PATHOPHYSIOLOGY of THE INTEGUMENT: INFECTIONS

Disorder	Etiology	Pathophysiology	Lab Findings and Diagnosis	Treatment
CUTAENOUS BACTERIAL INFECTION				
IMPETIGO	Primarily a pediatric disease **Non-bullous Impetigo** *S. aureus* and *S. pyogenes* Superficial infection with damagedskin barrier **Bullous Impetigo** *S. aureus* bacteriophage II → increased toxin secretion Localized form of SSS May occur on intact skin	**Non-bullous Impetigo** Yellowish serous crusting with vesicles and pustules Slow wound healing **Bullous Impetigo** Flaccid bullae Prodrome: malaise, fever, diarrhea Self-limiting disease with rapid resolution	Culture wound base or bulla fluid	Topical muporicin 2% ointment or oral ABx Cover sites to prevent extension
ECTHYMA	Resembles impetigo Typically associated with trauma *S. aureus* and *S. pyogenes*	Pustules and vesicles evolving to ulcerations with thick avid crust Wound healing leads to scarring	Wound culture	Oral ABx
ABSCESSES, FURUCNLCES, AND CARBUCLES	**RFs:** DM, elderly, immunosuppression, obesity, non-hygiene **Furuncles** are abscesses involving the hair follicicle **Carbuncles** are confluent collections of furuncles *S. aureus* is leading organism Anaerobes in inguinal lesions Sterile abscesses due to ruptured cysts	May occur anywhere, with preference for sites of trauma Tender nodules, usually fluctuant No systemic symptoms	Culture exudates	Drainage **ABx if**: Perinasal abscess Large or recurrent leion Cullulite No response to local control

ERYSIPELAS	Typically seen in eldery patients *S. pyogenes*	Erythematous plaque Well-defined border Typically involves the face and lower extremities Prodrome: fever, chills, malaise Recurrent infection results in obliteration of the lymphatic ducts		Oral ABx
ERYTHRASMA	*Corynebacterium minutissimum*	Erythematous patch with fine scle Well-defined border Favors axillae, inguinal folds, gluteal cleft, and moist skin **Asymptomatic**	**Wood's Lamp Exam** Results in red fluorescence	
SCALDED SKIN SYNDROME	*S. aureus* bacteriophage II → upregulation of **exfoliative toxins** (ET-A, ET-B) → bind to **desmoglein 1** → global desquamation R RFs: age < 6 yrs, renal failure (renal excretion of toxins, immunosuppression)	Prodrome: malaise, fever, cutaneous allodynia Erythema generalizing from the scalp Flaccid bullae Diffuse desquamation (3 – 5 d)	Bullae cultures are negative	Hospitalization IV ABx
CUTAENOUS FUNGAL INFECTION				
TINEA CORPORIS, CAPITIS, PEDIS, CRURIS	**Dermatophytes** *Trichophyton, Epidermphyton, Microsporum* spp. Anthropophilic strains undergo horizontal TMX Zoophilic: transmitted from animal contact Geophilic: transmitted through the soil	**Tinea corporis** Erythematous annular scaling plaques **Tinia Pedis** Erythema and scale on planat surae May have vesicles, pustules, and interdigital maceration **Tinea Capitis** White patches with scale and hair loss **Tinea Cruris** Erythematous patches, with maceration, in the inguinal creases Scrotal sparaing **Onychomycosis** Subungual hyperkeratosis, superficial white scale	**KOH Prep** Septate hyphal forms	Topical antifungals Prolonged systemic therapy for onychomycosis
PITYRIASIS (TINEA) VERSICOLOR	*Malazzezia furfur* TMX via direct contact	Asymptomatic Pink macules with powdery white superficial	**KOH Prep** Septate hyphal forms	Topical fungals Use oral Tx if disease is

