MelNet

Quality Statements to Guide Melanoma Diagnosis and Treatment in New Zealand

THIRD EDITION
2023

MelNet

Endorsed by

Te Aho o Te Kahu – Cancer Control Agency supports the use of the Quality Statements to Guide Melanoma Diagnosis and Care in New Zealand as a tool to guide clinical decision-making and promote best practice melanoma management in New Zealand. Te Aho o Te Kahu – Cancer Control Agency played a key role in completing the first edition and has remained involved in subsequent editions.

Citation: MelNet. 2023. *Quality Statements to Guide Melanoma Diagnosis and Treatment in New Zealand*. Christchurch: Melanoma Network of New Zealand (MelNet).

First published in October 2021 by MelNet. This version published in September 2023.

This document is available at **www.melnet.org.nz/resources**

Contents

Purpose 1

Background 2

Glossary of terms 3

AJCC: Melanoma of the skin staging (8th edition) 7

The quality statements 8

Quality statements 1: Prevention and early detection 13

- Quality statement 1.1: Prevention and early detection of melanoma 13
- Quality statement 1.2: Training of primary health care professionals 17
- Quality statement 1.3: People at increased risk of melanoma 19

Quality statements 2: Timely Access to Services 21

- Quality statement 2.1: Timely Access to Services 21

Quality statements 3: Investigation, diagnosis and staging 23

- Quality statement 3.1: Patient access to trained health care professionals 23
- Quality statement 3.2: Excision of melanocytic lesions 25
- Quality statement 3.3: Histopathological reporting 27
- Quality statement 3.4: Time to pathological diagnosis 29
- Quality statement 3.5: Sentinel node biopsy reporting 30
- Quality statement 3.6: Radiological staging 31

Quality statements 4: Multidisciplinary care 36

- Quality statement 4.1: Multidisciplinary meetings 36

Quality statements 5: Treatment 38

- Quality statement 5.1: Re-excision of histologically confirmed melanomas 38
- Quality statement 5.2: Desmoplastic/neurotropic melanoma 42
- Quality statement 5.3: Sentinel node biopsy technique 44
- Quality statement 5.4: Therapeutic/Completion lymphadenectomy 47
- Quality statement 5.5: Adjuvant and neoadjuvant therapy 51
- Quality statement 5.6: Patients with loco-regionally recurrent, locally advanced and stage IV melanoma 54

Quality statements 6: Follow-up and surveillance 57

- Quality statement 6.1: Clinical follow-up and surveillance 57

Quality statement 6.2: Patient self-examination 62
Quality statement 6.3: Follow-up cross-sectional imaging 64
Quality statement 6.4: Ultrasound imaging of draining node basins 70

Quality statements 7: Supportive Care 72
Quality statement 7.1: Supportive care 72

Quality statements 8: Care Coordination 74
Quality statement 8.1: Care coordination 74

Appendices 75
Appendix 1: National Melanoma Working Group members 75
Appendix 2: Example templates and associated guidance 76
Appendix 3: Example melanoma follow-up schedule 87
Appendix 4: Feedback contributors 88
Appendix 5: Summary of changes 90

Purpose

High-quality cancer care in New Zealand requires a nationally consistent, coordinated approach that advances equity and person-centred care.

The quality statements contained in this resource have been developed by the National Melanoma Working Group (NMWG) (see **Appendix 1**) and the Melanoma Network of New Zealand (MelNet),[1] in partnership with a wide range of sector experts and key stakeholders, including Te Aho o Te Kahu – Cancer Control Agency. They focus specifically on melanoma cancer.

The statements aim to reduce New Zealand's world-leading melanoma incidence rates and improve outcomes for all melanoma patients by guiding and informing work aimed at ensuring national consistency in the access and delivery of quality melanoma care. They are targeted at clinicians but are also a valuable resource for government health organisations, melanoma patients, and their families/whānau.

The statements comprise evidence-based statements that describe good-quality care and are reflective of global best practice. Where there was a lack of evidence, the statements' development was informed by expert opinion, which was arrived at by consensus.

While it is acknowledged that the resources and protocols of individual centres may differ, the statements are intended to outline best practice and function as the evidence base for quality-improvement activities.

The content is up to date at the time of publishing, and it is intended that the statements be formally reviewed periodically to ensure they remain an up-to-date resource for New Zealand clinicians. However, as a living document they can be updated at any time as new evidence emerges in the prevention, diagnosis and treatment of melanoma. MelNet as the guardian of this document **welcomes any feedback** outside of formal review periods to enable this to occur.

The intention is that the statements in this document be used to support improvements in quality melanoma care across New Zealand, and inform and align with cancer quality improvement programmes led by New Zealand Government agencies such as Te Aho o Te Kahu, the Cancer Control Agency[2].

For more information, please go to: **http://www.melnet.org.nz/resources**

[1] For more information about MelNet, see their website at: **www.melnet.org.nz/resources**
[2] For more information about Te Aho o Te Kahu, see their website at: **https://teaho.govt.nz**

Background

A range of tumour standards were developed by health sector working groups and patient representatives led by the four regional cancer networks that were set up to facilitate the implementation of the New Zealand Cancer Control Action Plan 2005–2010.[3] The first were the 2011 service provision standards for lung cancer patients.[4] These were followed in 2013 by provisional tumour standards for breast, bowel, head and neck, lymphoma, melanoma, myeloma, gynaecological, sarcoma, thyroid and upper gastrointestinal cancers.

In early 2019, the National Melanoma Working Group (NMWG) was convened to update the *Standards of Service Provision for Melanoma Patients in New Zealand – Provisional.* The NMWG reviewed the melanoma-specific sections of the provisional melanoma standards and updated these based on current evidence and best practice or, where evidence has not been available, through expert opinion, which was arrived at by consensus. The final document was released on the MelNet website in November 2021 and formally launched at the New Zealand Melanoma Summit in February 2022.

The NMWG reconvened in July 2022 and July 2023 with the purpose of reviewing the document to ensure the quality statements continued to reflect latest research and best practice. This resulted in the publication of the second edition in September 2022 and third edition in September 2023. Feedback received during the review processes was considered by the NMWG, of which most has been incorporated. Significant changes to clinical material are included as **Appendix 5**.

This body of work wouldn't have been possible without the hard work and robust discussion of the working group members. Thanks must also go to Professor John Thompson, Emeritus Professor of Melanoma and Surgical Oncology, The University of Sydney, for his invaluable peer review, and the numerous individual and groups whose positive feedback has helped shape this document.

[3] Cancer Control Taskforce. 2005. *The New Zealand Cancer Control Strategy: Action Plan 2005–2010.* Wellington: Ministry of Health.

[4] National Lung Cancer Working Group. 2011. *Standards of Service Provision for Lung Cancer Patients in New Zealand.* Wellington: Ministry of Health.

Glossary of terms

Term	Description
AAD	American Academy of Dermatology
ABCDEFG rule	A rule to recognise the early signs of melanoma: **A**symmetry: the spot is not symmetrical like a normal mole or freckle **B**order: the spot has a blurry or jagged edge **C**olour: the spot has more than one colour or changes colour **D**ifferent: the spot is larger than 6 mm diameter or different from the rest of your skin lesions (ugly duckling) **E**levated: the spot is raised with an uneven surface **F**irm: feels firm to touch **G**rowing: over weeks/months
Adjuvant therapy	Additional treatment in the form of radiotherapy or medications
AJCC	American Joint Committee on Cancer
Biopsy	Removal of tissue to be looked at under a microscope to help in the diagnosis of a disease
BRAF	An oncogene that encodes for the production of a protein called B-Raf, which is involved in signal transduction and regulation of cell division.
Breslow thickness	The single most important prognostic factor for clinically localised primary melanoma. The deeper the melanoma has grown, the more likely it is that some cells have spread through the blood stream or lymphatic system. Breslow thickness or 'depth' is measured from the top of the granular layer of the epidermis (or, if the surface is ulcerated, from the base of the ulcer) to the deepest invasive cell across the broad base of the tumour (dermal/subcutaneous) as described by pathologist Alexander Breslow.
CAP	College of American Pathologists
CGH	Comparative genomic hybridisation
Chemotherapy	Treatment with cytotoxic drugs
CLND	Complete lymph node dissection
CMN	Congenital melanocytic naevi
CNC	Cancer Nurse Coordinator
CNS	Clinical Nurse Specialist
CT	Computed tomography
Dermatoscopy	Examination of skin lesions via an incident light magnification system, using immersion oil on the skin surface or a polarised lens so the epidermis appears translucent
Desmoplastic melanoma	Malignant melanocytic tumour with fibroblastic proliferation appearing as an enlarging scar-like plaque
Diagnosis	The process of identifying a disease, such as a cancer, from its signs and symptoms

Term	Description
DNA	Deoxyribonucleic acid (the molecule that carries the genetic instructions for the development, functioning, growth and reproduction of all living things) *or* did not attend (an appointment)
Excisional biopsy	A biopsy where the entire piece of affected tissue is removed for pathological examination
FAMMM	Familial atypical multiple mole melanoma
FCT	Faster cancer treatment
FISH	Fluorescence in-situ hybridisation, the use of DNA sequences linked to a fluorescent marker, which acts as a probe to bind to specific DNA sequences on intact chromosomes
FNA	Fine-needle aspiration
FSA	First specialist assessment
GEP	Gene expression profile
GP	General practitioner
GPEP	General practice education programme
Health care professional	Generic term that includes doctors, nurses and allied health workers.
Histology	The study of the structure, composition and function of tissues and cells under a microscope
Ilioinguinal	Pertaining to the pelvis and groin regions
Incisional biopsy	A biopsy where only part of the affected tissue is removed
Isolated limb infusion (ILI)	A form of regional chemotherapy for recurrent disease that is confined to a limb
Langer's lines	Any one of a number of linear striations in the skin that delineate the general structural pattern, direction and tension of the subcutaneous fibrous tissue
Lesion	An area of abnormal tissue
Lymph node dissection	Surgical removal of a lymph node(s). Also called lymphadenectomy.
Lymph nodes	Small oval-shaped structures found in clusters throughout the lymphatic system. They form part of the immune system and are also known as lymph glands.
Lymphadenopathy	Disease or swelling of the lymph nodes
Lymphoscintigraphy	A nuclear-medicine-based diagnostic technique using scintillation scanning of technetium-99m antimony trisulphide colloid
Magnetic resonance imaging (MRI)	A radiological technique used to form pictures of the anatomy and the physiological processes of the body
MDM	Multidisciplinary meeting. A forum for health professionals with expertise in diagnosing and managing specific cancers to collectively review pertinent clinical information and make timely decisions regarding the recommended optimal treatment and care of individual patients at identified points in their cancer journey.

Term	Description
Melanoma	Any of a group of malignant neoplasms that originate in the skin and are composed of melanocytes (skin cells that are capable of producing melanin)
MELFO	MELanoma FOllow-up study, an international phase 3 randomised trial investigating the effects of a reduced stage-adjusted follow-up schedule for Stage IB-IIC cutaneous melanoma patients
MEK	Mitogen-activated extracellular signal-regulated kinase
Metastases	Also known as 'secondaries'; tumours or masses of cells that develop when cancer cells break away from the original (primary) cancer and are carried by the lymphatic and blood systems to other parts of the body
Metastasis	The spread of cancer from the primary site (place where it started) to other places in the body via the blood stream or the lymphatic system
MIA	Melanoma Institute Australia
Microstaging	A technique used to determine the stage of melanoma and certain squamous cell cancers
MIS	Melanoma in situ
MMS	Mohs micrographic surgery
Naevus/Naevi	A medical term for moles. There are several types, including 'common,' which is harmless, and 'dysplastic,' which is atypical and may increase the risk of melanoma.
NCCN	National Comprehensive Cancer Network, a non-profit alliance of more than 30 leading cancer centres in the United States dedicated to improving cancer care.
New Zealand Cancer Registry (NZCR)	A population-based register of all primary malignant diseases diagnosed in New Zealand, excluding squamous and basal cell skin cancers
NRAS	An oncogene that encodes for the production of a protein called N-Ras, which is involved in the regulation of cell division.
Positron emission tomography/ computed tomography (PET-CT)	A specialised imaging technique that demonstrates uptake of 18FDG in areas of high cell metabolism and can help differentiate between benign and malignant masses
PPE	Personal protective equipment, anything that is used or worn by a person (including clothing) to minimise risks to the person's health and safety
Radiotherapy	Treatment using high-energy X-rays to destroy cancer cells
RCPA	The Royal College of Pathologists of Australasia
RCT	Randomised controlled trial
RFS	Recurrence-free survival
SCAN rule	An alternative to the ABCDEFG rule to identify early signs of melanoma: **S**ore **C**hanging **A**bnormal **N**ew

Term	Description
SDELM	Sequential digital epiluminescent microscopy: the capture and assessment of successive macroscopic and dermatoscopic images
Sentinel node biopsy (SNB)	A procedure in which the sentinel lymph node is removed and examined histologically under a microscope to determine whether cancer cells are present
Skin lesions	Part of the skin that has abnormal growth or appearance compared with the skin around it
SLNB	Sentinel lymph node biopsy
SPECT	Single-proton emission computed tomography (also known as SPET)
SPF	Sun protection factor, a standard used to measure the effectiveness of sunscreens
Stage	A way of describing the size of a cancer and how far it has grown. Staging is important because it helps determine the treatments that are required
Te Aho o Te Kahu, Cancer Control Agency	A government agency created in recognition of the impact cancer has on the lives of New Zealanders. It is charged with leading and uniting efforts to deliver better cancer outcomes for Aotearoa New Zealand. Te Aho o Te Kahu is guided by the goals and outcomes in the National Cancer Action Plan 2019-2029.
Te Whatu Ora – Health New Zealand	The organisation responsible for ensuring all publicly funded health and disability services, including hospital and specialist services and primary and community care, are provided to all New Zealanders.
TNM staging	The most widely used cancer staging system and the global standard used to record the anatomical extent of disease. In the TNM system, each cancer is assigned a letter or number to describe the tumour, node and metastases. **T** refers to the size and extent of the original (primary) tumour **N** refers to the number of nearby lymph nodes that have cancer **M** refers to whether the cancer has metastasised (spread from the primary tumour to other parts of the body).
Tumour	An abnormal mass of tissue that results when cells divide more than they should or do not die when they should. Tumours may be benign (not cancer) or malignant (cancer).
UPF	Ultraviolet protection factor, a standard used to measure the effectiveness of sun protective fabrics
US	Ultrasound
UVI	UV Index. The measure of the intensity of UVR
UVR	Ultraviolet radiation

AJCC: Melanoma of the skin staging (8th edition)

AJCC Melanoma of the Skin Staging 8th Edition

Definitions

Primary Tumor (T)

- **TX** Primary tumor cannot be assessed (for example, curettaged or severely regressed melanoma)
- **T0** No evidence of primary tumor
- **Tis** Melanoma in situ
- **T1** Melanomas 1.0 mm or less in thickness
- **T2** Melanomas 1.1 - 2.0 mm
- **T3** Melanomas 2.1 - 4.0 mm
- **T4** Melanomas more than 4.0 mm

NOTE: a and b subcategories of T are assigned based on ulceration and thickness as shown below:

T CLASSIFICATION	THICKNESS (mm)	ULCERATION STATUS
T1	≤1.0	a: Breslow < 0.8 mm w/o ulceration b: Breslow 0.8-1.0 mm w/o ulceration or ≤ 1.0 mm w/ ulceration.
T2	1.1-2.0	a: w/o ulceration b: w/ ulceration
T3	2.1-4.0	a: w/o ulceration b: w/ ulceration
T4	>4.0	a: w/o ulceration b: w/ ulceration

Regional Lymph Nodes (N)

- **NX** Patients in whom the regional nodes cannot be assessed (for example previously removed for another reason)
- **N0** No regional metastases detected
- **N1-3** Regional metastases based on the number of metastatic nodes, number of palpable metastatic nodes on clinical exam, and presence or absence of MSI[2]

NOTE: N1-3 and a-c subcategories assigned as shown below:

N CLASSIFICATION	# NODES	CLINICAL DETECTABILITY/MSI STATUS
N1	0-1 node	a: clinically occult[1], no MSI[2] b: clinically detected[1], no MSI[2] c: 0 nodes, MSI present[2]
N2	1-3 nodes	a: 2-3 nodes clinically occult[1], no MSI[2] b: 2-3 nodes clinically detected[1], no MSI[2] c: 1 node clinical or occult[1], MSI present[2]
N3	>1 nodes	a: >3 nodes, all clinically occult[1], no MSI[2] b: >3 nodes, ≥1 clinically detected[1] or matted, no MSI[2] c: >1 nodes clinical or occult[1], MSI present[2]

Distant Metastasis (M)

- **M0** No detectable evidence of distant metastases
- **M1a** Metastases to skin, sub cutaneous, or distant lymph nodes
- **M1b** Metastases to lung
- **M1c** Metastases to all other visceral sites
- **M1d** Metastases to brain

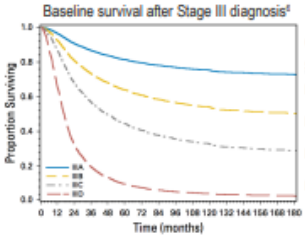
NOTE: Serum LDH is incorporated into the M category as shown below:

M CLASSIFICATION	SITE	Serum LDH
M1a-d	Skin/subcutaneous/nodule (a), lung (b) other visceral (c), brain (d)	Not assessed
M1a-d(0)	Skin/subcutaneous/nodule (a), lung (b) other visceral (c), brain (d)	Normal
M1a-d(1)	Skin/subcutaneous/nodule (a), lung (b) other visceral (c), brain (d)	Elevated

ANATOMIC STAGE/PROGNOSTIC GROUPS

	Clinical Staging[3]			Pathologic Staging[4,5]			
Stage 0	Tis	N0	M0	0	Tis	N0	M0
Stage IA	T1a	N0	M0	IA	T1a	N0	M0
Stage IB	T1b	..	..		T1b	..	..
	T2a	..	..	IB	T2a	..	..
Stage IIA	T2b	N0	M0	IIA	T2b	N0	M0
	T3a	..	..		T3a	..	..
Stage IIB	T3b	..	..	IIB	T3b	..	..
	T4a	..	..		T4a	..	..
Stage IIC	T4b	..	..	IIC	T4b	..	..
Stage III	Any T	≥N1	M0	IIIA	T1-2a	N1a	M0
	..	..	..		T1-2a	N2a	..
	..	..	..	IIIB	T0	N1b-c	M0
	..	..	..		T1-2a	N1b-c	..
	..	..	..		T1-2a	N2b	..
	..	..	..		T2b-3a	N1a-2b	..
	..	..	..	IIIC	T0	N2b-c	M0
	..	..	..		T0	N3b-c	..
	..	..	..		T1a-3a	N2c-3c	..
	..	..	..		T3b-4a	Any N	..
	..	..	..		T4b	N1a-2c	..
	..	..	..	IIID	T4b	N3a-c	M0
Stage IV	Any N	Any N	M1	IV	Any T	Any N	M1

Baseline survival after Stage III diagnosis[6]



Conditional, 5-year survival (%)[6]

Stage	Baseline	3y survivors
IIIA	81.4	83.1
IIIB	64.0	76.0
IIIC	44.5	66.7
IIID	9.8	40.6

Notes

[1] Nodes are designated as 'clinically detectable' if they can be palpated on physical exam and are confirmed melanoma by pathology following excision/biopsy.

[2] MSI comprise any satellite, locally recurrent, or in transit lesions.

[3] Clinical staging includes microstaging of the primary melanoma and clinical/radiologic evaluation for metastases. By convention it should be used after complete excision of the primary melanoma with clinical assessment for regional and distant metastases.

[4] Pathologic staging includes microstaging of the primary melanoma and pathologic information about the regional lymph nodes after partial or complete lymphadenectomy.

[5] Pathologic Stage 0 and I patients do not require pathologic evaluation of their lymph nodes, per NCCN 2018, cN is used to stage. However, pending MSLT2, current recommendations for physicians are to"discuss and consider" SLNB for patients with T1b Stage IA disease; and "discuss and offer" SLNB for patients with Stage IB disease (~3% and ~35% pretest probabilities, respectively).

[6] From Haydu et al., Journal of Clinical Oncology, 2017.

Produced following the 8th Ed. AJCC guidlines released January 1, 2017. Contact Dr. M. Gormally (mvgg07@gmail.com) for reprint. Version 1.5

Reference

- Gormally M, Medical Oncologist, Memorial Sloan Kettering Cancer Center, New York, United States of America. Melanoma Staging 8th edition Poster. Provided by email 1 August 2023.
- American Joint Committee on Cancer. 2017. *AJCC Cancer Staging Manual 8th edition.* New York, Springer New York.

The quality statements

The quality statements in this resource focus specifically on melanoma cancer. Each statement follows the format outlined below.

Component	Description
Description	A concise statement that provides guidance on important elements of high-quality health care for the specific topic.
Rationale	An evidence-based description of why the quality statement is important, including any appropriate additional context.
Good practice points	Practice points supported either by international literature or the consensus of feedback from consultation with New Zealand clinicians who are involved in providing care to patients with a specific tumour type.
References	Supporting international/national evidence for the quality statement, rationale and good practice points.

The quality statements described in this resource are listed below, with a hyperlink to the full description for each statement.

ID	Quality statement title	Description
1.1	Prevention and early detection of melanoma	Prevention and early detection of melanoma is a key priority in reducing the incidence of melanoma and improving melanoma outcomes. It is important that: • there are adequate prevention strategies that seek to both inform and protect the public regarding the dangers of excessive UVR exposure and its relationship to the rising incidence of melanoma. • people are offered information on risk factors and the early detection of melanoma • there is easily accessible information about referral pathways for anyone who is concerned about suspicious or concerning lesions.
1.2	Training of primary health care professionals	Primary health care professionals are trained to recognise skin lesions suspicious for melanoma.
1.3	People at increased risk of melanoma	People at increased risk of melanoma are identified and offered management appropriate to their level of risk.

ID	Quality statement title	Description
2.1	Timely access to services	Patients referred urgently with a high suspicion of melanoma receive their first cancer treatment within 62 days of receipt of referral. Patients referred urgently with a biopsy-confirmed or high suspicion of melanoma (including locally recurrent and metastatic melanoma and excluding melanoma in situ) have their FSA within 14 days of receipt of referral. Urgent diagnostic excision for lesions suspicious for melanoma occurs within 14 days of specialist assessment or image-based triage. Image-guided core or FNA biopsy of suspected tumour occurs within 14 days of the request being received. Patients with a confirmed diagnosis of melanoma (including locally recurrent or metastatic melanoma and excluding melanoma in situ) receive their first cancer treatment within 31 days of the decision to treat.
3.1	Patient access to trained health care professionals	Patients have access to: • health care professional trained in early detection and diagnosis of melanoma, including the use of dermatoscopy • health care professional trained in surgical skills required to undertake excision and direct closure of in-situ or thin melanoma • health care professional trained in triage and referral of patients with lesions of uncertain diagnosis, thicker melanoma and lesions at sites where surgery is difficult. • melanoma CNS or nurse who specialises in cancer care to coordinate all aspects of their care between secondary and primary care. This health professional should be a member of the MDM.
3.2	Excision of melanocytic lesions	The preferred biopsy technique for excision of melanocytic lesions suspected of being melanoma is a narrow complete excision biopsy, with 2-mm margins, that encompasses the entire lesion and is of sufficient depth to avoid transection at the base. All tissue specimens are sent for formalin-fixed paraffin-embedded histopathology.
3.3	Histopathological reporting	Melanoma is reported histopathologically and staged histopathologically, clinically and radiologically in accordance with the latest (8th edition) *AJCC Cancer Staging Manual*, 2017 (Amin et al 2017). The pathology report for the diagnosis of primary cutaneous melanoma and lymph node metastases is structured and includes a minimum data set for TNM staging and other variables thought to affect clinical behaviour and survival.

ID	Quality statement title	Description
3.4	Time to pathological diagnosis	A diagnosis of melanoma is reported in 5 working days in 80% of cases, and 90% of cases should have a final report in 10 working days. Cases requiring molecular studies or additional departmental consultation are excluded from this metric; however, these cases should have a provisional report and/or notification to the requesting clinician within 10 working days. Pathology departments should maintain a tracking system to monitor cases awaiting diagnosis and match diagnosis with request when received back in the department.
3.5	Sentinel node biopsy reporting	The current MIA or RCPA protocol fields are recommended for processing and reporting SNB.
3.6	Radiological staging	Radiological staging should be requested dependent on melanoma TNM status, level of risk and intended treatment. Oligometastasis may be resectable or treated with radiotherapy. Asymptomatic metastases may be appropriate for immunotherapy with a curative intent. In New Zealand access to this is dependent on radiologically evaluable unresectable or metastatic disease. If patient factors/co-morbidities deem patients unfit for any further treatment, do not perform routine staging.
4.1	Multidisciplinary meetings	Patients with the following should be discussed at a MDM: • complex reconstruction cases, including MIS • stages II (B and C) cases if management decisions are not straightforward • stages III and IV cutaneous melanoma cases • desmoplastic melanoma • melanoma in people under 25 years of age • non-cutaneous melanoma. The outcome of the MDM is documented and communicated to the treating clinician, GP and patient.
5.1	Re-excision of histopathologically confirmed melanomas	Histologically confirmed melanomas are re-excised, with additional clinical margins determined by Breslow thickness. Lesions meeting histological staging AJCC T1b or higher are referred to an appropriately trained and experienced surgical specialist for consideration of SNB staging at the time of the re-excision.
5.2	Desmoplastic/neurotropic melanoma	The MDM discusses the potential role of radiation treatment to improve local control in patients with desmoplastic/neurotropic melanoma.

ID	Quality statement title	Description
5.3	Sentinel node biopsy technique	SNB staging is offered to patients with T1b or thicker melanoma who could benefit from the procedure and is performed by surgeons trained and experienced in the technique. SNB in melanoma is carried out using triple localisation with preoperative lymphoscintigraphy and SPECT scan. Intra-operative localisation is performed with blue dye and a gamma probe.
5.4	Therapeutic/Completion lymphadenectomy	An oncological therapeutic lymphadenectomy is offered to all patients with clinically evident nodal disease after appropriate staging and discussion at a melanoma MDM.
5.5	Adjuvant and neoadjuvant therapy	All patients with resected stage III/IV melanoma or stage II (B or C) melanoma are: • discussed at a melanoma MDM (if management decisions are not straightforward) • considered for adjuvant radiotherapy and/or adjuvant systemic treatment or enrolment in clinical trials. • neoadjuvant therapy (i.e., systemic treatment prior to curative intent surgery) is a rapidly evolving area for locally advanced melanoma. Enrolment into clinical trial should be encouraged.
5.6	Patients with loco-regionally recurrent, locally advanced and stage IV melanoma	Patients with loco-regionally recurrent, locally advanced or stage IV melanoma are seen or discussed by melanoma specialists experienced in the care of melanoma patients and part of a melanoma MDM.
6.1	Clinical follow-up and surveillance	Follow-up is carried out by a health care professional experienced in melanoma diagnosis and management. The health care professional may be a specialist, GP, nurse practitioner or a combination working in conjunction with the patient and their family/whānau.
6.2	Patient self-examination	Patient self-examination is taught and is an integral part of melanoma follow-up.
6.3	Follow-up cross-sectional imaging	Follow-up cross-sectional imaging (CT or PET-CT) is determined by stage, symptoms/clinical findings and suitability for therapy. Oligometastasis may be resectable or treated with radiotherapy. Asymptomatic metastases may be appropriate for immunotherapy with a curative intent. In New Zealand access to this is dependent on radiologically evaluable unresectable or metastatic disease. If patient factors/co-morbidities deem patients unfit for any further treatment, do not perform routine staging.
6.4	Ultrasound imaging of draining nodal basins	US imaging of the draining nodal basins(s) can be considered in a select group of patients, in conjunction with routine clinical follow-up ± cross-sectional imaging as per TNM stage.

