Acne Vulgaris: Newest Guidelines

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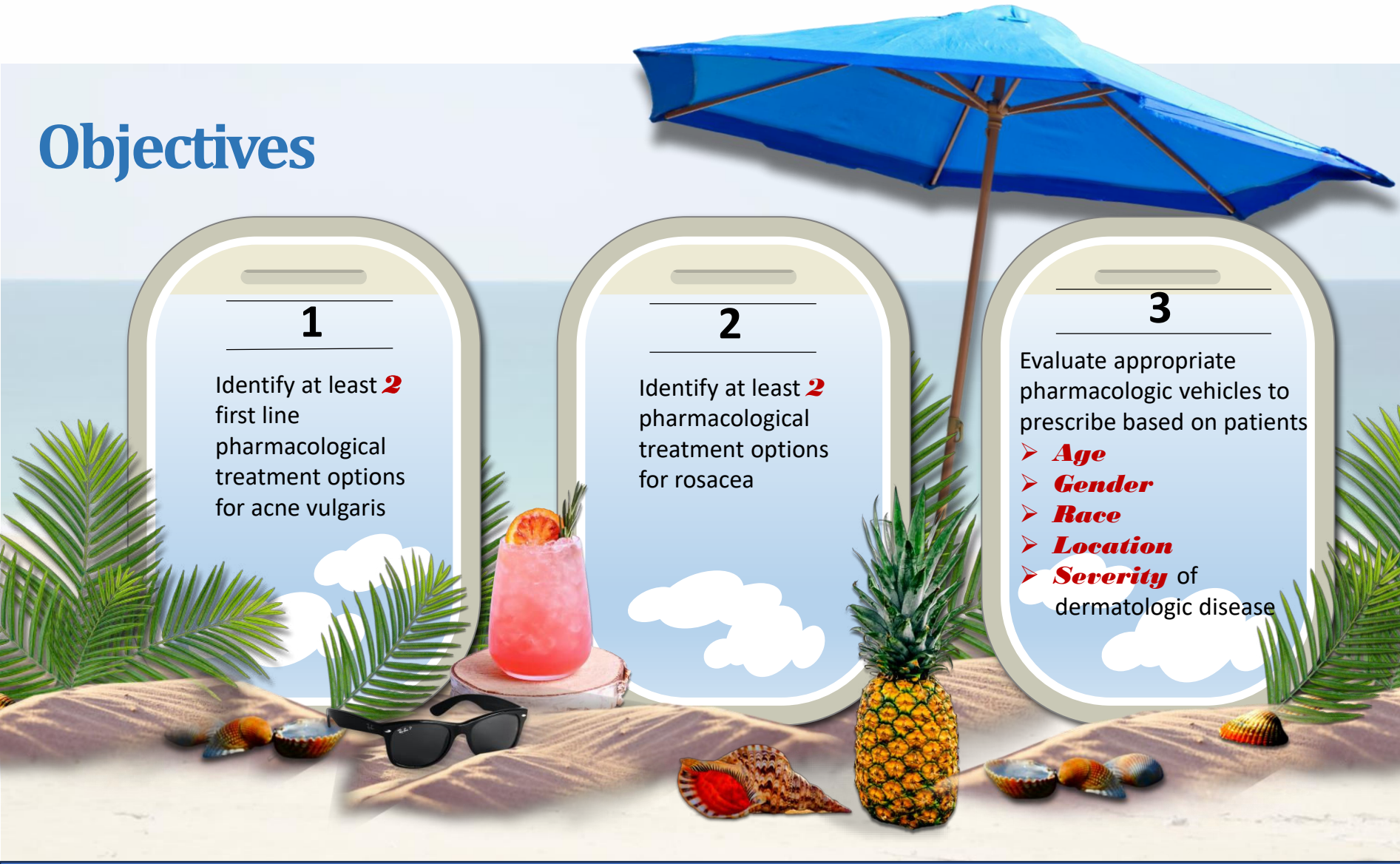
DISCLOSURES: ANY BAGGAGE?

- Current Contract: iPLEDGE FDA ACNE Scientific Safety Board
- National Speaker: Aesthetic Medical Educators Training
- **All relevant financial relationships have been mitigated**

Objectives



1

Identify at least **2** first line pharmacological treatment options for acne vulgaris

2

Identify at least **2** pharmacological treatment options for rosacea

3

Evaluate appropriate pharmacologic vehicles to prescribe based on patients

- ***Age***
- ***Gender***
- ***Race***
- ***Location***
- ***Severity*** of dermatologic disease

PATHOGENESIS: ACNE

Androgen ➡ Sebocyte and Keratinocyte

↓

Increased sebum &
Abnormal follicular keratinization

↓

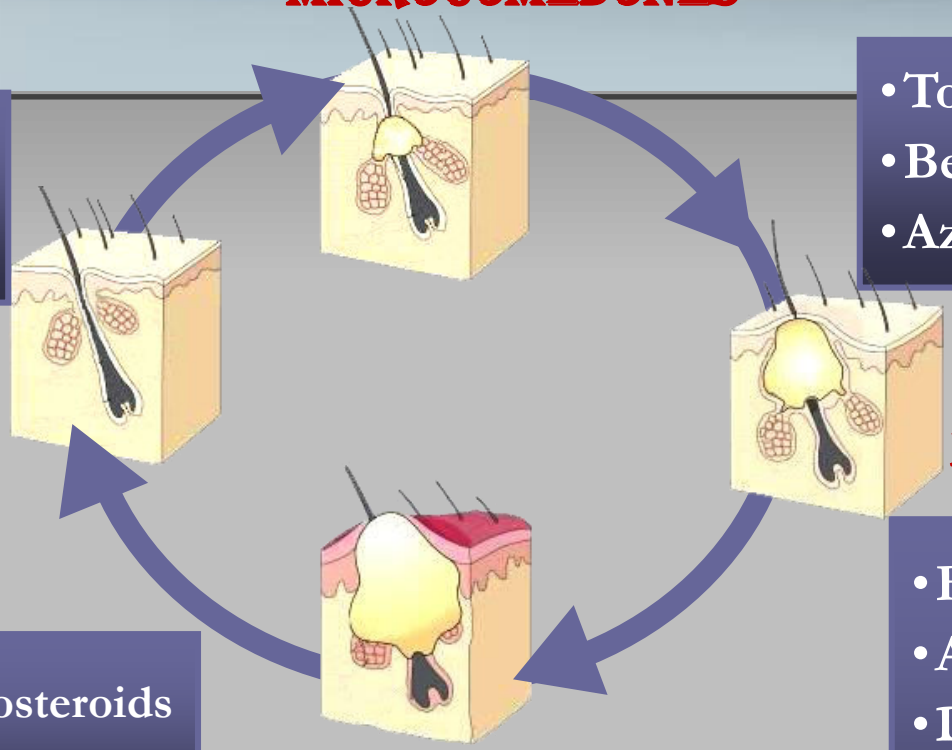
Follicular Plug

↓

Non-inflammatory ----------→ Inflammatory lesions

(comedones) *c. acnes* (previously *p. acnes*) (papules, pustules, nodules)

ACNE LESION: LIFE CYCLE



MICROCOMEDONES

- Topical Retinoids
- Benzoyl Peroxide
- Azelaic Acid

COMEDONES NONINFLAMMATORY

- Benzoyl Peroxide
- Antibiotics
- Dapsone
- Retinoids
- Azelaic Acid
- Sulfacetamide/Sulfur

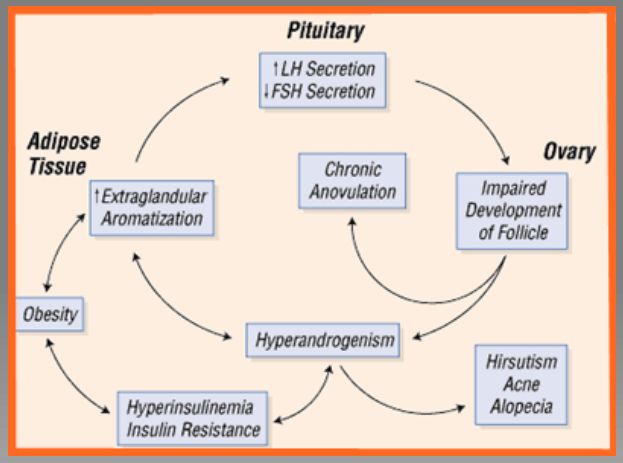
INFLAMMATORY LESIONS

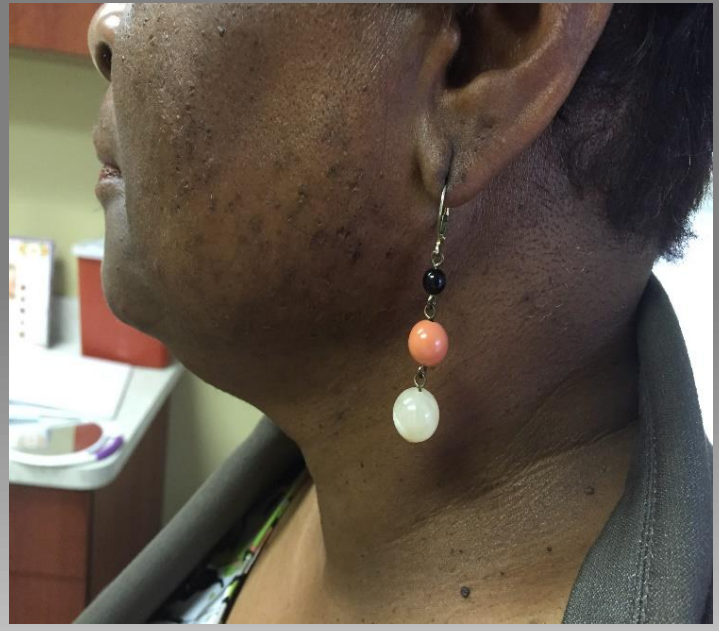
- Intralesional Corticosteroids
- Isotretinoin

REPAIR

- Medical Devices
- Retinoids

Permission granted by Dr. George Martin





LABORATORY TESTING

None Routinely Recommended Unless:

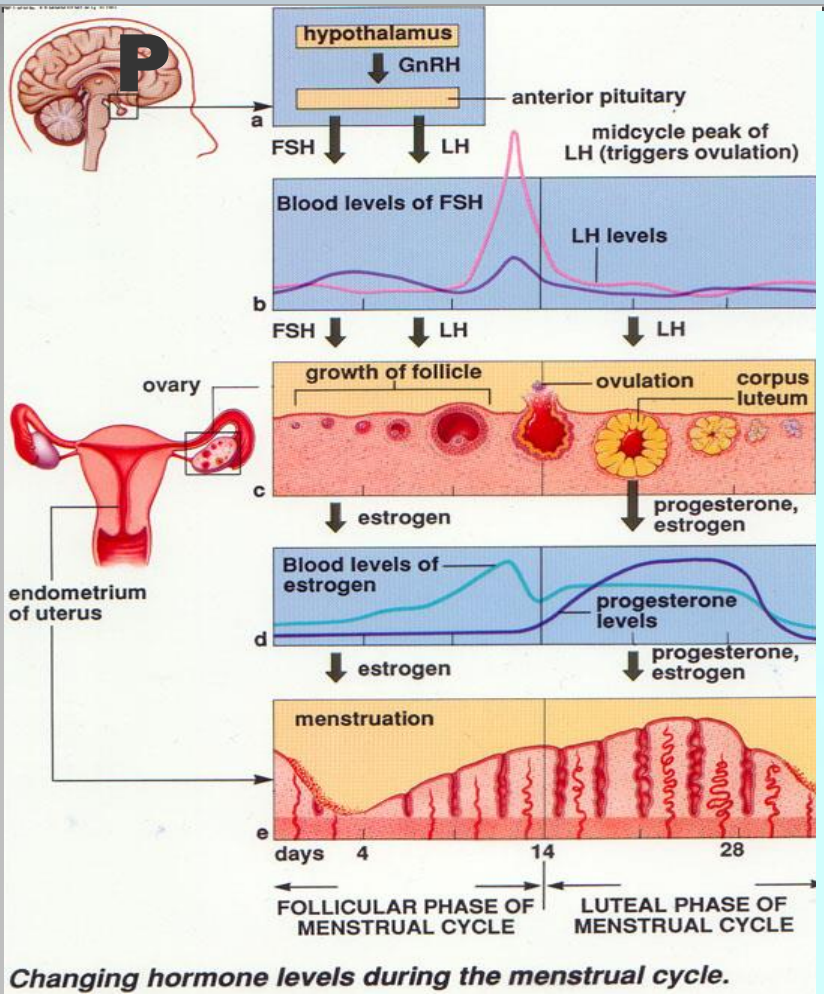
- **Abnormal Menses**
- **Acanthosis Nigricans**
- **Hair Loss/Thinning**
- **Hirsutism**
- **Refractory to Conventional Therap**

