Melanoma Identification & Biopsy

Matthew J. Laschuk, MD, FRCSC, FACS
June 13, 2025

Disclosures

- None

Goals

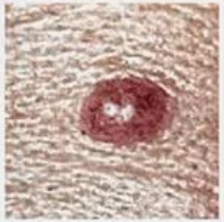
1. Melanoma Overview
2. Melanoma Biopsy
3. Review staging updates per AJCC 8th edition

Melanoma

Melanoma

- Malignant transformation of Melanocytes
  - Pigment producing cells within the basal epidermis
- Most commonly in light skinned patients
- Highly correlated with UV exposure[1]
- 3% of skin cancers
  - 65% of skin cancer mortality[2]

Clinical Detection

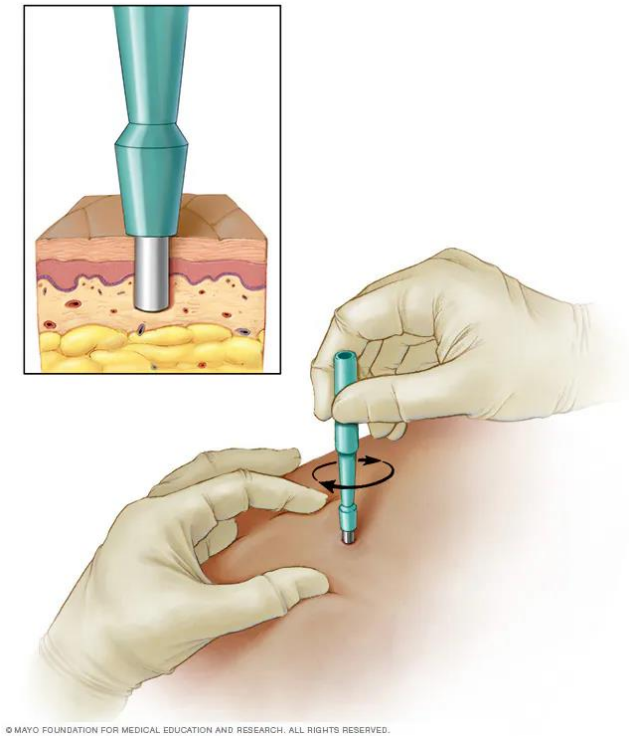
Normal Mole	Melanoma	Sign	Characteristic
		Asymmetry	when half of the mole does not match the other half
		Border	when the border (edges) of the mole are ragged or irregular
		Color	when the color of the mole varies throughout
		Diameter	if the mole's diameter is larger than a pencil's eraser

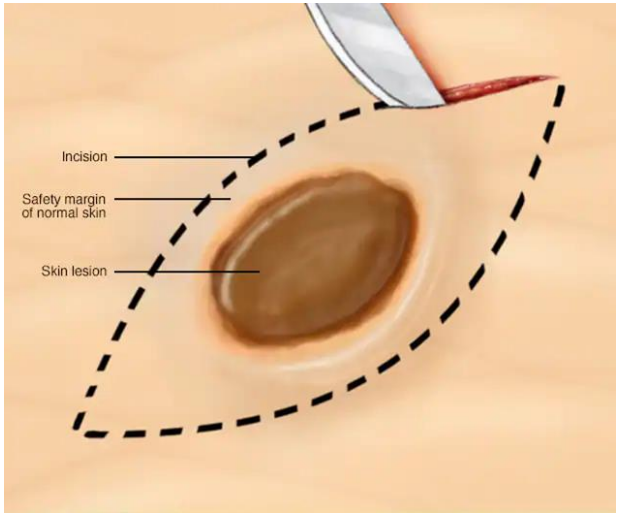
Photographs Used By Permission: National Cancer Institute

