

PAEDIATRIC & ADULT DERMATOLOGY

Macule	<1cm	Non elevated/ Non-Palpable lesion of altered colour change	• Erythema toxicorum, roseola, pityriasis rosea
Patch	>1cm	Non elevated/ Non-Palpable lesion of altered colour change	Psoriasis, tinea
Papule	<1cm	Elevated/Palpable lesion	Warts, SCC/BCC, • RED FLAG (Maculopapular) = Meningitis, Rubella, Measles, Kawasaki
Plaque	>1cm	Flat topped/Elevated/Palpable lesion	Psoriasis, seborrheic dermatitis
Nodule	>1cm	Solid/Elevated/Palpable lesion	SCC/BCC, lipoma, sebaceous cyst
Vesicle	<1cm	Fluid filled lesion	HSV, shingles/chicken pox, cellulitis
Bulla	>1cm	Fluid filled lesion	Burns
Urticaria	>1cm	Raised white or reddened itchy rash across body	Anaphylaxis, drug-reaction
Petechiae	<1cm	Pinpoint darkened spots due to bleeding on superficial skin	HSP, meningococcal septicaemia (non-blanching), Leukaemia, ITP

Symptoms	RF	Localised features	Generalised features
Where / distribution - Pruritis - Pain (which is worse?) - Inflammation = red, hot, swollen, painful - Discharge – pus, bleeding - Blistering - B Symptoms <u>Exacerbating factors</u> ➤ Autoimmune hx ➤ Propranolol	- Chronic Illnesses - Sexual History - FHx of atopy <u>Environmental</u> - Recent Travel - Insect & Plant Exposure - Drug Exposure - Hobbies - Ill contacts - Pets - Chemical Exposure	<u>Asymmetry</u> - Flexural/Extensor - Sun exposed/Clothing Covered - Dermatomal vs Truncal <u>Border</u>: Round/Oval/Annular/Reticular <u>Ulcer → erosion → fissure</u> <u>Colour</u> - Erythematous, Scaly - blanching - Hypopigmented/Hyperpigmented <u>Diameter</u> <u>Evolution</u> <u>Raised / vesicular vs pustular or flat</u> <u>Smooth vs rough</u>	- Lymph Nodes - Neurovascular status - Temperature <u>Koebner phenomenon</u> “<u>lesions at site of injury – skin scrape</u>” Vitiligo Psoriasis Warts Lichen planus – polygonal or planus purple, pruritic, plaques Lichen sclerosis – hourglass shape dry thinned autoimmune skin inflammation Molluscum contagiosum

RED FLAGS

	Erythema Multiforme	Non-blanching rash	Cellulitis	Urticaria (hives)	Steven Johnson Syndrome vs toxic epidermal necrolysis
Def	Itchy Red rash caused by Hypersensitivity reaction	Bleeding under the skin ➤ petechiae (< 3mm) = burst capillary ➤ Purpura (3-10mm) = leaking BV	Bacterial Infection of BOTH lower dermis + SC tissue	Rash caused by histamine release from mast cells: ➤ Acute - anaphylaxis (allergy), insect bites, meds, skin rubbing (dermatographism), viral infections ➤ Chronic - idiopathic, sunlight, exercise, hot or cold weather, strong emotions, autoimmune (e.g. SLE)	SJS and TEN = spectrum of same pathology (disproportionate immune response) = epidermal necrosis
RF	Viral infections ➤ HSV (cold sore) ➤ Mycoplasma Medications ➤ Penicillins ➤ NSAIDs ➤ Anti-convulsants (phenytoin)	DDx: ➤ Meningococcal septicaemia ➤ HSP – PAPA ➤ ITP – post-viral ➤ Acute leukaemia ➤ HUS – oliguria, aneima, diarrhoea ➤ Mechanical – SVC distribution (strong cough, vomit) – mostly around neck and eyes ➤ NAI ➤ Viral illness – influenza, enterovirus	➤ Immunocompromised ➤ Recent travel -high risk areas (underwater swimming, travelling bushes) ➤ Chronic illness ➤ Recent trauma		- Meds (ABx, allopurinol, anti-epileptics, NSAIDs) - Infections (HSV, CMV, HIV, mycoplasma) - HLA genetic types
Sx	Target lesion DOES NOT affect MM but does cause sore mouth (stomatitis) Arthralgia Headache Flu-like symptoms		➤ Painful unilateral red inflamed limb DDx : erysipelas = only epidermis	- Red small itchy patchy lumps - Assoc. w/ angioedema and skin flusing	Blistering and shedding of top layer of skin on lips and MM (e.g. eyes, lungs) → Leads to skin shedding days after SJS = <10% of body SA TEN = > 10% of body SA
COMP.		Death		Cellulitis and sepsis	2nd infection = skin breaks causes cellulitis and sepsis - Permanent skin damage + scarring - Vision loss – if eye involvement
Rx	Supportive mx ➤ If clear cause If unclear cause ➤ CXR – mycoplasma If severe ➤ Admit ➤ IVF, analgesia ➤ +/- ABx or antivirals	Identify cause: ➤ Check BP – HSP, HUS ➤ FBC, EUC, LFT, CRP, ESR, Coag (Leukaemia, infection) ➤ Blood culture ➤ UA ➤ LP Mx: ➤ Rx underlying cause ➤ ABCDE – IV 1g ceftriaxone (HiB, gram -ve) ➤ Benzyl – Neisseria, pneumo, GBS, listeria ➤ Notify health department if HiB and meningitis		Acute urticaria • IM adrenaline (if anaphylaxis) Chronic urticaria: • Antihistamines • PO steroids • Anti-leukotrienes (e.g. montelukast)	Medical emergency ➤ Steroids ➤ IVIg ➤ immunosuppressants
					 *TARGET LESIONS (ERYTHEMA MULTIFORME)

LIVIDO RETIUCULARIS

MOTTLED NET-LIKE DUE TO SWOLLEN BV assoc. to **COLD** exposure

ERYTHEMA AB IGNE

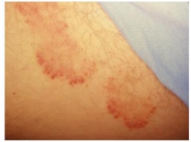
RETICULAR HYPERPIGMENTATION DUE TO LONG-TERM **HEAT** exposure

