MODULE 1

MELANOMA EPIDEMIOLOGY AND PATHOPHYSIOLOGY

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In partnership with Novartis

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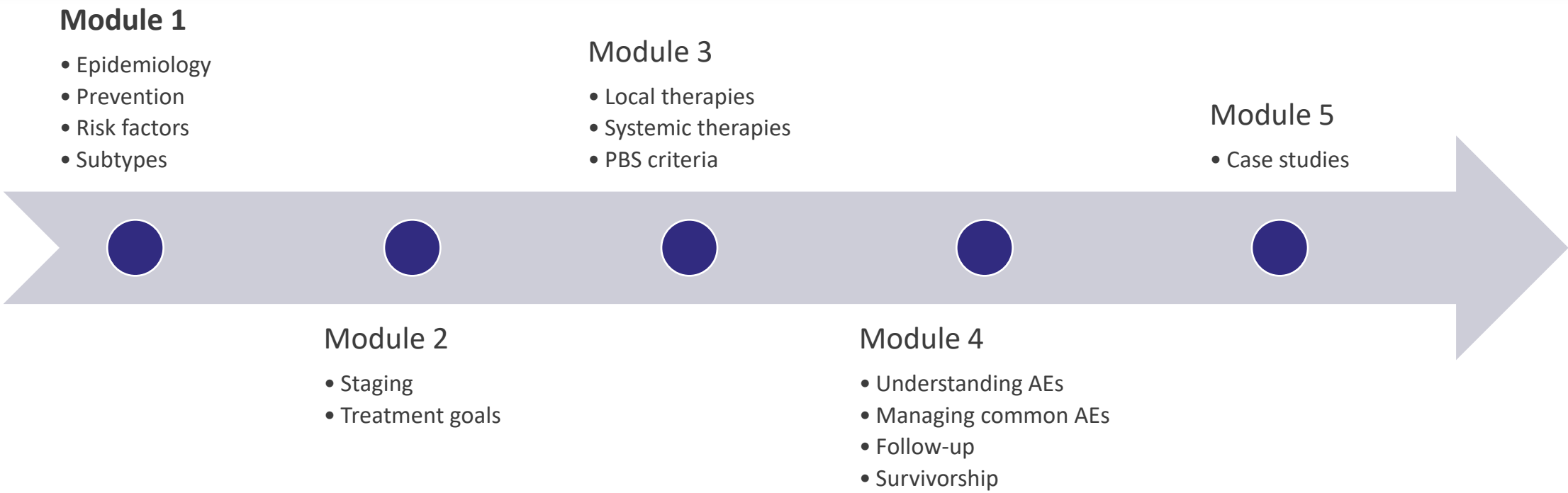
*We would like to acknowledge the contributions of **Ms Sarah Lane** and **Ms Megan Trewhella** who contributed to the module development, but no longer work in their previous capacity as a melanoma nurse consultant*

WHY LEARN ABOUT MELANOMA?

- With one of the highest incident rates in the world, melanoma is often referred to as Australia's cancer. The importance of early detection has led to sun awareness becoming a big part of Australian life
- Melanoma can be deadly. If left untreated, melanoma can spread beyond the skin to distal organs. Once spread, drug therapy is a big part of management. How patients manage treatment depends on getting the right advice at the right time
- The melanoma patient journey can be complex and difficult to navigate, involving many specialties in primary and secondary care. Patients can get lost in the system

- A melanoma nurse specialist can have a substantial impact on patients and their carers, guiding them through the health system, managing symptoms and helping them get the best from their drug treatment

COURSE OVERVIEW



- To help you understand more about the nature and impact of this disease, **Module 1** will look at the epidemiology, diagnosis and main subtypes of melanoma

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LEARNING OBJECTIVES

- To understand the incidence of melanoma worldwide and in Australia
- To identify key risk factors associated with the development of melanoma, including genetic or environmental predispositions
- To classify types of melanoma based on visual cues (superficial spreading, nodular, lentigo maligna, etc.)
- To understand the molecular mutations that drive melanoma growth and the role of the tumour microenvironment

MELANOMA IS A TYPE OF SKIN CANCER

- Skin cancers are abnormal growths of skin cells and are very common.
- They are named according to the type of cell that becomes malignant
- They are grouped together as non-melanoma and melanoma skin cancers[1,2]:

Non-melanoma skin cancers (NMSC)[1]	Melanoma[2]

• Predominantly basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) which begin in basal cell and squamous cell layers respectively
• Most common group: BCC accounts for ¾ of non-melanoma skin cancers
• More likely in those with light complexion and eye colour
• Typically occur in sun exposed areas e.g. face, but can occur on any skin surface
• BCC rarely metastasises, whereas SCC is more aggressive
• NMSC also includes Merkel Cell, a rare, aggressive form of cutaneous carcinoma
	• Begins in melanocytes (pigment cells)
	• Can occur on any skin surface
	  • In men, most commonly on the trunk or head and neck
	  • In women, most commonly on the arms and legs
	• Melanoma is more likely to metastasise compared to most NMSC

1. National Cancer Institute. Skin cancer treatment (PDQ®)- health professional version. Available at: https://www.cancer.gov/types/skin/hp/skin-treatment-pdq. Accessed November 2021.
2. National Cancer Institute. Melanoma treatmemt (PDQ®)- health professional version. Available at: https://www.cancer.gov/types/skin/hp/melanoma-treatment-pdq. Accessed November 2021

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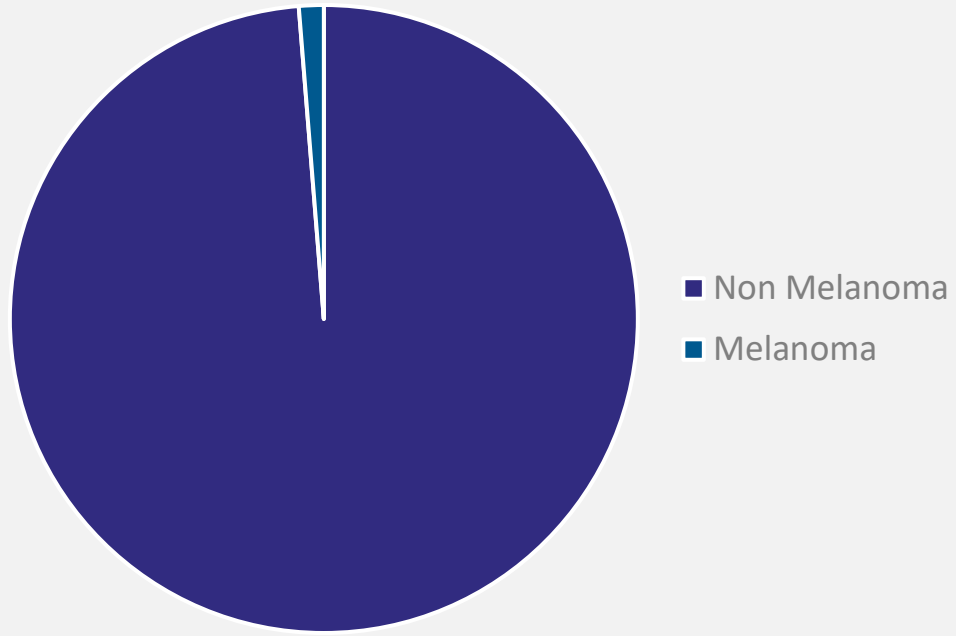
MELANOMA IS RARE BUT FATAL