In the presence of clinical suspicion
BIOPSY

Biopsy Techniques

1. Excisional biopsy
2. Incisional biopsy
3. Punch Biopsy
4. Shave Biopsy

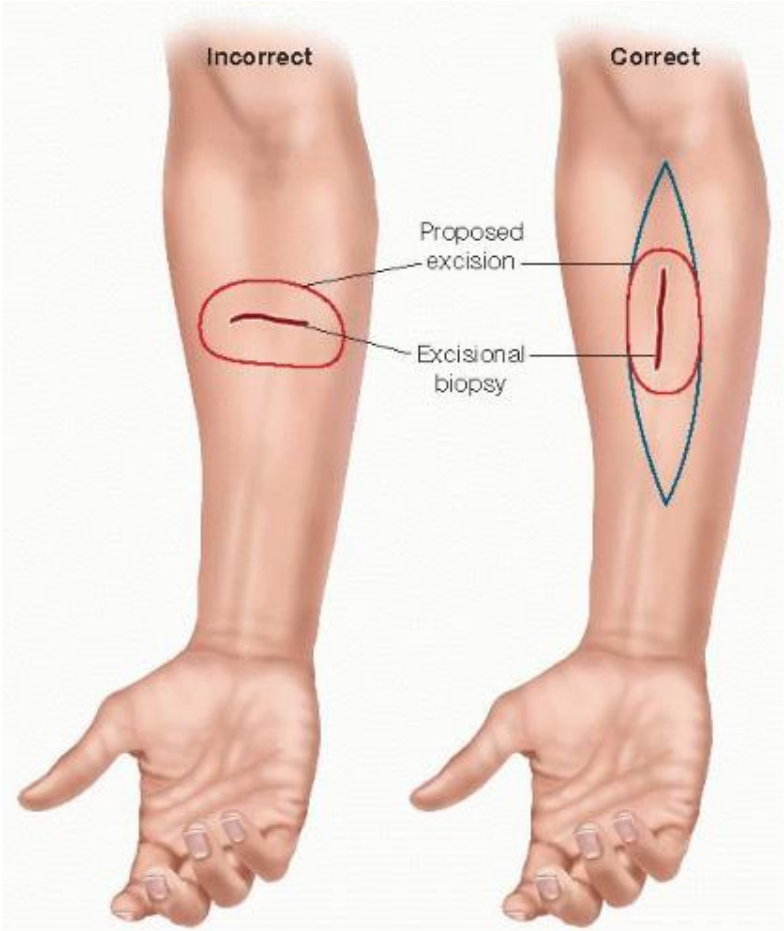




Excisional Biopsy

- Removal of the lesion with minimal margins
- Gold standard for biopsy of pigmented lesions

- Minimize tissue disruption/undermining
- Plan resection lines for later wider resection
  - Longitudinal resection on extremities

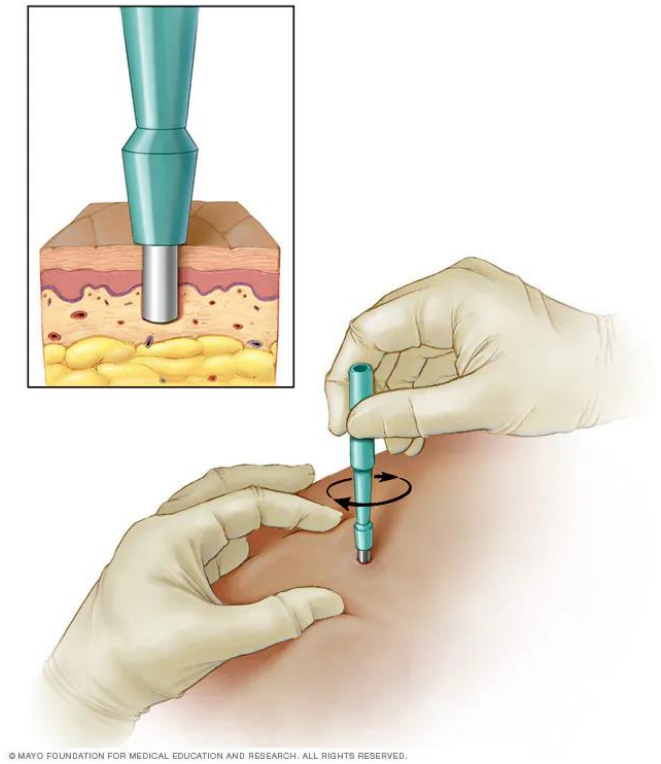


Incisional Biopsy

- A compromise
- Used if the lesion is too large for simple removal OR
  - Too large for your comfort level
- Select the most suspicious area for biopsy
- Still has high diagnostic value

Punch Biopsy

- A type of INCISIONAL biopsy
- Fast
- Easy
- Diagnostically valuable
- Select the thickest, most concerning portion of the lesion
- Take the biopsy into the subcutaneous fat



