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Characteristics and diagnostic performance of pathologists who enjoy interpreting melanocytic lesions

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Abstract

Diagnostic discrepancy among pathologists interpreting melanocytic skin lesions (MSL) is an ongoing concern for patient care. Given that job satisfaction could impact patient care, this study aimed to characterize which pathologists enjoy interpreting MSL and estimate the association between enjoyment and diagnostic accuracy. Pathologists' demographics, training, and experience were obtained by a cross-sectional survey. Associations between these characteristics and self-reported enjoyment when interpreting MSL were estimated by Pearson's Chi-square tests. Diagnostic accuracy was determined by comparing pathologists' MSL interpretations with reference standard diagnoses. Associations between enjoyment and diagnostic accuracy were evaluated by generalized estimating equations (GEE) models. One hundred and eighty-seven (90%) pathologists completed the study. Seventy percent agreed that interpreting MSL is enjoyable. Pathologists who enjoyed interpreting MSL were more likely to be board certified and/or fellowship trained in dermatopathology. (P=0.008), have ≥10 years of experience (P=0.010) and have an MSL caseload of ≥60 per month (P=<0.001). After adjustment, there was no association between enjoyment and diagnostic accuracy. Our data suggest that job dissatisfaction does not adversely affect diagnostic accuracy in the interpretation of melanocytic lesions, which is of importance given the progressive increase in annual biopsy rates and the attendant work demands imposed on pathologists.

Keywords: dermatopathology, diagnostic performance, melanocytic skin lesions

Introduction

The incidence of melanoma is rising faster than any other cancer [1], in part owing to an annual increase in skin biopsies since 2002 [2]. Melanocytic lesions can be challenging to interpret. Previous studies have noted substantial and frequent diagnostic errors in interpreting skin biopsies [3-6]. Diagnostic discrepancies cause harm to patients by preventing or delaying appropriate treatment, providing unnecessary or harmful treatment, or resulting in adverse psychological or financial repercussions [7]. Because of the clinical implications that diagnostic discrepancies have on patient safety and quality of care, it is important to further evaluate the potential sources of these discrepancies.

Physician job satisfaction, or enjoyment in daily clinical activities, is likely to impact physician

performance. Job satisfaction and burnout among physicians has been studied within the dermatology, pathology and dermatopathology fields [8-12]. Shanafelt et. al. found that, among pathologists and dermatologists, self-reported amount of burnout increased and amount of satisfaction with work-life balance decreased between 2011-2014 [11]. An earlier study identified a strong correlation between job satisfaction and the perceived ability to deliver optimal patient care among dermatologists [12]. Pathologist frustration with clinician-pathologist communication is likely to also play a role in diagnostic performance; a study of over 500 American Society of Dermatopathology (ASDP) dermatopathologists showed that there was a significant amount of dissatisfaction with the quality of clinical information in the requisition form that they are given to make a definitive diagnosis [13]. Pathologists currently face additional challenges and demands with the implementation and increasing use of electronic medical records [14]. Since 2014, patients have been able to receive direct access to their laboratory reports and the resulting risk of patient misinterpretation of reports and the associated demand on pathologists to respond to direct patient inquiries or requests is substantial [15]. Similarly, research on pathologist workload and demands on performance have identified limitations in clinical practice with the potential to contribute to major medical errors which can adversely affect patient care [16].

No known literature exists that evaluates the association between job satisfaction and diagnostic performance among pathologists when interpreting melanocytic skin lesions (MSL). In this study, we characterize the pathologist attributes that are correlated with enjoyment of MSL interpretation and evaluate whether level of enjoyment is associated with diagnostic accuracy using data from a national study of skin pathologists.

