PAEDIATRIC & ADULT DERMATOLOGY

Macule	<1cm	Non elevated/ Non-Palpable lesion of altered colour change
Patch	>1cm	Non elevated/ Non-Palpable lesion of altered colour change
Papule	<1cm	Elevated/Palpable lesion
Plaque	>1cm	Flat topped/Elevated/Palpable lesion
Nodule	>1cm	Solid/Elevated/Palpable lesion
Vesicle	<1cm	Fluid filled lesion
Bulla	>1cm	Fluid filled lesion

Symptoms	RF	Localised features	Generalised features
• **Where / distribution** • Pruritis • Pain (which is worse?) • Inflammation = red, hot, swollen, painful • Discharge – pus, bleeding • Blistering • B Symptoms •	• Chronic Illnesses • Sexual History • FHx of atopy *Environmental* • Recent Travel • Insect & Plant Exposure • Drug Exposure • Hobbies • Ill contacts • Pets • Chemical Exposure	1. *Assymetry* a. Flexural/Extensor b. Sun exposed/Clothing Covered c. Dermatomal vs Truncal 2. *Border:* Round/Oval/Annular/Reticular a. *Ulcer → erosion → fissure* 3. *Colour* a. Erythematous, Scaly b. blanching c. Hypopigmented/Hyperpigmented 4. *Diameter* 5. *Evolution* 6. *Raised / vesicular vs pustular or flat* 7. *Smooth vs rough*	• Lymph Nodes • Neurologic Status • Body Temperature • General Appearance ***Koebner phenomenon*** ***"lesions at site of injury"*** ➢ Vitiligo ➢ Psoriasis ➢ Warts ➢ Lichen planus ➢ Lichen sclerosis ➢ Mollascum 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 ➢	DDx: ➢ **Meningococcal septicaemia** ➢ HSP – PAPAH ➢ 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 inlafmfed 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
					

LIVEDO RETIUCLARIS	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 (*Koebner phenomenon)* • **Excess alcohol consumption** • Medication (BB, hydroxychloroquine, NSAIDs, prednisone withdrawal) • MetSyn • Stress (emotional + physical)	• May present with 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 psoraitc plaque removed * ***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 psoarisis

Scalp psoriasis (classical)	Guttate (droplet-like psoriasis)	Pustular Psoriasis	Chronic plaque psoriasis	Inverse (flexural) psoriasis	Erythordermic 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 • Auzpitz 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 psoraisis)	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	• Inflammed 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)   	**Psudo 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 r**ash - *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 • Phenoxymethypenilclin 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 • **Congenial 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** (*spares soles/palm*)	**Bone marrow suppression** → severe aplastic anemia and hydrops fetalis ➢ Pregnancy → fetal death ➢ May cause hepatitis, myocarditis or nephritis	Keep child away from pregnant women → day care!!!
6th disease: **Roseola Infantum** **(most asymptomatic)**	**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 (feacal-oral Tx) – *blisters infective until dry up*	**Coxsackie A16 / enterovirus** < *2yo* **Incubation days = 3-5 days**	**1)** **Viral prodrome (coryza + low grade fever)** *2)* **Day 1-2:** *Painful oral ulcers esp. on tongue* **3)** **Then: Contagious Vesicular** rash on the hands, feet, mouth, and buttocks	• *Dehydration* • *Bacterial superinfection* • *Encephalitis (ataxia)*	**Reassurance – self-resolve** ➢ *continue normal ADLs* ➢ *simple analgesia (aparcetamol)* ➢ *isolate at home (as highly contagious) = hand hygiene*
Molluscum Contagiosum	molluscum contagiousm 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)**	1. **Fever 1st** → Prodrome = fever + coryza + pharyngitis 2. **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 opthalm 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

