Tried & True Tips for the Treatment of Acne & Rosacea
Outline

- Acne Overview
- Acne Pathophysiology
- Acne Treatments
- Acne Scarring
- Rosacea Overview
- Rosacea Pathophysiology
- Rosacea Treatment
How to get from Here to There?
Acne Vulgaris: Why Care?

- Probably the hardest condition in derm to treat!
- Affects 40-50 million individuals/yr in the US
- Age:
  - Peak incidence is adolescence
  - Affects ~85% of people between 12-24 y/o
- 12% of women & 3% of men will continue to have clinical acne until 44 years of age
- Increased risk of acne??
  - ↑ risk with XYY karyotype
  - endocrine disorders (PCOS, hyperandrogenism, hypercortisolism and precocious puberty)
New Stats on Adult Hormonal Acne:

- Study prevalence of acne in adults >age 20 found that acne affects > than 50 % of women b/n ages 20-29 and > than 25 % of women b/n the ages of 40-49.

- The study found a disproportionate number of adult women were affected by acne compared to similar-aged men.

- A 2011 clinical study examining photos of women from age 10-70 for visible signs of acne found that 45 % of women aged 21-30 had clinical acne, 26 % of women aged 31-40 had clinical acne, and 12 % of women aged 41-50 had clinical acne.
This is what I’m seeing more in my office!

The Beard Sign
Sebaceous glands

- A sebaceous gland is a lipid-producing epithelial structure
- Distributed around the entire skin except for the palms, soles & dorsum of feet
- Variable in size: Largest on the forehead, nose, upper part of the back & chest (areas most exposed to rain and solar heat)
- Nearly all sebaceous glands are connected to hair follicles
Function

- Sebum is produced via holocrine secretion
  - Sebocytes disintegrate as they migrate towards the center of the gland
- Turnover time is 14 days
- Important thermoregulatory role
  - Emulsifies sweat creating a sweat sheet preventing loss of individual drops from the skin
  - Repels rain from skin & hair
Factors Regulating Gland Size and Sebum Production

- **Androgens**: DHEAS $\rightarrow$ Testosterone & DTH
  - The enzymes required to convert DHEAS to more potent androgens are present in sebaceous glands
  - Levels of DHEAS in SG parallel its activity
- **Melanocortins**: MSH and ACTH (↑sebum production)
- **Peroxisome Proliferator Activated Receptor**: very similar to retinoid receptors. In rats ↑lipid production
- **Acyl-coA:Diacylglycerol Acyltranferase (DGAT)**: enzyme involved in final step of triglyceride synthesis
The normal flora of the sebaceous follicles consist of bacteria and fungi.

The major fungi are *Malassezia spp.* (found in the acroinfundibulum amongst the most superficial desquamated scales).

*Staph. Epidermidis* & other micrococcii are found in the midinfundibulum.

*Propionibacterium spp.* predominate in the deeper parts of the follicle.
Mild/Moderate/Severe Acne

- Microcomedo
- Comedone=1º lesion (blackhead=open, whitehead=closed)
- Papules/Pustules
- Nodulocystic/Inflammatory acne
- PIH & Scars
Acne: How does it Form?

- **First step:** formation of the microcomedo which is caused by faulty keratinization.
- Corneocytes extruded and stuck in follicular ostium → follicular retention hyperkeratosis.
- Occurs due to combination of increased cellular cohesion & proliferation that creates a bottleneck phenomenon.
**Acne: How does it Form?**

- **Second Step:** As the comedo expands, the sebaceous lobule undergoes regression.
- Because of the very narrow opening to the skin surface, initially there is accumulation of loosely packed keratinocytes & sebum.
- With expansion of the comedo, contents become closely packed, creating whorled lamellar concretions.
- As the forces ↑, rupture of the comedo wall with extrusion of the immunogenic keratin and sebum occurs, resulting in inflammation: Third Step.

![Diagram of acne formation](image-url)
Types of Acne
Case 1

What type of acne is this?
Good Ol’ Comedongenic Acne Vulgaris

Clinical Features: Non-inflammatory lesions

What does that mean?

- **Closed comedones**: white heads
  - ~1 mm – skin-colored papules with no apparent follicular opening or associated erythema

- **Open comedones**: black heads
  - Dome-shaped papules with core of shed keratin
  - Melanin deposition & lipid oxidation within the debris may be responsible for black coloration
What are best treatments for this?