		scale Hyperpigm,eentation in winter Hypopigmentation in summer	interspersed with spore clusters	widespread
SEBORRHEIC DERMATITIS	**RFs:** HIV infection, Parkinson's *Pityrosporum* spp. Yeasts	Yellowsh greasy scale Affects scalp, glabella, alar creasis, inguinal folds Pupules and maceration The disease is notably recurrent.		Topical anitfungals Low-dose corticosteroids if no response to ABx therapy
CUTANEOUS CANDIDIASIS	**RFs:** summer, high humidity, obesity *Candida* spp. yeasts	**Intertrigo** Erythematous patches with auxialliary papules andpsutules Maceration Malodorous	**KOH Prep** Pseudohyhal forms (non-spetate elongated chains of yeast cells)	Topical antifungals Zinc oxide paste to prevent maceration
CUTAENOUS VIRAL INFECTION				
HERPES SIMPLEX	**HSV1:** affects the oral mucosa **HSV2:** affects genitals Infection is typically subclinical **Primary Infection** Exposure of naïve cutaneous immune system to HXV virus **Latent Infection** HSV travels via retrograde axonal transport to the DRG. **Secondary Infection** In response to a stimulus (immunosuppression, stress, UV), the virus travels to the nerve terminal and affects focal areas (non-dermatomal distribution)	Prodrome: tingling, paresthesias (may be focal) Painful vesicular erosions on the skin Scalloped borders in resolving lesions The distribution does NOT occur along a dermatome Lymphadenopathy seen during primary infection **Erythema Multiforme** Targetoid macules Recurrent lesion on skin and oral mucosa with spontaneous resolution	**Tzanck Prep** Muntinucleated giant cells (epitheliloid layers of keratinocytes) Serology PCR	Oral antivirals

VARICELLA ZOSTER (SHINGLES)	**VZV** enters the sensory nerve during the primary infection → travels to the DRG The virus is reactivated by **immunosuppression** → travels to skin surface along the dermatome of the affected spinal root	Prodrome: tingling and parasthesias Painful vesicles appearing along a dermatome **Postherpetic Neuralgia** RFs: elderly, immunocuppressed Chronic pain along the affected distribution	**Tzanck Prep** Muntinucleated giant cells (epitheliloid layers of keratinocytes)	Oral antivirals
HUMAN PAPILLOMA	**HPV** affects basal keratinocytes	**Verrucae** Verrucous papules Central black spots due to microthrombosis Verrucae may be flat (minimal scale)or hyperkeratotic (thick scale) Interrupted dermatoglyphs	Acetowhite improves contrast of the lesons against skin	Salicyclic acid (daily Tx) Cryotherapy Curettage Immunotherapy Laser Ablation
MOLLUSCUM CONTAGIOSUM	TMX via direct contact Presumed STI	Papules with umbilicated center No pruritis Spontaneous resolution		Cryotherapy Curettage Immunotherapy
ERYTHEMA INFECTIOSUM (FIFTH DISEASE)	Typically a pediatric disease Parvovirus B19 ssDNA virus TMX via respiratory droplets	**In peds:** Erythematous patches on cheeks converting to lacy reticulate patches **In adults:** Prodrome: headache, fever, abdominal pain Arthralgia May have apalstic crisis Hydrops fetalis if pregnant No cutaneous manifestation	Acute and convaslescent serum titres	No direct Tx Isolation from pregnant women Disease is NOT contagious upon appearance of the rash
PARASITIC INFECTION				
SCABIES	**RF:** densely populated communes (nursing homes, barracks) *Sarcoptes scabei* infects the stratum corneum	Intense nocturnal pruritis Papules and vesicles Burrows	**Scabies Prep** May visualize mites, eggs, and feces	Topical antiscabetics Oral antiscabetics for resistant mites or epidemics Source control

PATHOPHYSIOLOGY of THE INTEGUMENT: IMMUNOLOGIC DYSFUNCTION

Disorder	Etiology	Pathophysiology	Lab Findings and Diagnosis	Treatment
ALLERGIC CONTACT DERMATITIS (ACD)	Provoked by a TH1-skewed response, resulting in Delayed-Type Hypersensitivity (DTH) **Sensitization** Ag → formation of haptens → diffusion into epidermis → uptake by host LCs and DDCs → presentation to T cells in regional node → cloal proliferation → migration to skin Requires 7 – 14 d; thus, T cells arrive at skin after allergen is cleared → no primary reaction **Re-exposure** Rapid migration to skin → secretion of IL-2TNF-α, IFN-γ → histamine release and inflammatory response Requires 24 – 48 hrs.	Rash pattern often reflects contact surface Mild erythema Formation of vesicles and bullae Scale and lichenification Common allergens: Ni, topical ABx	Appearance of reaction 24 – 38 hrs after exposure Persists for 4 – 7 d.	
ATOPIC DERMATITIS (ECZEMA)	A TH2-skewed response due damage to the skin barrier and ectopic activation of humoral immunity Atopic triad: atopic dermatitis, asthma, allergic rhinitis Strong heritable pattern of atopy Heritable skin barrier dysfunction: may involve filaggrin (required for keratinocyte differentiation) Associated with *S. aureus* colonization Results in recurrent inoculation with Ag → TH2 response and suppression of TH1 pathway	Diffuse pruritis Erythematous papules and plaques Lichenification Infants: face, scalp, and extensor surfaces **Eczema Herpeticum** Widespread and serous herpes viral infections to due suppressed TH1 response and cutaneous CMI (va excess IL-10 secreted from activated TH2 cells)		

