(PBL) Dermatologic Conditions: Family Docs Have Skin in the Game (CME114-115)

Dermatologic Conditions: Family Docs Have Skin in the Game (CME116-117)

Nail Disorders/Abnormalities: The Good, the Bad, and the Ugly (CME118-119)

Skin Cancer Update for the Family Physician (CME120-121)

Venous Ulcers and Ulcerations in Patients with Diabetes: Applying the Evidence (CME122-123)
(PBL) Dermatologic Conditions:
Family Docs Have Skin in the Game

Eddie Needham, MD, FAAFP

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Learning Objectives

1. Practice applying new knowledge and skills gained from Dermatologic Conditions sessions, through collaborative learning with peers and expert faculty.

2. Identify strategies that foster optimal management of dermatologic conditions within the context of professional practice.

3. Formulate an action plan to implement practice changes, aimed at improving patient care.

Associated Sessions

• Dermatologic Conditions: Family Docs Have Skin in the Game
Dermatology terms

- Macule – flat lesion < 1 cm
- Patch – flat lesion > 1 cm
- Papule – raised lesion < 0.5 - 1 cm
- Plaque – raised lesion > 0.5 - 1 cm
- Vesicle – fluid-filled blisters < 0.5 cm
- Bulla – fluid-filled blisters > 0.5 cm
- Pustule – pus-filled blisters
Get to the Noun

• “It’s an erythematous, papular, excoriated, lichenified …” THANG
• Erythematous *papule*
• Lichenified *plaque*
• Getting to the noun gives a Ddx
• Papule $\rightarrow$ ...
• Vesicle $\rightarrow$ ...

General Principles in Dermatology

• If it’s dry, wet it.
• If it’s wet, dry it.
• If it itches, add steroids/anti-inflammatory.
• If you’re not sure, biopsy it.
Case #1

• 15 yo female presents with complaints of facial skin rash getting worse over past 6 months.
• Location
  • Face to include forehead, nose, cheeks, upper back and chest
• No fevers, weight stable, runs 3 miles 3-4 x/week, menses regular and moderate amount of flow.
• Social – family at home include Mom, Dad, and 2 younger sibs.
• Not sexually active, no EtOH or drugs of abuse
Based on Hx and PE, what is the Differential Diagnosis?

Questions to discuss at your table

• Differential diagnosis
• Final Diagnosis
• Treatment options
  • First line
  • Second line
Group answers

• Differential diagnosis?
• Final Diagnosis?
• Treatment options?
  • First line?
  • Second line?

Mild to moderate inflammatory
Acne Vulgaris
Acne Vulgaris - Pathophysiology

1. Androgen-mediated stimulation of the sebaceous gland
2. Abnormal keratinization leading to follicular plugging – comedo formation
3. Proliferation of Propionibacterium acnes within the follicle
4. Inflammation

• Genetics, stress, and diet may also play a role

Acne Classification

- Comedomal acne (no inflammation)
- Inflammatory acne (papules and pustules):
  - Mild to moderate severity
  - Moderate to Severe inflammatory acne
  - Severe Papulonodular Acne

Treatment – Comedomal Acne

- Topical retinoids are the mainstay of therapy
- Decrease formation of comedones and reduce inflammation
  - Tretinoin: Retin-A, not isotretinoin/Accutane ($40-68)
  - Adapalene ($90)
  - Tazarotene ($113)
- Treatment response of 40 – 70% within 12 weeks.
- Use a small pea-sized amount, apply the to affected areas at bedtime.

Treatment of Comedonal Acne
Topical retinoids

• Tretinoin: Cutaneous erythema, peeling, edema are dose-related
• Adapalene: Less skin irritation than tretinoin with similar efficacy
• Tazarotene: Most efficacious


Benzoyl peroxide

• Over-the-counter
• Antimicrobial
• Does NOT induce resistance
• Consider using in addition with any long term topical or oral antibiotic
Treatment – Inflammatory Acne
Mild to Moderate

• Topical antibiotics are the treatment of choice
  • Benzoyl peroxide
  • Azelaic acid: pregnancy category B (Azelex and Finacea)
  • Clindamycin
  • Erythromycin
  • Dual agents combining benzoyl peroxide with clindamycin or erythromycin
• Current recommendations suggest combining topical antibiotics with topical retinoids if tolerated by the patient.

Treatment – Inflammatory Acne Mild to Moderate

• Response to topical antibiotics
  • 30 to 80% improvement
  • 8 to 12 weeks of therapy
Women with acne

• For women with acne who desire birth control, oral contraceptives (OCs) are an excellent choice.

• OCs approved for acne in the USA include:
  • Orthotricyclin
  • Estrostep
  • Yaz
  • Others-35 😊

• Expected improvement from OCs alone is 40-70%.

Women with acne

• Women not responding to OCs, androgen-receptor blockers may be considered w/ 50-80% improvement:
  • Spironolactone 50-100 mg/day
    • Side effects include: diuresis, breast tenderness, menstrual irregularities
  • Flutamide 250 mg/day
    • Side effects include: GI upset, hepatotoxicity – check liver NZs
    • Is regularly used to treat prostate cancer as an antiandrogen
  • Cyproterone 50-100 mg/day
    • Side effects include: hepatotoxicity – check liver NZs
    • Is regularly used to treat prostate cancer as an antiandrogen
A 17 yo female with more severe acne presents with the exam and right.

Discuss at your table the Ddx and treatment options

Group answers

• Differential diagnosis?
  • “Bad” acne: caused by? E.g., Cushing’s?
• Final Diagnosis?
  • Severe or nodular or cystic or nodulocystic acne
• Treatment options?
  • First line? Isotretinoin/Accutane, derm consult
  • Second line? Oral antibiotics, OCPs, derm consult
Treatment – Inflammatory Acne Moderate to Severe

• Oral antibiotics are first line therapy having both antimicrobial and anti-inflammatory properties
  • Tetracyclines:
    • Tetracycline
    • **Doxycycline (preferred over tetracycline)**
    • **Minocycline (preferred over tetracycline)**
  • Erythromycin recommended less often secondary to resistant P. acnes
  • Consider benzoyl peroxide to help reduce resistance

Treatment – Inflammatory Acne Moderate to Severe

• Response to oral antibiotics
  • 64% to 86%
  • 6 to 8 weeks of therapy
Treatment – Inflammatory Acne Moderate to Severe

• Doxycycline
  • 50 to 100 mg daily to bid
  • 20 mg per day has been studied and is effective
  • Side effects include GI upset, more chance at photosensitivity than TCN.
  • Doxycycline may be taken with food.
  • Do not use in children less than 8 years old

Treatment – Inflammatory Acne Moderate to Severe

• Minocycline
  • 50 to 100 mg bid
  • Side effects include: vertigo, dizziness, ataxia, rare bluish discoloration to the skin.
  • Also associated with drug-induced lupus, autoimmune hepatitis, and a hypersensitivity syndrome.
  • Resistance to P. acnes is least with minocycline
Treatment of Severe Papulonodular Acne

• Oral isotretinoin/Accutane is the drug of choice.  
• It is used by itself except with women using oral contraceptives (OC).  
• Dose is 1 mg/kg per day for 20 weeks or a total cumulative dose of 120 mg/kg.

Isotretinoin

• Vitamin A metabolite  
• Actions  
  • Inhibits sebaceous gland differentiation  
  • Reduces sebaceous gland size  
  • Suppresses sebum production  
  • Normalizes follicular epithelial desquamation
Isotretinoin

• 80 to 90% success rate.

• Retreatment over 10 years in 88 patients:
  • 23% required a second course

• Chart review after three years of 179 patients receiving 1 course
  • 35% had no recurrence
  • 16% required topical therapy
  • 27% required oral antibiotics
  • 23% required a second course


Isotretinoin

• Side Effects
  • Dry lips and dry skin
  • Decreased night vision
  • Headache
  • Epistaxis
  • Backache
  • Benign intracranial hypertension
  • Mild to moderate elevation in liver enzymes
  • Elevation in lipids, especially triglycerides
  • Depression and suicide
Isotretinoin

- It is a known teratogen, pregnancy category X
- Major malformations occur in 40% of infants exposed in the first trimester.
- Women need two negative pregnancy tests before commencing a course of therapy, and monthly thereafter
- Women need two forms of contraception during Rx.
- Women need to sign a consent form for treatment.
- Physicians currently need to be registered with iPLEDGE to prescribe.

Acne - Treatment Summary

- Comedonal acne
  - Topical retinoids
- Mild to moderate acne
  - Topical retinoids with topical antibiotics/benzoyl peroxide
- Moderate to severe acne
  - Topical retinoids with oral antibiotics/benzoyl peroxide
- Papulonodular/scarring acne
  - Isotretinoin
- Maintenance
  - Topical retinoids +/- benzoyl peroxide +/- topical antibiotic
Case #2

• 30 yo male with sore throat, myalgias, and congestion 2 weeks ago that resolved.
• Now with rash on abdomen.
• Minimal itch
• Started with spot on right abdomen and is spreading.
• Last sexual contact >6 months ago.
Questions to discuss at your table

• Differential diagnosis
• Final Diagnosis
• Treatment options
  • First line
  • Second line

Group answers

• Differential diagnosis?
• Final Diagnosis?
• Treatment options?
  • First line?
  • Second line?
Pityriasis Rosea

DDx for papulosquamous eruptions

- Viral exanthem
- Tinea corporis
- Nummular eczema
- Pityriasis rosea
- Secondary syphilis
- Lichen planus
- Guttate psoriasis
- Granuloma annulare
Pityriasis Rosea

What type of eczema is this?
Guttate Psoriasis

Guttate Psoriasis
Guttate Psoriasis

Guttate Psoriasis
Guttate Psoriasis

Chronic itchy lesions
Lichen Planus
Lichen Planus

Lichen Planus
Lichen Planus

Wickham’s Striae – skin and oral
Wickham’s Striae

Pityriasis Rosea

- Papulosquamous eruption of undetermined cause
- May have a herald patch initially
- Oval papules and plaques
- Collarette of scale
- Lesions follow Langer’s lines
  - Christmas tree pattern on the back

Etiologies

• Purported viral etiology
• Some recent data has suggested Human herpes virus (HHV) 7
Human Herpes viridae

• HSV 1 and 2: Oral and genital herpes
• HHV 3: Varicella-Zoster
• HHV 4: Ebstein-Barr
• HHV 5: Cytomegalovirus
• HHV 6: Roseola
• HHV 7: virus in search of a disease ... PR?
• HHV 8: Kaposi’s sarcoma