- Only around 1% of skin cancers diagnosed are melanoma
- Whilst rare, they are clinically very impactful as they frequently metastasize, especially if the primary lesion is thick or initial treatment is inadequate
- Melanoma accounts for more deaths than all non-melanoma skin cancers combined

Skin Cancer Incidence[3]



1. National Cancer Institute. Skin cancer treatment (PDQ®)- health professional version. Available at: https://www.cancer.gov/types/skin/hp/skin-treatment-pdq. Accessed November 2021.
2. National Cancer Institute. Melanoma treatmemt (PDQ®)- health professional version. Available at: https://www.cancer.gov/types/skin/hp/melanoma-treatment-pdq. Accessed November 2021
3. American Cancer Society. https://www.cancer.org/cancer/melanoma-skin-cancer/about/key-statistics.html. Accessed May 2022

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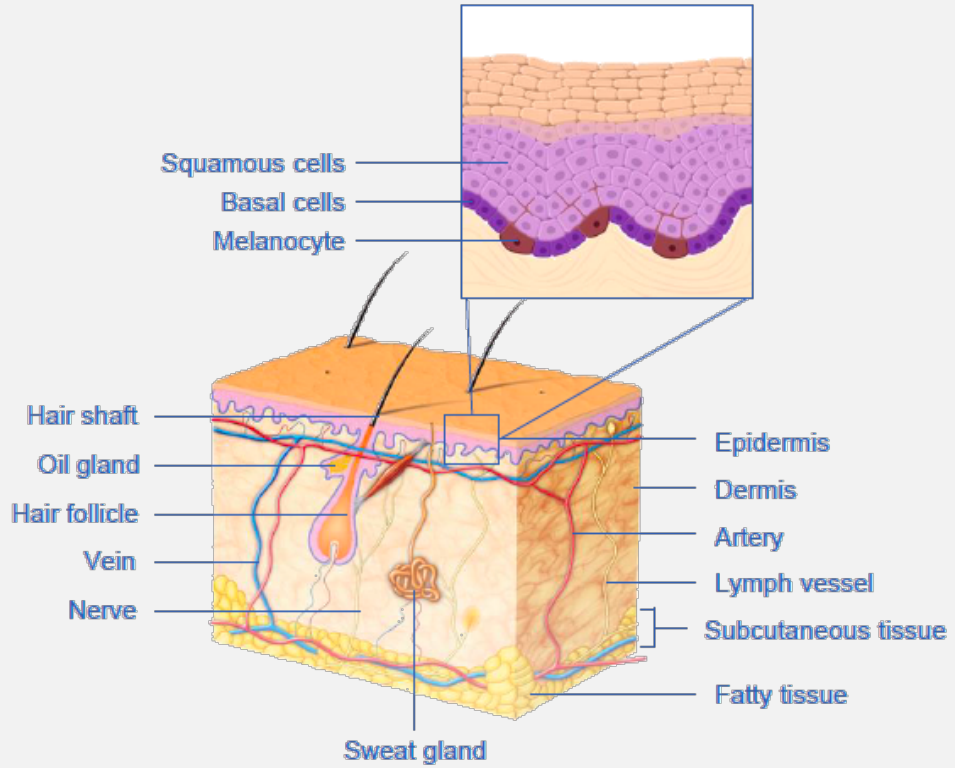
WHAT IS MELANOMA?[1]

- Melanomas originate from melanocytes, which reside in the skin and produce a protective pigment called melanin
- Melanomas may develop in or near a previously existing precursor lesion or in healthy-appearing skin
- A malignant melanoma developing in healthy skin is said to arise de novo, without evidence of a precursor lesion
- Most melanomas are induced by solar irradiation
- However, melanoma may also occur in unexposed areas of the skin, e.g. palms, soles and perineum
- Rarer subtypes can occur in the eye (ocular/uveal melanoma) and mucosae (mucosal melanoma)

Anatomy of the skin



1. Tan WW. Medscape. Malignant melanoma. Available at: https://www.melanoma.org.au/melanoma/assets/File/MIA_Melanoma%20Prevention%20Book.pdf. Accessed December 2021.