ID	Quality statement title	Description
7.1	Supportive care	Patients with melanoma and their families/ whānau have equitable and coordinated access to appropriate medical, allied health and supportive care services, in accordance with *Guidance for Improving Supportive Care for Adults with Cancer in New Zealand* (Ministry of Health 2010).
8.1	Care coordination	Patients managed by a melanoma MDT have access to a CNS, CNC or other health professional who is a member of the MDM to help coordinate all aspects of their care. Each treatment centre has a melanoma clinical lead to provide necessary leadership, guidance and provision of melanoma care.

Quality statements 1: Prevention and early detection

Quality statement 1.1: Prevention and early detection of melanoma

Description	Prevention and early detection of melanoma is a key priority in reducing the incidence of melanoma and improving melanoma outcomes. It is important that: • there are adequate prevention strategies that seek to both inform and protect the public regarding the dangers of excessive UVR exposure and its relationship to the incidence of melanoma. • people are offered information on risk factors and the early detection of melanoma • there is easily accessible information about referral pathways for anyone who is concerned about suspicious or concerning lesions.
Rationale	There is consistent evidence that the best avenues for reducing the burden of melanoma are prevention and early diagnosis (Whiteman 2017). The causal association of cutaneous melanoma and keratinocytic (non-melanoma) skin cancer and solar ultraviolet radiation (UVR) exposure is established. Although there is no scientifically validated safe threshold level of UVR exposure that allows for maximal vitamin D synthesis without increasing skin cancer risk, it is thought that the brief exposures required for vitamin D synthesis are unlikely to increase the risk (Ministry of Health 2012). There is strong evidence that exposure to UVR in artificial tanning devices (such as sunbeds and tanning units) causes DNA damage that can lead to the development of both melanoma and keratinocytic skin cancers. The risk increases with greater use and an earlier age at first use (Boniol et al 2012). Additionally, there is a need for raised awareness among Māori and other ethnic minorities as well as health practitioners and health systems to aid early detection of skin cancer and improve overall outcomes. The evidence shows that while melanoma is uncommon in Māori, they are more likely to be diagnosed with higher stage melanoma with poorer survival than non-Māori (Sneyd et al 2009, Hore et al 2010, Sneyd et al 2011). Melanoma is best detected early at the in-situ pre-invasive stage and managed with a re-excised 5–10 mm margin (Kunishige et al 2012). This avoids disease progression to advanced stages that requires excessive resourcing and a poorer outcome in terms of morbidity and mortality for patients. The prognosis for melanoma less than 1 mm thick is generally good; however, many patients with thin melanomas often only experience complications/progression of melanoma between 5 and 15 years after initial diagnosis and therefore require long-term follow-up (Lo et al 2018).

Rationale (continued)	It is well documented that survival decreases with increasing thickness of the primary melanoma (HPA and Melanoma Network of New Zealand 2017). Early detection with full-body skin checks, utilising dermatoscopy and digital dermatoscopy is best practice. Clinicians performing skin examinations for the purpose of detecting skin cancer should be trained in and use dermatoscopy (Cancer Council Australia Melanoma Guidelines Working Party 2019).
Good practice points	1.1.1 People are advised as follows: • exposure to UVR when the ultraviolet index (UVI) is 3 or higher or when spending time outdoors for extended periods of time should be limited and sunburn avoided. • brief sun exposure is needed to maintain vitamin D levels; total lack of sun exposure is not advisable without vitamin D supplementation (Ministry of Health 2012, National Cancer Control Policy Contributors 2018). • the use of artificial tanning devices is illegal for those under the age of 18 years and is strongly discouraged for those 18 years and over. Solaria for cosmetic purposes (Standards Australia/Standards New Zealand 2008) specifies that those under the age of 18 years and those with skin phototype 1 should not use sunbeds. Those 18 years and over should be informed of the risks and lack of evidence for any health benefits. The NMWG supports the position taken by the Cancer Society of NZ, Cancer Council Australia and the Australasian College of Dermatologists that commercial artificial tanning devices should be banned. • when the UV index is forecast to reach three or above or when people are outside for extended periods, UVR protection should be adopted by: – slipping on a shirt with long sleeves and a collar – slipping into shade – slopping on sunscreen that is ideally SPF 50, broad spectrum and water resistant at least 20 minutes before going outside and reapplying every 2 hours especially after being in the water or sweating – slapping on a wide-brimmed hat that shades the face, head, neck and ears – wrapping on close-fitting wrap-around style sunglasses that meet the standards (Standards Australia/Standards New Zealand 1067.1 and 1067.2:2016) (HPA and Melanoma Network of NZ 2017). 1.1.2 Prevention strategies include: • schools and other education settings having a sun protection policy, using sun protection practices and participating in the Cancer Society Sunsmart Schools accreditation programme. • comprehensive workplace policies and programmes, especially for outdoor workplaces (Health and Safety at Work Act 2015). Workplaces should be supported to implement SunSmart policies to guide best practice in scheduling work, personal protective equipment and skin checks. • quality shade structures factored into planning of public areas such as sports facilities, recreation spaces, education spaces, workplaces and private areas. • require national and local government to develop and implement comprehensive policies and public awareness campaigns.

Good practice points (continued)	• sunscreens being included as a therapeutic product to ensure quality standards of being fit for purpose (Standards Australia/Standards New Zealand 2604:2021) • UPF-rated clothing and sun protective hats (Standards Australia/Standards New Zealand 4399:2017). • public awareness campaigns supporting UV index awareness, sun protective behaviours and detection of melanoma at an early stage in a range of settings (HPA and Melanoma Network of New Zealand 2017, Ministry of Health 2019). 1.1.3 All adults, particularly those aged 50 years and over, are advised to: • regularly examine their skin (including skin not normally exposed to the sun) so they improve their awareness of any changes • get someone else to check areas that are difficult to see, such as their back • seek advice from a primary health care professional, surgeon, dermatologist or nurse specialist about suspicious lesions. Smart-phone applications should not be a substitute for a skin examination by a medical practitioner. 1.1.4 Information aimed at reducing melanoma deaths focuses on: • all adults; particularly males aged 50 years and over • raising awareness of melanoma in Māori and other ethnic minorities, including the specific features of nodular and acral lentiginous melanoma (Sneyd and Cox 2011). 1.1.5 Information developed for or provided to patients and their families/whānau aligns with core messages in the *New Zealand Skin Cancer Primary Prevention and Early Detection Strategy 2017 to 2022* (HPA and Melanoma Network of New Zealand 2017).

References

- Boniol M, Autier P, Boyle P, Gandini S. 2012. *Cutaneous melanoma attributable to sunbed use: Systematic review and meta-analysis*. BMJ ;345:e4757.
- Cancer Council Australia Melanoma Guidelines Working Party. 2019. *Clinical Practice Guidelines for the Diagnosis and Management of Melanoma*. Sydney: Melanoma Institute Australia. URL: **https://wiki.cancer.org.au/australia/Guidelines:Melanoma#top** (accessed 16 March 2020).
- Hore T, Robinson E, Martin RCW. 2010. Malignant melanoma amongst Maori and New Zealand Europeans, 2000 – 2004. *World J Surg* 34(8): 1788–92.
- HPA, Melanoma Network of New Zealand. 2017. *New Zealand Skin Cancer Primary Prevention and Early Detection Strategy 2017 to 2022*. Wellington: Health Promotion Agency (HPA). URL: **www.sunsmart.org.nz//sites/default/files/documents/FINAL-Strategy-2017-to-2022.pdf** (accessed 7 February 2020).
- Kunishige J, Brodland D, Zitelli J. 2012. Surgical margins for melanoma in situ. *Journal of the American Academy of Dermatology* 66(3): 438–44.
- Lo S, Scolyer R, Thompson J. 2018. Long-term survival of patients with thin (T1) cutaneous melanomas: a Breslow thickness cut point of 0.8 mm separates higher-risk and lower-risk tumors. *Annals of Surgical Oncology* 25(4): 894–902.
- Ministry of Health. 2019. *New Zealand Cancer Action Plan 2019–2029 – Te Mahere mō te Mate Pukupuku o Aotearoa 2019–2029*. Revised January 2020 Wellington: Ministry of Health.

- Ministry of Health. 2012. *The Consensus Statement on Vitamin D and Sun Exposure in New Zealand*. Wellington: Ministry of Health. URL: **www.health.govt.nz/system/files/documents/publications/vitamind-sun-exposure.pdf** (accessed 5 March 2020).
- National Cancer Control Policy Contributors. 2018. *Position statement - Sun exposure and vitamin D - risks and benefits.* Australia: National Cancer Control Policy. URL: **https://wiki.cancer.org.au/policy_mw/index.php?title=Position_statement_-_Risks_and_benefits_of_sun_exposure&oldid=7939** (accessed 2 July 2020).
- Sneyd MJ, Cox B. 2009. Melanoma in Maori, Asian, and Pacific peoples in New Zealand. *Cancer Epidemiol Biomarkers Prev* 18(6): 1,706-13.
- Sneyd MJ, Cox B. 2011. Clinical and histologic factors associated with melanoma thickness in New Zealand Europeans, Māori, and Pacific peoples. *Cancer* 117: 2,489–98.
- Standards Australia/Standards New Zealand. 2008. *Australian/New Zealand Standard AS/NZS 2635 (Solaria for cosmetic purposes).* Sydney: Standards Australia and Wellington: Standards New Zealand. URL: **https://www.standards.govt.nz/shop/asnzs-26352008/** (accessed 6 August 2021).
- Standards Australia/Standards New Zealand. 2016. *Australian/New Zealand Standard* AS/NZS AS/NZS 1067.1:2016 (Eye and face protection - Sunglasses and fashion spectacles - Part 1: Requirements). Sydney: Standards Australia and Wellington: Standards New Zealand. URL: **https://www.standards.govt.nz/shop/asnzs-1067-12016/** (accessed 6 August 2021).
- Standards Australia/Standards New Zealand. 2016. *Australian/New Zealand Standard* AS/NZS 1067.2:2016 (Eye and face protection - Sunglasses and fashion spectacles - Part 2: Test methods). Sydney: Standards Australia and Wellington: Standards New Zealand. URL: **https://www.standards.govt.nz/shop/asnzs-1067-22016/** (accessed 6 August 2021).
- Standards Australia/Standards New Zealand. 2017. *Australian/New Zealand Standard* AS/NZS 4399:2017 (Sun protective clothing - Evaluation and classification). Sydney: Standards Australia and Wellington: Standards New Zealand. URL: **https://www.standards.govt.nz/shop/asnzs-43992017/** (accessed 6 August 2021).
- Standards Australia/Standards New Zealand. 2021. *Australian/New Zealand Standard* AS/NZS 2604:2021(Sunscreen Products - Evaluation & Classification) Sydney: Standards Australia and Wellington: Standards New Zealand. URL: **https://www.standards.govt.nz/shop/asnzs-26042021/** (accessed 6 August 2021).
- Te Aho o Te Kahu. 2022. Pūrongo Ārai Mate Pukupuku, Cancer Prevention Report. Wellington: Te Aho o Te Kahu, Cancer Control Agency.
- Whiteman D. 2017. The epidemiology of melanoma: Recent changes and future challenges. *Journal of the European Academy of Dermatology and Venereology* 31(S3): 3.

Quality statement 1.2: Training of primary health care professionals

Description	Primary health care professionals are trained to recognise skin lesions suspicious for melanoma.
Rationale	Primary health care professionals play an important role in the opportunistic discovery of melanoma and non-melanoma skin cancer as part of their everyday practice. Therefore, it is essential they have the competence to identify lesions suspicious of melanoma. The use of dermatoscopy as part of a full skin examination increases the likelihood of identifying thin and in-situ melanoma and reduces the unnecessary removal of benign lesions (Kittler et al 2002). Therefore it is expected that all specialist general practitioners are trained in dermatoscopy either during their vocational training or as part of their continuing professional development*. All primary and secondary practitioners involved in the provision of skin cancer care, particularly early melanoma detection and follow up of care of melanoma patients should have training in clinical dermatoscopy. Novel artificial or augmented intelligence tools based on convolutional neural networks are available to assist in the classification of suspicious skin lesions. Clinical validation is incomplete in local settings and such tools should be used with caution; they are likely to be increasingly useful for triage of high-risk lesions alongside expert dermatoscopic analysis to enhance current clinical practices (Ferrante di Ruffano et al 2018, Haggenmüller et al 2021). ** Endorsed by Royal New Zealand College of General Practitioners (RNZCGP)*
Good practice points	1.2.1 All primary health care professionals are knowledgeable about the most precise methods to estimate a patient's risk of melanoma, and about subtypes of melanoma. 1.2.2 All primary health care professionals are alert for skin lesions with malignant features in the context of physical examinations performed for other reasons. 1.2.3 All primary health care professionals involved in early detection of melanoma should be trained in the use of the dermatoscope and regularly undertake refresher training (Harkemanne et al 2021). 1.2.4 As part of diagnosing a skin lesion, clinicians arrange to carry out a full skin check by themselves or another healthcare professional (Aitken et al 2009). 1.2.5 Teledermatology and e-referral systems should be implemented to allow accurate triage and therefore expedite management of atypical pigmented lesions. 1.2.6 Validated artificial intelligence tools are used alongside expert dermatoscopic analysis to enhance current clinical best practice. 1.2.7 All allied professionals who come into contact with people's skin have access to training in recognising skin changes suggestive of melanoma and in advising patients with suspicious lesions to see a health care professional (Melanoma Taskforce 2012). 1.2.8 Population-based skin screening is not recommended at this time in the absence of substantive evidence as to its effectiveness in reducing mortality (Johansson et al 2019).

References

- Aitken JF, Elwood M, Baade PD, et al. 2009. Clinical whole-body skin examination reduces the incidence of thick melanomas. *Int J Cancer* 126(2): 450–58.
- Ferrante di Ruffano L, Takwoingi Y, Dinnes J, et al. 2018. Computer-assisted diagnosis techniques (dermoscopy and spectroscopy-based) for diagnosing skin cancer in adults. *Cochrane Database Syst Rev* 12(12): CD013186.
- Haggenmüller S, Maron RC, Hekler A, et al. 2021 Skin cancer classification via convolutional neural networks: systematic review of studies involving human experts. *Eur J Cancer* 156: 202–216.
- Harkemanne E, Baeck M, Tromme I. 2021. Training general practitioners in melanoma diagnosis: a scoping review of the literature. *BMJ Open* 11(3): e043926.
- Johansson M, Brodersen J, Gøtzsche PC, et al. 2019. Screening for reducing morbidity and mortality in malignant melanoma. *Cochrane Database Syst Rev*. DOI: **http://dx.doi.org/10.1002/14651858.CD012352.pub2** (accessed 31 August 2020).
- Kittler H, Pehamberger H, Wolff K, et al. 2002. Diagnostic accuracy of dermoscopy. *Lancet Oncol* 3(3): 159–65.
- Melanoma Taskforce. 2012. *Mole and Skin Check Guidelines: Information on the signs of skin cancer for wellbeing, hair and beauty professionals*. London: Melanoma Taskforce and British Association of Dermatologists. URL: **www.bad.org.uk/skin-cancer** (accessed 28 July 2020).

Quality statement 1.3: People at increased risk of melanoma

Description	People at increased risk of melanoma are identified and offered management appropriate to their level of risk.
Rationale	While identification of those at increased risk for melanoma provides the potential to focus early detection and prevention, at present, it is not possible to identify the absolute risk of an individual developing melanoma. There is no evidence to compare the relative effectiveness of specific surveillance techniques for high-risk patients with those for average-risk patients. Increased age, skin phototype and sun damage are important risk factors for melanoma. Other factors that should be considered in clinical risk assessment include a personal history of melanoma, familial melanoma, large numbers of naevi, FAMM syndrome, previous non-melanoma skin cancer and immunosuppression (for example, in organ transplant recipients) (HPA and Melanoma Network of New Zealand 2017). Large CMN >20 cm in diameter have an increased risk of developing melanoma and neurocutaneous melanocytosis (Hale et al 2005; Krengel et al 2006). Sequential digital epiluminescent microscopy (SDELM) relies on taking and storing macroscopic and dermoscopic images of lesions of concern and repeating photos of these specific lesions over time to look for change. SDELM has been studied extensively over the past two decades. SDELM with short term monitoring (three months between images) has a sensitivity of 94% in diagnosing melanoma (excluding lentigo maligna which needs longer intervals) and specificity of 84% (Altamura et al 2008). SDELM not only allows the diagnosis of melanoma at an earlier stage than clinical examination alone but can also detect melanoma before they exhibit characteristic dermoscopic changes – one study demonstrated that 11% of changed lesions seen through SDELM over a three-month period were melanoma with none of them demonstrating classical dermoscopy features (Menzies et al 2001). SDELM has been shown to diagnose 20-50% of lesions that traditional epiluminescent microscopy could not diagnose with a single examination and melanoma diagnosed by SDELM are shown to be significantly thinner than those diagnosed by other means (0.41mm average vs 0.62mm Breslow thickness) (Haenssle et al 2010).
Good practice points	1.3.1 Health care professionals assess patients for future risk of melanoma using validated risk factors and a model that integrates personal risk factors into an overall index of risk. Appropriate and validated risk factors and model are provided at the website of the Melanoma Institute Australia (**www.melanomarisk.org.au**). Note: New Zealanders will need to enter 'Tasmania' as the 'Region in Australia most lived in' to ensure they receive an appropriate risk profile. An alternative validated New Zealand based calculator is available using a *bestpractice* account (login and password required) at **http://www.melnet.org.nz/uploads/Bestpractice_Melanoma-RPT.pdf** (Sneyd et al 2014). 1.3.2 Individuals with two or more first-degree relatives with a history of melanoma at younger than 40 years of age and those found to have melanoma and/or multiple atypical naevi are examined carefully and: • are placed under the long-term care of a health care professional who is competent in skin surveillance using dermatoscopy and digital dermatoscopy monitoring

Good practice points (continued)	• are considered for referral to regional clinical genetics services for further assessment, genetic counselling and discussion about genetic testing (rarely indicated) particularly those with multiple atypical naevi, are considered for baseline total body photography and high-quality sequential digital dermatoscopy imaging at 6- to 12-month intervals to detect new and changing lesions (Salerni et al 2012). • patients at high risk for melanoma should be encouraged to have high quality photographic images of all portions of their body. These are used by the patient to monitor for new or changing moles between skin checks. Provision of sequential digital epiluminescent microscopy (SDELM) should be considered best practice in clinics providing specialist services for skin malignancy screening.

References

- Altamura D, Avramidis M, Menzies SW. 2008. Assessment of the optimal interval for and sensitivity of short-term sequential digital dermoscopy monitoring for the diagnosis of melanoma. *Arch Dermatol* 144(4):502-506.
- Hale EK, Stein J, Ben Porat L, et al. 2005. Association of melanoma and neurocutaneous melanocytosis with large congenital melanocytic naevi-results from the NYU-LCMN registry. *British Journal of Dermatology* 152(3): 512–17.
- Haenssle HA, Korpas B, Hansen-Hagge C et al. 2010. Selection of patients for long-term surveillance with digital dermoscopy by assessment of melanoma risk factors. *Arch Dermatol*. 146(3):257-64.
- HPA, Melanoma Network of New Zealand. 2017. *New Zealand Skin Cancer Primary Prevention and Early Detection Strategy 2017 to 2022*. Wellington: Health Promotion Agency (HPA). URL: **www.sunsmart.org.nz//sites/default/files/documents/FINAL-Strategy-2017-to-2022.PDF** (accessed 7 February 2020).
- Krengel S, Hauschild A, Schafer T. 2006. Melanoma risk in congenital melanocytic naevi: a systematic review. *British Journal of Dermatology* 155(1): 1–8.
- Menzies SW, Gutenev A, Avramidis M et al. 2001. Short-term Digital Surface Microscopic Monitoring of Atypical or Changing Melanocytic Lesions. *Arch Dermatol*. 137(12):1583–1589.
- Salerni G, Carrera C, Lovatto L, et al. 2012. Benefits of total body photography and digital dermatoscopy ('two-step method of digital follow-up') in the early diagnosis of melanoma in patients at high risk for melanoma. *J Am Acad Dermatol* 67(1): e17–27.
- Sneyd MJ, Cameron C, Cox B. 2014. Individual risk of cutaneous melanoma in New Zealand: developing a clinical prediction aid. *BMC Cancer* 14: 359.

Quality statements 2: Timely Access to Services

Quality statement 2.1: Timely Access to Services

Description	Patients referred urgently with a high suspicion of melanoma receive their first cancer treatment within 62 days of receipt of referral. Patients referred urgently with a biopsy-confirmed or high suspicion of melanoma (including locally recurrent and metastatic melanoma and excluding melanoma in situ) have their FSA within 14 days of receipt of referral. Urgent diagnostic excision for lesions suspicious for melanoma occurs within 14 days of specialist assessment or image-based triage. Image-guided core or FNA biopsy of suspected tumour occurs within 14 days of the request being received. Patients with a confirmed diagnosis of melanoma (including locally recurrent or metastatic melanoma and excluding melanoma in situ) receive their first cancer treatment within 31 days of the decision to treat.
Rationale	Timely access to quality cancer management is important to support good health outcomes for New Zealanders and to reduce inequities. Key components of successful cancer management include early recognition and reporting of symptoms, expertise in identifying patients requiring prompt referral and rapid access to investigations and treatment. A suspicion of melanoma or melanoma diagnosis is very stressful for patients and their family/whānau. It is important that patients, family/whānau and GPs know how quickly patients can receive treatment. Long waiting times may affect local control and survival benefit for some patients with melanoma, and can result in delayed symptom management for palliative patients. The standards in this cluster ensure that: • patients receive quality clinical care • patients are managed through the pathway, and experience well-coordinated service delivery • delays are avoided as far as possible Shorter waits for cancer treatments is a government health target for all radiation treatment patients and chemotherapy patients. The FCT indicators adopt a timed patient pathway approach across surgical and non-surgical cancer treatment, and apply to inpatients, outpatients and day patients. Timely access to services is especially important to address inequities. It is well demonstrated that Māori tend to wait longer for cancer care and have worse outcomes. A major goal of these standards is to address this issue.

Good practice points	2.1.1 The FCT indicators exclude melanoma in situ. 2.1.2 Referral is ideally electronic, with (high-quality macroscopic and/or dermatoscopic) images of the lesion, including a ruler, attached. Suspicious lesions can then be triaged directly for diagnostic excision. 2.1.3 Teledermatoscopy reports are received by the referrer within five working days of the examination being performed. 2.1.4 Reports are distributed electronically. 2.1.5 'High suspicion of melanoma' refers to skin lesions likely to be invasive tumours; usually >6mm in diameter and irregular in structure and colour. There is often a reliable history of change over several months of observation, or observed by digital dermatoscopic surveillance.

Quality statements 3: Investigation, diagnosis and staging

Quality statement 3.1: Patient access to trained health care professionals

Description	Patients have access to: • health care professional trained in early detection and diagnosis of melanoma, including the use of dermatoscopy • health care professional trained in surgical skills required to undertake excision and direct closure of in-situ or thin melanoma • health care professional trained in triage and referral of patients with lesions of uncertain diagnosis, thicker melanoma and lesions at sites where surgery is difficult • melanoma CNS or nurse who specialises in cancer care to coordinate all aspects of their care between secondary and primary care. This health professional should be a member of the MDM.
Rationale	Early detection of melanoma requires differentiating lesions with minor atypical features and/or documented changes from benign lesions. Trained health care professionals can detect thinner (that is, more favourable prognosis) melanomas than the patient or another layperson might be able to detect. Where health care professionals are trained in the technique, dermatoscopy improves diagnostic accuracy and reduces removal of benign lesions that do not have suspicious features (Swetter et al 2019). Care coordination intended to improve equitable access to services and resources, improve communication and the transfer of information between services; recognising the complexity of the cancer journey. The coordination role includes provision of information and education and acts a single point of contact for patients and their family/whānau.

Good practice points	3.1.1	In primary health care practices, access to at least one designated primary health care professional trained in the dermatoscopic diagnosis and management of melanoma. Practices with solo practitioners who do not have this training should promptly refer patients to a trained clinician.
	3.1.2	Assessment includes family history, ethnicity, history of change, symptoms and the time course of symptoms.
	3.1.3	For the purpose of detecting melanoma, the whole skin surface is examined under good lighting.
	3.1.4	High-quality digital macroscopic and dermatoscopic images of lesions suspicious for melanoma are used to obtain second opinions and for clinicopathological correlation.
	3.1.5	Sequential digital dermatoscopic imaging may be used to detect changes in suspicious flat melanocytic lesions lacking dermatoscopic features of melanoma when monitored short-term (that is, over 3 months).
	3.1.6	Suspicious raised lesions should be excised and not monitored.
	3.1.7	Health care professionals should not rely solely on the use of automated instruments to diagnose primary melanoma.
	3.1.8	Regional cancer centres employ a melanoma nurse specialist. The nurse will have the appropriate training and knowledge to provide patients and their family/whānau information specific to the process involved in diagnosis and treatment of melanoma.
	3.1.9	Information provided is free, easily accessible and meets the needs of the individual. Such information is accurate, unbiased, culturally appropriate and is evidence-based practice.

References

- Cancer Council Australia Melanoma Guidelines Working Party. 2019. *Clinical Practice Guidelines for the Diagnosis and Management of Melanoma*. Sydney: Melanoma Institute Australia. URL: **https://wiki.cancer.org.au/australia/Guidelines:Melanoma#top** (accessed 6 July 2022).
- Swetter SM, Tsao H, Bichakjian CK, et al. 2019. Guidelines of care for the management of primary cutaneous melanoma. *Journal of the American Academy of Dermatology* 80(1): 208–50.

Quality statement 3.2: Excision of melanocytic lesions

Description	The preferred biopsy technique for excision of melanocytic lesions suspected of being melanoma is a narrow complete excision biopsy, with 2-mm margins, that encompasses the entire lesion and is of sufficient depth to avoid transection at the base. All tissue specimens are sent for formalin-fixed paraffin-embedded histopathology.
Rationale	Histopathological diagnosis requires evaluation of the architecture and cytology of the entire lesion. • evaluation of the architecture and cytology may not be achievable using the following procedures: • partial biopsies of atypical lesions may miss a small focus of melanoma. • partial biopsies with a punch device are at risk of sampling error. • shave biopsies prevent accurate measurement of a Breslow thickness. This may affect future management decisions regarding width of wide local excisions and suitability for SNB. • wide initial excisions, or complex wound closures should not occur because the use of flaps or significant undermining disrupt the lymphatics thereby reducing the accuracy of SNB and may compromise future reconstruction. • a greater than 2-mm margin on the initial excisional specimen will increase the difficulty of the closure after further wide local excision and may complicate assessment of adequacy of margins as a radial measure from the scar (Swetter et al 2019).
Good practice points	3.2.1 Suspicious lesions should be excised within 2 weeks of being identified. Alternatively, if the patient is referred to a melanoma specialist for excision, this should be actioned as soon as the biopsy result is available. 3.2.2 The clinical request form accompanying specimens submitted for biopsy is important for the accurate diagnosis of skin lesions. It should include a history, the specimen site, the type of biopsy and clinical/dermatoscopic description of the lesion. Where possible, especially for borderline lesions, clinical and dermatoscopic images, and/or an annotated diagram highlighting specific areas of concern within the lesion, are included. 3.2.3 A synoptic melanoma report (such as those developed by the Royal College of Pathologists of Australasia (RCPA) or the College of American Pathologists (CAP) is strongly recommended for routine use (refer **Appendix 2.2 and 2.3** for the RCPA and CAP form). 3.2.4 Partial/incomplete sampling (incisional biopsy) is acceptable in select clinical circumstances, such as facial or acral location, very large lesion or low clinical suspicion or uncertainty of diagnosis. 3.2.5 When an incisional biopsy, rather than an excisional biopsy, is taken, this must be highlighted on the pathology form and a request for longitudinal sectioning should be made.