Pityriasis Rosea - Treatment

• Aggressive Reassurance – lesions will resolve
• Medications:
  • Antihistamines
  • Topical steroids
  • Systemic steroids
• Usually resolves in 1-2 months. The pigmentary changes may take longer to resolve.
Antibiotics for PR

• Early data suggestive of potential benefit from erythromycin
• Data for newer macrolides, azithromycin and clarithromycin, not supportive of benefit
• Recent data using acyclovir suggests benefit

Acyclovir

• Randomized trial of 64 patients with PR Rx’d with 400mg 5xdaily for 1 week
  • At two weeks, erythema reduced in 79% treated vs 27% in untreated patients
  • At four weeks, erythema reduced 93% reduction vs 61% in untreated patients
  • Difference no longer significant at four weeks
• Second trial 38 patients treated with 800mg 5xdaily for 1 week vs 30 patients treated with vitamin C (no placebo)
  • At one week, erythema was reduced 53% in treated vs 10% in untreated patients
  • At two weeks, erythema was reduced 87% in treated vs 33% in untreated patients

Case #3

• 45 yo autistic male presents for a 6 month follow up visit with his caretaker.
• PMHx – stable HTN on lisinopril 20 mg daily
• You’ve personally followed this patient for 5 years
• Exam notable for a 2x3 cm lesion on the left forearm
Questions to discuss at your table

• Differential diagnosis
• Final Diagnosis
• Treatment options
  • First line
  • Second line
Group answers

• Differential diagnosis?
• Final Diagnosis?
• Treatment options?
  • First line?
  • Second line?

Melanoma
Differential Dx?

- Seborrheic Keratosis
- Compound/dermal nevus
- Granuloma annulare
- Basal cell cancer
- Melanoma
- Other tumor
Seborrheic Keratosis
Junctional nevus

Junctional Nevus
Compound Nevus

Dermal Nevus
Dysplastic nevi

Blue Nevus

http://dermis.net
Halo nevus
Hx: Appearance over 6-7 weeks

Normal skin previous
Questions to discuss at your table

• Differential diagnosis
• Final Diagnosis
• Treatment options
  • First line
  • Second line

Group answers

• Differential diagnosis?
• Final Diagnosis?
• Treatment options?
  • First line?
  • Second line?
This lesion is most consistent with:

A. Keratoacanthoma
B. Basal cell cancer
C. Melanoma
D. Pyogenic granuloma

Pyogenic granuloma
Pyogenic granuloma

- Short time to appear
- Often recedes spontaneously
- Mucus membranes – oral and vaginal
- If bothersome or diagnosis unclear, excisional biopsy

Diagnostic clues for keratoacanthoma

- Rapid appearance over 6-8 weeks
- Central keratin core, like a volcano
- Usually appear in sun exposed areas
- More common in men
Treatment of keratoacanthoma

• KA is now classified as a type of squamous cell carcinoma: SCC-KA type
• Excise completely with 4-5 mm margins
• The history is key to making the diagnosis in that these lesions appear rapidly; they are not slow growing.

Recommendations for clinical practice

• Use scientific nomenclature to describe lesions and create the differential diagnosis (SORT C)
• Consider punch biopsy when diagnosis of pigmented lesion uncertain (SORT C)
• Consider acyclovir for treatment of pityriasis rosea (SORT B)
• Topical steroids remain first line and effective for most dermatoses (SORT A)
Dermatology teaching sites

- [www.Dermis.net](http://www.Dermis.net)
- [Adolescent dermatology quiz](http://www.images.md)
- [www.images.md](http://www.images.md)
- [www.dermatlas.net](http://www.dermatlas.net)

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Addendum materials

• Rosacea
• Eczema, atopic dermatitis
• Benign skin tumors
• Pigmented skin lesions
Rosacea

• Chronic facial skin condition of unknown cause
• Location - Central face
  • Transient or persistent erythema, flushing, warmth
  • Telangiectasia
  • Inflammatory papules and pustules
  • Hyperplasia (thickening) of connective tissue
Rosacea

• Four subtypes
  • Erythematotelangiectatic
  • Papulopustular
  • Phymatous
  • Ocular
• One variant - granulomatous
Treatment

• Avoid triggers
• Mild cleansers, moisturizers, photoprotection with hats and SPF 30 sunscreens

Treatment

• Topical metronidazole
• Azelaic acid
• Brimonide, topical alpha-blocker to reduce erythema
• Oral doxycycline 20 mg bid and higher
• Phymatous Rx - Laser, light-based therapies
• Ocular sx – lid hygiene, topical cyclosporine, Abx
Atopic Dermatitis/Eczema

Atopic Dermatitis

• Chronic pruritic skin condition, flexural creases, lichenification over time
• “The scratch that itches”
• Onset usually before 2 years of age
• Only 10% diagnosed after age 5
• 30% of children with atopy develop asthma

Atopic Dermatitis

• Regular use of emollients after bathing
  • Wet wrap therapy for recalcitrant disease
• Topical steroids are main treatment
• Calcineurin inhibitors are second line
  • Tacrolimus ($34) and pimecrolimus ($97)
  • Black box warning – skin cancers and lymphoma

Doc, these bumps have been growing on me for the past 5 years and I’m tired of them.

Seborrheic Keratosis

• Waxy surfaced
• “Stuck on” appearing
• Slow growing
• Can excise/freeze/curette
• They are benign
Poll

These skin lesions are examples of:

A. Lipoma
B. Neurofibroma
C. Dermatofibroma
D. Seborrheic keratosis
Diagnostic clues

• Positive dimple sign
  • When the tumor is gently squeezed from the sides, it dimples down below the skin
  • Like an iceberg, the majority of the tumor is below the level of the skin
• Commonly occurs on the legs, especially in women
• Usual pigmentation is darker than surrounding skin

Treatment for dermatofibroma

• Aggressive reassurance
• Excisional biopsy if the lesion is irritating or concerning.
Well, doctors, what are these bumps? Remember, these have pigment

• Nevi aka “moles”
• Cancers: melanoma, BCC, SCC?
• Dermatofibroma
• SK, seborrheic keratosis
• Others
• If in doubt, consider biopsy

Nevi – three types

• Junctional – cells are at the dermoepidermal junction above the basement membrane. Flat lesions.
• Compound – cells are both above the basement membrane and in the dermis. Slightly raised lesions.
• Dermal – cells are only in the dermis. Raised lesions.
Here’s a special variety of mole
Blue Nevus

Are these lesions running circles around you? Try this one on for size.
And these are...?

Yet some more types of moles with fancy names...
Nevus anemicus
And this is ...?

Nevus Spilus
What are these common splotches called?

Ephelides ... AKA Freckles
Cutaneous horn
Cutaneous Horn

• Sharply excise these and send them for pathology to check for squamous cell cancer at the base.
Psoriasis
This is an example of inverse psoriasis

- Differential Dx includes:
  - Seborrheic dermatitis
  - Candidal intertrigo
  - Cutaneous T cell lymphoma (mycosis fungoides)

Psoriasis treatment

- Consider dermatology consult
- High potency topical steroids: group 1 often needed
- PUVA, UVB and tar
- Immunomodulators
  - (e.g., methotrexate, cyclosporine)
- Biologic agents
  - TNF alpha inhibitors: etanercept, infliximab
  - Monoclonal Abs: against interleukins or TNF-α
Psoriasis - systemic effects

- Psoriatic arthritis, classically at the sacro-ileac joint
  - Seronegative spondyloarthritis
  - Negative for Rheumatoid factor = sero(-)
- Cup in saucer deformity of distal finger tufts
- Digit swelling, dactylitis

Poll
Patient with sore throat last week and now with a diffuse rash.

A. Generalized lichen planus
B. Guttate psoriasis
C. Varicella (chicken pox)
D. Pityriasis Rosea

Guttate Psoriasis
Guttate psoriasis – diagnostic clues

• GP spares the palms and soles (vs secondary syphilis)
• Guttate pattern is classic
  • Water droplets sprinkled on skin
  • Central scale

Guttate Psoriasis

• GP is strongly associated with a preceding or concurrent GABS infection.
  • 70-80% patients
• Immune reaction to infection.
• A genetic predisposition plays an important role

Guttate Psoriasis - treatment

• Reassurance and emollients
• Topical steroids
• UVB phototherapy
• Systemic agents are rarely necessary
• Empiric treatment for streptococcal infection and tonsillectomy for recurrent attacks

Lichen Planus – the 5 P’s

• Purple
• Pruritic
• Polygonal
• Planar
• Papules and plaques
• It’s not PUPP (pruritic urticarial papules and plaques of pregnancy)
Lichen Planus
Treatment

• Topical steroids, high potency initially
• Intrallesional steroids
• Antihistamines
• PUVA for generalized LP
• Kenalog in orabase for oral lesions on buccal mucosa (Wickham’s striae)

Recommendations for clinical practice - Acne

1. Topical retinoids are effective for noninflammatory and inflammatory acne (SORT A)
2. Oral antibiotics are effective for moderate to severe acne (SORT A)
3. Benzoyl peroxide should be used in conjunction with topical and oral antibiotics to reduce the risk of bacterial resistance (SORT C)
4. Topical Abx are more effective when used with topical retinoids (SORT A)
5. Combined OCPs can be used to treat inflammatory and noninflammatory acne (SORT A)
Questions
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Learning Objectives

1. Evaluate the presented skin condition and determine differential diagnosis and the need for further testing or referral.

2. Counsel patients on lifestyle modifications and proper skin care to control flare-ups and avoid outbreaks.

3. Create a disease management strategy for patients with a diagnosed dermatologic condition based on the type and severity of the condition.

4. Devise an evidence-based treatment plan, considering referral to a dermatologist when treatment goals are not met or when there is significant scarring.

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Comedomal Acne
Inflammatory Acne (papules and pustules), mild to moderate severity
Moderate to Severe Inflammatory Acne
Severe Papulonodular/Cystic Acne
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  • Side effects include: vertigo, dizziness, ataxia, rare bluish discoloration to the skin.
  • Also associated with drug-induced lupus, autoimmune hepatitis, and a hypersensitivity syndrome.
  • Resistance to P. acnes is least with minocycline

Treatment of Severe Papulonodular Acne

• Oral isotretinoin/Accutane is the drug of choice.
• It is used by itself except with women using oral contraceptives (OC).
• Dose is 1 mg/kg per day for 20 weeks or a total cumulative dose of 120 mg/kg.
Isotretinoin

• Vitamin A metabolite

• Actions
  • Inhibits sebaceous gland differentiation
  • Reduces sebaceous gland size
  • Suppresses sebum production
  • Normalizes follicular epithelial desquamation

Isotretinoin

• 80 to 90% success rate.