Personal images: H. Roebuck

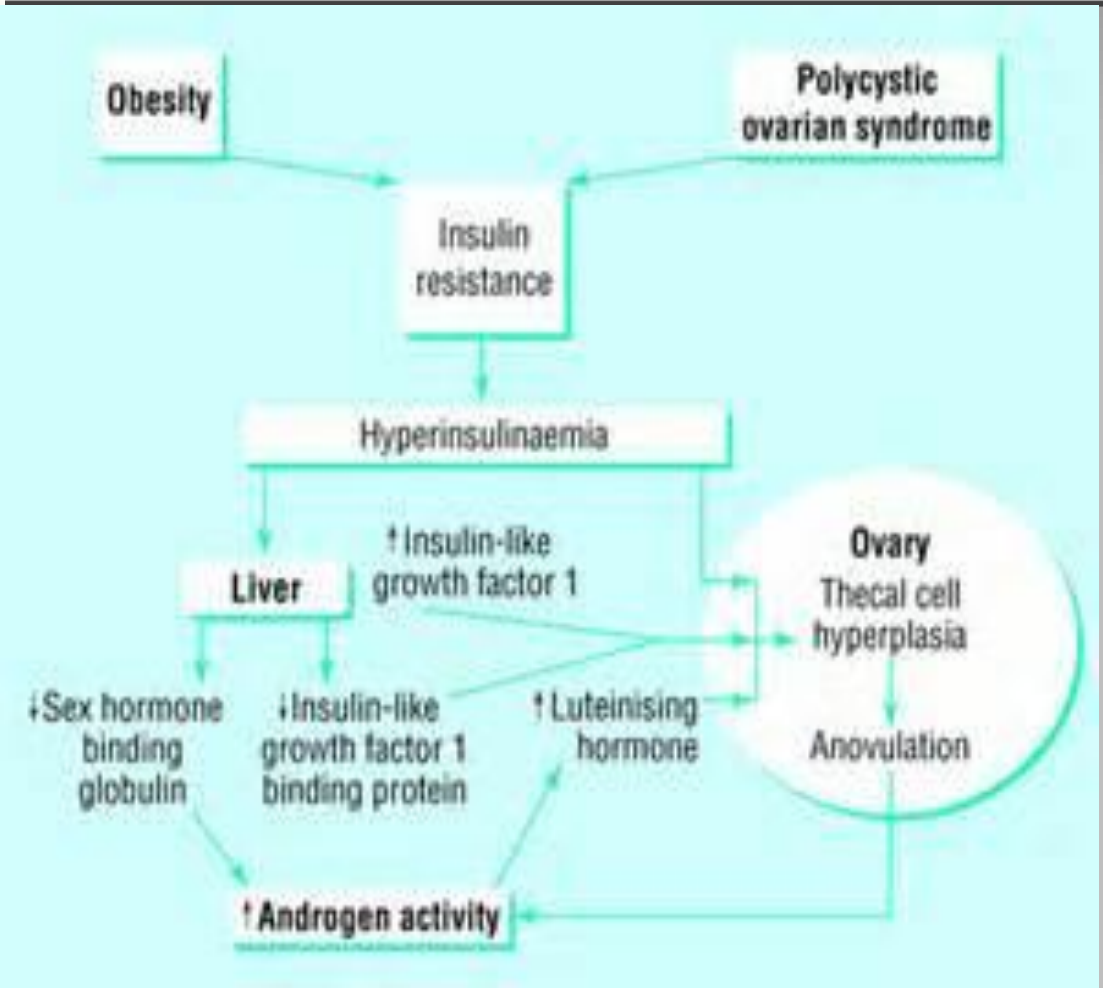
PHARMACOLOGY

- OCP
- Metformin
- Spironolactone

Personal images: H. Roebuck



Changing hormone levels during the menstrual cycle.



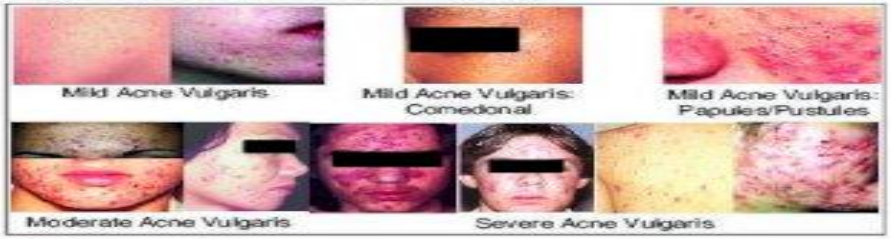
EVALUATION FOR PCOS

Lab or Imaging Study	Expected Result or Explanation
Free testosterone	Elevated in PCOS
Total testosterone	Elevated in PCOS
Sex hormone binding globulin	Suppressed in PCOS
LH, FSH	Generally LH is higher than FSH; older criteria noted that LH is 2x > FSH; however this is not always seen
Prolactin	To exclude hyperprolactinemia
TSH, free T4	To exclude hypothyroidism
DHEAS, 17 alpha-hydroxyprogesterone (17-OHP)	To screen for CAH, androgen-secreting tumors (in which case the DHEAS level is significantly elevated, generally over 600 – 700 mcg/dL)
Morning cortisol level and/or 24-hour urinary free cortisol	To exclude Cushing syndrome
Beta-HCG	To exclude pregnancy
Consider insulin-like growth factor 1 (IGF-1)	To exclude acromegaly IGF-1, like insulin, can increase androgen production and lower levels of sex hormone binding globulin
Lipid profile	To screen for hyperlipidemia
Hemoglobin A1c	To evaluate for glucose intolerance
Comprehensive metabolic profile	To evaluate renal and hepatic function prior to potential initiation of medication CMP also provides fasting blood glucose level
Oral glucose tolerance test	Should be performed in all girls with PCOS, regardless of BMI – not necessarily as part of screening labs, but once diagnosed
Pelvic ultrasound	To exclude masses and anatomical disorders causing menstrual dysfunction

Acne Treatment Guidelines

Definition

ACNE VULGARIS is a common, chronic, multifactorial, polymorphic, inflammatory, non-infectious disease involving the pilosebaceous unit (PSU).



Pathogenesis

Four factors play major roles:
(1) abnormal desquamation of follicular keratinocytes; follicular epidermal hyperproliferation
(2) excess sebum production
(3) proliferation of anaerobic *Propionibacterium acnes (P acnes)*
(4) immune and inflammatory responses

Androgenic stimulation, genetic and external factors target both the sebocytes and keratinocytes. This leads to sebaceous hyperplasia/hyperseborrhea and follicular hyperkeratosis, respectively. Changes in the follicular homeostasis lead to accumulation of these materials and distention of sebaceous follicle lumina (microcomedo). Comedogenesis ensues and there is proliferation of *P acnes*. Production of proinflammatory chemotactic and cytokine factors leads to inflammation of acne and the activation of host immune responses.

Classification of Acne Severity	
MILD	predominance of comedones ≤20 with few inflammatory papules ≤15
MODERATE	predominance of inflammatory papules and pustules ≥15 with comedones and few nodules ≤3
SEVERE	primarily nodules and cysts ≥3 with presence of comedones, papules and pustules

General Management Strategies in Acne

- Perform careful patient history
- Teach patients about gentle skin cleansing
- Show appropriate application technique for topical therapies
- Help patients to have realistic expectations of therapy
- Show empathy for patients' distress due to acne

Microbiologic Testing

- Routine microbiologic testing is unnecessary in the evaluation and management of patients with acne.
- Those who exhibit acne-like lesions suggestive of gram-negative folliculitis may benefit from microbiologic testing: bacterial cultures, including antibacterial sensitivities.

Endocrinologic Testing

- Routine endocrinologic evaluation (e.g., for androgen excess) is not indicated for the majority of patients with acne.
- Laboratory evaluation is indicated for patients who have acne and additional signs of androgen excess.
  - In prepubertal children, a hand film for bone age is a practical screen prior to specific hormonal testing.
  - Increased awareness of clinical signs of androgen excess will help identify those patients who may benefit from further evaluation and treatment by an endocrinologist or gynecologic endocrinologist.
  - The following laboratory tests may be helpful: free testosterone, dehydroepiandrosterone sulfate (DHEAS), leutinizing hormone (LH), and follicle-stimulating hormone (FSH)

Acne Treatment General Guidelines	
MILD	
Comedonal	
First Choice	Topical Retinoid
Alternatives	Alternative Topical Retinoid or Azelaic Acid or Salicylic Acid
Papules/Pustules	
First Choice	Topical Retinoid + Topical Antimicrobial ± Benzoyl Peroxide (BPO)
Alternatives	Alternative Topical Retinoid or Azelaic Acid + alternative Topical antimicrobial
MODERATE	
Papulopustules / Nodules	
First Choice	Topical Retinoid+ Oral Antibiotic ± BPO
Alternatives	Alternative Oral Antibiotic + Alternative Topical Retinoid ± BPO
Alternative for Females	Oral Antiandrogen + Topical Retinoid/Azelaic Acid ± Topical Antimicrobial
SEVERE	
Nodulo-cystic	
First Choice	Oral Isotretinoin
Alternatives	High dose Oral Antibiotic + Topical Retinoid + BPO
Alternative for Females	High Dose Oral Antiandrogen + Topical Retinoid/ ± Alternative Topical Antimicrobial

ADJUNCTIVE THERAPY
Comedo extraction, Intralesional steroid injection

MAINTENANCE THERAPY for all types of acne
Topical Retinoids ± BPO

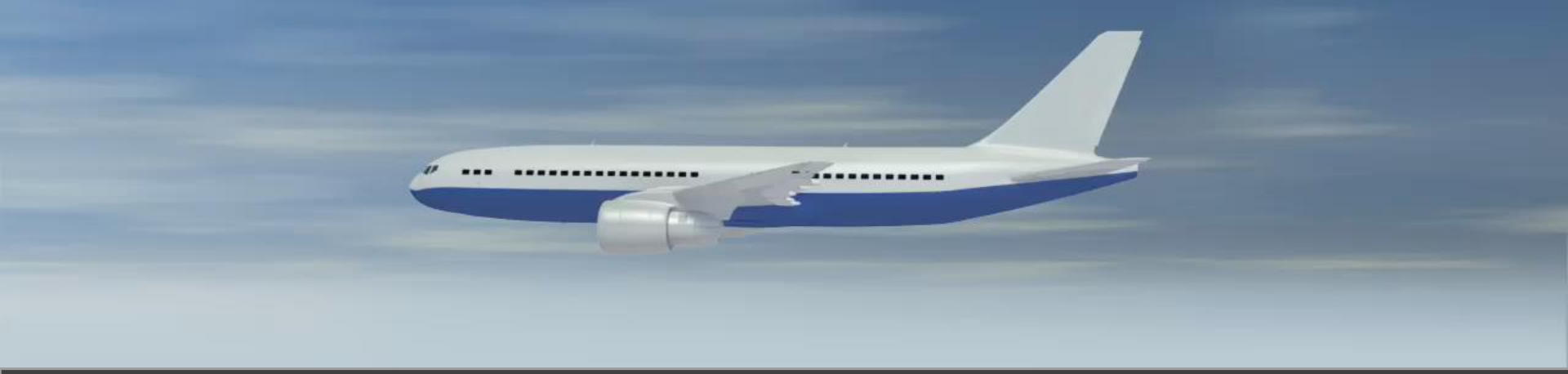
Topical Therapy

- Topical therapy is the standard of care in acne treatment.
- Topical retinoids are important in acne treatment. They reduce obstruction within the follicle and are useful in the management of both comedonal and inflammatory acne.
- Benzoyl peroxide is a bactericidal agent and combinations with erythromycin or clindamycin reduce bacterial resistance and enhance efficacy.
- Topical antibiotics (e.g., erythromycin and clindamycin) are effective acne treatments. However, the use of these agents alone can be associated with the development of bacterial resistance.
- Salicylic acid is a comedolytic/keratolytic that is moderately effective in the treatment of acne.
- Azelaic acid possesses comedolytic and antibacterial

