MELANOMA AND KERATINOCYTE CANCER:

A guide for medical practitioners

Skin cancer is divided into two main types:

Melanoma

Melanoma develops in melanocytes (pigment-producing skin cells) and has a high risk of metastasis if untreated.

Common subtypes include:

- **Superficial spreading melanoma (SSM)**
- **Nodular melanoma (NM)**
- **Lentigo maligna melanoma (LMM)**

Keratinocyte cancer (KC)

KC develops from keratinocytes in the epidermis.

Subtypes include:

- **Squamous cell carcinoma (SCC)**
- **Basal cell carcinoma (BCC)**

Burden and disparities

Two in three Australians will develop skin cancer in their lifetime.

Non-Caucasian populations, despite lower incidence, have a **risk of delayed diagnosis** and rarer melanoma subtypes.

In 2022, there were **~1,700 new cases** of melanoma and 140+ deaths in WA

Men are **twice** as likely as women to die from melanoma.

Risk factors for skin cancer:

- Fair skin (Fitzpatrick skin types I &II)
- Family history of melanoma or KC
- Personal history of skin cancer
- Increasing age
- Occupational sun exposure
- Immune suppression, especially organ transplant recipients

Melanoma risk factors:

- Multiple naevi (>100) or atypical naevi (>5) or giant naevi (>20cm diameter)
- Dysplastic naevus syndrome
- High intermittent sun exposure

Keratinocyte risks factors:

- Radiation therapy
- Chemical exposure (e.g., arsenic)
- Psoralen (PUVA) treatment for psoriasis
- Rare genetic conditions (e.g., xeroderma pigmentosum, albinism, Gorlin syndrome)

Causes of skin cancer

The primary cause of melanoma and keratinocyte cancers is unprotected exposure to ultraviolet (UV) radiation. Key contributing factors include:

- **UV radiation (UVA and UVB):** Contributes to skin damage, premature ageing, and skin cancer.
- **Sun-exposure patterns:** Melanoma and KC are both associated with sun exposure, but the pattern of exposure differs. Melanoma is strongly linked to intermittent sun exposure, while keratinocyte cancers are more often linked to chronic exposure.
- **Cumulative exposure:** Conditions like actinic keratosis and SCC are associated with total lifetime sun exposure.

Cancer Council WA

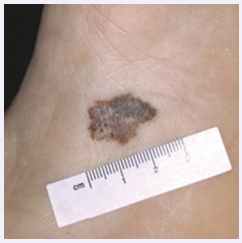
WA Kirkbride MELANOMA ADVISORY SERVICE

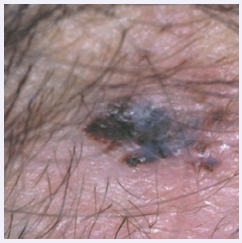
MELANOMA

Diagnosis

Superficial spreading melanoma (SSM)

- The most common type of melanoma (55-60%)
- Can appear as a new spot or as a change in the size, colour or shape of an existing mole
- Typically on the head and neck, trunk (males), or lower limbs (females), but can appear anywhere, even on non–sun-exposed skin
- A patient diagnosed with SSM is at increased risk of developing a new primary melanoma



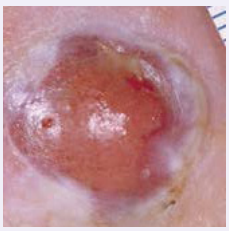


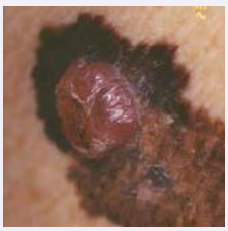
Lentigo maligna melanoma (LMM)

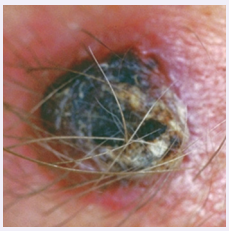
- Slow-growing form of melanoma in situ, accounting for 10–15%, that can be difficult to recognise
- Commonly found at sites of frequent sun exposure, such as the head and neck of the elderly
- Margin determination can be challenging, and local recurrence is more common than in other types of melanoma