• Retreatment over 10 years in 88 patients:
  • 23% required a second course

• Chart review after three years of 179 patients receiving 1 course
  • 35% had no recurrence
  • 16% required topical therapy
  • 27% required oral antibiotics
  • 23% required a second course

Isotretinoin

• Side Effects
  • Dry lips and dry skin
  • Decreased night vision
  • Headache
  • Epistaxis
  • Backache
  • Benign intracranial hypertension
  • Mild to moderate elevation in liver enzymes
  • Elevation in lipids, especially triglycerides
  • Depression and suicide

Isotretinoin

• It is a known teratogen, pregnancy category X
• Major malformations occur in 40% of infants exposed in the first trimester.
• Women need two negative pregnancy tests before commencing a course of therapy, and monthly thereafter
• Women need two forms of contraception during Rx.
• Women need to sign a consent form for treatment.
• Physicians currently need to be registered with iPLEDGE to prescribe.
Women with acne

• For women with acne who desire birth control, oral contraceptives (OCs) are an excellent choice.

• OCs approved for acne in the USA include:
  • Orthotricyclin
  • Estrostep
  • Yaz
  • Others-35

• Expected improvement from OCs alone is 40-70%.

Women with acne

• Women not responding to OCs, androgen-receptor blockers may be considered w/ 50-80% improvement:
  • Spironolactone 50-100 mg/day
    • Side effects include: diuresis, breast tenderness, menstrual irregularities
  • Flutamide 250 mg/day
    • Side effects include: GI upset, hepatotoxicity – check liver NZs
    • Is regularly used to treat prostate cancer as an antiandrogen
  • Cyproterone 50-100 mg/day
    • Side effects include: hepatotoxicity – check liver NZs
    • Is regularly used to treat prostate cancer as an antiandrogen
Acne - Treatment Summary

• Comedonal acne
  • Topical retinoids

• Mild to moderate acne
  • Topical retinoids with topical antibiotics/benzoyl peroxide

• Moderate to severe acne
  • Topical retinoids with oral antibiotics/benzoyl peroxide

• Papulonodular/scarring acne
  • Isotretinoin

• Maintenance
  • Topical retinoids +/- benzoyl peroxide +/- topical antibiotic

Rosacea
Rosacea

• Chronic facial skin condition of unknown cause
• Location - Central face
  • Transient or persistent erythema, flushing, warmth
  • Telangiectasia
  • Inflammatory papules and pustules
  • Hyperplasia (thickening) of connective tissue

Rosacea

• Four subtypes
  • Erythematotelangiectatic
  • Papulopustular
  • Phymatous
  • Ocular
• One variant - granulomatous
Treatment

• Avoid triggers
• Mild cleansers, moisturizers, photoprotection with hats and SPF 30 sunscreens
Treatment

- Topical metronidazole
- Azelaic acid
- Brimonide, topical alpha-blocker to reduce erythema
- Oral doxycycline 20 mg bid and higher
- Phymatous Rx - Laser, light-based therapies
- Ocular sx – lid hygiene, topical cyclosporine, Abx

Atopic Dermatitis/Eczema
Atopic Dermatitis

• Chronic pruritic skin condition, flexural creases, lichenification over time
• “The scratch that itches”
• Onset usually before 2 years of age
• Only 10% diagnosed after age 5
• 30% of children with atopy develop asthma

Atopic Dermatitis

• Regular use of emollients after bathing
  • Wet wrap therapy for recalcitrant disease
• Topical steroids are main treatment
• Calcineurin inhibitors are second line
  • Tacrolimus ($34) and pimecrolimus ($97)
  • Black box warning – skin cancers and lymphoma
Doc, these bumps have been growing on me for the past 5 years and I’m tired of them.
Seborrheic Keratosis
Seborrheic Keratosis

• Waxy surfaced
• “Stuck on” appearing
• Slow growing
• Can excise/freeze/curette
• They are benign
Melanoma
Differential Dx?

- Seborrheic Keratosis
- Compound/dermal nevus
- Granuloma annulare
- Basal cell cancer
- Melanoma
- Other tumor
Poll Question 1:

These skin lesions are examples of:

A. Lipoma  
B. Neurofibroma  
C. Dermatofibroma  
D. Seborrheic keratosis

Diagnostic clues

• Positive dimple sign  
  • When the tumor is gently squeezed from the sides, it dimples down below the skin  
  • Like an iceberg, the majority of the tumor is below the level of the skin  
• Commonly occurs on the legs, especially in women  
• Usual pigmentation is darker than surrounding skin
Treatment for dermatofibroma

• Aggressive reassurance
• Excisional biopsy if the lesion is irritating or concerning.
Well, doctors, what are these bumps? Remember, these have pigment

- Nevi aka “moles”
- Cancers: melanoma, BCC, SCC?
- Dermatofibroma
- SK, seborrheic keratosis
- Others
- If in doubt, consider biopsy
Nevi – three types

• Junctional – cells are at the dermoepidermal junction above the basement membrane. Flat lesions.
• Compound – cells are both above the basement membrane and in the dermis. Slightly raised lesions.
• Dermal – cells are only in the dermis. Raised lesions.
Junctional Nevus

Compound Nevus
Dermal Nevus
Dysplastic nevi

Here’s a special variety of mole
Are these lesions running circles around you? Try this one on for size.
And these are…?

Halo nevus
Yet some more types of moles with fancy names...
Nevus anemicus
And this is ...?
(Linear) Epidermal Nevus
What are these common splotches called?

Ephelides ... AKA Freckles

Hx: Appearance over 6-7 weeks

Normal skin previous
Poll Question 2:

This lesion is most consistent with:

A. Keratoacanthoma
B. Basal cell cancer
C. Melanoma
D. Pyogenic granuloma
Diagnostic clues

• Rapid appearance over 6-8 weeks
• Central keratin core, like a volcano
• Usually appear in sun exposed areas
• More common in men

Treatment of keratoacanthoma

• KA is now classified as a type of squamous cell carcinoma: SCC-KA type
• Excise completely with 4-5 mm margins
• The history is key to making the diagnosis in that these lesions appear rapidly; they are not slow growing.
Cutaneous horn
Cutaneous Horn

• Sharply excise these and send them for pathology to check for squamous cell cancer at the base.
Pyogenic granuloma

• Short time to appear
• Often recedes spontaneously
• Mucus membranes – oral and vaginal
• If bothersome of diagnosis unclear, excisional biopsy
Psoriasis
This is an example of inverse psoriasis

• Differential Dx includes:
  • Seborrheic dermatitis
  • Candidal intertrigo
  • Cutaneous T cell lymphoma (mycosis fungoides)

Psoriasis treatment

• Consider dermatology consult
• High potency topical steroids: group 1 often needed
• PUVA, UVB and tar
• Immunomodulators
  • (e.g., methotrexate, cyclosporine)
• Biologic agents
  • TNF alpha inhibitors: etanercept, infliximab
  • Monoclonal Abs: against interleukins or TNF-α
Psoriasis - systemic effects

- Psoriatic arthritis, classically at the sacro-ileac joint
  - Seronegative spondyloarthritis
  - Negative for Rheumatoid factor = sero(-)
- Cup in saucer deformity of distal finger tufts
- Digit swelling, dactylitis
Poll Question 3:

Patient with sore throat last week and now with a diffuse rash.

A. Generalized lichen planus
B. Guttate psoriasis
C. Varicella (chicken pox)
D. Pityriasis Rosea

Guttate Psoriasis
Guttate psoriasis – diagnostic clues

• GP spares the palms and soles (vs secondary syphilis)
• Guttate pattern is classic
  • Water droplets sprinkled on skin
  • Central scale

Guttate Psoriasis

• GP is strongly associated with a preceding or concurrent GABS infection.
  • 70-80% patients
• Immune reaction to infection.
• A genetic predisposition plays an important role

Guttate Psoriasis - treatment

- Reassurance and emollients
- Topical steroids
- UVB phototherapy
- Systemic agents are rarely necessary
- Empiric treatment for streptococcal infection and tonsillectomy for recurrent attacks
Poll Question 4:

What eruption might this be?

A. Erythema marginatum  
B. Secondary syphilis  
C. Nummular eczema  
D. Pityriasis rosea
Pityriasis Rosea

- Papulosquamous eruption of undetermined cause
- May have a herald patch initially
- Oval papules and plaques
- Collarette of scale
- Lesions follow Langer’s lines
  - Christmas tree pattern on the back

Etiologies

• Purported viral etiology
• Some recent data has suggested Human herpes virus (HHV) 7

Wait ... What?!!
Human Herpesviridae

- HSV 1 and 2: Oral and genital herpes
- HHV 3: Varicella-Zoster
- HHV 4: Ebstein-Barr
- HHV 5: Cytomegalovirus
- HHV 6: Roseola
- HHV 7: virus in search of a disease ... PR?
- HHV 8: Kaposi’s sarcoma

Pityriasis Rosea - Treatment
- Aggressive Reassurance – lesions will resolve
- Medications:
  - Antihistamines
  - Topical steroids
  - Systemic steroids
- Usually resolves in 1-2 months. The pigmentary changes may take longer to resolve.
Antibiotics for PR

• Early data suggestive of potential benefit from erythromycin
• Data for newer macrolides, azithromycin and clarithromycin, not supportive of benefit
• Recent data using acyclovir suggests benefit

Acyclovir

• Randomized trial of 64 patients with PR Rx’d with 400mg 5xdaily for 1 week
  • At two weeks, erythema reduced in 79% treated vs 27% in untreated patients
  • At four weeks, erythema reduced 93% reduction vs 61% in untreated patients
  • Difference no longer significant at four weeks
• Second trial 38 patients treated with 800mg 5xdaily for 1 week vs 30 patients treated with vitamin C (no placebo)
  • At one week, erythema was reduced 53% in treated vs 10% in untreated patients
  • At two weeks, erythema was reduced 87% in treated vs 33% in untreated patients

Chronic itchy lesions
Poll Question 5:

What is the most likely diagnosis for this itchy rash on the volar aspect of the wrists?