PHARMACOLOGY:
VEHICLE MATTERS

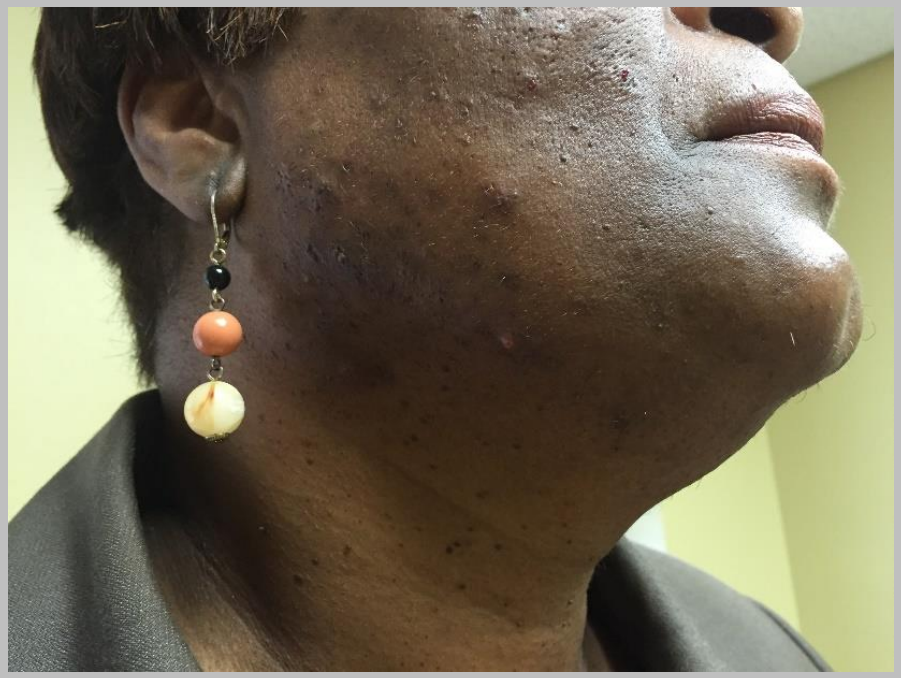
- Cream
- Foam
- Gel
- Lacquer
- Lotion
- Ointment
- Paste
- Powder
- Solution
- Spray
- Tincture

INTERACTIONS:

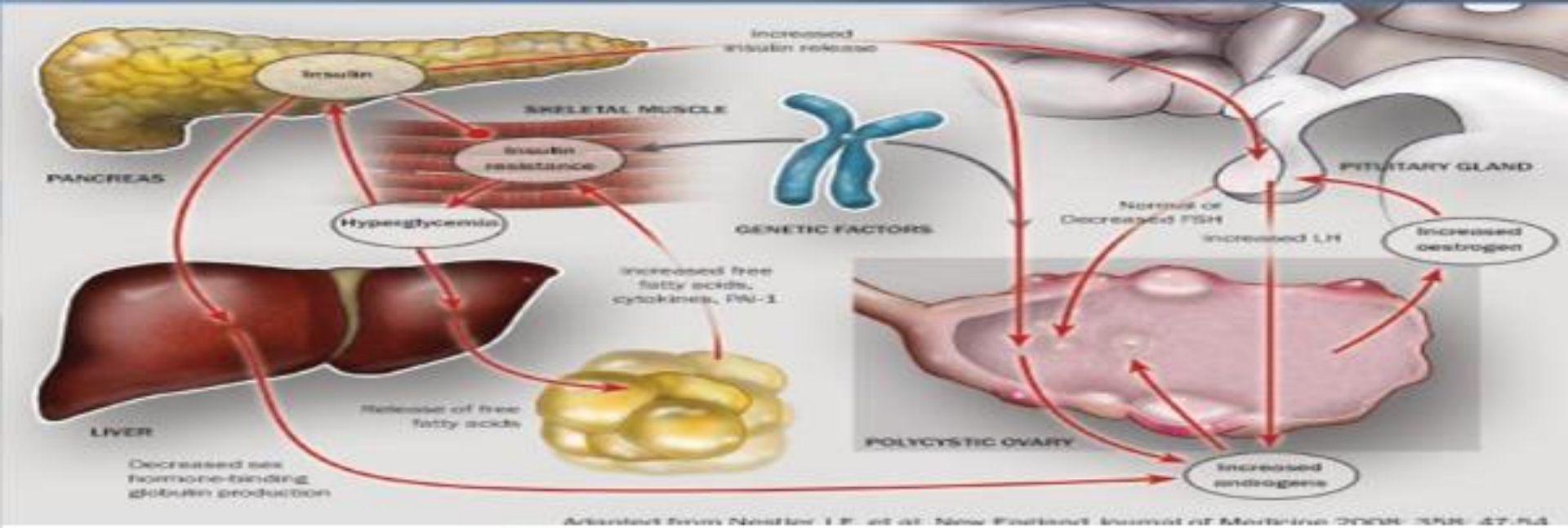


Rachel a 42 year old with severe ACNE and ACANTHOSIS NIGRICANS is suspected of having PCOS. Her quantitative HCG is 2 and her 75-G oral glucose tolerance test (OGTT) results show her 2 hour post-load glucose value is 152 mg/dL which indicates she has:

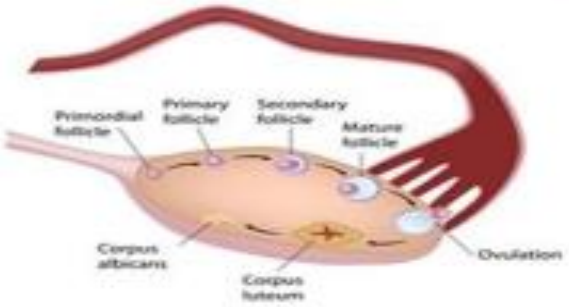
A. **Gestational diabetes**
B. **Type 1 diabetes mellitus**
C. **Type 2 diabetes mellitus**
D. **Impaired glucose tolerance**



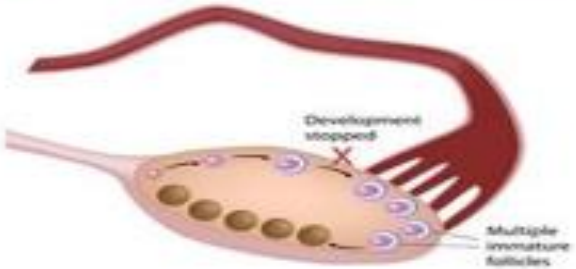
Personal image: H. Roebuck



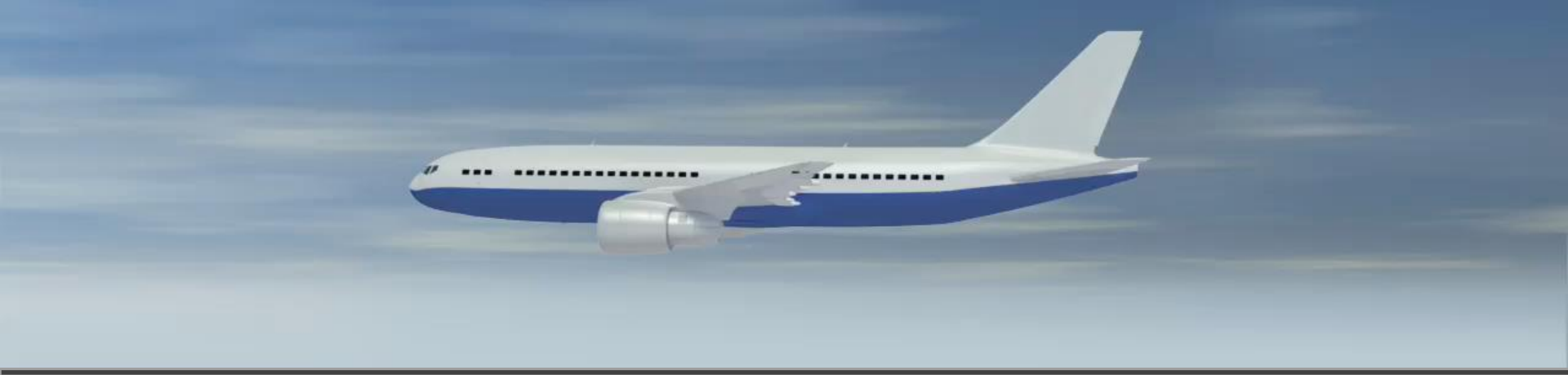
Insulin resistance in women with polycystic ovary syndrome



Normal Ovary



Polycystic Ovary



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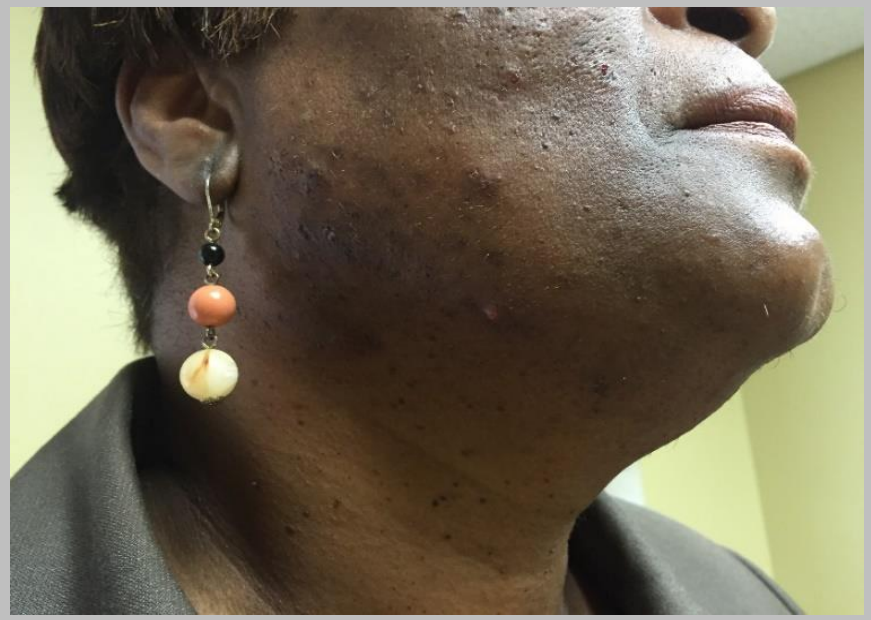