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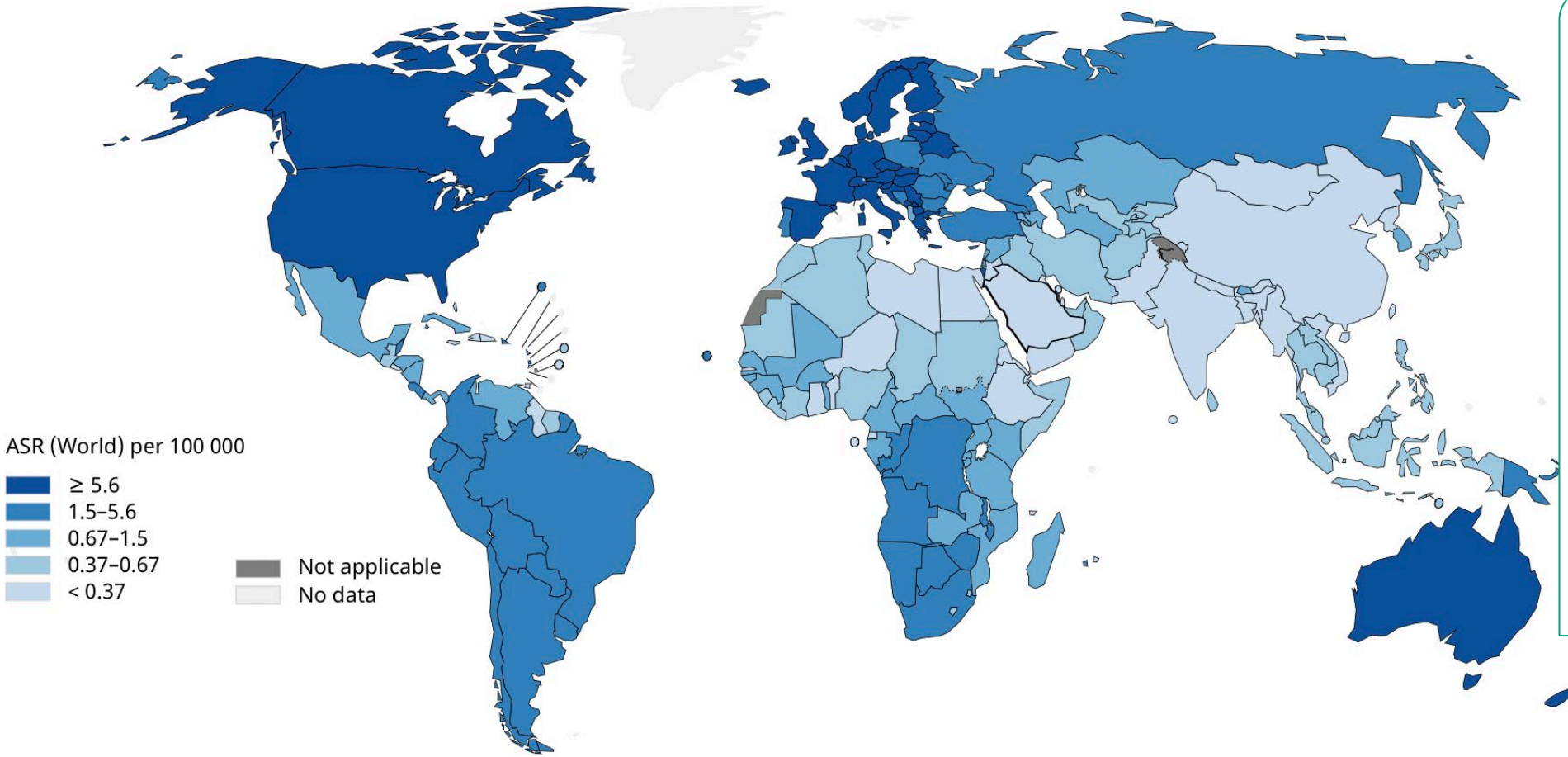
TYPES OF MELANOMA[1]

Cutaneous melanoma is the most common and the most well-studied type of melanoma[1]

Type	Proportion	Features
Cutaneous (skin)	>90%	Cancer of skin melanocytes. The main subtypes are covered in more detail later in this module
Ocular (eye)	~5%	Melanoma arising from melanocytes situated in the eye • The uvea is the most frequent site of origin of ocular melanomas (uveal melanoma)
Mucosal	~1%	Melanoma arising from melanocytes located in the mucosal membrane lining of the respiratory, GI, or urogenital tracts
Other	~2%	Melanoma can arise in other areas of the body where melanocytes exist

1. Chang AE *et al. Cancer* 1998;83:1664–78.

AUSTRALIA HAS ONE OF THE HIGHEST RATES OF MELANOMA IN THE WORLD[1]



Australia and New Zealand have the highest rates of melanoma in the world. Every year, ~16,000 people are diagnosed with melanoma in Australia[2]

This is attributed to the high proportion who are fair skinned and are exposed to the sun from early childhood

1. Globocan. Available at: https://gco.iarc.fr. Accessed December 2021. 2. Cancer Council. Understanding Melanoma. A guide for people with cancer, their families and friends. Available at: https://www.cancer.org.au/assets/pdf/understanding-melanoma-cancer-booklet. Accessed December 2021.

ASR: Age Standardised Rate

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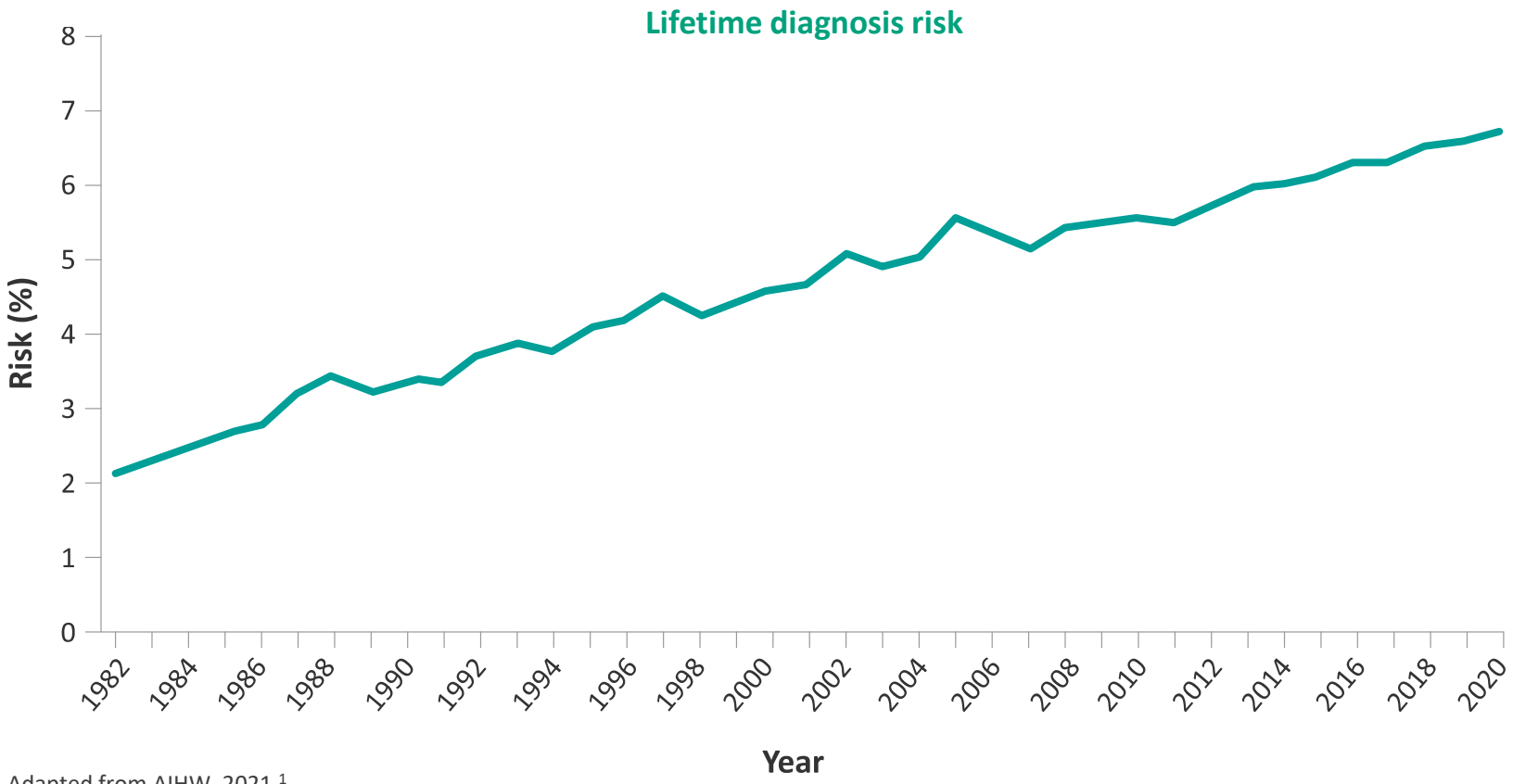
THE LIFETIME RISK OF BEING DIAGNOSED WITH MELANOMA IN AUSTRALIA CONTINUES TO GROW[1]