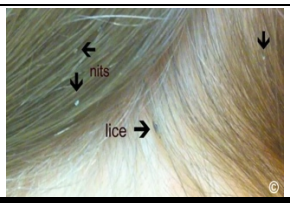
	Rosacea	Neonatal cephalic pustulosis (neonatal acne)	Acne vulgaris
Define	• > 30 yo • **flushing < 5mins** • Transient inflamed papules/ pustules or hyperplasia of CT • Telangiectasias • *2° features* = burning stinging plaque, dry and oedema w/ eye involved	• **Small follicular keratotic papules** on extensor surface of arms and thighs @ 6-12 mths ➢ XS KERATIN	➢ Chronic inflammation with or without infection of pilosebaceous unit → creating **comedones** o 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** – *explains why puberty worsens acne* • **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) 	*Conservative* • Exfoliation *Medical* • 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 squeecing pimples • Low GI and stress management ***PHARM:***

	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 • Monitor for PCOS • Erythromycin given to pregnant (tetracylines= teratogenic)
Severe ACNE	• **Isoretinoin (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

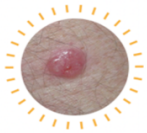
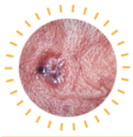
ECZEMA

	Impetigo	Contact dermatitis (Nappy rash)	Atopic dermatitis (eczema)
Define	➢ **Contagious** S. aureus infection of superficial skin *Bullous impetigo* ➢ Fluid filled vesicles that burst ➢ Leads to SSSS *Non-bullous impetigo* ➢ Nose and mouth ➢ Golden crust	• Friction between skin and nappy PLUS contact with urine and faeces *DDx: candida infection* • Check for oral thrush • Larger red macules • Circular well-demarcated scaly border • Satellite lesions	• **Chronic relapsing** and **remitting** atopic inflammatory skin condition o **Due to defects in skin barrier to allow entry for irritants, mircobes and allergens → generates immune response** • **Scaly itchy red maculopapular rash** on flexor • *Repeat scratching* → infection, scar + lichenification • **Consider perioaral dermatitis → trigger due to food, mask or cold air**
RF	• Scabies, • Poor personal hygiene • Neonates and < 2yo (if bullous impetigo)	• Pre-term infants • 9-12 mths of age • Warm moist environment • Delayed nappy change • Irritant soap productions and vigorous cleaning	• Genetics -FHx of allergic rhinitis or atopy • Dry skin
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	• Candida infection • Erosions and ulceration → cellulitis • Jacquet's erosive diaper dermatitis • Perianal psuedoverrucous papules	• Bacterial infection – S. aureus o May need admission and IV ABx
Rx	• Avoid scratching, touching, sharing tools • School exemption (isolation > 48 hrs) • Bactroban ointment (mupirocin) ➢ PO flucloxacillin if widespread	***Conservatives*** *Avoid trigger products* ➢ Switch to highly absorbent nappies ➢ ASAP nappy change ➢ Water or gentle alcohol free products to clean nappy area ➢ Reduce nappy time ***If infection suspected:*** ➢ Anti-fungal cream ➢ ABx (topical or PO flucloxacillin)	*Conservative → maintain skin barrier to prevent flares* • Reduce bath time (lukewarm)—od • Soap-free cleanser – long-term • Mix bleach and water and soak in baths *Medical* **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) o ***Low/mild*** = (hydrocort 0.5-2.5%) → face only (thinner skin) o ***Medium/mod*** = (diprosone) → trunks or hands o ***High/potent*** = (e.g. betamethasone 0.1%) • **Perioral dermatitis** → topical clindamycin (anti-inflammatory effects)
			