Good practice points (continued)	3.2.6	Narrow-margin excisional biopsy may be performed if an initial partial biopsy is inadequate for diagnosis or microstaging, but it should not generally be performed if the initial specimen meets the criteria for consideration of SLNB.
	3.2.7	Excisional biopsies must be performed considering the need for future wide local excision. Excision biopsies on the extremities should be longitudinally orientated following the direction of lymphatic flow. In most cases, this will also facilitate the closure should a wide local excision be subsequently required.
	3.2.8	The use of skin flaps and grafts to close diagnostic excisional biopsy defects should be avoided.
	3.2.9	Practitioners should record the number needed to excise (query melanoma) to melanoma ratio (severe atypia/MIS/melanoma).
	3.2.10	Use of 'derm dotting' by applying coloured nail varnish via a toothpick or a fine brush on the areas showing dermatoscopically concerning features can help pathologists make more accurate diagnoses.

References

- Cancer Council Australia Melanoma Guidelines Working Party. 2019. *Clinical Practice Guidelines for the Diagnosis and Management of Melanoma*. Sydney: Melanoma Institute Australia. URL: **https://wiki.cancer.org.au/australia/Guidelines:Melanoma#top** (accessed 6 July 2022)
- Paul SP. 2018. Biodynamic excisional skin tension lines for surgical excisions: untangling the science. *Annals of the Royal College of Surgeons England* 100: 330–337.
- Swetter SM, Tsao H, Bichakjian CK, et al. 2019. Guidelines of care for the management of primary cutaneous melanoma. *Journal of the American Academy of Dermatology* 80(1): 208–50.
- van Akkooi A. Updates in skin cancer diagnosis and management. https://melanomaeducation.org.au/courses/melanoma148/lessons/masterclass148/ Retrieved 01/06/2022

Quality statement 3.3: Histopathological reporting

Description	Melanoma is reported histopathologically and staged histopathologically, clinically and radiologically in accordance with the latest (8th edition) AJCC Cancer Staging Manual 2017 (Amin et al 2017). The pathology report for the diagnosis of primary cutaneous melanoma and lymph node metastases is structured and includes a minimum data set for TNM staging and other variables thought to affect clinical behaviour and survival.
Rationale	Formal staging of cancer is fundamental in providing clinicians and patients with prognostic information, developing treatment strategies and directing and analysing clinical trials. Staging of cutaneous melanoma continues to evolve through identification and careful analysis of potential prognostic factors (Gershenwald et al 2017). Pathologic assessment of a tissue biopsy is a critical aspect in the multidisciplinary management of melanoma patients. Such assessment establishes a definitive diagnosis in most cases, and provides information that, to a major extent, influences patient prognosis and directs the next stages of management. Consistency of reporting is improved by the use of discrete data elements. Structured pathology reports are more likely to be complete and therefore more usable for clinicians' purposes, which also improves decision-making for melanoma treatment. This type of reporting also allows for easy retrieval of data elements for a variety of uses, including audit, the NZCR and research. Synoptic reports may include a 'comments' or 'microscopic' section, which allows description of an unusual morphology and immunohistochemical stains.
Good practice points	3.3.1 The AJCC guidelines are adopted. 3.3.2 The lesion is sectioned and examined histologically after formalin fixation and paraffin embedding. 3.3.3 For accurate assessment of T1a, T1b and T2 lesions, at least three levels (not simply serial sections) of the biopsy tissue are examined. Breslow thickness in lesions in and around the 1-mm mark is critical for T1–T2 staging. Three to six levels are commonly obtained, and multiple are recommended. 3.3.4 Pathologists reporting melanocytic lesions and melanoma have undergone adequate training, participate in regular continuing medical education in this field and have ready access to a second opinion for difficult cases. 3.3.5 A synoptic melanoma report for melanoma primaries such as that developed by the RCPA or CAP is strongly recommended for routine use to support national consistency and the NZCR database (refer **Appendix 2.2 and 2.3** for the RCPA form and CAP form for fields required). 3.3.6 An indication as to whether the case has been reported to the NZCR is included on the report.

Good practice points (continued)	3.3.7	Recommendations based on the current literature for diagnostic, prognostic and therapeutic molecular testing are as follows: • ancillary diagnostic molecular techniques (for example, CGH, FISH, GEP) may be used to assist diagnosis for equivocal melanocytic neoplasms. • routine molecular testing, including GEP, for prognostication is discouraged until better use criteria are defined. The application of molecular information for clinical management, for example, sentinel lymph node eligibility, follow-up and/or therapeutic choice is not recommended beyond a clinical study or trial. • testing of the primary cutaneous melanoma for oncogenic mutations (for example, BRAF, NRAS) is not recommended in the absence of metastatic disease. There is insufficient evidence to recommend routine molecular profiling assessment for baseline prognostication. Evidence is also lacking around the use of molecular classification to alter patient management beyond current guidelines (for example, NCCN and AAD). The criteria for and the utility of prognostic molecular testing, including GEP, in aiding clinical decision-making (for example, SLNB eligibility, surveillance intensity and/or therapeutic choice) needs to be evaluated in the context of clinical studies or trials. • BRAF testing should be performed for stage III and IV patients if it will impact future management, that is, use of BRAF/MEK inhibitors.

References

- Amin MB, Greene FL, Edge SB, et al. 2017. The eighth edition AJCC cancer staging manual: continuing to build a bridge from a population-based to a more 'personalized' approach to cancer staging. *CA: A Cancer Journal for Clinicians* 67(2): 93–9.
- Gershenwald J, Scolyer R, Hess K, et al. 2017. Melanoma staging: evidence-based changes in the American Joint Committee on Cancer eighth edition cancer staging manual. *CA: A Cancer Journal for Clinicians* 67(6): 472–92.

Quality statement 3.4: Time to pathological diagnosis

Description	A diagnosis of melanoma is reported in 5 working days in 80% of cases, and 90% of cases should have a final report in 10 working days. Cases requiring molecular studies or additional departmental consultation are excluded from this metric; however, these cases should have a provisional report and/or notification to the requesting clinician within 10 working days. Pathology departments should maintain a tracking system to monitor cases awaiting diagnosis and match diagnosis with request when received back in the department.
Rationale	A diagnosis of melanoma is an important first step in management and, as for all malignant diagnoses, a timely report is highly desirable. A target of five working days for 80% of cases allows for courier transport, adequate fixation of the specimen before sectioning, tissue processing and special stains (not for molecular testing where necessary), and finally examination by the pathologist, transcription and report release (Royal College of Pathologists of Australasia 2020). Additional immunohistochemical or molecular testing and referral to other colleagues in the same department, city or overseas for confirmation / expert opinion of the lesion may take longer than the prescribed limits. If the case is likely to take more than 10 days to report, an initial report or other communication to the clinician should be issued in the interim, followed by a supplementary or amended report.
Good practice points	3.4.1 A final report is produced within 5 working days in 80% of cases. 3.4.2 A final report is produced within 10 working days 90% of cases. 3.4.3 A final report is produced within 15 working days in 98% of cases. 3.4.4 Where there are delays in producing a final report (for example, in the case of an expert opinion being sought), a provisional report or notification is provided within 5 working days.

Reference

- Royal College of Pathologists of Australasia. 2019. *Turnaround Time in Anatomical Pathology*. URL: **https://www.rcpa.edu.au/Library/College-Policies/Guidelines/Turnaround-Time-in-Anatomical-Pathology#page67** (accessed 30 July 2021).

Quality statement 3.5: Sentinel node biopsy reporting

Description	The current MIA or RCPA protocol fields are recommended for processing and reporting SNB.
Rationale	SNB is a very strong prognostic and staging technique; its use is supported by the literature, including by the AJCC (Amin et al 2017, Wen et al 2021). The protocol used to process and report SNB should achieve the best possible detection rate.
Good practice points	3.5.1 Latest RCPA or CAP guidelines should be followed for processing sentinel lymph nodes. 3.5.2 Reporting of the sentinel node is synoptic/structured to allow key elements to be easily identified for MDM review. The MIA fields are recommended (refer **Appendix 2.4**). 3.5.3 A synoptic sentinel node report is strongly recommended for routine use to support national consistency and the NZCR database.

Reference

- Amin MB, Greene FL, Edge SB, et al. 2017. The eighth edition AJCC cancer staging manual: continuing to build a bridge from a population-based to a more 'personalized' approach to cancer staging. *CA: A Cancer Journal for Clinicians* 67(2): 93–9.

Quality statement 3.6: Radiological staging

Description	Radiological staging should be requested dependent on melanoma TNM status, level of risk and intended treatment. Oligometastasis may be resectable or treated with radiotherapy. Asymptomatic metastases may be appropriate for immunotherapy with a curative intent. In New Zealand access to this is dependent on radiologically evaluable unresectable or metastatic disease. If patient factors/co-morbidities deem patients unfit for any further treatment, do not perform routine staging. For ongoing surveillance refer to **Quality Statement 6.3**
Rationale	The available literature assessing various imaging techniques is limited; most studies are of retrospective design and are difficult to compare due to variability in both methodology and patient groups assessed (Cancer Council Australia Melanoma Guidelines Working Party 2019). These recommendations are made accepting that individual centre's resources and protocols may differ but should be considered as best practice. **Body imaging** PET-CT has improved diagnostic accuracy over CT alone, particularly for the detection of extracerebral distant metastatic disease (Xing et al 2011). A small retrospective study comparing staging PET-CT with CT alone found major therapy changes in 52% of patients based on PET-CT findings, particularly with regard to surgical management (Schüle et al 2016). Routine radiological staging for asymptomatic patients with stage 0, I and II disease is generally not recommended due to low rates of true-positive findings and comparatively high rates of false-positive findings (Barsky et al 2014; Bikhchandani et al 2014; Orfaniotis et al 2012; Vural Topuz et al 2018; NCCN 2019). A reasonably large percentage of recurrence is local (nodal, satellite or in transit) and is often detected by the patient or clinician (Swetter et al 2018). For thick melanomas (that is, T4, stage IIB and C disease), there are conflicting views in the literature. There is little evidence to support significant benefit of initial staging with PET-CT or CT due to low yield and high false-positive rates; although there are suggestions that PET-CT may play a role in early identification of distant metastases and consequent upstaging during initial staging workup (Arrangoiz et al 2012; Danielsen et al 2016, Yılmaz et al 2020, Ravichandran et al 2020). Additionally, there may be inherent value in establishing a baseline for future surveillance (Ravichandran et al. 2020). In some high-risk clinical situations, baseline PET-CT may add value with regard to altering the proposed treatment/therapy. The recent National Institute for Health and Care (NICE) guidelines (July 2022) now suggest considering baseline staging CT imaging for stage IIB disease and offering staging CT imaging for stage IIC disease.

Rationale (continued)	Ultrasound of the draining nodal basins can provide a useful adjunct to clinical examination in selected clinical situations, such as high-risk stage II patients with equivocal clinical examination, obesity or failed/declined SNB. There is evidence that US can detect lymph node metastasis with a reasonable degree of accuracy, with literature supporting increased sensitivity of US compared with clinical examination (Bafounta et al 2004; Machet et al 2005). For patients with positive sentinel lymph nodes with low nodal tumour volume, there is little evidence to support the value of baseline cross-sectional imaging. In particular, staging imaging in this group has a high false-positive rate, which may lead to inappropriate further investigation and/or interventions (Holtkamp et al 2017). However, the rate of relapse in this group is not negligible, and it may be that the volume of loco-regional or distant metastatic disease is below the threshold for imaging detection at initial diagnosis (Wagner et al 2011). Therefore, follow-up surveillance imaging should be considered at an appropriate time interval based on risk of recurrence. In patients with high-risk stage III disease (stage IIIB, C and D disease), baseline PET-CT detection of occult metastasis may upstage the patient which can have significant implications for further management. In a small retrospective study by Groen et al (2019), 18% of patients with stage III disease were upstaged to stage IV. Patients with stage IV disease may present clinically or as an unexpected finding on imaging (with or without a history of melanoma). If widespread metastatic disease is identified on CT, PET-CT is unlikely to add value. **Brain imaging** It is widely accepted that MRI is superior to CT for the detection of cerebral metastases and is therefore preferable. The AJCC recognises patients with central nervous system metastases as having the worst prognosis of all melanoma patients with distant metastatic disease (M1d category) (Amin et al 2017). The incidence of developing brain metastases increases with TNM stage. The risk of cerebral metastasis in stages I and II disease is low, and routine staging is generally not recommended. Patients with stage III disease, macroscopic nodal and/or in-transit disease have been associated with increased risk of brain metastases (Samlowski et al 2017). In stage IV disease, the risk of concurrent cerebral and extracerebral metastasis at diagnosis is higher and has been reported in up to 20% of patients (Vosoughi et al 2018). There is a small subgroup of patients with metastatic disease involving only the brain.

Good practice points

3.6.1 All staging imaging investigations should be completed within 2 weeks of referral.

3.6.2 **Stages 0 (MIS), I and IIA**

For patients with stage 0 (MIS), I or II (A) disease, excluding SNB (where indicated), baseline cross-sectional imaging is not routinely recommended in asymptomatic patients.

3.6.3 **Stages IIB or C**

In patients with high-risk stage II disease with thick melanomas (T4 and stage IIB or C disease), baseline imaging investigation may be appropriate and should be discussed at a melanoma MDM. Initial staging with PET-CT can be considered following MDM discussion. Survival prediction tools such as that developed by the **Melanoma Institute of Australia for Stage II** may aid in decision making (Melanoma Institute of Australia, 2024).

3.6.4 **Stage IIIA**

For patients with stage IIIA under clinical/US observation, initial cross-sectional imaging is not recommended due to low true-positive findings and high false-positive rates. Surveillance imaging is recommended to detect progression (discussed further in **section 6.3**).

If completion lymphadenectomy is planned baseline PET-CT is recommended.

3.6.5 **Stage IIIB, C and D**

For patients with stage III (B, C and D) disease, baseline imaging with PET-CT and dedicated imaging of the brain is recommended if potential upstaging may influence treatment/therapy. MRI brain is preferred over contrast-enhanced CT.

3.6.6 **Stage IV**

Contrast-enhanced staging CT of the chest, abdomen and pelvis should be performed. Neck CT should be added if the primary is in the head, neck or upper trunk. Dedicated brain imaging is recommended. MRI brain is recommended over contrast-enhanced CT.

Baseline PET-CT for stage IV disease should be guided by the MDM and recommended in certain clinical circumstances, such as if:

- there is oligometastatic metastatic disease demonstrated on conventional CT that would be amenable to surgery or radiotherapy
- there are equivocal findings on conventional CT that could potentially change treatment decisions.

3.6.7 An US of the lymph node basins draining the primary site may be considered if physical examination is equivocal, limited by body habitus, or SNB has failed or was declined. Although the sensitivity of US is higher than clinical examination, it is no substitute to SNB (this is discussed further in **section 6.4**). Negative nodal basin US is not a substitute for biopsy of clinically suspicious lymph nodes.

3.6.8 Contrast-enhanced brain MRI is preferred over contrast-enhanced CT due to improved diagnostic accuracy if diagnosing brain metastases early will alter management of the patient.

3.6.9 If low-dose CT is performed as part of the PET-CT examination, it is not of diagnostic quality for detection of brain metastases. Additional diagnostic quality brain imaging may therefore be required depending on the type of CT imaging acquired during PET-CT.

References

- Amin MB, Edge S, Greene F, et al (eds). 2017. *AJCC Cancer Staging Manual (8th edition)*. Switzerland: Springer.
- Arrangoiz R, Papavasiliou P, Stransky CA, et al. 2012. Preoperative FDG-PET/CT is an important tool in the management of patients with thick (T4) melanoma. *Dermatology research and practice* 2012: 614,349.
- Bafounta ML, Beauchet A, Chagnon S, et al. 2004. Ultrasonography or palpation for detection of melanoma nodal invasion: a meta-analysis. *Lancet Oncol* 5(11): 673–80.
- Barsky M, Cherkassky L, Vezeridis M, et al. 2014. The role of preoperative positron emission tomography/computed tomography (PET/CT) in patients with high-risk melanoma. *J Surg Oncol* 109(7): 726–29.
- Bikhchandani J, Wood J, Richards AT, et al. 2014. No benefit in staging fluorodeoxyglucose-positron emission tomography in clinically node-negative head and neck cutaneous melanoma. *Head Neck* 36(9): 1,313–16.
- Cancer Council Australia Melanoma Guidelines Working Party. 2019. *Clinical Practice Guidelines for the Diagnosis and Management of Melanoma*. Sydney: Melanoma Institute Australia. URL: **https://wiki.cancer.org.au/australia/Guidelines:Melanoma#top** (accessed 16 March 2020).
- Danielsen M, Kjaer A, Wu M, et al. 2016. Prediction of positron emission tomography/computed tomography (PET/CT) positivity in patients with high-risk primary melanoma. *Am J Nucl Med Mol Imaging* 6(5): 277–85.
- Groen LC, Lazarenko SV, Schreurs HW, et al. 2019. Evaluation of PET/CT in patients with stage III malignant cutaneous melanoma. *American journal of nuclear medicine and molecular imaging* 9(2): 168–75.
- Holtkamp LHJ, Read RL, Emmett L, et al. 2017. Futility of imaging to stage melanoma patients with a positive sentinel lymph node. *Melanoma Research* 27(5): 457–62.
- Machet L, Nemeth-Normand F, Giraudeau B, et al. 2005. Is ultrasound lymph node examination superior to clinical examination in melanoma follow-up? A monocentre cohort study of 373 patients. *Br J Dermatol* 152(1): 66–70.
- Melanoma Institute of Australia. 2024. MIA Prediction Tool for Stage II. URL: **https://www.melanomarisk.org.au/Stage2Land** (accessed 13 March 2024).
- NCCN. 2022. *Clinical Practice Guidelines in Oncology (NCCN Guidelines).* Pennsylvania: National Comprehensive Cancer Network (NCCN). URL: **www.nccn.org/professionals/physician_gls/default.aspx** (accessed 27 July 2022).
- National Collaborating Centre for Cancer. 2015. *Melanoma: Assessment and management*. *NICE guideline NG14*. Cardiff: National Collaborating Centre for Cancer. URL: https://www.nice.org.uk/guidance/ng14.
- Orfaniotis G, Mennie JC, Fairbairn N, et al. 2012. Findings of computed tomography in stage IIB and IIC melanoma: A six-year retrospective study in the South-East of Scotland. *Journal of Plastic, Reconstructive & Aesthetic Surgery* 65(9): 1,216–19.
- Ravichandran S, Nath N, Jones DC, et al. 2020. The utility of initial staging PET-CT as a baseline scan for surveillance imaging in stage II and III melanoma. *Surg Oncol*. 35:533-539.
- Samlowski WE, Moon J, Witter M, et al. 2017. High frequency of brain metastases after adjuvant therapy for high-risk melanoma. *Cancer Med* 6(11): 2,576–85.

- Schüle SC, Eigentler TK, Garbe C, et al. 2016. Influence of (18)F-FDG PET/CT on therapy management in patients with stage III/IV malignant melanoma. *Eur J Nucl Med Mol Imaging* 43(3): 482–8.
- Swetter SM, Tsao H, Bichakjian CK, et al. 2019. Guidelines of care for the management of primary cutaneous melanoma. *Journal of the American Academy of Dermatology* 80(1): 208–50.
- Vosoughi E, Lee JM, Miller JR, et al. 2018. Survival and clinical outcomes of patients with melanoma brain metastasis in the era of checkpoint inhibitors and targeted therapies. *BMC Cancer* 18(1): 490.
- Vural Topuz Ö, Görtan FA, Kaya Döner ZR, et al. 2018. Usefulness of (18)F-FDG PET/CT in cutaneous melanoma patients with negative sentinel lymph nodes and high Clark levels. *Molecular Imaging and Radionuclide Therapy* 27(2): 66–72.
- Wagner T, Meyer N, Zerdoud S, et al. 2011. Fluorodeoxyglucose positron emission tomography fails to detect distant metastases at initial staging of melanoma patients with metastatic involvement of sentinel lymph node. *Br J Dermatol* 164(6): 1,235–40.
- Xing Y, Bronstein Y, Ross MI, et al. 2011. Contemporary diagnostic imaging modalities for the staging and surveillance of melanoma patients: a meta-analysis. *J Natl Cancer Inst* 103(2): 129–42.
- Yılmaz H, Orhan E, Şahin E, et al. 2020. Efficacy of positron emission tomography and computed tomography in clinical staging of cutaneous malignant melanoma. *Dermatologic Therapy* 33(3): e13,304.

Quality statements 4: Multidisciplinary care

Quality statement 4.1: Multidisciplinary meetings

Description	Patients with the following should be discussed at a MDM: • complex reconstruction cases, including MIS • stages II (B and C) cases if management decisions are not straightforward • stages III and IV cutaneous melanoma cases • desmoplastic melanoma • melanoma in people under 25 years of age • non-cutaneous melanoma. The outcome of the MDM is documented and communicated to the treating clinician, GP and patient.
Rationale	International evidence shows that multidisciplinary care is a key part of providing best-practice treatment and care for patients with cancer. Cancer MDMs are part of the philosophy of multidisciplinary care. Effective MDMs result in positive outcomes for patients receiving the care, for health professionals involved in providing the care and for health services overall. Benefits include improved treatment planning, improved equity of patient outcomes, more patients being offered the opportunity to enter relevant clinical trials, improved continuity of care and less service duplication, improved coordination of services, improved communication between care providers and more efficient use of time and resources (Thompson and Williams 2019). Patients with advanced melanoma can be complex to manage due to several factors, including variation in presentation, the potential involvement of any organ and the unpredictable course of their disease progression. Recent advances and controversies in melanoma management reinforce a need for carefully considered treatment pathways to optimise care. The collection and presentation of accurate patient information at MDMs and comprehensive feedback to patients are fundamental to high-quality care.

Good practice points	4.1.1	Minimum core membership of a melanoma MDM consists of a general surgeon and/or plastic surgeon, a pathologist, a radiation oncologist, a medical oncologist, a radiologist and a CNS and/or a CNC. Ideally other MDT members are encouraged to be involved, including dermatologists, nurse practitioners, GPs, geriatricians, Māori and Pacific liaison, adolescent and young adult key workers and palliative care team members.
	4.1.2	The melanoma MDM process within each hospital and region is documented, including: appointment of MDM members, referral pathways, meeting frequency and videoconferencing links between regional and provincial hospitals, where appropriate.
	4.1.3	Details of patients discussed at the MDM and their appropriateness for available clinical trials are recorded on a standardised MDM template.
	4.1.4	A dedicated CNS, CNC or other health professional is appointed to coordinate written and verbal outcomes.
	4.1.5	Adequate support staff and resources are available to the MDM. Smaller provincial MDTs or treating clinicians present patients to regional MDMs in person or via teleconferencing.
	4.1.6	The MDM records and discusses patients with stage TIb melanoma and above if required.
	4.1.7	The MDM records information in a database that can be collated and analysed locally, regionally and nationally.
	4.1.8	Treating clinicians record reasons for not following treatment plans recommended by the MDM.
	4.1.9	Recommendations from MDM discussions are available as an electronic record and accessible to other members of a patient's health care team within 2 working days.
	4.1.10	All Māori patients and their family/whānau are offered an opportunity to access Whānau Ora assessments and cultural support services.
	4.1.11	All patients diagnosed with melanoma are offered referral to a supportive care service such as the Cancer Society as part of the continuum of standard care (Ministry of Health 2010).

References

- Ministry of Health. 2010. Guidance for Improving Supportive Care for Adults with Cancer in New Zealand. Wellington: Ministry of Health. URL: **https://www.health.govt.nz/system/files/documents/publications/supp-care-guidance-mar2010.pdf** (accessed 6 August 2021).
- Ministry of Health. 2012. Guidance for Implementing High-Quality Multidisciplinary Meetings: Achieving best practice cancer care. Wellington: Ministry of Health. URL: **Guidance for implementing high-quality multidisciplinary meetings (health.govt.nz)** (accessed 13 August 2023)
- Te Aho o Te Kahu. 2021. HISO 0038.4:2021 Cancer Multidisciplinary Meeting Data Standard. Wellington: Te Aho o Te Kahu.
- Thompson J, Williams G. 2019. Multidisciplinary care of cancer patients: a passing fad or here to stay? *ANZ Journal of Surgery* 89(5): 464–65.

Quality statements 5: Treatment

Quality statement 5.1: Re-excision of histologically confirmed melanomas

Description	Histologically confirmed melanomas are re-excised, with additional clinical margins determined by Breslow thickness. Lesions with histological staging AJCC T1b or higher are referred to an appropriately trained and experienced surgical specialist for consideration of SNB staging at the time of the re-excision (see **Quality Statement 5.3**).
Rationale	Wide excision with evidence-based clinical margins aims to provide enduring local control and cure patients without occult lymphatic or haematogenous spread. Excision margins for invasive melanoma are evidence based, with data from multiple prospective RCTs (Veronesi et al 1988, 1991; Balch et al 1993; Cohn-Cedermark et al 2000; Khayat et al 2003; Utjés et al 2019). These were measured margins often from a scar after a complete excision though did include some residual melanoma. There are no randomised control trials to assess safe pathological margins. Decisions as to need for a further re-excision if the wide local excision has residual melanoma should be based on the initial pathology, margins already achieved and patient factors. Generally, these studies have excluded head, neck and acral melanoma. Amelanotic melanoma and desmoplastic may need wider excision as the margin can be difficult to see clinically. Excision margins for invasive melanoma of less than 1 cm are associated with higher local, regional and distant recurrence rates (Haydu et al 2016; MacKenzie et al 2016). For melanoma 2 mm or less, there is not strong evidence that margins >1 cm improve local recurrence or survival (Veronesi et al 1991). A large multicentre trial is currently underway after an initial feasibility study (Moncrieff et al 2018). Excision margins >2 cm for melanoma do not appear to influence survival (Utjés et al 2019; Cohn-Cedermark et al 2000). Evidence for depth of excision in invasive melanoma is less robust, but expert consensus is that this should include tissue down to but not including deep fascia unless this is clinically involved. For subungual melanoma, difficulty in obtaining adequate deep margins has led to the recommendation for amputation at the next proximal interphalangeal joint. There is some evidence that more conservative surgery may give equivalent results in MIS of the nail unit (Cochran et al 2014; Duarte et al 2015).