The lifetime risk of being diagnosed with melanoma is estimated to have tripled since 1982[1]

Part of the increase in the total population's risk of being diagnosed with melanoma is due to increasing life expectancy

Adapted from AIHW, 2021.[1]

Mortality risk for 2019 – 2020 are based on projections.

Note: lifetime risk is not the risk for the 'average lifetime', it includes all people within the population and in very broad terms may be considered as risk by age 100 and more.

1. Australian Institute of Health and Welfare. Cancer data in Australia, 2021. Available at: https://www.aihw.gov.au/reports/cancer/cancer-data-in-australia/contents/cancer-data-commentaries/risk-of-melanoma. Accessed December 2021.

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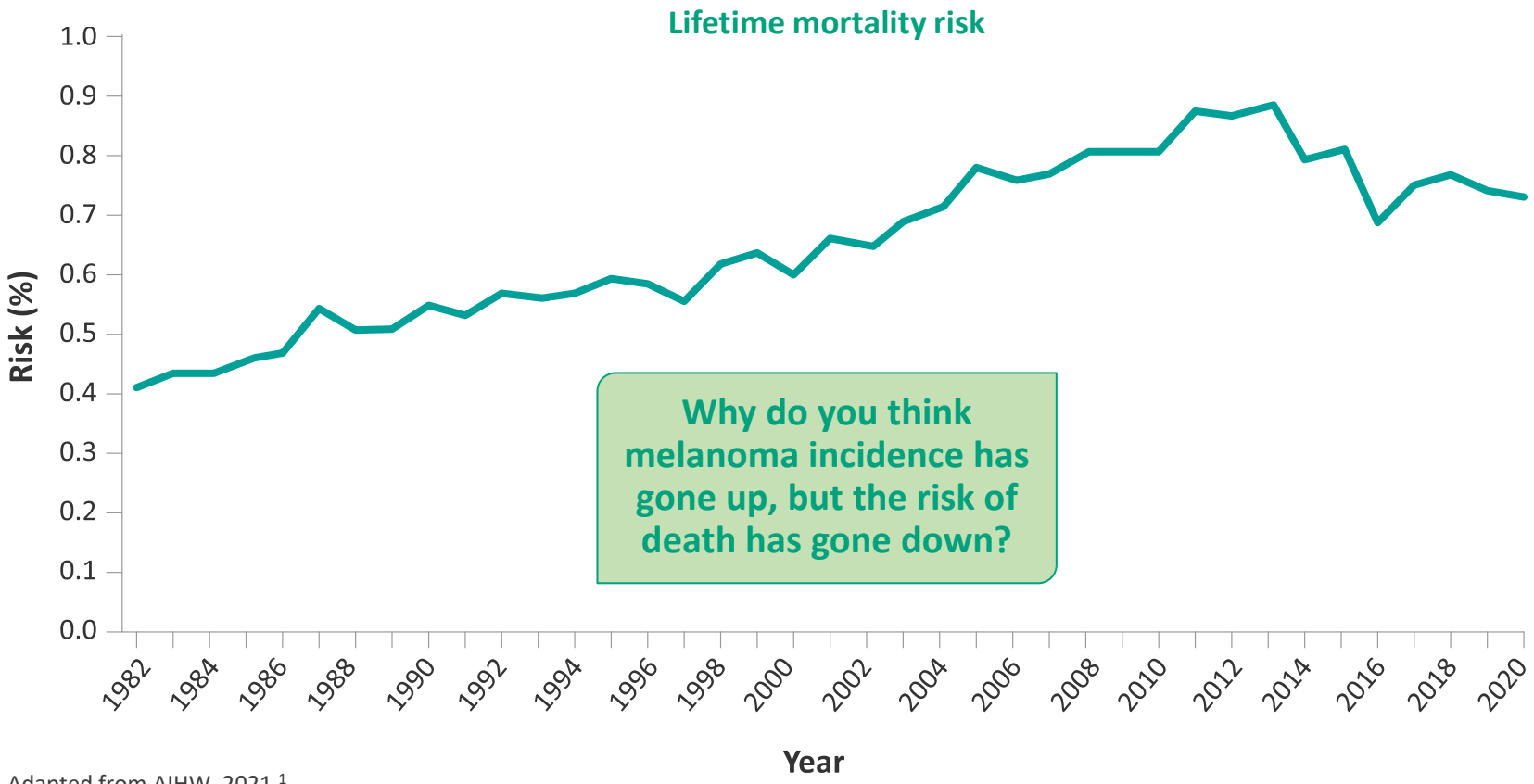
THE LIFETIME RISK OF DYING FROM MELANOMA WAS RISING UP UNTIL 2013[1]



The lifetime risk of death from melanoma continued to rise up until 2013[1]

Total population's risk of death from melanoma

- 1 in 240 people in 1982,
- 1 in 110 people in 2013
- 1 in 140 people in 2020

Adapted from AIHW, 2021.[1]

Mortality risk for 2019 – 2020 are based on projections.

Note: lifetime risk is not the risk for the 'average lifetime', it includes all people within the population and in very broad terms may be considered as risk by age 100 and more.

1. Australian Institute of Health and Welfare. Cancer data in Australia, 2021. Available at: https://www.aihw.gov.au/reports/cancer/cancer-data-in-australia/contents/cancer-data-commentaries/risk-of-melanoma. Accessed December 2021.