Methods

Study population - During the period of July 2013-March 2015 we invited pathologists who interpreted skin tissue and practiced in one of the following states: California, Connecticut, Hawaii, Iowa, Kentucky, Louisiana, New Jersey, Utah, New Mexico, Washington, to participate in a nationwide study called the Melanoma Pathology Study (M-Path). Pathologists were considered eligible if they interpreted MSL as part of their usual caseload, had been interpreting for at least one year before the start of the study, and planned to continue interpreting MSL for the next two years. We identified potentially eligible pathologists through purchased membership lists from the Collage of American Pathologists and the American Society of Dermatopathology, Internet searches, and telephone calls to pathology laboratories. We excluded residents and fellows. Pathologists were asked to confirm their eligibility status through an email invitation or phone call; they could select from one of three options: eligible and interested, eligible but not interested/available, and not eligible. The Institutional Review Boards at the University of Washington, Dartmouth College, Oregon Health and Science University, Rhode Island Hospital, and Fred Hutchinson Cancer Research Center approved study activities.

Pathologist survey - The pathologist survey (Appendix) assessed participant demographics, training, and experience. A variable for total MSL caseload (<60 versus. ≥60 cases per month) was created by combining participants' responses to two survey questions, "in a typical month, how many cases of melanoma (including both melanoma in situ and invasive melanoma) do you interpret?" and "in a typical month, how many benign melanocytic skin lesions do you interpret?" Additionally, participants reported their level of agreement using a 6-point Likert scale from 1 ('strongly disagree') to 6 ('strongly agree') when asked to rate the statement, "interpreting melanocytic skin lesions is enjoyable." For the analysis, we collapsed the Likert responses to this question into the following four comparison groups: 1) disagree (includes 'strongly disagree' and 'disagree' and 'slightly disagree') and 2) agree (includes 'slightly agree', 'agree' and 'strongly agree'). A full copy of the survey is shown in the Appendix.

Participant and reference diagnoses - Once the survey was complete, participants were randomly assigned to independently interpret one of five sets of 48 skin

pathology cases in glass-slide format by completing an online Melanocytic Pathology Assessment Tool and Hierarchy for Diagnosis (MPATH-Dx) histology form for each case [17]. The 240 cases included in these sets were stratified by patient age and medical chart documentation of the original diagnosis. Additional information on the development and allocation of the cases is reported elsewhere [17-19]. All 240 cases, with one glass slide per case, were previously reviewed independently by three highly experienced consensus panel dermatopathologists and then again together as a group to reach a consensus reference diagnosis for each case [18]. The same 240 glass slides were then allocated to sets and randomly assigned to participating pathologists. Each set consisted of cases that, based on consensus panel review, ranged from benign MSL to invasive melanoma, with an equal distribution of the different histological subtypes. Pathologists' diagnoses for each case were mapped to one of five MPATH-Dx classes [17].

Statistical analysis

Associations between pathologist characteristics and enjoyment of interpreting MSL were tested for statistical significance using Pearson's Chi-square tests. Diagnostic performance was defined as the overall discordance and concordance proportions when comparing participant case interpretations to the reference standard diagnosis. Discordance for each case was defined as a participant diagnosis that was classified into a different MPATH-Dx class compared to the reference standard diagnosis, whereas concordance was defined as a participant diagnosis that was classified into the same MPATH-Dx class as the reference standard diagnosis. The statistical significance of the comparison was determined by use of logistic regression models with concordance versus. discordance as the binary outcome and enjoyment as the predictor of interest. Unadjusted and adjusted models were fit with generalized estimating equations (GEE) using an independence working correlation matrix, owing to our assumption that case interpretations between participants are independent from each other. We identified pathologists as the independent units of analysis. Two-sided P values were based on Wald statistics. All statistical analyses were performed with STATA version 14 (StataCorp. 2015. Stata Statistical Software: Release 14, College Station, TX).