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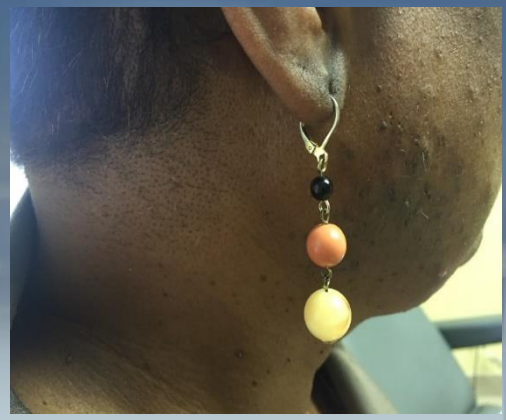
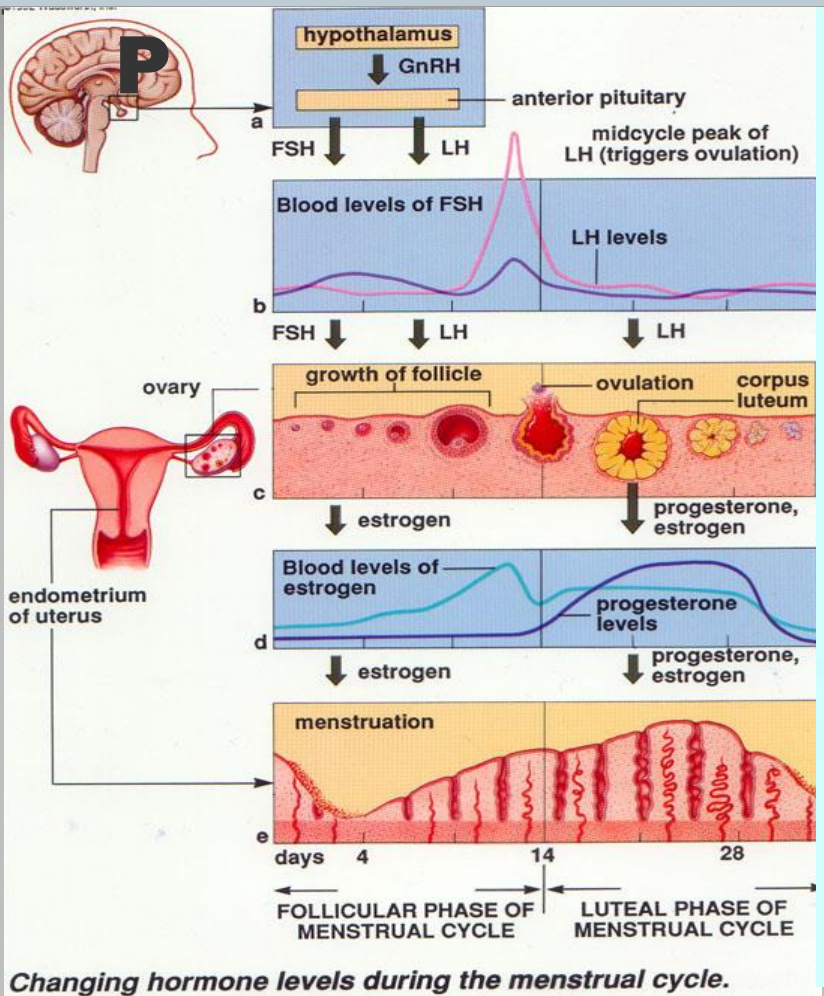
Diagnostic Criteria for PCOS

National Institutes of Health Criteria (1990)	Rotterdam Consensus Criteria (2003)	Androgen Excess and PCOS Society (2006)
Must Include all of the following: • Hyperandrogenism and/or hyperandrogenemia • Anovulation or oligo-ovulation • Exclusion of possible related disorders	Must include two of the following: • Anovulation or oligo-ovulation • Clinical or biochemical signs of hyperandrogenism • Polycystic ovaries	Requires all of the following: • Hyperandrogenism • Ovarian dysfunction • Exclusion of possible related disorders
The presence of polycystic ovaries is not necessary for diagnosis	All possible related disorders must be ruled out for a diagnosis of PCOS to be made	Emphasizes that the diagnosis of PCOS should not be made without evidence of hyperandrogenism
First developed and most commonly used criteria today	Formulated to expand on NIH diagnostic definition of PCOS	Formulated to provide an evidence-based definition

PHARMACOLOGY

- OCP
- Metformin
- Spironolactone





Changing hormone levels during the menstrual cycle.

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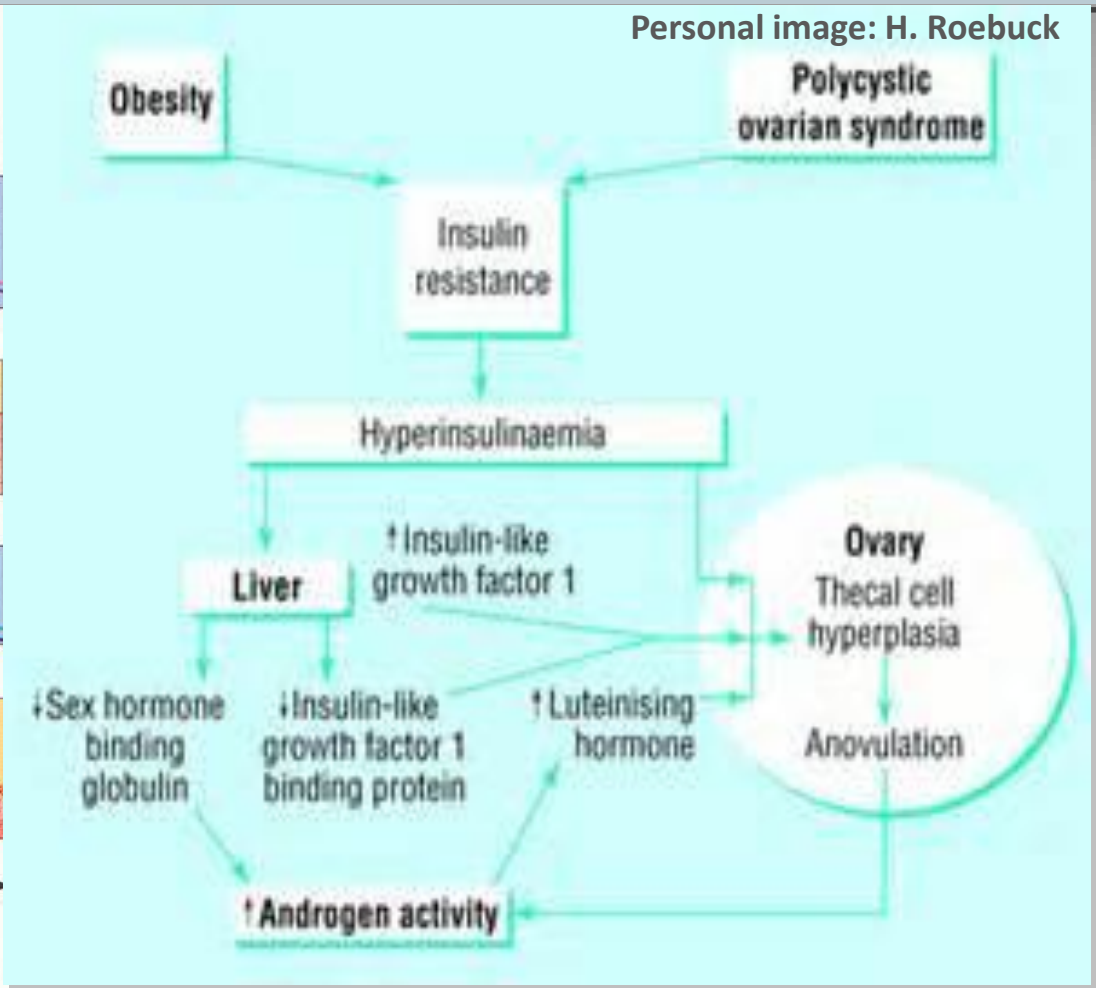
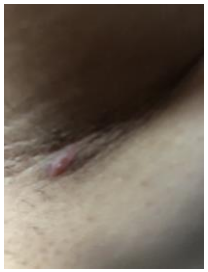
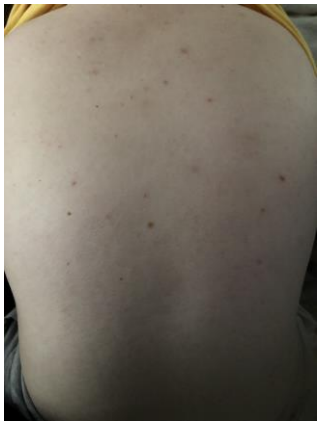
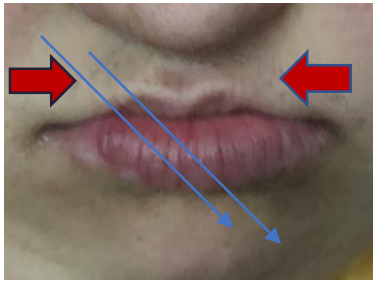


PEDIATRIC CASE STUDY



- 16 year old patient
- Acanthosis Nigricans Axillae
- Hair Thinning
- Hirsutism
- Hypothyroidism
- Menstrual Cycles: *6-8* per year
- Papulopustular and Nodular Truncal Acne
- Pacemaker and Open Heart Surgery History
- **PHARMACOLOGY RECOMMENDATIONS:**





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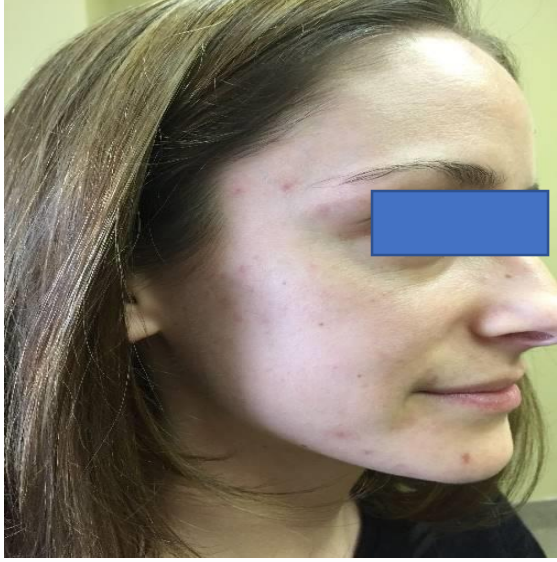
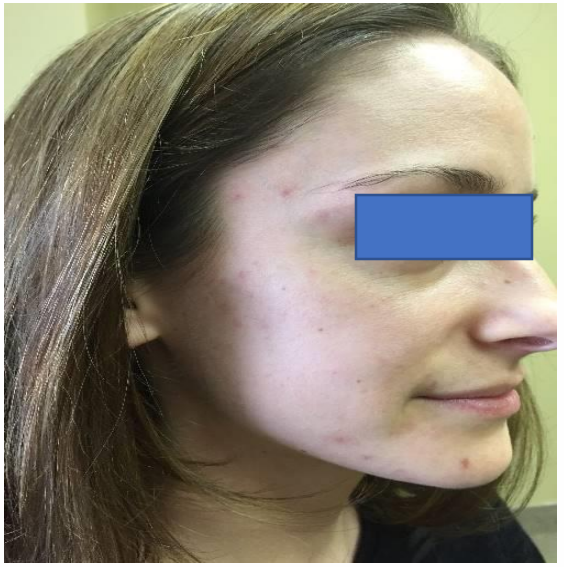
CASE STUDY

