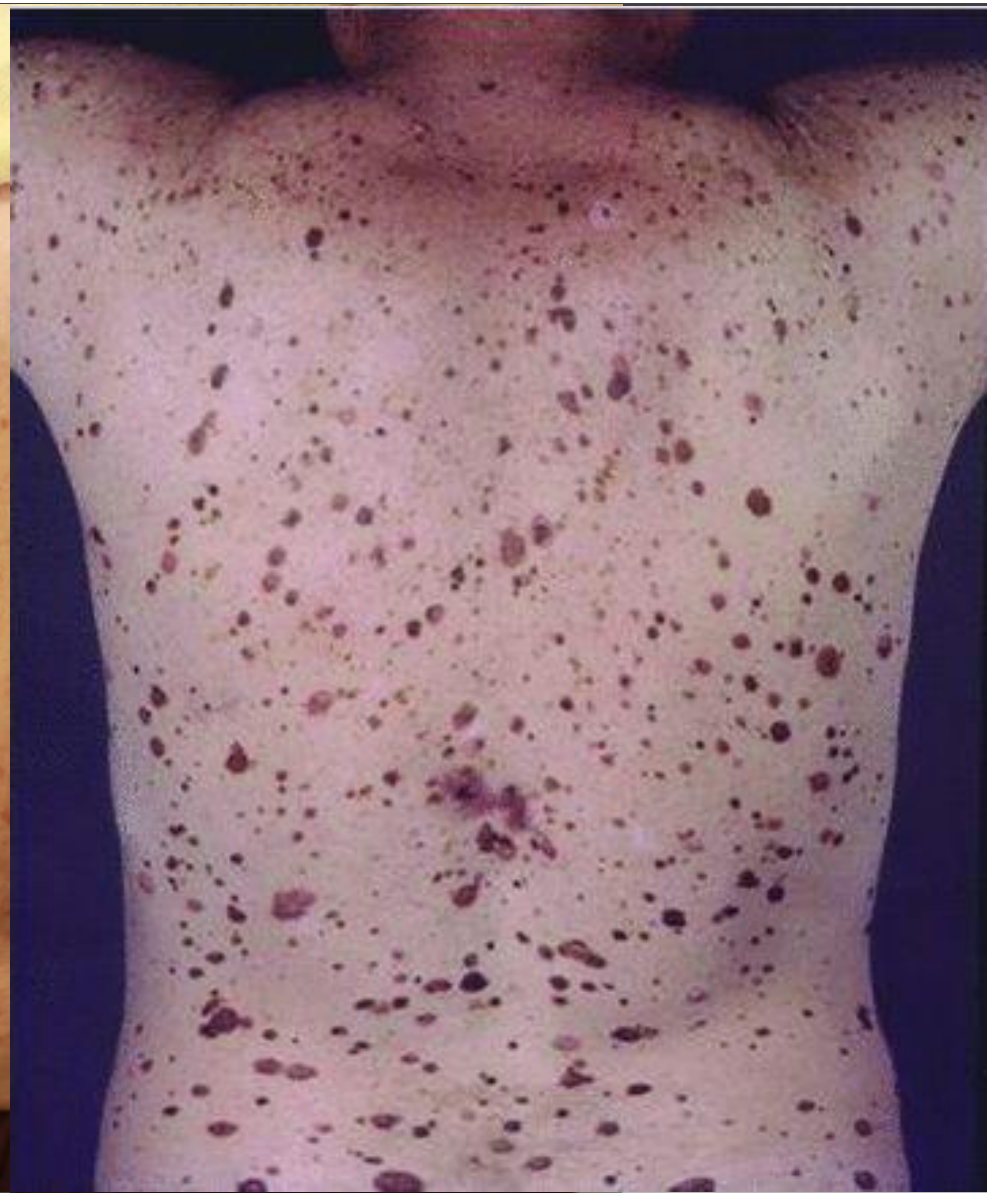
The spot looks different from the rest or is changing in size, shape, or color.