URTICARIA	This is a disease of inappropriate Mast Cell degranulation via IgE cross-linking or other stimulus Allergens (prior sensitization) Some drugs Pressure, temperature Mast cells → release histamine, LTs, PGs → vasodilation and increased permeability → edema	Pruritic annular edematous pink papules and plaque (wheals) Linear wheals: dermatographism **Angioendema:** urticara occurring in the dermis, commonly affecting the lips and face	Evanescent lesions (individual lesions have rapid turnover time, ~ 24 hrs)	
PSORIASIS	This involves aberrant signaling resulting in increased mitotic rate of the basal layer TH1 cells → epidermal growth factor → increased rate of proliferation → tick plaques with scale Also CD8+ T cells and TH17	Erythematous plaques Well-defined margins Mica-like slvery white scale Moderate pruritis Affects extensor surfaces (elbows, kneed, sacrum) Associated with psoriatic arthritis and involvement of the nails		
EXANTHEMATOUS DRUG ERUPTION	> 90% of all drug eruptions Distribution of metabolites in skin → DTH → (systemic ACD) Requires 4 – 14 d.	Erythematous macules and papules Morbilliform lesions (similar to measles) Gradually become confluent Spread from trunk and upper extremities outwards	Common drugs involved ABx Anticonvuslants NSAIDs (aspirin hypersensitivity)	
URTICARIAL DRUG ERUPTION	Occurs rapidly EXCEPT with ACE inhibitors (due to bradykinin) Type I Hypersensitivity May cause laryngeal edema and anaphylaxis	Urticarial manifestations Angioedema		
STEVENS-JOHNSON SYNDROM (SJS) and	Activation of apoptotic cascade in keratinocytes → diffuse epidermal necrosis Requires 7 – 21 d (~ exanthematous drug	Erythematous dusky macules Gradually become confluent Progressive mucosal ulcerations		

TOXIC EPIDERMAL NECROLYSIS (TEN)	reactions)	Formation of bullae Denuding of the epidermis Most patients have systemic symptoms		

PATHOPHYSIOLOGY of THE INTEGUMENT: CORNIFYING DISEASES

Disorder	Etiology	Pathophysiology	Lab Findings and Diagnosis	Treatment
ICTHYOSIS VULGRIS (IV)	Leading disorder of cornification AD inheritance + variable expression Largely idiopathic Associated with the atopic triad	Symptoms emerge in peds Xerosis, white adherent scale Affects trunk and extremities Keratosis pilaris: hyperkeratosis of the follicles on extensor surfaces Aggravated by cold and desiccated air		
PALMAOPLANTAR KERATODERMA (PPK)	AD and AR inheritance Mutations in keratin	Hyperkartosis on plasma nd soles Thick yellowish plaues with ertyhematous borders Hyperhydrosis		Curettage Topical softners

