

# Acne

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# Learning Objectives

- to recognize different patterns of acne
- to discuss new treatment modalities
- to gain appreciation for side effects and proper use of common acne medications

# Why should you care?



# Stages of Acne Vulgaris

- Stage I: comedonal
- Stage II: papular
- Stage III: pustular
- Stage IV: cysts and nodules

## Cutaneous scarring

- “punched out”, “ice pick”
- atrophic
- hypertrophic

# More Acne Variants

- Gram-negative acne
- Steroid-induced acne
- Occupational acne
- Acne excoriée
- Acne cosmetica
- Acne mechanica
- Neonatal acne



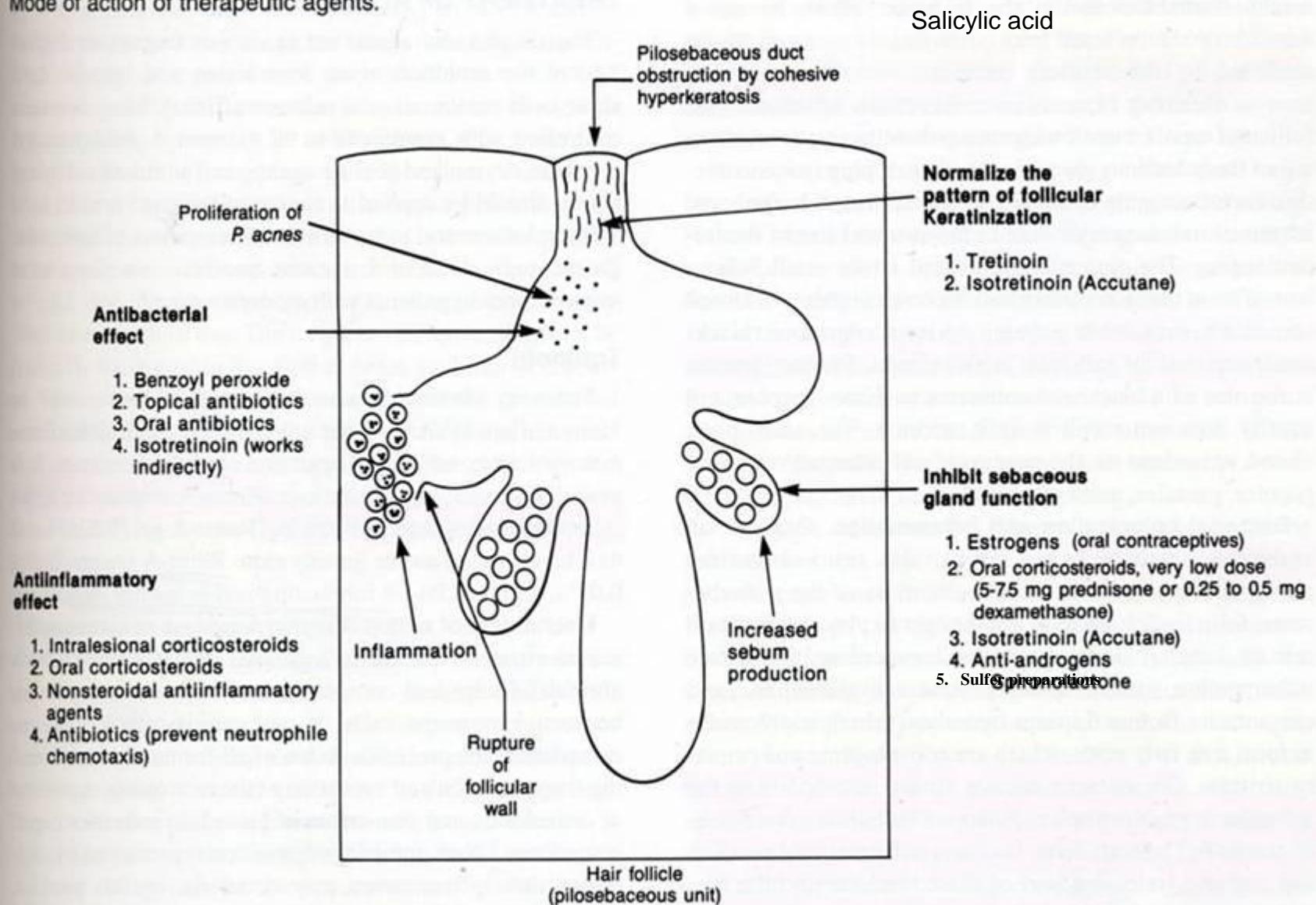
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Acne excoriée

