Adolescent Angst:
Diagnostic and Treatment Algorithms for Acne

Aimee Smidt, MD, FAAD, FAAP
University of New Mexico School of Medicine, Depts. of Dermatology & Pediatrics
July 2016

Conflicts of Interest
• I have served as a consultant for:
  – Galderma (Early Acne Intervention Council)
  – Pierre-Fabre
• Developed Skindex-Teen © (Quality of Life instrument)
• Some medications discussed FDA off-label

This is an 11 yo girl with forehead and T-zone acne, not responding to OTC benzoyl peroxide. What type of acne, and how would you treat?

A) Mild comedonal; Salicylic acid wash, topical retinoid
B) Mild inflammatory; topical benzoyl peroxide-clindamycin combination BID
C) Moderate to severe mixed (inflammatory & comedonal); benzoyl peroxide wash, topical clindamycin, oral antibiotic, topical retinoid
D) Severe nodulocystic; refer for isotretinoin

This 16 yo boy has facial and truncal involvement, using benzoyl peroxide wash and topical erythromycin. He says this is a “good day” and everything is just making him dry. What type of acne, and how would you treat?

A) Mild comedonal; salicylic acid wash, topical retinoid
B) Mild inflammatory; topical benzoyl peroxide-clindamycin combination BID
C) Moderate to severe mixed (inflammatory & comedonal); topical benzoyl peroxide-clindamycin, oral minocycline, topical retinoid
D) Severe nodulocystic; refer for isotretinoin

This 17 yo boy has struggled with acne for 2 years. The other PCP in your group has had him on oral minocycline and combo BP-clindamycin for 6 months without response. What type of acne, and how would you treat?

A) Mild comedonal; salicylic acid wash, topical retinoid
B) Mild inflammatory; topical benzoyl peroxide-clindamycin combination BID
C) Moderate to severe mixed (inflammatory & comedonal); benzoyl peroxide wash, topical clindamycin, oral TMP-SMX, topical retinoid
D) Severe nodulocystic; refer for isotretinoin

Acne: Epidemiology/Associations
• Most common skin disorder in US
• Affects >80-85% of individuals
• Usually between 11-30 yo
• Concerning long-term effects:
  – Permanent scarring
  – Psychosocial withdrawal, decreased QoL
• Majority of pts can be treated by PCP with traditional/first-line therapies
• No “Gold Standard” treatment; must be individualized based on type of acne
Acne: Epidemiology/Associations

- Familial tendency (AD?)
- Typical "adolescent acne" usually begins around pubertal onset (or slightly earlier)
  - Girls 12-13 yo
  - Boys 14-15 yo
- "Pre-adolescent acne" at 8-9 yo (or earlier)
- >50% affected into 20s +
- Can have earlier or later onset, usually in setting of androgen dysfunction or PCOS

Acne Pathogenesis

1. Pilosebaceous unit obstruction...
2. ↑sebum production (Hormonal influence)...
3. Bacterial proliferation (Propionibacterium acnes)
4. Inflammation (Genetically determined hypersensitivity?)

Acne: Other Triggers

- Stress
- Hormonal fluctuations/menses
- Mechanical/occlusion
  - Sports gear (eg helmets)
  - Hair or hair products
  - Comedogenic makeup
- Medications
  - Anabolic steroids, progestin
  - Lithium
  - INH
- Pathologic androgen excess/PCOS
- Diet????
  - Milk/dairy (hormones)
  - Refined carbs/"high glycemic index" → inflammation

Types of Acne Lesions

- Active:
  - (Microcomedone)
  - Open comedone ("blackhead")
  - Closed comedone ("whitehead")
  - Papule
  - Pustule ("pus bump")
  - Nodule/Cyst/Sinus tract
- Sequelae:
  - Dyspigmentation
    - Usually postinflammatory HYPERpigmentation
  - Scarring
    - Hypertrophic/keloidal
    - Atrophic/pitting/"ice pick"

Diagnostic Algorithm – Categorizing Acne

Is it:
- Mild
- Moderate
- Severe
?
- With/without scarring
- Impact on QoL
- Truncal involvement
- "Good, bad or average day"

Acne Types...