Nodular melanoma (NM)

- Accounts for 10–15% of melanomas; can metastasise early as it has little radial growth within the epidermis but penetrates vertically into the dermis
- Can develop in normal-appearing skin or within another type of melanoma
- Differs from SSM in appearance. It is more likely to be symmetrical and uniform in colour (red, pink, brown or black), lighter in colour, and may be firm to the touch
- May develop a crusty surface that bleeds easily
- Develops most commonly on sun-damaged skin and in older people, particularly men







The ABCD(E) acronym can help distinguish an SSM from a normal mole:	
A	**Asymmetry:** the lesion is irregular in shape or colour pattern.
B	**Border:** the border or outline of a melanoma is usually irregular.
C	**Colour:** there is variation in colour within the lesion. Multiple colours visible using dermoscopy.
D	**Diameter:** the lesion is usually greater than 6 mm across. However, suspicious lesions of smaller diameter should also be investigated.
E	**Evolving:** the lesion changes over time (size, shape, surface, colour, or symptoms such as itch). This is the most important clinical indicator of melanoma.

The ABCD(E) acronym is unreliable in the diagnosis of NM but the following features EFG – can assist with the diagnosis	
E	**Elevated:** the lesion can appear as a small, round, raised lump on the skin. Colour may be uniform and may be black, brown, pink or red.
F	**Firm:** the lesion feels firm to the touch when palpated.
G	**Grows:** a nodule that has been growing progressively for more than a month should be assessed as a matter of urgency.

Any lesion with ABCDE or EFG features for more than one month should be investigated. Refer urgently to a clinician experienced in skin cancer surgery or excise immediately with a 2mm margin. **Do not** use local flaps or halo grafts if melanoma is suspected.

Diagnosis tools

- **Dermoscopy** uses a hand-held magnifying tool that reveals skin lesion features invisible to the naked eye. It improves diagnostic accuracy and reduces unnecessary excisions. Training in dermoscopy is recommended for GPs involved in skin cancer care.
- **Sequential digital dermoscopy imaging (SDDI)** compares successive dermoscopic images to detect subtle changes in melanomas that may not show clear signs initially.
- **Total body photography** allows the detection of suspicious changes and is useful in high-risk patients or patients with dysplastic naevus syndrome.
- **In vivo confocal microscopy** is a non-invasive "optical biopsy" with the visualisation of cellular morphology and organisation in deeper skin layers. It is useful for difficult diagnoses and elucidation of margins in indistinct lesions (i.e., amelanotic melanoma, LM). This technique is used in specialised centres.

Biopsy and excision for melanoma or suspicious naevi

- Excision of the entire lesion with a 2mm margin is recommended.
- Partial biopsies (punch biopsy or shave biopsy) are less accurate than excisional biopsy and should be avoided. If complete excision is impractical, a large incisional biopsy incorporating as much of the atypical part of the lesion as possible is the best alternative.
- Deep shave excisions including the deep dermis and subcutaneous tissue are acceptable for lesions that are clinically superficial.
- Punch excision may be suitable for small lesions where the entire lesion can be removed using a large punch biopsy.
- The excision or biopsy should not interfere with subsequent treatment. For this reason, wide excisions, flap reconstructions, halo grafts, and curettage of suspicious lesions are contraindicated.

Smartphone apps for pigmented lesions

Smartphone apps that assess pigmented lesions are not reliable and should not be used for melanoma diagnosis. None to date have demonstrated sufficient agreement with specialist clinical opinion to be considered adequate.