Rationale (continued)	For T1b and thicker melanomas, SNB is the best staging and prognostic test. It allows potential access to adjuvant immune or targeted therapy and may confer a survival advantage in some patients. The appropriate use criteria published by the American College of Mohs Surgeons in 2012 included lentigo maligna melanoma and melanoma in situ as an indication for the use of Mohs micrographic surgery (MMS) in mask and head and neck areas, it was deemed "uncertain" on the torso and extremities (Ad Hoc Task Force 2012). This technique was first described by Zitelli's group in 1997 (Zitelli 1997). Staged excision is an alternative when MMS is not an option for the management of melanoma. It involves serial step radial sectioning through the specimen with rapid paraffin-fixed slide processing and pathologist review. Accurate mapping of the melanocytic lesion by the pathologist in conjunction with the surgeon allows for precise margin analysis with subsequent targeted serial surgical excision of areas not clear of melanoma. In a population of head and neck melanoma and melanoma in situ, Moyer et al reported in 2016 that 74% of the lentigo maligna subtype had a mean margin from lesion to clearance for melanoma in situ of 9.3mm and 13.7mm for invasive melanoma. Only 41% of melanoma in situ lesions and 3% with an invasive component were cleared with 5mm margins. 74.5% of melanoma in situ were clear with 10mm margins and 52% for invasive melanoma. They reported a 5-year recurrence rate of 1.4% increasing to only 2.2% at 10 years (Moyer et al 2016).
Good practice points	5.1.1 All doctors who undertake re-excision of melanoma are appropriately trained and experienced. 5.1.2 Margins may be modified by clinical site or patient co-morbidities. 5.1.3 Re-excision of melanoma in situ to 5–10 mm clinical margins and AJCC T1a cases of melanoma to 10 mm clinical margins can be performed as a local anaesthetic procedure by either an appropriately trained and experienced primary health care doctor or a melanoma specialist. 5.1.4 Lesions meeting histological staging AJCC T1b or higher are referred to an appropriately trained and experienced surgical specialist for consideration of SNB staging at the time of the re-excision. 5.1.5 Excisions have vertical edges and extend to, but do not include, the deep fascia, as clinically appropriate. 5.1.6 Precise measurement of clinical margins is mapped out from the edge of the scar or remaining lesion with a ruler before the definitive excision. 5.1.7 For in situ or invasive melanoma of lentigo maligna sub-type, management could be considered with margin-controlled surgery such as Mohs or staged excision with rushed paraffins. Staged excision can be performed by any surgeon or dermatologist, in concert with the local histopathologist increasing its utility at a population level. 5.1.8 Patients are provided with information about surgical excision risks: wound infection, haematoma, failure of skin graft and flap, numbness, scarring, seroma and lymphoedema and the possibility that further surgery will be required. 5.1.9 Patients undergoing surgery are offered the choice for their tissue to be disposed of by standard methods or utilising appropriate tikanga processes. 5.1.10 Patients are informed about melanoma in general and increased risks for new melanoma and advised to undergo regular full-body skin checks.

Good practice points (continued)

5.1.11 Appropriate data collection systems are in place to collate, publish and audit data on post-surgery complications.

5.1.12 Clinicians adhere to the guidelines listed in the following table:

Breslow thickness	Additional clinical margin
Naevus with severe cytological or architectural atypia	5 mm
Melanoma in situ (Tis)	5–10 mm
<1.0 mm (T1)	10 mm
1–2 mm (T2)	10–20 mm
2–4 mm (T3)	20 mm
>4 mm (T4)	20 mm

References

- Ad Hoc Task Force. 2012. AAD/ACMS/ASDSA/ASMS 2012 appropriate use criteria for Mohs micrographic surgery: a report of the American Academy of Dermatology, American College of Mohs Surgery, American Society for Dermatologic Surgery Association, and the American Society for Mohs Surgery. *J Am Acad Dermatol* 67(4):531-550. Erratum in: *J Am Acad Dermatol*. 2015 72(4):748.
- Balch CM, Urist MM, Karakousis CP, et al. 1993. Efficacy of 2-cm surgical margins for intermediate-thickness melanomas (1 to 4 mm). Results of a multi-institutional randomized surgical trial. *Annals of surgery* 218(3): 262–9.
- Cochran AM, Buchanan PJ, Bueno RA Jr, et al. 2014. Subungual melanoma: a review of current treatment. *Plastic and Reconstructive Surgery* 134(2): 259–73.
- Cohn-Cedermark G, Rutqvist LE, Andersson R, et al. 2000. Long term results of a randomized study by the Swedish Melanoma Study Group on 2-cm versus 5-cm resection margins for patients with cutaneous melanoma with a tumor thickness of 0.8–2.0 mm. *Cancer* 89(7): 1,495–501.
- Duarte AF, Correia O, Barros AM, et al. 2015. Nail melanoma in situ: clinical, dermoscopic, pathologic clues, and steps for minimally invasive treatment. *Dermatol Surg* 41(1): 59–68.
- Haydu LE, Stollman JT, Scolyer RA, et al. 2016. Minimum safe pathologic excision margins for primary cutaneous melanomas (1–2 mm in thickness): analysis of 2,131 patients treated at a single center. *Ann Surg Oncol* 23(4): 1,071–81.
- Khayat D, Rixe O, Martin G, et al. 2003. Surgical margins in cutaneous melanoma (2 cm versus 5 cm for lesions measuring less than 2.1-mm thick). *Cancer* 97(8): 1,941–6.
- MacKenzie Ross AD, Haydu LE, Quinn MJ, et al. 2016. The association between excision margins and local recurrence in 11,290 thin (T1) primary cutaneous melanomas: a case-control study. *Ann Surg Oncol* 23(4): 1,082–89.
- Moncrieff, M.D., Gyorki, D., Saw, R. et al. 2018. 1 Versus 2-cm Excision Margins for pT2-pT4 Primary Cutaneous Melanoma (MelMarT): A Feasibility Study. *Ann Surg Oncol*. **25**: 2541–2549.
- Moyer JS, Rudy S, Boonstra PS et al. 2017. Efficacy of Staged Excision With Permanent Section Margin Control for Cutaneous Head and Neck Melanoma. *JAMA Dermatol*. 153(3):282-288.

- Tzellos T, Kyrgidis A, Mocellin S, et al. 2014. Interventions for melanoma in situ, including lentigo maligna. *Cochrane Database Syst Rev* (12): CD010308.
- Utjés D, Malmstedt J, Teras J, et al. 2019. 2-cm versus 4-cm surgical excision margins for primary cutaneous melanoma thicker than 2 mm: long-term follow-up of a multicentre, randomised trial. *The Lancet* 394(10197): 471–77.
- Veronesi U, Cascinelli N. 1991. Narrow excision (1-cm margin). A safe procedure for thin cutaneous melanoma. *Arch Surg* 126(4): 438–41.
- Veronesi U, Cascinelli N, Adamus J, et al. 1988. Thin stage I primary cutaneous malignant melanoma. Comparison of excision with margins of 1 or 3 cm. *N Engl J Med* 318(18): 1,159–62.
- Zitelli JA, Brown C, Hanusa BH. Mohs micrographic surgery for the treatment of primary cutaneous melanoma. *J Am Acad Dermatol*. 1997 37(2 Pt 1):236-45.

Quality statement 5.2: Desmoplastic/neurotropic melanoma

Description	The MDM discusses the potential role of radiation treatment to improve local control in patients with desmoplastic/neurotropic melanoma.
Rationale	Desmoplastic melanoma account for 1–4% of all primary cutaneous melanoma and exhibit different biological behaviour to non-desmoplastic melanoma. They have lower rates of sentinel node and distant metastasis (Dunne et al 2017; Hughes et al 2021). However, they also have an increased risk of local recurrence (6–15%) (Chen et al 2008; Guadagnolo et al 2014; Strom et al 2014). Desmoplastic melanoma most commonly occur in males, older patients, and on the head and neck and there is an increased risk (30–60%) of neurotropism (Quinn et al 1998; Hughes et al 2021). Currently, there have been no RCTs examining the excision margins required to minimise local recurrence in desmoplastic melanoma; however, studies have confirmed that local recurrence is strongly related to involved resection margins (Chen et al 2008; Guadagnolo et al 2014; Strom et al 2014; Hughes et al 2021). There are no published RCTs investigating the role of adjuvant radiotherapy in desmoplastic melanoma. Observational studies have reported a local recurrence benefit from adjuvant radiotherapy in desmoplastic melanoma with neurotropism and inadequate histological margins (Chen et al 2008; Guadagnolo et al 2014; Strom et al 2014; Varey et al 2017; Hughes et al 2021).
Good practice points	5.2.1 Radiation treatment is considered for patients with desmoplastic melanoma where the melanoma is unresectable or where the clinical margins are <8 mm (Varey et al 2017). 5.2.2 Radiation should be considered for head and neck primary sites and in other sites where the melanoma has marked neurotropism or is >4 mm thick (Chen et al 2008; Guadagnolo et al 2014; Strom et al 2014). 5.2.3 SNB should still be considered in patients with desmoplastic melanoma based on their clinical and histopathological risk factors and discussion at a melanoma MDM.

References

- Chen JY, Hruby G, Hong A, et al. 2008. Desmoplastic neurotropic melanoma: A clinicopathologic analysis of 128 cases. *Cancer* 113(10): 2,770–78.
- Dunne J, Wormald J, Steele J, et al. 2017. Is sentinel lymph node biopsy warranted for desmoplastic melanoma? A systematic review. *Journal of Plastic, Reconstructive & Aesthetic Surgery* 70(2): 274–80.
- Guadagnolo BA, Zagars GK, Prieto V, et al. 2014. The role of adjuvant radiotherapy in the local management of desmoplastic melanoma. *Cancer* 120(9): 1,361–68.
- Hughes T, Williams G, Gyorki D, et al. 2021. Desmoplastic melanoma: a review of its pathology and clinical behaviour, and of management recommendations in published guidelines. *Journal of the European Academy of Dermatology and Venereology*. DOI: 10.1111/jdv.17154.

- Quinn MJ, Crotty KA, Thompson JF, et al. 1998. Desmoplastic and desmoplastic neurotropic melanoma: experience with 280 patients. *Cancer* 83(6) :1,128–35.
- Strom T, Caudell JJ, Trotti AM, et al. 2014. Radiotherapy influences local control in patients with desmoplastic melanoma. *Cancer* 120(9): 1,369–78.
- Varey AHR, Goumas C, Hong AM, et al. 2017. Neurotropic melanoma: An analysis of the clinicopathological features, management strategies and survival outcomes for 671 patients treated at a tertiary referral center. *Modern Pathology* 30(11): 1,538–50.

Quality statement 5.3: Sentinel node biopsy technique

Description	SNB staging is offered to patients with T1b or thicker melanoma who could benefit from the procedure and is performed by surgeons trained and experienced in the technique. SNB in melanoma is carried out using triple localisation with preoperative lymphoscintigraphy and SPECT scan. Intra-operative localisation is performed with blue dye and a gamma probe.
Rationale	Studies have shown that the SNB technique is useful for identifying small lymph node metastases in patients with T1b and above melanoma. There is an expected nodal positivity rate for intermediate thickness melanoma of approximately 20% (Morton et al 2014). SNB allows for accurate staging, prognostic information, improved regional control and potential access to adjuvant treatment (Madu et al 2017; Wong et al 2018; Dummer et al 2016) (Adjuvant trials – see med onc references – EORTC 18 071, COMBI –AD, EORTC11325/Keynote 054 study) (Cancer Council Australia Melanoma Guidelines Working Party 2019; Dummer et al 2012; National Collaborating Centre for Cancer 2015; NCCN 2019, Wen et al 2021; Rivalland et al 2022). Thin melanomas (<1mm) are the most common form of melanoma and can usually be cured through surgical removal of the primary tumour. The expected rate of node positivity in thin melanoma is 5.2%, increasing to 8% in those >0.8 mm, where the benefit of SNB starts to outweigh the false-negative rate and risk (Han et al 2013; Wong et al 2018; Gershenwald and Scolyer 2018). The AJCC staging system has identified an improved prognosis for patients with thin melanoma >0.8 mm who had a SNB when negative compared with those who did not undergo SNB (Gershenwald et al 2017). Thick melanomas (>4 mm) are more likely to undergo haematogenous metastasis. There are few studies focusing on the use of SNB in patients with thick melanomas. However, recent evidence of relapse free survival (RFS) with adjuvant treatments suggests full staging with SNB will allow informed discussion about adjuvant treatments (Eggermont et al 2015, 2018; Long et al 2017; Weber et al 2017; Seth et al 2020). There is no survival benefit proven for completion lymphadenectomy for micro-metastatic nodal disease, although the largest and most recent trial (MSLT II) had a mean SNB deposit of only 1.11 mm in the observation group (interquartile range 0.23–1.38 mm) (Faries et al 2017; Leiter et al 2016, 2019).
Good practice points	5.3.1 SNB staging is considered for all patients with melanoma T1b or thicker. SNB should be used for patients with thick melanomas for accurate staging to facilitate regional control or potential access to adjuvant treatment. 5.3.2 In order to make an informed choice about SNB, patients are provided with information about the likelihood of the SNB being positive based on the histological features of their melanoma and utilisation of the MIA sentinel node positivity nomogram (Melanoma Institute Australia 2021). Clinicians inform patients of the role of SNB, the technique itself, its limitations, potential complications and alternative management options if it is declined. This discussion is facilitated by both the primary clinician and the surgeon who performs SNB.

Good practice points (continued)	5.3.3	Pre-operative lymphoscintigraphy and SPECT is carried out to identify which draining lymph node fields contain the sentinel node(s). Technetium-99 nanocolloid is injected intradermally either side of the middle of the scar. Dynamic and static lymphoscintigrams are obtained.
	5.3.4	Lymphoscintigrams are reported by radiologists and nuclear medicine specialists trained and experienced in the technique.
	5.3.5	SNB is performed by surgeons trained and experienced in the technique.
	5.3.6	SNB is performed within 18 hours of lymphoscintigraphy.
	5.3.7	Incisions are marked out with consideration of completion lymphadenectomy access, should this be required.
	5.3.8	All patients with a positive SNB receive MDM discussion regarding the choice of observation versus completion lymphadenectomy or access to adjuvant treatment.
	5.3.9	Where SNB is not performed in patients with T1b (or over) melanoma, active clinical and radiological surveillance is offered unless comorbidities preclude (US 4–6 monthly for 2 years).
	5.3.10	Appropriate data collection systems are in place to collate, report and audit post-surgery complications.

References

- Cancer Council Australia Melanoma Guidelines Working Party. 2019. *Clinical Practice Guidelines for the Diagnosis and Management of Melanoma*. Sydney: Melanoma Institute Australia. URL: **https://wiki.cancer.org.au/australia/Guidelines:Melanoma#top** (accessed 16 March 2020).
- Dummer R, Hauschild A, Guggenheim M, et al. 2012. Cutaneous melanoma: ESMO clinical practice guidelines for diagnosis, treatment and follow-up. *Annals of Oncology* 23(S7): vii86–vii91.
- Dummer R, Siano, M, Hunger RE, et al. 2016. The updated Swiss guidelines 2016 for the treatment and follow up of cutaneous melanoma. *Swiss Med Wkly*. DOI: 10.4414/smw.2016.14279.
- Eggermont AMM, Blank CU, Mandala M, et al. 2018. Adjuvant pembrolizumab versus placebo in resected stage III melanoma. *N Engl J Med* 378: 1,789–801.
- Eggermont AM, Chiarion-Sileni V, Grob JJ, et al. 2015. Adjuvant ipilimumab versus placebo after complete resection of high-risk stage III melanoma (EORTC 18071): a randomised, double-blind, phase 3 trial. *Lancet Oncol* 16(5): 522–30.
- Faries MB, Thompson JF, Cochran AJ, et al. 2017. Completion dissection or observation for sentinel-node metastasis in melanoma. *New England Journal of Medicine* 376(23): 2,211–22.
- Gershenwald, JE, Scolyer, RA. 2018. Melanoma staging: American Joint Committee on Cancer (AJCC) 8th edition and beyond. *Ann Surg Oncol* 25(8): 2,105–10.
- Gershenwald J, Scolyer R, Hess K, et al. 2017. Melanoma staging: evidence-based changes in the American Joint Committee on Cancer eighth edition cancer staging manual. *CA: A Cancer Journal for Clinicians* 67(6): 472–92.
- Han D, Zager JS, Shyr Y, et al. 2013. Clinicopathologic predictors of sentinel lymph node metastasis in thin melanoma. *J Clin Oncol* 31(35): 4,387–93.
- Leiter U, Stadler R, Mauch C, et al. 2016. Complete lymph node dissection versus no dissection in patients with sentinel lymph node biopsy positive melanoma (DeCOG-SLT): a multicentre, randomised, phase 3 trial. *The Lancet Oncology* 17(6): 757–67.

- Leiter U, Stadler R, Mauch C, et al. 2019. Final analysis of DeCOG-SLT trial: no survival benefit for complete lymph node dissection in patients with melanoma with positive sentinel node. *J Clin Oncol* 37(32): 3000–8.
- Long GV, Hauschild A, Santinami M, et al. 2017. Adjuvant dabrafenib plus trametinib in stage III BRAF-mutated melanoma. *N Engl J Med* 377: 1,813–23.
- Madu MF, Wouters MWJM, van Akkooi ACJ. 2017. Sentinel node biopsy in melanoma: current controversies addressed. *European Journal of Surgical Oncology (EJSO)* 43(3): 517–33.
- Melanoma Institute of Australia. 2021. MIA Prediction Tool for Sentinel Node Metastasis Risk. URL: **http://www.melanomarisk.org.au/SNLLand** (accessed 1 April 2021).
- Morton D, Thompson J, Cochran A, et al. 2014. Final trial report of sentinel-node biopsy versus nodal observation in melanoma. *New England Journal of Medicine* 370(7): 599–609.
- National Collaborating Centre for Cancer. 2015. *Melanoma: Assessment and management*. *NICE guideline NG14*. Cardiff: National Collaborating Centre for Cancer. URL: https://www.nice.org.uk/guidance/ng14.
- NCCN. 2022. *Clinical Practice Guidelines in Oncology (NCCN Guidelines).* Pennsylvania: National Comprehensive Cancer Network (NCCN). URL: **www.nccn.org/professionals/physician_gls/default.aspx** (accessed 27 July 2022).
- Rivalland, G., Stephens, R., & McCrystal, M. (2022). Current role of sentinel lymph node biopsy in early-stage melanoma. *The New Zealand medical journal*, *135*(1557), 97–99.
- Seth R, Messersmith H, Kaur V, et al. 2020. Systemic therapy for melanoma: ASCO guideline. *J Clin Oncol* 38(33): 3,947–70. DOI: 10.1200/JCO.20.00198. Epub 2020 Mar 31. PMID: 32228358.
- Weber J, Mandala M, Del Vecchio M, et al. 2017. Adjuvant nivolumab versus ipilimumab in resected stage III or IV melanoma. *New England Journal of Medicine* 377(19): 1,824–35.
- Wen D & Martin RCW. 2021. Proposed quality performance indicators of sentinel lymph node biopsy for cutaneous melanoma. *ANZ J Surg*. Online ahead of print.
- Wong SL, Faries MB, Kennedy EB, et al. 2018. Sentinel lymph node biopsy and management of regional lymph nodes in melanoma: American Society of Clinical Oncology and Society of Surgical Oncology Clinical Practice Guideline Update. *Annals of Surgical Oncology* 25(2): 356–77.

Quality statement 5.4: Therapeutic/Completion lymphadenectomy

Description	An oncological therapeutic lymphadenectomy is offered to all patients with clinically evident nodal disease after appropriate staging and discussion at a melanoma MDM.
Rationale	Management of the nodal bed in patients with high-risk melanoma has moved from elective node clearance in all to therapeutic clearance in those with clinical or radiological detectable disease and sentinel node biopsy in those without. Therapeutic nodal dissection for clinically involved nodes is associated with 5-year survival of 30-50% which outweighs all other forms of treatment currently and thus is accepted and recommended. (Dummer et al 2012, 2016; National Collaborating Centre for Cancer 2015; NCCN 2022; Cancer Council Australia Melanoma Guidelines Working Party 2019, Smithers et al 2021) Sentinel node biopsy has been used to distinguish stage III patients at an earlier point in their disease process, providing excellent prognostic information and allowing the latest staging (**see AJCC: Melanoma of the skin staging 8th edition**) to stratify patients much more effectively as seen by the improved survival in those classified in the earlier stages. There is a continued move towards less nodal surgery, with a further shift from nodal clearance in all patients with a positive sentinel node to a surveillance approach after two large trials (MSLT II and DeCOG-SLT) showed no difference in overall survival. However, these two trials either excluded or had few patients with high-risk sentinel node disease i.e. disease volume >2mm, extranodal spread, more than 3 positive nodes or patients with micro satellitosis. Recent New Zealand retrospective studies (Williams et al 2022, 2023) have shown a higher mean volume of sentinel node disease (2.55mm) as well as an increased rate of positive non sentinel nodes on completion dissection (22.2% v 11.5%). Research will become available as to the safety of surveillance in these high-risk groups (Broman et al 2020). In the meantime, all patients with positive sentinel nodes should be discussed at an MDM and the patient made aware of the pros and cons of completion lymph node dissection versus surveillance. This is particularly important while New Zealand patients are not able to access funded adjuvant immunotherapy after a positive SNB. Radiological surveillance is a key part of the observation and needs to be available if this is the preferred pathway. The previously used terms of micro and macroscopic disease in lymph nodes have been variable in meaning. High volume melanoma centres contributing to the literature likely have much easier access to high quality USS in clinic or at the time of their lymphoscintigraphy, thus converting patients to 'macroscopic' nodal disease leading to a nodal clearance rather than sentinel node biopsy. The 8th edition of the AJCC melanoma staging replaces these terms with the more appropriate 'clinically occult' and 'clinically evident' i.e. found on clinical examination or imaging. What histological size of a deposit in a positive sentinel node relates to this is still unclear. We have suggested 5mm or greater nodal disease would potentially be radiologically detected pre-op and thus, until the evidence of safety of observation in this group becomes available, a discussion between lymph node clearance and observation with serial US should be had in this group.

Rationale (continued)	Broman et al 2021 have shown in a small number of matched high-risk patients who were observed versus had a complete lymph node dissection (n= 51) that although there were higher number of SLN-basin recurrences this was not significant, and most recurrences were outside the SLN basin. There were no significant differences in distant metastasis, distant metastasis free survival or death due to melanoma. In keeping with the move towards less nodal surgery, less iliac nodal dissection is being performed although there is a paucity of published prospective evidence comparing survival or morbidity of inguinal versus ilioinguinal node dissection. In the MSLT II trial, there was no difference in lymphoedema rates between the two procedures. Iliac nodes are positive in 30–39% after an ilioinguinal node dissection for macroscopic disease, decreasing to 9.3% after a positive sentinel node only. PET-CT before groin dissection may highlight positive iliac / obturator node disease but is not sensitive to small volume disease. Lymphoscintigraphy prior to the SNB may also give information on where the secondary tier nodes lie. (Verver et al 2018; Faries et al 2017; Cancer Council Australia Melanoma Guidelines Working Party 2019; Spillane et al 2011, 2013; Kretschmer et al 2001; Kissin 1987; Allan et al 2008; Glover et al 2014; Jonk et al 1988). Nodal harvest numbers for therapeutic node dissection have been investigated (Spillane 2011, Martin 2022). These numbers reflect both the extent of operative dissection and of pathological analysis. There is RCT evidence that radiation after a lymph node dissection for patients considered to be at intermediate to high risk of recurrence in the nodal region decreases the risk of recurrence but does not improve overall survival (Henderson et al 2015). Surveillance of patients with resected positive sentinel node disease may be better focussed on distant spread, with cross sectional imaging. These patients are also at risk of nodal disease which may potentially be found at a smaller size on US. US is more user dependent, time consuming, and in New Zealand, is a limited resource. High risk patients are more likely to receive adjuvant immunotherapy internationally but this is not yet publicly funded in NZ. Reports are showing that in this group distant recurrences are more common than locoregional recurrences, even in those without complete lymph node dissection. Locoregional recurrences being more often found clinically and distant disease with cross sectional imaging. (Owen et al 2020 and Rauwerdink 2020).
Good practice points	5.4.1 Unless high-risk features such as extranodal spread, multiple positive nodes or an immune-suppressed patient are present, patients with SNB disease of <5 mm are recommended for observation with node field US every 6 months for the first 3 years by an experienced sonographer 5.4.2 Therapeutic node dissection is offered to patients with clinically evident nodal metastases or patients with positive SN's who do not wish to or cannot be appropriately followed up with US where clinically indicated. 5.4.3 All patients who are being considered for a completion lymphadenectomy receive a whole-body PET-CT beforehand. 5.4.4 Lymphadenectomy is performed by trained and experienced surgeons. 5.4.5 Operation notes fully describe the anatomical boundaries of the lymphadenectomy and lymph node levels removed. 5.4.6 Therapeutic neck lymphadenectomies are tailored to individual patients' metastatic disease and the site of the primary melanoma and may include radical, modified radical or selective neck lymphadenectomy with or without a parotidectomy.

Good practice points (continued)	5.4.7 A therapeutic axillary lymphadenectomy includes levels I–III. 5.4.8 A therapeutic inguinal lymphadenectomy involves skeletonisation of the femoral vessels and removal of pudendal nodes, nodes anterior to the external oblique and Cloquet's nodes in the femoral canal.5.4.9 An ilioinguinal node dissection is performed for PET-CT positive or for biopsy proven melanoma metastases in inguinal and pelvic nodes in the absence of distant disease. Ilioinguinal node dissection to be performed if the second-tier node of a positive SNB (not deemed appropriate for observation) is in the iliac chain on lymphoscintigraphy. 5.4.10 A therapeutic iliac and obturator lymphadenectomy involves skeletonisation of the iliac vessels and obturator nerve from at least the common iliac artery bifurcation to the inguinal ligament. 5.4.11 For high-risk nodal disease adjuvant radiation treatment should be considered. **See Quality Statement 5.5.** 5.4.12 Patients must have access to a lymphoedema therapist to prescribe and fit compression garments and provide education about pre- and post-operative lymphoedema management. 5.4.13 Appropriate data collection systems are in place to collate, report and audit data on post-surgery complications.

References

- Allan CP, Hayes AJ, Thomas JM. 2008. Ilioinguinal lymph node dissection for palpable metastatic melanoma to the groin. *ANZ J Surg* 78(11): 982–6.
- Amin MB, Greene FL, Edge SB, et al. 2017. The eighth edition AJCC cancer staging manual: continuing to build a bridge from a population-based to a more 'personalized' approach to cancer staging. *CA: A Cancer Journal for Clinicians* 67(2): 93–9.
- Broman K, Hughes T, Dossett L, et al, 2021. Surveillance of Sentinel Node-Positive Melanoma Patients with Reasons for Exclusion from MSLT-II: Multi-Institutional Propensity Score Matched Analysis. *Journal of the American College of Surgeons* 232(4):424-431.
- Cancer Council Australia Melanoma Guidelines Working Party. 2019. *Clinical Practice Guidelines for the Diagnosis and Management of Melanoma*. Sydney: Melanoma Institute Australia. URL: **https://wiki.cancer.org.au/australia/Guidelines:Melanoma#top** (accessed 16 March 2020).
- Dummer R, Hauschild A, Guggenheim M, et al. 2012. Cutaneous melanoma: ESMO clinical practice guidelines for diagnosis, treatment and follow-up. *Annals of Oncology* 23(S7): vii86–vii91.
- Dummer R, Siano M, Hunger RE, et al. 2016. The updated Swiss guidelines 2016 for the treatment and follow up of cutaneous melanoma. *Swiss Med Wkly*. DOI: 10.4414/smw.2016.14279.
- Faries MB, Thompson JF, Cochran AJ, et al. 2017. Completion dissection or observation for sentinel-node metastasis in melanoma. *N Engl J Med* 376(23): 2,211–22.
- Glover AR, Allan CP, Wilkinson MJ, et al. 2014. Outcomes of routine ilioinguinal lymph node dissection for palpable inguinal melanoma nodal metastasis. *Br J Surg* 101(7): 811–19.
- Henderson MA, Burmeister BH, Ainslie J, et al. 2015. Adjuvant lymph-node field radiotherapy versus observation only in patients with melanoma at high risk of further lymph-node field relapse after lymphadenectomy (ANZMTG 01.02/TROG 02.01): 6-year follow-up of a phase 3, randomised controlled trial. *Lancet Oncol* 16(9): 1,049–60.