MILD
- Comedonal
- Inflammatory
- Nodulocystic
- Hormonal

MODERATE
(Mixed)

SEVERE
- Inflammatory
Acne Conglobata & Acne Fulminans
- Severe presentation
- Usually teen males
- Multiple connecting sinuses/tracts
- Scarring
- May have systemic symptoms, bony pain
- Associated autoinflammatory syndromes
- Warrants aggressive treatment/referral

Acne Excoriee (des jeunes filles)
- “Factitial dermatitis”
- Exogenous manipulation
- Often in the setting of anxiety, OCD, or body dysmorphic issues
- Treat with topicals
- Recognize the behavior
- Referral to behavioral health can help

Acne Treatment Algorithms – in Brief
- Mild Comedonal
  - Topical retinoid, SA; (consider BP)
- Mild inflammatory or Mixed
  - Combo topical therapy: BP, antibiotic, retinoid
- Moderate Inflammatory or Mixed
  - Above topicals + oral antibiotic +/- hormonal
- Severe Inflammatory or Mixed
  - As for moderate, (consider hormonal or isotretinoin)
- Hormonal
  - OCP/spironolactone +/- topicals
- Nodulocystic
  - Referral for isotretinoin or other

Caveat...
Make the regimen as easy/efficient as possible
- Teenagers want fast response
- Have already tried “everything”
- Need to gain trust
- Written handouts/Instructions
- Involve the patient
- Assess comprehension, whether pt is “up for it”
- Link to other patterned behaviors (brushing teeth)
- Takes 2-3 months to show effect – keep doing!
- Re-evaluate every few months (or refer if necessary)

Acne Treatment: Benzoyl Peroxide
- Mainstay of most acne therapy
- No lower age limit
- OTC or Rx
- Antimicrobial
- Anti-inflammatory
- Mild comedolytic
- Concentrations range 2.5-10%
- Cleanser (bar or liquid), cream, gel, lotion, shaving cream
- Bleaches clothing, linens, towels
- Irritant: drying, redness
- Rare true allergic rxn

Clinical Pearls: Benzoyl Peroxide
- Warn about the bleaching!
  - If treating body, use of tightener with cold water
  - Tell teens to get cheap white towels for the bathroom
- Get slow!
  - Emphasize MAI: amount, thin layer
  - Patients, write. always rework it
  - Shouldn’t “see on your skin”
  - Can start every other day and titrate to use more frequently
- Start gentle – 4% 1% CREAM not gel
- If using as wash, start once a day
  - Gentle cleanser other time of day
  - Can be used in shower if liberal acne
- Redness/dryness usually represents irritation, NOT allergy
- Can use (non-comedogenic) moisturizer to combat dryness
- Oily skin:
  - BP as cleanser, cream, gel or combo product
- “Sensitive” skin:
  - BP as cleanser or avoid, work up to combo products
Other OTC topical considerations

- **Salicylic acid (beta-hydroxy)**
  - OTC
  - Reduces sebum, drying but less so
  - Comedolytic
  - Gel, lotion, wash, cream
- **Glycolic acid (alpha-hydroxy)**
  - OTC, derived from fruit/yogurt
  - Reduces sebum, drying but less so
  - Comedolytic
  - Wash, cream
  - Safe in pregnancy

  **Clinical Pearls:**
  - Available OTC in many “anti-aging” products, maybe a good idea in those with very dry or sensitive skin
  - Typically more expensive, brand-name products, so may limit availability to general population
  - Help with postinflammatory hyperpigmentation

Acne Treatment: Topical Retinoids

- Normalize keratinization
- Builds dermal collagen
- Comedolytic
- Anti-comedogenic
- “Unclog pores” and help with scarring

- Apply sparingly (pea-sized amount)
- Applied at night
  - Sun inactivates
  - Increase photosensitivity
- Multiple vehicle choices
- Considered teratogenic

**From “weakest” to “strongest”:**

- **Adapalene (Differin)**
  - 0.1%, 0.3%
  - Cream, gel, lotion
- **Tretinoin (Retin-A, Renova, etc)**
  - (0.01%), 0.025%, 0.05%, 0.1%
  - Cream, gel, micro-gel
- **Tazarotene (Tazorac)**
  - 0.05%, 0.1%
  - Cream, gel, foam

Clinical Pearls: Topical Retinoids

- Cream less irritating/drying than gel
- Gels are slightly “stronger” at same concentration (0.1 crm ≠ 0.1 gel)
- Start 2-3 x/week then advance slowly
- Start low concentration, increase as tolerated (unless v oily to start)
- Can make worse before better (2-3 weeks), need to get over the “hump”
  - Redness, dryness, peeling
  - Worse blackheads/whiteheads
- Warn about photosensitivity, use sunscreen
- May need PA – advocate for patient, check what is actually dispensed

Acne Treatment: Topical ABX & Others

- **Clindamycin** - MAINSTAY
  - 1% gel, lotion
  - Resistance without BP
- **Erythromycin**
  - Gel, cream, ointment
  - Resistance
- **Sulfacetamide**
  - Helpful for rosacea, odor
- **Dapsone [Aczone]**
  - Anti-neutrophilic therefore anti-inflammatory
  - Newer on market
  - Rare risk clinically insignificant hemolysis
- **Azelaic acid (Azelaic, Finacea)**
  - 20% cream
  - Antibacterial and anti-comedonal, decreases hyperpigmentation
  - Irritant side effects
  - Safe in pregnancy