A. Lichen planus
B. Secondary syphilis
C. Granuloma annulare
D. Rocky Mountain spotted fever
Wickham’s Striae – skin and oral
Wickham’s Striae
Lichen Planus – the 5 P’s

- Purple
- Pruritic
- Polygonal
- Planar
- Papules and plaques
- It’s not PUPP (pruritic urticarial papules and plaques of pregnancy)

Lichen Planus
Treatment

- Topical steroids, high potency initially
- Intralesional steroids
- Antihistamines
- PUVA for generalized LP
- Kenalog in orabase for oral lesions on buccal mucosa (Wickham’s striae)
Recommendations for clinical practice - Acne

1. Topical retinoids are effective for noninflammatory and inflammatory acne (SORT A)
2. Oral antibiotics are effective for moderate to severe acne (SORT A)
3. Benzoyl peroxide should be used in conjunction with topical and oral antibiotics to reduce the risk of bacterial resistance (SORT C)
4. Topical Abx are more effective when used with topical retinoids (SORT A)
5. Combined OCPs can be used to treat inflammatory and noninflammatory acne (SORT A)

Recommendations for clinical practice

• Consider punch biopsy when diagnosis of pigmented lesion uncertain (SORT C)
• Consider acyclovir for treatment of pityriasis rosea (SORT B)
• Topical steroids remain first line and effective for most dermatoses (SORT A)
Dermatology teaching sites

- [www.Dermis.net](http://www.Dermis.net)
- [Adolescent dermatology quiz](http://Adolescent dermatology quiz)
- [www.images.md](http://www.images.md)
- [www.dermatlas.net](http://www.dermatlas.net)

Eddie Needham, MD, FAAFP
Email: Eddie.Needham.MD@AdventHealth.com
Questions
Nail Disorders/Abnormalities: The Good, the Bad, and the Ugly

Edward Mayeaux, MD, FAAFP, DABFM, DABPM

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The content of my material/presentation in this CME activity will include discussion of unapproved or investigational uses of products or devices as indicated: Posaconazole is not approved by the FDA to treat onychomycosis.

Edward Mayeaux, MD, FAAFP, DABFM, DABPM

Professor and Chair, Department of Family and Preventive Medicine/Professor of Obstetrics and Gynecology, University of South Carolina School of Medicine, Columbia

Dr. Mayeaux lives and practices in Columbia, South Carolina. He has received the American Society for Colposcopy and Cervical Pathology (ASCCP) Award of Merit four times and has also received numerous faculty teaching awards. He focuses on women’s health and skin diseases, noting that the most important trends in the field are the rise and fall of methicillin resistant Staphylococcus aureus (MRSA); changes in Pap test recommendations and follow up; and changes in human papillomavirus (HPV) testing recommendations. Dr. Mayeaux considers keeping up with the rapidly changing knowledge base in medicine and physician burnout to be family medicine’s most critical challenges. Other professional interests include health care quality, preventive medicine, and returning joy to medical practice.
Learning Objectives

1. Assess normal nail anatomy and identify common disorders.

2. Describe the appearance and clinical significance of the most common nail disorders.

3. Evaluate treatment options and indications for nail bed surgery and repair.

4. Counsel patients on proper nail care to avoid infections or the development of nail abnormalities.

Audience Engagement System

Step 1

Step 2

Step 3
Nails - Introduction

- Protects distal phalanges
- Increases mechanical traction
- Enhances fine touch
- Cosmesis
- Surgical methods may be needed to diagnose and treat nail problems

Normal Nail Anatomy

- **Nail plate**
  - Hard, flexible
  - “The nail”
  - Keratinized sq. cells
  - Borders - proximal and lateral nail folds
  - Longitudinal grooves on dorsal surface
Normal Nail Anatomy

- **Nail bed**
  - Highly vascular
  - Germinal tissue
  - Longitudinal ridges - interdigitates with nail
  - Borders lunula, lateral nail folds, and hyponychium

Examsnining the Nail

- Remove polish
- Examine all 20 nails
- Digits relaxed
  - Note shape, contour, and color
  - Observe obliquely for superficial plate changes
  - Distal groove, folds, and eponychium

Examining the Nail

- Examine lunula
- Squeeze the digit tip
  - Assess lesion color changes
  - Assess refill
- Transilluminate
- Make simple drawings

Poll Question #1

Nail changes associated with infection or neoplasia include:

A. Leukonychia punctata
B. Longitudinal melanonychia
C. Transverse striate leukonychia
D. Onychogryphosis

Courtesy of Dr. E.J. Mayeaux, Jr.
Normal Variants

- Longitudinal ridging
  - Benign, parallel, elevated nail ridges
  - More common with aging

- Leukonychia punctata and transverse striate leukonychia
  - Benign, white spots or lines in the nails
  - Typically don’t extend width of nail
Habit Tic Deformity

- May result from minor trauma
- Most common childhood nail condition
- Reassure no
  Tx is necessary
- Behavior modification helpful
- OCD - high dose fluoxetine

Courtesy of Dr. E.J. Mayeaux, Jr., M.D.

Onychogryphosis

Courtesy of Dr. Richard Usatine

Courtesy of Dr. E.J. Mayeaux, Jr.
Longitudinal Melanonychia

• Tan, brown, or black stripe
  – Runs longitudinally through nail

• Increased nail melanin deposition
  – Simulated by deposition of other chromogens in or under nail

• Melanoma must be considered
  – Bx if cause not apparent

Longitudinal Melanonychia

- More common with darker skin
  - 77% of African-Americans >20 years and ~100% >50 years
  - 10% to 20% of Japanese descent
  - Common in Hispanics
  - Unusual among whites
- More common in frequently used fingers and thumb

Subungual Melanoma

- Small number of patients with LM have subungual melanoma
- Separating benign from malignant lesions is often difficult
- Band-width >6mm, band wider proximally, color heterogeneity and blurry lateral borders warrant biopsy

Mannava KA,. Hand Surgery. 2013: 18; 133-139.
Subungual Melanoma

• 45% to 60% arise on hand
  – Most in the thumb
• On foot, occurs on great toe
• Median age = 60s and 70s
• Males = females

Subungual Melanoma

• Hutchinson's sign
  – Periungual spread of pigment into the proximal or lateral nail folds
  – Presumes melanoma
• Pseudo-Hutchinson's sign
  – Benign LM visible through nail fold

 Courtesy of The Color Atlas of Family Medicine

 Courtesy Robert Gilson, MD and The Color Atlas of Family Medicine
Subungual Melanoma

- Biopsy if etiology uncertain
- Provide adequate tissue
- No single bx method best
  - Dystrophy less with distal matrix bx
  - Appearance less crucial in the toes
  - Bx more aggressively in older patients

Poll Question #2

Nail changes not commonly associated with psoriasis include:

A. Nail plate pitting
B. Onycholysis and onychorrhexis
C. Oil drop sign
D. Mees lines
Psoriasis

• Hereditary skin disorder
  • Affects 2% to 3% of U.S. population
  • Prevalence increases with age

Courtesy of Dr. E.J. Mayeaux, Jr., M.D.
Psoriasis

• Nail involvement - 80% lifetime
• Usually coexists with skin psoriasis
• Nail involvement = higher incidence of arthritis
• Nail plate pitting
  • Prox. matrix forms superficial plate
  • Pinpoints to punched out lesions
  • Not specific for psoriasis


Inflammation and Nail Signs

1. Pitting
2. Leukonychia
3. Crumbling

Psoriasis - Nail Plate Pitting

Psoriasis
- Longitudinal matrix involvement produces ridging or splitting
- Transverse produces Beau's lines
- Intermediate produces leukonychia and diminished integrity

Psoriasis – Onycholysis/-rhexis

Psoriasis
- Bed psoriasis = local onycholysis
  - Oil drop sign
  - Salmon patch sign

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Dr. E.J. Mayeaux, Jr.
Psoriasis

• Vascular dilatation & tortuosity
• Splinter hemorrhages of bed

Psoriasis

• Distal onycholysis enhances microbial colonization
  • Greenish-blue discoloration suggests Candida or Pseudomonas

 Courtesy of Dr. E.J. Mayeaux, Jr.
Psoriasis Treatment

**Nail Matrix Psoriasis**
- Clobetasol propionate 0.05% cream (1/d under occlusion)
- Triamcinolone acetonide 10 mg/mL (4 - 0.1-mL injections)
- Acitretin PO 0.3 mg/kg/d
- DMARDs (anti-TNF-a, IL-17, IL-12/23)

**Nail Bed Psoriasis**
- Calcipotriol/betamethasone cream (1/d UO)
- Triamcinolone acetonide 10 mg/mL (4 0.1-mL injections)
- Tazarotene 0.1% cream or ointment (1/d UO)
- Clobetasol propionate 0.05% cream (1/d UO)
- Acitretin 0.3 mg/kg/d (OA)
- Cyclosporine 2.5 mg/kg/d (OA)

---

**Psoriasis Treatment Cochrane**

- Infliximab 5 mg/kg = 57.2% nail score improvement versus -4.1% for placebo (P < 0.001)
- Golimumab 50 -100 mg showed 33% & 54% improvement versus 0% for placebo (P < 0.001)
  - Infliximab and golimumab showed significant results after short-term treatment
- Evidence for topical treatments is inconclusive & of poor quality (does not say they do not work)

---

Polyuria-urethane 16% for Nails

- FDA approved nail solution for the treatment of nail dystrophy
- For brittle nail syndrome
- Mechanically supports the damaged nail plate using a polymer blend that creates strong adhesion
- Forms a breathable barrier while protecting and strengthening the nail
- Allows for oxygen transfer while blocking water absorption

Lichen Planus

- Uncertain etiology
Lichen Planus

• Nail involvement in 10% of patients
  – Brittle, ridged nails most common
  – Onychorrhexis or splitting

© Dr. Richard Usatine

Lichen Planus

• Proximal matrix ds produces onychorrhexis or splitting

Courtesy of Dr. E.J. Mayeaux, Jr., M.D.
Lichen Planus

• Diffuse matrix atrophy produces thinning of the plate
• Tends to predominate centrally, producing "angel wing" deformity
• Pterygium results of matrix scarring
  • Specific for lichen planus
  • Total matrix scarring - anonychia

Lichen Planus

• Onset at any age
  • Most common in fifth or sixth decade
• Fingernails and toenails affected
• Involvement of nail bed or hyponychium produces subungual hyperkeratosis or distal onycholysis
Lichen Planus Diagnosis