Dr. C’s Tips

- **Always start off with a wash**
  - Prime the skin for 3 days with Cetaphil or Cerave wash (ceramides)
  - Glycolic and/or salicylic acid washes (Murad, Neutrogena, Panoxyx liquid soap, Clean and Clear, Sulfur soap)
  - Use Cetaphil or Cerave wash on dry days

- **Topical Antimicrobials**
  - Benzoyl Peroxide (helps decrease resistance to abx)
    - Onexton/Acanya/Duac/Benzaclin=Benzoyl Peroxide + Clindamycin (+erythro, +Zinc)
  - Abx: erythromycin, clindamycin.
  - Azelaic acid (-/tyrosinase), sodium sulacetamide, resorcin, salicylic acid
What are best treatments for this?

Dr. C’s Tips

- Retinoids at bedtime
  - (anti-inflammatory, inhibits leukocytes, pro-inflammatory cytokines, TLR and transcription factors, normal desquamation)
    - Differin=Adapalene; mild, great for sensitive skin types that can’t tolerate tretinoin
    - Epiduo: Adapalene and BPO
    - Retin-A=Tretinoin
      - My favorites include Ziana (tretinoin/clindamycin), Atralin (tretinoin), Veltin (tretinoin/clindamycin) Retin A micro for very oily skin
    - Tazorac=Tazarotene (category X, should get pregnancy test)
Case 2: What type of acne is this?
Papular/Pustular Acne Vulgaris

Clinical Features: Inflammatory lesions

- Originate with comedo, then expand to form papules, pustules which can then form nodules and cysts
- Very common to see only on forehead or chin or both
What are the best treatments for this?

Dr C’s Tips

- **Always start off with a wash**
  - Prime the skin for 3 days with Cetaphil or Cerave wash (ceramides)
  - Glycolic and/or salicylic acid washes (Murad, Neutrogena, Panoxy liquid soap, Clean and Clear, Sulfur soap)
  - Use Cetaphil or Cerave wash on dry days

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What are best treatments for this?

Dr. C’s Tips

- Sometimes if non-compliant patient and not too severe, try am monotherapy only with Onexton or Acanya or try combination tretinoin/adapalene with clindamycin or BPO at bedtime

- Facials are highly recommended to prevent patient from “popping” own pimples, minimizes post inflammatory pigmentation and acne scarring
Treatment of Acne

**New Kid on the Block**
- **Dapsone 5% gel now 7.5% gel**: has both anti-inflammatory and antimicrobial properties
  - Inhibition of neutrophil myeloperoxidase and eosinophil peroxidase activity, suppression of hypochlorous acid production, scavenging of ROS, suppression of neutrophil activity, and inhibition of chemoattractant-induced signal transduction
  - Antimicrobial activity is by inhibition of bacterial dihydropterase synthase in the folic acid metabolic pathway.
Case 3: What type of acne is this?
Clinical Variants:
Acne excoriée des jeunes filles

- Primarily in **young women**
- Comedones and inflammatory papules are **neurotically excoriated** → crusted erosions
- **DX clue**: linear erosions suggest self-mutilation
- **Underlying psychiatric component** should be suspected (e.g., OCD, Anxiety Disorder)
- **Tx**: Antidepressants & Psychotherapy
What are the best treatments for this?

- **Dissuade PICKING!!**
- Heal skin first, apply Mupirocin (Bactroban) ointment am and pm x 1 week until healed/almost healed
- Then start acne regimen depending if papular/pustular and or cystic/nodular, combination as discussed before
- If anxiety and or depression is a major concern, consider psychiatric evaluation for anxiolytics, anti-depressants. Be cognizant if OCD
Case 4: What type of acne is this?
Cystic & Nodular Acne Vulgaris

Clinical Features: Inflammatory lesions

- Originates with comedo, then expand to form papules, pustules, nodules & cysts
- Nodules form and become markedly inflamed, indurated and tender
- Frequently coalesce to form massively inflamed complex plaques that can include sinus tracts
What are the best treatments for this?