PATHOPHYSIOLOGY of THE INTEGUMENT: BULLOUS DISEASES

Disorder	Etiology	Pathophysiology	Lab Findings and Diagnosis	Treatment
Structure of the Basement Membrane Zone **BPAG1** is INTRACELLULAR and anchored to the hemidesmosomes of the basal keratinocytes : binds keratin within the cytosol **BPAG2** IS TRANSMEMBRANE and contains Collagen XVII : connects BPAG1 and Laminin 5 (lamina densa). Spans the lamina lucida. The lamina densa contains reticular Collagen IV The sublamina densa contains Collagens I, III, and XVII (predominant)				
IMMUNOBULLOUS DISEASE				
PEMPHIGUS VULGARIS (PV)	AutoAbs directed against Desmoglein 3 Loss of intercellular attachments between basal keratinocytes → but no separation of dermis and epidermis "Tombstoning" appearance	Flaccid bullae, usually inapparent on presentation due to rupture Painful oral erosions Erosions on scalp with crusting	DIF: intracellular signal due to antibody complexes with Desmoglein 3 Nikolsky +ve	Limited: high-dose topical steroids Severe dz or involvement: prednisone
BULLOUS PEMPHIGOID (BP)	Typically affects elderly patients AutoAbs directed against BPAG-1 and BPAG-2	Tense bullae on trunk and extremities Severe pruritis Urticarial or popular eruptions Oral mucositis is rare Typically not painful	DIF: Abs to BPAG-1 and BPAG-2. Linear staining of IgG and C3. Epidermis is detached from the basement membrane. Nikolsky –ve	Prognosis better than in PV Tx with topical steroids and oral ABx ISDs are second-line drugs
CICATRICAL PEMPHIGOID (CP)	Bullous disease affecting the mucosa AutoAbs directed against BPAG-2 and Laminin 5	Oral lesions (90%) Ocular lesions (66%) Ectropion, decreased visual acuity, pain, blindness Only 25% have skin involvement Bullae are painful, leading to scarring Chronic and indolent natural history	DIF: linear IgG deposition within the lamina lucida IIF: no signal since there are no circulating Abs Nikolsky: -ve	Intensive ISDs Routine ophthalmologic assessment

INHERITED MECHANOBULLOUS DISEASE				
EPDERMOLYSIS BULLOSA (EB) SIMPLEX	AD inheritance Lack of epidermal keratins	Bullae and erosions on soles with walking or increased abrasion		
JUNCTIONAL EB	AR inheritance Mutations in BPAG-2 and Laminin 5	Diffuse bullae with scarring Mucosal lesions may lead to blindness and esophageal structure.		Increased risk of squamous cell carcinoma
DYSTROPHIC EB	AD and AR inheritance Mutations or lack of Collagen VII	Diffuse bullae with scarring Typically involves contractures and digital deformities		
ALLERGIC BULLOUS DISEASE				
DERMATITIS HERPETIFORMIS (DH)	Associated with Celiac Disease Diarrhea and malabsorption	Extreme pruritis Vessicles are usually rupturedby excoriation Occiput, extensor surfaces of upper and lower extremities, buttocks		Dapsone (folate synthesis inhibitor) Gluten-free diet Decreases risk of gastric lymphoma

PATHOPHYSIOLOGY of THE INTEGUMENT: PILOSEBACEOUS DISEASE

Disorder	Etiology	Pathophysiology	Lab Findings and Diagnosis	Treatment
ACNE VULGARIS	Abnormal keratinization around acroinfundibulum (increased proliferation and retention) → microcomedone → expansion → occlusion of the follicular outlet, impaction of keratinocytes and sebum → regression of the sebaceous lobule → rupture of comedone → release of keratins (immunogenic) and sebum → inflammatory response Neutrophils: suppurative pustules Lymphocytes and macropages: papules, nodules, cysts Increased sebum: adrenarche and increased DHEAS → 5 DHT Colonization by *P. acnes* → generation of FFAs → increased keratinization → formation of comedones	Closed Comedones (whiteheads): papules without follicular opening → progress to pustules and papules Open Comedones (blackheads): papules with dilated follicular outlets. Coloration is due to melanin deposition and FA oxidation. **Nodulocystic Acne** Coalescence of smaller papules and pustules → sinus tracts → scarring (comedonal acne usually does not result in scarring)		**Topical Retinoids** Primary Tx Normalize follicular keratinization Rupture of existing closed comedones Prevent formation of comedones **Topical Anti-inflammatory and Antimicrobial Agents** Benzoyl Peroxide + Topical ABx: inhibits bacterial growth and reduced inflammation. Use combination to prevent resistance. **Oral ABx Therapy** Tetracycline, doxycycline, TMP-SMX Required for popular and pustule acne. Comedones: Topical retinoids + BP Superficial: Topical retinoids + BP + ABx Nodulocystic: isotretenoin
ACNE FULMINANS	Occurs in males 13 – 16 yrs Preceded by limited comedonal acne	Abrupt eruption of nodulocystic and supperative acne Coalesce to form large supperative plaques with hemorrhagic crust. Scarring is typically severe. Systemic symptoms: fever, malaise, arthralgia, myalgia, hepatosplenomegalu		
ACNE VARIANTS	**Acne Conglobata** Fulminant acne without systemic symptoms. Involved in the follicular occlusion tetrad. **Acne Mechanica** Trauma to the pilosebaceous unti by abrasion. Linear and geometric acneiform distribution. **Acne Excoriee** Typically associated with neurotic excoriation.			