healthline

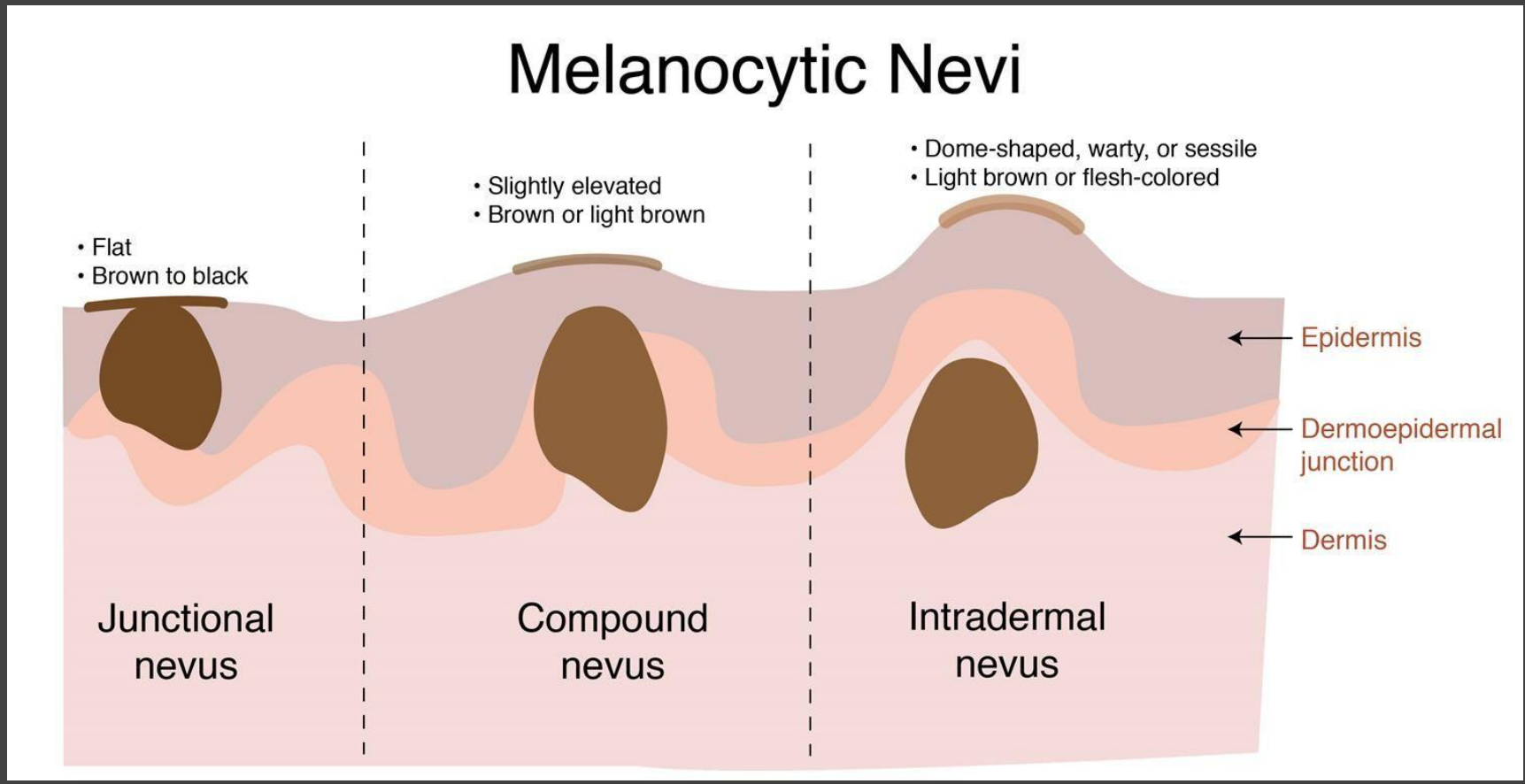
Ugly Ducklings





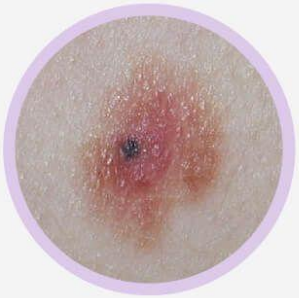


Nevus Classification



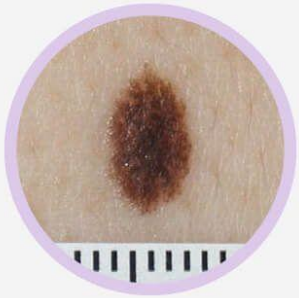
TYPES OF MOLES

CONGENITAL MELANOCYTIC NEVI

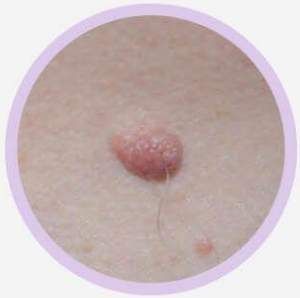


Combined Nevus

Compound Nevus

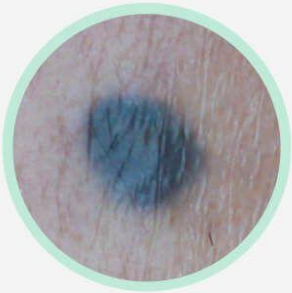


Junctional Nevus

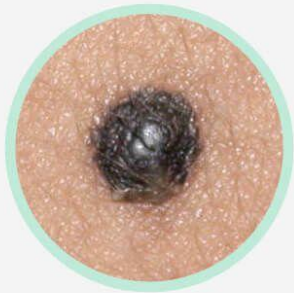


Intradermal Nevus

ACQUIRED MELANOCYTIC NEVI

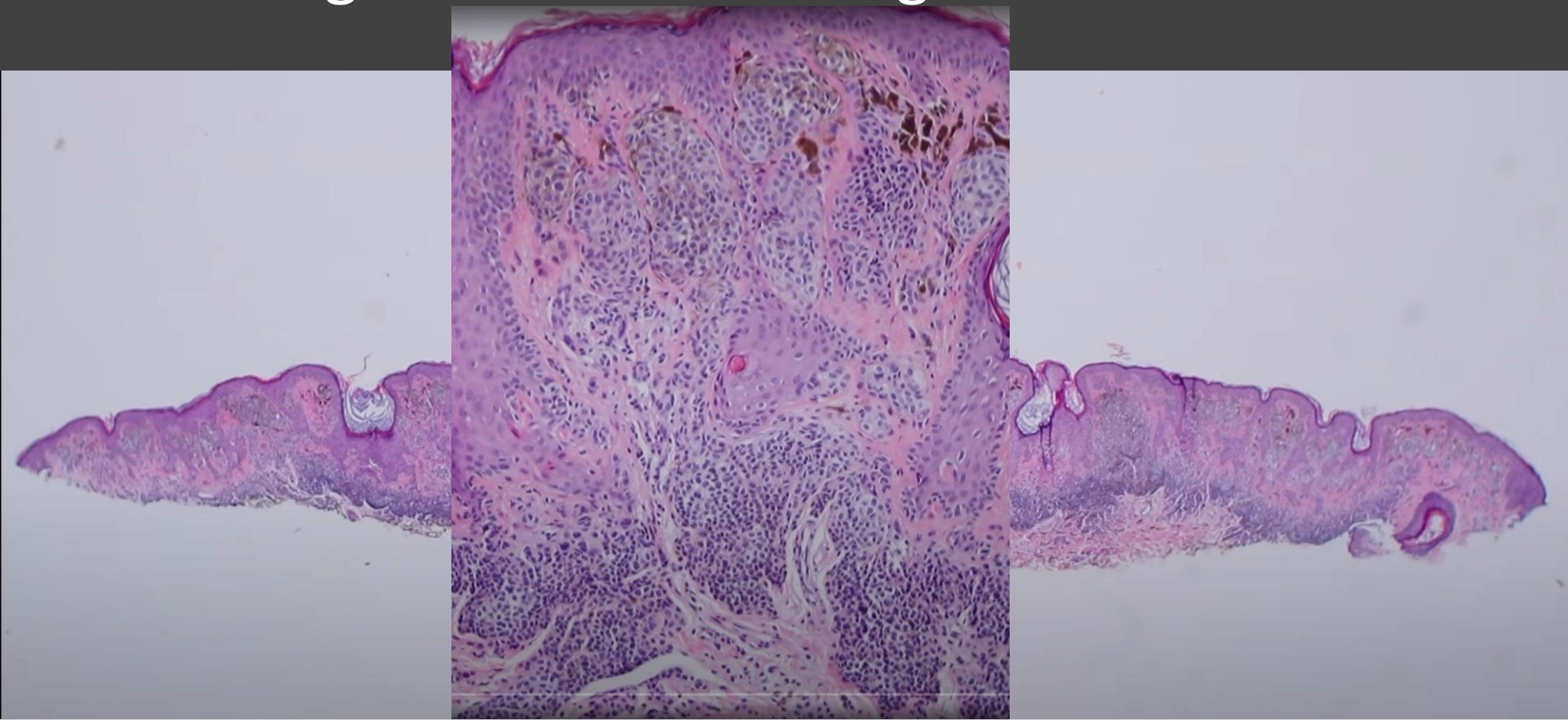


Blue Nevus



Dark Nevus

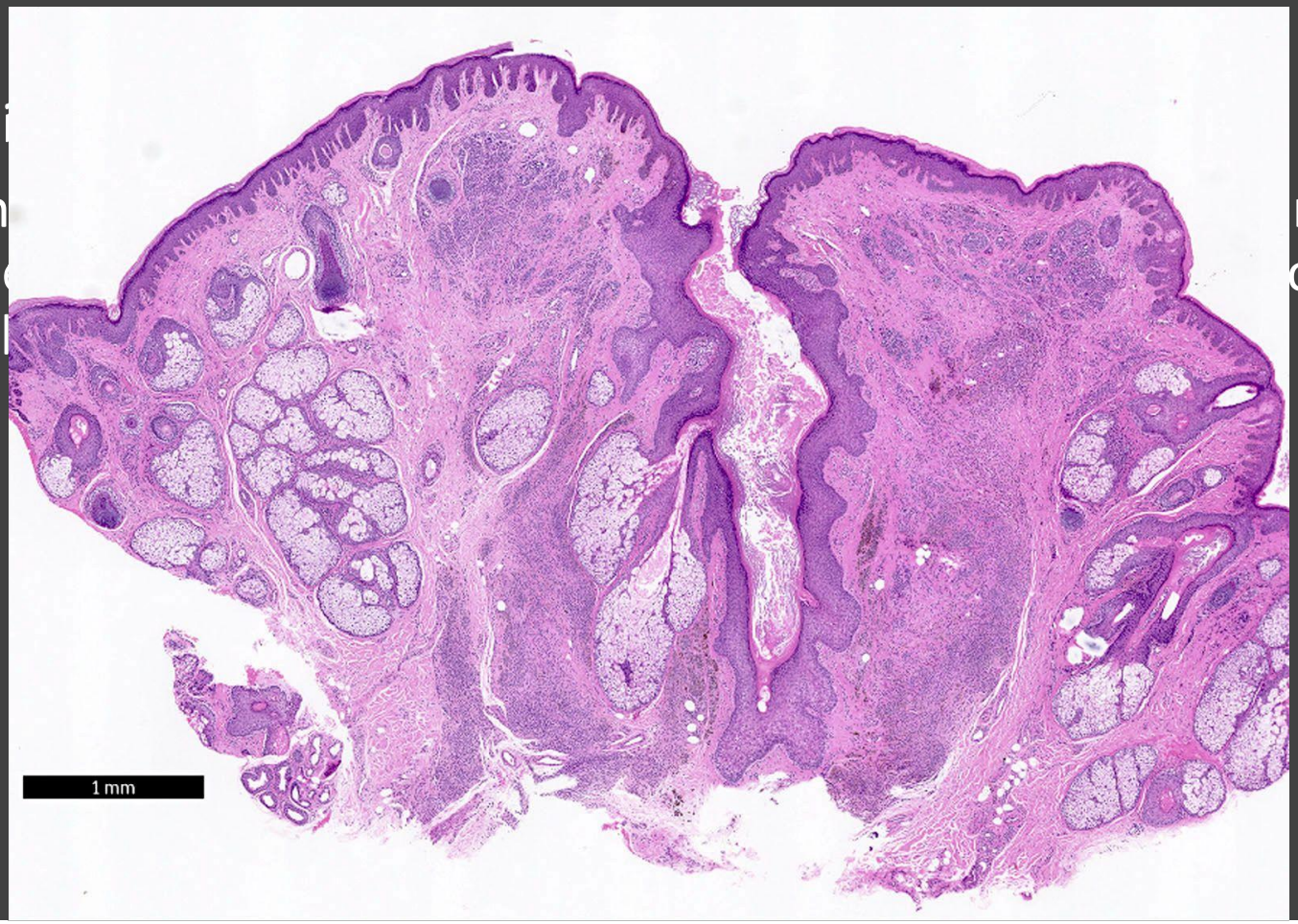
Histologic Features of Benign Nevus



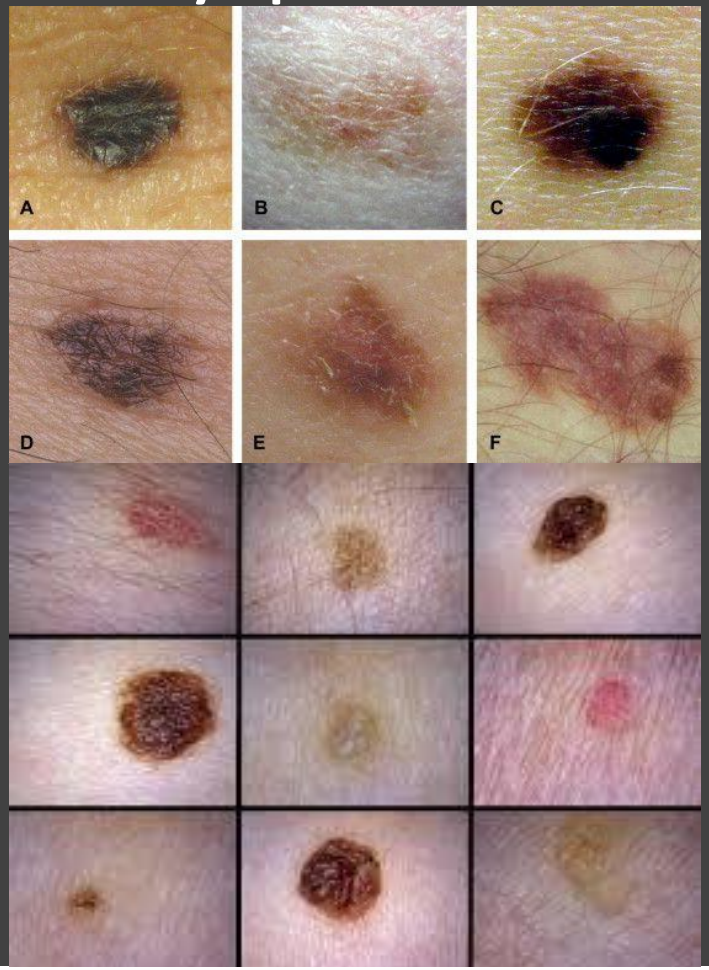
Congenital Features of Nevi

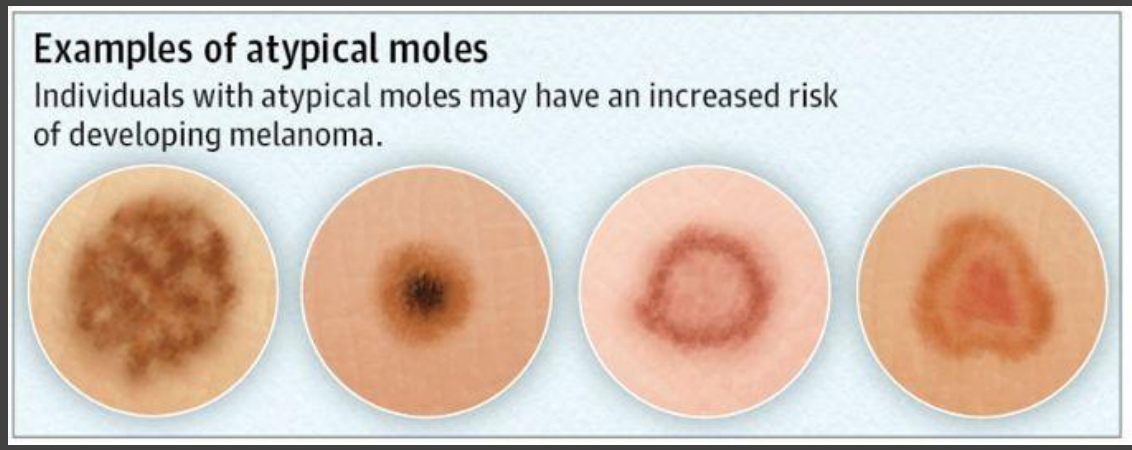
Indicati

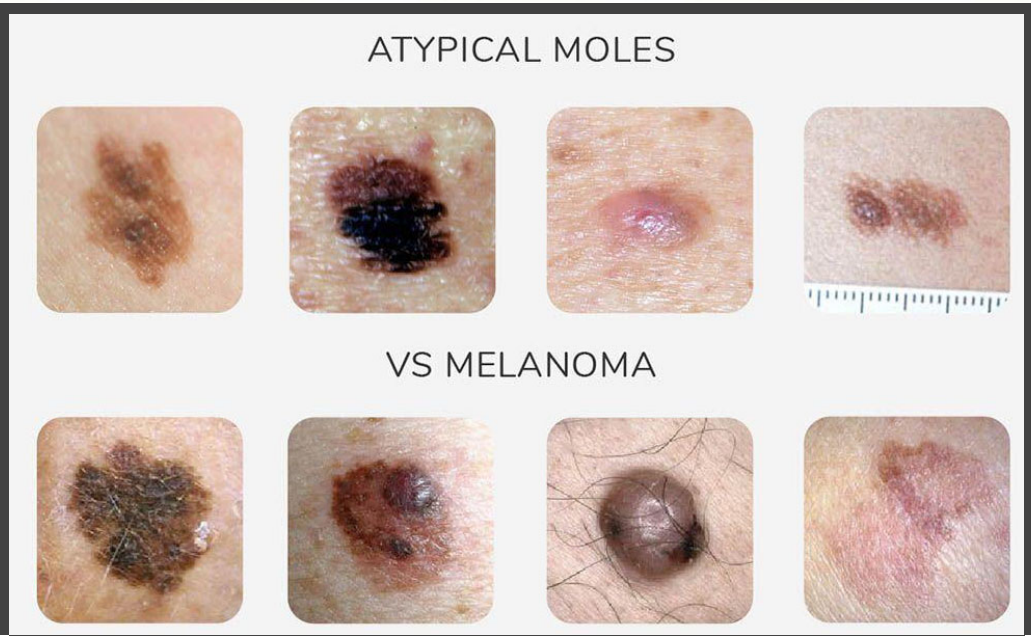
- Exten rves (not perin ollagen bundl



Dysplastic Nevus

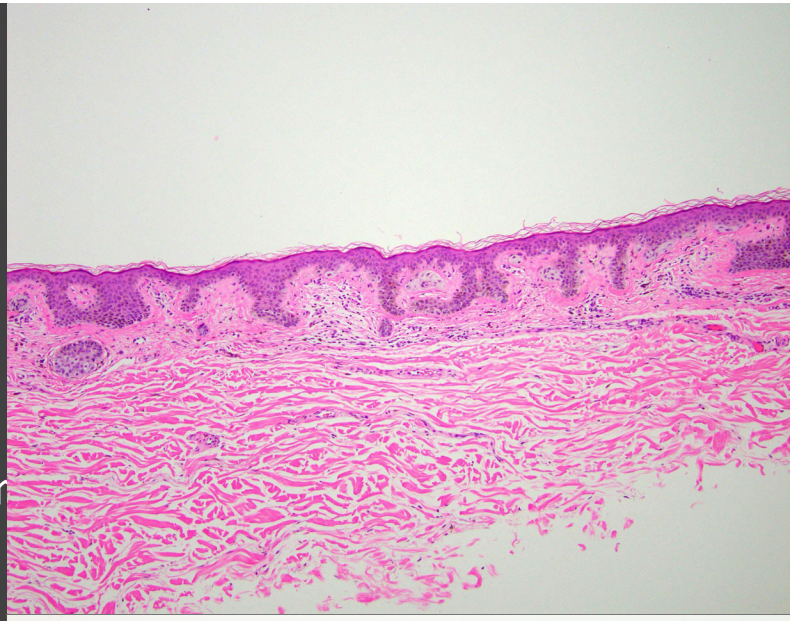


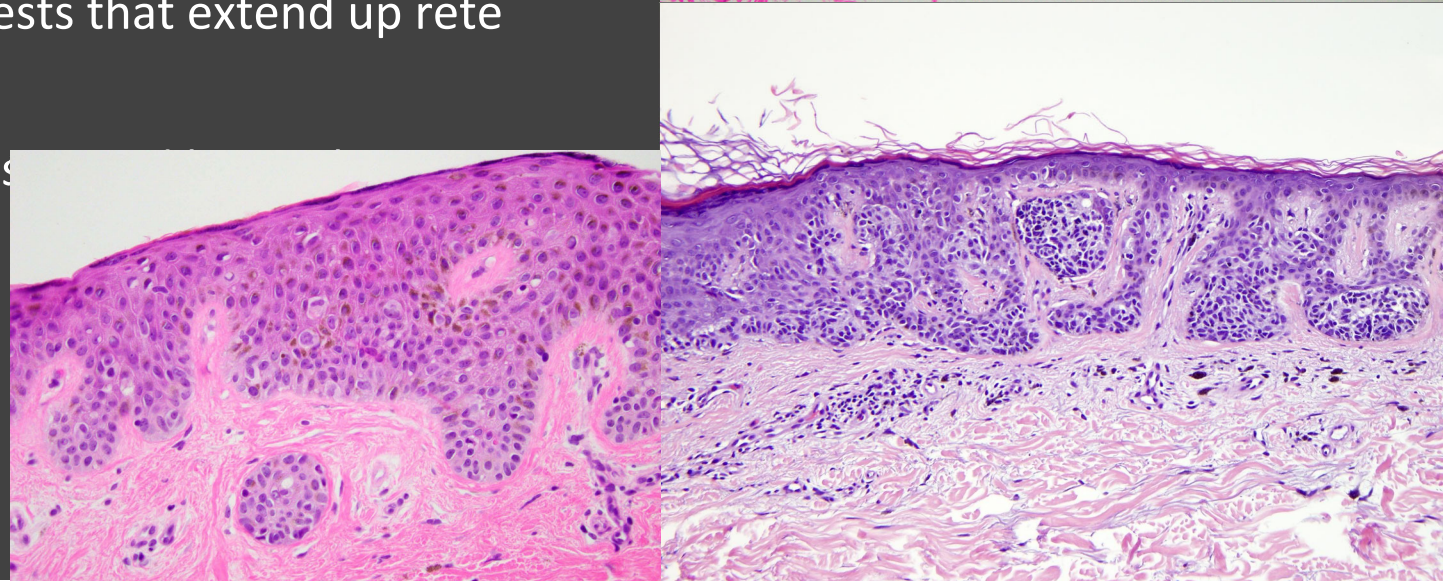




Dysplastic Nevi Histology

- Architectural atypia
  - Asymmetry of melanocytic growth
  - Epidermal component extending beyond lateral r
  - Bridging of nests along rete
  - Irregularly sized nests that extend up rete
- Cytologic atypia
  - Increased nuclear s