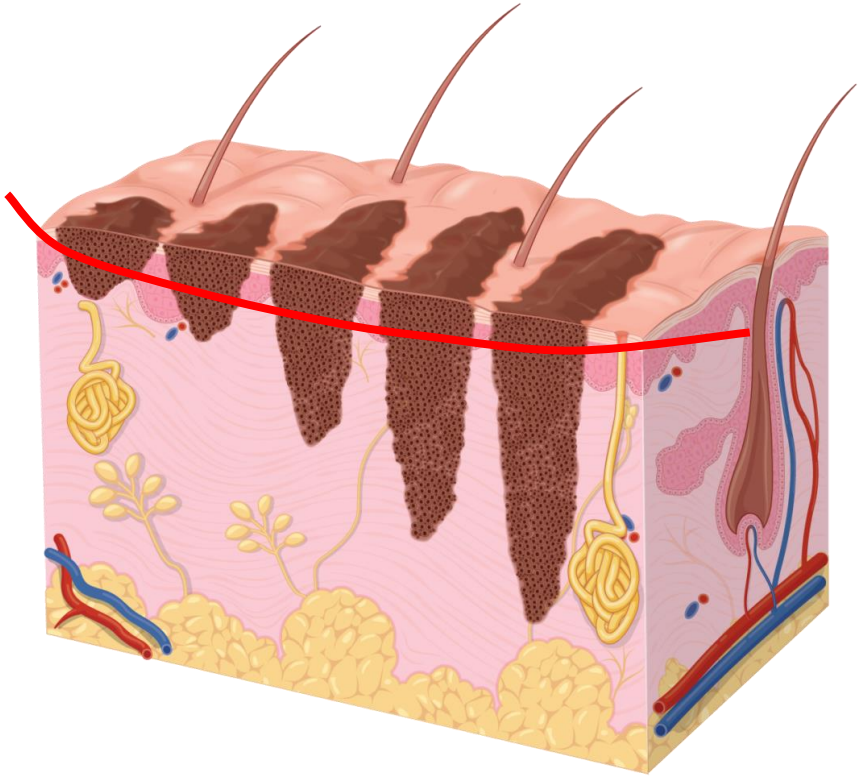
Punch Biopsy

Pearls:

1. Use local *with epinephrine*. Everywhere.
2. Select the largest punch you can to include the whole lesion
3. If unable to remove lesion with punch, select at least 3-4mm

Shave Biopsy

- A tangentially excised biopsy specimen
- Usually transected in the mid dermal plane
- *Irresponsible* to perform on a PIGMENTED lesion without near certainty it is benign
- Regularly compromises staging of Melanoma **PERMANENTLY**



Biopsy Take-aways

1. When in doubt, take a biopsy!
    a. Biopsy of the lesion is the fastest route to appropriate management
2. Excisional biopsy is best, but punch biopsy is acceptable
3. NEVER shave a pigmented lesion with any diagnostic uncertainty