PSORIASIS + DDx

Pathogenesis [not curable]	Risk factors	Clinical features	General Rx
- Chronic autoimmune skin condition (2-3%) hyperproliferation of keratinocytes and inflammation due T-cell immune dysregulation (release of inflammatory cytokines → IL1B, TNFa and IL17A) - Bimodal distribution (15-25yo and 50-60 yo) 1 in 3 psoriasis patients suffer from psoriatic arthritis Strong familial & genetic disposition (30%) – 1st deg relatives	Streptococcal infection precipitate guttate psoriasis (Esp. in children) Trauma – localises psoriasis (<i>Koebner phenomenon</i>) Excess alcohol consumption - Medication (BB, hydroxychloroquine, NSAIDs, prednisone withdrawal) - MetSyn - Stress (emotional + physical)	+/- onycholysis, koilonychia, ridging (50%) Dry flaky scaly well-demarcated red plaque with silvery scale → affects extensor surfaces (e.g. elbows and knees) + scalp, lower back - Mild itching Auspitz sign = small bleeding points after psoriatic plaque removed DDx: eczema (itchy, has skin thinning) 'Psoriasis Area and Severity Index (PASI) = assess psoriasis based on redness, thickening and scaling	Conservative - Reduce sun exposure - Avoid smoking, alcohol - Reduce stress Medical - Topical steroids - Topical vit D analogues (calcipotriol) - Topical tacrolimus (calcineurin) – only in adults - Phototherapy or narrow band UVB – for extensive guttate psoriasis

Scalp psoriasis (classical)	Guttate (droplet-like psoriasis)	Pustular Psoriasis	Chronic plaque psoriasis	Inverse (flexural) psoriasis	Erythrodermic psoriasis
Diffuse or well-circumscribed plaques	- Acute onset of widespread small plaques (often on trunk) 2-3 wks after streptococcal throat infection → mostly young adults	- Rare = pustules under red skin - Confined to palms and soles → scaling red - Triggered by withdrawal of systemic steroids	- Most common (90% in psoriasis patients) - Thick well-defined red scaly plaques → extensors + lower back - Auspitz sign (bleeding) when plaque removed	- Found under folds (armpits, groins, breasts) - Sharp-edged patches (no scaling)	Rare dermatological emergency (Acute + chronic) - Red inflamed psoriasis areas whole body - Systemic illness causing temp. dysregulation, electrolyte disturbance, cardiac failure
Steroid lotions	1) Phototherapy 2) Topical CS 3) ENT referral + tonsillectomy		Treatment resistant	Treatment resistant	Oral meds to control symptoms
				 	

Differential Dx:

Tinea (Ringworm)	Pityriasis rosea	Intertrigo	Seborrheic dermatitis "cradle's cap"
Def Fungal infection of the skin (dermatophytosis) Well-demarcated itchy red scaly annular patch or plaque DDx: pityriasis versicolor	Generalised Self limiting rash (with 3/12) NOT contagious	Irritant dermatitis (confused with flexural psoriasis)	Inflammatory condition affecting sebaceous glands → usu. found in scalp, eyebrows and nasolabial folds
RF - XS sweat - Occlusive clothing - Chronic illness	Post-viral URTI	- Not showering - Not removing clothing - Poor hygiene	10% if infants (3 wks - 12 mths)
Sx Tinea capitis = scalp + hair loss Tinea pedis "athlete's foot" = foot (between toes) Tinea cruris = groin Tinea corporis = body Onychomycosis = fungal nail infection (thickened, discoloured and deformed nails)	Herald small scaly oval red rash/patch on trunk – Xmas tree distribution Along langer's lines (skin creases) - Low grade Fever - Malaise, Fatigue - Headache - Arthralgia, sore throat	- Inflamed red skin with fissuring and peeling - Moist areas of body	- Greasy rash - self-limiting and usu. resolved by 4 mths old
Rx Scrap scales → M/C/S Conservative - Loose breathable natural clothing - Keep area clean, dry - Use separate towel, new socks - Avoid scratching and spreading to other areas Medical Topical antifungals (minimise steroid combos) → risk of cataract LAMISIL = Athlete's foot - Pevaryl – back Hydrozole (only if itchy BUT avoid 1st) → steroid may mask an underlying fungal infection → tinea incognito Amorolfine nail lacquer for nail infections for 6-12 months PO terbinafine (if resistant -monitor LFTs)  	- Self-limiting - Continue normal ADLs (not contagious) - If itchy → emollients, topical, sedating antihistamines (chlorphenamine)   	Pseudo cream 	Conservative Gentle emollient = mineral oil Medical Scalp = Ketoconazole shampoo (left on for 5 minutes before washing off) Face & body - Anti-fungal topical up to 4 weeks +/- topical hydrocortisone 1% for inflamed areas and itch If unresponsive - Refer to dermatologist  

VIRAL-INDUCED RASHES (VIRAL EXANTHEMS)