- Jonk A, Kroon BB, Rümke P, et al. 1988. Results of radical dissection of the groin in patients with stage II melanoma and histologically proved metastases of the iliac or obturator lymph nodes, or both. *Surg Gynecol Obstet* 167(1): 28–32.
- Kissin MW, Simpson DA, Easton D, et al. 1987. Prognostic factors related to survival and groin recurrence following therapeutic lymph node dissection for lower limb malignant melanoma. *Br J Surg* 74(11): 1,023–26.
- Kretschmer L, Neumann C, Preusser KP, et al. 2001. Superficial inguinal and radical ilioinguinal lymph node dissection in patients with palpable melanoma metastases to the groin – an analysis of survival and local recurrence. *Acta Oncol* 40(1): 72–78.
- Leiter U, Stadler R, Mauch C et al. 2019. Final Analysis of DeCOG-SLT Trial: No Survival Benefit for Complete Lymph Node Dissection in Patients with Melanoma With Positive Sentinel Node. *Journal of Clinical Oncology : official journal of the American Society of Clinical Oncology*, *37*(32): 3000–3008.
- Morton DL, Thompson JF, Cochran AJ, et al. 2014. Final trial report of sentinel-node biopsy versus nodal observation in melanoma. *New England Journal of Medicine* 370(7): 599–609.
- National Collaborating Centre for Cancer. 2015. *Melanoma: Assessment and management*. *NICE guideline NG14*. Cardiff: National Collaborating Centre for Cancer. URL: https://www.nice.org.uk/guidance/ng14.
- NCCN. 2022. *Clinical Practice Guidelines in Oncology (NCCN Guidelines).* Pennsylvania: National Comprehensive Cancer Network (NCCN). URL: **www.nccn.org/professionals/physician_gls/default.aspx** (accessed 27 July 2022).
- Owen CN, Shoushtari AN, Chauhan D et al. 2020. Management of early melanoma recurrence despite adjuvant anti-PD-1 antibody therapy. *Annals of Oncology* 31(8): 1075-1082.
- Rauwerdink, DJW, Molina G, Frederick DT et al. 2020. Adjuvant Therapy Failure Patterns in the Modern Era of Melanoma Management. *Ann Surg Oncol* 27: 5128–5136.
- Smithers BM, Saw RPM, Gyorki DE, et al. 2021. Contemporary management of locoregionally advanced melanoma in Australia and New Zealand and the role of adjuvant systemic therapy. *ANZ J Surg* 91 Suppl 2: 3-13.
- Spillane A, Allan C, Haydu L, et al. 2013. We need a trial to evaluate whether patients with involved inguinal lymph nodes should have inguinal or ilio-inguinal lymphadenectomy; an overview of the proposed trial Anzmtg 01.12 Eagle Fm Protocol. *Asia-Pacific Journal of Clinical Oncology* 9(Suppl. 3): 155.
- Spillane AJ, Haydu L, McMillan W, et al. 2011. Quality assurance parameters and predictors of outcome for ilioinguinal and inguinal dissection in a contemporary melanoma patient population. *Ann Surg Oncol* 18(9): 2,521–28.
- Verver D, Madu MF, Oude Ophuis CMC, et al. 2018. Optimal extent of completion lymphadenectomy for patients with melanoma and a positive sentinel node in the groin. *Br J Surg* 105(1): 96–105.
- Williams TS, Arahill-Whitham J, Bailey TA, et al. 2023. New Zealand patients have a higher melanoma burden in sentinel nodes and completion lymphadenectomy than patients in MSLT-II. *Journal of Plastic, Reconstructive and Aesthetic Surgery* 83: 98 – 105.
- Williams TS, Tallon B, Adams BM. 2021. Melanoma sentinel lymph node biopsy and completion lymph node dissection: A regional hospital experience. *Journal of Plastic, Reconstructive and Aesthetic Surgery* 75(2): 730 - 736.

Quality statement 5.5: Adjuvant and neoadjuvant therapy

Description	All patients with resected stage III/IV melanoma or stage II (B or C) melanoma are: • discussed at a melanoma MDM (if management decisions are not straightforward) • considered for adjuvant radiotherapy and/or adjuvant systemic treatment or enrolment in clinical trials • neoadjuvant therapy (i.e., systemic treatment prior to curative intent surgery) is a rapidly evolving area for locally advanced melanoma. Enrolment into clinical trials should be encouraged.
Rationale	Systemic therapies have been shown to improve disease-free survival in patients with resected stage III and IV melanoma (Eggermont et al 2015, 2018; Long et al 2017; Weber et al 2017; Seth et al 2020). This is not currently funded in New Zealand and participation in clinical trials should be encouraged (Te Aho o Te Kahu, 2022). There is randomised trial evidence that radiation after a lymph node dissection for patients considered at intermediate to high risk of recurrence in the nodal region can decrease the risk of recurrence by approximately 15% but does not improve overall survival (Henderson et al 2015). There are a number of clinical trials investigating the role of neo-adjuvant systemic treatment with immune checkpoint inhibitor or BRAF/MEK targeted treatments. These studies have shown a high correlation between pathological response to high relapse-free survival (Rozeman et al 2019, Blank et al 2022, Long et al 2019). The recent SWOG1801 trial is the first randomised phase II clinical trial to demonstrate an improved event-free survival with neoadjuvant pembrolizumab compared to adjuvant pembrolizumab in resectable stage IIIC and IVB melanoma (Patel et al 2022). The long-term survival outcomes from these neoadjuvant studies are awaited and the optimal neoadjuvant regimen is yet to be established._While this is a rapidly evolving area, currently there is insufficient data to use these treatments in resectable disease outside of clinical trial settings.

Good practice points	5.5.1 Adjuvant systemic therapy is discussed in the following situations: • selected stage II B/C patients • stage III patients (except IIIA if microscopic lymph node metastasis is <1 mm) (offered 12 months of adjuvant checkpoint inhibitor therapy) • stage III patients expressing BRAF V600-activating mutation (except IIIA if microscopic lymph node metastasis is <1 mm) (offered 12 months of adjuvant checkpoint inhibitor therapy or BRAF/MEK inhibitor therapy) • stage IV patients with resected disease (offered 12 months of adjuvant checkpoint inhibitor therapy). 5.5.2 Adjuvant post-operative radiation therapy is discussed in the following situations (Henderson et al 2015): • palpable (macroscopic) metastatic nodal involvement of one or more parotid nodes, two or more neck or axillary nodes or three or more groin nodes • extranodal spread (of tumour) • a maximum metastatic node diameter of ≥3 cm in the neck or ≥4 cm in the axilla or groin.

References

- Blank CU, Reijers ILM, Saw RPM et al. 2022. Survival data of PRADO: A phase 2 study of personalized response-driven surgery and adjuvant therapy after neoadjuvant ipilimumab (IPI) and nivolumab (NIVO) in resectable stage III melanoma. *Journal of Clinical Oncology* 40(16): 9501.
- Eggermont AMM, Blank CU, Mandala M, et al. 2018. Adjuvant pembrolizumab versus placebo in resected stage III melanoma. *N Engl J Med* 378: 1,789–801.
- Eggermont AM, Chiarion-Sileni V, Grob JJ, et al. 2015. Adjuvant ipilimumab versus placebo after complete resection of high-risk stage III melanoma (EORTC 18071): a randomised, double-blind, phase 3 trial. *Lancet Oncol* 16(5): 522–30.
- Henderson MA, Burmeister BH, Ainslie J, et al. 2015. Adjuvant lymph-node field radiotherapy versus observation only in patients with melanoma at high risk of further lymph-node field relapse after lymphadenectomy (ANZMTG 01.02/TROG 02.01): 6-year follow-up of a phase 3, randomised controlled trial. *The Lancet Oncology* 16(9): 1,049–60.
- Long GV, Hauschild A, Santinami M, et al. 2017. Adjuvant dabrafenib plus trametinib in stage III BRAF-mutated melanoma. *N Engl J Med* 377: 1,813–23.
- Long GV, Saw RPM, Lo S, et al. 2019. Neoadjuvant dabrafenib combined with trametinib for resectable, stage IIIB-C, $BRAF^{V600}$ mutation-positive melanoma (NeoCombi): a single-arm, open-label, single-centre, phase 2 trial. *The Lancet Oncology* 20(7): 961-971.
- Patel SP, Othus M, Chen Y, et al. 2023. Neoadjuvant–Adjuvant or Adjuvant-Only Pembrolizumab in Advanced Melanoma. *New England Journal of Medicine 388:813-823.*
- Rozeman EA, Menzies AM, van Akkooi ACJ et al. 2019. Identification of the optimal combination dosing schedule of neoadjuvant ipilimumab plus nivolumab in macroscopic stage III melanoma (OpACIN-neo): a multicentre, phase 2, randomised, controlled trial. *The Lancet Oncology* 20(7): 948-960.
- Seth R, Messersmith H, Kaur V, et al. 2020. Systemic therapy for melanoma: ASCO guideline. *J Clin Oncol* 38(33): 3,947–70. DOI: 10.1200/JCO.20.00198. Epub 2020 Mar 31. PMID: 32228358.

- Te Aho o Te Kahu. 2022. Mārama ana ki te Āputa: he tātari i te wāteatanga o ngā rongoā mate pukupuku i Aotearoa | Understanding the Gap: an analysis of the availability of cancer medicines in Aotearoa. Wellington: Te Aho o Te Kahu.
- Weber J, Mandala M, Del Vecchio M, et al. 2017. Adjuvant nivolumab versus ipilimumab in resected stage III or IV melanoma. *New England Journal of Medicine* 377(19): 1,824–35.

Quality statement 5.6: Patients with loco-regionally recurrent, locally advanced and stage IV melanoma

Description	Patients with loco-regionally recurrent, locally advanced or stage IV melanoma are seen or discussed by melanoma specialists experienced in the care of melanoma patients and part of a melanoma MDM. Patients should be staged as per Quality Statement 3.6.
Rationale	Systemic treatment with anti-PD1 based immune therapy or BRAF/MEK inhibitors has been shown to improve outcomes in resectable and unresectable stage III and IV disease (Seth et al 2020). Anti-PD1 based combination immunotherapy has increased average survival of advanced melanoma from 6-9 months to five-year survival of 50% (Larkin et al 2019, Tawbi et al 2022). Approximately 40-50% of patients treated with immunotherapy have durable responses measured in years. Approximately 40% of advanced melanoma are driven by an activating mutation in BRAF. Molecularly targeted therapy inhibitor BRAF/MEK can be used with improved median progression-free survival of 11-15 months (Robert et al 2019, Ascierto PA et al 2021, Drummer et al 2018). BRAF/MEK inhibitors are currently not funded in New Zealand and enrolment into clinical trial is encouraged (Te Aho o Te Kahu 2022). In select cases, surgery has been shown to be effective in palliating symptoms and, in patients with oligometastatic disease, it may improve overall survival (Bello 2019). Radiation treatment has been shown to be effective in controlling microscopic disease, palliating symptoms and decreasing recurrence of melanoma after surgery (Henderson et al 2015). Stereotactic radiation treatment of melanoma brain metastases gives high rates of local control (Nieder et al 2014).
Good practice points	**Surgery** 5.6.1 Where there are multiple dermal recurrences: surgical excision/ablation, and/or systemic checkpoint inhibitor or targeted therapies are considered as first line treatment. Where these have failed or are not appropriate, intralesional or topical treatments may be appropriate. 5.6.2 ILI should be considered in patients who have failed all other treatment options (currently provided by Te Whatu Ora Waitematā). 5.6.3 Isolated clinical recurrence in a previously resected node field is considered for resection when possible. If, on staging PET-CT, there is distant disease, checkpoint inhibitor immunotherapy or targeted therapy should be trialled first if clinically appropriate. 5.6.4 For patients with asymptomatic oligometastatic disease, for example, bowel, liver, lung or adrenal, surgical resection or radiation is considered along with adjuvant treatment options (radiotherapy or systemic treatment). 5.6.5 For patients with limited brain metastasis and no or minimal extracranial disease, resection of the brain metastasis is considered.

Good practice points (continued)	5.6.6 For patients with single-level spinal cord compression and minimal or no other metastatic disease, urgent surgical or radiation treatment is considered. **Radiation oncology** 5.6.7 Stereotactic radiation treatment is considered for patients with a single or a small number of brain metastases and minimal or controlled extracranial disease (Nieder et al 2014). 5.6.8 Radiation to the tumour bed cavity after resection of a brain metastasis could be considered (Mahajan et al 2017). Whole brain radiation treatment has not been shown to improve survival outcomes following local treatment of brain metastases from melanoma (Mahajan et al 2017). 5.6.9 For patients with multiple brain metastases, whole brain radiation therapy may provide some palliative benefits. 5.6.10 Patients with localised symptoms from melanoma metastases at any site are considered for referral for radiation treatment to these sites. **Medical oncology** 5.6.11 Where treatment is being considered, patients with advanced melanoma (unresectable stage III or IV disease) should have their tumour assessed for the presence of the BRAF V600 mutation. 5.6.12 BRAF/MEK inhibitor therapy is available for BRAF-mutation-positive patients. 5.6.13 Checkpoint inhibitor immunotherapy should be available for all patients with unresectable stage III or IV disease. 5.6.14 Palliative systemic therapy is considered for patients who are not candidates for, or who have progressed following treatment with immunotherapy, BRAF-inhibitor therapy or appropriate clinical trial systemic therapy.

References

- Ascierto PA, Dréno B, Larkin J et al. 2021. 5-Year Outcomes with Cobimetinib plus Vemurafenib in *BRAF*V600 Mutation–Positive Advanced Melanoma: Extended Follow-up of the coBRIM Study. *Clin Cancer Res*. 27 (19): 5225–5235.
- Bello DM. 2019. Indications for the surgical resection of stage IV disease. *J Surg Oncol* 119(2): 249–61.
- Drummer R, Ascierto PA, Gogas HJ et al. 2018. Encorafenib plus binimetinib versus vemurafenib or encorafenib in patients with BRAF-mutant melanoma (COLUMBUS); a multicentre, open-label, randomised phase 3 trial. *The Lancet Oncology.* 19(5): 603 – 615.
- Henderson MA, Burmeister BH, Ainslie J, et al. 2015. Adjuvant lymph-node field radiotherapy versus observation only in patients with melanoma at high risk of further lymph-node field relapse after lymphadenectomy (ANZMTG 01.02/TROG 02.01): 6-year follow-up of a phase 3, randomised controlled trial. *Lancet Oncol* 16(9): 1,049–60.
- Larkin J, Chiarion-Sileni V, Gonzalez R et al. 2019. Five-year survival with combined nivolumab and ipilimumab in advanced melanoma. *N Engl J Med* 381: 1535 – 1546.
- Mahajan A, Ahmed S, McAleer MF, et al. 2017. Post-operative stereotactic radiosurgery versus observation for completely resected brain metastases: a single-centre, randomised, controlled, phase 3 trial. *Lancet Oncol* 18(8): 1,040–48.

- Nieder C, Grosu AL, Gaspar LE. 2014. Stereotactic radiosurgery (SRS) for brain metastases: a systematic review. *Radiation Oncology* 9(1): 1–9.
- Robert C, Grob JJ, Stroyakovskiy D et al. 2019. Five-year outcomes with dabrafenib plus trametinib in metastatic melanoma. *N Engl J Med*. 381: 626 – 636.
- Seth R, Messersmith H, Kaur V, et al. 2020. Systemic therapy for melanoma: ASCO guideline. *J Clin Oncol* 38(33): 3,947–70. DOI: 10.1200/JCO.20.00198. Epub 2020 Mar 31. PMID: 32228358.
- Tawbi HA, Schadendorf D, Lipson EJ et al. 2022. Relatlimab and Nivolumab versus Nivolumab in untreated advanced melanoma. *N Engl J Med.* 386: 24 – 34.
- Te Aho o Te Kahu. 2022. Mārama ana ki te Āputa: he tātari i te wāteatanga o ngā rongoā mate pukupuku i Aotearoa | Understanding the Gap: an analysis of the availability of cancer medicines in Aotearoa. Wellington: Te Aho o Te Kahu.

Quality statements 6: Follow-up and surveillance

Quality statement 6.1: Clinical follow-up and surveillance

Description	Follow-up is carried out by a health care professional experienced in melanoma diagnosis and management. The health care professional may be a specialist, GP, nurse practitioner or a combination working in conjunction with the patient and their family/whānau.
Rationale	The purpose of follow-up is to: • detect recurrence early • detect new primary melanoma • provide ongoing patient education regarding self-examination and safe sun exposure • provide psychosocial support • detect lymphoedema. Until recently, there have been no completed RCTs comparing various follow-up schedules, therefore follow-up recommendations have been based on expert opinion. It is generally accepted that those with more advanced disease should have more frequent follow-up, however, there is no international consensus, and schedules vary dramatically between countries (Cancer Council Australia Melanoma Guidelines Working Party 2019; Francken et al 2005, 2008; Nieweg and Kroon 2006; Dicker et al 1999; Speijers et al 2010; Francken and Hoekstra 2009; Marsden et al 2010; Swetter et al 2019; Turner et al 2011). Less frequent follow-up visits are recommended than in earlier guidelines. The MELanoma FOllow-up (MELFO) study is a recently published randomised trial and has provided some support for this, showing the less frequent follow-up group reported significantly less cancer-related stress with the recurrence rate being the same in both groups (Damude et al 2016). Less frequent follow-up visits are now recommended in the Cancer Council Australia Melanoma Guidelines Working Party 2019 based on recurrence patterns and hazard rates. This provides a rational basis for timing and duration of follow-up (Leiter et al 2012; Salama et al 2013). Overall studies in stages I–III disease show 80% of recurrences occur within the first 3 years. The risk for recurrence for all stages after 10 years decreases to approximately 1% (Cancer Council Australia Melanoma Guidelines Working Party 2019). However, for stage I melanoma, almost 25% of melanoma-related deaths occur after 10 years. Those with melanoma 0.9–1.0mm thick being at significantly greater risk than those with melanoma 0.8 mm or thinner (Lo et al 2018). Patients with a history of melanoma (including melanoma in situ) have an increased risk of developing subsequent primary melanoma (Kang et al 1992, Johnson et al 1998, Goggins et al 2003, Schoellhammer et al 2009, Youlden et al 2014, Pomerantz et al 2015, Cust et al 2020).

Rationale (continued)	The risk varies significantly between patients (Müller et al 2019, Pastor-Tomás al 2020) and the risk factors may be different to first primary melanoma risk factors (Müller et al 2019, Cust et al 2020). There is little benefit in long term extension of follow-up beyond 10 years (Cancer Council Australia Melanoma Guidelines Working Party 2019) except for patients with additional risk factors (see 6.1.6) and these patients should be provided access to long-term dermatologic exams and encouraged to perform 3-monthly regular self-examination. Selection of patients for long term surveillance will be aided as risk assessment tools are developed and certified (Vuong et al 2014, Cust et al 2020).
Good practice points	6.1.1 Clinical surveillance consists of a review of systems for signs or symptoms of disease recurrence, physical examination of the excision scar and surrounding skin, regional and distant lymph node examination, and head-to-toe dermatoscopic skin examination. 6.1.2 Follow-up visits should involve a thorough history focusing on symptoms that can indicate recurrent disease. For example: new skin lesions, palpable tumours in lymph node fields and unexplained systemic complaints such as fatigue, shortness of breath, headache or gastrointestinal symptoms. 6.1.3 Follow-up visits should include examination of the primary melanoma site and a physical examination for lymphadenopathy. Particular attention should be given to the in-transit pathway, that is, the skin between the site of the melanoma and the draining lymph node field(s). 6.1.4 Establish a monitoring process for patients at risk of lymphoedema development: • Closely monitor any symptoms, especially during first year after surgery (Hyngstrom et al., 2013). • It is recommended to use Bio-Impedance method to identify the condition at a subclinical stage (Hidding et al., 2016; Ridner et al., 2019). • Raise awareness among patients and educate regarding any symptoms during follow up. • Ensure access to early interventions if symptoms are detected and/ or there is 5% to 10% increase in limb volume (Rockson et al., 2019) 6.1.5 Recommended follow-up protocols assessing for disease recurrence/metastatic spread are as follows: • stage IA melanoma should be assessed annually for 10 years. • stage IB, IIA melanoma should be assessed 6 monthly for 2 years and then annually until the 10th anniversary. • stage IB and above melanoma with no SNB should receive 6 monthly US of draining node fields for 2 years. • stage IIB-IIC, IIIA-D melanoma should be assessed 4 monthly for 2 years, 6 monthly in the third year and annually thereafter until the 10th anniversary. • stage IV melanoma should be assessed as for stage III, with additional visits as per clinical requirements. 6.1.6 Follow-up frequency and duration may vary depending on the patient's needs and risk assessment. It may be appropriate to follow-up stage I melanoma beyond 10 years because of the late mortality in this group (Lo et al 2018) and higher risk patients, including those over 65 years of age, high risk sites (acral, scalp and neck) and nodular subtype (Green et al 2012).

Good practice points (continued)	6.1.7	Any person diagnosed with melanoma in situ should be offered biennial complete dermatoscopic skin check for at least 10 years for early identification and treatment of new suspicious skin lesions. Lifelong annual surveillance is recommended for patients with multiple melanomas, atypical mole syndrome, multiple naevi (especially >100 naevi) and/or atypical naevi (Gandini et al 2005), for whom digital dermatoscopic surveillance is also recommended. Lifelong biennial skin checks are also recommended for patients over 65 years, Fitzpatrick skin type I or II, significant actinic keratosis, or a history of epithelial cancers such as BCC's or SCC's (Müller et al 2019). Risk for subsequent melanomas can be calculated through the Melanoma Institute of Australia subsequent primary melanoma risk calculator (Melanoma Institute Australia 2021).
	6.1.8	A written follow-up plan should be made with the patient and given to the patient and their GP. A lead clinician should be nominated and made known to the patient and GP. Ideally, this would change from a hospital-based clinician to a primary health care clinician once hospital-level care has been completed (Nashan et al 2004, Murchie et al 2010, Francken et al 2010).
	6.1.9	The lead clinician should be responsible for maintaining and actioning the patient's melanoma follow-up, investigation requests and results. Recalling and corresponding with the patient may be delegated to other health care providers.
	6.1.10	Follow-up should provide patients with clinically appropriate reassurance and psychosocial support. Many patients experience anxiety before and during their follow-up visits. Some patients may require additional follow-up visits for reassurance (Rychetnik et al 2013).

References

- Australian Cancer Network and The New Zealand Guidelines Group Melanoma Guidelines Revision Working Party. 2008. *Clinical Practice Guidelines for the Management of Melanoma in Australia and New Zealand*. Sydney: The Cancer Council Australia and Australian Cancer Network and Wellington: New Zealand Guidelines Group. URL: **www.health.govt.nz/publication/clinical-practice-guidelines-management-melanoma-australia-and-new-zealand** (accessed 2 September 2020).
- Barbour, A, A/Professor Alexander Guminski, Dr. Wendy Liu, Menzies, S, A/Professor Rachael Morton, Cancer Council Australia Melanoma Guidelines Working Party. *Clinical question: What is the ideal setting, duration and frequency of follow-up for melanoma patients? . In: Clinical practice guidelines for the diagnosis and management of melanoma.* Sydney: Melanoma Institute Australia. URL: **https://wiki.cancer.org.au/australiawiki/index.php?oldid=196934** (accessed 26 October 2021).
- Cust AE, Badcock C, Smith J, et al. 2020. A risk prediction model for the development of subsequent primary melanoma in a population-based cohort. *Br J Dermatol* 182(5): 1,148–57.
- Damude S, Hoekstra-Weebers JE, Francken AB, et al. 2016. The MELFO-Study: prospective, randomized, clinical trial for the evaluation of a stage-adjusted reduced follow-up schedule in cutaneous melanoma patients-results after 1 year. *Ann Surg Oncol* 23(9): 2,762–71.
- Dicker TJ, Kavanagh GM, Herd RM, et al. 1999. A rational approach to melanoma follow-up in patients with primary cutaneous melanoma. Scottish Melanoma Group. *Br J Dermatol* 140(2): 249–54.

- Francken AB, Accortt NA, Shaw HM, et al. 2008. Follow-up schedules after treatment for malignant melanoma. *Br J Surg* 95(11): 1,401–7.
- Francken AB, Bastiaannet E, Hoekstra HJ. 2005. Follow-up in patients with localised primary cutaneous melanoma. *Lancet Oncol* 6(8): 608–21.
- Francken AB, Hoekstra HJ. 2009. Follow-up of melanoma patients: the need for evidence-based protocols. *Annals of Surgical Oncology* 16(4): 804–5.
- Francken AB, Hoekstra-Weebers JW, Hoekstra HJ. 2010. Is GP-led follow-up feasible? *British Journal of Cancer* 102(10): 1,445–6.
- Gandini S, Sera F, Cattaruzza MS, et al. 2005. Meta-analysis of risk factors for cutaneous melanoma: I. Common and atypical naevi. *European Journal of Cancer* 41(1): 28–44.
- Green AC, Baade P, Coory M, et al. 2012. Population-based 20-year survival among people diagnosed with thin melanomas in Queensland, Australia. *J Clin Oncol* 30(13): 1,462–7.
- Goggins WB, Tsao H. 2003. A population-based analysis of risk factors for a second primary cutaneous melanoma among melanoma survivors. *Cancer* 97(3): 639–43.
- Hidding J.T, Viehoff P.B, et.al. 2016. Measurement Properties of Instruments for Measuring of Lymphedema: Systematic Review, *Physical Therapy*, 96(12): 1965–1981.
- Hyngstrom, J. R., Chiang, et al. 2013. Prospective assessment of lymphedema incidence and lymphedema-associated symptoms following lymph node surgery for melanoma. *Melanoma research,* 23(4), 290–297.
- Johnson TM, Hamilton T, Lowe L. 1998. Multiple primary melanomas. *J Am Acad Dermatol* 39(3): 422–7.
- Kang S, Barnhill RL, Mihm MC Jr, et al. 1992. Multiple primary cutaneous melanomas. *Cancer* 70(7): 1,911–6.
- Leiter U, Buettner PG, Eigentler TK, et al. 2012. Hazard rates for recurrent and secondary cutaneous melanoma: an analysis of 33,384 patients in the German Central Malignant Melanoma Registry. *J Am Acad Dermatol* 66(1): 37–45.
- Lo SN, Scolyer RA, Thompson JF. 2018. Long-term survival of patients with thin (T1) cutaneous melanomas: a Breslow thickness cut point of 0.8 mm separates higher-risk and lower-risk tumors. *Ann Surg Oncol* 25(4): 894–902.
- Marsden JR, Newton-Bishop JA, Burrows L, et al. 2010. Revised UK guidelines for the management of cutaneous melanoma 2010. *J Plast Reconstr Aesthet Surg* 63(9): 1,401–19.
- Melanoma Institute of Australia. 2021. MIA Prediction Tool for Sentinel Node Metastasis Risk. URL: **www.melanomarisk.org.au/SubMelForm** (accessed 2 April 2021).
- Müller C, Wendt J, Rauscher S, et al. 2019. Risk factors of subsequent primary melanomas in Austria. *JAMA Dermatol* 155(2): 188–95.
- Murchie P, Nicolson MC, Hannaford PC, et al. 2010. Patient satisfaction with GP-led melanoma follow-up: a randomised controlled trial. *British Journal of cancer* 102(10): 1,447–55.
- Nashan D, Kirschner F, Strittmatter G, et al. 2004. Patients' view of melanoma follow-up. *J Dtsch Dermatol Ges* 2(2): 105–10.
- Nieweg OE, Kroon BB. 2006. The conundrum of follow-up: should it be abandoned? *Surg Oncol Clin N Am* 15(2): 319–30.