- Always start off with a wash
  - Prime the skin for 3 days with Cetaphil or Cerave wash (ceramides)
  - Glycolic and/or salicylic acid washes (Murad, Neutrogena, Panoxyl liquid soap, Clean and Clear, Sulfur soap)
  - Use Cetaphil or Cerave wash on dry days
- Topical Antimicrobials
  - Benzoyl Peroxide (helps decrease resistance to abx)
    - Onexton/Acanya/Duac/Benzaclin=Benzoyl Peroxide + Clindamycin (+erythro, +Zinc)
  - Abx: erythromycin, clindamycin
What are the best treatments for this?

- **Retinoids:** (anti-inflammatory, inhibits leukocytes, pro-inflammatory cytokines, TLR and transcription factors, normal desquamation)
  - Differin=Adapalene
  - Epiduo=Adapalene with BPO
  - Retin-A=Tretinoin
  - Tazorac=Tazarotene

- **Dapsone 5% gel**

- **PO**
  - Abx: tetracycline, doxycycline (Monodox), minocycline (Solodyn), bactrim, erythromycin, trimethoprim, dapsone
  - **Isotreinoin**
  - Spironolactone, Prednisone, OCP

IL Kenalog 2.5-3mg/kg: beware of atrophy
PO Antibiotics: Both are antibacteriacidal and anti-inflammatory

- Doxycycline 100mg PO BID x 2 weeks then QD x 4 more weeks until seen in follow up. SE include photosensitivity, upset stomach, esophagitis if takes within 2 hours of laying flat. Can not take with dairy.

- Minocycline 100mg daily, Solodyn (weight based); least photosensitive; SE include GI upset, dizziness, drug rash (DRESS)
PO meds, when and how to use them?
Papular & Nodulocystic

- **Spironolactone (Aldactone)**
  - An aldosterone antagonist that was used initially as a K-sparing diuretic in the treatment of HTN and CHF
  - Inhibits sebaceous gland activity by decreasing androgen-stimulated sebocyte proliferation *in vitro* and inhibits sebaceous activity in a dose-dependent fashion.
  - The majority of women who present with late-onset or post-teen persistent acne, even with classic hormonal-pattern acne, do not exhibit an increase in serum androgen levels. Regardless, this latter subset still benefits from oral spironolactone, with the onset of therapeutic effect often noted within **4 to 8 weeks**
  - Start off at 50 mg daily, then increase up to 100 mg daily; no need to check K levels anymore per recent studies
  - Ask about OCP usage (Yaz, Yasmin), coconut water, avocado, banana diet
Hormonal Acne: The Dirt on OCP’s
Which ones to use...

- OCP’s that contain the following ingredients can be used to treat both inflammatory and non-inflammatory acne: Estradiol combined with either: levonorgestrel, norethindrone, norgestimate, drospirenone, cyproterone acetate, chlormadinone acetate, dienogest or desogestrel
  - Ortho-tricyclen (ethinyl estradiol and norgestimate)
  - Estrostep Fe-28 (norethindrone/ethinyl estradiol/ferrous fumurate)
  - Yaz, Yasmin (drospirenone/ethinyl
Isotretinoin

- AKA Claravis, Sotret, Accutane, Amnesteem, Myorisan
- 13-cis retinoic acid, works on all 4 pathways of acne
- Dosage at 150-200mg/kg/Day to take with fatty meal
- Usual starting dosage is 40-60mg day
- Screen for treatment for depression, personal or familial hx of IBD
- Screening Labs monthly: Bhcg, LFTs, fasting lipids (initially CBC)

iPLEDGE™
Committed to Pregnancy Prevention
Isotretinoin

- SE: teratogenicity (Females: highly recommend OCP unless signs waiver of abstinence), skin dryness, nosebleeds, GI upset, headaches, myalgia, arthralgia, hyperTG, elevated LFTs, night vision changes, depression, aggression, photosensitivity, poor wound healing
- Worsening of acne initially, most improvement noted at month 2-3
- Sometimes PO Prednisone needed initially to calm down flares
- Tips: Cerulip, aquaphor to lips, Cerave wash, face moisturizer, cream, Broad spectrum sunscreen, Omega-3 fatty acids, probiotics
- MUST STOP ALL TOPICAL ACNE MEDS AND PO ABX AS CAN GET PSEUDOTUMOR CEREBRI WITH TETRACYCLINES AND ISOTRETINOIN
Case 5: Patient comes in to see you, states has had severe acne for a while, now worsened with fever and myalgia. What type of acne is this?
Clinical Variants: Acne Fulminans