Acne Treatment: Combo Products

- **Clindamycin + BP = Benzac, Duacl, Acanya, generic**
  - Most widely used amongst dermatologists
  - Less issue with resistance
  - All forms are not equal (may limit compliance)
  - Use only thin layer – should not “see it” on skin
  - Can use non-comedogenic moisturizer to improve tolerability
- **Erythromycin + BP = Benzacclin**
  - Theoretical resistance
  - Needs to be refrigerated (may limit compliance)
- **Adapalene + BP = Epiduo**
  - Great for early/pre-adolescent acne
- **Tretinoin + Clindamycin gel = Ziana, Veltin**
  - Great to simplify routine, usually done with BP wash
Acne Treatment: Oral Antibiotics

- **General Guidelines:**
  - Topicals alone may suffice
  - Usually require 3-4 month trial
  - Continue no longer than necessary (but do give enough time)
  - Consider resistance

- **Tetracyclines:**
  - Usually first-line for acne
  - Teratogenic, contraindicated < 9 yo
  - Can all cause pseudotumor cerebri, vulvovaginal candidiasis
  - Other side effects specific to specific drug

  - (Tetracycline)
    - 250-500 mg BID
    - GI upset usually limits
  
  - Doxycycline
    - 50-100 mg BID
    - GI upset (take with food)
    - Dairy limits absorption
    - Consider teen’s schedule
    - Photosensitivity!

  - Minocycline
    - 50-100 mg BID
    - Vertigo, HA
    - Esophagitis
    - DRESS (Drug hypersensitivity)
    - Blue-gray pigmentation
    - Lupus-like syndrome

- **Second-line:**
  - Cephalexin (Cephalexin, Celladron)
  - TMP SMX
  - Amoxicillin/Ampicillin
  - Clindamycin
  - Erythromycin

  - Party Line: None of these should impact OCP effect

Clinical Pearls: Oral Antibiotics

- If “on fence”, I treat
  - Unless specific contraindication or patient/parental concern
- Can get quicker results...
  - Gain trust in regimen effectiveness
  - Allow time for topicals to work

  - 2-3 month course to start, reassess

  - Doxycycline first line, accessible, lower serious risk

  - Important limitations:
    - GI upset/nausea
    - Take with snack/food, but not dairy
    - Sun sensitivity (skin type, activities)

Acne Treatment: Hormonal

- Work to oppose androgen effect
- Use in girls who:
  - Report menstrual fluctuations
  - Have lower face/jawline predominance
  - Are older and still have acne

- Can get quicker results...
  - Gain trust in regimen effectiveness
  - Allow time for topicals to work

- 2-3 month course to start, reassess

  - Doxycycline first line, accessible, lower serious risk

  - Important limitations:
    - GI upset/nausea
    - Take with snack/food, but not dairy
    - Sun sensitivity (skin type, activities)

Acne Treatment: Oral Isotretinoin

- For severe nodulocystic or recalcitrant acne
- Must be registered in “pledge” system as prescriber and as patient
- Requires compliant, committed patient/family

- Contraindications:
  - Lack of comprehension
  - Desire to become pregnant in near future
  - Psychiatric hx
  - Inflammatory bowel dz hx/fam hx

- Typical 4-6+ month course, with monthly labs
- 1+ mg/kg/day, sometimes “low & slow”
- Goal cumulative dose 125-150 mg/kg
- Recent data supports 200+ mg/kg to ↓ recurrence

- 10, 20, 30, 40 mg capsules

- Not usually a “cure,” but can be a “game changer”
  - 25% perhaps never have to use anything else
  - 50% acne recurs but manageable
  - 25% acne recurs, need 2nd course

- Teratogenic – females must use 2 forms contraception

- Numerous other side effects:
  - Xerosis, cheilitis, dermatitis, hair loss
  - Decreased night vision, dry eyes
  - Transient hyperlipidemia, hypertriglyceridemia
  - Muscle/joint pains, rhabdomyolysis, hyperostosis
  - Hepatitis, ?IBD risk
  - HA, mood changes
  - Depression/anxiety/homicidal ideation risk
Acne Treatment in Pregnancy

- Conservative approach often taken – but consider more aggressive if scarring/QoL impact
- Topicals safer than orals
- Alpha-hydroxy acid washes
- Can also consider laser (PDL, Blue light)

- Category B:
  - Topical Erythromycin, Clindamycin, Metronidazole
  - Sodium sulfacetamide
  - PO Erythromycin, Keflex

- Category C:
  - Benzoyl peroxide
  - Salicylic acid
  - Topical Dapsone, Adapalene, Tretinoin
  - PO Bactrim, Fluoroquinolones, Spironolactone