COMMON UNUSUAL PRESENTATIONS

	Chilblains / perniosis	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**
			

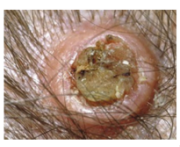
COMMON SKIN CANCERS

	Actinitic/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 metastasis	➢ 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 • Cunulative Sun-exposed areas • Immunosuppression (may be due to HPV) • Usu. head and neck • 2° malignancy in old RT sites or chronically inflamed skin
Signs	• Freckling (early) • Yellow nodularity (solar elactosis) • Solar comedones • Wrinkling & facial telangectasias (adults) *Late changes:* • **Solar keratoses** = red scaly large patches and plaques on face, back of hands/forearms ➔ • *Other:* brown macules, easy bruising, white patches (guttate hypomelanosis) 	 **Nodular BCC** Slow-growing pearly-rolled edged red papules on face with surface telangiectasias  **Superficial BCC** Flat macules/patches on trunk/shoulders with scaling and micro-erosions  **Pigmented** Brown blue-black papules, nodules that are raised firm with smooth shiny surface  **Ulcerative BCC** Translucent pearly ulcers with rolled edges and crusts (that separate when pulled)  SCC – Images by A/Prof ShyamalaHuilgol Basosqaumous BCC	• 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 prsent

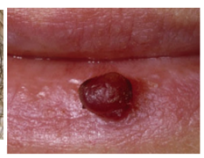
General DDx:

- ➢ **Keratoacanthoma** = central keratotic plug appearing like a boil ➔ excision + RT
- ➢ ***dermal naevus (moles)***
- ➢ ***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***
- ➢ ***syphilils chancre***

Keratoacanthoma

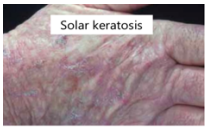


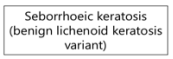
Pyogenic granuloma

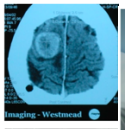


Melanoma

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	***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)
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 *patterns formed by pigment and BVs)* • Wide excision elliptical biopsy w/ clear margins (> 2mm) • MRI = check for brain mets	
Mx	1. No action 2. Biopsy skin lesion (punch/shave/excision) 3. Refer (dermatologist, plastic surgeon)	




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?**

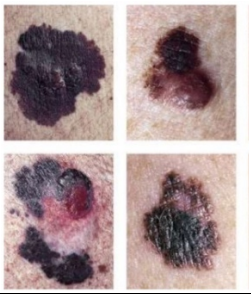
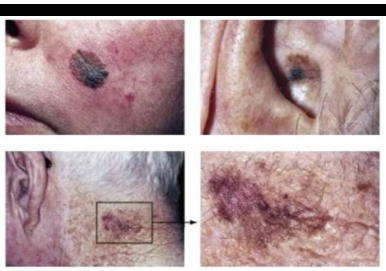
For nodular melanoma (which invades vertically) ➔ urgent refer + excision

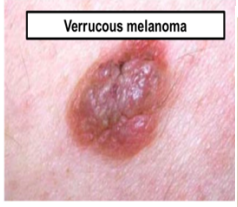
- **Elevated**
- **Firm**
- **Growing** proegssively > 1 month

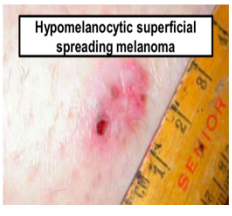
Types of lesions:

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 itch!**
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

Types Melanoma

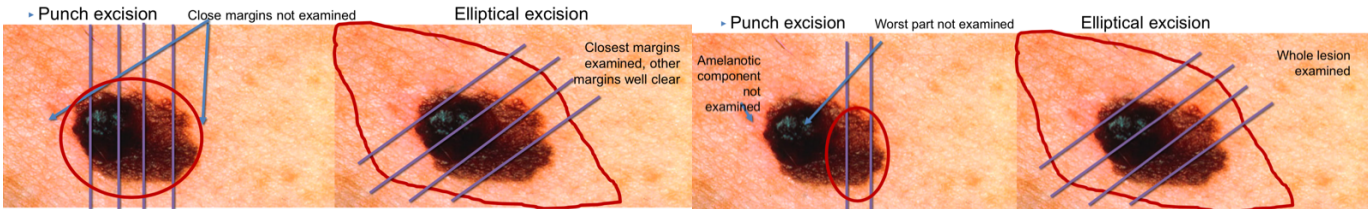
			
Superficial spreading melanoma [most common]	***Nodular Melanoma [2nd most common]***	***Lentigo Maligna melanoma [3rd most common]***	***Acral lentiginous melanoma [dark skinned, Jap]***
• Asymmetric impalpable flat lesion • Irregular border of heterogeneous colour • large diameter • Margins of lesion 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. palms/soles* • Becomes invasive early