- Straightforward when the disorder coexists with cutaneous signs
- Mycologic studies to exclude onychomycosis
- If negative, a nail biopsy will likely be needed to confirm the diagnosis
  - Examination should include H&E and PAS staining

Lichen Planus Treatment

- Unless matrix scarring has occurred, disease is treatable
- Intrallesional corticosteroid therapy
  - Triamcinolone acetonide 2.5 to 5.0 mg/mL injected into proximal and lateral folds at monthly intervals
  - Diffuse to the underlying matrix
- Systemic or topical corticosteroids
- Acitretin at a dose of 0.35 mg/kg per day may be a treatment option in recalcitrant cases

Poll Question #3

True statements about paronychia include all of the following except:

A. Acute paronychia is usually bacterial
B. Chronic paronychia is usually fungal
C. Acute paronychia treatment consists of incision and drainage
D. Paronychia resolution usually requires antibiotic therapy

Paronychia

• Acute inflammation of the lateral and/or proximal nail folds
• Predisposing factors
  • Overzealous manicuring
  • Nail biting
  • Thumbsucking
  • Diabetes mellitus
  • Frequently immersed in water
  • Antiretroviral HIV therapy
Paronychia

- Milder cases Tx with warm soaks for 15 minutes two to four times daily, with or without systemic antibiotics
- More severe cases require I&D
- For chronic paronychia, trauma and irritants must be eliminated
  - Broad spectrum antifungals

Onychomycosis

- Fungal infection of the nails
- Dermatophytes most common
  - May be other fungi and Candida
- Single digit or multiple digits
- Very common in adults
  - May also occur in children
- Trauma predisposes to infection

Onychomycosis - 4 Patterns

- Distal subungual onychomycosis
  - Most common
  - Invades hyponychium
  - Distal nail turns yellow or white


Onychomycosis

- Distal subungual onychomycosis
  - Plate crumbles
  - Accumulation of hyperkeratotic debris

Courtesy of Dr. E.J. Mayeaux, Jr., M.D.

Courtesy of Wikimedia.
Onychomycosis - 4 Patterns

- Superficial (white) onychomycosis
  - Not all are white
  - T. rubrum
  - Aspergillus species
  - Fusarium species
  - C. albicans


Onychomycosis Diagnosis

- Tendency to label any nail process as a fungal infection
  - Only 50% are onychomycosis
- Confirm Dx/species before treatment
  - Prep with ETOH, trim excess nail, take scrapings/trim
  - 8-10 shards, scraping, or grinding for culture
  - PCR testing
- Leukonychia and psoriasis confused with onychomycosis
  - Also eczema or habitual picking

Onychomycosis Diagnosis

- Office microscopy
- 1 drop KOH 10-20% - wait for 5-30 min.
  - Faster with heating or adding DMSO 40%
  - PAS staining helps
- Culture to identify spp in 4-6 weeks
  - Sabouraud's medium


Comparison of Onychomycosis Diagnostic Parameters

### Onychomycosis Tx

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Course</th>
<th>Cure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Griseofulvin (Grifulvin V)</td>
<td>500mg PO qday or 15-20mg/kg/day</td>
<td>4-9 months (f), 6-12 months (t)</td>
<td></td>
</tr>
<tr>
<td>Terbinafine (Lamisil)</td>
<td>250mg PO qday or &lt; 20kg: 62.5mg/day</td>
<td>6 weeks (f), 12 weeks (t)</td>
<td>76%</td>
</tr>
<tr>
<td>Terbinafine (Lamisil) pulse (not FDA indicated)</td>
<td>500mg 1wk/mo x4mo (not thoroughly studied)</td>
<td>6 weeks (f), 12 weeks (t)</td>
<td></td>
</tr>
<tr>
<td>Itraconazole (Sporanox)</td>
<td>200mg daily</td>
<td>2 months (f), 3 months (t)</td>
<td>69%</td>
</tr>
<tr>
<td>Itraconazole (Sporanox) pulse</td>
<td>200mg BiD or 5mg/kg/day capsules for 1 wk/month</td>
<td>2 months (f), 3 months (t)</td>
<td>63%</td>
</tr>
<tr>
<td>Fluconazole (Diflucan) (not FDA indicated)</td>
<td>150mg or 3-6mg/kg once weekly (not thoroughly studied)</td>
<td>12-16 weeks (f), 18-26 weeks (t)</td>
<td>48%</td>
</tr>
<tr>
<td>Ciclopirox 8% nail lacquer (Penlac)</td>
<td>Apply daily to nail and 5mm skin.</td>
<td>Up to 48 weeks</td>
<td>58.3%</td>
</tr>
<tr>
<td>Efinaconazole 10% soln (Jublia)</td>
<td>Apply to affected toenail(s) qDay</td>
<td>Up to 48 weeks</td>
<td></td>
</tr>
<tr>
<td>Tavaborole (Kerydin)</td>
<td>Apply to affected toenail(s) qDay</td>
<td>Up to 48 weeks</td>
<td></td>
</tr>
</tbody>
</table>


### Oral Onychomycosis Tx

- Newer generation oral antifungal (itraconazole and terbinafine) have replaced older therapies
  - Shorter treatment regimens, higher cure rates, and fewer adverse effects
- Posaconazole (not approved by the US FDA for onychomycosis)
  - Better efficacy with terbinafine than with other oral agents
- To decrease the adverse effects and duration of oral therapy, topical treatments and nail avulsion may be combined with oral antifungal management
VapoRub for Onychomycosis??

- Vicks VapoRub has been advocated in the lay literature as an effective tx
  - Photographs @ 4, 8, 12, 24, 36, 48 wks
  - Endpts: mycological cure & satisfaction
  - 5/18 (27.8%) mycological cure @ 48 wks
  - 10/18 (55.6%) had partial clearance
  - 3/18 (16.7%) showed no change


<table>
<thead>
<tr>
<th>Nonprescription Tx</th>
<th>Agent</th>
<th>Administration</th>
<th>Clinical cure rate</th>
<th>Mycotic cure rate</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ageratina pichinchensis</td>
<td>Q 3 day x1 month, 2x/week for 2nd month, then weekly for 3rd month</td>
<td>71 5%</td>
<td>9%</td>
<td>110 patients; = control group, (used ciclopirox)</td>
</tr>
<tr>
<td></td>
<td>(snakeroot) ext.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cyanoacrylate, hydroquinone,</td>
<td>Soak and debride, then apply Q2 weeks</td>
<td>NA</td>
<td>35 – 65%</td>
<td>54 patients @ three months</td>
</tr>
<tr>
<td></td>
<td>undeceylenic A, (Renewed Nail)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Melaleuca alternifolia</td>
<td>Apply BiD</td>
<td>NA</td>
<td>NA</td>
<td>Cochrane found no benefit</td>
</tr>
<tr>
<td></td>
<td>(tea tree) oil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mentholated ointment</td>
<td>Apply small amount with cotton swab daily</td>
<td>28</td>
<td>28</td>
<td>56% partial, and 17% had none</td>
</tr>
<tr>
<td></td>
<td>(Vicks Vaporub)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Physical Tx

<table>
<thead>
<tr>
<th>Agent</th>
<th>Administration</th>
<th>Clinical cure rate</th>
<th>Mycotic cure rate</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual-wavelength nearinfrared laser (Noveon) ¹</td>
<td>Days 1, 14, 42, &amp; 120</td>
<td>26-65%</td>
<td>30%</td>
<td>Evaluated @ 6 months</td>
</tr>
<tr>
<td>Neodymium: yttriumaluminum-garnet laser (Patholase Pinpointe) ²</td>
<td>1-3 sessions 4-6 weeks apart</td>
<td>NA</td>
<td>11-61%</td>
<td>37 toenails with onychomycosis</td>
</tr>
</tbody>
</table>


### Pincer Nails

- Result of inward folding of the lateral edges of the nail

![Pincer Nails Image](image-url)
Pincer Nails

- Tube-shaped nail
- Nail bed may be painfully enclosed
- Lateral pressure from shoes is a likely etiology
- Nail removal or reconstruction may be necessary if pain is significant

Changes Associated with Systemic Disease

- Beau's lines
  - Transverse linear depressions
  - Suppressed nail growth secondary to local trauma or severe illness
  - Appear symmetrically in several or all nails

Courtesy of Dr. E.J. Mayeaux, Jr., M.D.
Assoc. with Systemic Disease

• Mees’s lines
  • Multiple white transverse lines
  • Historically arsenic intoxication
  • Begins in matrix & extends across nail
  • Usually single, but may be multiple
  • Move distally as the nail grows
  • Bx showed plate fragmented
  • Chemical analysis of nail or hair

Choosing Wisely

• Don’t prescribe oral antifungal therapy for suspected nail fungus without confirmation of fungal infection (American Academy of Dermatology October 29, 2013)
  • Approximately half of nails with suspected fungus do not have a fungal infection. As other nail conditions, such as nail dystrophies, may look similar in appearance, it is important to ensure accurate diagnosis of nail disease before beginning treatment. By confirming a fungal infection, patients are not inappropriately at risk for the side effects of antifungal therapy, and nail disease is correctly treated.

https://www.choosingwisely.org/
Practice Recommendations

• The use of correct terminology facilitates communication and documentation
• Some common changes such as leukonychia punctata, transverse striate leukonychia, and onychogryphosis are mainly benign
• Longitudinal melanonychia with band-width >6mm, band wider proximally, and color heterogeneity are concerning for melanoma
• Hutchinson's sign presumes melanoma
• Oral Terbinafine and Itraconazole are the most effective treatments for onychomycosis

Thank you!

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University of South Carolina School of Medicine
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ej.mayeaux@uscmed.sc.edu
Questions
Skin Cancer Update for the Family Physician

Richard Usatine, MD, FAAFP

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Richard Usatine, MD, FAAFP

Professor, Department of Family Medicine, Division of Dermatology and Cutaneous Surgery, University of Texas (UT) Health San Antonio

Dr. Usatine is a graduate of Columbia University College of Physicians and Surgeons in New York. He completed his residency in family medicine at the University of California, Los Angeles (UCLA), as well as a fellowship in medical education from UCLA. He is the co-author of 10 books and the lead author of eight books, including The Color Atlas and Synopsis of Family Medicine, Dermatological and Cosmetic Procedures in Office Practice, and Cutaneous Cryosurgery. He has published more than 130 journal articles and has won numerous teaching and humanitarian awards. Dr. Usatine is the founding director of the University Health System Skin Clinic in San Antonio, Texas. He runs the only underserved dermatology family medicine fellowship in the United States and is the national chair of the AAFP’s yearly skin course. In 2009, he began teaching dermoscopy to primary care providers at the national level in collaboration with Ashfaq Marghoob, MD, a world leader in dermoscopy research.