- Category D:
  - Tetracyclines

- Category X:
  - Topical Tazarotene (Tazorac)
  - Isotretinoin
  - OCPs
  - Cyproterone (hormonal)

- Unknown:
  - Zinc

Postinflammatory Dyspigmentation

- More common with darker skin types
- Sun exposure can make worse
- Sometimes more alarming to patient than active lesions
- Reassurance – not scar
- May take 6-12 months to improve/resolve
- Topicals can help:
  - SA gel/cleanser
  - Retinoids
  - Azelaic acid
  - Non-comedogenic sunscreen!
- For persistent, would consider (cosmetic):
  - Chemical peels (SA, GA, etc)
  - Laser

Acne Scarring

- Different types
  - Atrophic, ice pick/box car
  - Hypertrophic or keloidal
- Results from inflammation or traumatizing skin
- Reason to avoid manipulation!
  - Warm compresses
  - Direct extraction only when superficial pustule
- Reassurance...
- Evaluate response to therapy after 6-12 months
  - Topicals – retinoids
  - IL steroid injxns for hypertrophic
- Cosmetic procedures:
  - Dermabrasion
  - Surgical recision
  - Fractionated and/or ablative laser

Acne Treatment

- Mild Comedonal
  - Topical retinoid, SA cleanser
- Mild Inflammatory or Mixed
  - Combo topical therapy: BP, antibiotic, retinoid
- Moderate Inflammatory or Mixed
  - Above + oral antibiotic +/- hormonal
- Severe Inflammatory or Mixed
  - Above + oral antibiotic (consider hormonal or isotretinoin)
- Hormonal
  - OCP/Spironolactone + topicals
- In Pregnancy
  - Start with topicals (BP, glycolic/azelaic acid, abx), avoid retinoids
- Nodulocystic
  - Referral for isotretinoin or other

Making the regimen as easy as possible...

- Give written instructions
- Make specific cleansing recommendations
  - i.e. “Wash your face twice a day, once with a gentle cleanser, once with the medicated soap I’ve recommended”
- Explain purpose of different medications
- Use analogies (prevention not spot treatment)
- Allow enough time for regimen to work
- Use strong enough regimen that is likely to work!
- Give enough medication and refills
- Follow through with PAs etc if needed
One final note...

- **Neonatal “acne”**
  - Congenital/first weeks
  - Maternal hormonal influence
  - Hypersensitivity to *Malessezia* species
  - Papules, pustules, no comedones
  - No treatment required
  - “Neonatal Cephalic Pustulosis”

- **Infantile**
  - Presents at 3-6 months+
  - Comedones, papules, pustules, +/- nodulocysts
  - Transient adrenal/gonadal androgen production
  - Can scar!
  - Treat like typical teen acne
    - Start with topicals
    - Refer for further treatment

Childhood Acne

- **Childhood (later than 6 months old)**
  - More persistent, severe
  - Comedones, papules, pustules, +/- nodulocysts
  - Can scar!
  - Treat like teen acne
    - Start with topicals
    - Usually needs oral
  - Likely warrants endocrine referral if severe, especially if 2-7 yo
    - Start with X-ray for bone age
    - DHEAS
    - Testosterone
    - 17OH progesterone
    - LH, FSH, prolactin

Evidence-based recommendations for the diagnosis and treatment of pediatric acne.

This is an 11 yo girl with forehead and T-zone acne, not responding to OTC BP. What type of acne, and how would you treat?

A) Mild comedonal; SA wash, topical retinoid
B) Mild inflammatory; topical BP-clindamycin
C) Moderate mixed (inflammatory and comedonal); BP wash, topical clindamycin, oral antibiotic, topical retinoid
D) Severe nodulocystic; refer for isotretinoin

This 16 yo boy has diffuse facial and some truncal involvement, using BP wash and topical erythromycin. He says this is a “good day” and everything is just making him dry. What type of acne, and how would you treat?

A) Mild comedonal; SA wash, topical retinoid
B) Mild inflammatory; topical BP-clindamycin
C) Moderate mixed; BP wash, topical clindamycin, oral antibiotic, topical retinoid
D) Severe nodulocystic; refer for isotretinoin

This 17 yo boy has struggled with acne for about 2 years. The other PCP in your group has had him on oral minocycline and combo BP-clinda for 6 months without response. What type of acne, and how would you treat?

A) Mild comedonal; SA wash, topical retinoid
B) Mild inflammatory; topical BP-clindamycin
C) Moderate mixed; BP wash, topical clindamycin, oral antibiotic, topical retinoid
D) Severe nodulocystic; refer for isotretinoin

Thanks!
asmidt@salud.unm.edu