	Drug-Induced Ance Anabolic steroids, corticosteroids, phenytoin, lithium, INH Monomorphic papules (Acne Vulgaris involves polymorphic lesions) **Neonatal Acne** Small inflammatory papules seen in a zygomatic distribution Typically benign and self-limiting			
ROSACEA	Commonly seen with light skin Typically does not involve scarring Triggering stimuli: Cold, UV, pressure, emotional stress, EtOH, spicy foods	**Primary Clinical Presentation** Hx of labile transient erythema Tonic erythema Telangiectasias Papules and pustules in malar distribution NO COMEDONES! **Secondary Findings** Allodynia (burning and stinging) Central xerosis Ocular manifestations (keratitis sicca, foreign body sensation, burning) Rhinophyma **Periorifacial Dermatitis** Recurrent small perioral and periocular papules Exacerbated by topical corticosteroids **Pyoderma Faciale** Abrupt eruption of papules and pustules. Typically centrofacial. **Steroid Rosacea** Seen with topical and systemic steroids. Abrupt discontinuation causs a flare. Suppress with ABx or calcineurin inhibitors.		Topical retinoids + ABx Facial telangiectasis: laser ablation

HIDRADENITIS SUPPERATIVA (HS)	Occlusion of apocrine glands These are found in the axillary fossa and perineum Occurs after adrenarche Skewed towards females (3:1) Underlying pathology is follicular hyperkeratinization Seen in the follocicualr occlusion tetrad (acne inversa): **HS** **Acne Conglobata** **Dissecting Cellulitis**: affects scalp and involves perifollicular pustules and nodules, leading to alopeciawith scarring **Pilonidal Cyst**: abscess near the natal cleft and sacrum	Inflammatory papules and nodules in intertrigenous areas Development of sinus tracts and hypertrophic scarring Chronic drainage and pain Androgen levels are typically NML		Weight reduction (reduces maceration) Topical ABx Prednisone or oral retinoids Steroid injection Drainage Laser Ablation
HYPERHYDROSIS	Increased secretory function of eccrien glands	**Primary** Due to increased sympathetic outflow (emotional hydrosis) **Secondary** Underlying abnormality (neurologic, neoplastic, endocrine)		Botulism toxin injection (inhibits Ach release from presynaptic cell).

PATHOPHYSIOLOGY of THE INTEGUMENT: DISORDERS OF PIGMENTATION

Disorder	Etiology	Pathophysiology	Lab Findings and Diagnosis	Treatment
VITILIGO	Autoimmune disease resulting in melanocyte destruction	Depigmented patches Typically affect skin near mouth, eyes, nose, hands, genitals. Focal areas of melanocyte depletion May be generalized or segmental Associated with a spectrum of autoimmune disorders: Alopecia areata, Hashimoto's disease, pernicious anemia	**Wood's Lamp** Accentuates depigmented skin (Dz vitiligo) Also accentuates epidermal deposition of pigment (use to determine response to melasma to bleaching agents)	Photoprotection due to increased risk of burn Narrow-band UV-B therapy Topical corticosteroids Calcineurin inhibitors
PIEBALDISM	AD inheritance Mutation in c-KIT tyrosine kinase receptor Normally binds steel factor and regulates melanocyte proliferation and chemotaxis	Typically exhibit a white hair patch Patterned depigmentation that remains unchanged over time		Narrow-band UV-B therapy Topical corticosteroids Calcineurin inhibitors
PITYRIASIS ALBA	Associated with atopic dermatitis Typically seen in peds	Ill-defined hypopigmented patches with overlying scale		
ALBINISM	AR inheritance Mutation in tyrosinase	**Oculocutaenous Albinism** Hypopigmentation or depigmentation of the hair, skin, and eyes. Typically associated with ocular findings: nystagmus, photophobia, decreased visual acuity		Increased risk of carcinoma
MALSMA	Occurs during pregnanacy or HRT Estrogens and progesterone stimulate synthesis of melanin	Dark patchy hyperpigmentation in a photoditributed pattern		Laser ablation Bleaching agents (hydroquinone, azelaic acid)
ADDISON'S DISEASE	Adrenal Insufficiency Decreased cortisol → increased ACTH and MSH synthesis → increased binding to MCR-1 → upregulate melanin	Diffuse bronze pigmentation		