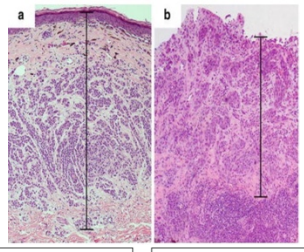
Wide Excisional Biopsy

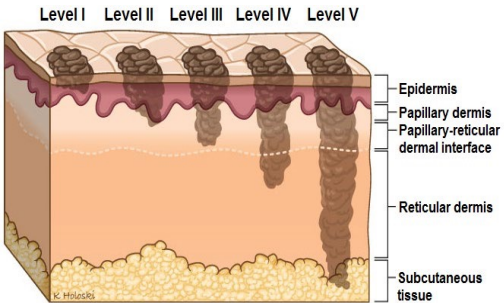
- **WIDE EXCISION** biopsy (**elliptical**) with 1-3mm margins [preferred]
- Avoid larger margins to permit accurate subsequent lymphatic mapping
- Always parallel to lymphatics
- PUNCH BIOPSY ONLY for difficult anatomic areas (e.g. Palm/sole, digit, face, ear)

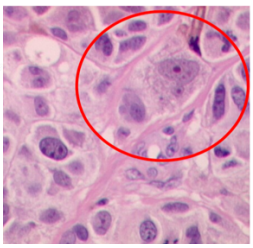


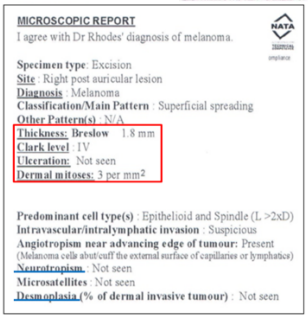
Pathology Reporting

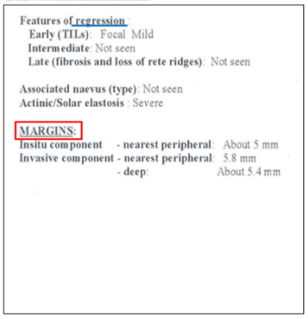
Diagnosis	Is it primary melanoma?
Breslow thickness (nearest 0.1 mm)	granular layer of epidermis to deepest melanoma cell
Clark level	depth of skin invasion in the skin (important for thin melanomas)
Ulceration	Strongly linked to tumour thickness ➔ poorer prognosis if present
Mitotic rate	independent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







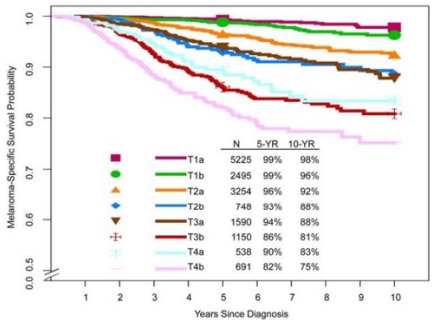




Pathology Staging = primary cutaneous melanoma & nodal metastatic disease (AJCC stage III)

	Dependent
Primary tumour (T)	• Breslow thickness, • Presence of ulceration • # of mitoses per mm²
Regional LN (N) *mets*	i.e. 1 or 2 contiguous nodal basins and lymphatic channels draining primary tumour site
Distant metastasis (M)	Organs or tissues distant from primary tumour + regional nodes (e.g. liver, brain, lung)

Category	**Breslow Thickness of melanoma**	**Margins of wider excision (*down to muscle fascia*)**	**5-year Survival rates**
	Melanoma in-situ	**0.5cm**	
Thin melanoma (T1)	0.1 – 1mm	**1cm**	**95-100%**
Intermediate thick (T2)	>1mm – 2mm	**1 – 2cm**	**80-96%**
Intermediate thick (T3)	>2mm – 4mm	**2 – 3cm**	**60-75%**
Thick melanomas (T4)	>4mm	**2 – 3cm**	**37-50%**