Disease Number	Cause	Sx	Complications	Rx
1st disease: Rubeola (Measles) DDx: Kawasaki, rubella, viral	Measles Virus (paramyxoviridae)	- Widespread maculopapular rash (from head downwards) Preceded by 3 C's = coryza, conjunctivitis, cough, LN, Koplik spots (1-4 days before rash)	- Otitis media - Pneumonia - Diarrhoea - Encephalitis / (PSE) meningitis	Self-limiting - MMR vaccine - Notifiable disease - PCR and Measle antibodies to confirm
2nd disease: Scarlet Fever	GAS	Sandpaper rash - red blotchy macular rash on trunk spreading outwards strawberry tongue - w/ perioral pallor + sore throat - Spread via droplets or fomites	- Acute rheumatic fever → rheumatic heart disease (arthralgia + erythema marginatum – SJS) PSGN IE – murmur, fever, peripheral stigmata (osler)	- Throat swab - Phenoxymethylpenicillin PO for 10 days - Notifiable disease Post-Rx: - Urine dipstick - ECHO
3rd disease German Measles	Rubella Virus (Togavirus)	- Widespread maculopapular rash (from head downwards) - Preceded by 3 C's = coryza, conjunctivitis, cough, occipital and post-auricular LN, FORCHEIMER SPOTS (Red petechiae on soft palette)	- Thrombocytopenia and encephalitis Congenital rubella syndrome in pregnancy → deaf, blind and congenital heart disease	Self-limiting - Notifiable disease - PCR and Measle antibodies to confirm - Avoid pregnant women
4th disease "Duke's disease" staph/ strep scalded skin syndrome (SSSS)	staph/ streptococcus (TSST-1 superantigen toxin -breaks down proteins holding skin cells together)	- Generalised patches of red thin wrinkled skin → Leads to sore bullae Nikolsky sign – gentle rubbing skin causes it to peel away - Systemic Sx = fever, lethargy, dehydration	Cellulitis and sepsis - rheumatic heart disease + post-strep GN	- IV Abx - amoxicillin - Fluid and electrolyte balance
5th disease: Erythema infectiosum "slapped cheek"	Parvovirus B19	- Low grade fever + coryza before Stage (1) 'slapped cheeks' appearance Stage (2) Lacey maculopapular rash on limb + trunk (<i>sparres soles/palm</i>)	Bone marrow suppression → aplastic anemia and hydrops fetalis - Pregnancy → fetal death - May cause hepatitis, myocarditis or nephritis Encephalitis and febrile seizures	Keep child away from pregnant women → day care!!!
6th disease: Roseola Infantum (most asymptomatic - TRUNCAL rash)	HHV 6 (main) or HHV 7 < 2yo	3-7 day non-focal high grade (> 40) fever + coryza → febrile convulsion - MAY CAUSE → myocarditis, GBS, thrombocytopenia - Rash on day 3-5 of illness → Rose blanching Maculopapular - HHV 1+2 = Cold sores and genital herpes - HHV 3 (VZV) = chicken pox and shingles	- HHV 4 (EBV) = glandular fever - HHV 5 (CMV) = teratogen - HHV 8 = kaposi's sarcoma	Reassurance – self-resolve - Continue day-care Only test if immunocompromised (HHV6-PCR usu. on blood) Antivirals (ganciclovir) → immunocompromised → aim to decrease viral load
Hand-foot mouth disease (fecal-oral Tx) – blisters infective until dry up	Coxsackie A16 / enterovirus < 2yo Incubation days = 3-5 days	Viral prodrome (coryza + low grade fever) Day 1-2: Painful oral ulcers esp. on tongue Then: Contagious Vesicular rash on the hands, feet, mouth, and buttocks	- Dehydration - Bacterial superinfection - Encephalitis (ataxia)	Reassurance – self-resolve - continue normal ADLs - simple analgesia (paracetamol) - isolate at home (as highly contagious) – hand hygiene
Molluscum Contagiosum	molluscum contagiosum virus (pox virus)	- small flesh coloured papules with centra dimple - spread by direct contact or sharing items (e.g. towels, bedsheets)		Reassurance – self-resolve continue normal ADLs
Varicella (chicken pox)	VZV (HHV3)	Fever 1st → Prodrome = fever + coryza + pharyngitis Contagious Very itchy vesicular rash (BEGINS in trunk spreading to → face, scalp, limbs) Contagious - Spread via droplets - Symptomatic 10 days after exposure - Not contagious if lesions all crusted	- Dehydration - Bacterial superinfection - Encephalitis (ataxia) - Pneumonia - Conjunctival lesions	Self-limiting in children - Antivirals in elderly - calamine lotion for itch or chlorphenamine Avoid contact w/ immunocomp (e.g. cancer pts, HIV, DM, pregnant) If pregnant: - Unvaxxed – give VZV Ig - Delivery – give VZV Ig + acyclovir
Shingles (Ramsay Hunt syndrome)	reactivation of VZV (chicken pox virus)	Localised blistering/painful rash (reactivation of VZV) Hutchinson's sign = dermatome of nasociliary nerve +/- headache and fever	Pain may obscure other diseases → abdo pain and chest pain Neuropathic pain – difficult to describe (electric shocks)	- Self-limiting in children - Antivirals in elderly - Urgent ophthalm referral if Hutchinson's sign
Eczema Herpeticum	VSV or HSV1	COLD-sores -widespread PAINFUL vesicular rash containing pus Fever, lethargy, irritable and reduced oral intake + Lymphadenopathy	Life-threatening bacterial superinfection esp. if immunocompromised	- Viral swabs – - Acyclovir PO/IV
HSP (IgA vasculitis)	Autoimmune	- Fever - Palpable purpura + Abdo pain, arthralgia, haematuria, (PAPAH)	Main comp. = ISS - Resp = diffuse alveolar haem - Neuro = altered mental state - Genital = exc. torsion	Mild pain = self-limiting (regular Panadol + NSAID) - SC oedema = HoB + rest Severe pain → Oral pred = 60mg/day max (1-2mg/kg) - Avoid aspirin = Reye's syndrome
Dengue Fever	Dengue virus (Sri Lanka)	- Fever + petechiae - ARTHRALGIA, MYALGIA - Funny metallic taste - Polydipsia - Ophthalmoplegia - Cold extremity	- FBC (↓WCC, plt, ↑HCT) - EUC, ESR - Serology – NS1 antigen virus +IgM after 4 days + IgG after 7-10 days	- Mosquito repellent - Supportive care (analgesia, anti-pyretics, fluids, O2)



FACIAL ACNE

Rosacea		Neonatal cephalic pustulosis (neonatal acne)		Acne vulgaris													
Define	> 30 yo flushing < 5mins - Transient inflamed papules/pustules or hyperplasia of CT - Telangiectasias <u>2^o features</u> = burning stinging plaque, dry and oedema w/ eye involved	Small follicular keratotic papules on extensor surface of arms and thighs @ 6-12 mths ➤ XS KERATIN	➤ Chronic inflammation with or without infection of pilosebaceous unit → creating comedones ○ Assoc. Propionibacterium acnes ➤ Multiple inflamed painful pustules on face, neck and back ➤ Tender on palpation ➤ Pustular discharge may be present														
RF	- Sun exposure - Spice food - Emotional stress - Hot water /weather	- Unvaxxed traveller - Immunosuppressed	Psych – stress, anxiety, depression XS androgen hormones – <i>explains why puberty worsens acne</i> Sensitive or oily skin Skin – impetigo, rosacea, folliculitis Autoimmune- Behcet's Drugs – acne side effects Hormonal – PCOS Topical products esp. topical steroid usage														
Rx	- Avoid triggers - Metronidazole (topical) - Oral doxycycline (Reduce inflammation) 	<u>Conservative</u> - Exfoliation <u>Medical</u> - urea or salicyclic acid to moisten and loosen scale 	NON-PHARM - Use of non-comedogenic oil free skin products (to avoid skin irritation or blocked pores) - Keep hair clean and off face and neck - Advise against picking or squeezing pimples - Low GI and stress management PHARM: <table><tr><th></th><th>Therapy</th><th>A/E and CI</th></tr><tr><td>Mild ACNE</td><td> 1st line = Benzoyl peroxide (DUAC) - Not PBS subsidised </td><td> - Dryness and redness - Bleaches clothes, towels (wash hands after application) </td></tr><tr><td>Mod ACNE</td><td> Oral doxy 6 wks (assess response over 3-6/12) Females = oral ABx or COCP Both =continue topical DUAC </td><td> Doxy = photosensitive rash +GI upset + yellowing teeth in children - Monitor for PCOS - Erythromycin given to pregnant (tetracyclines= teratogenic) </td></tr><tr><td>Severe ACNE</td><td> Isotretinoin (Roaccutane) = ONLY if early scarring present – prescribed by dermatologist - Stop tetracyclines 5 days prior to isotretinoin (↑ICP) </td><td> CI: pregnancy, BF, HC, or tetracycline usage, depression - Photosensitivity skin, - A+D – suicidal ideation - SJS or TEN - Check MH </td></tr></table>		Therapy	A/E and CI	Mild ACNE	1st line = Benzoyl peroxide (DUAC) - Not PBS subsidised	- Dryness and redness - Bleaches clothes, towels (wash hands after application)	Mod ACNE	Oral doxy 6 wks (assess response over 3-6/12) Females = oral ABx or COCP Both =continue topical DUAC	Doxy = photosensitive rash +GI upset + yellowing teeth in children - Monitor for PCOS - Erythromycin given to pregnant (tetracyclines= teratogenic)	Severe ACNE	Isotretinoin (Roaccutane) = ONLY if early scarring present – prescribed by dermatologist - Stop tetracyclines 5 days prior to isotretinoin (↑ICP)	CI: pregnancy, BF, HC, or tetracycline usage, depression - Photosensitivity skin, - A+D – suicidal ideation - SJS or TEN - Check MH		
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ECZEMA