PATHOPHYSIOLOGY of THE INTEGUMENT: DISORDERS OF THE DERMIS

Disorder	Etiology	Pathophysiology	Lab Findings and Diagnosis	Treatment
DISORDERS OF CONNECTIVE TISSUE				
EHLERS-DANLOS SYNDROME	Defect in post-translational modification of collagen monomers	Joint hypermobility Hyperelasticity of the skin with intact recoil Skin fragility Atrophic (fish mouth) scares Eccymosis Arterial rupture GI rupture		
PSEUDOXANTHOMA ELASTICUM	AD inheritance Aggregation of elastic fibers (elastin and fibrillin in microfibrils) Onset typically before second decade	**Cutaneous**: yellwish papules on neck and axillae **Ocular**: universal, leading to decreased visual acuity **Cardiovascular**: claudication, HTN, angina, MI (caused by occlusion of lumens of intermediate arteries)		Typically involves cardiology, dermatology, and ophthalmology
MARFAN SYNDROME	AD inheritance	Tall stature Arachnodactyly Ectopia lentis Mitral valve prolapsed, dilitated aortic rooT, aortic dissection Scoliosis, joint hypermobility, pectus excavatum		
DISORDERS OF CUTANEOUS VASCULATURE				
LIVEDO RETICULARIS (LR)	Hypoperfusion of the superficial and deep vascular plexi	Reticular macular erythema Favors lower extremities		
LEUKOCYTOCLASTIC VASCULITIS	Typically a reaction to medications or infection	Palpable purpura Favors lower extremities Inflammation of renal vessels → AKI and renal insufficiency		Discontinue or remove causative agent Monitor renal function

SCLEROTIC DERMAL DISEASE				
MORPHEA	Essentially localized scleroderma	Expanding erythematous plaque Progressive induration Central hypogigmentation evoling into an annular lesion with lila c ring Involves the trunk Associated with **Raynaud's Syndrome**	Histologically identical to scleroderma	
SCLERODERMA (PROGRESSIVE SYSTEMIC SCLEROSIS)		**Limited:** CREST syndrome Calcinosis cutis Raynaud's Esophageal dysmotility and dysphagia Slerodactyly Facial telangiectasia **Diffuse** Pulmonary fibrosis, renal failure, cardiac disease Cutaneous disease		
SUBCUTANEOUS DISEASE				
PANNICULITIS	Inflammation of the subcutaneous adipose tissue Commonly caused by **Erythema Nodosum** DTH in response to infection, medications (orogesterone, estrogens, PCN, SMX), sarcoidosis, IBD	Tender, erythematous, non-ulcerating nodules Affects the lower extremities		Discontinue medications Tx underlying inflammatory disease Bed rest Elevation and compression NSAIDs

PATHOPHYSIOLOGY of THE INTEGUMENT: PHOTOSENSITIVE DERMATOSES

Disorder	Etiology	Pathophysiology	Lab Findings and Diagnosis	Treatment
PHOTOTOXICOSIS	NOT an immunologic reaction: does not require sensitization Due to reaction to activated metabolite Amiodarone, Furosemide, Naproxen, (FQs) Phytophotodermatitis involves caustic plant molecules (furocoumarins)	Erythema, edema, itching within a photodistribution Onset within hours of exposure Burning and stinging Development of bullae in extreme reactions Phytophotodermatitis: patchy or linear erythema, post-inflammatory hyperpigmentation		
PHOTOALLERGY	Requires sensitization **DTH reaction** Typically caused by SMX	Erythema and itching Papular and papulovesicular lesions Onset within 24 – 73 hrs after reexposure		
POLYMORPHOUS LIGHT ERUPTIONS (PMLE)	Occurs in temperate climates Most episodes occur in spring due to increased exposure Onset between 10 -30 yrs 25% sensitive to UV-B 25% sensitive to UV-A + UV-B 50% sensitive to UV-A **DTH reaction**	Edema, pink papules merging to plaques Psudovesicles (no fluid can be aspirated) Pruritis **Extends to photoprotected sites**		UV blockade Limit exposure Topical corticosteroids Low-dose UV-B phototherapy
XERODERMA PIGMENTOSUM	AR inheritance Defects in NER pathway	Presents during peds with frequent sunburns Development of BCC and SCC < 10 yrs High likelihood of melanoma Neurologic deficits Increased risk of CNS, ling, GI, renal, and hematologic malignancy		Rigorous UV avoidance
PORPHYRIA				