- Most **severe form** of cystic acne → **abrupt onset**, can be in patients who already had acne, nodular and suppurative
- Uncommon, affects primarily young **males 13-16 years of age**
- Face, neck, chest, back & arms are all affected
- **Variable systemic manifestations**
  - Osteolytic bone lesions: the clavicle and sternum → followed by the ankles, humerus and iliosacral joints.
  - Fever, arthralgias, myalgias, hepatosplenomegaly and severe prostration.
  - Erythema nodosum
  - Elevated ESR, proteinuria, leukocytosis and/or anemia
Acne Conglobata

- Severe, eruptive nodulocystic acne without systemic manifestations

 Follicular Occlusion Tetrad

1. Acne conglobata
2. Dissecting cellulitis of the scalp
3. Hidradenitis suppurativa
4. Pilonidal cysts

Perifolliculitis capitis abscedens et suffodiens
Case 6: 26 y/o M “Crossfitter” comes in to see you, complains of back acne. What is pertinent in HPI?
Whey Acne and all dairy alike!

- Casein and Whey are the culprits...
- Casein increases IGF-1 levels and whey increases insulin secretion
- TX: Stop Whey protein shakes, Panoxyl liquid soap 10%, Clindamycin solution am and pm, PO Abx
Acne & Diet

- Avoid high glycemic diets as they will spike insulin levels which promote inflammation and trigger oil gland secretion
- Probiotics decrease inflammation
- Vitamins A, E and Zinc decrease inflammation and improve acne
- Niacinamide (Vit B3) improves circulation
Acne Clinical Variants you should be aware of....
Clinical Variants:

Acne Mechanica

- Secondary to repeated mechanical & frictional obstruction of the pilosebaceous outlet resulting in comedo formation
- Mechanical factors include rubbing by helmets, chin straps, suspenders & collars
- Involved Linear and geometrically distributed areas
- Tx: Eliminating the inciting forces
Clinical Variants: Drug Induced Acne

Abrupt, monomorphous eruption of inflammatory papules & pustules

NO COMEDONES
Drug-induced Acne

HILDA’s VET

- Halogenodermas: Iodides, Bromides
- Isoniazid
- Lithium
- Dilantin (anticonvulsants)
- Azathioprine
- Steroids
- Vitamins B6, B12
- EGF-I
- Thiouracil
- Cyclosporine
Clinical Variants: Neonatal Acne

- Affects 20% of healthy newborns
- Small, inflamed papules on cheeks and across the nasal bridge appear at 2wks and resolved by 3 mo.
- Pathogenesis under debate
  - Malassezia sympodialis, furfur (neonatal cephalic pustulosis)
  - Maternal hormones
- Tx. Ketoconazole 2% & benzoyl peroxide
Clinical Variants: Infantile Acne

- Presents at 3-6 months of age
- Comedo formation is more prominent & may lead to pitted scarring
- Pathogenesis
  - Infant boys have ↑ LH levels → testosterone
  - Adrenal gland is immature → increase DHEA
- Typically resolves within 1-2 years
- Tx.
  - Topical tretinoin or benzoyl peroxide
  - Oral isotretinoin for severe nodulocystic presentations
Hidradenitis suppurativa

- 5 painful abscesses/month
- Complications - rare: SCC, interstitial keratitis, spondyloarthropathy, urethral vesical, rectal fistulas, anemia, hypoprotenemia, amyloidosis
- DDx: furuncles, Bartholin abscess, scrofuloderma, actinomycosis, granuloma inguinale, lymphogranuloma venerum
- Tx: IL steroids, topical abx, PO abx, abx soap, Loose fitting clothes, top Aluminum Chloride to ↓ sweat, Botox, PO abx if infection, Isotretinoin—seldom cures, Infliximab, Humira, Finasteride, wide surgical excision: moderate morbidity, most effective at limiting recurrence

Proven association:
- SMOKING MAKES IT WORSE
- OBESITY MAKES IT WORSE
Acne: Sequelae
The Real Reason We Treat

- Early tx of acne essential for the prevention of lasting cosmetic disfigurement
- Postinflammatory hyperpigmentation & persistent erythema
- Pitted or nodular hypertrophic scars are the often sequelae of both nodular and cystic acne
- Anetoderma-like lesions (soft, hypopigmented) can be seen on upper trunk
Acne Scars...What I use