Dr. Usatine co-developed an interactive app for smartphones and tablets called “Dermoscopy: Two Step Algorithm.” He has also developed more than 80 dermatology instructional videos (many available for free on YouTube) and the Interactive Dermatology Atlas website (www.dermatlas.net). His photographs of skin disorders have been used in many books, monographs, journal articles, and educational websites, including use by the American Cancer Society (ACS) and VisualDx. In addition to serving as the family medicine editor for VisualDx, Dr. Usatine is an associate editor of The Journal of Family Practice and the author of “Photo Rounds Friday” on the journal’s website. Further biographical information is available at https://en.wikipedia.org/wiki/Richard_P._Usatine.
Learning Objectives

1. Use evidence-based recommendations to screen and diagnose patients at risk for skin cancer.

2. Use appearance-oriented and motivational interviewing (MI) strategies to educate patients on the importance of skin cancer prevention, appropriate sun protection and methods of early detection and diagnosis.

3. Apply recommended evidence-based skin biopsy techniques to verify skin cancer diagnosis and determine most appropriate surgical or pharmacologic treatment.

4. Counsel skin cancer survivors about recognizing the characteristics of potentially malignant skin lesions and using sun protection.

Audience Engagement System

Step 1

Step 2

Step 3
Skin Cancers
3 most common types

• Basal Cell Carcinoma (BCC) – most common
• Squamous Cell Carcinoma (SCC)
• Melanoma – least common

BCC and SCC

• most common skin cancers
• most important risk factors
  • sun exposure
  • family history
  • skin type
• incidence of these cancers increase with age related to cumulative sun exposure
Basal Cell Carcinoma

• the most common skin cancer
• 90% appear on face, ears, head
Find and treat BCC early

Main Types Basal Cell Carcinomas

- Nodular BCCs - most common
- Superficial BCCs
- Sclerosing and infiltrating BCCs - least common
Pattern of Nodular BCCs

- raised pearly white, smooth translucent surface with telangiectasias

- Smooth surface
- May ulcerate with a bloody crust
- May be pigmented
Pearly nodular BCCs on the nose

Superficial BCC
Superficial BCCs

- Pink scaling plaques.
- May have a thready border (slightly raised and pearly).
- Occasionally they have shallow erosions or crusts.

More superficial BCCs
Pattern of Sclerosing BCCs

- Ivory or colorless
- Flat or atrophic
- Indurated
- May resemble scars
- Called morpheaform because of their resemblance to localized scleroderma

Sclerosing BCC – less common and more aggressive
Infiltrating BCCs

• May look like melanoma
• Increased pigment

Pigmented BCCs
Pigmented BCC
Back

Dermatoscopes
Pigmented BCC
• “Leaf-like” pattern

Location of BCC
• Nodular and sclerosing tumors most commonly occur on the face, head, and neck
• Superficial BCCs most often develop on the trunk and the extremities
Differential Diagnosis of Nodular BCC

- Intradermal (dermal) nevus
- Sebaceous hyperplasia
- Fibrous papule of the face

Differentiating Intradermal Nevus from Nodular BCC

- Intradermal nevus
  - Stable size and Soft
  - No crusting or ulceration
  - May have telangiectasias
Differentiating Sebaceous Hyperplasia from Nodular BCC

• Sebaceous hyperplasia
  • May have yellow coloration
  • stable size
  • umbilication without ulceration
Diagnosis of Basal Cell Carcinomas

- shave biopsy
  - Fast and effective method for all BCCs
Shave Biopsy Resources

• Supplies:
  • Blades
  • Aluminum chloride -70% in water is my preference
• JFP video on shave biopsy – can search Usatine on Youtube
Treatment options for BCC

- Electrodesiccation and curettage
- Cryotherapy with 3-5 mm margins
- Excision with 3-5 mm margins
- Mohs surgery
- Imiquimod or 5-fluorouracil for superficial BCC
- Hedgehog inhibitors- Vismodegib and Sonidegib (for locally advanced or metastatic BCC)
- Radiation therapy
Cryotherapy for small nonaggressive BCCs

Elliptical excision with margins
Imiquimod for Superficial BCC

- 5x/week for 6 weeks
- 30 treatment days
- Expensive and time consuming for patient
- Use packets for more than one day

AES Question 1

Your shave biopsy shows this to be a BCC, as expected. The single best treatment to produce the highest cure rate and the best cosmetic result is:

A. Electrodesiccation and curettage
B. Cryotherapy with 4 - 5 mm margins
C. Excision with 3-4 mm margins
D. Mohs surgery
Mohs surgery

- removal of tumor by scalpel in sequential horizontal layers.
- each tissue sample is frozen, stained, and microscopically examined
- repeated until all the margins are clear
- treatment of choice for BCCs with poorly defined margins
  - Nose, eyelids, ears
Basal Cell Nevus Syndrome (Gorlin Syndrome)

Vismodegib – first systemic tx for BCC
Hedgehog signalling inhibitors (Vismodegib and Sonidegib)

- Approved in US for the treatment of adult patients with metastatic BCC, or with locally advanced BCC where surgery and/or radiation therapy are not appropriate (includes Gorlin Syndrome).
More aggressive BCCs

- Need surgery:
  - Micronodular
  - Infiltrating
  - Sclerosing
  - Perineural invasion

Recurrence rates after treatment of BCCs

- curettage and desiccation 4-18%
- cryotherapy 3-4% (0-16%)
- excision 2 - 8%
- Mohs surgery 1%
  - A systematic review of treatment modalities for primary basal cell carcinomas. Archives of Dermatology, 1999, 135(10), 1177-1183
Bowen disease - features

- SCC in situ
- mainly sun exposed areas
- slightly elevated red scaly plaque with well-demarcated borders
Location of SCCs

- same distribution as BCCs.
- especially on the lips, ears, and scalp
SCCs on the nose – can you use epi for bx?
You can use epinephrine with your lidocaine on the nose, toes, fingers and hose (Myth Busted)
AES Question 2
The most likely diagnosis for this lesion is:

1. Dermatofibroma
2. SCC of the keratoacanthoma type
3. Basal cell carcinoma
4. An inflamed seborrheic keratosis
## SCCs with an increased risk of metastasis

- larger, advanced lesions
- SCC on mucous membranes (in the oral cavity, on the lips)
- SCC on ears
- SCC arising in burn

## Treatment options for SCC

- Excision with 4 - 6 mm margin
- Mohs for SCC with perineural invasion, recurrent SCC and areas of functional and cosmetic importance
- Reserve these for SCC in situ:
  - Curettage and desiccation after a shave biopsy
  - Cryotherapy – deep and wide freeze with 5 mm margin
3-year risk of new BCC or SCC

• BCC after BCC was 44%
• SCC after SCC was 18%
• Supports ongoing skin exams

ABCDE's of melanoma.

• A - asymmetry.
• B - Border irregular.
• C - Color variation.
• D - Diameter > 6mm (pencil eraser).
• E – Evolving
Melanoma types

- Superficial spreading melanoma most common type, representing 70%
- Nodular melanoma - 15-30%
- Lentigo maligna melanoma 4-15%
- Acral lentiginous melanoma 2-8%
- Amelanotic melanoma – less common

Superficial spreading melanoma
2 melanomas under 6 mm picked up with dermoscopy

Courtesy of ISIC - https://isic-archive.com/
The National Comprehensive Cancer Network (NCCN) Melanoma Guidelines on the principles of biopsy state

- Excisional biopsy (elliptical, punch [when whole lesion is small], or saucerization) with 1-3 mm margins is preferred. Avoid wider margins to permit accurate subsequent lymphatic mapping.

- Full-thickness incisional or punch biopsy of clinically thickest portion of the lesion is acceptable in certain anatomic areas (e.g., palm/sole, digit, face and ear) or for very large lesions.


Saucerization of whole suspected melanoma is the recommended technique.
Punch biopsy

• The impact of partial biopsy on histopathologic diagnosis of cutaneous melanoma has been studied extensively by Ng, et al. in Australia.

• They found increased odds of histopathologic misdiagnosis were associated with punch biopsy of part of the melanoma (Odds Ratio, 16.6) and shallow shave biopsy (OR, 2.6) compared with excisional biopsy (including saucerization).

• Punch biopsy of part of the melanoma was also associated with increased odds of misdiagnosis with an adverse outcome (OR, 20).
Melanoma delayed diagnosis because no biopsy was done. Punch bx was preferred for depth but a deep shave would have worked too.

Melanoma in-situ – saucerization or deep shave for breadth.
Nodular melanoma (37 yo woman)

Breslow depth is 8.5 mm

Margins too wide for diagnostic biopsy and too narrow for treatment.
73yo man

Melanoma - 22 mm depth

Margins narrow but punch or shave would have worked as well for diagnosis and to plan definitive surgery with sentinel node biopsy.
Can you monitor a suspicious lesion?

- Never monitor an elevated nodule.
- Nodular melanomas grow fast and deep.
- Do an immediate biopsy.
- Referral can lead to unacceptable delays unless you pick up the phone and make contact with the specialist.

Lentigo maligna melanoma
Venous Ulcers and Ulcerations in Patients with Diabetes: Applying the Evidence

Brian Rayala, MD
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Brian Rayala, MD

Residency faculty/Director of Procedural Training, Department of Family Medicine, University of North Carolina (UNC) School of Medicine, Chapel Hill; Staff physician, UNC Hospitals Wound Healing and Podiatry Center, Chapel Hill

Dr. Rayala has received multiple awards for excellence in teaching and clinical care, including the 2017 UNC Distinguished Teaching Award for Post-Baccalaureate Instruction, the 2014 and 2016 UNC Family Medicine Residency Teaching Award, and the 2015 and 2017 UNC Health Care and Faculty Physicians Award for Carolina Care Excellence. In addition, he has been named among the "Best Doctors in America" since 2009. He has special training and interest in dermatology, wound medicine, and medical procedures.
Learning Objectives

1. Establish protocols to systematically and routinely evaluate all patients at risk of developing diabetic or venous ulcers.

2. Develop collaborative care plans with diabetic patients emphasizing diabetic foot ulcer prevention strategy adherence; and develop collaborative care plans with patients with venous ulcers, emphasizing adherence to strategies aimed at prevention of recurrence.