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RISK FACTORS FOR MELANOMA[1]

- Exposure to ultraviolet (UV) radiation is a critical modifiable risk factor in the development of most melanomas
- Acute, intense and intermittent blistering sunburns, especially on areas of the body that only occasionally receive sun exposure, are the greatest risk factor for the development of sun exposure-induced melanoma

Additional risk factors:

Greatly elevated risk factors for cutaneous melanoma include:

- Changing mole
- Dysplastic naevi in familial melanoma
- More than 50 naevi, 2 mm or greater in diameter

Moderately elevated risk factors for cutaneous melanoma include:

- One family member with melanoma
- Previous history of melanoma
- Sporadic dysplastic naevi
- Congenital naevi

Slightly elevated risk factors for cutaneous melanoma include:

- Immunosuppression
- Sun sensitivity
- History of acute, severe, blistering sunburns
- Freckling

1. Tan WW. Medscape. Malignant melanoma. Available at: https://www.melanoma.org.au/melanoma/assets/File/MIA_Melanoma%20Prevention%20Book.pdf. Accessed December 2021.

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PREVENTING MELANOMA[1]

- The focus of melanoma prevention is avoidance of sun exposure
- Everyone, especially those at high risk of developing a melanoma, should wear protective clothing, avoid peak sun hours, protect children against exposure to UV radiation, avoid tanning booths, and wear sunscreen with a sun protection factor (SPF) of at least 15
- First-degree relatives of a patient diagnosed with familial melanoma should be encouraged to have annual skin examinations

SPF measures how much UV radiation is required to produce sunburn on protected skin relative to the unprotected skin.. Skin protected with a SPF15 sunscreen would require 15 times the amount of UV radiation of unprotected skin to get burnt[2]

1. Tan WW. Medscape. Malignant melanoma. Available at: https://www.melanoma.org.au/melanoma/assets/File/MIA_Melanoma%20Prevention%20Book.pdf. Accessed December 2021.
2. https://www.fda.gov/about-fda/center-drug-evaluation-and-research-cder/sun-protection-factor-spf

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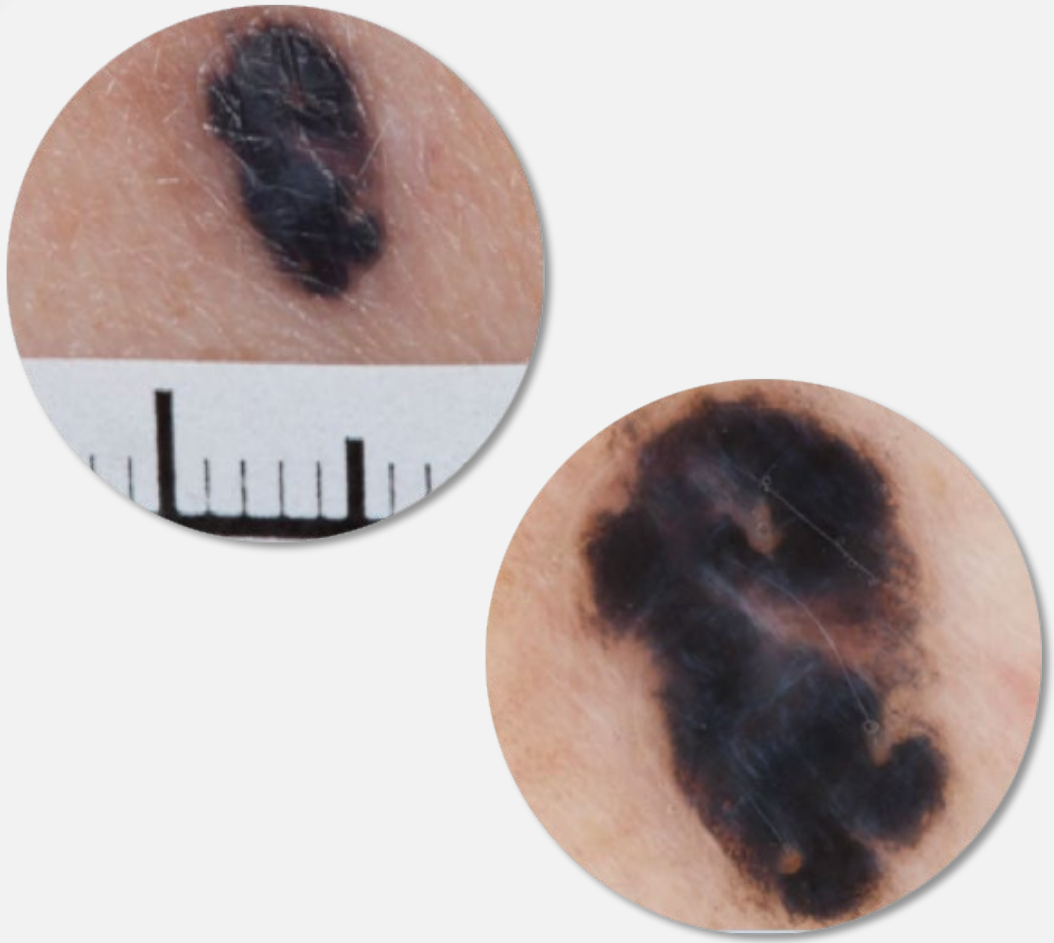
EARLY DETECTION OF MELANOMA[1]

- Most melanomas are initially self-detected
- Patients often present to their general practitioner (GP). A GPs role in early melanoma detection is critical
- A new lesion or one where change has been noticed should be examined carefully
- A dermatoscope is frequently used as it can aid in the correct identification of melanoma
- An individual's underlying risk should be considered when assessing lesions of concern and tailoring surveillance
- Complete excisional biopsy to achieve accurate tumour microstaging of a suspected lesion is essential for obtaining reliable prognostic information, planning further management and accessing some drug therapies

Dermascope image (vs naked eye)



1. Mar VJ *et al. Aust J Gen Pract* 2020;49:733–9.

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IDENTIFYING CUTANEOUS MELANOMA[1]

ABCDE signs of melanoma
Asymmetry
Border irregularity
Colour variability/**C**hange
Different
Evolving

EFG signs of melanoma
Elevated
Firm
Growing

- The 'ABCDE' of melanoma is an acronym designed to help the public and clinicians identify features in a skin lesion that may suggest an early or *in situ* melanoma (superficial spreading, lentigo maligna or acral lentiginous melanoma)
- The EFG of melanoma is another acronym designed to help identify skin changes in a lesion suggestive of nodular melanoma
- Further details on identifying cutaneous melanoma can be found on the dermnetnz.org page given beneath. Dermatology colleagues may also be able to help

1. Jin Q. DermNet NZ. ABCDEFG of melanoma. Available at: https://dermnetnz.org/topics/abcdes-of-melanoma. Accessed December 2021.