  - Pleomorphism
  - Nucleoli





Dysplastic Nevi Pathology Report

Surgical Pathology Clinical Information

Rule out dysplastic nevus.

Surgical Pathology Gross Description

{DERM} The specimen is received in formalin in a single container labeled with the patient's name, "[redacted]" and designated "mid upper back." Received is a 1.2 x 1.0 cm thin shave of white-tan skin excised to a depth of 0.1 cm (margin inked black). There is a 1.0 x 0.9 cm ill defined, orange-tan macule that grossly abuts the nearest resection margin. The specimen is serially sectioned and submitted entirely in a single cassette.

Surgical Pathology Summary of Sections

1A - mid upper back - 6

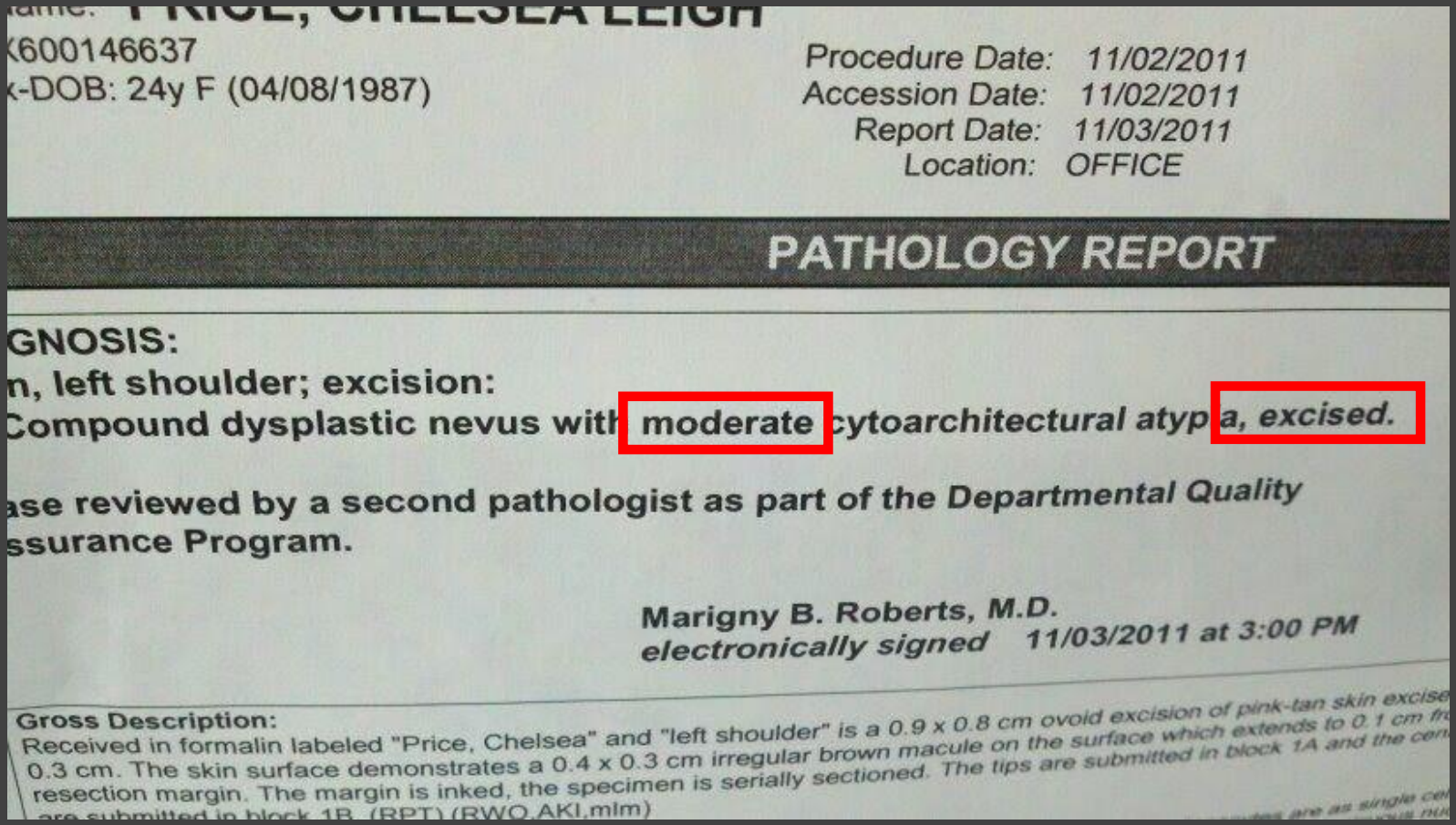
Surgical Pathology Microscopic Interpretation

Skin, mid upper back; shave biopsy:
- Compound nevus with congenital features and mild dysplasia.

SP Teaching Physician Statement

The attending pathologist whose name appears on this report has personally reviewed the diagnostic slides and where appropriate has edited the gross and/or microscopic portion of the report in rendering the interpretation. [redacted] (resident) contributed to this report.