3. Apply current evidence-based recommendations and guidelines for treatment of diabetic or venous ulcers, coordinating referral to subspecialists as indicated.

4. Establish and coordinate multidisciplinary teams, utilizing a patient-centered care approach, for the care and management of patients with diabetic and venous ulcers.

Audience Engagement System

Step 1

Step 2

Step 3
Poll Question 1

Primary care providers who practice in Wound Care Centers:

- YES
- NO

Presentation Topics

- Evaluation of diabetic and venous ulcers
- Management of diabetic and venous ulcers
- Engaging the patient
Presentation Topic #1: Evaluation of Diabetic and Venous Ulcers

Learning objective:
• Establish protocols to systematically and routinely evaluate all patients at risk of developing diabetic or venous ulcers.

Evaluation of Diabetic and Venous Ulcers: Detailed Wound Assessment
## Wound Assessment: Etiology

<table>
<thead>
<tr>
<th>Location</th>
<th>Diabetic</th>
<th>Venous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foot</td>
<td></td>
<td>Above malleolus (gater area)</td>
</tr>
<tr>
<td>Color (base)</td>
<td>Normal</td>
<td>Ruddy</td>
</tr>
<tr>
<td>Granulation tissue</td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>Necrotic tissue</td>
<td>Variable</td>
<td>Rarely present</td>
</tr>
<tr>
<td>Exudate</td>
<td>Variable</td>
<td>Moderate to heavy</td>
</tr>
<tr>
<td>Depth</td>
<td>Variable</td>
<td>Usually shallow</td>
</tr>
<tr>
<td>Wound margins</td>
<td>Well defined</td>
<td>Irregular</td>
</tr>
<tr>
<td>Surrounding skin</td>
<td>Tearing, callus</td>
<td>Erythematous, scaly, excoriated, hyperpigmented (stasis dermatitis)</td>
</tr>
<tr>
<td>Edema</td>
<td>Variable</td>
<td>Moderate to severe</td>
</tr>
<tr>
<td>Skin temperature</td>
<td>Normal or warm</td>
<td>Normal or warm</td>
</tr>
<tr>
<td>Infection</td>
<td>Frequent</td>
<td>Less common, variable</td>
</tr>
<tr>
<td>Pain</td>
<td>Painless</td>
<td>Minimal unless infected or desiccated</td>
</tr>
<tr>
<td>Peripheral pulses</td>
<td>Present/palpable</td>
<td>Present/palpable</td>
</tr>
<tr>
<td>Capillary refill</td>
<td>Normal (&lt;3 secs)</td>
<td>Normal (&lt;3 secs)</td>
</tr>
</tbody>
</table>

## Wound Assessment: Etiology

**Diabetic Foot Ulcer**
Wound Assessment: Etiology
Venous Leg Ulcer

Poll Question 2

Risk assessment tools for the diabetic foot help screen at-risk patients. Validation studies measuring their diagnostic accuracy have found them to have:

A. Good positive predictive value (PPV) and positive likelihood ratio (+LR)
B. Good negative predictive value (NPV) and negative likelihood ratio (-LR)
C. Both A and B
D. None of the above
### Evaluation of Diabetic Ulcers: Who to Screen

- **Diabetic Foot Ulcer (DFU)**
  - Evidence to support screening for primary prevention of ulceration or amputation among diabetics? **Insufficient** (*SORT A*)
  - Evidence for secondary prevention? **YES** (*SORT B*)
  - **Recommendation:**
    - Screen all diabetics yearly, or more frequently if with risk factors for ulceration. (*SORT C*)
    - Prescribe therapeutic footwear w/ demonstrated pressure relief for pts w/ prior plantar foot ulcer. (*SORT B*)


### Evaluation of Diabetic Ulcers: How to Screen

- **DFU**
  - **Recommendation:** Use any of the several diabetic foot risk stratification systems (e.g., UT, ADA, IWGDF, SIGN, Seattle) [*SORT C*]
    - Accurate, most have been validated, excellent for screening (good NPV and –LR)
    - If patient does not have neuropathy, PVD, foot deformity, prior ulcer or amputation – very low risk of ulcer or amputation within 12-24 months
    - Note: if test is positive, post-screening interventions are not effective for primary prevention, but some evidence for secondary prevention.

Evaluation of Diabetic Ulcers: How to Screen

• DFU
  – History:
    • Prior DFU
    • Prior amputation
    • Age, duration of diabetes
  – Clinical Exam:
    • Neuropathy – 10g monofilament/SWM (5 areas each foot); 128Hz tuning fork (distal phalanx, great toe)
    • PVD – check dorsalis pedis and posterior tibial pulses
    • Foot deformity – able to use off-shelf shoes?

Evaluation of Diabetic Ulcers: Post-screening Intervention (SORT C)\(^6\)

<table>
<thead>
<tr>
<th>ADA Category</th>
<th>Definition</th>
<th>Recommendations</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No loss of protective sensation (LOPS), No PAD, No deformity</td>
<td>• Pt education on foot care, including appropriate footwear</td>
<td>Yearly (PCP or specialist)</td>
</tr>
</tbody>
</table>
| 1            | LOPS w/wo deformity | • Consider prophylactic surgery if shoes cannot accommodate deformity  
• Pt education  
• Prescriptive or accommodative footwear | q3-6 mos (PCP or specialist) |
| 2            | PAD w/wo LOPS | • Accommodative footwear  
• Consider vascular consult | q2-3 mos (specialist) |
| 3            | H/o ulcer or amputation | • Pt education on foot care  
• Consider vascular consult | q1-2 mos (specialist) |

Poll Question 3

Strong evidence supports interventions toward:

A. Primary prevention of venous leg ulcers
B. Secondary prevention of venous leg ulcers
C. Both A and B
D. None of the above

Evaluation of Venous Ulcers: Who to Screen

• Venous Leg Ulcer (VLU)
  – Evidence to support screening for secondary prevention of VLU? YES (SORT A)\(^7\)
  – Recommendation:
    • Identify patients in your practice with prior VLU; they are good candidates for compression therapy to prevent recurrence. (SORT A)\(^7\)
    • Insufficient evidence on use of compression for primary prevention of VLU. (SORT A)\(^8\)

Evaluation of Diabetic Ulcers: Systematic Evaluation

- Evaluation of diabetic pt with foot ulcer\(^9\)
  - Assess neurologic and vascular status of foot
  - Cleanse, debride
  - Detailed wound assessment, probe ulcer
  - Assess for purulence or signs of inflammation
  - Obtain appropriate specimens for culture
  - Consider x-ray or MRI
  - Obtain other appropriate labs (ESR, CBC, Bld cx)
  - Consider ABI or LE arterial dopplers
  - Assess medical comorbidities and psychosocial factors
  - Determine need for surgical consultation


Evaluation of Diabetic Ulcers: DFU Risk Stratification

**Diabetic Foot Infection (DFI) Classification\(^10\)**

<table>
<thead>
<tr>
<th>Clinical description</th>
<th>Infectious Diseases Society of America</th>
<th>International Working Group on the Diabetic Foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound without purulence or any manifestations of infection</td>
<td>Uninfected</td>
<td>1</td>
</tr>
<tr>
<td>&gt;3 Manifestations of inflammation (swelling, erythema, pain, tenderness, warmth, or induration); any cellulitis or erythema extends above ankle level and infection is limited to skin or superficial subcutaneous tissue; no local complications or systemic illness</td>
<td>Mild</td>
<td>2</td>
</tr>
<tr>
<td>Infection in a patient who is systemically well and metabolically stable but has history of the following: cellulitis extending (\supset ) above ankle level; deep tissue abscess; gangrene; muscle, tendon, joint, or bone involvement</td>
<td>Moderate</td>
<td>3</td>
</tr>
<tr>
<td>Infection in a patient with systemic toxicity or metabolic instability (e.g., fever, chills, tachycardia, hypotension, confusion, vomiting, leukocytosis, acidosis, hyperglycemia, or azotemia)</td>
<td>Severe</td>
<td>4</td>
</tr>
</tbody>
</table>

- Prospectively validated in 1,166 pts
- Reliably predicts hospitalization and amputation

Evaluation of Venous Ulcers: Systematic Evaluation

- Evaluation of pt with venous leg ulcer
  - Assess vascular status of foot
  - Cleanse, debride, detailed wound assessment
  - Assess for signs of clinical infection
  - Obtain appropriate specimens for culture
  - Consider ABI or LE arterial dopplers; venous reflux studies
  - Assess medical comorbidities and psychosocial factors
  - Determine need for surgical consultation
  - Consider use of classification and scoring methods (e.g., CEAP, VCSS, QoL) to quantify burden of disease (SORT C)\(^{11}\)

\[^{11}\] Phlebology. 2014;29(1 suppl):153-156.

Presentation Topic #2: Management of Diabetic and Venous Ulcers

Learning objectives:

- Establish and coordinate multidisciplinary teams, utilizing a patient-centered care approach, for the care and management of patients with diabetic and venous ulcers.

- Apply current evidence-based recommendations and guidelines for treatment of diabetic or venous ulcers, coordinating referral to subspecialists as indicated.
Poll Question 4

Primary care providers who practice inpatient medicine:

• YES
• NO

Management of Diabetic Ulcers: Patient-centered Team-based Approach

• Multidisciplinary foot care team
  – For inpatient care of pts w/ DFI (SORT C)\(^\text{12}\)
    • Primary care, surgery, podiatry, ID, endocrine, nursing, nutrition, rehab, social work, care manager
  • Primary care – experts in care coordination
  – Need for a care pathway for managing each pt (SORT C)\(^\text{13,14}\)
  – Approach must be centered on the patient

### Management of Diabetic Ulcers: Treatment Based on Severity\textsuperscript{15}

<table>
<thead>
<tr>
<th>IDSA Class</th>
<th>Pathogen</th>
<th>Antibiotics</th>
<th>MRSA Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uninfected</td>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Mild, Moderate</td>
<td>G+ cocci</td>
<td>Amoxicillin/clavulanate, Cefdinir, Cephalexin, Dicloxacillin, Levofloxacin, Clindamycin*</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Doxycycline, TMP-SMX, Clindamycin*, Linezolid</td>
<td>Yes</td>
</tr>
<tr>
<td>Moderate, Severe</td>
<td>G+ cocci; G-rods; anaerobes</td>
<td>Ampicillin/sulbactam, Cefoxitin, Ceftriaxone, Clindamycin/fluoroquinolones*, Ertapenem, Imipenem/cilastin, Moxifloxacin, Piperacillin/tazobactam, Ticarcillin/clavulanate</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vancomycin, Daptomycin, Tigecycline, Linezolid</td>
<td>Yes</td>
</tr>
</tbody>
</table>

\textsuperscript{15}. Am Fam Physician. 2013 Aug 1;88(3):177-184.