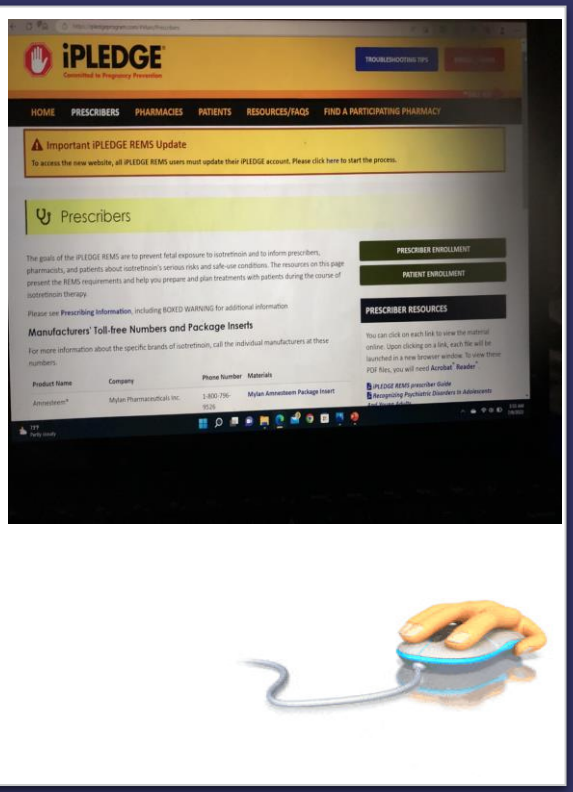


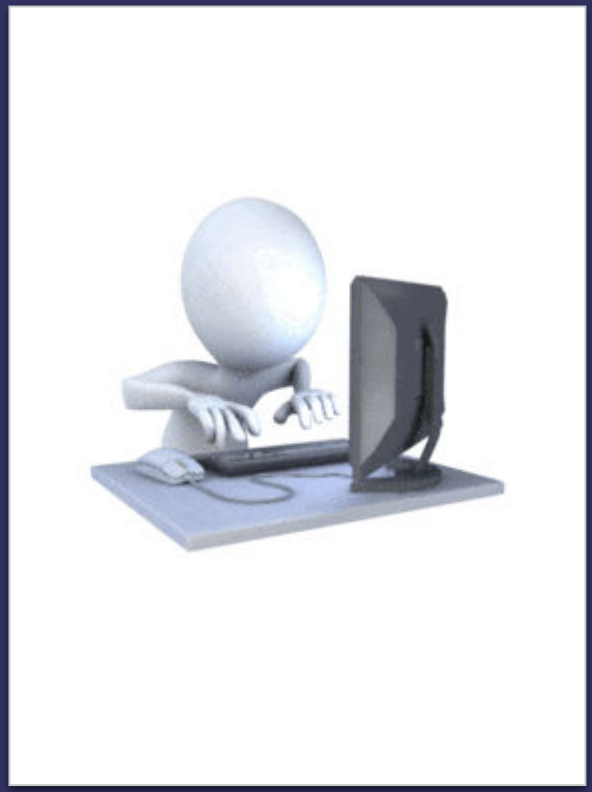
- 32 year old female
- Completed 3 courses of *isotretinoin*
- Dapsone 5% cream BID (Acne)
- Enalopril 5 mg QD (HTN)
- Ibuprofen 800 mg (Dysmenorrhea)
- Pseudoephedrine OTC (Allergy/Sinus)
- Remains on OCP: contains drospirenone/ethinyl estrodiol and levfomefolate calcium (Acne & PCOS)
- Spironolactone 100mg QD (Hirsutism & PCOS)
- Trimethroprim 100 mg BID (UTI)

Which of her medications can cause hyperkalemia?

A. Dapsone, Pseudoephedrine, & Spironolactone
B. Ibuprofen, Pseudoephedrine, & Tretinoin
C. Enalapril, Spironolactone, & Trimethoprim
D. Pseudoephedrine, Spironolactone, & Tretinoin







PHARMACOLOGY: FDA SAFETY PROGRAM

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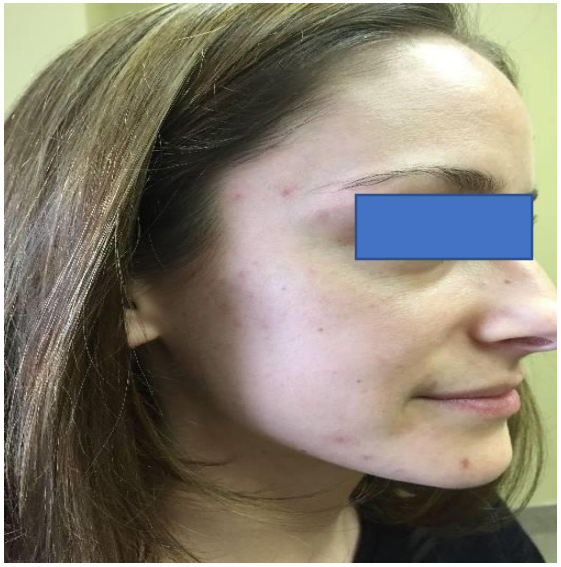
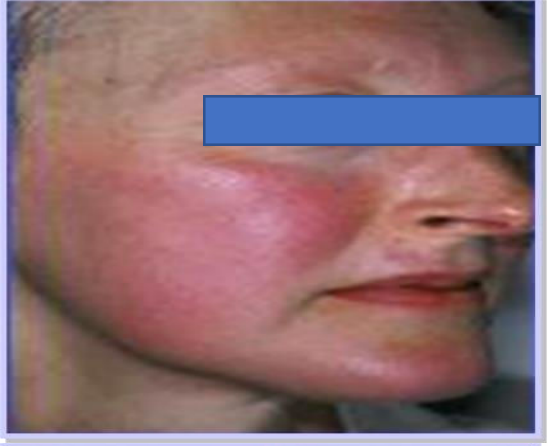
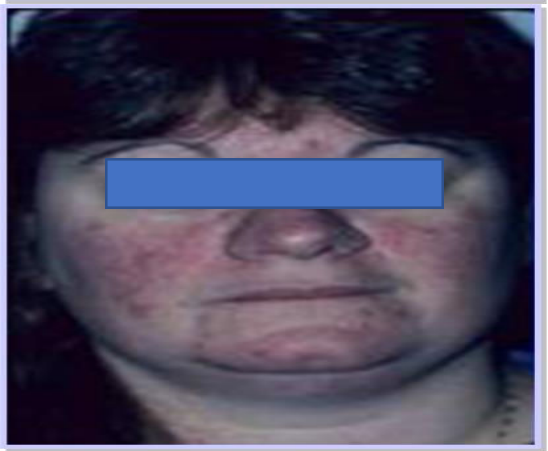
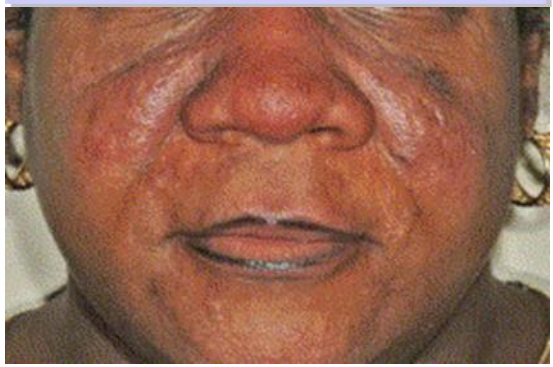


ROSACEA

- Affects ***16 million***
- Chronic Vascular Disease
- More common in Women ***3:1***
- Men: More Phymata
- Occular: Can lead to vision loss
- Pediatric Patients also found to experience genital flushing







DIAGNOSTIC CRITERIA

SOLE REQUISITE CRITERION:

Persistent erythema of the central face for a minimum of 3 months

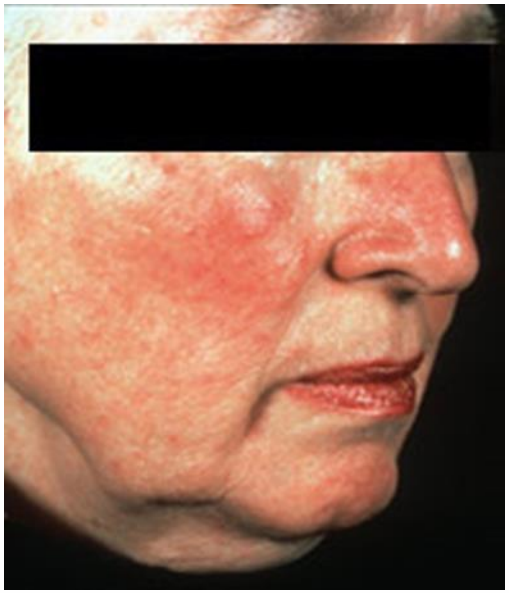
Supportive Findings:

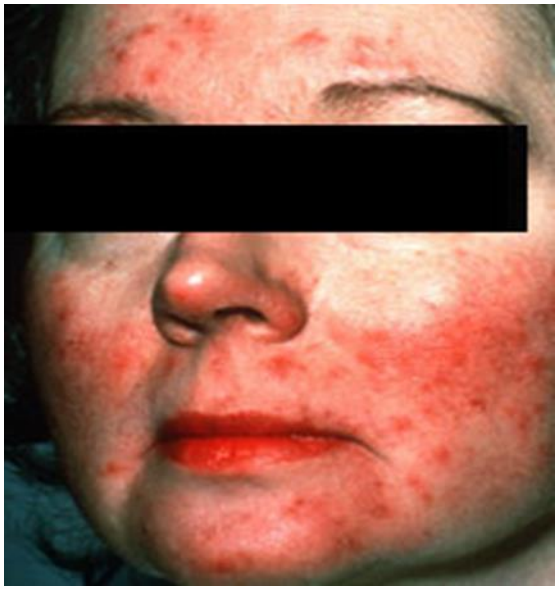
- Flushing
- Papules
- Pustules
- Telangiectasia
- *Not Required*

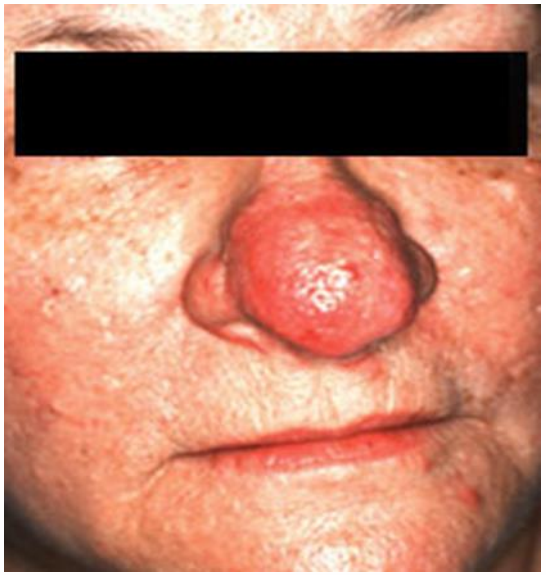
Secondary Features:

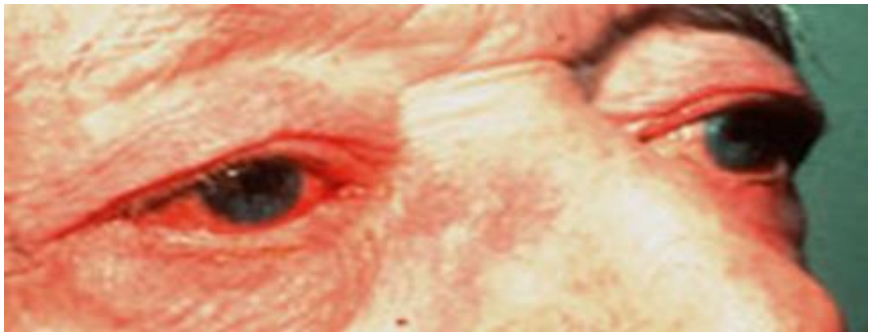
- Burning or stinging
- Edema
- Plaques
- Dry appearance
- Ocular manifestations
- Phymatous changes