# Acne treatments

Figure 7-6

Mode of action of therapeutic agents.



# Acne Treatment Algorithm

Acne Severity	Mild	Moderate	Severe	
				
<b>1<sup>st</sup> Choice</b>	Comedonal	Mixed and papular/pustular	Mixed and papular/pustular	Nodular
	Topical retinoid	Topical retinoid + topical antimicrobial	Oral antibiotic + topical retinoid ± topical BPO	Oral antibiotic + topical retinoid + topical BPO
<b>Alternative(s)</b>	Alt. topical retinoid <i>or</i> azelaic acid <i>or</i> salicylic acid	Alt. topical retinoid <i>or</i> topical antimicrobial <i>or</i> alt. topical retinoid + topical antimicrobial <i>or</i> azelaic acid	Alt. oral antibiotic + alt. topical retinoid ± alt. topical BPO	Oral isotretinoin <i>or</i> alt. oral antibiotic + topical retinoid ± topical BPO/azelaic acid
<b>Alternative(s)</b> <i>for females</i>	See 1 <sup>st</sup> choice	See 1 <sup>st</sup> choice	Oral antiandrogen + topical retinoid/azelaic acid ± topical antimicrobial	Oral antiandrogen + topical retinoid ± oral antibiotic ± topical antimicrobial
<b>Maintenance therapy</b>	Topical retinoid		Topical retinoid ± BPO	

# Topical medications

- Benzoyl peroxide
- Retinoids
- Antibiotics
- Dapsone
- Combination products
- Salicylic acid
- Sulfur products

# Topical antibacterials

- Benzoyl peroxide preparations
  - 2.5–20% - eg. Benzac AC, Oxy , Benoxyl , PanOxyl, Clindoxyl, BenzaClin, Tactupump
- Antibiotics
  - Clindamycin phosphate (1-2%)
    - Dalacin T, Clindets
  - Erythromycin (1-5%)
- Dapsone
  - Aczone 5% gel

# Retinoids : Vitamin A acid

- Tretinoin (Stieva-A, Retin A)
- Retin A micro
- Adapalene (Differin, Differin XP)
- Tazarotene (Tazorac)

# Combination Formulations

- Antibiotic combo
  - Benzamycin gel (5% benzoyl peroxide + 3% erythromycin)
- Antibiotic + benzoyl peroxide
  - Clindoxyl gel/Benzaclin gel (5% benzoyl peroxide + 1% clindamycin)
- Antibiotic + retinoids
  - Stievamycin Gel (0.01-0.05% tretinoin + 4% erythromycin)
  - Biacna Gel (clindamycin 1.2% + tretinoin 0.025%)
- Benzoyl peroxide + retinoids
  - Tactupump (Epiduo) gel (adapalene 0.1%+ BP 2.5%)
  - Tactupump (Epiduo) forte(adapalene 0.3% +BP 2.5%)

# Systemic therapies

- Oral antibiotics
- Oral contraceptives and antiandrogens
- Oral retinoids

# Antibiotics

- Tetracyclines
  - Most commonly prescribed for moderate to severe acne
  - Tetracycline, doxycycline, minocycline
    - Suppress growth of *P. acnes*
    - Intrinsic anti-inflammatory properties
    - Avoid excessive sun exposure (except minocycline)
    - Avoid in pregnant women
    - Improvement in 6 weeks but may take 3-6 mo.

