

Dermatologic Disorders

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Acne

Acne

- Hair follicles and their corresponding sebaceous glands that produce excessive oil
- Follicles get plugged
- Typically affects the upper part of the body, face, neck, trunk
- Whiteheads/blackheads
- Redness, papules
- Release of pus – pustules
- Scarring

Risk Factors

- Age
 - Puberty age
 - Excessive androgen production
- Medications
 - Exogenous androgens
 - Steroids
 - Lithium
- Diet
 - Chocolate
- Stress
- Family history

Drug Therapy

- Topical retinoids
 - Typically first line for most patients
 - Vitamin A derivatives
 - Tretinoin (Retin-A), tazarotene (Tazorac), adapalene (Differin)
 - Can be used in combination with benzoyl peroxide and/or topical antibiotics
 - Do not apply at the same time as benzoyl peroxide
 - If using both, usually do one in the morning and one at night (may reduce effectiveness and/or increase peeling, adverse effects risk)
 - Dryness, irritation, flaking adverse effects

Drug Therapy

- Benzoyl peroxide
 - Mechanism of Action: Inhibits growth of *P. acnes* bacteria and helps reduce inflammation by breaking down proteins and lipids in sebum
 - Can be used in mild cases as monotherapy or in combination for moderate to severe acne
 - Redness, irritation, dryness, flaking, burning are most common adverse effects
 - Can help reduce bacterial resistance risk especially when used in combination with oral or topical antibiotics
 - Alert patients that it can stain/bleach clothes, towels etc.

Drug Therapy

- Topical antibiotics
 - Mechanism of Action: Inhibits bacterial growth by inhibiting protein synthesis
 - Clindamycin, erythromycin
 - Topical adverse effects possible, (i.e. irritation, redness etc.)
 - Do NOT use as monotherapy - bacterial resistance is a possible concern, used with benzoyl peroxide or retinoids to reduce this risk

Drug Therapy

- Salicylic acid
 - Mechanism of Action: keratolytic agent that can help with anti-inflammatory and antibacterial activity
 - Alternative if topical retinoids or other agents are not tolerable
 - Available OTC
 - Inexpensive
 - Less robust evidence to support use

Drug Therapy

- Systemic antibiotics
 - Minocycline, doxycycline, erythromycin, sulfa/trimethoprim
 - Typically used in combo with other agents
 - Not first line due to potential for systemic adverse effects and antibiotic resistance risk
 - Most common adverse effects are GI for systemic antibiotics

Drug Therapy

- Tetracycline derivatives
 - Cation interactions (Fe, Calcium, etc.)
 - Educate patients of sunburn risk
 - Careful with women of child-bearing age – contraindicated for acne use; tooth discoloration
- Erythromycin
 - 3A4 inhibitor so drug interaction concerns
 - QTc prolongation risk
- Sulfamethoxazole/trimethoprim
 - Long term risks of bone marrow suppression
 - Rash/SJS risk (rare)
 - Trimethoprim can elevate potassium levels (exacerbated by other drugs, i.e. ACE/ARB/Aldosterone Antagonist)
 - Administer with full glass of water

Oral Isotretinoin

- Oral isotretinoin is recommended for the treatment of severe nodular acne
 - Mechanism of Action: Activates retinoic acid receptors which can help create immunomodulatory and anti-inflammatory activity
 - Reserved for very serious cases of acne
 - Routine monitoring of liver function tests, serum cholesterol, and triglycerides at baseline and again until response to treatment is established is recommended
 - Birth defect risk
 - Special REMS program
 - iPLEDGE
 - Required pregnancy test being negative before issuing the medication every month
 - Only allowed to dispense within a given window
 - Adverse effects; dry lips, CNS effects, hair thinning, nose bleeds, swelling of eye lids or lips, sun sensitivity, and rarely SJS

Alternative Considerations

- Oral Contraceptives (Females)
 - Mechanism of Action: May help in managing acne via anti-androgenic effects
 - See contraception for more information
- Spironolactone (Aldactone)
 - Mechanism of action: Potassium sparing diuretic that is an aldosterone antagonist and provides antiandrogenic effects as well
 - Acne dosing ranges from 50-200 mg
 - See heart failure/hypertension for more information
- Severe inflammation – consider corticosteroids

Dermatitis

Dermatitis

- Contact, Atopic (Eczema)
 - Inflamed skin
 - Redness
 - Itchy
- Treatment
 - Topical Steroids
 - Calcineurin Inhibitors (i.e. tacrolimus)