Rosacea: Variants

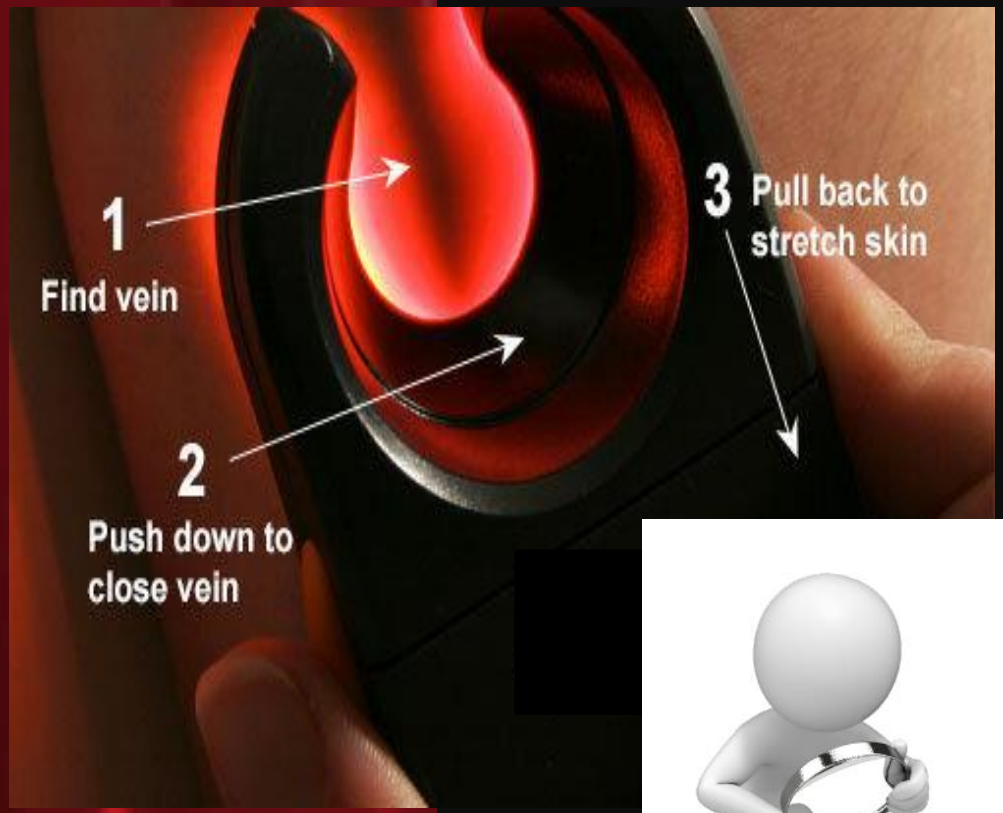








TELANGIECTASIA ASSESSMENT



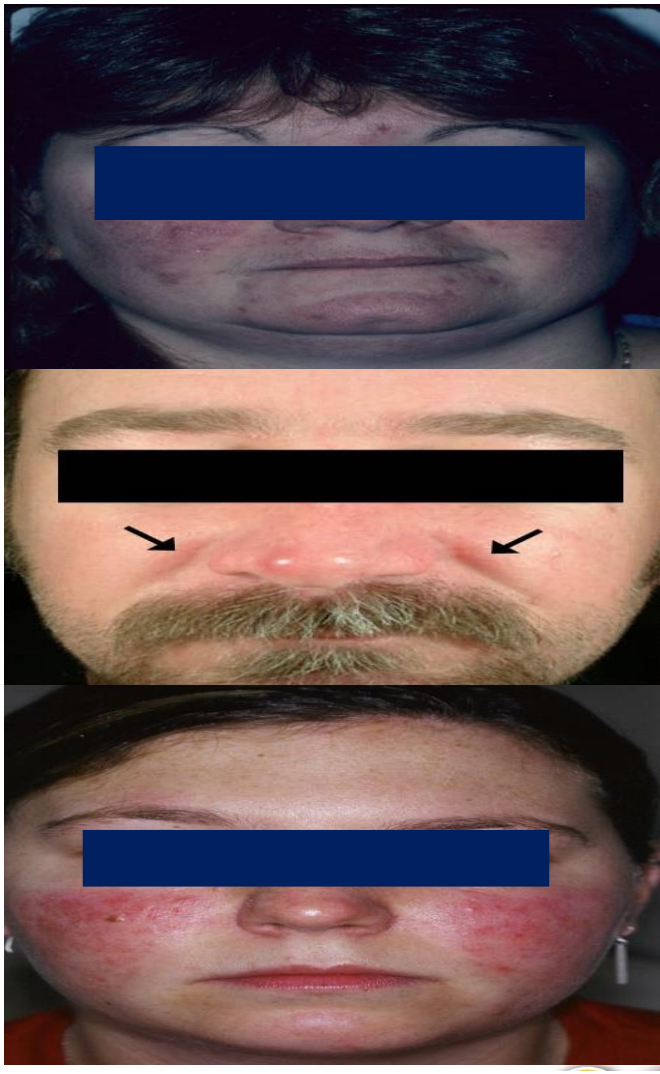
PAPULOPUSTULAR ROSACEA

- **Inflammatory lesions**:
- Papules and or Pustules
- Sparing of periocular skin
- Flushing though mild
- Edema sometimes noted

A

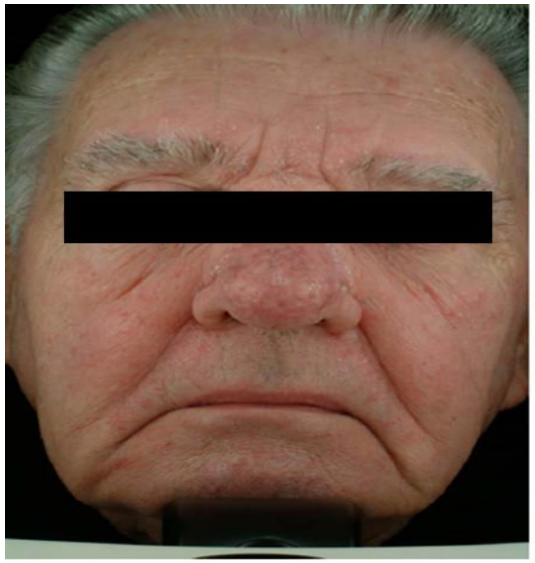
B

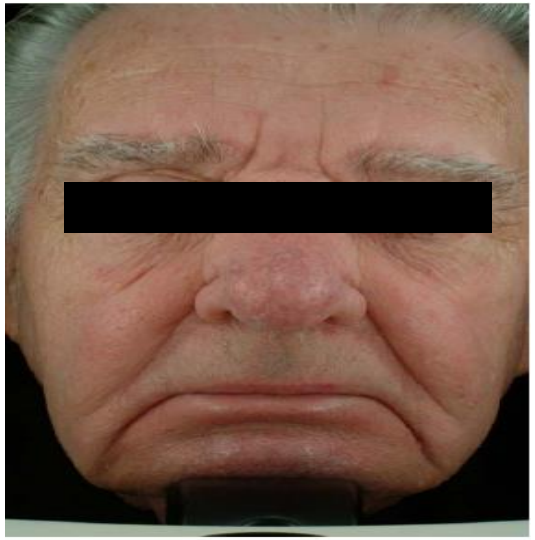
C



PHARMACOLOGY CASE STUDY:

- Comorbid Conditions
- Systemic Medication
- Tolerates Topicals



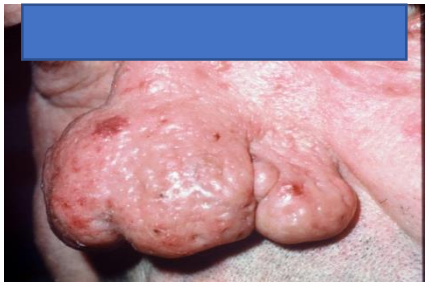


PHYMATOUS ROSACEA CASE STUDY

- ACTINIC KERATOSES
- SEBACEOUS HYPERPLASIA
- SEBORRHEIC DERMATITIS

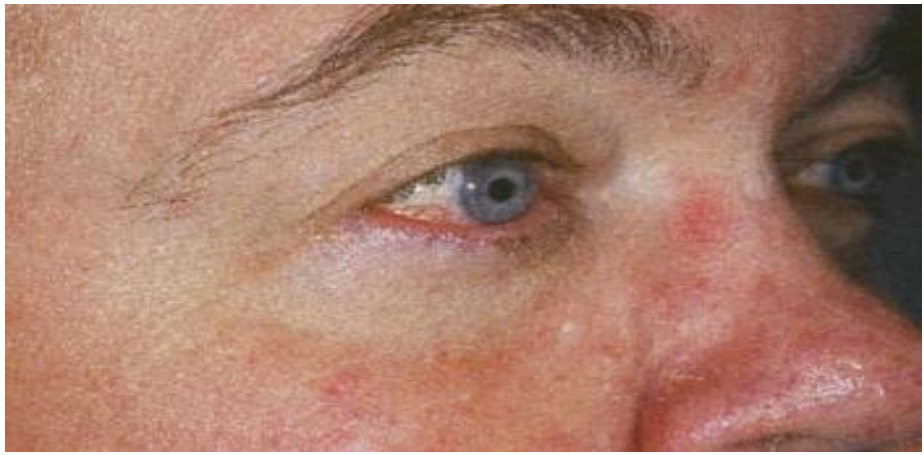
PHARMACOLOGY

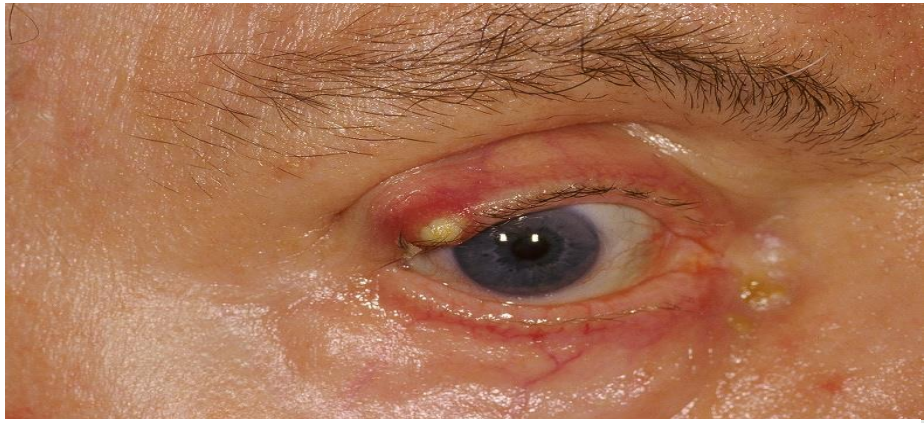
- Azelaic Acid
- Isotretinoin
- Retinoid



OCULAR ROSACEA

- Can precede cutaneous signs
- Severity not proportional to the severity of facial rosacea
- **FREQUENT SYMPTOMS:**
- Burning, Stinging, Itching
- Blurred Vision
- Light-sensitivity
- Foreign Body sensation
- ***50%*** of all rosacea patients
- Blepharitis and Conjunctivitis
- **PHARMACOLOGY**
- Lid Hygiene
- Eye Drops
- Antibiotics





TRIGGER FACTORS

HEAT
Inside (eg, exercise, hot baths, overdressing)
Outside (eg, radiant heat)
Hot food/beverages

EXERTION
Exercise, chronic cough, lifting

EMOTIONS
Anger, stress, embarassment

WEATHER
Hot, cold, strong winds, spring season

FOOD

Cayenne pepper	36%
Hot coffee	35%
Chocolate	33%
Tomatoes	31%
Hot tea	30%
Citrus fruits	27%
Black pepper	18%
Cheese	14%
Cured meats	14%