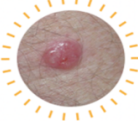
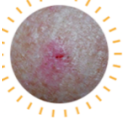
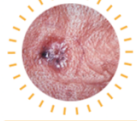
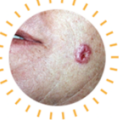
Impetigo		Contact dermatitis (Nappy rash)		Atopic dermatitis (eczema)	
Define	Contagious S. aureus infection of superficial skin <u>Bullous impetigo</u> ➢ Fluid filled vesicles that burst ➢ Leads to SSSS <u>Non-bullous impetigo</u> ➢ Nose and mouth ➢ Golden crust	• Friction between skin and nappy PLUS contact with urine and faeces <u>DDx: candida infection</u> • Check for oral thrush • Larger red macules • Circular well-demarcated scaly border • Satellite lesions	• Chronic relapsing and remitting atopic inflammatory skin condition ○ Due to defects in skin barrier to allow entry for irritants, microbes and allergens → generates immune response • Scaly itchy red maculopapular rash on flexor • <u>Repeat scratching</u> → infection, scar + lichenification • Consider perioral dermatitis → trigger due to food, mask or cold air	DDx dermatitis: 1) Drug reaction 2) Tinea 3) Psoriasis 4) Scabies 5) Vasculitis 6) coeliac	
RF	• Scabies, • Poor personal hygiene • Neonates and < 2yo (if bullous impetigo)	• 9-12 mths of age • Warm moist environment • Delayed nappy change • Irritant soap productions and vigorous cleaning • Investigate occupation	• FHx of allergic rhinitis or atopy • Dry skin • Stress		
Site	Scalp + forehead	Areas of friction (NOT skin creases)	Face, hand, feet, neck, flexor surfaces		
Itchy	Nil	Present	Present		
Pain	Nil	• Sometimes	• Sometimes		
COMP.	Cellulitis SSSS (if bullous impetigo) Scarlet fever PSGN sepsis	• Candidal infection /nappy rash • Erosions and ulceration → cellulitis • Jacquet’s erosive diaper dermatitis • Perianal psuedoverrucous papules	• Bacterial infection -cellulitis – S. aureus ○ May need admission and IV ABx ○ 500mg cefalexin qid for 5-10 days (or 450mg clindamycin tds alternative)		
Rx	<u>LIFESTYLE</u> • Avoid scratching, touching, sharing tools • School exemption (isolation > 48 hrs) <u>Medical</u> • Bactroban ointment (mupirocin) ➢ PO flucloxacillin if widespread	<u>Conservatives</u> <i>Avoid trigger products</i> ➢ Switch to highly absorbent nappies ➢ ASAP nappy change ➢ Water or gentle alcohol free products to clean nappy area ➢ Reduce nappy time <u>If infection suspected:</u> ➢ Anti-fungal cream ➢ ABx (topical or PO flucloxacillin)	<u>Conservative</u> → maintain skin barrier to prevent flares • Reduce bath time (lukewarm)—od • Soap-free cleanser – long-term • Mix bleach and water and soak in baths <u>Medical</u> Topical CS (low VS medium VS high potency) • Fatty ointment → cream → lotion • High lipid Ointment more uncomfortable BUT less likely to wash off (compared to lotion) ○ Low/mild = (hydrocort 0.5-2.5%) → face only (thinner skin) ○ Medium/mod = (diprosone) → trunks or hands ○ High/potent = (e.g. betamethasone 0.1%) • Perioral dermatitis → topical clindamycin (anti-inflammatory effects)		

			Treatment to break itch-scratch cycle ➤ Antihistamines (premethazine) – to reduce itch ➤ Low dose amitriptyline (to sleep)
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COMMON UNUSUAL PRESENTATIONS

	Chilblains / pernio	Scabies	Head lice
Def	Painful red inflamed BV due to cold exposure	Sarcoptes scabiei (tiny mites) – burrow under skin	Pediculus humanus capitis parasite ➤ spread by close head-to-head contact or sharing close equipment
RF		- crowded + poor hygiene - homeless + malnutrition - older patients	School aged children
Sx	- FHx - Tight humid clothing	CONTAGIOUS itchy skin (usu. finger webs) - Red dots or Trace marks where mites burrowed - Rash (8 weeks after infestation)	- Itchy scalp - Identify nits (eggs) or lice on visible exam
COMP	Extremities (toes, fingers)	DDx: bed bug bites ➤ Itchy linear rash ONLY nighttime	Contagious
Rx	Socks/ gloves GTN ointment	Rx all close contacts - air linen for > 72 hrs - Topical 5% permethrin (ASAP leave for 8-12 hrs + 7days after to kill hatched) →itching may continue 4 wks after successful Rx - Oral Ivermectin (if difficult to Rx or crusted scabies)	Demiticone 4% - left on to dry for 8 hrs (overnight) → repeated 7 days late to kill any remaining head lice that may have hatched since then Fine combing
			