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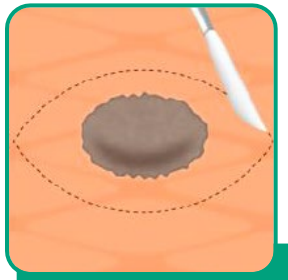
SKIN BIOPSY OF MELANOMA[1,2]

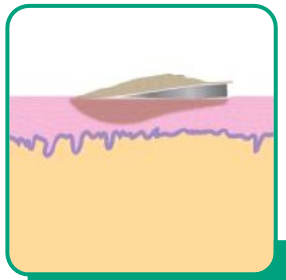
Suspicious lesions require biopsy for confirmation and disease staging.

There are four common types of skin biopsies:



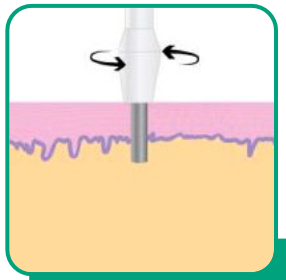
Excisional biopsy

A scalpel is used to remove the entire growth with a ~2mm margin (most common)



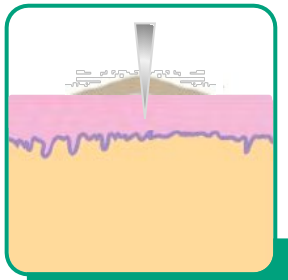
Shave biopsy

A thin, sharp blade is used to shave off the abnormal growth



Punch biopsy

A sharp, hollow tool is used to remove a circle of tissue from the abnormal area



Incisional biopsy

A scalpel to remove part of the growth

If possible, depending on location and size of lesion, the entire tumour can be removed at biopsy stage

1. National Institutes of Health. Melanoma Treatment (PDQ®)-Patient Version. Available at: https://www.cancer.gov/types/skin/patient/melanoma-treatment-pdq. Accessed December 2021.
2. Mayo Clinic. Skin biopsy. Available at: https://www.mayoclinic.org/tests-procedures/skin-biopsy/about/pac-20384634. Accessed December 2021.

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INVESTIGATIONS TO DIAGNOSE MELANOMA AND DETERMINE ACCURATE STAGING[1,2]

Primary Care: Diagnosing the primary lesion	Secondary Care: Identifying distal spread
Clinical examination	Fine needle aspiration (FNA) or core biopsy or sentinel lymph node (SLN) biopsy; will require a core biopsy if FNA is not diagnostic
Dermoscopy	CT scan
Histopathology of biopsied specimen (via excisional, shave, punch or incisional biopsy)	PET-CT scan
	MRI with gadolinium
	Ultrasound
	Blood tests e.g. for LDH

A dermoscope is a small lighted tool used to shine light on and magnify suspicious lesions. Examining a patient with this tool helps improve the accuracy of melanoma diagnoses[3]

CT, computed tomography; FNA, fine needle aspiration; LDH, lactate dehydrogenase; MRI, magnetic resonance imaging; PET, positron emission tomography.

1. National Institutes of Health. Melanoma Treatment (PDQ®)-Patient Version. Available at: https://www.cancer.gov/types/skin/patient/melanoma-treatment-pdq. Accessed December 2021. **2.** Cancer Council Australia. Understanding Melanoma. A guide for people with cancer, their families and friends. January 2021. **3.** European Society for Medical Oncology. Melanoma: a guide for patients. https://www.esmo.org/content/download/6618/115129/file/ESMO-ACF-Melanoma-Guide-For-Patients.pdf. Accessed December 2021.

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MELANOMA IS CONFIRMED BY HISTOPATHOLOGY

Bloggs, Jo E 12/3/45 MRN 1234567

Pathologist Diagnostic Opinion
Left lateral buttock-superficial spreading melanoma, Clark level IV, depth of invasion 1.9 mm, in situ 4 mm to the closest lateral margin.

Synoptic
Diagnosis of primary melanoma: Superficial spreading melanoma
Breslow thickness: 1.9 mm
Clark level: 4
Surgical margins involved?: no
Surgical margins:
Nearest peripheral margin to in-situ: 4mm
Nearest peripheral margin to invasive component: 5mm
Ulceration: no
Mitotic rate of the dermal invasive melanoma: 2per mm2
Microsatellites: no
Lymphovascular invasion: yes
Tumour-infiltrating lymphocytes (T!Ls): none
Intermediate/late regression: no
Desmoplasia: no
Neurotropism: no
Evidence of an associated benign melanocytic lesion?: no
Clinical Information Provided Clinical Notes: 6 o'c enlarging pigmented lesion with central amelanotic vascular area L lateral buttock.
SSM invasive, ? >2cm

Macroscopic Description
Labelled "Left lateral buttock". An unorientated elliptical excision of skin, 20 x 8 x 4 mm (L x W x D). There is a central dark nodule, 5 x 5 x 1, 1 mm from the nearest margin. Margins are inked blue.

MIcroscopIc Description
Of skin, show surface para keratin deep to which atypical melanocytes are seen infiltrating the epidermis with vertical migration and also infiltrating the dermis with no evidence of maturation, to a depth of 1.9 mm. The cells are epithelioid in appearance and there is minimal lymphocytic reaction. Two mitoses are seen per millimetre squared. Laterally, atypical melanocytes extend within the epidermis. The in situ melanoma is 4 mm to the lateral margin, the invasive melanoma is 5 mm lateral margin. Lymphovascular invasion is identified.

- Pathology reports are highly detailed and can be quite daunting at first
- They help confirm diagnosis, provide important prognostic information that can help management
- Typically they present a high level diagnosis at the top followed by more specific details
- The style may vary. A Synoptic report contains all the key information in bullet point form. Narrative reports provide the information in more of a story
- A pathology report based on a surgical specimen will contain details of the margins and spread

Further details on the information in these reports will be provided in this and subsequent modules

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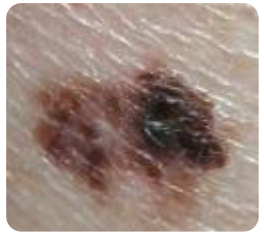
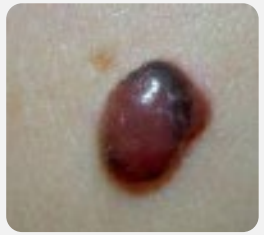
THE SUBTYPE OF CUTANEOUS MELANOMA IS DETAILED IN THE PATHOLOGY REPORT[1]

Subtype	How common?	What does it look like?	Where is it found?	How does it grow?
Superficial spreading melanoma 	~70% of cutaneous malignant melanomas	Many arise from a pigmented dysplastic naevus, often one that has long been stable	May be found on any body surface, especially the head, neck, and trunk of males and the lower extremities of females	Often grows slowly and becomes more dangerous when it invades the dermis Radial growth stage followed by a vertical growth phase
Nodular melanoma 	~10–15% of melanomas	These lesions are the most symmetrical and uniform of the melanomas and are dark brown or black	Commonly found on all body surfaces, especially the trunk of males	The radial growth phase may not be evident; however, if this phase is evident, it is short-lived, because the tumour advances rapidly to the vertical growth phase, thus making it a high-risk lesion. Up to one third of nodular melanomas are amelanotic or non-pigmented[2]

Images from DermNetNew Zealand.