ALCOHOL

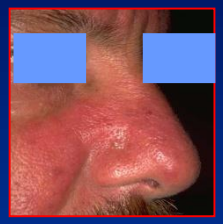
Red wine	48%
Liquor	37%
Beer	26%

TOPICAL PRODUCTS
Astringents
Irritants
Some cosmetics

DISEASE
Carcinoid syndrome
Mastocytosis, tumors
Migraine headaches
Hot flashes

DRUGS
Vasodilators, nicotinic acid, calcium channel blockers, cholinergic agents, cyclosporin A, opiates, tamoxifen, erectile disfunction Medications

ROSACEA PATHOGENESIS



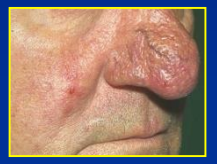
Erythema
Flush

Prolonged
Vasodilation
Skin Damage

Telangiectases

Hot Skin
Microbes

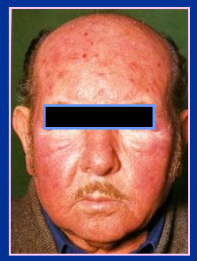
Irritation
Seborrheic Dermatitis
Hot Skin
Microbes



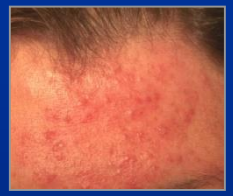
Papules
Pustules

Lymphatic
Stasis

Edema



Dermatitis
(Dryness)



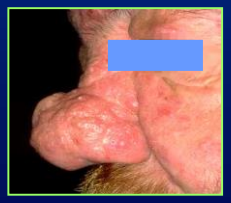
Chronic
Inflammation

Factor XIII

Lymphatic
Stasis

Barrier
Disruption
Sensory
Irritation

Demodex



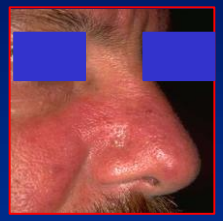
Fibrosis
Phymata

Chronic
Inflammation

Cellulitis

Stinging

Rosacea Pathogenesis



Erythema Flush

Prolonged Vasodilation Skin Damage

Telangiectases

Irritation

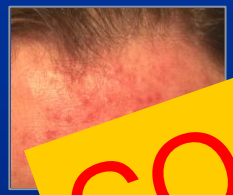
Seborrheic Dermati…

Hot Sk…

Hot Skin Microbes

Papules Pustules

Lymphatic Stasis



Dermatitis (Dryness)

COMPLEX AND UNRESOLVED

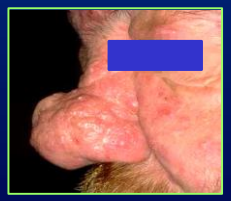
…nic …flammation

Factor XIII

Lymphatic Stasis

Barrier Disruption Sensory Irritation

Demodex



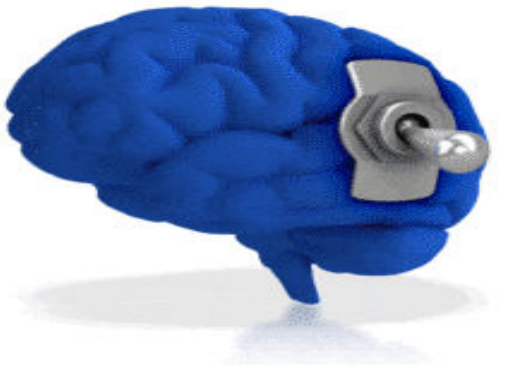
Fibrosis Phymata

Chronic Inflammation

Cellulitis

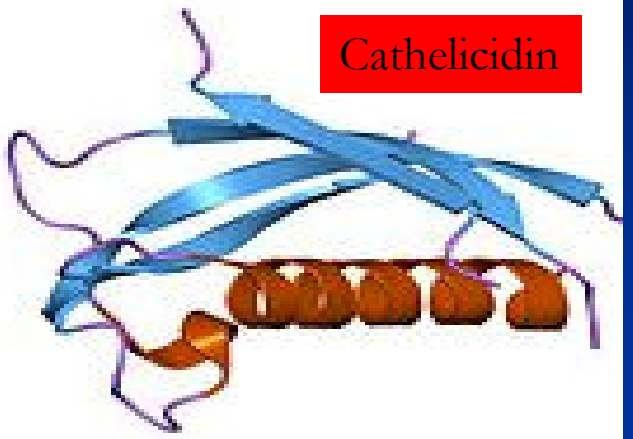
Stinging

NEUROVASCULAR DYSREGULATION

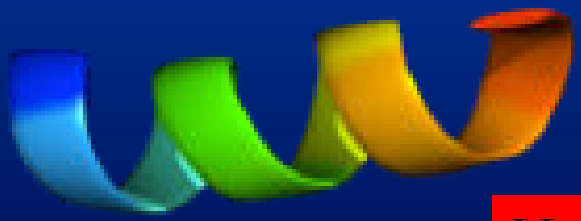


- **Flushing:** Increased facial blood flow
- **Neurosensory:** Stinging and burning
- **Neurogenic Inflammation:** Heat/warmth and spices *capsaicin*
- **Norepinephrine Release:** presynaptic sensory nerve channels causes vasodilation
- **Emotional Stress:** activates sympathetic nervous system: releases chemicals that induce flushing, papules and pustules

CATHELICIDINS:
ANTIMICROBIAL PEPTIDES (AMPS)



KLK-5 (SCTE)



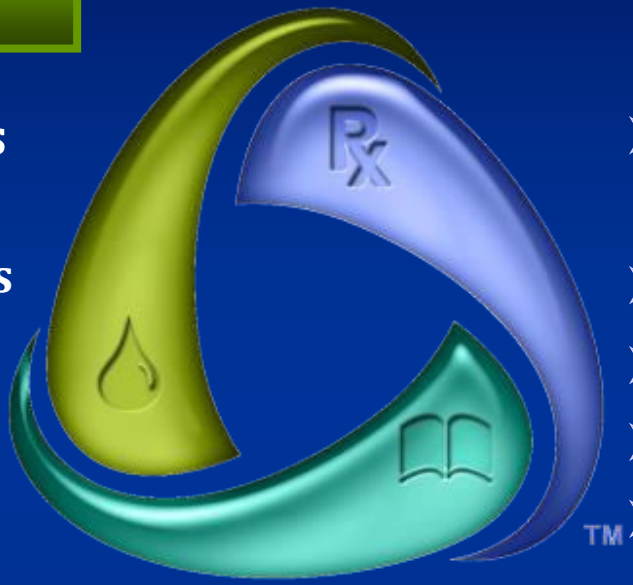
LL-37

- Patients with rosacea have elevated levels of **cathelicidin** and **KLK-5**
- **Cathelicidin** is cleaved into the antimicrobial peptide **LL-37** by both **kallikrein 5** serine proteases
- Excessive production of **LL-37** is suspected to be a contributing cause in ***ALL variants*** of *Rosacea*

ROSACEA: A Triad Approach to Patient Care

Skin Care

- Cleansers & Moisturizers
- Skin barrier repair
- Appropriate cosmeceuticals
- **SUN PROTECTION**



Prescriptions

- Flare control maintenance
- **PHARMACOLOGY:**
- Erythema
- Papules & Pustules
- Comorbid Conditions

Patient Education

- Inform patients about the chronic, long-term nature of rosacea
- Manage patient expectations about therapy
- Teach patients to identify and manage trigger factors
- Stress importance of adherence after initial improvement

Pharmacology: *Rosacea Therapies*

2013-Present
- Topical Brimonidine .33%
- Topical Ivermectin 1%
- Oxymetazoline HCL 1%
- Probiotics
- New Research: Genetics

1953
- Oral Tetracycline

1956
- Topical Sulfacetamide-Sulfur

1967
- Oral Doxycycline

Mid-1970s
- Topical Antibiotics
- Erythromycin
- Clindamycin

1972
- Oral Minocycline

2002
- Topical Azelaic Acid 15%
- Generic Metronidazole .75%

2005
- Topical Metronidazole 1.0%

2006
- Subantimicrobial Docycycline 40mg

1988
- Topical Metronidazole

Late 1990s - 2004
- Sulfacetamide-Sulfur Formulations

Pharmacology: Vehicle Matters

- Cream
- Foam
- Gel
- Lacquer
- Lotion
- Paste
- Powder
- Ointment
- Spray
- Tincture or Solution

Interaction

ROSACEA: A PHARMACOLOGIC PERSPECTIVE

- Dietary and lifestyle changes
- Free provider and patient information available:
- WWW.ROSACEA.ORG
- Topical Metronidazole: Cream, Gel, Lotion
- Azelaic Acid: Cream, Foam, Gel (Finacea®)
- Ivermectin 1% Cream (Soolantra®)
- Brimonidine 0.33% Gel (Mirvaso®)
- Oxymetazoline HCL 1% (Rhofade®)
- Topical retinoids: Cream, Foam, Gel
- Isotretinoin in severe cases: Oral (iPLEDGE Program)
- Ocular: Doxycycline (Oracea®) and Gentle Shampoo/Wipes

PHARMACOLOGY: TOPICAL AZALEIC ACID

- FDA approved 2003: **PAPULOPUSTULAR ROSACEA**
- Decreases cathelicidin expression after 4 weeks
- Decrease KLK-5 mRNA expression after 12 weeks
- Has comedolytic properties: **ACNE & MELASMA**
- Foam vehicle more tolerable than the cream or gel

PHARMACOLOGY: ORAL DOXYCYCLINE

- Subantimicrobial Dose:
- ANTI-INFLAMMATORY
- Doxycycline: 40mg Capsules Decreases LL-37 levels
- Doxycycline: 20 mg By Mouth BID
- Indirectly Inhibits Serine Protease Activity (SPA) by Inhibiting Matrix Metalloproteinases (MMPS)
- Improves PAPULOPUSTULAR
- Improves OCULAR ROSACEA
- EDUCATE TO WEAR SUN PROTECTION

DEMODEX FOLLICULORUM AND *BACILLUS OLERONIUS*

- ***DEMODEX FOLLICULORUM:*** most common ectoparasites
- Increased mite prevalance found in people with **PAPULOPUSTULAR ROSACEA**
- New evidence suggests:
  - ***DEMODEX*** form a symbiotic relationship with ***BACILLUS OLERONIUS***, an anaerobic bacterium able to eliminate lipid degradation products, which ***DEMODEX*** cannot

PHARMACOLOGY:

- ***BACILLUS OLERONIUS***, not ***DEMODEX***, is responsible for an increase in an **INFLAMMATORY REACTION**
- ***BACILLUS OLERONIUS*** **TREATMENT:**
- Doxycycline, Erythromycin, Minocycline
- Topical Ivermectin: Soolantra®

MMPs: ROSACEA, GLIOMAS, & PARKINSON'S

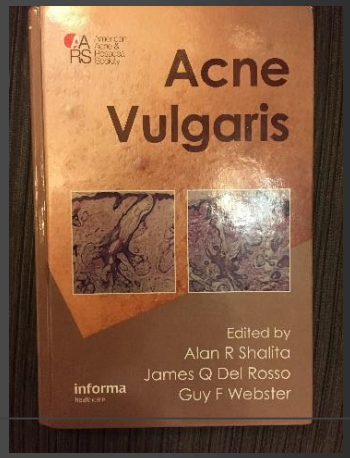
- MMPs may contribute to the link between ROSACEA and the risk for glioma and PARKINSON'S DISEASE
- MMP upregulation is seen in all three disease states and is associated with NEUROINFLAMMATION
- Incidence in ROSACEA patients 4 times Higher
- The incidence of PARKINSON'S DISEASE was 7.62 per 10,000 person-years among rosacea patients vs. 3.54 in the general population

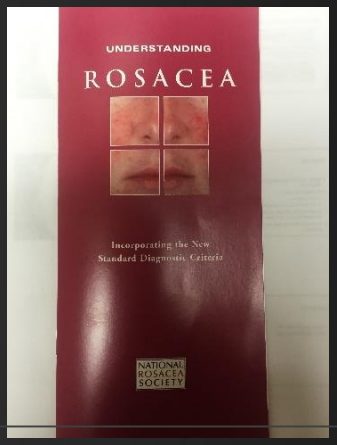
THE NEUROPROTECTIVE EFFECT:

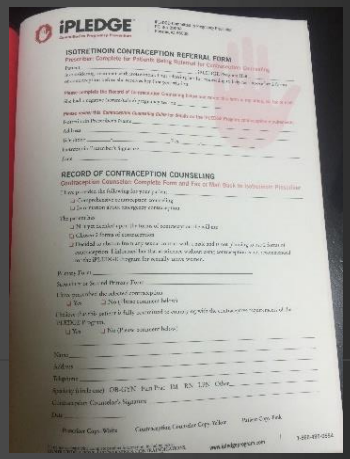
- TCN: Reduces risk of Parkinson's disease in patients with **ROSACEA**
- The Danish Study
- 2% ⬇ in Parkinsons if Tetracycline
- **INHIBITS MMP EXPRESSION:** may explain potential neuroprotective effect

SEX MAKES ROSACEA FLARE

UTILIZE RESOURCES







Patient & Provider=Ticket to Success!