Treatment

Appropriate primary treatment depends on the Breslow thickness of the tumour and involves excision with margins based on the primary tumour thickness (Tis-T4) classification. Melanomas with a Breslow thickness ≥0.8mm should be assessed for sentinel lymph node metastasis risk and referred to a melanoma multidisciplinary team (MDT), such as the Western Australian Kirkbride Melanoma Advisory Service (WAKMAS), for consideration of treatment options **before wide local excision**.

Primary tumour thickness classification	Breslow thickness	Clinical margin
Tis - Melanoma in situ	Melanoma cells are found only in the non-vascular epidermis and have not penetrated into the dermis	5mm clearance
T1	Less than 1mm thick	10mm clearance
T2	Between 1mm and 2mm thick	10-20mm clearance*
T3	Between 2mm and 4mm thick	
T4	More than 4mm thick	Consider a 20mm clearance*

Notes:

The optimal excision margin for melanoma with **Breslow thickness ≥2mm is debated. While clinical practice guidelines suggest a **20mm** margin, current evidence is limited.*

*Sentinel lymph node biopsy (SLNB) is generally **not offered** to patients who have already had their lesion excised with a wide margin. Definitive excision should wait until **SLNB has been discussed** with a surgeon who performs the procedure.*

*Flap reconstruction affects lymphatic drainage and **should not be performed** if **SLNB has not been discussed** in patients with **Breslow thickness ≥0.8mm**.*

*If partial biopsy shows **Breslow thickness <0.8mm**, excise the remaining lesion with a **2mm margin** before definitive treatment. If subsequent pathology confirms **≥0.8mm, SLNB discussion** is needed.*

Other treatment options

Surgery

- The Melanoma Institute of Australia (MIA) has developed a web-based risk calculator (melanomarisk.org.au/SNLForm) to estimate sentinel node positivity based on patient and tumour characteristics. SLNB should be discussed with patients with an estimated risk greater than 5%. ***The tool should be used for all primary melanomas ≥0.8 mm thick.***
- Resection of isolated metastases may be performed for therapeutic or palliative purposes. However, this should first be discussed at a melanoma MDT (e.g., WAKMAS) in case **neoadjuvant systemic therapy** is indicated.

Radiation

- Radiotherapy may be considered as adjuvant treatment where the lesion has a high risk of local recurrence (e.g., desmoplastic melanoma).
- Radiotherapy may be used for palliative management of metastatic lesions where systemic treatment has failed.

Clinical Trials

- Trials of new treatments for various stages of melanoma are ongoing. For information on available trials, including those for patients with advanced Stage II disease, please contact WAKMAS.

GPs play a vital role in monitoring immune-related side effects and supporting patients with chronic survivorship needs.

Medical Oncology

Treatment types

- **Targeted therapy:** Inhibits the mitogen-activated protein kinase pathway (BRAF and MEK inhibitor) in BRAF-mutant melanoma. Often used in combination for greater efficacy with reduced side effects.
- **Immunotherapy:** Modulates immune responses by blocking checkpoints on T cells (CTLA-4, PD-1). Combination immunotherapies increase effectiveness but carry higher risk of autoimmune toxicities.

Indications for treatment

- **High-risk Stage II & sentinel node positive Stage III**: Patients with Stage IIB and IIC melanoma, or those with microscopic nodal involvement (Stage IIIA–B) are at higher risk of recurrence after surgery. Adjuvant immunotherapy (anti-PD-1 agents) or targeted therapy is now considered to reduce relapse risk.
- **Stage III macroscopic (clinically apparent) melanoma**: Patients with bulky or clinically detectable nodal disease should be offered neoadjuvant immunotherapy before surgery to reduce tumour burden and improve long-term outcomes. Patients should be referred early to multidisciplinary melanoma services (e.g., WAKMAS) for treatment planning.
- **Stage IV metastatic melanoma:** Immunotherapy has dramatically improved outcomes with long-term remission in approximately 50% of patients. In BRAF V600-mutant melanoma, targeted therapy offers rapid disease control but is generally used when immunotherapy is contraindicated or disease is aggressive.