- Pastor-Tomás N, Martínez-Franco A, Bañuls J, et al. 2020. Risk factors for the development of a second melanoma in patients with cutaneous melanoma. *J Eur Acad Dermatol Venereol* 34(10): 2,295–2,302.
- Pomerantz H, Huang D, Weinstock MA. 2015. Risk of subsequent melanoma after melanoma in situ and invasive melanoma: a population-based study from 1973 to 2011. *J Am Acad Dermatol* 72(5): 794–800.
- Ridner, S. H., Dietrich, M. S, et al. 2019. A Randomized Trial Evaluating Bioimpedance Spectroscopy Versus Tape Measurement for the Prevention of Lymphedema Following Treatment for Breast Cancer: Interim Analysis. *Annals of surgical oncology*, *26*(10), 3250–3259.
- Rockson, S. G, Keeley, V, et al. 2019. Cancer-associated secondary lymphoedema. *Nature reviews. Disease primers*, *5*(1), 22.
- Rychetnik L, McCaffery K, Morton R, et al. 2013. Psychosocial aspects of post-treatment follow-up for stage I/II melanoma: a systematic review of the literature. *Psychooncology* 22(4): 721–36.
- Salama AK, de Rosa N, Scheri RP, et al. 2013. Hazard-rate analysis and patterns of recurrence in early stage melanoma: moving towards a rationally designed surveillance strategy. *PLoS One* 8(3): e57665.
- Schoellhammer HF, Torisu-Itakura H, Huynh Y, et al. 2009. Second primary melanoma: Risk factors, histopathologic features, and survival. *J Clin Oncol* 27:15s (suppl; abstr 9073).
- Speijers MJ, Francken AB, Hoekstra-Weebers JEHM, et al. 2010. Optimal follow-up for melanoma. *Expert Review of Dermatology* 5(4): 461–78.
- Swetter SM, Tsao H, Bichakjian CK, et al. 2019. Guidelines of care for the management of primary cutaneous melanoma. *Journal of the American Academy of Dermatology* 80(1): 208–50.
- Turner RM, Bell KJ, Morton RL, et al. 2011. Optimizing the frequency of follow-up visits for patients treated for localized primary cutaneous melanoma. *J Clin Oncol* 29(35): 4,641–46.
- Vuong K, McGeechan K, Armstrong BK, et al. 2014. Risk prediction models for incident primary cutaneous melanoma: a systematic review. *JAMA Dermatol* 150(4): 434–44.
- Youlden DR, Youl PH, Soyer HP, et al. 2014. Distribution of subsequent primary invasive melanomas following a first primary invasive or in situ melanoma Queensland, Australia. *JAMA Dermatol* 150(5): 526–34.

Quality statement 6.2: Patient self-examination

Description	Patient self-examination is taught and is an integral part of melanoma follow-up.
Rationale	Patient education in self-skin examination is an integral component of the follow-up schedule and facilitates earlier detection of disease recurrence. The Yale Melanoma Unit, the MELFO Study and the *2008 Australia New Zealand Guidelines* deem self-skin examination as an important tool in detecting recurrence. In Australia, 75% of patients detect their own recurrence; the worldwide mean is 62% (Ruark et al 1993; Francken et al 2005, 2007; Jillella et al 1995). Interestingly, when self-skin examination was not included in the modelling analysis of the Melanoma Institute of Australia data, the numbers of patients in whom there was a delay in recurrence diagnosis rose from 1 to 4.5% (Turner et al 2011). Patient education in self-skin-examination should therefore be an integral component of the follow-up schedule.
Good practice points	6.2.1 Patients should be provided with written information and shown how to self-examine their skin and regional lymph nodes. Recommend following the ABCDEFG rule, or alternatively the SCAN rule. 6.2.2 Patients using smart phone teledermatoscopy as part of their self-examination should be encouraged to use validated applications. 6.2.3 Patient adoption of smartphone applications to communicate suspicious lesions to the lead carer is encouraged. Studies have confirmed that patients are accepting of and capable of taking high-quality dermatoscopic images at home to facilitate teledermatology (Janda et al 2019; Manahan et al 2015; Wu et al 2015; Horsham et al 2016).

References

- Francken AB, Bastiaannet E, Hoekstra HJ. 2005. Follow-up in patients with localised primary cutaneous melanoma. *Lancet Oncol* 6(8): 608–21.
- Francken AB, Shaw HM, Accortt NA, et al. 2007. Detection of first relapse in cutaneous melanoma patients: implications for the formulation of evidence-based follow-up guidelines. *Ann Surg Oncol* 14(6): 1,924–33.
- Horsham C, Loescher LJ, Whiteman DC, et al. 2016. Consumer acceptance of patient-performed mobile teledermoscopy for the early detection of melanoma. *Br J Dermatol* 175(6): 1,301–10.
- Janda M, Horsham C, Koh U, et al. 2019. Redesigning skin cancer early detection and care using a new mobile health application: protocol of the SKIN Research Project, a Randomised Controlled Trial. *Dermatology* 235(1): 11–8.
- Jillella A, Mani S, Nair B, et al. 1995. The role for close follow-up of melanoma patients with AJCC stages I-III: a preliminary analysis. *Proc Am Soc Clin Oncol*: 13.
- Manahan MN, Soyer HP, Loescher LJ, et al. 2015. A pilot trial of mobile, patient-performed teledermoscopy. *Br J Dermatol* 172(4): 1,072–80.
- Ruark DS, Shaw HM, Ingvar C, et al. 1993. Who detects the first recurrence in stage I cutaneous malignant melanoma: patient or doctor? *Melanoma Research* 3(1): 44.
- Turner RM, Bell KJ, Morton RL, et al. 2011. Optimizing the frequency of follow-up visits for patients treated for localized primary cutaneous melanoma. *J Clin Oncol* 29(35): 4,641–46.
- Wu X, Oliveria SA, Yagerman S, et al. 2015. Feasibility and efficacy of patient-initiated mobile teledermoscopy for short-term monitoring of clinically atypical nevi. *JAMA Dermatol* 151(5): 489–96.

Quality statement 6.3: Follow-up cross-sectional imaging

Description	Follow-up cross-sectional imaging (CT or PET-CT) is determined by stage, symptoms/clinical findings and suitability for therapy. Oligometastasis may be resectable or treated with radiotherapy. Asymptomatic metastases may be appropriate for immunotherapy with a curative intent. In New Zealand access to this is dependent on radiologically evaluable unresectable or metastatic disease. If patient factors/co-morbidities deem patients unfit for any further treatment, do not perform routine surveillance.
Rationale	These recommendations are made accepting that individual centre's resources and protocols may differ but should be considered as best practice. Refer **Appendix 3** for example follow up schedule **Body imaging** The optimal cross-sectional imaging (PET-CT or CT) surveillance regime for high-risk melanoma remains controversial, and there is currently no international consensus. Even in high-risk melanoma patients, there are no high-quality data to indicate improved survival outcomes following routine follow-up cross-sectional imaging. It is generally agreed that PET-CT has superior diagnostic accuracy over conventional CT (Xing et al 2011). In those clinical settings where CT findings are equivocal or there are clinical findings highly suspicious for recurrence, PET-CT results may alter the treatment course, particularly when surgery is being considered (Schüle et al 2016). There are, however, no prospective data that directly compare the two modalities with regard to the magnitude of differences in survival outcomes. For patients with thick melanomas (that is, T4 tumours), baseline staging with PET-CT is controversial, due to low yield and high false-positive rate (as discussed in **Quality Statement 3.6**). There are, however, significant relapse rates, particularly in patients with stage IIC disease. In a retrospective study of pathologic stage II patients by Lee et al (2017), 46% of stage IIC patients relapsed, and of those, 52% of first relapses were systemic. Imaging detected relapse in 31% of these patients. Stage IIC patients notably relapsed earlier with a higher proportion of systemic metastases (especially in lung and brain) when compared to other stage II subgroups. Bleischer et al 2020 retrospective cohort study of Stage II melanoma patients reported that 27% of patients recurred and 27% of those recurrences were detected by surveillance imaging. Of those who recurred with Stage IIC melanoma, imaging detected recurrence in 44%. The National Institute for Health and Care (NICE) guidelines (July 2022) suggest considering baseline staging and surveillance CT imaging for stage IIB disease and offering staging and surveillance imaging for Stage IIC disease.

Rationale (continued)	From the limited data available, baseline staging cross-sectional imaging in patients with a positive SLN (stage IIIA with low nodal tumour volume) appears to be of little benefit, with low yield and high rates of false-positive tests (Holtkamp et al 2017; Lewin et al 2018; Scheier et al 2015). This can lead to further unnecessary investigations, some of which may be invasive/morbid. However, the rate of recurrence in this group is not insignificant. Although a high percentage of first relapses are loco-regional and often detected by the patient or clinician, a less intensive PET-CT surveillance regime in this group has been shown to detect asymptomatic recurrence/progression with 70% sensitivity and 87% specificity (Lewin et al 2018). The approach to cross-sectional imaging surveillance of patients with higher stage III and stage IV disease varies widely. For example, the National Comprehensive Cancer Network (NCCN) in the United States suggests follow-up PET-CT or CT every 3–12 months for 2 years, then 6-12 months for another 3yrs to screen for recurrence or metastatic disease (NCCN 2023). Regarding salvage curative surgery, radiotherapy or emerging systemic therapies, there is some evidence that treatments are more effective in the setting of low tumour volume, making early detection of recurrence and/or distant metastatic disease relevant (Ibrahim et al 2020, Freeman et al 2019; Joseph et al 2018, Leon-Ferre et al 2017).In conjunction with intensive clinical follow-up, the addition of routine cross-sectional imaging does allow earlier detection of recurrent disease (Park et al 2017), but the impact on overall survival is still unclear (Podlipnik et al 2016). Cross-sectional imaging follow-up should be guided by the probability of recurrence at any stage. For patients with asymptomatic stage IIIB, C, D or stage IV disease, more frequent cross-sectional imaging, for example, 3–6 monthly in the first 3 years, should be considered, when the rates of recurrence are highest. Particularly in stage III disease, a sub-stage approach to follow-up regimes may be beneficial (Melanoma Focus 2023, Lewin et al 2018). Recently, it has been reported that CT and PET-CT have reasonable sensitivity and specificity for detection of recurrence over long follow-up periods (Turner et al. 2021). Surveillance CT has also been shown to be cost-effective (Podlipnik et al 2019) With emerging systemic therapies, routine follow-up cross-sectional imaging also provides assessment of therapeutic response. In particular, the apparently high negative predictive value of PET-CT seems to be reasonably consistent and notably reassuring (Leon-Ferre et al 2017). In stage IIC, stage IIIB, C, D and stage IV disease, more frequent surveillance imaging (for example, 3, 4 or 6 monthly in the first 3 years) is recommended with the aim of detecting relapse at an earlier time point (Lim et al 2018). This acknowledges that although the actual benefit of earlier imaging detection on survival outcomes is not yet known, there are now more treatment options available. For younger patients, it is important to consider minimising ionizing radiation dose. This can be achieved by limiting the scan range, using lower dose CT techniques or MRI instead where possible. For example, low dose chest CT with MRI abdomen/pelvis +/- brain MRI. Dose reduction techniques can be employed in PET CT scanning by reducing the radiopharmaceutical dose and using non diagnostic quality low dose CT (Kaste 2011). For pregnant patients, risks to the foetus from CT and MRI vary at different stages of the pregnancy. In lower risk pregnant patients, surveillance may be delayed to the postpartum period. For both these groups, the imaging strategy should be considered specifically for each patient and may need consultation with a radiologist (Melanoma Focus 2023).

Brain imaging

It is widely accepted that MRI is superior to CT for the detection of cerebral metastases.

The AJCC recognises that patients with central nervous system metastases have the worst prognosis of all melanoma patients with distant metastatic disease (M1d category) (Amin et al 2017).

The incidence of developing brain metastases increases with TNM stage. For stage III patients, macroscopic nodal and in-transit disease has been associated with an increased risk of brain metastases (Samlowski et al 2017). There has also been an association between primary tumour ulceration and development of brain metastasis (Zakrzewski et al 2011).

As with relapse at other sites, development of brain metastases generally occurs in the first 3 years (Samlowski et al 2017; Fife et al 2004).

Previously, the poor prognosis of those with brain metastases may have precluded routine surveillance for those at risk. However, with the recent advances in surgery, stereotactic radiotherapy and systemic therapy, there are improved treatment outcomes (particularly in the setting of smaller tumour volume and asymptomatic lesions).

This would suggest that earlier detection increases the treatment options available to patients, although there is little evidence to directly support this.

Given the prognostic implications and treatment options available in low-volume metastatic brain disease, regular surveillance brain imaging is recommended for patients with stage IIC, stage IIIB, C, D and stage IV disease in the first 3 years with less frequent surveillance following this. Contrast-enhanced brain MRI is preferred over contrast-enhanced CT due to improved diagnostic accuracy (particularly if there is previous documented metastatic brain disease).

Good practice points	6.3.1 **Stage I and II (A and B)** For patients with stage I or II (A and B) disease, routine surveillance imaging is not recommended if the patient is asymptomatic. 6.3.2 **Stage IIC, III and IV** In asymptomatic patients, routine follow-up with contrast-enhanced CT of the chest, abdomen and pelvis (± neck) can be considered at 3- to 12-monthly intervals in the first 3–5 years as stratified by clinical stage and time from diagnosis. Surveillance high-resolution brain imaging (brain MRI or contrast-enhanced CT head) should be considered in high-risk patients at 3- to 12-monthly intervals in the first 3–5 years as stratified by clinical stage and time from diagnosis. The following is recommended as a guide to follow-up imaging - refer **Appendix 3** for a tabulated example follow up schedule • stage IIC: CT chest, abdomen and pelvis ± neck and brain MRI or CT head 6 monthly for 3 years. Consider annual surveillance imaging in years 3–5 following diagnosis. • stage IIIA: CT chest, abdomen and pelvis (± neck) at 6 months and then at 12 months. Annually after that until the third anniversary. • stage IIIB, C, D and stage IV: CT chest, abdomen and pelvis ± neck and brain MRI or CT head 3–6 monthly for 3 years. Annual follow-up imaging in years 3–5 following diagnosis. 6.3.3 If a patient develops suspicious clinical or equivocal radiological findings, biopsy-proven local recurrence or distant metastatic disease, PET-CT is recommended if the patient is a candidate for further surgical management, radiotherapy or systemic therapy. When CT has shown widespread metastatic disease and PET-CT will not change the planned management, the latter can be omitted. 6.3.4 For patients with stage III and stage IV disease on active treatment (systemic therapy or radiotherapy), the follow-up imaging schedule will be determined by the oncology team, likely based on symptomatology and/or for response assessment. The above schedule, however, may be a useful guide to the desirable minimum frequency of imaging. 6.3.5 In younger or pregnant patients, attempts should be made to minimise exposure to ionizing radiation which may include low dose CT techniques and/or MRI instead. An appropriate imaging strategy should be individualised for these patients, and may require consultation with a radiologist.

References

- Amin MB, Edge S, Greene F, et al (eds). 2017. *AJCC Cancer Staging Manual (8th edition)*. Switzerland: Springer.
- Bleicher J, Swords DS, Mali ME, et al. 2020. Recurrence patterns in patients with Stage II melanoma: The evolving role of routine imaging for surveillance. J Surg Oncol.122(8):1770-1777.

- Fife KM, Colman MH, Stevens GN, et al. 2004. Determinants of outcome in melanoma patients with cerebral metastases. *Journal of Clinical Oncology* 22(7): 1,293–300.
- Francis V, Sehji T, Barnett M, et al. 2021. Radiological imaging of melanoma: a review to guide clinical practice in New Zealand. *N Z Med J* 134(1528): 79 – 87.
- Freeman M, Laks S. 2019. Surveillance imaging for metastasis in high-risk melanoma: importance in individualized patient care and survivorship. *Melanoma Management* 6(1): MMT13.
- Holtkamp LH, Read RL, Emmett L, et al. 2017. Futility of imaging to stage melanoma patients with a positive sentinel lymph node. *Melanoma Research* 27(5): 457–62.
- Ibrahim AM, Le May M, Bossé D, et al. 2020. Imaging Intensity and Survival Outcomes in High-Risk Resected Melanoma Treated by Systemic Therapy at Recurrence. Ann Surg Oncol. 27(10):3683-3691.
- Joseph RW, Elassaiss-Schaap J, Kefford R, et al. 2018. Baseline Tumor Size Is an Independent Prognostic Factor for Overall Survival in Patients with Melanoma Treated with Pembrolizumab [published correction appears in Clin Cancer Res. 2018 Dec 1;24(23):6098]. *Clin Cancer Res*.;24(20):4960-4967.
- Kaste SC. 2011. PET-CT in children: where is it appropriate? Pediatr Radiol. 2011 Sep;41 Suppl 2(0 2):509-13.
- Lee AY, Droppelmann N, Panageas KS, et al. 2017. Patterns and timing of initial relapse in pathologic stage II melanoma patients. *Annals of Surgical Oncology* 24(4): 939–46.
- Leon-Ferre RA, Kottschade LA, Block MS, et al. 2017. Association between the use of surveillance PET/CT and the detection of potentially salvageable occult recurrences among patients with resected high-risk melanoma. *Melanoma Research* 27(4): 335–41.
- Lewin J, Sayers L, Kee D, et al. 2018. Surveillance imaging with FDG-PET/CT in the post-operative follow-up of stage 3 melanoma. *Annals of Oncology* 29(7): 1,569–74.
- Lim KHJ, Spain L, Barker C, et al. 2018. Contemporary outcomes from the use of regular imaging to detect relapse in high-risk cutaneous melanoma. ESMO Open 2018;**3**:e000317.
- Melanoma Focus. 2023. Melanoma Focus 2022 Consensus Statement on Imaging FU for cutaneous melanoma surveillance. https://melanomafocus.org/wp-content/uploads/2022/09/Melanoma-Focus-2022-Consensus-Statement-on-Imaging-FU-for-cutaneous-melanoma-surveillance_final-web-copy.pdf. (Accessed 28 June 2023).
- National Collaborating Centre for Cancer. 2015. *Melanoma: Assessment and management*. *NICE guideline NG14*. Cardiff: National Collaborating Centre for Cancer. URL: https://www.nice.org.uk/guidance/ng14.
- NCCN. 2023. *Clinical Practice Guidelines in Oncology (NCCN Guidelines)*. Pennsylvania: National Comprehensive Cancer Network (NCCN). URL: **www.nccn.org/professionals/physician_gls/default.aspx** (accessed 18 June 2023)
- Park TS, Phan GQ, Yang JC, et al. 2017. Routine Computer Tomography Imaging for the Detection of Recurrences in High-Risk Melanoma Patients. *Ann Surg Oncol*. 24(4):947-951. Podlipnik S, Carrera C, Sánchez M, et al. 2016. Performance of diagnostic tests in an intensive follow-up protocol for patients with American Joint Committee on Cancer (AJCC) stage IIB, IIC, and III localized primary melanoma: a prospective cohort study. *Journal of the American Academy of Dermatology* 75(3): 516–24.
- Podlipnik S, Moreno-Ramírez D, Carrera C, et al. 2019. Cost-effectiveness analysis of imaging strategy for an intensive follow-up of patients with American Joint Committee on Cancer stage IIB, IIC and III malignant melanoma. *Br J Dermatol*. 2019;180(5):1190-1197.

- Samlowski WE, Moon J, Witter M, et al. 2017. High frequency of brain metastases after adjuvant therapy for high-risk melanoma. *Cancer Medicine* 6(11): 2,576–85.
- Scheier B, Lao CD, Kidwell KM, et al. 2015. Utility of pre-operative PET/CT staging in sentinel lymph node-positive melanoma. *Journal of Clinical Oncology* 33(15): 6,566.
- Schüle S-C, Eigentler TK, Garbe C, et al. 2016. Influence of 18 F-FDG PET/CT on therapy management in patients with stage III/IV malignant melanoma. *European Journal of Nuclear Medicine and Molecular Imaging* 43(3): 482–8.
- Turner, R.M., Dieng, M., Khanna, N. et al. 2021. Performance of Long-Term CT and PET/CT Surveillance for Detection of Distant Recurrence in Patients with Resected Stage IIIA–D Melanoma. *Ann Surg Oncol* **28**, 4561–4569.
- Xing Y, Bronstein Y, Ross MI, et al. 2011. Contemporary diagnostic imaging modalities for the staging and surveillance of melanoma patients: a meta-analysis. *Journal of the National Cancer Institute* 103(2): 129–42.
- Zakrzewski J, Geraghty LN, Rose AE, et al. 2011. Clinical variables and primary tumor characteristics predictive of the development of melanoma brain metastases and post-brain metastases survival. *Cancer* 117(8): 1,711–20.

Quality statement 6.4: Ultrasound imaging of draining node basins

Description	US imaging of the draining node basin(s) can be considered in a select group of patients, in conjunction with routine clinical follow-up ± cross-sectional imaging as per TNM stage.
Rationale	These recommendations are made accepting that individual centre's resources and protocols may differ but should be considered as best practice. US of the draining regional lymph node basins may provide a useful adjunct to clinical examination, particularly when clinical examination is limited (such as in obese patients), when SNB has failed or not performed when indicated, or as surveillance of SNB-positive node basins when completion lymphadenectomy is not performed. Following the results of the MSLT-II trial, nodal surveillance with US is likely to increase (Faries et al 2017). There is evidence that US can detect lymph node metastasis with a reasonable degree of accuracy, with literature to support increased sensitivity of US compared with clinical examination (Bafounta et al 2004; Machet et al 2005). Sonographic features suspicious for nodal malignancy as defined by Vassallo et al (1992) remain consistent criteria in the literature for lymph node malignancy and include longitudinal to transverse diameter ratio <2 mm, echogenic central hilum narrowed or absent (suggesting diffuse hypoechogenicity) and concentric or eccentric widening of the peripheral cortex. Nodal size alone is not a good discriminator as small nodes may have malignant features and benign reactive nodes may be notably enlarged. Other suspicious features include peripheral vascularity on colour Doppler sonography and intranodal necrosis (Ahuja et al 2008). A combination of more than one suspicious finding has been shown to increase the sensitivity of detection (Moerhle et al 1999). The success of sonographic nodal assessment therefore relies on the expertise of the sonographer, requiring a high level of technical skill and knowledge.

Good practice points	6.4.1	US imaging of the node basin(s) should be performed in a select group of patients, in conjunction with routine clinical examination and appropriate cross-sectional imaging surveillance based on TNM stage: • patients with stage IB, stage IIA, B or C where SNB is not performed when clinically indicated • patients with SNB-positive stage III disease where completion lymphadenectomy is not performed • patients in whom SNB failed • considered for patients where clinical examination is difficult (for example, obesity). See **Appendix 3** for example follow up schedule.
	6.4.2	Recommended frequency of US imaging is 4–6 monthly for 2 years. For those patients undergoing US surveillance who have not had SNB, baseline US is also advised.
	6.4.3	There may be more than one draining node basin. For primary tumours in the head and neck, bilateral neck US is advised. In the torso this would be bilateral axilla, neck, inguinal and iliac basins so cross sectional imaging may be more practical with CT neck, chest, abdomen, pelvis down to the upper thigh.
	6.4.4	Sonographic features suspicious for malignancy include: longitudinal to transverse diameter ratio <2 mm, loss or narrowing of the echogenic central hilum / diffuse echogenicity, concentric or eccentric widening of the peripheral cortex and peripheral vascularity on colour doppler sonography. A combination of multiple suspicious findings is likely to improve diagnostic accuracy. Equivocal sonographic findings may need short-interval follow-up US or FNA biopsy.

References

- Ahuja A, Ying M, Ho S, et al. 2008. Ultrasound of malignant cervical lymph nodes. *Cancer Imaging* 8(1): 48.
- Bafounta M-L, Beauchet A, Chagnon S, et al. 2004. Ultrasonography or palpation for detection of melanoma nodal invasion: a meta-analysis. *Lancet Oncol* 5(11): 673–80.
- Faries MB, Thompson JF, Cochran AJ, et al. 2017. Completion dissection or observation for sentinel-Node metastasis in melanoma. *New England Journal of Medicine* 376(23): 2,211–22.
- Francis V, Sehji T, Barnett M, et al. 2021. Radiological imaging of melanoma: a review to guide clinical practice in New Zealand. *N Z Med J* 134(1528): 79 – 87.
- Machet L, Nemeth-Normand F, Giraudeau B, et al. 2005. Is ultrasound lymph node examination superior to clinical examination in melanoma follow-up? A monocentre cohort study of 373 patients. *British Journal of Dermatology* 152(1): 66–70.
- Moehrle M, Blum A, Rassner G, et al. 1999. Lymph node metastases of cutaneous melanoma: diagnosis by B-scan and color Doppler sonography. *Journal of the American Academy of Dermatology* 41(5): 703–9.
- Vassallo P, Wernecke K, Roos N, et al. 1992. Differentiation of benign from malignant superficial lymphadenopathy: the role of high-resolution US. *Radiology* 183(1): 215–20.

Quality statements 7: Supportive Care

Quality statement 7.1: Supportive care

Description	Patients with melanoma and their families/whānau have equitable and coordinated access to appropriate medical, allied health and supportive care services, in accordance with *Guidance for Improving Supportive Care for Adults with Cancer in New Zealand* (Ministry of Health 2010).
Rationale	The psychological, social, physical and spiritual needs of cancer patients are many and varied. These needs can to a large extent be met by allied health care teams in hospitals and in the community. Adults with cancer enjoy improved quality of life following needs assessment and provision of supportive care. Non-government organisations, including the Cancer Society and Melanoma New Zealand, perform an important role in providing supportive care.
Good practice points	7.1.1 Patients have their supportive care and psychosocial needs assessed using validated tools (such as the 'Distress Thermometer' or a cancer-related distress self-assessment tool) and documented at each stage of their cancer journey and have access to services appropriate to their needs. The 'Distress Thermometer' is a simple widely used screening tool, but deficiencies in its utility as a standalone assessment of psychosocial stress in cancer patients should be recognised (Mitchell 2007, Stewart-Knight et al 2012, Guan et al 2019, Ownby 2019, Jewett et al 2020, Klingenstein et al 2020). 7.1.2 Information in a language and format appropriate to the patient is offered to each new patient with cancer, and meets the guidelines set out in *Rauemi Atawhai: A guide to developing health education resources in New Zealand* (Ministry of Health 2012). 7.1.3 Patients have access to mental health services appropriate to their needs. Those experiencing significant distress or disturbance are referred to appropriate specialist health practitioners. 7.1.4 Māori patients and their family/whānau are offered access to Whānau Ora assessments and cultural support services. 7.1.5 Māori patients and those from other cultural groups and their family/whānau are offered access to culturally appropriate cancer support services.