- **PIPA and Scars:**
  - **Chemical Peels:**
    - Salicyclic Acid Peels (Beta Peels), Perfect 10 Peels, Vitalize Peels, Kojic acid, Arbutin, Hydroquinone
  - **Lasers & Energy Devices:**
    - Intense Pulsed Light, Pulsed Dye Laser, Fractionated ablative and non-ablative laser resurfacing, Radiofrequency devices
  - **Injectable Fillers**
  - **Microdermabrasion and microneedling**
Rosacea

- Persistent erythema of the convex surfaces of the face (cheeks/nose>brow/chin) ± telangiectasia, flushing, clustered erythematous papules/pustules
- Fair skinned \( \square \) 30-50 yo
- Etiology: not understood, genetics, environment, hypersensitivity to demodex folliculorum, vascular liability, actinic damage
  - **Erythematotelangiectatic Type**
    - Flushing-burn/stings 2/2 stress, hot, spicy, ETOH, cold, exercise (no Light-headed, palpitate, sweat)
    - Fine texture ± scale/roughness, with time→purplish suffusion and telangiectasia
  - **Papulopustular**
    - Red central face + erythema, papules w/ a pinpoint pustule, ± flushing
    - Normal to slightly sebaceous skin, ± edema of affected sites
  - **Glandular**
    - \( \varpi \) with thick sebaceous skin (\( \varpi \)central face, \( \varphi \)chin)
    - Edematous papules, Large pustules, ± nodulocystic lesions (less flushing/telangiectasia)
    - *Rhinophyma*
Rosacea: Other Findings

- **Ocular**
  - Affects 50% of rosacea patients, likely due to Meibomian gland impaction with decreased lipids in tears
  - Blepharitis, recurrent chalazion, conjunctivitis, keratitis, iritis, episcleritis \( \rightarrow \) blindness 2/2 corneal opacities *OPTHO REFERRAL
  - 40% abnormal Schirmer test
  - Stinging, gritty, itchy, burning sensation, light sensitivity, foreign body sensation
  - Can occur before skin disease
  - Tx: PO tetracyclines, erythromycin opthalmic ointment, cyclosporin opthalmic drops

- **Peri-oral dermatitis**
Perioral (periorificial) Dermatitis

- Common, ♀ 20-35 yo
- Discrete papules/pustules on an erythematous/scaly base
- Symmetrically around the mouth, with a clear zone 5mm between the vermilion border and the affected skin
- No pruritus, +uncomfortable burning sensation
- 2/2 Fluorinated topical steroids, inhalers
- Tx: d/c topical steroid, po abx, tacrolimus ointment, differin, azelaic acid, topical flagyl
- Periocular Dermatitis: lower eyelids and adjacent skin
Rosacea

- **Rhinophyma** - Nose
- **Gnatophyma** - Chin
- **Metophyma** - forehead and nose saddle
- **Otophyma** - Earlobes
- **Blepharophyma** - Eyelids
Ocular rosacea
Pyoderma Faciale
Rosacea Fulminans

- Uncommon, Post-adolescent ♀
- Intense reddish/cyanotic erythyma + superficial & deep abscesses, cystic lesions, ± sinus tracts. Greenish/Yellowish purulent material, oily substance
- Distinguish from acne: No comedones, rapid onset, fulminating course
  - spares back/chest
- Treat like Acne Fulminans: PO steroids, Accutane
Rosacea: Treatment

- **Control of Inflammation**
  - **Topical**: metronidazole, sodium sulfaacetamide-sulfur, azelaic acid, benzoyl peroxide, abx, tacrolimus, tretinoin, topical Afrin (oxymetazoline), dapsone gel 5%, ivermectin 1% cream
  - **Oral**: Tetracycline, macrolides, metronidazole, isotretinoin

- **Repair of Structural Damage**
  - Pulsed Dye Laser, Intense Pulsed light, Nd:yag laser, surgical techniques, tretinoin

- **Prevention**
  - Sunscreens, cosmetics (light green-tinted foundation set in powder), avoid flushing triggering factors
Take Home Tips

- Make a Plan
- Prime the barrier
- Write it down
- Demonstrate how to apply medications
- Manage expectations
- Take photos
- Close follow up
Thank you! Schimento05@gmail.com