T category	**Thickness**	**Ulceration status**
T1	≤ 1.0mm	Unknown of unspecified
T1a	< 0.8mm	Without ulceration
T1b	< 0.8mm 0.8-1.0mm	With ulceration With or without ulceration
T2		Unknown of unspecified
T2a	> 10.-2.0mm	Without ulceration
T2b		With ulceration
T3		Unknown of unspecified
T3a	> 20.-4.0mm	Without ulceration
T3b		With ulceration
T4		Unknown of unspecified
T4a	> 4.0mm	Without ulceration
T4b		With ulceration

N category	**No. of tumour involved regional LN**	**In-transit ± satellite mets**
N1		
N1a	1 occult node (SLNBx)	No
N1b	1 clinically detectable node	No
N1c	No LN	Yes
N2		
N2a	2-3 occult nodes	No
N2b	2-3 clinically detectable nodes	No
N2c	1 occult/detectable node	Yes
N3		
N3a	≥ 4 occult nodes	No
N3b	≥ 4 clinically detectable nodes	No
N3c	≥ 2 occult/detectable node	Yes

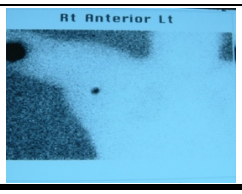
*OCCULT nodes = melanoma nodes without primary melanoma on skin (immune system inadequate to kill melanoma node but sufficient for primary melanoma)

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
	• **Pre-operative lymphoscintigram**
	• **Intra-operative identification**
	• **Surgical excision**
	• **Pathology**
		• **Lymphoedema [MAIN] usu. from axillary or ilio-inguinal dissection**
		• Persistent drainage
		• Lymphocele
		• Wound infections
			1. **Adjuvant RT** (if nodal METs or Diameter ≥3cm or # of LNs ≥ 1-3)
			2. **Exclude METs➔** PET/CT scan + MRI Brain
			3. **Therapeutic LN dissection (usu. neck, axilla, groin)** remove tumour and surrounding LN (Preserve neurovascular structures if possible)
			4. **BRAF testing for possible inclusion in neoadjuvant trial**

Should we stage prior to SLN Bx? ➢ Only if **intermediate and thick melanomas** ➢ CXR + Bloods + LFT + LDH ➢ *NO CT or PET SCANS needed!*			

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

Microsatellite	*Microscopically* identified tumour deposit separated from primary lesion by normal tissue
Satellite	*Clinically identified* separate tumour nodule separate from primary tumour < 2cm
In-transit metastasis	*Clinically identified* 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

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

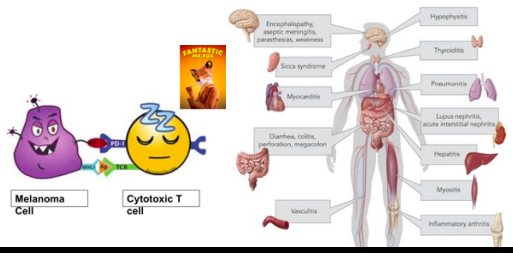
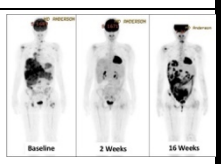
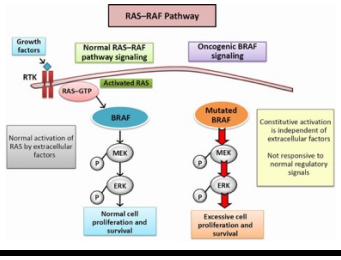
*Radiotherapy *poorly controls* regional disease