# Adverse Effects of tetracyclines

Gastrointestinal –  
nausea, vomiting,  
epigastric burning

- Tetracycline >doxycycline & minocycline

Controversy over  
relationship with OCP

## Tetracycline

- Inhibited by iron, zinc & calcium
- Serum sickness & Stevens Johnson syndrome – rare!

## Minocycline

- Dizziness & pseudotumor cerebri
- Lupus & hyperpigmentation

## Doxycycline

- photosensitivity

# Other antibiotics

- Macrolide
  - Erythromycin
- Sulfonamide
  - Trimethoprim-Sulfamethoxazole

# Dosage examples

- Tetracycline 500 mg po bid or tid
- Doxycycline 100 mg po bid
- Minocycline 50-100 mg po qhs – bid
  - Doses of tetracyclines vary, as anti-inflammatory effect needs lower doses and antimicrobial higher doses, so depends on treatment aims and philosophy
  - All these are often continued for months (short courses unlikely to do much)

# Hormonal- Women only

- Oral Contraception
  - Tri-Cyclen
    - Ethinyl estradiol (35mcg)/Norgestinate
  - Diane 35
    - Ethinyl estradiol & cyproterone acetate (androgen blockade)
  - Yasmin
    - Ethinyl estradiol & spironolactone derivative (drospirenone)
- Aldactone (Spironolactone)

# Oral retinoids

- Isotretinoin (Accutane, Clarus, Epuris)
  - 13-cis retinoic acid
  - Moderate-severe unresponsive acne
  - 85% of pts clear their acne
  - 90% reduction of sebum production
  - *P. acnes* unable to survive
  - Normalization of follicular keratinization

# Dosage

- Isotretinoin
  - 0.5 – 1.0 mg/kg/day (40mg/d avg. teen)
  - Total dose 120 mg/kg (up to 150mg/kg)
  - Usually start low 0.5 mg/kg X 4 wks. then increase to 1 mg/kg/day
    - Practically, for average-sized person, start at 40 mg/day, then increase to 60 or 80 mg/day after a month or so if tolerated

# Adverse Effects

- Teenager
  - Flare first month
  - Dry eyes, dry nose, dry mouth
  - Active teens = sore joints and muscles
  - Can't drink EtOH (liver)
  - Females must not get pregnant while on it and for at least 6 wks. following discontinuation of drug – potent teratogen
    - Some guidelines quote 3 months

# Adverse Effects

- Liver toxicity
  - Monitor with liver function test
- Serum Triglycerides, Cholesterol may increase
- Teratogenicity ~50%, most significant adverse effect
- EtOH – must avoid
- ?Depression - controversial

# Should you do monthly labs?

Research

## Original Investigation

### Laboratory Monitoring During Isotretinoin Therapy for Acne: A Systematic Review and Meta-analysis

Young H. Lee, MD; Thomas P. Schamitz, BS; Joshua Muscat, PhD; Allshine Chen, MS; Gaytri Gupta-Elera, BS; Joslyn S. Kirby, MD, MEd, MS

**IMPORTANCE** Oral isotretinoin has been associated with several adverse effects, but evidence-based estimates of laboratory changes during isotretinoin therapy in large patient samples are limited.

**OBJECTIVE** To develop estimates of the laboratory changes that occur during isotretinoin therapy for acne using extant data and meta-analytic methods.

**DATA SOURCES** A comprehensive search strategy using Ovid/MEDLINE, EMBASE, and gray literature was conducted (1960-August 1, 2013) to identify all relevant studies of isotretinoin use in acne vulgaris. Terms related to acne treatment, isotretinoin, and diagnostic procedures were searched with all available synonyms.

**STUDY SELECTION** Inclusion criteria consisted of clinical trials using oral isotretinoin, doses of 40 mg/d or more, duration of at least 4 weeks, patients aged 9 to 35 years with acne vulgaris, and 10 or more participants. Studies from all countries published in any language were included. Exclusion criteria were use of modified isotretinoin products, isotretinoin therapy for conditions other than acne vulgaris, and concomitant acne therapy. The initial search yielded 342 records; 116 of these were screened for full-text examination.