1. Tan WW. Medscape. Malignant melanoma. Available at: https://www.melanoma.org.au/melanoma/assets/File/MIA_Melanoma%20Prevention%20Book.pdf. Accessed December 2021.
2. Australian Cancer Network Melanoma Guidelines Revision Working Party. Clinical Practice Guidelines for the Management of Melanoma in Australia and New Zealand. The Cancer Council Australia and Australian Cancer Network, Sydney and New Zealand Guidelines Group, Wellington (2008).

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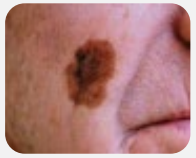
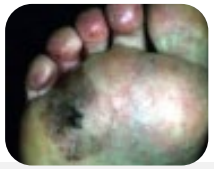
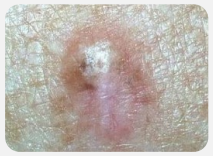
THE MAIN SUBTYPES OF CUTANEOUS MELANOMA (CONT'D)[1]

Subtype	How common?	What does it look like?	Where is it found?	How does it grow?
Lentigo maligna melanoma 	10–15% of melanomas	May have areas of hypo-pigmentation and often are quite large	Typically found on chronically sun-exposed areas (e.g., hand, neck)	Grows slowly in diameter over 5 to 20 years or longer[4]
Acral lentiginous melanoma 	1–2% of melanomas[2]	Starts as an enlarging patch of discoloured skin. It is often thought to be a stain at first	Occur on the palms, soles, and subungual areas	Extremely aggressive, with rapid progression from the radial to vertical growth phase.
Desmoplastic melanoma 	~1% of melanomas[3]	Presents as a slowly enlarging area of thickened skin, sometimes described as scar-like. It is often skin coloured but may be pigmented[3]	Most common on sun-exposed areas of the head and neck (>50%)[3]	Becomes more distinctive in time, often growing over months to years before it is recognised[3]

Images from DermNetNew Zealand.

1. Tan WW. Medscape. Malignant melanoma. Available at: https://www.melanoma.org.au/melanoma/assets/File/MIA_Melanoma%20Prevention%20Book.pdf. Accessed December 2021. **2.** Oakley A. DermNet NZ. Acral lentiginous melanoma. Available at: https://dermnetnz.org/topics/acral-lentiginous-melanoma. Accessed December 2021. **3.** Oakley A. DermNet NZ. Desmoplastic melanoma. Available at: https://dermnetnz.org/topics/desmoplastic-melanoma. Accessed December 2021. **4.** Oakley A. DermNet NZ. Lentigo maligna and lentigo maligna melanoma. Available at: https://dermnetnz.org/topics/lentigo-maligna-and-lentigo-maligna-melanoma. Accessed December 2021.

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SEVERAL FACTORS ARE IMPORTANT TO THE PROGNOSIS OF MELANOMA

The chances of a good outcome following a diagnosis of melanoma are influenced by several factors often seen in a pathology report. These include:

- If there is a known mutation that is driving the melanoma e.g. BRAF
- If certain cells of the immune system are in or around the tumour (tumour microenvironment)
- If there is evidence the tumour has spread into the lymph or vasculature

Further important details relate to the pathological findings of the tumour itself. These will now be covered in more detail.

COMMONLY REPORTED PROGNOSTIC FEATURES OF MELANOMA[1,2]

Report feature	Description
Anatomical location	Location of the tumour on the body. Whether the tumour is located on sun-exposed or covered areas of the body is important. Tumours in the eye or mucous membranes indicate a distinct type of melanoma.
Sun damage	Degree of damage to surrounding skin.
Melanoma subtype	Superficial spreading melanoma, nodular melanoma, lentigo maligna melanoma, acral-lentiginous melanoma.
Thickness	Sometimes referred to as Breslow thickness. The depth of the lesion helps determine T category in staging, with thresholds of 1.0, 2.0 and 4.0 mm. Staging will be explained further in the next module
Ulceration	Broken skin on the surface of a lesion. May indicate a more aggressively growing melanoma and is associated with worse survival outcomes.
Regression	Presence and extent of tumour shrinkage or cell death. May be prognostic because it indicates that the tumour may have been larger previously.
Surgical margins	0.5–2 cm margin of healthy skin surgically removed with the tumour. Presence or absence of tumour cells in this margin is noted.
Mitotic rate	Rate of cell division in the lesion. Higher rate may indicate faster growing melanoma.

1. Michielin O *et al. Ann Oncol* 2019;30:1884–901. **2.** Gershenwald J *et al. CA Cancer J Clin* 2017;67:472–92.

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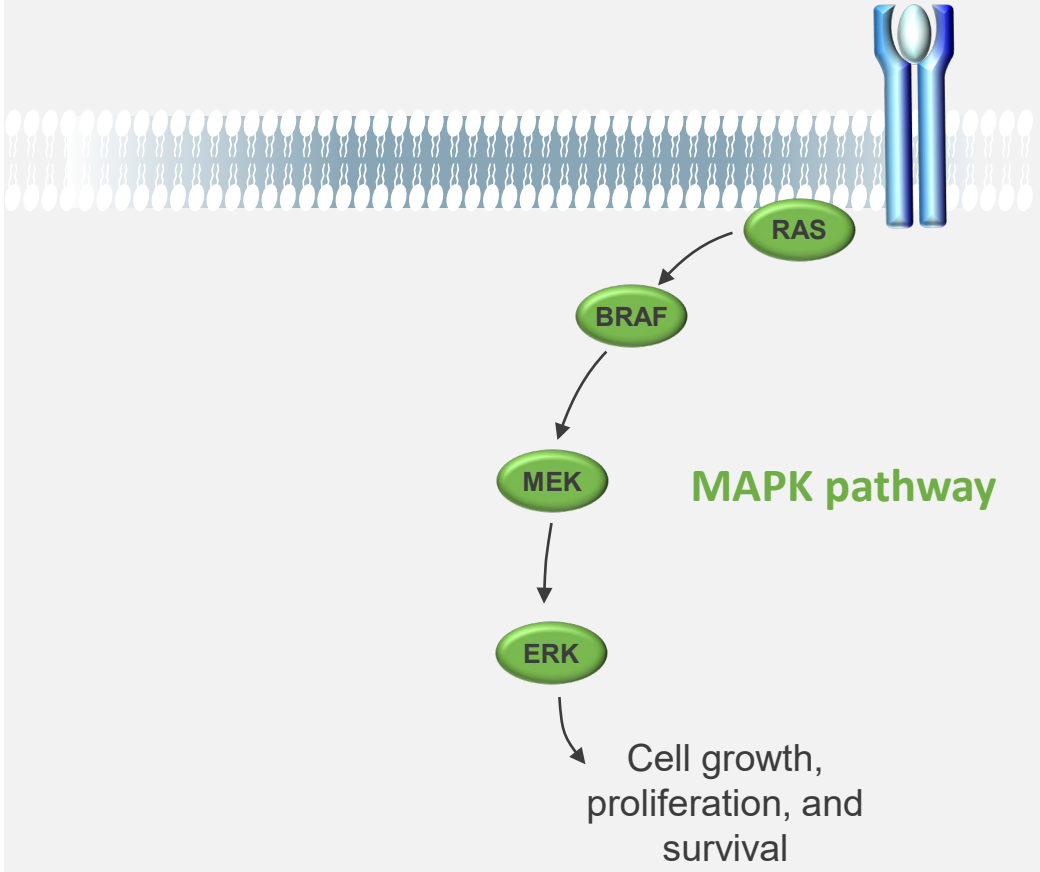
BRAF IS A COMMON DRIVER MUTATION IN CUTANEOUS MELANOMA[1]