PATHOPHYSIOLOGY of THE INTEGUMENT: NEOPLASTIC DISEASE

Disorder	Etiology	Pathophysiology	Lab Findings and Diagnosis	Treatment
BENIGN CUTANEOUS LESIONS				
BENIGN MELANOCYSTIC NEVI	Ectopic clustering of melanocytes during migration from the neural crest to epidermis **Junctional**: epidermis **Compound:** epidermis + dermis **Dermal**	**Junctional:** uniform brown macule with accentuated skin markings **Compound:** exophytic, lighter shade **Dermal:** exophytic, subtle shade Congenital nevi develop cobbled surfaces with age; no color variation May arise *de novo*, peaks count typically in third decade		Educate patients about dysplastic nevi and photoprotection Excise inflamed nevi
SEBORRHEIC KERATOSIS	Very common lesion Onset during 30 – 40 yrs	High variability in color Stuck-on appearance Waxy, verrucous, or keratotic surface Pseudohorn cysts (foci of keratin)		Observe Curettage Cryotherapy
EPIDERMOID CYSTS	Onset after adrenarche Plugging of hair follicle outlet Epidermal implantation The cyst is attached to the epidermis Inflammation due to rupture into the dermis True infection is uncommon	Compressible and fluctuant subcutaneous mass No visible surface changes May see puncta Contain impacted and macerated keratin (frequently malodorous)		Observation Steroid injection Oral ABx Excision with recurrent inflammation
PREMALIGNANT LESIONS				
ACTINIC KERATOSES	Mutations within keratinocyte genome Results in hyperproliferation RFs: UV exposure, skin types I and II, male, age, prior history of AK	Rough papular lesions with scale Tender on palpation Photodistribution Malignant transformation possible if lesions are refractory, undergoing rapid growth, or ulcerating		

DYSPLASTIC NEVI	Unknown etiology	High variability in color Universal macular base with central papule Large (5 – 12 mm) Irregular and diffuse borders Histology demonstrates variable atypia with NO CORRELATION to gross morphology		Observation Excision with severe atypia
		MALIGNANT LESIONS		
BASAL CELL CARCINOMA (BCC)	Most common cancer in US 90% of lesions occur on head and neck Paranasal skin is commonly affected RR = 3 compared to SCC in immunocompetent patients UV damage to basal keratinocytes	**Nodular** (50 – 80%) Pearly and translucent surface Facial telangiectasias Rolled border Friable Spontaneous bleeding **Superficial** (15%) Erythematous thin plaque with scale Slow growth rate Similar to ectopic dermatitis and AK **Morpheaform** (5%) High-grade subtype Atrophic scar-like hypopigmentation (papular) Diffuse margins		
BASAL CELL NEVUS SYNDROME	AD inheritance	Multiple BCC Palmar pits Mandibular cysts		Rigorous photoprotection
SQUAMOUS CELL CARCINOMA (SCC)	RR = 3 compared to BCC in immunosuppressed background UV damage to squamous keratinocytes HPV Chronic inflammation	Affects all sites with squamous epithelium Erythematous lesions with induration Thick scale Ulceration		
MALIGNANT MELANOMA	1/3 from preexisting nevi 2/3 from spontaneous nevi RFs: multiple nevi, large nevi, dysplastic nevi, FH, prior melanoma, lentigo, UV exposure, sunburns, high SES, XP and	**Superficial** (60 – 70%) Melanoma *in situ* Long radial growth phase with rapid vertical growth	May not be able to distinguish from dysplastic nevi May be pink: amelanotic melanoma	Wide excision with margins dependent on Breslow depth Sentinal node Bx Lymphadenectomy

	other DNA repair defects, immunosuppression Familial variant: increased risk of melanoma and pancreatic cancer Slow radial growth phase without invasion Vertical growth: Breslow depth is the strongest prognostic parameter	**Nodular** (15 – 30%) Most rapid growth rate Short radial growth phase **Lentigo Meligna Melanoma** (5 – 15%) Onset > 70 yrs Typically affects face Flat lesions **Acral Lentigenous Melanoma** (5 – 10%) Occurs with darker skin Palmar, plantar, and subungual distribution Long radial growth phase Presents late in course Metastasis to skin, lungs, and liver	Ulceration is associated with a poor prognosis	Adjuvant chemoRx if disease is metastatic