Dysplastic Nevi Pathology Report



K600146637
x-DOB: 24y F (04/08/1987)

Procedure Date: 11/02/2011
Accession Date: 11/02/2011
Report Date: 11/03/2011
Location: OFFICE

PATHOLOGY REPORT

GNOSIS:
n, left shoulder; excision:
Compound dysplastic nevus with moderate cytoarchitectural atyp a, excised.

ase reviewed by a second pathologist as part of the Departmental Quality ssurance Program.

Marigny B. Roberts, M.D.
***electronically signed* 11/03/2011 at 3:00 PM**

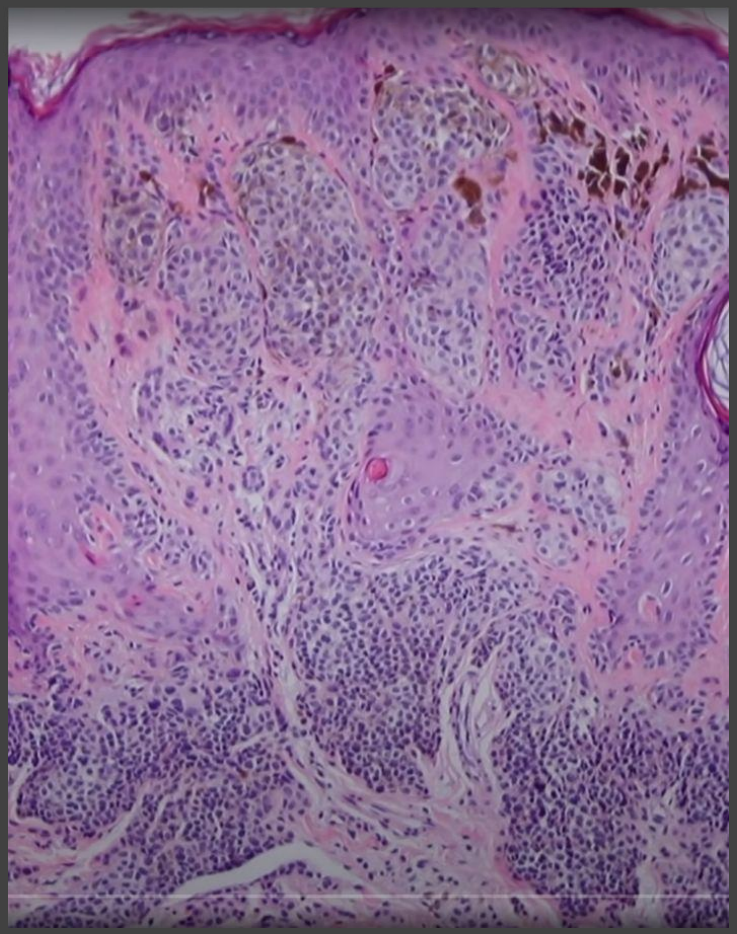
Gross Description:
Received in formalin labeled "Price, Chelsea" and "left shoulder" is a 0.9 x 0.8 cm ovoid excision of pink-tan skin excise
0.3 cm. The skin surface demonstrates a 0.4 x 0.3 cm irregular brown macule on the surface which extends to 0.1 cm fr
resection margin. The margin is inked, the specimen is serially sectioned. The tips are submitted in block 1A and the cen
are submitted in block 1B. (RPT) (RWO,AKI,mlm)

Special site nevi

- Scalp
- Ear
- Breast
- Genital skin
- Umbilicus
- Axilla
- Flexural sites
- Acral skin

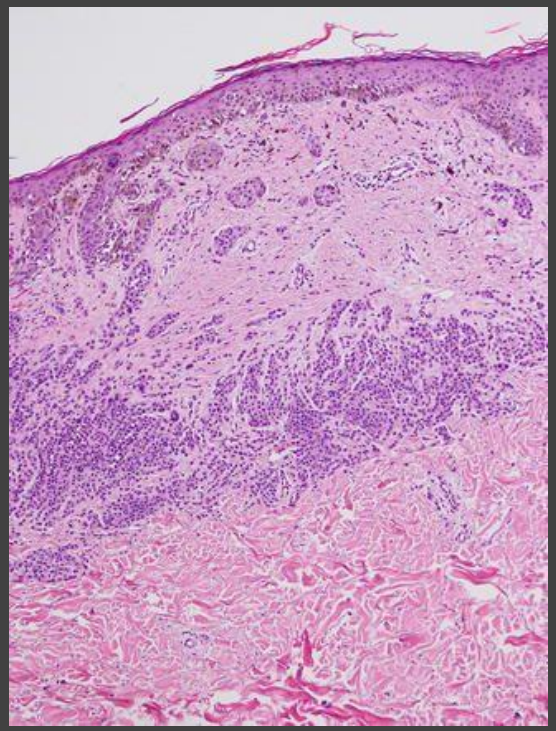
- Some atypical histologic and architectural features
- No severe cytologic atypia
- Dermal maturation preserved

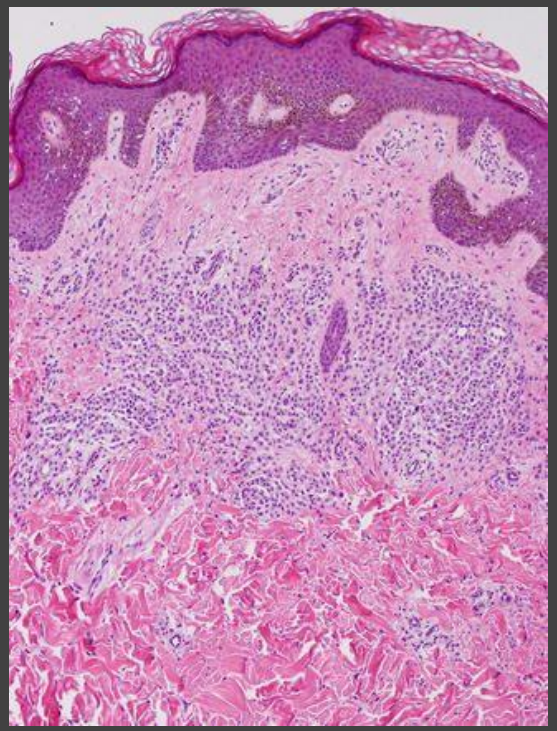
Special site nevi: dermal maturation

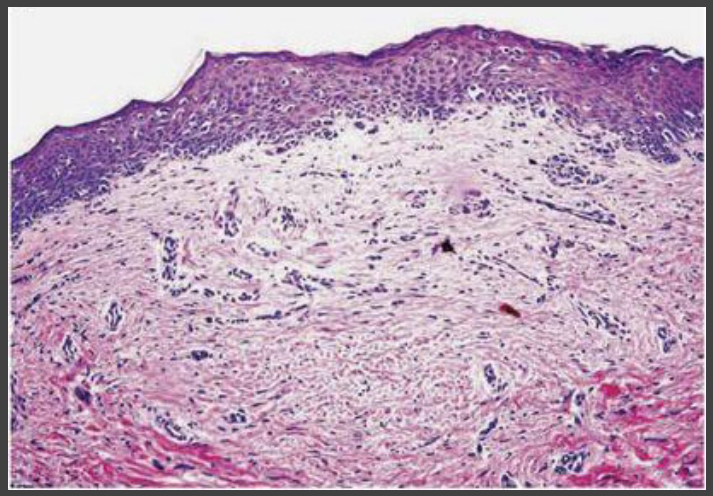


Recurrent Nevus

(following trauma, biopsy, or incomplete excision)



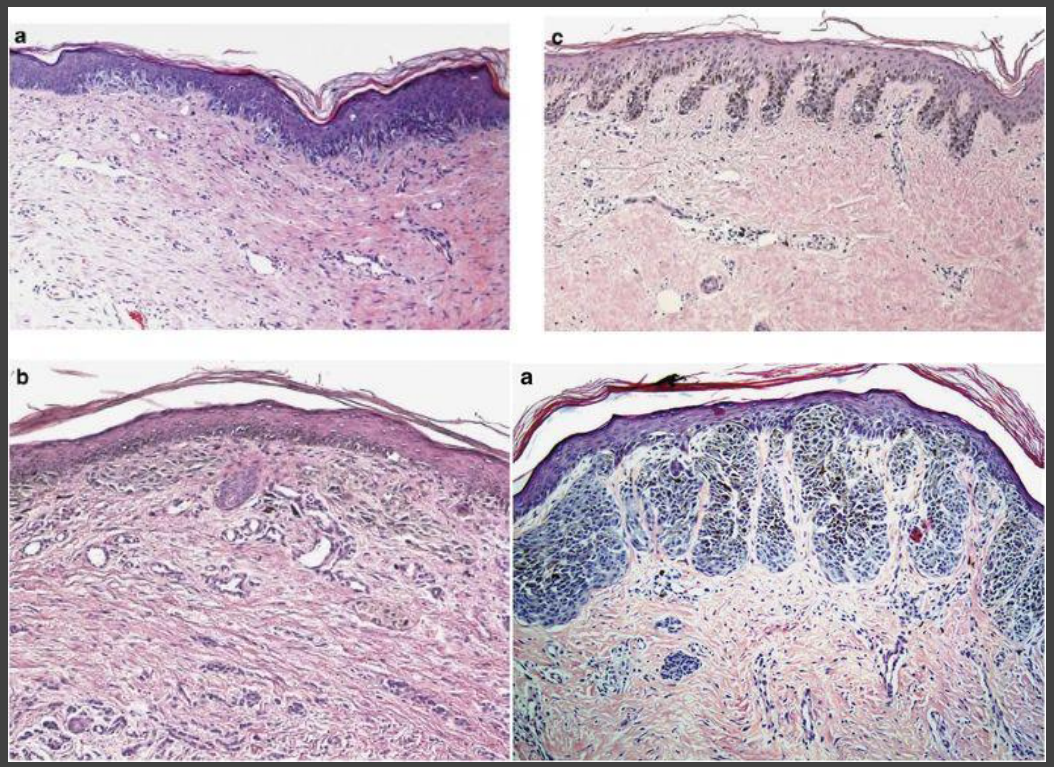


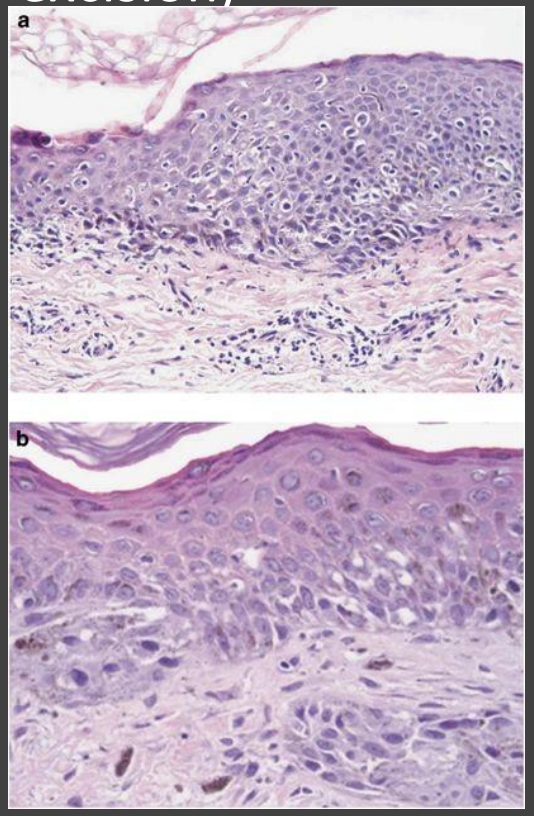


Dermal Scar always present

Recurrent Nevus

(following trauma, biopsy, or incomplete excision)