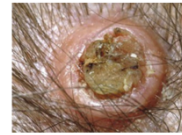
COMMON SKIN CANCERS

	Actinic/Solar/UV Changes	BCC	SCC
Desc	Sunburn = within 2-6 hrs exposure (fever, N+V) – redness resolves with peeling ○ Phototype 1-3 = high skin cancer risk ○ Phototype 4-6 = low skin cancer risk	➤ Most common ➤ Locally invasive non-melanocytic cancer (non-tender) → derived from stratum germanatum layer (keratinocytes and melanocytes) ➤ Low potential to metastasise	➤ 2nd most common ➤ Invasive in-situ (Tender) ➤ High potential to metastasise
RF	• Sunsensitive = burn easily, susceptible to skin cancer, red hair and freckles, unable to tan, early signs of solar damage • Abnormal photosensitivity - SLE, porphyria (genetic), or use of photosensitising meds or topicals	• 40 y.o. fair-skinned males • Chronic sun exposure • Previous BCC • Genetics (e.g. Gorlin, Rombo syndrome) • Immunosuppression	• 40 y.o. fair-skinned males • Cumulative Sun-exposed areas • Immunosuppression (may be due to HPV) • Usu. head and neck • 2^o malignancy in old RT sites or chronically inflamed skin
Signs	• Freckling (early) • Yellow nodularity (solar elastosis) • Solar comedones • Wrinkling & facial telangiectasias (adults) <u>Late changes:</u> • Solar keratoses = red scaly large patches and plaques on face, back of hands/forearms → • Other: brown macules, easy bruising, white patches (guttate hypomelanosis) 	     SCC – Images by A/Prof ShyamalaHuligol	• Firm TENDER papule or plaque • Keratotic crusted surface [NO pearly edges like BCC] • Ulceration & bleeding [late stages]  SCC Bowen's disease
Rx	• Cryotherapy • 5-FU? • Immunotherapy • Topical imiquimod (ALDARA cream) → activates immune cells • excision	• High-risk = Mohs micrographic surgery [6-10mm margin] or radiotherapy for recurrent BCC or SCC ○ Face > 6mm ○ Poorly defined border, recurrent, immunosuppressed ○ Perineural involvement → need RT ○ Infiltrating, sclerosing → need RT • Low-risk = ○ Trunk, limb > 20mm ○ Nodular lesions = surgical excision [4mm margin] ○ Superficial BCC = cryotherapy, Topical imiquimod, photodynamic therapy, efudix, surgery, cautery	Cutaneous SCC • Surgical excision + pathology • 4mm = low risk • 6-10mm = high -risk Advanced SCC • Surgery + RT + FU to monitor recurrence • Staging via US, X-ray, CT, LN biopsy • Adjuvant RT = if neurovascular invasion present

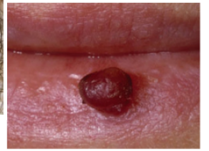
General DDx:

- **Keratoacanthoma** = central keratotic plug appearing like a boil → excision + RT
- **Intra dermal naevus (moles)** – **most common mole in adults**
- **pyogenic granuloma** → **BENIGN proliferation of capillary blood vessels (DDx: hemangiomas)** - PREGNANCY, MEDS,
- **Hypertrophic Bowen's disease** = single red scaly plaque confined to epidermis - **full-thickness dysplasia of epidermis**
→ surgery, RT, cryo, PDT, 5-FU, Imiqui
- **dermatofibroma,**
- **benign naevus,**
- **seborrheic keratosis**
- **syphilis chancre**

Keratoacanthoma



Pyogenic granuloma



Melanoma

Epi	- Highest rates of skin cancer in Australia (2 in 3 develop skin cancer by age of 70) - Melanocytic vs non-melanocytic (SCC, BCC)				
RF	<table border="1"> <tr> <td>Environ</td><td> Exposure to sunlight (UVA, UVB) - Geographical location </td></tr> <tr> <td>Host factors</td><td> # of dysplastic naevi (> 5) - PMHx of melanoma, SCC, BCC FHx of melanoma Sun sensitivity or inability to tan → Pale skin = Blue/green eyes & blond/red hair - Immunosuppression (e.g. transplant, autoimmune conditions, myeloproliferative) </td></tr> </table>	Environ	Exposure to sunlight (UVA, UVB) - Geographical location	Host factors	# of dysplastic naevi (> 5) - PMHx of melanoma, SCC, BCC FHx of melanoma Sun sensitivity or inability to tan → Pale skin = Blue/green eyes & blond/red hair - Immunosuppression (e.g. transplant, autoimmune conditions, myeloproliferative)
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Sx	- Lesions commonly on trunk in males, lower limbs in females - May affect low UV exposed areas e.g. acral lentiginous - Brain METs present in 20% at presentation, rest is death (if chemo-resistant → <12 mths to live – poor prognosis)				
Ix	- Physical exam – dermatoscopy (visualise <i>patterns formed by pigment and BVs</i>) Wide excision elliptical biopsy w/ clear margins (> 2mm) MRI = check for brain mets				
Mx	- No action - Biopsy skin lesion (punch/shave/excision) - Refer (dermatologist, plastic surgeon)				



Types of lesions:

Bullae	Circumscribed, elevated fluid filled lesion > 0.5cm in diameter
Plaque	Circumscribed, elevated skin > 0.5cm in diameter with distinct edge
Erosion	Focal loss of epidermis, moist and well-circumscribed
Ulcer	Focal erosion of epidermis and dermis → heals with scar
Wheal	Circumscribed firm smooth elevated lesion with central pallor, irregular borders and is very itchy!
Nodule	Solid raised palpable lesion >0.5cm
Papule	Solid raised lesion < 0.5cm
Vesicle	Raised circumscribed accumulation of clear serous fluid within papule < 0.5cm in diameter
Petechiae	Small red, brown or purple non-blanching macule <0.5cm
Pustule	Accumulated yellow fluid in epidermis/dermis <1cm
Lichenification	Well-defined rough skin with accentuated skin markings (i.e. skin lines)
Excoriation	Loss of epidermis following trauma