**DATA EXTRACTION AND SYNTHESIS** Two authors independently reviewed the publications to determine eligibility, and disagreements were resolved by a third author. Generated weighted means and 99% CIs were calculated using the reported means (SDs or SEs). A random effects model was created, and statistical heterogeneity was quantified. Data were analyzed from August 25, 2014, to December 4, 2015.

**MAIN OUTCOMES AND MEASURES** Laboratory values for lipid levels, hepatic function, and complete blood cell count were evaluated.

**RESULTS** Data from 61 of the 116 studies were evaluated; 26 studies (1574 patients) were included in the meta-analysis. The mean (99% CI) values during treatment (nonbaseline) for triglycerides was 119.98 mg/dL (98.58-141.39 mg/dL); for total cholesterol, 184.74 mg/dL (178.17-191.31 mg/dL); for low-density lipoprotein cholesterol, 109.23 mg/dL (103.68-114.79 mg/dL); for high-density lipoprotein cholesterol, 42.80 mg/dL (39.84-45.76 mg/dL); for aspartate aminotransferase, 22.67 U/L (19.94-25.41 U/L); for alanine aminotransferase, 21.77 U/L (18.96-24.59 U/L); for alkaline phosphatase, 88.35 U/L (58.94-117.76 U/L); and for white blood cell count, 6890/uL (5700/uL-8030/uL). This meta-analysis showed that (1) isotretinoin is associated with a statistically significant change in the mean value of several laboratory tests (white blood cell count and hepatic and lipid panels), yet (2) the mean changes across a patient group did not meet a priori criteria for high-risk and (3) the proportion of patients with laboratory abnormalities was low.

**CONCLUSIONS AND RELEVANCE** The evidence from this study does not support monthly laboratory testing for use of standard doses of oral isotretinoin for the standard patient with acne.

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- Editorial page 17
- Author Audio Interview at [jamadermatology.com](http://jamadermatology.com)
- Supplemental content at [jamadermatology.com](http://jamadermatology.com)

- Lipid and hepatic screen baseline and repeat in 2 months
- In women consider regular pregnancy testing

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# Physical Agents

- Acne surgery
  - manual removal of comedones
  - drainage of pustules and cysts
- Intralesional corticosteroid therapy
- Cryosurgery
- Chemical peels
- Blue light
- Photodynamic therapy
  - photosensitizer + light – shrinks sebaceous glands
- Laser

# Part 2 – Hidradenitis Suppurativa

# Hidradenitis Suppurativa

- Chronic, recurrent, inflammatory disease
- Axilla, mammary, inguinal, perianal, perineal
- Multiple nodules, sinus tracts, fistulas and scarring

# HS Comorbidities

- Smoking
- Obesity
- Hypertension
- Dyslipidemia
- Diabetes
- Thyroid Disorders
- Psychiatric Disorders
- Arthropathies

# HS Hurley Stages



**Stage I –**  
**68% of patients**  
Single or multiple  
abscesses

**Stage II –**  
**28% of patients**  
Recurrent abscesses,  
sinus tract formation

**Stage III –**  
**4% of patients**  
Diffuse involvement of  
area, multiple  
interconnected tracts and  
abscesses

# HS Treatments

- Antibiotics (topical and oral, dapson)
- Surgery (Local excision, grafting)
- Biologic Therapies
  - Approved: Adalimumab
  - Others: Infliximab, Ustekinumab
- Retinoids
- Hormonal Therapies
- Intralesional steroids
- Laser (CO<sub>2</sub> laser, NdYAG laser)

# PEARLs

- Acne
  - Chronic condition – multiple treatment modalities
  - Topical retinoids – 1<sup>st</sup> line treatment in acne; used in maintenance
  - Systemic therapy early to avoid scarring acne
- HS
  - Chronic condition associated with smoking and obesity
  - New biologic treatments