Recurrent Nevus

- Recommended to not leave partially biopsied nevi behind
  - patients can be terrible historians especially if these are re-biopsied years later

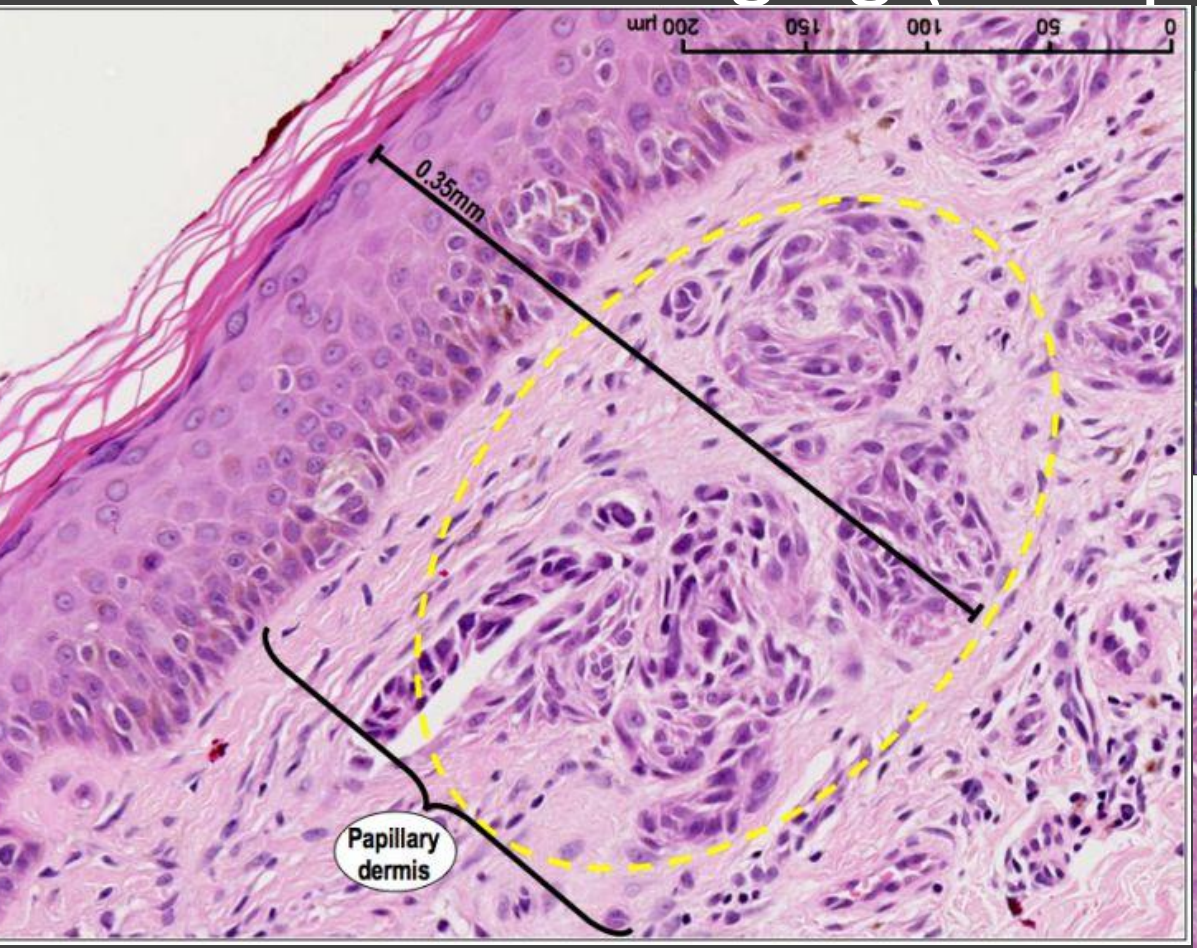
- Pathologist needs to see *entire lesion* to differentiate between recurrent or traumatized nevus and melanoma
  - May still be difficult to differentiate between melanoma and dysplastic nevus
  - Will likely recommend complete resection (variable margins)

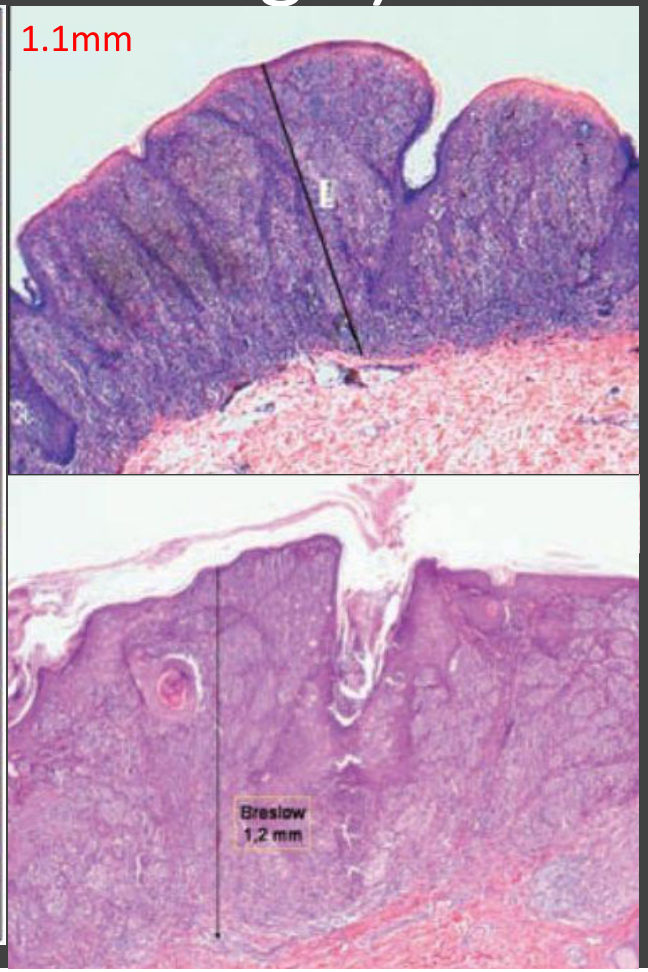
Melanoma Staging (histopathologic)

The things that matter

- Ulceration (can also be clinical)
- Tumor regression (favorable feature)
- Margins (deep and lateral)
- Depth (Breslow depth measured to 0.1mm)
- Mitotic rate (higher mitotic rate correlates to more aggressive lesions)
- Microsatellite(s)
- Lymphovascular invasion
- Neurotrophism (perineural invasion, intraneural invasion)

Melanoma Staging (histopathologic)





Melanoma Staging by Depth

pT Category

___ pT not assigned (cannot be determined based on available pathological information)

___ pT0: No evidence of primary tumor (e.g., unknown primary or completely regressed melanoma)

pT1: Melanoma 1.0 mm or less in thickness, ulceration status unknown or unspecified (see Note D)

___ pT1a: Melanoma less than 0.8 mm in thickness, no ulceration

___ pT1b: Melanoma less than 0.8 mm in thickness with ulceration; or Melanoma 0.8 to 1.0 mm in thickness with or without ulceration

___ pT1 (subcategory cannot be determined)

pT2: Melanoma greater than 1.0 to 2.0 mm in thickness, ulceration status unknown or unspecified

___ pT2a: Melanoma greater than 1.0 to 2.0 mm in thickness, no ulceration

___ pT2b: Melanoma greater than 1.0 to 2.0 mm in thickness, with ulceration

___ pT2 (subcategory cannot be determined)

pT3: Melanoma greater than 2.0 to 4.0 mm in thickness, ulceration status unknown or unspecified

___ pT3a: Melanoma greater than 2.0 to 4.0 mm in thickness, no ulceration

___ pT3b: Melanoma greater than 2.0 to 4.0 mm in thickness, with ulceration

___ pT3 (subcategory cannot be determined)

pT4: Melanoma greater than 4.0 mm in thickness, ulceration status unknown or unspecified

___ pT4a: Melanoma greater than 4.0 mm in thickness, no ulceration

___ pT4b: Melanoma greater than 4.0 mm in thickness, with ulceration

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___ pT3 (subcategory cannot be determined)

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___ pT4a: Melanoma greater than 4.0 mm in thickness, no ulceration
___ pT4b: Melanoma greater than 4.0 mm in thickness, with ulceration
___ pT4 (subcategory cannot be determined)

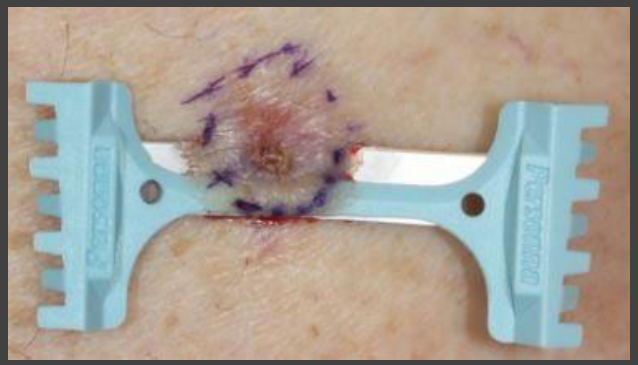
According to the American Cancer Society , the 5-year survival rate for stage 4 melanoma is 15–20%

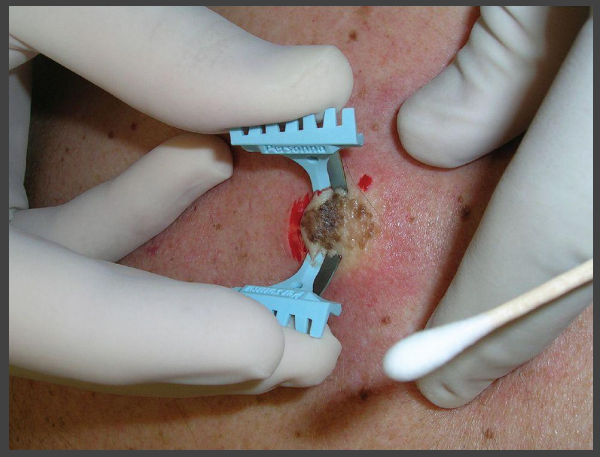
Proper Biopsy Technique for Pigmented Lesions