- Additionally, genetic testing may be ordered and a mutation panel will be added in a supplementary report
- Many institutions test BRAF reflexively, while others need it to be specifically ordered on pathology request forms
- 40–50% of all patients with metastatic melanoma have a *BRAF* mutation, which can result in increased cell proliferation, growth and survival[2]
- *BRAF* mutations are associated with a poorer prognosis[3]
- The prevalence of *BRAF* mutations in melanoma has led to the development of BRAF inhibitors[1]
- Other less common molecular mutations associated with melanoma include *NRAS, KIT and PTEN* as well as *GNAQ* and *GNA1,* particularly in ocular melanoma[1,4]



Adapted from The Cancer Genome Atlas Network, 2015.[5]

1. Bello DM *et al. Cancer Control* 2013;20:261—81. **2.** Ottaviano M *et al. Int J Mol Sci* 2021;22(7): 3474. **3.** Long GV *et al. J Clin Oncol* 2011;29:1239–46.
4. National Cancer Institute. Melanoma treatment (PDQ®)- health professional version. Available at: https://www.cancer.gov/types/skin/hp/melanoma-treatment-pdq. Accessed December 2021.
5. The Cancer Genome Atlas Network. *Cell.* 2015;161(7):1681-1696

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THE ROLE OF THE TUMOUR MICROENVIRONMENT IN MELANOMA[1]

- The growth and progression of cutaneous melanomas are strongly affected by melanoma metabolic changes and interplay with the tumour microenvironment that sustain tumour development and immune escape[1]
- The tumour microenvironment describes the non-cancerous cells in the tumour and these may have a predictive significance for tumour behaviour and response to therapy[2]
- Traditionally cancer treatment focused on the cancer cells, but an increased understanding of the role of the tumour microenvironment has made it a promising therapeutic target[2]

1. Avagliano A *et al. Front Oncol* 2020;10:722. **2.** Wang JJ *et al. Eur Rev Med Pharmacol Sci* 2018;22:3855–64.

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RECENT ADVANCES IN MELANOMA CARE[1-3]

Melanoma treatment options will be discussed in more detail in Module 3

- Rapid advances in therapeutic options for patients with advanced melanoma have placed new emphasis on early identification, accurate staging and a comprehensive understanding of the tumour drivers and microenvironment
- Chemotherapy is rarely used in the treatment of advanced melanoma following the introduction of multiple new systemic therapies included targeted agents and immunotherapies
- Determining a patient's suitability for these treatments includes evaluation of factors contained in the pathology report e.g. it is harmful to give a patient a BRAF inhibitor if their tumor is not BRAF mutated

1. Schvartsman G *et al. Ther Adv Med Oncol* 2019;11:1758835919851663. **2.** Kwak M *et al. J Surg Oncol* 2019;119:222–31. **3.** Mar VJ *et al. Aust J Gen Pract* 2020;49:733–9.

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MODULE 1: SUMMARY

- Melanoma is cancer that begins in melanocytes[1]
- Exposure to UV rays is the major modifiable risk factor for melanoma[1]
- Melanoma is much less common than the typical non-melanoma skin cancers (basal cell and squamous cell carcinoma); however, it is much deadlier due to its propensity to metastasise[5]
- Cutaneous melanoma is the most frequent and the most well-studied type of melanoma[6]
- *BRAF* mutations are the most common driver mutations in melanoma[2-4]
  - ~50% of all patients with metastatic melanoma have a BRAF mutation, which can result in increased cell proliferation, growth and survival[2-4]
  - *BRAF* mutations are associated with a poorer prognosis[7]

1. Tan WW. Medscape. Malignant melanoma. Available at: https://www.melanoma.org.au/melanoma/assets/File/MIA_Melanoma%20Prevention%20Book.pdf. Accessed December 2021. **2.** The Cancer Genome Atlas Network. Cell 2015;161:1681–96. **3.** Hayward NK *et al. Nature* 2017;545:175–80. **4.** Rabbie R *et al. J Pathol.* 2019;247:539–51. **5.** National Cancer Institute. Melanoma treatment (PDQ®)- health professional version. Available at: https://www.cancer.gov/types/skin/hp/melanoma-treatment-pdq. Accessed December 2021. **6.** Chang AE *et al. Cancer* 1998;83:1664–78. **7.** Long GV *et al. J Clin Oncol* 2011;29:1239–46.

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PRACTICE YOUR PRACTICE

- Identify a surgeon or theatre nurse involved in the excision of cutaneous melanomas in your institution
- Ask them to talk you through how surgical specimens of a suspected melanoma are obtained and how they differ
- Walk the path of the specimen from theatre to the pathology lab and discuss with colleagues there how the sample is processed, what they are typically tested for, what and who's involved and what the typical turnaround times are
- Discuss with oncology colleagues how the different sub-types of melanoma can affect their decision making and patient outcomes

FOR **PRESCRIBING INFORMATION**, PLEASE CLICK:

Dabrafenib | Trametinib | Vemurafenib | Cobimetinib | Encorafenib
Binimetinib | Nivolumab | Ipilimumab | Pembrolizumab

FOR **PBS INFORMATION,** PLEASE CLICK:

Dabrafenib | Trametinib | Vemurafenib | Cobimetinib | Encorafenib
Binimetinib | Nivolumab | Ipilimumab | Pembrolizumab

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