Describing Skin Lesions – Melanoma

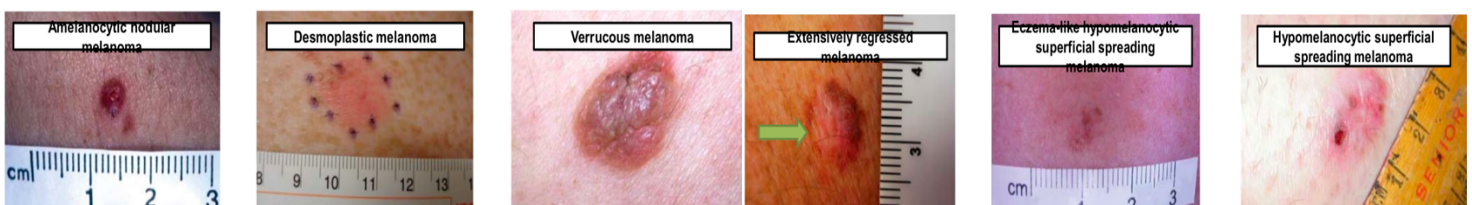
- Asymmetry**: most early melanomas are asymmetrical
- Border**: borders of melanomas are uneven (>7mm)
- Colour/Chaos**: heterogenous - brown, tan, or black = 1st sign of melanoma
- Diameter**: early melanomas grow larger than common moles
- Evolving**: Mole is changing in size, shape or colour
- +/- itching, bleeding/sensation change**
- Can you see BVs?, black dots?**

For nodular melanoma (which invades vertically) → urgent refer + excision

- Elevated**
- Firm**
- Growing** progressively > 1 month

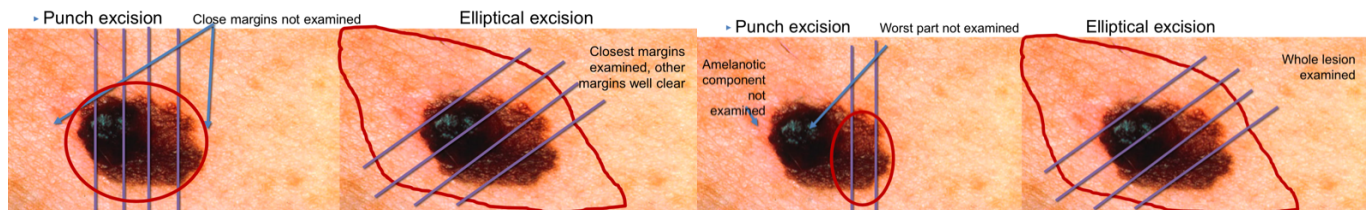
Types Melanoma

<u>Superficial spreading melanoma [most common]</u>	<u>Nodular Melanoma [2nd most common]</u>	<u>Lentigo Maligna melanoma [3rd most common]</u>	<u>Acral lentiginous melanoma [dark skinned, Jap]</u>
- Asymmetric impalpable flat lesion - Irregular border of heterogeneous colour - large diameter - Margins of lesion are flat +/- ulceration or bleeding - Trunks and limbs	- Firm + Symmetrical - Elevated, dome like palpable lesions Invades vertically directly into adjacent dermis Greater thickness = MOST AGGRESSIVE = Poor prognosis Hard to grade	- Asymmetrical, poorly demarcated border, - Consistent colour, 8mm diameter - Slowly evolving pigmented lesion in exposed skin areas: hand, head/face, neck in elderly people 1st begins as tan, flat lesions ("Hutchinson's melanotic freckle") *Difficult to excise due to location	"BOB MARLEY CANCER" - Multiple Irregular hyperpigmented macules that develop into nodules on sole of feet → most likely amputation - May become ulcerated - Areas not excessively exposed to sunlight e.g. <i>palms/soles</i> - Becomes invasive early



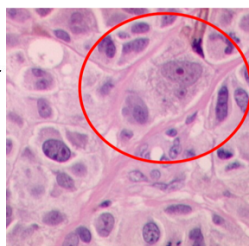
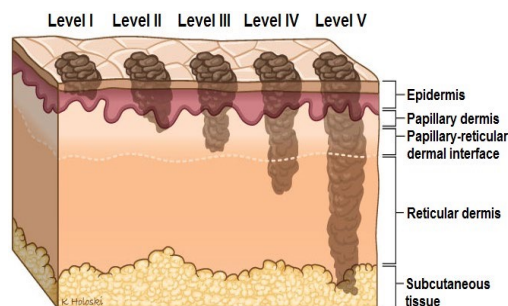
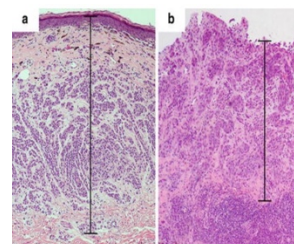
Wide Excisional Biopsy

- **WIDE EXCISION** biopsy (**elliptical**) with 1-3mm margins [preferred]
- Avoid larger margins to permit accurate subsequent lymphatic mapping
- Always parallel to lymphatics
- **PUNCH BIOPSY ONLY** for difficult anatomic areas (e.g. Palm/sole, digit, face, ear)



Pathology Reporting

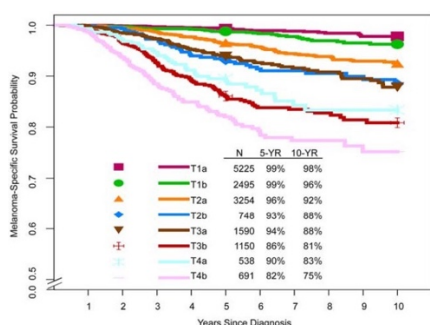
Diagnosis	Is it primary melanoma?
Breslow thickness (nearest 0.1 mm)	granular layer of epidermis to deepest melanoma cell
Clark level	depth of skin invasion in the skin (important for thin melanomas)
Ulceration	Strongly linked to tumour thickness → poorer prognosis if present
Mitotic rate	independent prognostic factor in localised melanoma
Other	• desmoplasia, regression, margins of excision • Neurovascular invasion



MICROSCOPIC REPORT I agree with Dr Rhodes' diagnosis of melanoma.	
Specimen type: Excision	
Site: Right post auricular lesion	
Diagnosis: Melanoma	
Classification/Main Pattern: Superficial spreading	
Other Patterns: N/A	
Thickness: Breslow 1.8 mm	
Clark level: IV	
Ulceration: Not seen	
Dermal mitoses: 3 per mm ²	
Predominant cell type(s): Epithelioid and Spindle (L > 2x D) Intravascular/intralymphatic invasion: Suspicious Angiotropism near advancing edge of tumour: Present (Melanoma cells abut/cut the external surface of capillaries or lymphatics) Neurotropism: Not seen Microsatellites: Not seen Desmoplasia (% of dermal invasive tumour): Not seen	
Features of regression: Early (TILs): Focal Mild Intermediate: Not seen Late (fibrosis and loss of rete ridges): Not seen Associated naevus (type): Not seen Actinic/Solar elastosis: Severe	
MARGINS: In situ component - nearest peripheral: About 5 mm Invasive component - nearest peripheral: 5.8 mm - deep: About 5.4 mm	