Corticosteroids

- Reduces inflammation by slowing activity of inflammatory mediators like histamine, kinins, and prostaglandins
- Skin thinning
- Enlarged blood vessels
- Systemic steroid adverse reactions are possible with prolonged, large quantity use
- For mild disease, select a low potency topical corticosteroid
- For moderate disease, may select a medium to high-potency topical steroid
- A few common potency examples - in order of least potent to most
 - Hydrocortisone (Cortizone)
 - Fluocinonide (Lidex), betamethasone valerate (Celestone, Diprolene)
 - Triamcinolone (Kenalog)
 - Clobetasol propionate (Clobevate), betamethasone dipropionate

Common Steroids

- Determinants of potency
 - Drug
 - Percentage
- Table
 - <https://www.psoriasis.org/about-psoriasis/treatments/topicals/steroids/potency-chart>

Calcineurin Inhibitors

- Reduces T-cell activation and also release of inflammatory cytokines
- Tacrolimus (Protopic), pimecrolimus (Elidel)
- Potential alternative to steroids in mild-moderate cases
- Adverse effect profile better than topical corticosteroids, typically no systemic effect risk; local irritation to site of application is most likely side effect
- Boxed warning due to rare cases of malignancy

Severe Cases

- For severe cases, may see systemic therapy given short term as adjunct therapy
 - Corticosteroids
 - Antihistamines (first generation if itching at night is problematic)
 - Biologic agents such as dupilumab or JAK inhibitors for severe cases

Psoriasis

Psoriasis

- Inflammation
- Excessive growth in the epidermis
 - Raised, rough skin
 - Scaly appearance
- Most common location
 - Elbows
 - Knees
 - Scalp
- Can result in pain in the joints (psoriatic arthritis)

Management

- Localized areas
 - Topical corticosteroids
 - Triamcinolone, betamethasone, etc.
 - Vitamin D analogs calcipotriene, calcitriol
 - Calcineurin inhibitors
 - Can increase risk of skin cancer
 - Coal tar
 - Messy

Management

- Moderate to Severe Disease
 - Systemic retinoids (acitretin)
 - Birth defect in females
 - Methotrexate
 - LFT, CBC
 - Similar dosing to RA – 10-25 mg per week
 - Folic acid
 - Cyclosporine
 - Immunosuppressive
 - HTN, nephrotoxicity, infection/malignancy risk
 - Tons of drug interactions
 - Biologics (etanercept, infliximab, etc.)
 - Risk of malignancy, infection
 - Injection/infusion
 - Expensive

Medication Causes of Skin Disorders

- Rash
 - Antibiotics
 - Sulfa
 - Penicillins
 - Macrolides
 - Opioids
- SJS risk
 - Antiepileptic (i.e. carbamazepine, lamotrigine)
 - Allopurinol
 - Penicillins
- **Timing, Timing, Timing

Steven Johnson's Syndrome

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SJS

- Severe skin reaction
 - Pain
 - Redness
 - Hives
 - Blisters/necrosis
- Complications
 - Sepsis
 - Cellulitis
 - Respiratory involvement
 - Skin damage

At Risk Patients

- Immunosuppressed
 - HIV
- Previous history of SJS
- HLA-B 1502 Gene
 - Chinese
 - Indian
 - Southeast asia

Medication Related Causes

- Allopurinol
- Lamotrigine
- Carbamazepine
 - HLA-B*1502 gene may place at higher risk
- Barbituates
- Phenytoin
- Sulfa
- PCN's
- NSAIDs
- Acetaminophen

Management

- Stop offending agent
- Simple analgesics for pain
- Monitor/treat as appropriate
 - Sepsis
 - Cellulitis
- Corticosteroids to reduce inflammation, pain as necessary
- Wound care as needed

Allergic Rhinitis

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Allergic Rhinitis

- Runny nose
- Sneezing
- Red, itchy eyes
- Sinus pressure
- Coughing
- Sore throat
- Make sure not from acute illness
- Reassess treatment throughout the year

Treatment

- Nasal corticosteroids
 - Fluticasone (Flonase, Veramyst), mometasone (Nasonex), triamcinolone (Nasacort), budesonide (Rhinocort)
 - Mechanism of Action: Stimulation of glucocorticoid receptors which results in a reduction in inflammation
 - First line agent – most effective
 - May take some time for max effect
 - Side effects (overall usually well tolerated)
 - Taste disturbance, nasal irritation
- Many patients will know what works best for them