Good practice points (continued)	7.1.6	Individually tailored written information in a plain language format is offered to each new patient with melanoma, and cover: • general background information about melanoma. • treatment options: specific local arrangements, including information about the MDT and support services, and whom the patient should contact if necessary. • local self-help/support groups and other appropriate organisations.
	7.1.7	Health professionals ensure that patients understand the information provided or refer them on to suitably qualified service providers/advisors who can interpret information for them.
	7.1.8	Patients are provided with adequate support and information to make decisions about their future health care in consultation with health care providers and family/whānau.

References

- Cancer Society, Central Cancer Network, Cancer Nurses College. 2018. Cancer Survivorship Consensus Statement. Wellington: Cancer Society. URL: **https://www.cancer.org.nz/assets/Uploads/Survivorship-Consensus-Statement.pdf** (accessed 16 August 2023)
- Guan B, Wang K, Shao Y, et al. 2019. The use of distress thermometer in advanced cancer inpatients with pain. *Psychooncology* 28(5): 1004–10.
- Jewett PI, Teoh D, Petzel S, et al. 2020. Cancer-related distress; revisiting the utility of the National Comprehensive Cancer Network distress thermometer problem list in women with gynecologic cancers. *JCO Oncol Pract* 16(8): e649–59.
- Klingenstein A, Samel C, Garip-Kuebler A, et al. 2020. The National Comprehensive Cancer Network distress thermometer as a screening tool for the evaluation of quality of life in uveal melanoma patients. *Acta Ophthalmol* 98(3): e381–87.
- Ministry of Health. 2010. Guidance for Improving Supportive Care for Adults with Cancer in New Zealand. Wellington: Ministry of Health. URL: **https://www.health.govt.nz/system/files/documents/publications/supp-care-guidance-mar2010.pdf** (accessed 6 August 2021).
- Ministry of Health. 2012. Rauemi Atawhai: A guide to developing health education resources in New Zealand. Wellington: Ministry of Health. URL: **https://www.health.govt.nz/system/files/documents/publications/rauemiatawhai4web.pdf**
- Mitchell AJ. 2007. Pooled results from 38 analyses of the accuracy of distress thermometer and other ultra-short methods of detecting cancer-related mood disorders. *J Clin Oncol* 25(29): 4670–81.
- Ownby KK. 2019. Use of the distress thermometer in clinical practice. *J Adv Pract Oncol* 10(2): 175–79.
- Stewart-Knight K, Parry R, Abey A, et al. 2012. Does the distress thermometer work? A systematic review of the evidence for its use and validity. *BMJ Support Palliat Care* 2: A30.

Quality statements 8: Care Coordination

Quality statement 8.1: Care coordination

Description	Patients managed by a melanoma MDT have access to a CNS, CNC or other health professional who is a member of the MDM to help coordinate all aspects of their care. Each treatment centre has a melanoma clinical lead to provide necessary leadership, guidance and provision of melanoma care.
Rationale	The cancer journey is complex, and it is not uncommon for a patient to be seen by many specialists and across the public and private sectors. 'Care coordination' refers to a system or a role primarily intended to expedite patient access to services and resources, improve communication and the transfer of information between services, address patients' information needs and improve continuity of care throughout the cancer continuum. Key responsibilities of care coordinators include: • early identification and assessment of patients at greatest need of support. • care coordination (see above). • provision of information, support and nursing care • provision of advice/education to other nurses and health professionals. • ensuring best-practice service provision. • collaboration with other health professionals to improve outcomes for patients. Given the specialist knowledge required and responsibilities involved, care coordinators should be a health professional with special interest in melanoma.
Good practice points	8.1.1 All patients with melanoma have a nominated single point of contact – ideally a nurse with an in-depth/specialist knowledge of melanoma – to support them to access psychosocial support and information, help them self-manage their disease and provide coordination of their cancer journey e.g., coupling radiology investigations or outpatient visits together. 8.1.2 Services provide all patients with this person's name and contact details, and the care coordinator makes initial contact with the patient within seven days of the initial diagnosis. 8.1.3 Tools are developed to specifically meet the needs of Māori (such as Whānau Ora assessments); these tools are used to inform patient treatment plans and care coordination.

Appendices

Appendix 1: National Melanoma Working Group members

The National Melanoma Cancer Working Group (3rd edition) comprised:

Chair

Dr Susan Seifried, General Surgeon, Te Whatu Ora Nelson Marlborough

Members

Dr AJ Seine, Dermatologist, Skin Centre, Tauranga

Dr Annie Wong, Medical Oncologist, Te Whatu Ora Capital, Coast and Hutt Valley

Dr Bronwen McNoe, Senior Research Fellow Preventative and Social Medicine, University of Otago

Dr Chris Adams, Plastic Surgeon, Te Whatu Ora Capital, Coast and Hutt Valley

Dr Chris Boberg, General Practitioner, Skin Check

Dr Dirk Venter, General Practitioner, Venter Medical Ltd

Dr Luke Bradford, Medical Director, Royal New Zealand College of General Practitioners

Dr Richard Massey, Pathologist, Pathology Associates New Zealand

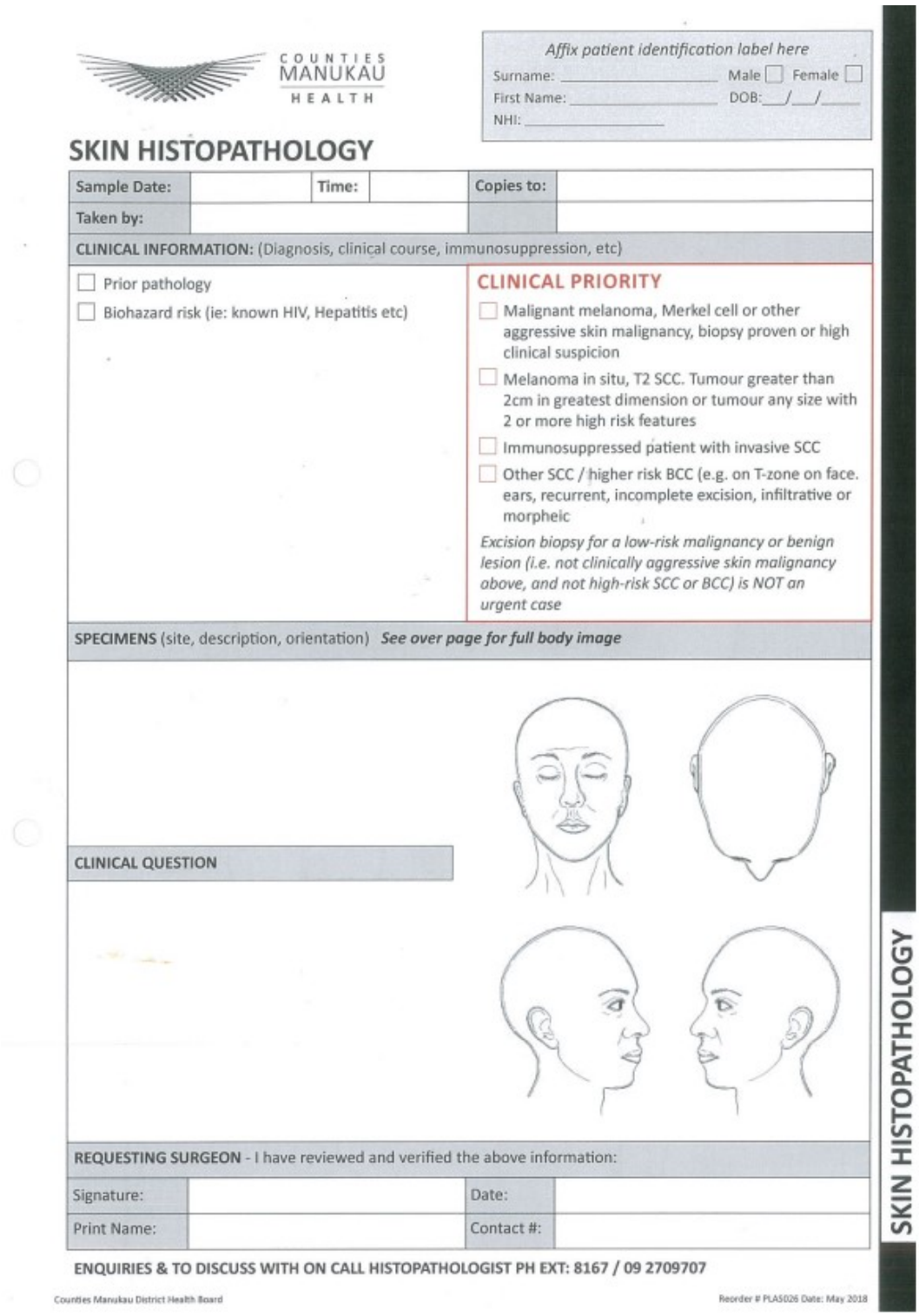
Dr Victoria Francis, Radiologist, Te Whatu Ora Waitematā

Katrina Patterson, Chief Executive Officer, Melanoma Network of New Zealand (MelNet)

Nicola Hobbs, Cancer Nurse Coordinator, Te Whatu Ora Waitaha Canterbury

Appendix 2: Example templates and associated guidance

2.1 Te Whatu Ora Counties Manukau: Skin histology request form



COUNTIES MANUKAU HEALTH

Affix patient identification label here

Surname: _____ Male ☐ Female ☐

First Name: _____ DOB: ___/___/____

NHI: _____

SKIN HISTOPATHOLOGY

Sample Date:		Time:		Copies to:	
Taken by:					

CLINICAL INFORMATION: (Diagnosis, clinical course, immunosuppression, etc)

☐ Prior pathology

☐ Biohazard risk (ie: known HIV, Hepatitis etc)

CLINICAL PRIORITY

☐ Malignant melanoma, Merkel cell or other aggressive skin malignancy, biopsy proven or high clinical suspicion

☐ Melanoma in situ, T2 SCC. Tumour greater than 2cm in greatest dimension or tumour any size with 2 or more high risk features

☐ Immunosuppressed patient with invasive SCC

☐ Other SCC / higher risk BCC (e.g. on T-zone on face. ears, recurrent, incomplete excision, infiltrative or morpheic

Excision biopsy for a low-risk malignancy or benign lesion (i.e. not clinically aggressive skin malignancy above, and not high-risk SCC or BCC) is NOT an urgent case

SPECIMENS (site, description, orientation) ***See over page for full body image***

CLINICAL QUESTION

REQUESTING SURGEON - I have reviewed and verified the above information:

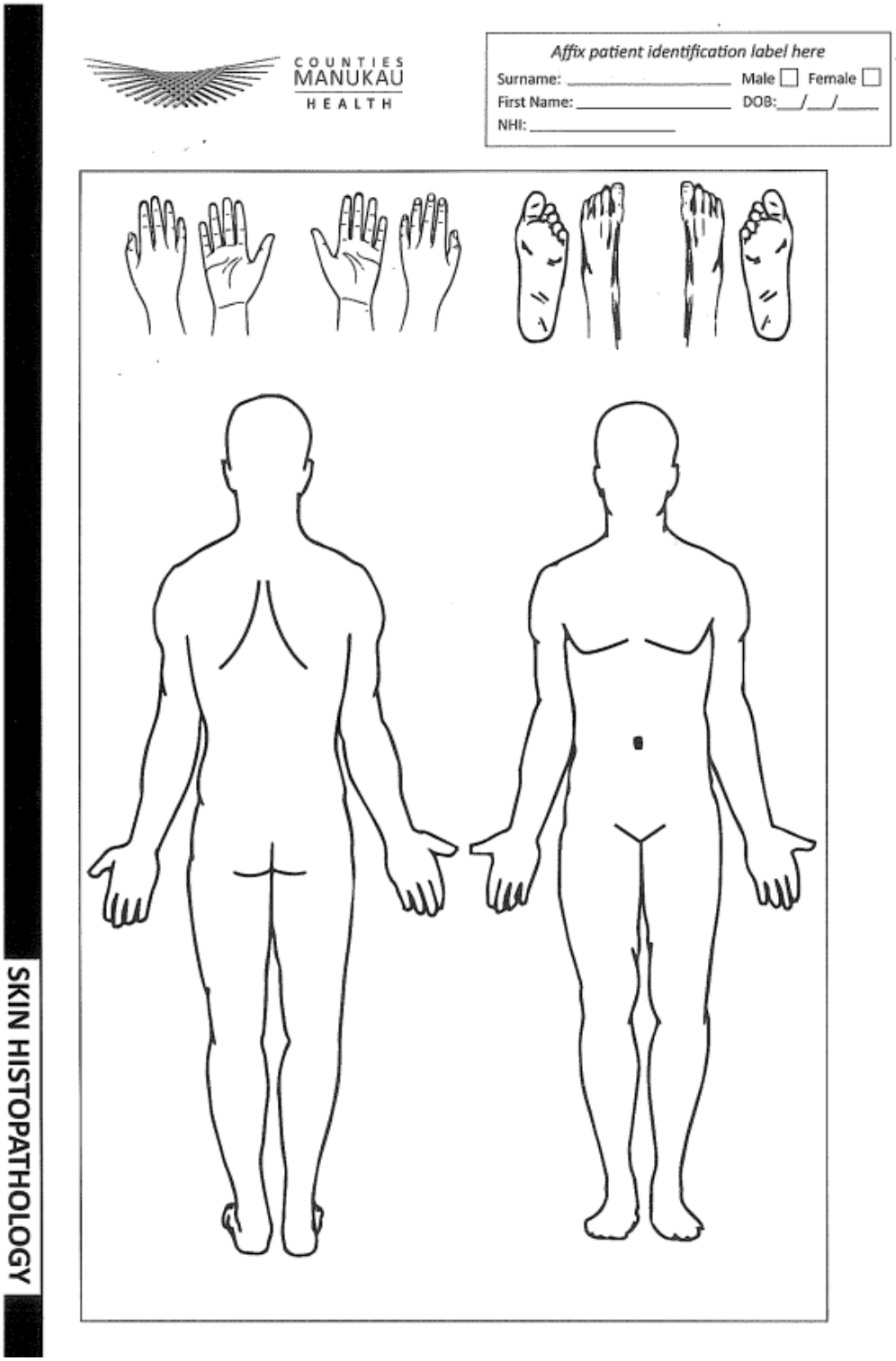
Signature:		Date:	
Print Name:		Contact #:	

ENQUIRIES & TO DISCUSS WITH ON CALL HISTOPATHOLOGIST PH EXT: 8167 / 09 2709707

Counties Manukau District Health Board

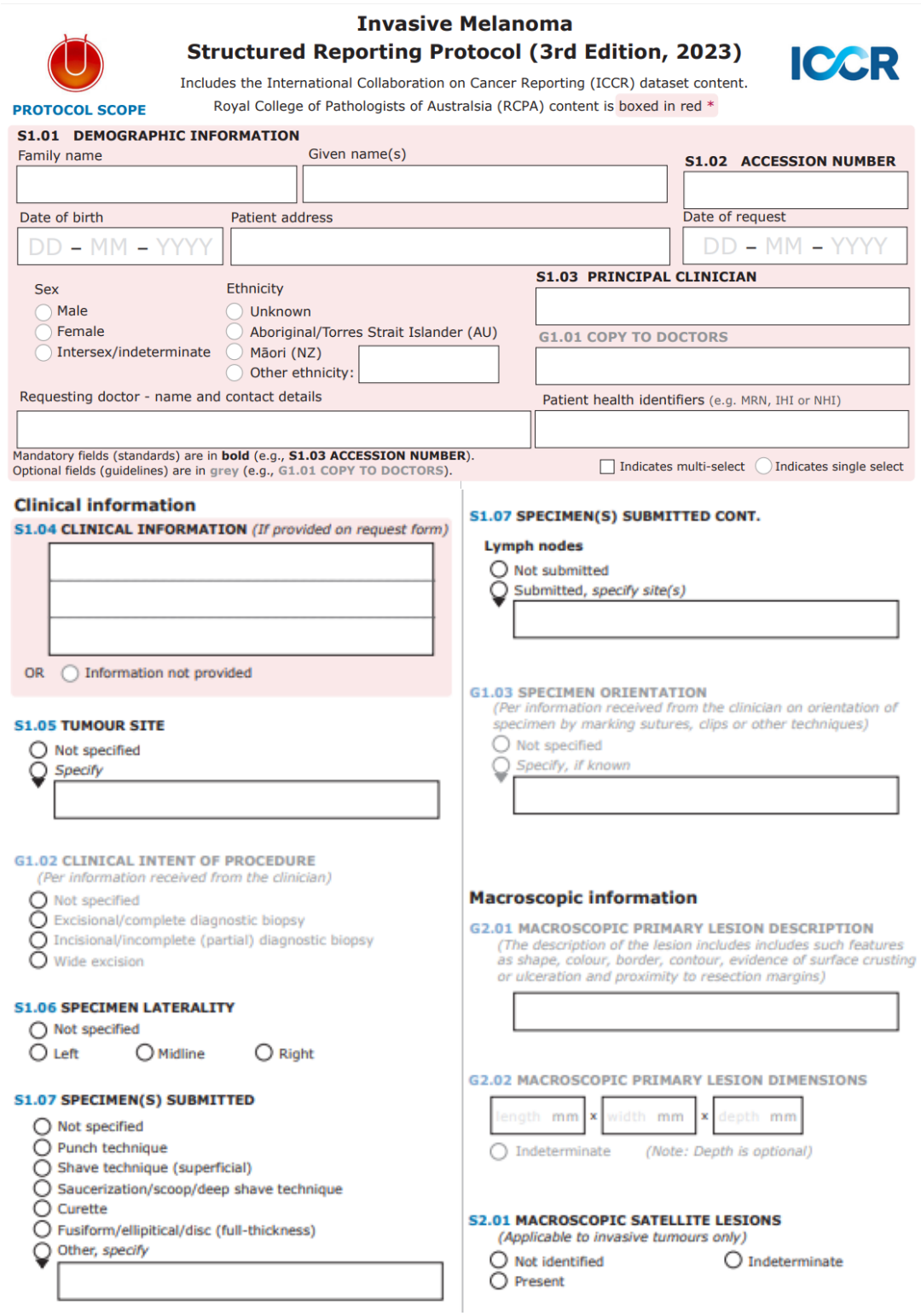
Reorder # PLAS026 Date: May 2018

SKIN HISTOPATHOLOGY



(Courtesy of Counties Manukau District Health Board).

2.2 Royal College of Pathologists of Australasia: Primary cutaneous melanoma structured reporting protocol 3rd edition



Invasive Melanoma
Structured Reporting Protocol (3rd Edition, 2023)

Includes the International Collaboration on Cancer Reporting (ICCR) dataset content.
Royal College of Pathologists of Australasia (RCPA) content is boxed in red *

PROTOCOL SCOPE

S1.01 DEMOGRAPHIC INFORMATION

Family name | Given name(s) | **S1.02 ACCESSION NUMBER**

Date of birth (DD – MM – YYYY) | Patient address | Date of request (DD – MM – YYYY)

Sex: ○ Male ○ Female ○ Intersex/indeterminate

Ethnicity: ○ Unknown ○ Aboriginal/Torres Strait Islander (AU) ○ Māori (NZ) ○ Other ethnicity:

S1.03 PRINCIPAL CLINICIAN

G1.01 COPY TO DOCTORS

Requesting doctor - name and contact details

Patient health identifiers (e.g. MRN, IHI or NHI)

Mandatory fields (standards) are in **bold** (e.g., **S1.03 ACCESSION NUMBER**).
Optional fields (guidelines) are in grey (e.g., G1.01 COPY TO DOCTORS).

☐ Indicates multi-select ○ Indicates single select

Clinical information

S1.04 CLINICAL INFORMATION *(If provided on request form)*

OR ○ Information not provided

S1.05 TUMOUR SITE

○ Not specified
○ *Specify*

G1.02 CLINICAL INTENT OF PROCEDURE
(Per information received from the clinician)

○ Not specified
○ Excisional/complete diagnostic biopsy
○ Incisional/incomplete (partial) diagnostic biopsy
○ Wide excision

S1.06 SPECIMEN LATERALITY

○ Not specified
○ Left ○ Midline ○ Right

S1.07 SPECIMEN(S) SUBMITTED

○ Not specified
○ Punch technique
○ Shave technique (superficial)
○ Saucerization/scoop/deep shave technique
○ Curette
○ Fusiform/elliptical/disc (full-thickness)
○ Other, *specify*

S1.07 SPECIMEN(S) SUBMITTED CONT.

Lymph nodes

○ Not submitted
○ Submitted, *specify site(s)*

G1.03 SPECIMEN ORIENTATION
(Per information received from the clinician on orientation of specimen by marking sutures, clips or other techniques)

○ Not specified
○ *Specify, if known*

Macroscopic information

G2.01 MACROSCOPIC PRIMARY LESION DESCRIPTION
(The description of the lesion includes includes such features as shape, colour, border, contour, evidence of surface crusting or ulceration and proximity to resection margins)

G2.02 MACROSCOPIC PRIMARY LESION DIMENSIONS

length mm x width mm x depth mm

○ Indeterminate *(Note: Depth is optional)*

S2.01 MACROSCOPIC SATELLITE LESIONS
(Applicable to invasive tumours only)

○ Not identified ○ Indeterminate
○ Present

G2.03 OTHER LESION(S)

- ○ Not identified
- ○ Present
  Macroscopic description of other lesion(s)

G2.04 NATURE AND SITE OF ALL BLOCKS

G2.05 OTHER MACROSCOPIC COMMENTS

Microscopic information

G3.01 MELANOMA SUBTYPE (select all that apply)
(Value list modified from the World Health Organization Classification of Skin Tumours (2023))

- ☐ Low-CSD melanoma (superficial spreading melanoma)
- ☐ Lentigo maligna melanoma (high-CSD melanoma)
- ☐ Desmoplastic melanoma
- ☐ Malignant Spitz tumour (Spitz melanoma)
- ☐ Acral melanoma
- ☐ Mucosal melanomas (genital, oral, sinonasal)
- ☐ Melanoma arising in blue naevus
- ☐ Melanoma arising in giant congenital naevus
- ☐ Nodular melanoma
- ☐ Naevoid melanoma
- ☐ Melanoma, not otherwise classified
- ☐ Other, *specify*

S3.01 SURGICAL MARGIN/TISSUE EDGES

- ○ Cannot be assessed
- ○ Not involved by melanoma in situ or invasive melanoma
  Distance of melanoma in situ or invasive tumour from closest margin ○ ≤1 mm ○ >1 mm
  Specify closest location(s), if possible
- ○ Involved by melanoma in situ
  Specify location(s), if possible
- ○ Involved by invasive melanoma
  Specify location(s), if possible

S3.02 BRESLOW THICKNESS
(Measurement should be to the nearest 0.1 mm as per AJCC staging)

Specify ○ / At least ○ ____ mm ○ Indeterminate

S3.03 ULCERATION

- ○ Not identified ○ Indeterminate
- ○ Present
  - ⇩ **G3.02 EXTENT OF ULCERATION** ____ mm

S3.04 MITOTIC COUNT

____ /mm² ○ Indeterminate

S3.05 MICROSATELLITES

- ○ Not identified ○ Indeterminate
- ○ Present
  - ⇩ **S3.06 MICROSATELLITES: MARGINS**
    - ○ Cannot be assessed
    - ○ Not involved by microsatellite
    - ○ Involved by microsatellite

S3.07 LYMPHOVASCULAR INVASION

- ○ Not identified ○ Indeterminate
- ○ Present

G3.03 TUMOUR-INFILTRATING LYMPHOCYTES

- ○ Not identified
- ○ Brisk
- ○ Non brisk

G3.04 TUMOUR REGRESSION

- ○ Not identified ○ Indeterminate
- ○ Present
  - ⇩ **G3.05 TUMOUR REGRESSION: MARGINS**
    - ○ Cannot be assessed
    - ○ Not involved by regression
    - ○ Involved by regression

S3.08 NEUROTROPISM/PERINEURAL INVASION

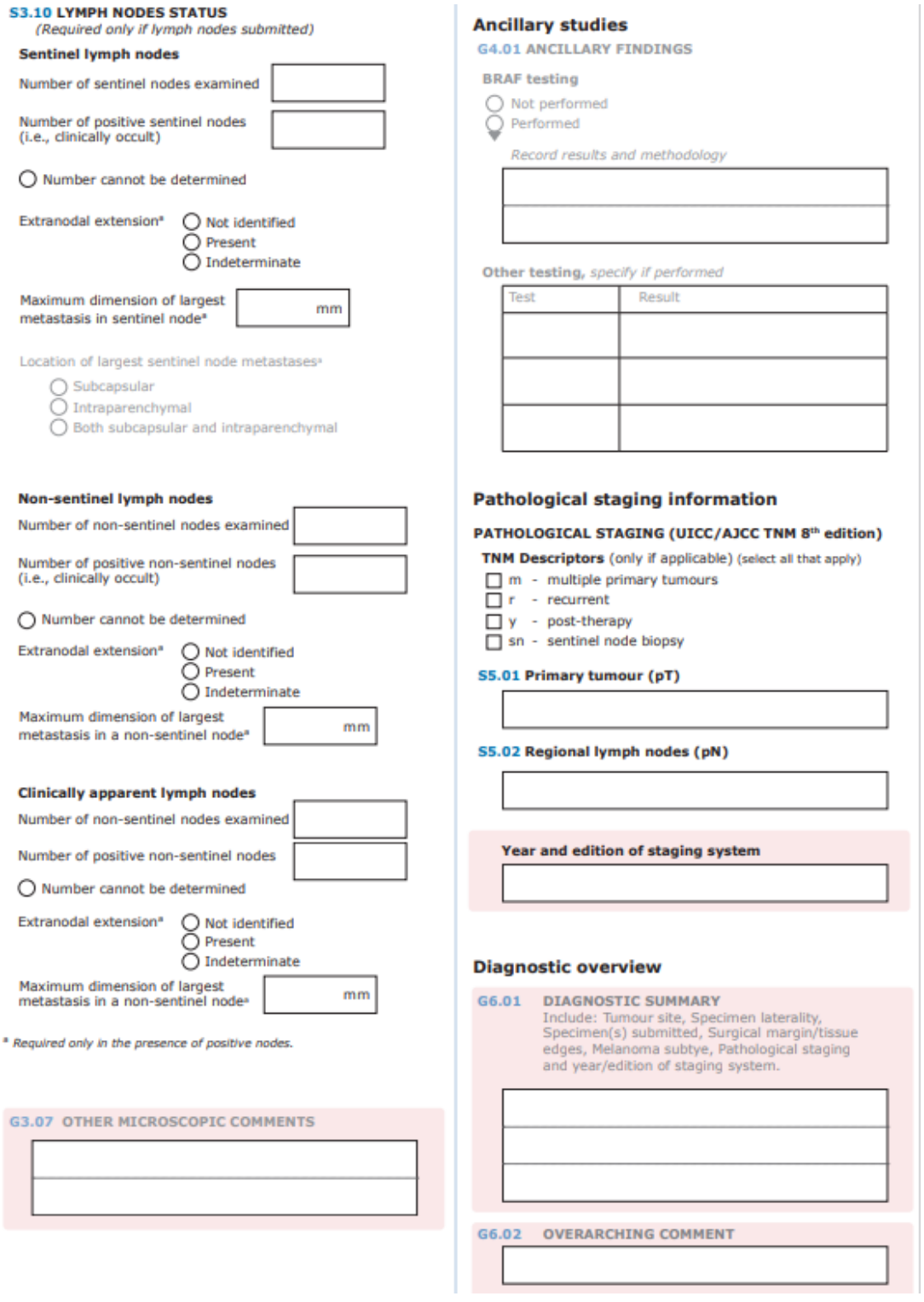
- ○ Not identified ○ Indeterminate
- ○ Present

S3.09 DESMOPLASTIC MELANOMA COMPONENT

- ○ Not identified
- ○ Present
  - ○ Pure (>90% desmoplastic melanoma)
  - ○ Mixed desmoplastic/non-desmoplastic melanoma

G3.06 ASSOCIATED MELANOCYTIC LESION

- ○ Not identified
- ○ Present, *describe*



S3.10 LYMPH NODES STATUS
(Required only if lymph nodes submitted)

Sentinel lymph nodes

Number of sentinel nodes examined

Number of positive sentinel nodes (i.e., clinically occult)

Number cannot be determined

Extranodal extension[a] Not identified / Present / Indeterminate

Maximum dimension of largest metastasis in sentinel node[a] mm

Location of largest sentinel node metastases[a]
Subcapsular
Intraparenchymal
Both subcapsular and intraparenchymal

Non-sentinel lymph nodes

Number of non-sentinel nodes examined

Number of positive non-sentinel nodes (i.e., clinically occult)

Number cannot be determined

Extranodal extension[a] Not identified / Present / Indeterminate

Maximum dimension of largest metastasis in a non-sentinel node[a] mm

Clinically apparent lymph nodes

Number of non-sentinel nodes examined

Number of positive non-sentinel nodes

Number cannot be determined

Extranodal extension[a] Not identified / Present / Indeterminate

Maximum dimension of largest metastasis in a non-sentinel node[a] mm

[a] Required only in the presence of positive nodes.