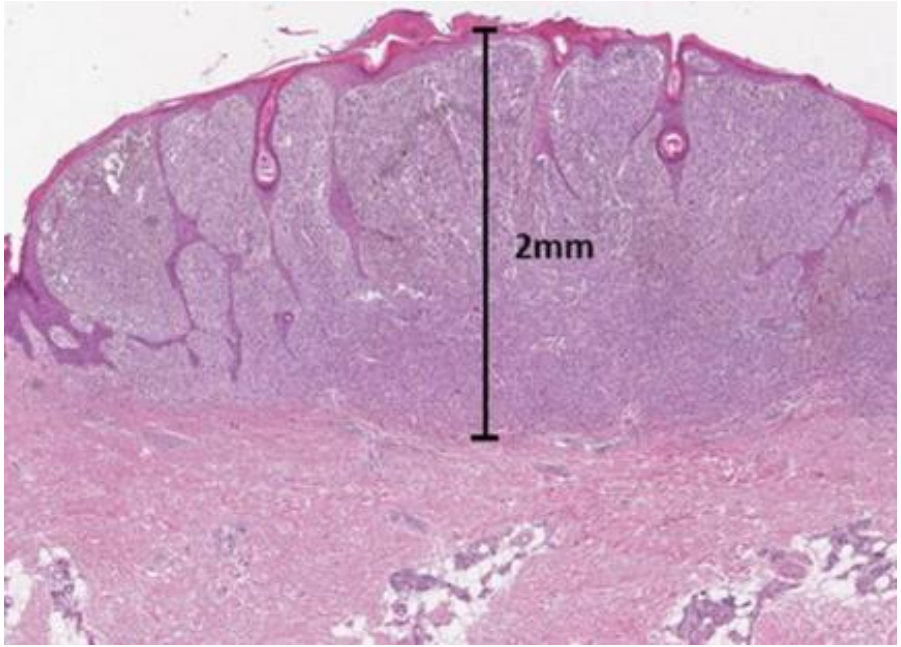
Preoperative Imaging

- Patients with M*is* and *clinically* node negative disease do not require preoperative imaging[3]
- Consideration should be given to nodal assessment in equivocal Lymph node basin exams (ie/ morbidly obese patients)

Staging - AJCC 8th Edition

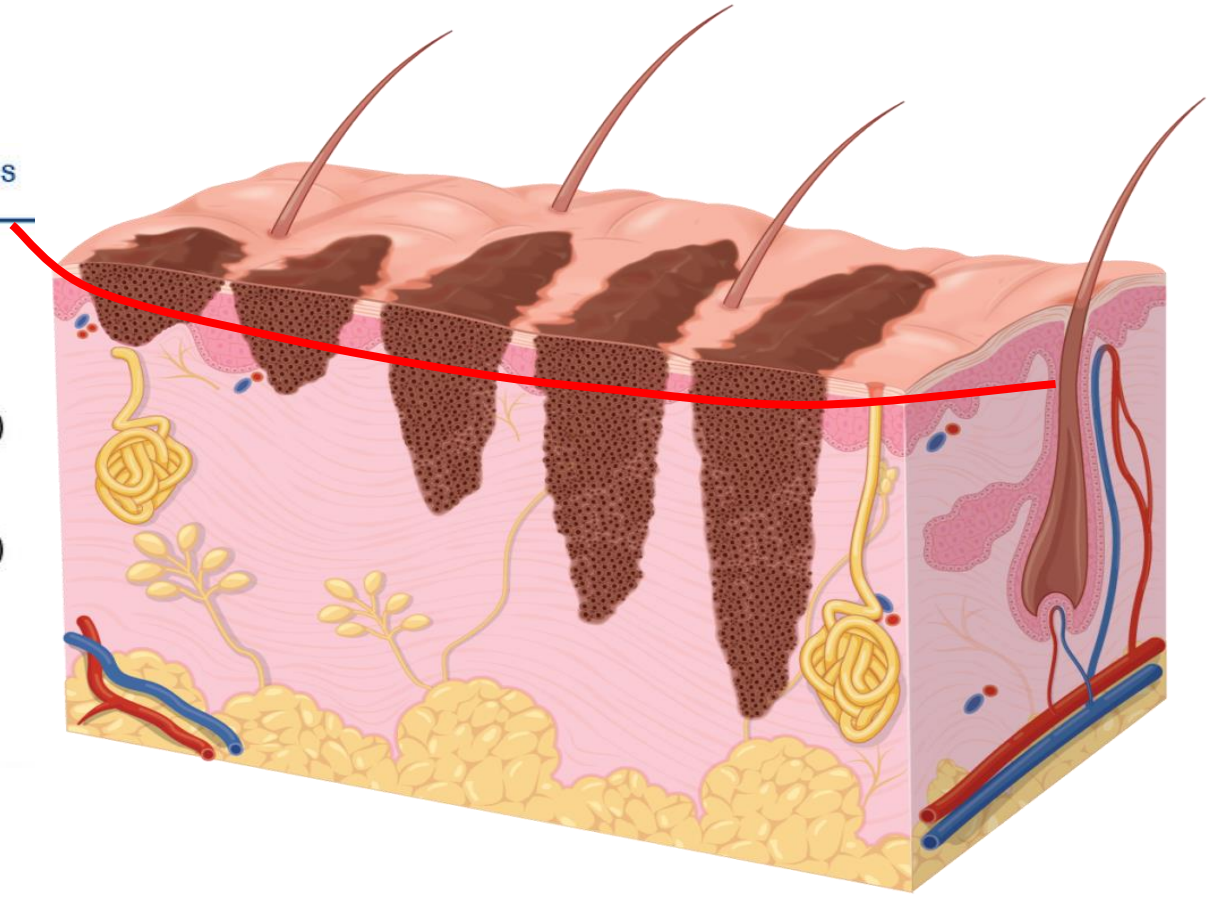
Primary Tumour - T

- Based upon ***Breslow Depth*** and presence or absence of ***Ulceration***
- Breslow Depth
  - Vertical depth of tumour extension on microscopy
  - Increases in initial depth correlate with increased risk of metastasis[1]