Follow-up

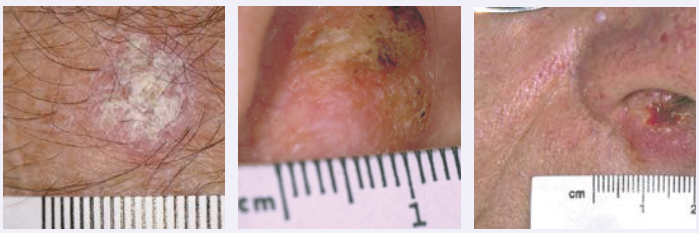
All patients require follow-up every 3–6 months for at least 5 years due to the risk of recurrence and new primary melanomas. Patients should be educated to recognise and monitor skin changes, undergo regular full skin checks by a health professional, and have further testing as needed. Self-check information is available at: www.myuv.com.au/skincancer.

KERATINOCYTE CANCER

Diagnosis

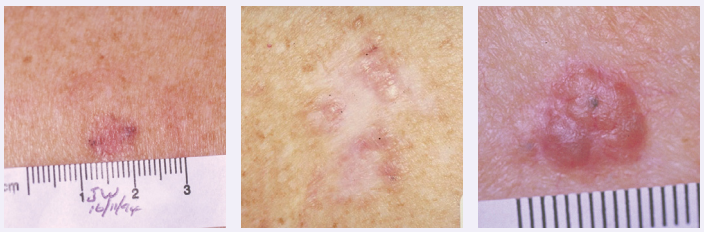
Squamous cell carcinoma (SCC)

- May metastasise when advanced
- Commonly affects the face (lower lip, ears, nose, cheeks, eyelids), neck, hands, and forearms. In men, it is most often on the head and neck; in women, on the lower limbs, followed by the head and neck
- Higher-risk features include lesions on the face or scalp, histologically aggressive subtypes, large tumours, and those in immunosuppressed individuals
- Appears as a thickened, red, scaly nodule that may bleed and ulcerate over time
- Grows over weeks to months and may be painful



Basal cell carcinoma (BCC)

- The most common type of skin cancer
- Appears as a well-defined lump or scaly patch, often red or pearly, which may bleed or ulcerate, then heal and recur
- Most common on the head and neck, but also occurs on the trunk, limbs, and areas not exposed to sunlight
- Usually grows slowly and rarely metastasises
- High-risk BCC subtypes (e.g., micronodular, infiltrating, or morphoeic) and BCCs in immunosuppressed individuals have higher recurrence rates after surgery