G3.07 OTHER MICROSCOPIC COMMENTS

Ancillary studies

G4.01 ANCILLARY FINDINGS

BRAF testing
Not performed
Performed

Record results and methodology

Other testing, specify if performed

Test	Result

Pathological staging information

PATHOLOGICAL STAGING (UICC/AJCC TNM 8th edition)

TNM Descriptors (only if applicable) (select all that apply)
m - multiple primary tumours
r - recurrent
y - post-therapy
sn - sentinel node biopsy

S5.01 Primary tumour (pT)

S5.02 Regional lymph nodes (pN)

Year and edition of staging system

Diagnostic overview

G6.01 DIAGNOSTIC SUMMARY
Include: Tumour site, Specimen laterality, Specimen(s) submitted, Surgical margin/tissue edges, Melanoma subtye, Pathological staging and year/edition of staging system.

G6.02 OVERARCHING COMMENT

Note: The above protocol is the most recent version available as of the time of publication. The most up to date version of the reporting protocol should always be used.

Available from: https://www.rcpa.edu.au/Library/Practising-Pathology/Structured-Pathology-Reporting-of-Cancer/Cancer-Protocols

2.3 College of American Pathologists: Protocol for the examination of excision specimens from patients with melanoma of the skin

CAP Approved **Skin • Melanoma 4.1.0.0**
Excision

 # Note: For melanoma in situ, elements that assess the invasive component are not applicable and should not be reported.

Maximum Tumor (Breslow) Thickness (applicable to invasive tumor only) (Note D)
Specify (millimeters): ___ mm
or
At least (millimeters): ___ mm (explain): _____
___ Cannot be determined (explain): _____

Ulceration (required for invasive tumor only) (Note E)
___ Not identified
___ Present
+ Extent of ulceration (millimeters): ____ mm
___ Cannot be determined

Microsatellite(s) (applicable to invasive tumor only) (Note F)
___ Not identified
___ Present
___ Cannot be determined

Margins (Note G)

Peripheral Margins#
___ Negative for invasive melanoma
+ Distance of invasive melanoma from closest peripheral margin (millimeters):
+ ___ Specify ___ mm
+ ___ Less than ___ mm
+ ___ Greater than ___ mm
+ ___ Cannot be determined (explain): _____
+ Specify location(s), if possible: _____
___ Invasive melanoma present at margin
Specify location(s), if possible: _____
___ Negative for melanoma in situ
+ Distance of melanoma in situ from closest peripheral margin (millimeters):
+ ___ Specify ___ mm
+ ___ Less than ___ mm
+ ___ Greater than ___ mm
+ ___ Cannot be determined (explain): _____
+ Specify location(s), if possible: _____
___ Melanoma in situ present at margin
Specify location(s), if possible: _____
___ Cannot be assessed

Deep Margin#
___ Negative for invasive melanoma
+ Distance of invasive melanoma from deep margin (millimeters):
+ ___ Specify ___ mm
+ ___ Less than ___ mm
+ ___ Greater than ___ mm
+ ___ Cannot be determined (explain): _____
___ Invasive melanoma present at margin
___ Negative for melanoma in situ
___ Melanoma in situ present at margin
___ Cannot be assessed

Surgical Pathology Cancer Case Summary

Protocol posting date: August 2019

MELANOMA OF THE SKIN: Excision, Re-Excision

Select a single response unless otherwise indicated.

Procedure (select all that apply) (Note A)
___ Excision
___ Re-excision
___ Sentinel node(s) biopsy
___ Lymphadenectomy, regional nodes (specify): _____
___ Other (specify): _____
___ Not specified

+ Specimen Laterality
+___ Right
+___ Left
+___ Midline
+___ Not specified

+ Tumor Site (Note B): _____

Macroscopic Satellite Nodule(s) (applicable to invasive tumor only)
___ Not identified
___ Present
___ Cannot be determined

Histologic Type (Note C)
___ No residual melanoma identified

Invasive Melanoma
___ Superficial spreading melanoma (low-cumulative sun damage (CSD) melanoma)
___ Lentigo maligna melanoma
___ Desmoplastic melanoma
+____ Pure desmoplastic melanoma
+____ Mixed desmoplastic melanoma
___ Acral melanoma
___ Melanoma arising in a blue nevus (blue nevus-like melanoma)
___ Melanoma arising in a giant congenital nevus
___ Spitz melanoma (malignant Spitz tumor)
___ Nodular melanoma
___ Nevoid melanoma
___ Melanoma, not otherwise classified
___ Other histologic type not listed (specify): _____

Melanoma In Situ (anatomic level I)#
___ Melanoma in situ, superficial spreading type (low-cumulative sun damage (CSD) melanoma in situ)
___ Melanoma in situ, lentigo maligna type
___ Acral melanoma in situ
___ Melanoma in situ arising in a giant congenital nevus
___ Melanoma in situ, not otherwise classified
___ Other histologic type not listed (specify): _____

Mitotic Rate (applicable to invasive tumor only) (Note H)
___ None identified
___ Specify (mitoses/mm^2): _____ mitoses/mm^2
___ Cannot be determined

+ Anatomic (Clark) Level (applicable to invasive tumor only) (Note D)
+ ___ At least level _____ (explain): _____
+ ___ II (melanoma present in but does not fill and expand papillary dermis)
+ ___ III (melanoma fills and expands papillary dermis)
+ ___ IV (melanoma invades reticular dermis)
+ ___ V (melanoma invades subcutis)
+ ___ Cannot be determined

Lymphovascular Invasion (applicable to invasive tumor only) (Note I)
___ Not identified
___ Present
___ Cannot be determined

Neurotropism (applicable to invasive tumor only) (Note J)
___ Not identified
___ Present
___ Cannot be determined

+ Tumor-Infiltrating Lymphocytes (applicable to invasive tumor only) (Note K)
+ ___ Not identified
+ ___ Present, nonbrisk
+ ___ Present, brisk
+ ___ Cannot be determined

Tumor Regression (Note L)
___ Not identified
___ Present, involving less than 75% of lesion
___ Present, involving 75% or more of lesion
___ Cannot be determined

Regional Lymph Nodes (applicable to invasive tumor only) (Note M)
Note: If nodes from more than one nodal basin are included, each nodal basin should be reported separately.
___ No lymph nodes submitted or found
___ Uninvolved by tumor cells
Total Number of Lymph Nodes Examined: ____
Number of Sentinel Nodes Examined (if applicable): ____
___ Involved by tumor cells
Total Number of Lymph Nodes Involved: ____
___ Number cannot be determined (explain): _____
+ Location (specify)[#]: _____
[#]*Note: Locations may include subcapsular, intramedullary, and other locations.*
Number of Sentinel Nodes Involved (required only if sentinel nodes examined and involved): ____
___ Number cannot be determined (explain): _____

+ Size of Largest Metastatic Deposit[#] ____mm
[#] *Note: Relevant only if larger than sentinel lymph node metastatic deposits.*

+ Size of Largest Metastatic Deposit in Sentinel Lymph Node ____mm

+ Extranodal Extension

+ ___ Not identified
+ ___ Present
+ ___ Cannot be determined

Matted Nodes
___ Not identified
___ Present

Total Number of Lymph Nodes Examined: ____
___ Number cannot be determined (explain): _____
Number of Sentinel Nodes Examined (if applicable): ____

Pathologic Stage Classification (pTNM, AJCC 8th Edition) (Note N)

Note: Reporting of pT, pN, and (when applicable) pM categories is based on information available to the pathologist at the time the report is issued. Only the applicable T, N, or M category is required for reporting; their definitions need not be included in the report. The categories (with modifiers when applicable) can be listed on 1 line or more than 1 line.

+ ___ Classification assigned in this report includes information from a prior procedure (explain):
_____

Note: In general, CAP cancer protocol case summaries are intended to guide reporting on the specimen that the pathologist is evaluating at that time. However, melanoma cases frequently include multiple procedures. Because of this, a prior procedure that was performed may affect the pathologic classification of the tumor.

In order to represent this appropriately in the pathology report, information from prior procedures may be incorporated into the assignment of pathologic classification if it is available. When information from a prior procedure is included in this report, details of that procedure should be documented in the report as well.

TNM Descriptors (required only if applicable) (select all that apply)
___ m (multiple)
___ r (recurrence or retreatment)
___ y (posttherapy or post-neoadjuvant therapy)

Primary Tumor (pT)
___ pTX: Primary tumor thickness cannot be assessed (eg, diagnosis by curettage) (explain): _____
___ pT0: No evidence of primary tumor (eg, unknown primary or completely regressed melanoma)
___ pTis: Melanoma in situ (ie, not an invasive tumor: anatomic level I)
___ pT1: Melanoma 1.0 mm or less in thickness, ulceration status unknown or unspecified (see Note D)
___ pT1a: Melanoma <0.8 mm in thickness, no ulceration
___ pT1b: Melanoma <0.8 mm in thickness with ulceration OR melanoma 0.8 to 1.0 mm in thickness with or without ulceration
___ pT2: Melanoma >1.0 to 2.0 mm in thickness, ulceration status unknown or unspecified
___ pT2a: Melanoma >1.0 to 2.0 mm in thickness, no ulceration
___ pT2b: Melanoma >1.0 to 2.0 mm in thickness, with ulceration
___ pT3: Melanoma >2.0 to 4.0 mm in thickness, ulceration status unknown or unspecified
___ pT3a: Melanoma >2.0 to 4.0 mm in thickness, no ulceration
___ pT3b: Melanoma >2.0 to 4.0 mm in thickness, with ulceration
___ pT4: Melanoma >4.0 mm in thickness, ulceration status unknown or unspecified
___ pT4a: Melanoma >4.0 mm in thickness, no ulceration
___ pT4b: Melanoma >4.0 mm in thickness, with ulceration

Regional Lymph Nodes (pN) (applicable to invasive tumor only)
___ pNX: Regional lymph nodes not assessed (e.g., SLN biopsy not performed, regional nodes previously removed for another reason)

___ pN0: No regional lymph node metastasis detected
___ pN1: One tumor-involved node or in-transit, satellite, and/or microsatellite metastases with no tumor-involved nodes
___ pN1a: One clinically occult tumor-involved node (ie, detected by sentinel node biopsy) with no in-transit, satellite and/or microsatellite metastases
___ pN1b: One clinically detected tumor-involved node with no in-transit, satellite and/or microsatellite metastases#
___ pN1c: Presence of in-transit, satellite and/or microsatellite metastases with no regional lymph node disease
___ pN2: Metastasis in two to three regional nodes or in-transit, satellite, and/or microsatellite with one tumor-involved node
___ pN2a: Two to three clinically occult tumor-involved node (ie, detected by sentinel node biopsy) with no in-transit, satellite and/or microsatellite metastases
___ pN2b: Two to three tumor-involved nodes at least one of which was clinically detected with no in-transit, satellite and/or microsatellite metastases#
___ pN2c: One clinically occult or clinically apparent tumor-involved node with presence of in-transit, satellite and/or microsatellite metastases
___ pN3: Metastasis in four or more regional lymph nodes, or in-transit, satellite or microsatellite metastases with two or more tumor-involved nodes or any number of matted nodes without or with in-transit, satellite or microsatellite metastases
___ pN3a: Four or more clinically occult tumor-involved nodes (ie, detected by sentinel node biopsy) with no in-transit, satellite and/or microsatellite metastases
___ pN3b: Four or more tumor-involved nodes, at least one of which was clinically detected, with no in-transit, satellite and/or microsatellite metastases#
___ pN3c: Two or more clinically occult or clinically detected tumor-involved nodes with in-transit, satellite and/or microsatellite metastases and/or any number of matted nodes with in-transit, satellite and/or microsatellite metastases

 # Note: pN1b, 2b, and 3b subcategories are dependent on clinical information that may be unavailable to the pathologist. If this information is not available, the parent category (pN1, pN2 or pN3) should be selected.

Distant Metastasis (pM) (required only if confirmed pathologically in this case)

Note: AJCC pM category suffixes "(0)" and "(1)", which denote LDH level of elevation, are NOT included in the surgical pathology report. LDH levels, as with other clinical parameters, may be included in the final classification by clinicians with access to this data.

___ pM1: Distant metastasis (documented in this specimen)
___ pM1a: Distant metastasis in skin, subcutaneous tissues, soft tissues including muscle and/or nonregional lymph nodes
___ pM1b: Distant metastasis to lung with or without M1a sites of disease
___ pM1c: Distant metastasis to non-CNS visceral sites with or without M1a or M1b sites of disease
___ pM1d: Distant metastasis to CNS with or without M1a, M1b or M1c sites of disease

Specify site(s), if known: _____

+ Additional Pathologic Findings (select all that apply)

+ ___ Associated nevus (specify type): _____
+ ___ Other (specify): _____

+ Ancillary Studies

Note: For molecular genetic reporting, the CAP Melanoma Biomarker Template should be used. Pending biomarker studies should be listed in the Comments section of this report.

+ Comment(s)

Note: The above protocol is the most recent version available as of the time of publication. The most up to date version of the reporting protocol should always be used.

Available from: https://documents.cap.org/protocols/cp-skin-melanoma-excision-19-4100.pdf

2.4 Melanoma Institute Australia: sentinel node biopsy form

Feature	Description
Anatomical site of sentinel node (node field)	
Number of tumour foci	
Intranodal location involved by tumor	
Maximum dimension of largest deposit (mm)	
Maximum tumour penetrative depth (mm)	
% cross-sectional area of sentinel node involved by tumor	
Perinodal lymphatic invasion	
Extranodal spread	
Immunophenotype of tumour • S-100 • HMB-45 • MelanA	
Nodal naevus cells	
Other comments	

(Courtesy of Professor Richard Scolyer, Melanoma Institute Australia.)

Appendix 3: Example melanoma follow-up schedule

Stage	Clinical Follow Up	Radiology
Melanoma In Situ IA	12 monthly GP review for ten years	N/A
IB, IIA (-ve SNB)	Initial post op review SOPC 6 monthly GP review first two years 12 monthly GP review until year ten	
IB , IIA (no SNB)	6 monthly SOPC review first two years 12 monthly GP review until year ten	**If no SNB and clinically appropriate** USS nodal basin 6 monthly for two years (CT instead if on torso)
IIB (no SNB)	4 monthly review first two years (SOPC/GP) 6 monthly review third year (SOPC/GP) 12 monthly GP review until year ten	**If no SNB and clinically appropriate** USS nodal basin 6 monthly for two years (CT instead if on torso)
IIIA (+ve SNB)	4 monthly review first two years (SOPC/GP) 6 monthly review third year (SOPC/GP) 12 monthly GP review until year ten	**No completion dissection:** Alternate USS nodal basin with CT chest, abdomen, pelvis 6 monthly for three years **Completion node dissection:** CT chest, abdomen, pelvis 6 monthly for one year then annual to three years
IIC IIIB, C, D IV resected	4 monthly review first two years (SOPC/GP) 6 monthly review third year (SOPC/GP) 12 monthly GP review until year ten	CT chest, abdomen, pelvis and MRI brain at three months then 6 monthly for three years then annual for year four and five
IV un-resected	Tailored as indicated by treatment/symptoms/MDT	
Guide	SOPC = Surgical Out-Patient Clinic (Hospital) GP = General Practitioner (Family Doctor)	

Follow up should include:

- Examination of the primary site and nodal basins along with the lymphatic route
- Annual whole body skin surveillance
- Order appropriate next investigations and give sun protection advice

Appendix 4: Feedback contributors

Feedback from the following parties was evaluated by the New Zealand Melanoma Working Group and included where appropriate:

Institution

First edition

Cancer Society New Zealand

New Zealand Dermatological Society Incorporated

New Zealand Medical Association

New Zealand Nurses Organisation Cancer Nurses College

The Royal Australian and New Zealand College of Radiologists

The Royal College of Pathologists of Australasia

Skin Cancer College of Australasia

Second edition

Cancer Society New Zealand

Skin Cancer College of Australasia

New Zealand Dermatological Society Incorporated

New Zealand Association of General Surgeons

Third edition

Cancer Society New Zealand

The Royal College of Pathologists of Australasia

The Royal New Zealand College of Urgent Care

National Radiation Advisory Group

Individual

First edition

Bronwen McNoe, Senior Research Fellow, Social & Behavioural Research Unit, Department of Preventive & Social Medicine, University of Otago
Dr Jeremy Simcock, Plastic Surgeon, Canterbury District Health Board
Dr Jonathan Mathy, Plastic Surgeon, Auckland Regional Plastic, Reconstructive & Hand Surgery Unit; NZ National Burn Unit and Honorary Associate Professor, University of Auckland School of Medicine
Dr Keith Monnington, Skin Cancer Doctor and Immediate Past President of Skin Cancer College of Australasia
Lee-Ann Creagh, Clinical Nurse Specialist, Waikato Hospital
Linda Buxton, Health Promotion, Otago/Southland Division, Cancer Society
Lucia Bercinskas, Senior Policy Analyst, New Zealand Nurses Organisation
Dr Mark Taylor, Clinical Director of Primary and Integrated Care, Waikato DHB
Dr Stuart Johnson, Lead Anatomic Pathologist, Hutt Hospital (Wellington SCL)
Susan Mary Millmow, Clinical Nurse Specialist/Cancer Care Coordinator, Hutt Valley DHB
Dr Amanda Oakley, Dermatologist, Waikato DHB

Second edition

Dr Amanda Oakley, Dermatologist, Te Whatu Ora Waikato
Dr AJ Seine, Dermatologist, Skin Centre

Third edition

Mr Brandon Adams, Plastic Surgeon, Da Vinci Clinic, Tauranga
Mr Jeremy Simcock, Plastic Surgeon, Te Whatu Ora Waitaha Canterbury
Trish Leathem, Skin Cancer Clinical Nurse Specialist, Te Whatu Ora Counties Manuka

Appendix 5: Summary of changes

This section describes the clinical changes made in this edition and the previous one. Minor corrections and editorial changes have not been identified.

	2022, Second Edition	2023, Third Edition
Quality Statement 1.1: Prevention and early detection of melanoma	• Terminology of 'non-melanoma skin cancer' changed to 'keratinocytic skin cancer' • Sunscreen SPF rating changed from "at least 50" to "at least 30 to 50" (GPP 1.1.1) • Shade in public areas broadened to include education spaces and workplaces (GPP 1.1.2) • Inclusion of statement that national and local government develop and implement comprehensive policies and public awareness campaigns (GPP 1.1.2) • Additional references: Ministry of Health (2019), National Cancer Control Policy Contributors (2018), Te Aho o Te Kahu (2022)	• Inclusion of statement that information on referral pathways be made available (Description) • Terminology of 'thicker' changed to 'higher stage' (Rationale) • Reference to months of the year when UVR protection should be used removed (GPP 1.1.1) • Sunscreen SPF rating changed from "at least 30 to 50" to "ideally SPF 50" • Additional reference: Boniol (2012)
Quality Statement 1.3: People at increased risk of melanoma	• Inclusion of use of sequential digital epiluminescent microscopy (SDELM) for high-risk patients (Rationale and GPP 1.3.2) • Additional references: Altamura (2008), Haenssle (2010), Menzies (2001)	

Quality Statement 3.1: Patient access to trained health care professionals	• Previous GPP 3.1.9 which stated that "the nurse provide appropriate strategies to help the patient self-manage their disease" moved to GPP 8.1.1. • Additional reference: Cancer Council Australia Melanoma Guidelines Working Party (2019)	
Quality Statement 3.2: Excision of melanocytic lesions	• Reference to Langer's lines removed and replaced with statement that excision biopsies on the extremities be longitudinally orientated following the direction of lymphatic flow (GPP 3.2.7) • Additional references: Cancer Council Australia Melanoma Guidelines Working Party (2019), Paul (2018), van Akkooi	
Quality Statement 3.4: Time to diagnosis		• Chapter title changed to "Time to *pathological* diagnosis" (Title)
Quality Statement 3.6: Radiological staging	• Addition of statement that negative nodal basin US is not a substitute for biopsy of clinically suspicious lymph nodes (GPP 3.6.7) • Clarification that brain MRI is preferred over CT **if** diagnosing brain metastases early will alter management of the patient (GPP 3.6.9)	• Description and good practice points significantly reworked to merge recommendations from description into good practice points • Level of risk added as a dependency for radiological staging (Description) • Addition of statements addressing oligometastasis, asymptomatic metastases and patient factors/co-morbidities (Description). • Inclusion of statement about usefulness of PET-CT in establishing a baseline for future surveillance (Rationale) • Inclusion of information on NICE guidelines (2022) use of CT imaging for staging of IIB and IIC disease (Rationale)

		• Reference to MIA Stage II prediction tool added (GPP 3.6.3) • Additional references: Ravichandran (2020), NICE Guidelines (updated to 2022), Melanoma Institute of Australia (2024)
Quality Statement 4.1: Multidisciplinary meetings	• Geriatrician and Māori and Pacific liaison included as other ideal MDT members (GPP 4.1.1)	• Assessment of patient appropriateness for clinical trials included in details recorded at MDM (GPP 4.1.3) • Additional references: Te Aho o Te Kahu (2021), Ministry of Health (2012)
Quality Statement 5.1: Re-excision of histologically confirmed melanomas	• New good practice point (5.1.7) to address margin-controlled surgery as a management option for in situ or invasive melanoma of lentigo maligna sub-type • Additional references: Ad Hoc Task Force (2012), Moyer (2017), Zitelli (1997)	• Addition of statement on pathological excision margins and the need for further re-excision if WLE has residual melanoma (Rationale) • Addition of statement on excision of amelanotic and desmoplastic melanoma (Rationale) • Inclusion of information on Moncrieff trial (Rationale) • Additional reference: Moncrieff (2018)
Quality Statement 5.3: Sentinel node biopsy technique	• Additional reference: Rivalland (2022)	• Updated reference: NICE guidelines
Quality Statement 5.4: Therapeutic/completion lymphadenectomy	• Rationale significantly revised • Statement added that ilioinguinal node dissection be performed if the second-tier node of a positive SNB (not deemed appropriate for observation) is in the iliac chain on lymphoscintigraphy (GPP 5.4.9)	• Reference to NZ retrospective studies and future research on surveillance for high risk groups (Rationale) • Addition of statement that patients with positive sentinel nodes be discussed at MDM and the patient

	• Good practice point 5.4.13 on mean nodal harvest numbers for therapeutic node dissection removed - for further review and adjustment to minimum numbers as part of 2023 review • Additional references: Broman (2021), Leiter (2019), Owen (2020), Rauwerdink (2020)	made aware of the pros and cons of management approaches (Rationale) • Addition of statement on importance of radiological surveillance in observation (Rationale) • Additional references: Williams (2021, 2023), NICE guidelines (updated)
Quality Statement 5.5: Adjuvant therapy	• Inclusion of neo-adjuvant systemic treatment in rationale • Additional references: Blank (2022), Long (2019), Rozeman (2019), Te Aho o Te Kahu (2022)	• Chapter title changed to "Adjuvant *and neoadjuvant* therapy" (Title) • Inclusion of neo-adjuvant therapy in description (Description) • Neoadjuvant therapy trial data updated (SWOG 1801) (Rationale) • Additional references: Patel (2023)
Quality Statement 5.6: Patients with loco-regionally recurrent, locally advanced and stage IV melanoma	• Inclusion of systemic treatment with anti-PD1 based combination immunotherapy and molecularly targeted therapy inhibitor in rationale • Additional references: Ascierto (2021), Drummer (2018), Larkin (2019), Robert (2019), Tawbi (2022), Te Aho o Te Kahu (2022)	• Use of intralesional and topical treatments amended to be as a second-line treatment option only (GPP 5.6.1)
Quality Statement 6.1: Clinical follow-up and surveillance	• Monitoring process for patients at risk of lymphoedema added as GPP 6.1.4 • Additional references: Hidding (2016), Hyngstrom (2013), Ridner (2019), Rockson (2019)	
Quality Statement 6.3: Follow-up cross-sectional imaging	• NCCN example of cross-sectional imaging surveillance updated to align with 2022 edition	• Addition of statements addressing oligometastasis, asymptomatic metastases and patient factors/co-morbidities (Description).

		• Description and good practice points significantly reworked to merge recommendations from description into good practice points • Data from Bleischer et al 2020 and reference to NICE guidelines added (Rationale) • Research on effectiveness of surveillance CT and PET-CT added (Turner, Podlipnik) (Rationale) • Statement on use of imaging in younger and pregnant patients added (Rationale) • Inclusion of good practice point on use of imaging in younger or pregnant patients (GPP 6.3.4) • Additional references: Bleicher (2020), Ibrahim (2020), Joseph (2018), Kaste (2011), Park (2017), Melanoma Focus (2023), Lewin (2018), Lim (2018), Turner (2021), Nice Guidelines (updated), NCCN (updated to 2023)
Quality Statement 6.4: Ultrasound imaging of draining node basins	• GPP 6.4.3 updated to specify imaging for the torso	• Terminology of 'fields' changed to 'basins'
Quality Statement 7.1: Supportive care		• Additional references: Cancer Society (2018)
Quality Statement 8.1: Care coordination	• Vocation of care coordinator changed from clinical nurse specialist to a health professional with special interest in melanoma (Rationale) • GPP 8.1.1 updated to include self-management of disease (moved from GPP 3.1.9)	• Example of how care could be coordinated provided (GPP 8.1.1)
Appendices	• Example melanoma follow-up schedule added (Appendix 3)	• Link to RCPA reporting form updated (Appendix 2.2)

		• Appendix 2.2 (RCPA Structured Reporting Protocol) updated to 3rd edition