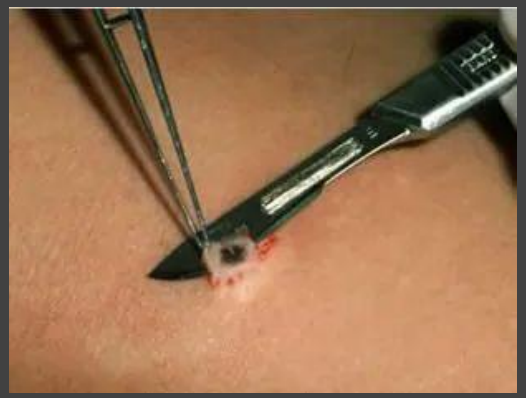
"Patients presenting with a suspicious pigmented lesion, optimally should undergo an excisional biopsy, preferably with 1- to 3-mm margins." (Coit DG, Andtbacka R, Bichakjian CK, et al. Melanoma. J Natl Compr Canc Netw. 2009;7:250-275)

Scoop Shave the Entire Lesion

Take a Picture and Send it with specimen







Negative margins for melanocytic lesions

Size of melanoma	Excision margin
Melanoma in situ	5mm
< 1.0mm	1cm
1.0–2.0mm	1–2cm
2.0–4.0mm	1–2cm
> 4.0mm	2cm

Proper Biopsy Technique for Pigmented Lesions

Scoop Shave the Entire Lesion

2-3mm depth is goal

Shave then punch (meh)

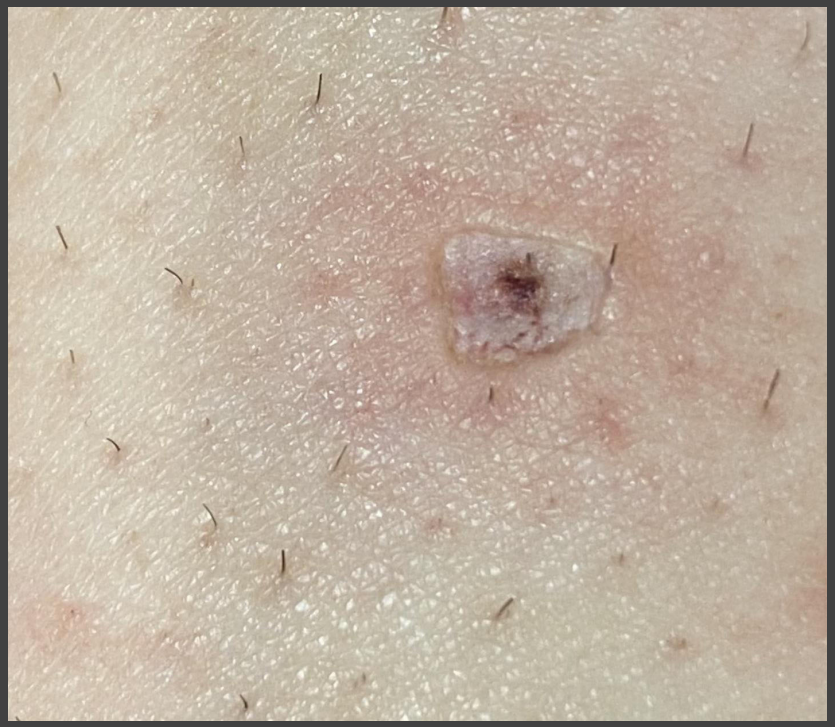
DO NOT PUNCH BIOPSY PIGMENTED LESIONS

Often lesions too deep to remove with shave are either very malignant or very benign

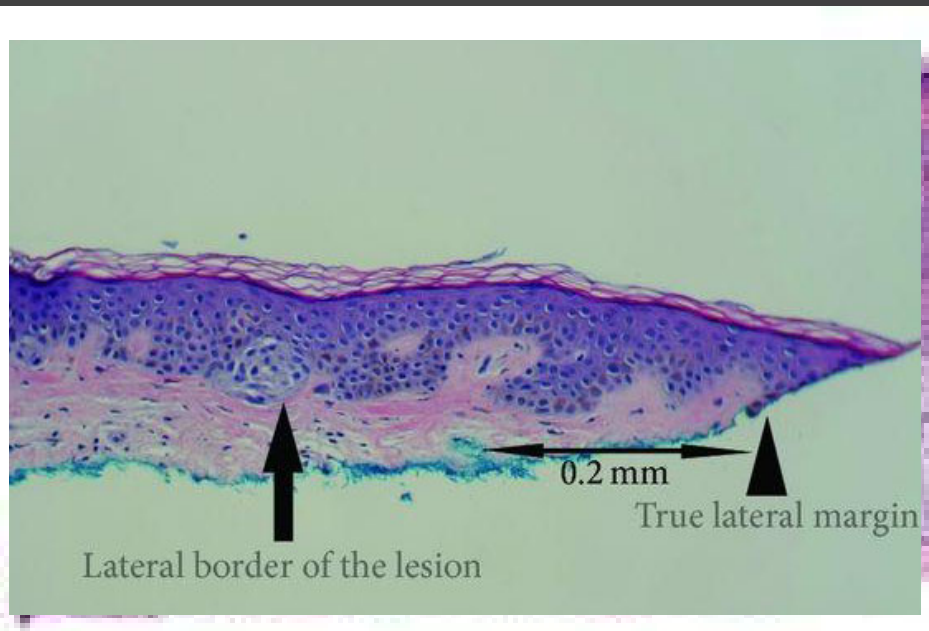
If the lesion is too big to remove completely

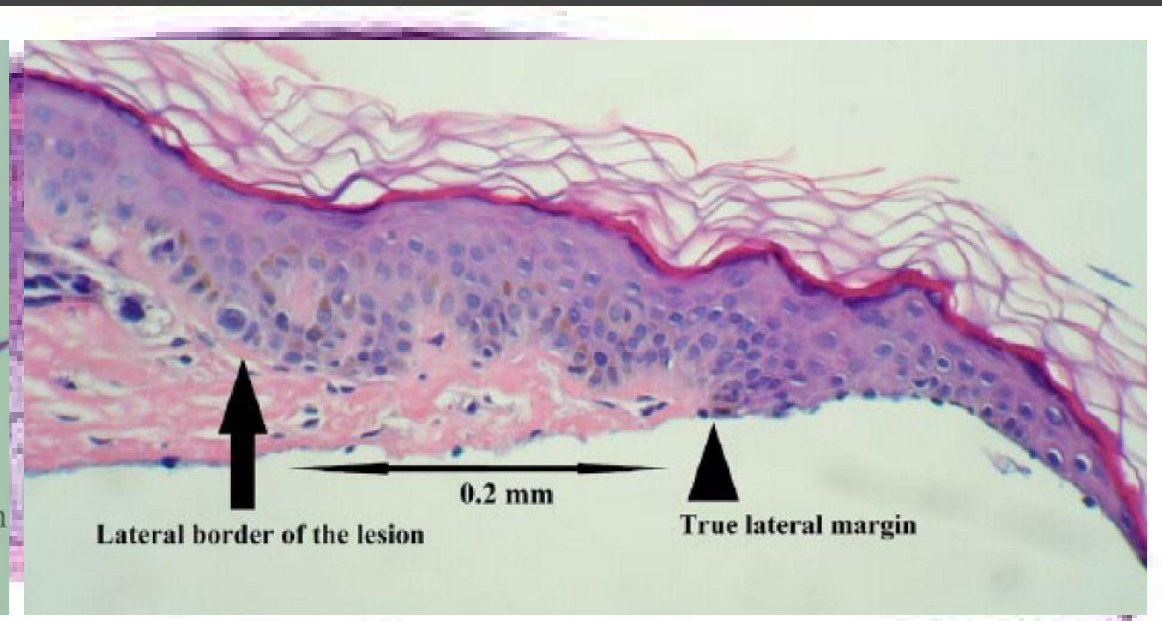
- Sample from the edge
- Get as deep as you can (2-3mm minimum)
- Include a clinical picture