### Management of Diabetic Ulcers: Diabetic Foot Osteomyelitis\textsuperscript{16}

<table>
<thead>
<tr>
<th>Bone or Joint Infection</th>
<th>Route of Admin</th>
<th>Duration of Tx</th>
</tr>
</thead>
<tbody>
<tr>
<td>No residual infected tissue (e.g., postamputation)</td>
<td>PO or IV</td>
<td>2-5 days</td>
</tr>
<tr>
<td>Residual infected soft tissue (but not bone)</td>
<td>PO or IV</td>
<td>1-3 weeks</td>
</tr>
<tr>
<td>Residual infected (but viable) bone</td>
<td>Initially IV, then oral</td>
<td>4-6 weeks</td>
</tr>
<tr>
<td>No surgery, or residual dead bone postop</td>
<td>Initially IV, then oral</td>
<td>≥ 3 months</td>
</tr>
</tbody>
</table>

- No regimen, route, or duration has been found to be superior

Management of Diabetic Ulcers: Moderate to Severe DFI

- Surgical Interventions:
  - I & D of abscess
  - Debridement
  - Revascularization
  - Amputation

Poll Question 5

Which DFU treatment is supported by the strongest evidence?

A. Hyperbaric oxygen therapy (HBOT)
B. Negative pressure wound therapy (NPWT)
C. Off-loading with non-removable cast
# Management of Diabetic Ulcers: Dressings

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Comments</th>
<th>Cochrane Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hydrogel</strong></td>
<td>• Effective for low-grade DFU compared to gauze dressing (possible bias in studies)</td>
<td>17. Cochrane Database Syst Rev. 2013;(3):CD009101.</td>
</tr>
<tr>
<td></td>
<td>• Use may be justified by cost and wound mx properties (e.g., exudate mx)</td>
<td>19. Cochrane Database Syst Rev. 2013;(3):CD009110.</td>
</tr>
<tr>
<td><strong>Silver-containing dressings</strong></td>
<td>• Insufficient evidence to treat DFU or to treat/prevent wound infection in general</td>
<td>21. Cochrane Database Syst Rev. 2006;(2):CD005082.</td>
</tr>
<tr>
<td></td>
<td>• May be effective for partial thickness burns and infected post-op wounds (low-quality evidence)</td>
<td></td>
</tr>
</tbody>
</table>
### Management of Diabetic Ulcers: Topical Therapies

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Comments</th>
<th>Cochrane Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Growth factors</strong></td>
<td>• May be effective (low-quality evidence)</td>
<td>27. Cochrane Database Syst Rev. 2015;(10):CD008548.</td>
</tr>
<tr>
<td><strong>Platelet-rich plasma (PRP), autologous</strong></td>
<td>• May be effective (low-quality evidence)</td>
<td>28. Cochrane Database Syst Rev. 2016;(5):CD006899.</td>
</tr>
<tr>
<td><strong>Negative pressure wound therapy (NPWT)</strong></td>
<td>• May be effective for post-op wound healing compared to moist dressings (low-quality evidence)</td>
<td>29. Cochrane Database Syst Rev. 2018;(10):CD010318.</td>
</tr>
</tbody>
</table>

### Management of Diabetic Ulcers: Systemic Therapy

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Comments</th>
<th>Cochrane Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• not effective for ulcer healing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Reduces need for surgery (amputations) and duration of hospitalization</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Consider adding G-CSF to usual care for limb-threatening infection</td>
<td></td>
</tr>
</tbody>
</table>
## Management of Diabetic Ulcers: Other Therapies

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Comments</th>
<th>Cochrane Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hyperbaric oxygen therapy (HBOT)</strong></td>
<td>• May be effective for healing DFU in the short-term but NOT long-term (low-quality evidence)</td>
<td>31. Cochrane Database Syst Rev. 2015;(6):CD004123.</td>
</tr>
</tbody>
</table>
| **Off-loading (pressure relief)** | • Non-removable casts more effective than removable casts or dressings  

## Management of Diabetic Ulcers: Other Therapies

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Comments</th>
<th>Cochrane Reference</th>
</tr>
</thead>
</table>
| **Debridement** | • Autolytic: hydrogel increases healing rate compared to gauze or usual care  
                                | • Enzymatic (e.g., collagenase): insufficient evidence  
                                | • Biologic (e.g., larval therapy): insufficient evidence  
| **Phototherapy** | • May be effective (low-quality evidence) | 34. Cochrane Database Syst Rev. 2017;(6):CD011979. |
### Management of Venous Ulcers: Dressings

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Comments</th>
<th>Cochrane Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alginate, foam</strong></td>
<td>• Insufficient evidence of superiority over other dressings</td>
<td>35. Cochrane Database Syst Rev. 2015;(8):CD010182.</td>
</tr>
<tr>
<td></td>
<td>• Use may be justified by cost and wound mx properties (e.g., exudate mx)</td>
<td>36. Cochrane Database Syst Rev. 2013;(5):CD009907.</td>
</tr>
<tr>
<td><strong>Silver-containing dressings</strong></td>
<td>• Insufficient evidence to treat or prevent wound infection</td>
<td>22. Cochrane Database Syst Rev. 2010;(3):CD006478.</td>
</tr>
<tr>
<td><strong>Cadexomer iodine dressing</strong></td>
<td>• Effective for healing VLU compared to standard dressing</td>
<td>37. Cochrane Database Syst Rev. 2014;(5):CD003557.</td>
</tr>
</tbody>
</table>

### Management of Venous Ulcers: Topical Therapies & Physical Modalities

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Comments</th>
<th>Cochrane Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>(allograft)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(PRP), autologous</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Negative pressure wound</strong></td>
<td>• Insufficient evidence</td>
<td>40. Cochrane Database Syst Rev. 2015;(7):CD011354.</td>
</tr>
<tr>
<td>therapy (NPWT)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electromagnetic therapy</strong></td>
<td>• Insufficient evidence</td>
<td>42. Cochrane Database Syst Rev. 2015;(7):CD002933.</td>
</tr>
</tbody>
</table>
Management of Venous Ulcers: Systemic & Other Therapies

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Comments</th>
<th>Cochrane Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• May be effective monotherapy</td>
<td></td>
</tr>
<tr>
<td>Sulodexide</td>
<td>• May be effective but dose and adverse effects need to be studied</td>
<td>45. Cochrane Database Syst Rev. 2016;(6):CD010694.</td>
</tr>
<tr>
<td>Flavonoids</td>
<td>• May be effective (low-quality evidence)</td>
<td>47. Cochrane Database Syst Rev. 2013;(5):CD006477.</td>
</tr>
</tbody>
</table>

Management of Venous Ulcers: Surgery

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Comments</th>
<th>Cochrane Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Enzymatic: insufficient evidence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Biologic: larvae may be effective (low-quality evidence)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Surgical: insufficient evidence</td>
<td></td>
</tr>
</tbody>
</table>
Management of Venous Ulcers: Compression Therapy

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Comments</th>
<th>Cochrane Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Multilayer (w/ elastic component) more effective than unilayer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Higher compression better than lower compression</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Compliance is low</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Insufficient evidence as a substitute to compression bandages</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Limited evidence: IPC + compression more effective than compression alone</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Rapid IPC more effective than slow IPC</td>
<td></td>
</tr>
</tbody>
</table>

Presentation Topic #3: Engaging the Patient

Learning objective:

• Develop collaborative care plans with diabetic patients emphasizing diabetic foot ulcer prevention strategy adherence; and develop collaborative care plans with patients with venous ulcers, emphasizing adherence to strategies aimed at prevention of recurrence.
Presentation Topic #3: Engaging the Patient

• Collaborative Care Plan
  – Diabetic Ulcer and Amputation Prevention
    • Primary and secondary prevention: Patient education interventions improve foot care knowledge and behavior in the short term, but NOT rates of amputation or ulceration. (SORT A)\textsuperscript{54,55}
  – Venous Leg Ulcer Prevention
    • Insufficient evidence that pt education increases compliance with compression therapy. (SORT A)\textsuperscript{56}

Practice Recommendations

• Perform, at least, yearly diabetic foot exams and consider use of diabetic foot risk stratification tools to identify pts at risk for DFU (SORT C). Prescribe therapeutic footwear for pts with prior DFU to prevent recurrence (SORT B). Identify pts with prior VLU; they will benefit from lifelong compression therapy to prevent recurrence (SORT A).

• Systematic evaluation of pts with DFU and VLU includes neurologic (DFU only) and vascular foot assessment, cleansing, debridement, detailed wound assessment, probing (DFU only), obtaining culture, imaging & labs, assessing comorbidities, considering consultation, and using DFU and VLU risk classification tools (SORT C).

• Weak evidence supports the establishment of multidisciplinary foot care teams that utilize care pathways for inpatient management of DFI (SORT C). The primary care physician carries the important role of coordinating care among different specialties and of advocating for patients and their holistic treatment (SORT C).

Practice Recommendations

- Evidence-based therapies for DFUs include non-removable casts w/wo Achilles tendon lengthening (SORT A), use of hydrogel for dry low-grade ulcers, antimicrobial dressings, and NPWT postoperatively (SORT B). Evidence-based therapies for VLUs include compression therapy, oral pentoxifylline, bilayer artificial skin w/ compression, and early endovenous ablation (SORT A). Cadexomer iodine dressings may improve healing (SORT B). Ibuprofen dressings and EMLA are helpful for pain control (SORT B).

- Among diabetics, collaborative care plans that focus on pt education improve knowledge and behavior in the short-term, but NOT rates of ulceration or amputation (SORT A). For VLU, compliance to compression therapy remains challenging and the role of pt education to address this remains unclear (SORT A).

Questions
<table>
<thead>
<tr>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>29. Cochrane Database Syst Rev. 2018; (10):CD010318</td>
</tr>
</tbody>
</table>
References

42. Cochrane Database Syst Rev. 2015; (7):CD002933.
50. Cochrane Database Syst Rev. 2015; (9):CD008599.

Contact

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  - Brian_Rayala@med.unc.edu