Pathology Staging = primary cutaneous melanoma & nodal metastatic disease (AJCC stage III)

	Dependent		Breslow Thickness of melanoma	Margins of wider excision (down to muscle fascia)	5-year Survival rates
Primary tumour (T)	• Breslow thickness, • Presence of ulceration • # of mitoses per mm²		Melanoma in-situ	0.5cm	
Regional LN (N) mets	i.e. 1 or 2 contiguous nodal basins and lymphatic channels draining primary tumour site		Thin melanoma (T1)	1cm	95-100%
			Intermediate thick (T2)	1 – 2cm	80-96%
			Intermediate thick (T3)	2 – 3cm	60-75%
Distant metastasis (M)	Organs or tissues distant from primary tumour + regional nodes (e.g. liver, brain, lung)		Thick melanomas (T4)	2 – 3cm	37-50%



T category	Thickness	Ulceration status	N category	No. of tumour involved regional LN	In-transit ± satellite mets
T1	≤ 1.0mm	Unknown of unspecified	N1		
T1a	< 0.8mm	Without ulceration	N1a	1 occult node (SLNBx)	No
T1b	< 0.8mm	With ulceration	N1b	1 clinically detectable node	No
	0.8-1.0mm	With or without ulceration	N1c	No LN	Yes
T2	> 1.0-2.0mm	Unknown of unspecified	N2		
T2a		Without ulceration	N2a	2-3 occult nodes	No
T2b		With ulceration	N2b	2-3 clinically detectable nodes	No
			N2c	1 occult/detectable node	Yes
T3	> 2.0-4.0mm	Unknown of unspecified	N3		
T3a		Without ulceration	N3a	≥ 4 occult nodes	No
T3b		With ulceration	N3b	≥ 4 clinically detectable nodes	No
			N3c	≥ 2 occult/detectable node	Yes
T4	> 4.0mm	Unknown of unspecified			
T4a		Without ulceration			
T4b		With ulceration			

OCCULT nodes = melanoma nodes without primary melanoma on skin (immune system inadequate to kill melanoma node but sufficient for primary melanoma)

Pathology Staging: When to biopsy the sentinel lymph node?

***Sentinel LN = 1st lymph node in regional basin that receives lymph flow from tumour**

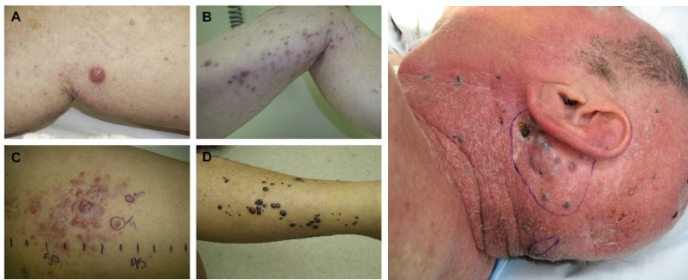
Indications	Procedure	Complications	Mx of nodal metastasis
- Melanoma is > 1mm Breslow thickness - Melanoma is 0.8-1mm Breslow thickness PLUS - Clark level ≥ IV OR - Higher mitotic rate OR 40 years of age *no biopsy = 0.75-1mm + pathological features Should we stage prior to SLN Bx? ➤ Only if intermediate and thick melanomas ➤ CXR + Bloods + LFT + LDH ➤ <u>NO CT or PET SCANS needed!</u>	- Pre-operative lymphoscintigram - Intra-operative identification - Surgical excision - Pathology	Lymphoedema [MAIN] usu. from axillary or ilio-inguinal dissection - Persistent drainage - Lymphocele - Wound infections	Adjuvant RT (if nodal METs or Diameter ≥3cm or # of LNs ≥ 1-3) Exclude METs → PET/CT scan + MRI Brain Therapeutic LN dissection (usu. neck, axilla, groin) remove tumour and surrounding LN (Preserve neurovascular structures if possible) BRAF testing for possible inclusion in neoadjuvant trial

Types of METs: Satellite, microsatellite and In-transit metastases (Stage III)

Microsatellite	<u>Microscopically</u> identified tumour deposit separated from primary lesion by normal tissue
Satellite	<u>Clinically identified</u> separate tumour nodule separate from primary tumour < 2cm
In-transit metastasis	<u>Clinically identified</u> tumour nodule > 2cm from primary tumour between primary tumour and regional LNs Usu. after primary melanoma and LN removed → melanoma spreads to blocked LN but pushed up to skin

Treatment of in-transit disease

- Single in-transit metastasis: excision with SLN biopsy
 - Small finite number of metastasis → complete excision with negative margins OR Cryotherapy/fulguration
 - IF unable to excise
 - Intradermal injections with iFN alfa-2b, PV-10, T-VEC
 - Diphencyprone cream
 - Hyperthermic isolated limb perfusion
 - Systemic treatment (CHEMO)
- *Radiotherapy poorly controls regional disease



Follow-up recommendations

- 6-12 mth Annual skin check for life + patient education
 - Patients who did **NOT** undergo SLNBx or complete LN dissection
 - LN USS every 3-12 months for first 2-3 years after Dx
 - FU** influenced by:
 - risk of recurrence & nodal recurrence
 - prior primary melanoma
 - family hx
- *Refer to genetic counsellor for **p16/CDKN2A mutation testing** if ≥3 invasive melanoma or mix of invasive melanoma and pancreatic cancer in an individual or family

Therapies for metastatic or unresectable melanoma

	Immunotherapy – 1 st line	Targeted therapy = 2 nd line
Objective	Stimulate or restore ability of immune system to fight disease	Target genes activated in cancer cells
MoA	Melanoma = very immunological cancer (i.e. Melanoma antigens are recognised by T-cells due to high mutation rate)	- Melanomas = high mutation load (like lung) → - Targetable mutations in ≈ 70% of cutaneous melanoma pts
Rx	BOTH reactivate melanoma-targeting T cells by suppressing their inhibition <u>Ipilimumab</u> (anti-CTLA-4): improves overall survival <u>Nivolumab</u> (anti-PD-1): disrupts PD-1/PD-L1 interaction	Drugs attack BRAF protein directly - Vemurafenib (Zelboraf), - Dabrafenib (Tafinlar), - Encorafenib (Braftovi)
Adv.	- Assoc. between vitiligo & melanoma regression with Rx - Rx kills melanocytes = causes vitiligo Highest solid organ response to immune checkpoint inhibitors	KEY: Only effective in those with BRAF^{V600} mutation → those <u>WITHOUT</u> mutation makes tumours grow faster This is only 50% of sufferers [E > K > R]
Disadv.	If left untreated, immune-related adverse effects (irAE) cause devastating outcomes → Early identification & Rx key - Anti-PD1 (e.g. pembrolizumab) may not work for everyone Combined Rx (BRAF-WT + Brain mets+ Sx – FND) = better response rates but higher toxicity Multiple resistance (both innate and acquired) mechanisms with heterogeneity again a major hurdle	- Despite high response rates, majority develop acquired resistance within 12 months → high relapse rate [heterogeneity cause?] - Other driver mutations (clonal pop. survives and proliferates) BRAF inhibitor a/e = SCC, rash, stem warts