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

T CLASSIFICATION	THICKNESS (mm)
T1	≤1.0
T2	1.1-2.0
T3	2.1-4.0
T4	>4.0



Regional Lymph Nodes - N

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:

Distant Metastasis - M

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

Staging

ANATOMIC STAGE/PROGNOSTIC GROUPS							
Clinical Staging[3]				Pathologic Staging[4]			
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	M0	M0
	T3a	..	..		T2a	..	..
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

Staging

1. Stage I - Stage II disease
    a. Based EXCLUSIVELY on the *Breslow depth* and *ulceration*

ANATOMIC STAGE/PROGNOSTIC GROUPS							
Clinical Staging[3]				Pathologic Staging[4]			
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	M0	M0
	T3a	..	..		T2a	..	..
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

Staging

1. Stage I - Stage II disease
    a. Based EXCLUSIVELY on the Breslow depth
2. Stage II vs. Stage III/IV
    a. Presence of metastasis

ANATOMIC STAGE/PROGNOSTIC GROUPS							
Clinical Staging[3]				Pathologic Staging[4]			
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	M0	M0
	T3a	..	..		T2a	..	..
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

Surgical Management

Resection Margins

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

Sentinel Lymph Node Biopsy

Sentinel Lymph Node

- The first lymph node(s) within the lymphatic basin reached by lymph draining from the primary lesion[4]
- Complete nodal staging can be obtained by focused sampling of the sentinel lymph node alone

Sentinel Lymph Node Biopsy

- Surgical technique that employs preoperative lymphoscintigraphy to facilitate surgical biopsy of the sentinel lymph nodes without complete lymphadenectomy

Sentinel Lymph Node Biopsy - Who gets one?

T1a

- <0.8mm tumour
- Statistical risk of positive biopsy <5%[3]
- NOT typically recommended

T1b

- 0.8mm-1.0mm tumour
- OR <1.0mm *with* ulceration

- Risk of positive biopsy 5-10%[3]
- Sentinel Node Biopsy recommended

Adjuvant Therapy

- Will be covered next by Dr. Mathews

Candidates:

1. Stage III or IV disease
    a. Ie/ Nodal or distant metastasis
2. Locally advanced disease
    a. Stage IIb/IIc
        i. Based exclusively on breslow depth

Key Points

1. Melanoma is a relatively rare but Do-Not-Miss diagnosis
2. Early biopsy is critical
    a. Results in most expeditious and accurate management
    b. Surgical and adjuvant therapy decisions CANNOT be made until biopsy result is available
3. Full thickness biopsies are best
    a. Excisional or punch

References

1. Amin MB, Edge SB, Greene FL, et al., eds. AJCC Cancer Staging Manual. 8th ed.New York: Springer, 2017
2. Naik, P. P. (2021). Cutaneous Malignant Melanoma: A review of Early Diagnosis and Management. *World Journal of Oncology*, *12*(1), 7–19. https://doi.org/10.14740/wjon1349
3. Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Guideline Melanoma: Cutaneous V.2.2025. © National Comprehensive Cancer Network, Inc. 202X. All rights reserved. Accessed May 2025. To view the most recent and complete version of the guideline, go online to NCCN.org.
4. Morton, D. L., Cochran, A. J., Thompson, J. F., Elashoff, R., Essner, R., Glass, E. C., Mozzillo, N., Nieweg, O. E., Roses, D. F., Hoekstra, H. J., Karakousis, C. P., Reintgen, D. S., Coventry, B. J., & Wang, H. (2005). Sentinel node biopsy for Early-Stage melanoma. *Annals of Surgery*, *242*(3), 302–313. https://doi.org/10.1097/01.sla.0000181092.50141.fa

Questions?