Shave then punch

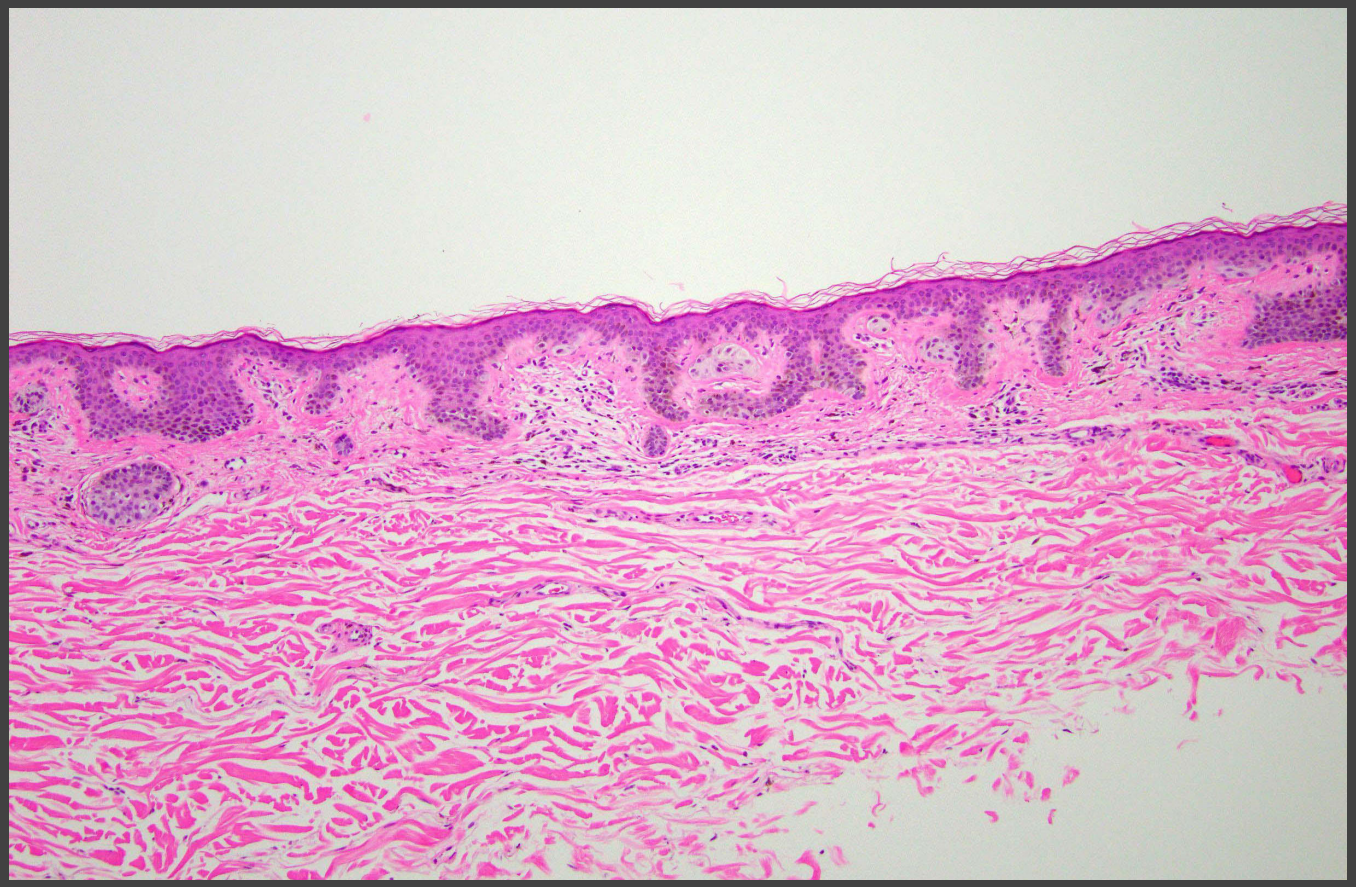


Proper Biopsy Technique for Pigmented Lesions

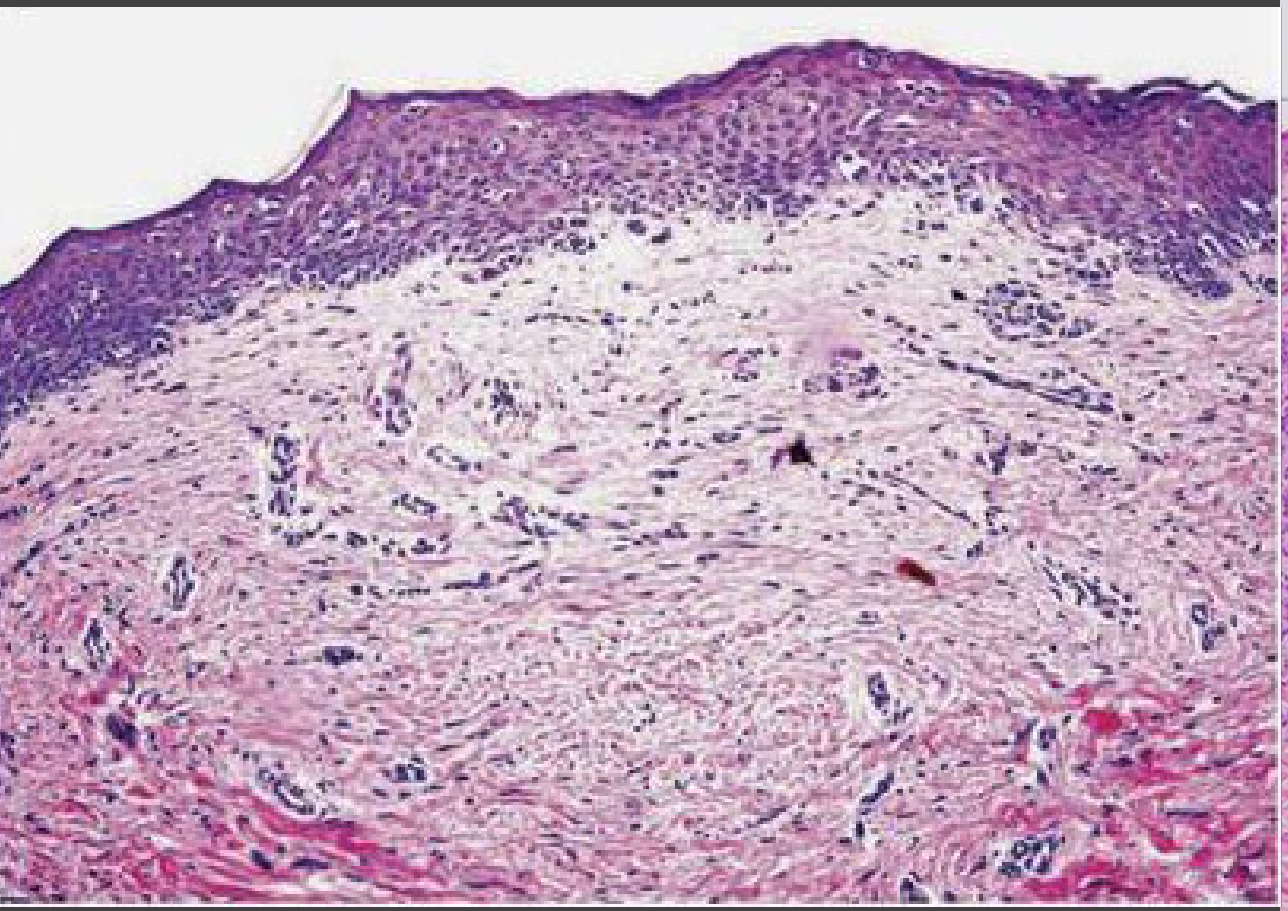


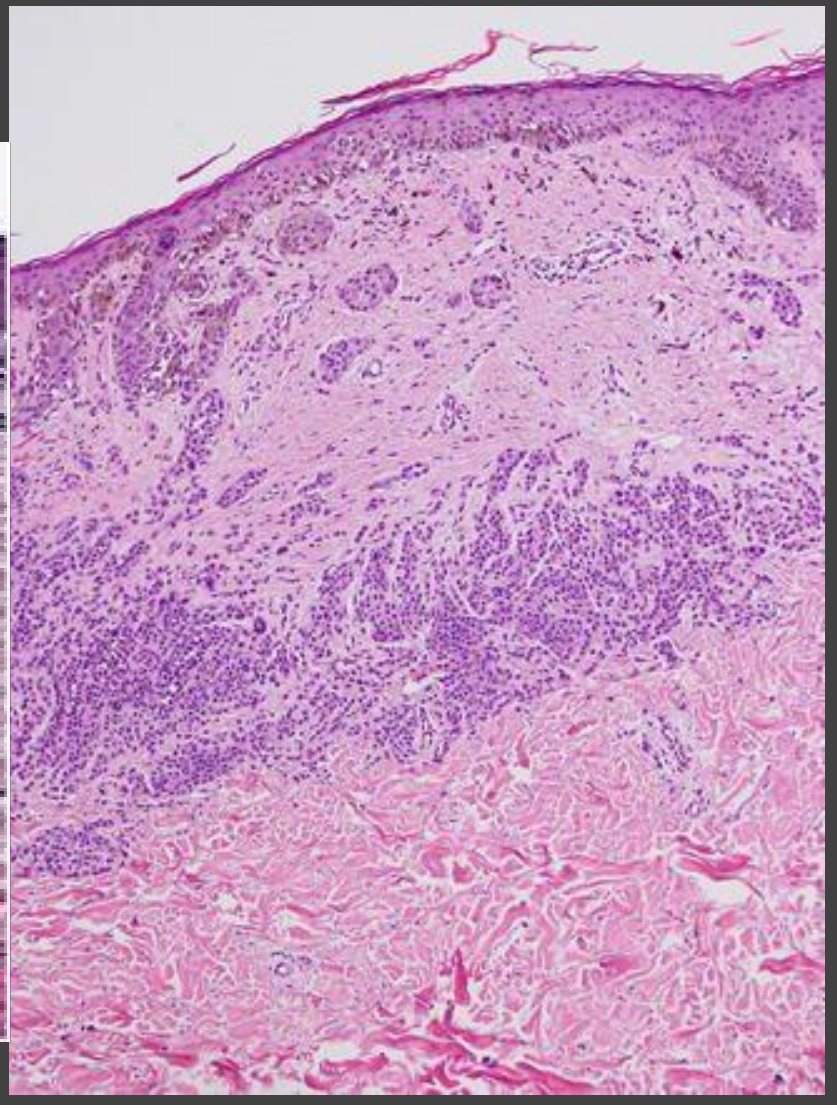


Dysplastic Nevi Histology



Recurrent Nevus

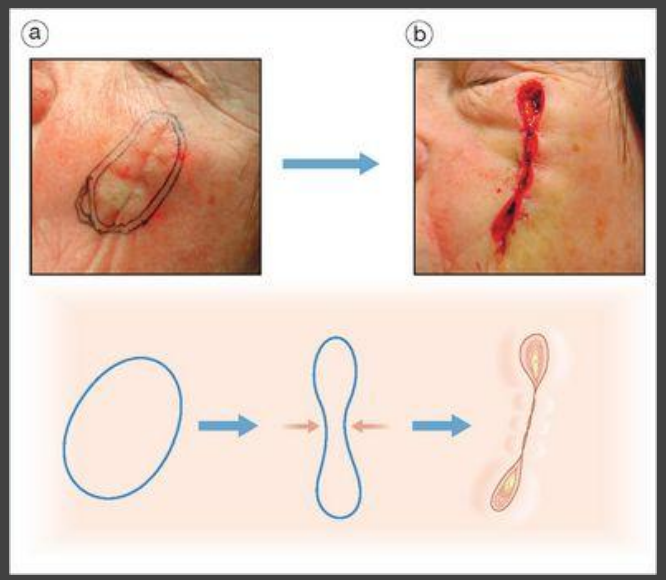


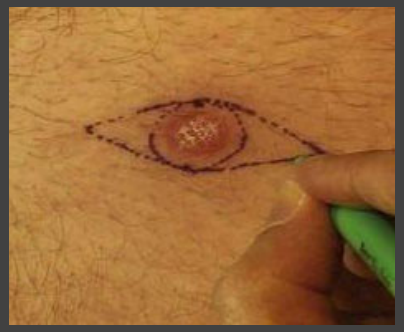


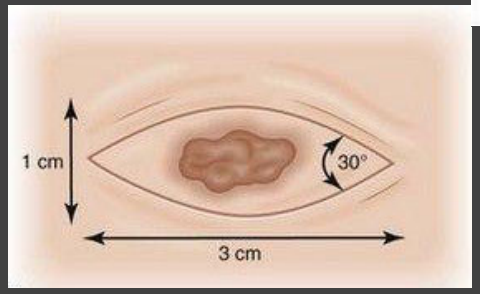
Guidelines for Re-excision

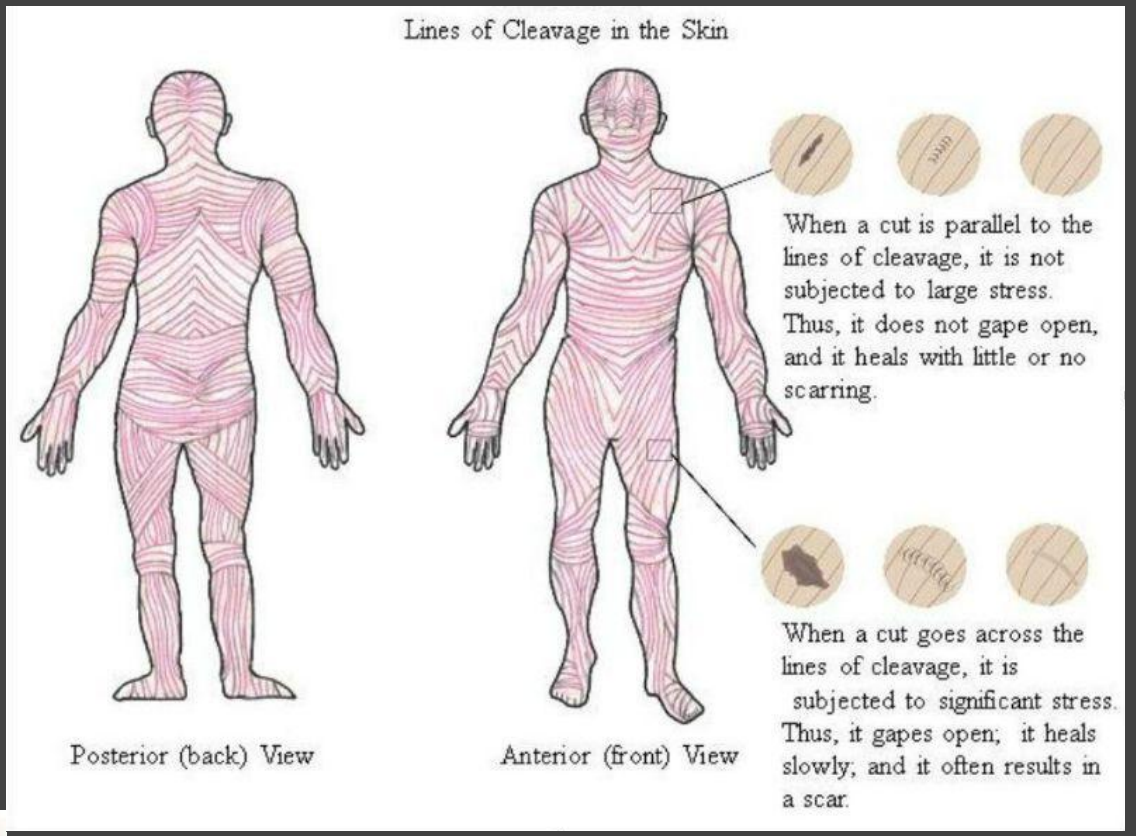
- Completely remove benign to mildly dysplastic nevi
  - Refer to Moh's surgery for cosmetically sensitive areas
- 0.5cm margins for severely dysplastic nevi and melanoma in situ
  - Refer to Moh's surgery for cosmetically sensitive areas
  - Remember that 0.5cm margins on a lesion already completely out is 1cm excision
  - Elliptical excision to prevent dog ears
- 1cm margins for melanoma
  - Refer to Moh's for <1mm (pT1) on cosmetically sensitive areas
  - Refer to General Surgery for <1mm (pT1) on non-cosmetically sensitive areas AND >1mm (pT2 and higher) for concurrent SLN biopsy

Elliptical Excision



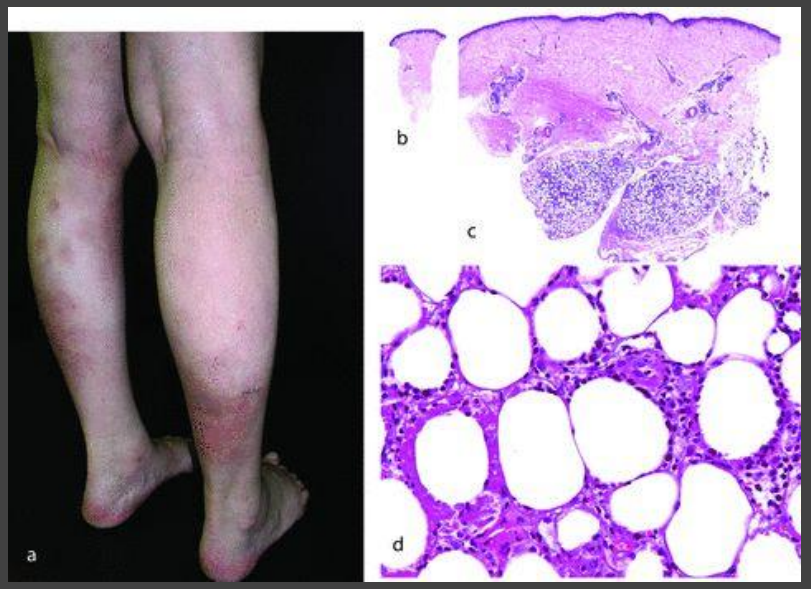




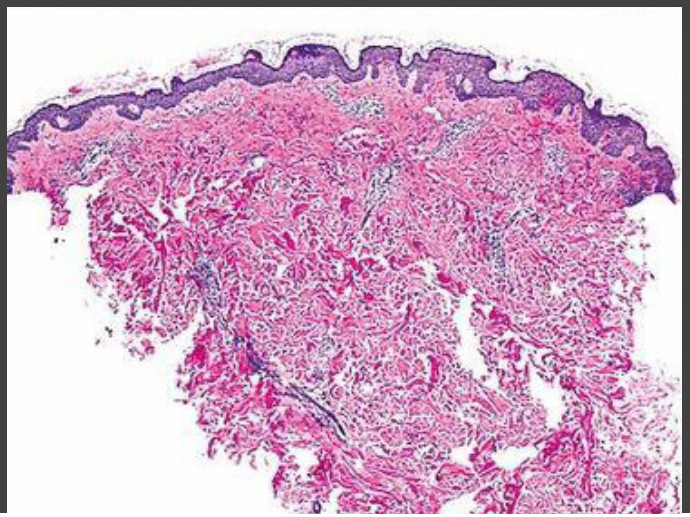


Final thoughts on biopsies

- Always punch biopsy a rash
  - Need to see deep dermis and subcutis
  - Panniculitis



  - Urticaria



Labeling Your Biopsy Specimens

- Include patient face sheet (billing, identification, etc)
- Include biopsy site and laterality
  - Left forehead
  - Right parietal scalp
  - Midline midback
- Include type of biopsy
  - Shave
  - Punch
  - Excisional
  - Incisional
- Initial and date
- Can’t beat a picture (especially for rashes and pigmented lesions)

Pathology Report Correlation

Specimens

A Skin-Surgical Pathology, left posterior shoulder, tang bx, atypical nevus vs r/o melanoma

Final Diagnosis

A. SKIN, LABELED AS "LEFT POSTERIOR SHOULDER", TANGENTIAL BIOPSY / SHAVE REMOVAL:

- UNUSUAL TRAUMATIZED JUNCTIONAL MELANOCYTIC NEVUS, SEE COMMENT
- SOX-10 IMMUNOHISTOCHEMICAL STAIN: HIGHLIGHTS INCREASED NUMBERS OF SINGLE UNIT JUNCTIONAL MELANOCYTES, IRREGULAR NESTS, AND RARE PAGETOID SCATTER

COMMENT: If a lesion persists or recurs at this site, complete removal is recommended.

Electronically signed by Jessica Ashley Forcucci, MD on 11/3/2023 at 7:50 PM

Diagnosis Comment

This case was reviewed at the Dermatopathology Consensus Conference on 11/3/2023 (Drs. Forcucci and Scribner).

Specimen No : 370583-20BR Referrer Dr Tim Aung

DIAGNOSTIC SUMMARY:

1. ABDOMINAL WALL - INVASIVE MELANOMA (SUPERFICIAL SPREADING TYPE, LEVEL 4); RE-EXCISION RECOMMENDED.

2. RIGHT 2ND TOE - NODULAR BASAL CELL CARCINOMA.

Reported by [redacted]

Clinical Notes: Histology; 1. 2 - 4mm margin excision of red patch mid abdominal (nick 12 o'clock), 2. 4mm punched biopsy of dimple erythema R 2nd toe (?BCC). ?Amelanotic MM or MM as per dermoscopic features, toe - ?BCC.

Macroscopic:

1. Labelled '**1. Abdominal wall**'. A 38 x 20 x 8mm skin ellipse. A suture marks one transverse edge, oriented 12 o'clock (12 o'clock green, 6 o'clock black). There is a variegated pink tan patch 16 x 14mm. 1A 2TS 1LS 3 o'clock; 1B 3TS; 1C 2TS 1LS 9 o'clock.

2. Labelled '**2. R 2nd toe**'. A 4 x 4mm skin punch with a tan macule 2 x 2mm. 2A bisected in total.

Microscopic:

1. **SYNOPTIC REPORT FOR MALIGNANT MELANOMA**

Diagnosis: Invasive melanoma.
Site: Abdominal wall.
Subtype: Superficial spreading type.
Margin status: Clear, re-excision recommended.
Tumour Thickness (Breslow): 1.5mm.
Clark level: 4.
Ulceration: Absent.
Mitotic count: 1/mm²
Microsatellites: Absent.
Perineural invasion: Absent.
Perineural invasion: Absent.
Lymphovascular invasion: Absent.
Regression:
- Early (TILS): Absent.
- Late (Fibrosis): Present.

Associated benign naevus: Present. There is a benign intradermal component present.
Excision Margins:
- Peripheral invasive:
  - 12 o'clock: 5mm.
  - 3 o'clock: >8mm.
  - 6 o'clock: 2.75mm.
  - 9 o'clock: >8mm.
- Peripheral in-situ:
  - 12 o'clock: 3mm.
  - 3 o'clock: >8mm.
  - 6 o'clock: 2mm.
  - 9 o'clock: >8mm.
- Deep: 5.5mm.

Description/Comment: The specimen comprises a portion of skin extending to the subcutis showing an atypical compound melanocytic proliferation consistent with an invasive melanoma of superficial spreading type. The junctional component shows a predominantly lentiginous and occasionally nested architecture with severe cytoarchitectural dysplasia and pagetoid spread. The intradermal component shows atypical epithelioid cells which extend into the reticular dermis. There is also a small benign intradermal component.

RML REGIONAL MEDICAL LABORATORY SPLA Pathology Laboratory Associates

Patient Name: TEST, TEST
DOB/Age/Sex: 11/8/1951 56 years Female
MRN: 999999
Client Name: CLAREMORE INDIAN HOSPITAL
Provider: DOC TEST1 MD
Consulting:

Case #: D-08-0013911
Collected: 2/29/2008 12:08:00 PM
Received: 2/29/2008 12:08:00 PM
Deliver to: N/A
N/A
N/A, N/A N/A

SURGICAL PATHOLOGY REPORT

Diagnosis
Skin, left axilla, punch biopsy-
axillary granular parakeratosis.

Test, Pathologist Pathologist (Electronic Signature)

PT 02/29/2008

Microscopic Examination
Sections show parakeratotic confluent scale containing an abundance of prominent keratohyalin granules. The underlying epidermis shows psoriasiform hyperplasia without acantholysis. The histology defines axillary granular parakeratosis.

Gross Examination
Punch biopsy of skin: left axillary
Size: 0.4 x 0.4 cm
Excision depth: 0.5 cm
Specimen is bisected and entirely submitted in 1 cassette for microscopic examination.

PT /PT

Specimen
From left axillary

Pertinent History
Hailey Hailey

Annie Morrison, MD, FAWM

- 406-540-3100
- AnnieMorrisonMD@gmail.com

- For all your dermatopathology or dermatology questions

References

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