Treatment

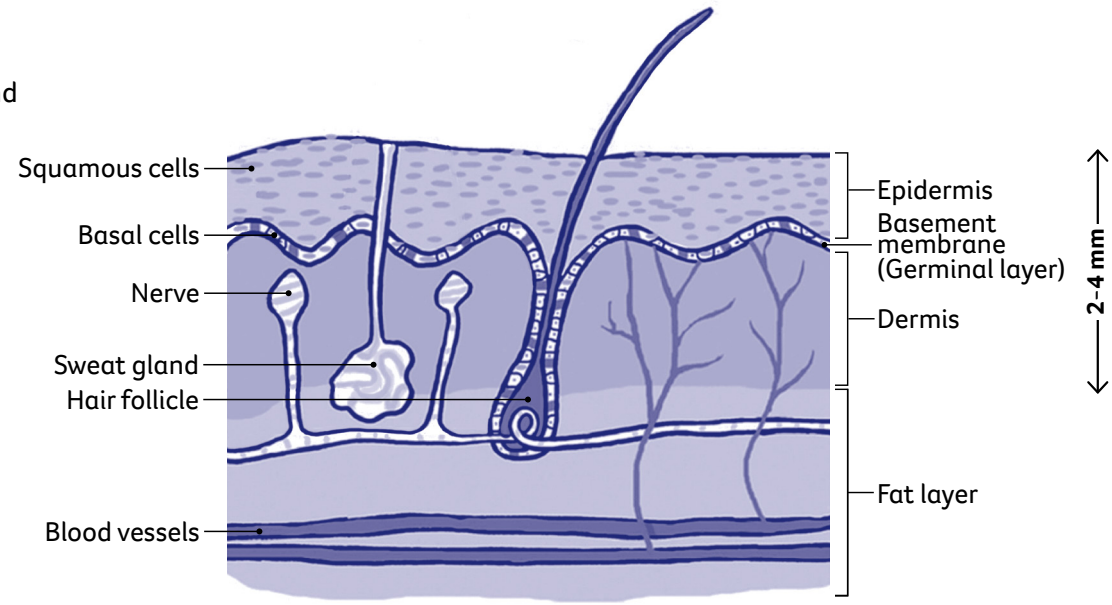
- Surgical excision of the tumour with a margin of normal-looking tissue
- Radiotherapy
- Curettage and electrodesiccation may be used for larger BCCs on the trunk
- For biopsy-proven superficial lesions: cryotherapy, topical agents (e.g. imiquimod cream, 5-fluorouracil cream), or photodynamic therapy
- Systemic therapy for advanced, unresectable, or metastatic disease

In general, the choice of treatment depends on:

- Tumour size
- Tumour thickness
- Histological features
- Anatomic site
- Patient preference, age, and medical comorbidities

Follow-up

Follow-up frequency after treatment for KC depends on histological clearance and tumour risk. Patients with multiple previous skin cancers should be followed up more regularly (every 3-6 months) and educated on recognising changes in their skin and draining lymph nodes, where applicable.



MELANOMA AND KERATINOCYTE CANCER

Screening

Population-based screening for melanoma or KC is **not recommended** due to insufficient evidence that it reduces morbidity and mortality.

Specialised melanoma and KC advisory services

Western Australian Kirkbride Melanoma Advisory Service (WAKMAS) provides comprehensive advice from a multidisciplinary panel of specialists regarding the management of complex, advanced, and metastatic malignant melanoma.

Harry Perkins Institute of Medical Research
6 Verdun St, QEII Medical Centre, Nedlands
T: 08 6151 0860 | F: 08 6151 1032
E: wakmas@perkins.org.au
wakmas.org.au

The Australasian College of Dermatologists website provides a "Find a Dermatologist" search function to assist in finding Dermatologists by location.

dermcoll.edu.au

The Australian Society of Plastic Surgeons website provides a "Find a Surgeon" search function to assist in finding Plastic Surgeons by location.

T: 02 9437 9200 | F: 02 9437 9210
E: info@plasticsurgery.org.au
plasticsurgery.org.au

Patient education and self-monitoring

No specific self-check technique or frequency has been proven to reduce morbidity, but regular self-examination may assist with early detection.

- **Patients at very high risk for melanoma** should be taught self-examination including checking draining lymph nodes, and should be reviewed by a clinician every 3-6 months, supported by total body photography and dermoscopy. Approximately 75% of melanoma recurrences are detected by patients themselves.
- **Patients treated for KC** should be taught to self-examine their skin, and those with a history of SCC should be advised to check their draining lymph nodes.
- **For the general population**, regular self-skin examinations are encouraged to help individuals become familiar with their skin. They should consult a health professional if they notice any changes. Additional self-check resources are available at www.myuv.com.au/skincancer.

Key references

Cancer Council Australia Melanoma Guidelines Working Party.

Clinical practice guidelines for the diagnosis and management of melanoma.

Cancer Council Australia Keratinocyte Cancers Guidelines Working Party.

Clinical practice guidelines for keratinocyte cancer.

When all of us work together, no one has to face cancer alone.

Your patients can call our 13 11 20 cancer information and support service today.