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

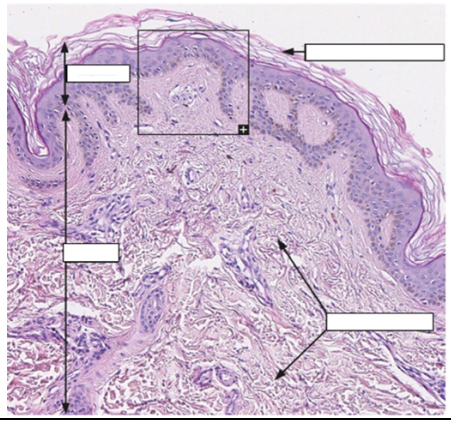
	Immunotherapy – 1st line	Targeted therapy = 2nd line
Objective	**Stimulate or restore ability of immune system to fight disease**	**Target genes activated in cancer cells**
MoA	• Melanoma = very immunological cancer (i.e. Melanoma antigens are recognised by T-cells due to high mutation rate)	• Melanomas = high mutation load (like lung) ➔ • Targetable mutations in ≈ 70% of cutaneous melanoma pts
Rx	BOTH reactivate melanoma-targetting T cells by suppressing their inhibition • *Ipilimumab* (anti-CTLA-4): improves overall survival • *Nivolumab* (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 **WITHOUT** 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

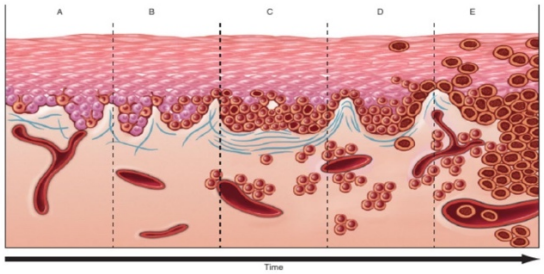
Epidermis and dermis of Skin

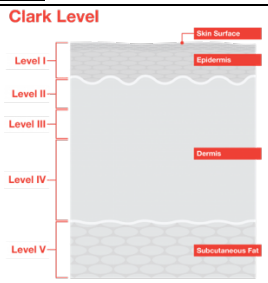
- **Most superficial** layer = stratum corneum
- **Deepest l**ayer = stratum basale
- **Cells in epidermis** = keratinocytes
- Small cells with clear cytoplasm at dermal-epidermal junction called ***basale cell***

	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:*

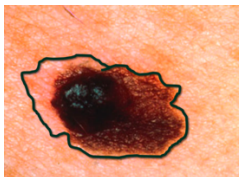




- A = lentigo
- B = Clark level I (melanoma in situ) = junctional naevus
- C= Clark level II (invasion into superficial/papillary dermis) = invasive melanoma
- D= Clark level III (has filled papillary dermis) = invasive melanoma
- E = Clark level IV (invaded reticular dermis i.e. dermis/hypodermis junction)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

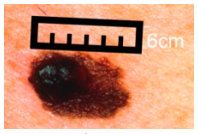
Describing the lesions?

Asymmetrical



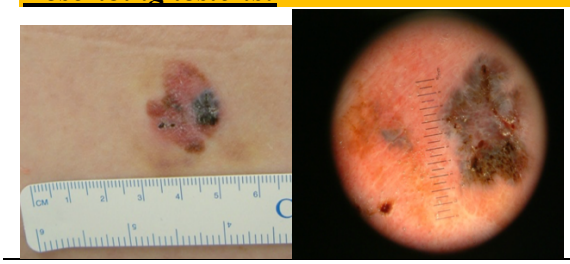
Irregular Border

3 colours [heterogeneous]



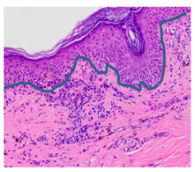
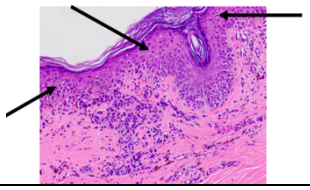
6cm diameter

Describing lesions:



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

Lentigo melanoma	• Asymmetrical, poorly dermacated 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*** **Due to melanocytes spreading across the dermal epidermal junction* 	**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 is 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. 0.8mm – 1mm thick melanomas with adverse features to discuss SNL biopsy ○ **Clark IV or V – ulcerated -- high mitosis** 3. > 1mm thick melanomas to discuss SNL biopsy