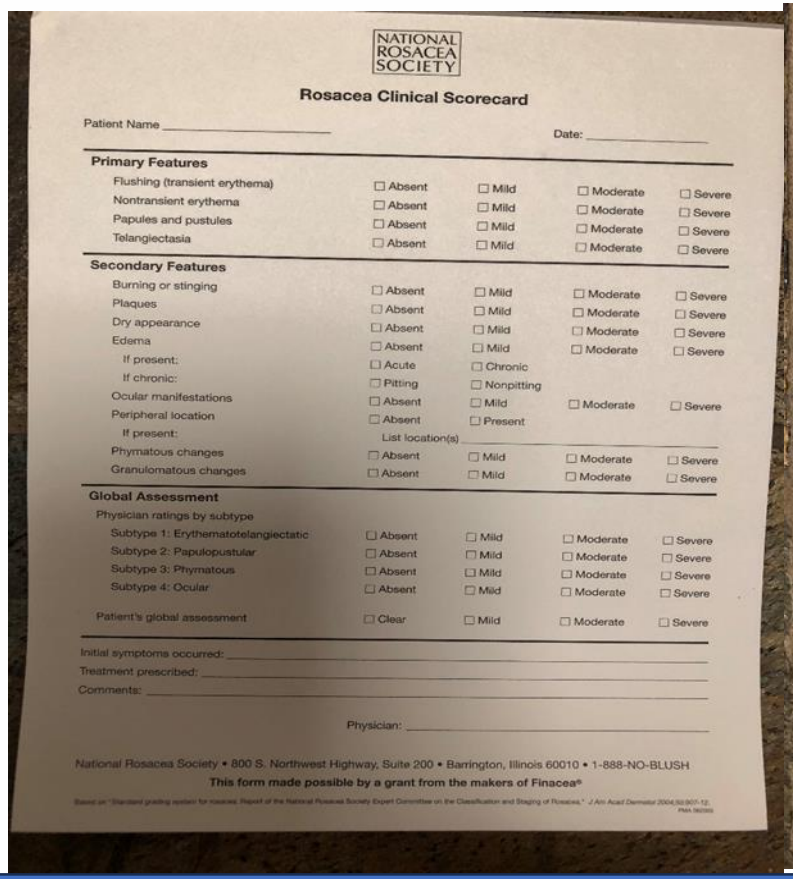
- Collaboration: iPledge Funding

NEW ROSACEA TOOL KIT: 1-888-NO-Blush

Diagnostic Tool Sheet

Managing ROSACEA

ROSACEA Diary



NATIONAL ROSACEA SOCIETY

Rosacea Clinical Scorecard

Patient Name _____ Date: _____

Primary Features				
Flushing (transient erythema)	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
Nontransient erythema	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
Papules and pustules	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
Telangiectasia	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
Secondary Features				
Burning or stinging	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
Plaques	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
Dry appearance	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
Edema	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
If present:	☐ Acute	☐ Chronic		
If chronic:	☐ Pitting	☐ Nonpitting		
Ocular manifestations	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
Peripheral location	☐ Absent	☐ Present		
If present:	List location(s) _____			
Phymatous changes	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
Granulomatous changes	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
Global Assessment				
Physician ratings by subtype				
Subtype 1: Erythematotelangiectatic	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
Subtype 2: Papulopustular	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
Subtype 3: Phymatous	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
Subtype 4: Ocular	☐ Absent	☐ Mild	☐ Moderate	☐ Severe
Patient's global assessment	☐ Clear	☐ Mild	☐ Moderate	☐ Severe

Initial symptoms occurred: _____

Treatment prescribed: _____

Comments: _____

Physician: _____

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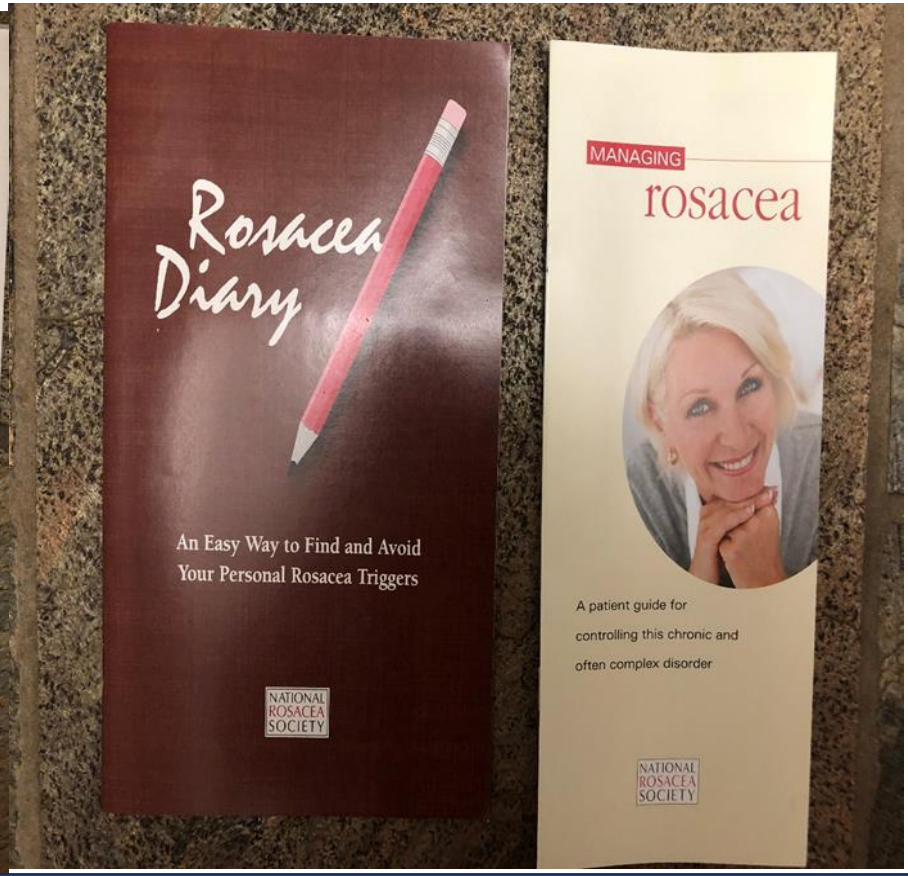
This form made possible by a grant from the makers of Finacea®

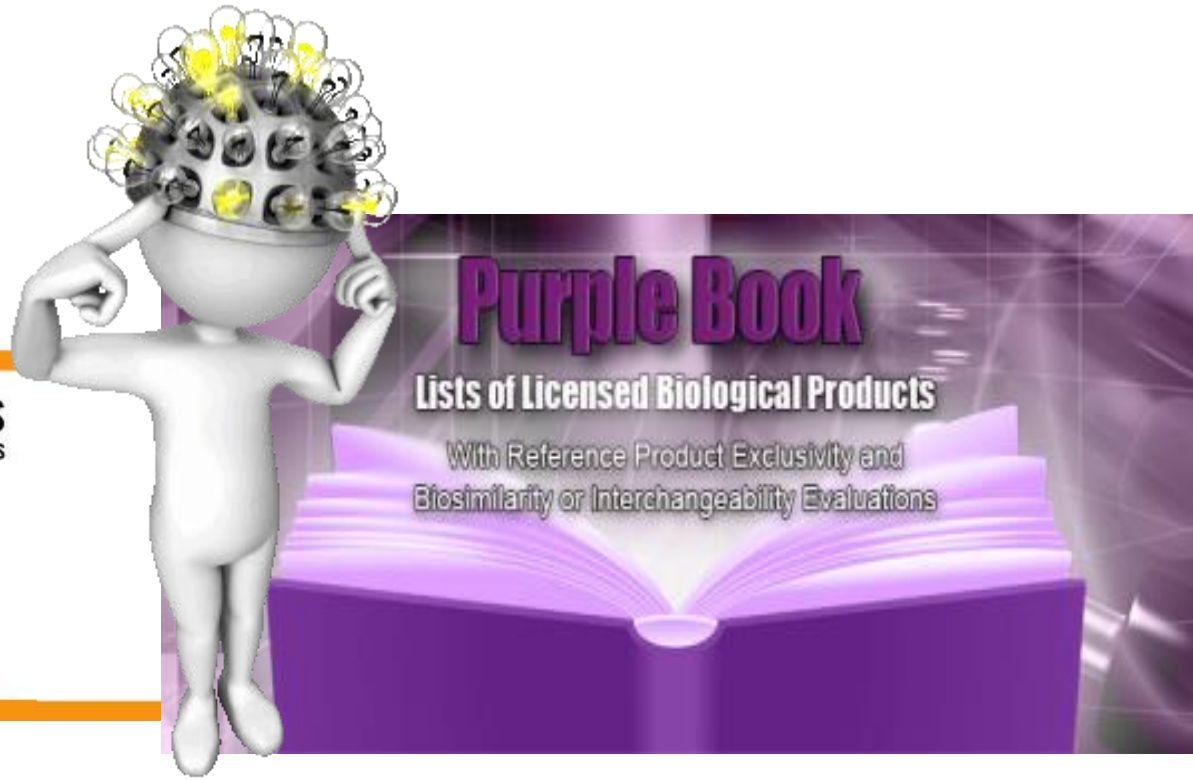


Resources for Patients and Clinicians

- **Consumer Lab: Identifies quality health and nutritional products through independent testing**
- **American Botanical Council: Reliable herbal medicine information**

RESOURCES FOR THE HEALTHCARE COMMUNITY

FDA Listings of Generics and Biologics, Including Biosimilars



- A listing of approved **small-molecule drugs** and their **generic** equivalents
- Lists of **licensed biological products,** including **biosimilars** and interchangeability evaluations

US FDA Website. Orange Book. http://www.fda.gov/Drugs/InformationOnDrugs/ucm129662.htm. Accessed June 16, **2022. 2. US FDA Website.** Purple Book http://www.fda.gov/Drugs/DevelopmentApprovalProcess/HowDrugsareDevelopedandApproved/ApprovalApplications/TherapeuticBiologicApplications/Biosimilars/ucm411418.htm. Accessed June 16, 2022.

What is Your Professional Imprint?

RESOURCES

- WWW.ROSACEA.ORG
- WWW.ACNEANDROSACEA.ORG
- ADVERSE REACTIONS
- 1800-FDA-1088
- www.accessdata.fda.gov
- World Health Organization:
- Medication without Harm

www.who.int/patientsafety/medication-safety/en/

- www.fda.gov/health-professionals
- www.ncbi.nlm.nih.gov/home/learn/


Enjoy
the
Journey!

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