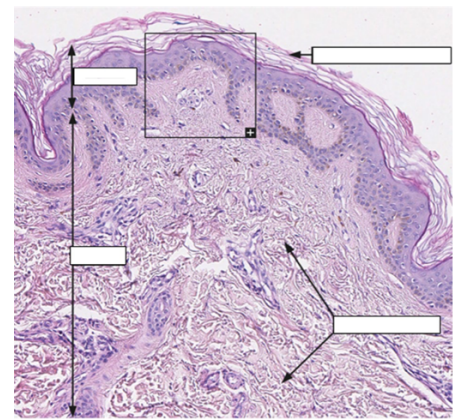
Quiz for melanoma

Epidermis and dermis of Skin

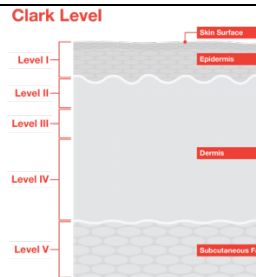
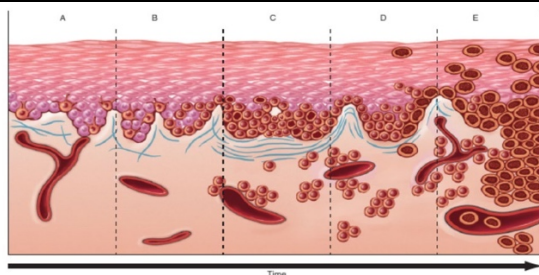
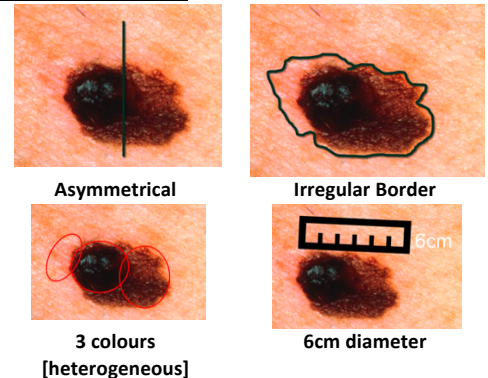
- **Most superficial layer** = stratum corneum
- **Deepest layer** = stratum basale
- **Cells in epidermis** = keratinocytes
- Small cells with clear cytoplasm at dermal-epidermal junction called **basale cell**

	Exam	Histology
Lentigo	Small, sharply circumscribed, pigmented macule surrounded by normal-appearing skin	Hyperplasia of epidermis and increased pigmentation of the basal layer
Naevus	Flat mole with a single uniform colour (usually black)	Pigmented cells (melanocytes) aggregate together in groups

**Lentigenes, Naevi and Melanomas are ALL comprised of melanocytes:*

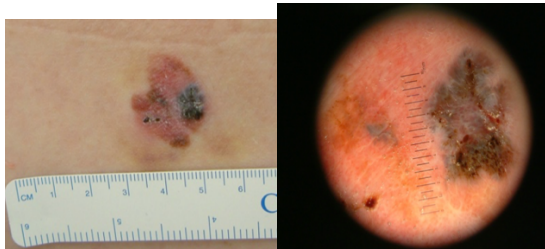


Describing the lesions?



- A = lentigo
- B = Clark level I (melanoma in situ) = junctional naevus
- C = Clark level II (invasion into superficial/papillary dermis) = invasive melanoma
- D = Clark level III (has filled papillary dermis) = invasive melanoma
- E = Clark level IV (invaded reticular dermis i.e. dermis/hypodermis junction)
- Clark level V (invaded into subcutaneous tissue)

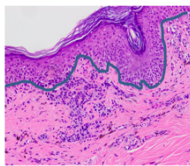
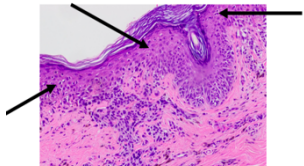
Describing lesions:



Asymmetrical well-demarcated 2cm diameter lesion with irregular border with heterogeneous black centre surrounded by disproportionate erythema



Lentigo melanoma	• Asymmetrical, poorly demarcated border, • Consistent colour, 8mm diameter
Nodular melanoma	• A- Symmetrical • B - Well embroidered • C - Varied colour, very erythematous (Melanoma often attracts inflammation) → Ulcerated nodulated melanoma
Acral melanoma	• Extensive Discoloured, very pigmented, nodule on bottom of the foot → most likely amputation

What are the 2 most important factors for prognosis from the primary lesion?	1. Ulceration 2. Breslow Thickness
How is melanoma staged and graded?	• Staged = TNM (T = Breslow and ulceration) • Graded = Not graded
What are three other factors that are important in the histopathology report?	1. Margins 2. Ulceration 3. Mitotic rate
What is lentiginous spread? Slowly progressive melanoma <i>*Due to melanocytes spreading across the dermal epidermal junction</i>	
	What is pagetoid spread? & What is the clark level? • Single melanocyte above basal layer (Similar to Paget's disease of the breast) • Clark level III 
If a melanoma is on a limb, what extra examination should be performed to check for metastasis?	• Check sentinel lymph node for possible biopsy [i.e. LN examination] • PET/CT scan + MRI Brain for staging
Metastatic Melanoma can be treated with DaBRAFanib and VerRAFanib if it harbours a certain mutation. What mutation is this?	BRAF ^{V600} mutation
When do you need to refer a patient with a primary melanoma to a melanoma surgeon?	1. Excision of Melanoma in difficult areas or where margins difficult to identify 2. <u>0.8mm – 1mm</u> thick melanomas with adverse features to discuss SNL biopsy ○ Clark IV or V – ulcerated -- high mitosis 3. <u>> 1mm</u> thick melanomas to discuss SNL biopsy