Antihistamines

- Antihistamines
 - 2nd generation (loratadine - Claritin, cetirizine - Zyrtec etc.)
 - Sedation, not nearly as bad as first generation, dry mouth SE's
 - Usually much better tolerated than 1st generation so use of these agents is preferred
 - May be considered as add on therapy to nasal corticosteroids for moderate to severe cases
 - May be considered for monotherapy in some patients for mild or seasonal symptoms
 - 1st generation (diphenhydramine, doxylamine, etc.)
 - Highly anticholinergic
 - Not first line, however they are more commonly used in an allergic reaction due to their more systemic general antihistamine properties
 - Caution in elderly, avoid use if possible for allergic rhinitis
 - Might be advantageous if patient's allergies are causing insomnia
 - See urticaria for more information on antihistamines

Antihistamines

- Nasal sprays (azelastine – Astelin, olopatadine – Patanase)
 - Alternative to adding a 2nd generation oral antihistamine for moderate to severe cases
 - Combination product with nasal glucocorticoid is advantageous due to convenience (azelastine/fluticasone)

Other Therapies

- Systemic Decongestants
 - Pseudoephedrine (Sudafed) and phenylephrine (Sudafed PE)
 - Mechanism of Action: Stimulates alpha-adrenergic receptors which causes vasoconstriction and potential relief of nasal symptoms
 - Because of alpha stimulation
 - Can raise blood pressure (avoid in patients who aren't controlled)
 - Contribute to urinary retention (i.e. patients with BPH)
 - Possibly increase anxiety/insomnia
 - Contained within many combination products with an oral antihistamine (i.e. Claritin D, Allegra D, etc.)
 - Oral phenylephrine not that effective per FDA

Other Therapies

- Nasal Decongestant

- Oxymetazoline (Afrin)

- Mechanism of Action: Stimulates alpha-adrenergic receptors, causes vasoconstriction and potential relief of nasal symptoms
 - Nasal spray
 - Use only for 3 days max due to risk of rebound congestion

- Nasal saline

- Minimal to no side effects
 - Can help with symptoms, irritation, and removal of mucous

Other Therapies

- Leukotriene modifiers
 - Montelukast (Singulair)
 - Mechanism of Action: Blocks leukotriene receptors which is an important pathway in the inflammatory process
 - Typically reserved for if other treatments fail or patients have corresponding reactive airway disease
 - Boxed warning for psychiatric events such as aggression, suicide, and depression

Eye Disorders

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Glaucoma

- Leading cause of blindness worldwide
- Peripheral loss
- Borderline Pressure 18-25
 - Assessment for damage
 - If damage, treatment
 - Some may argue >22
- Greater than 25 - treatment

Glaucoma Treatment

- Prostaglandins – first line therapy
 - Mechanism of Action: Agonist at prostaglandin FP receptor with lowers intraocular pressure by increasing outflow of the aqueous humor
 - Latanoprost (Xalatan), travoprost (Travatan), bimatoprost (Lumigan)
 - Side effects
 - eye pigment changes
 - eye irritation
- Beta-blockers
 - Mechanism of Action: Blunts adrenergic effects in the eye which ultimately leads to a reduction in aqueous humor production and reduction in intraocular pressure
 - Timolol (Timoptic), betaxolol (Betoptic), levobunolol (Betagan)
 - Systemic side effects rare but possible
 - Bradycardia, hypotension etc.

Glaucoma Treatments

- Alpha agonist
 - Mechanism of Action: Increases outflow, decreases production of aqueous humor
 - Brimonidine (Alphagan)
 - Eye irritation
- Carbonic anhydrase inhibitor
 - Mechanism of Action: By blocking carbonic anhydrase, this results in a reduction in fluid from aqueous humor and helps lower pressures
 - Dorzolamide (Trusopt), brinzolamide (Azopt), acetazolamide (Diamox)
 - Can leave a metallic taste in the mouth
 - Oral option sometimes used in refractory cases (acetazolamide) – can have impact on electrolytes/kidney function

Preventing Diabetic Retinopathy

- Blood sugar control
- Hypertension
- Regular Exams

Medications That Cause Eye Problems

- Hydroxychloroquine
- Tamsulosin
 - Floppy iris syndrome
 - Concern in cataract surgery
- Dry eyes
 - Cornea scratch/damage
 - Anticholinergics
 - Diuretics
- Cataract
 - Steroid use