Results

Pathologists' characteristics and enjoyment of interpreting MSL - Of 301 eligible pathologists, 207 (68.8%) completed the survey and 187 of the 207 (90%) completed interpretations of 48 glass slides. The pathologist recruitment flow is shown in **Figure 1**. There were no statistically significant differences among the 207 eligible pathologists who agreed to participate and the 94 who were eligible but declined to participate with respect to mean age, time spent in direct medical care, or practice in a community of ≥250,000 people (data not shown). To

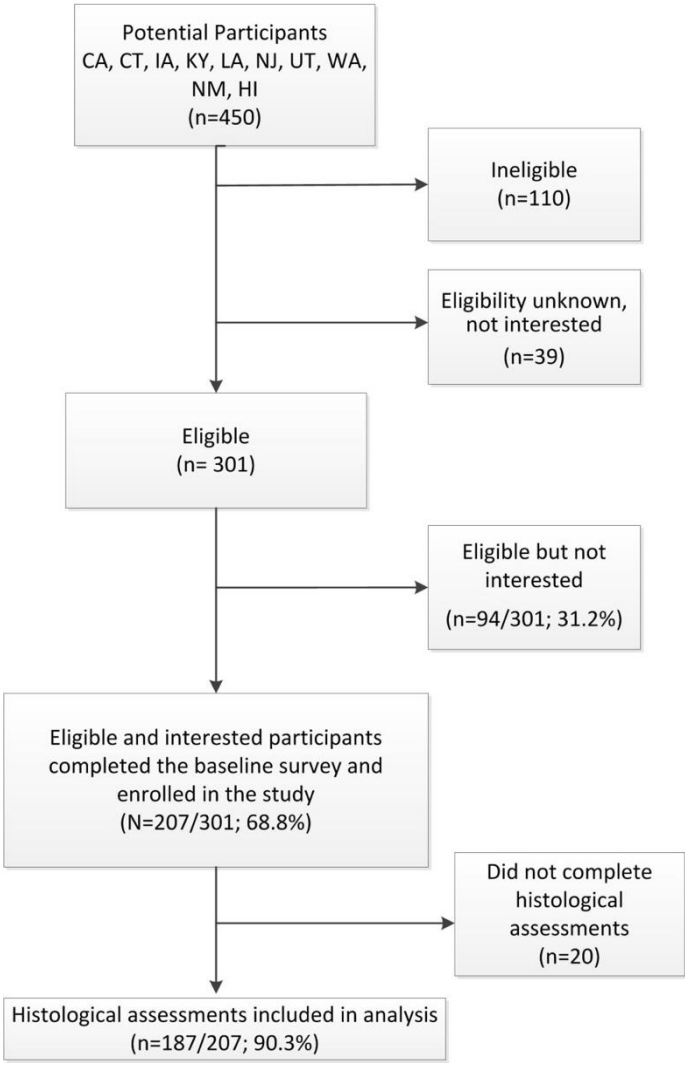

Figure 1. *Recruitment flowchart of invited M-Path Study pathologists.*

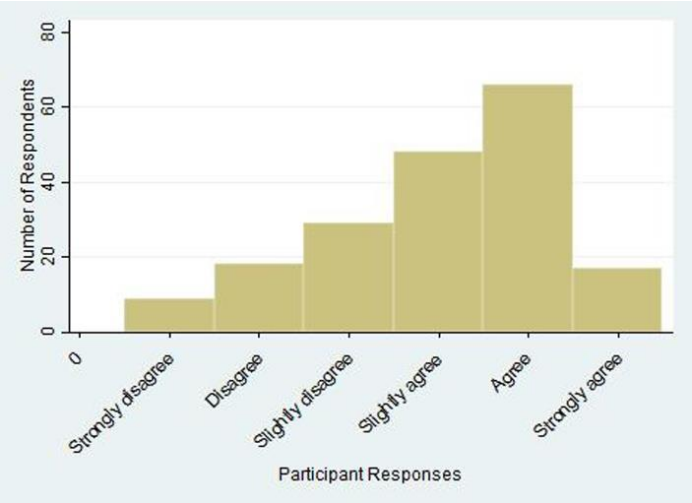

Figure 2. *Responses of pathologists (N=187) to the survey question (submitted as an Appendix), "interpreting melanocytic skin lesions is enjoyable."*

make valid comparisons between the associations of enjoyment with characteristics from the survey and data on their subsequent diagnostic accuracy, main analyses were conducted among the 187 pathologists who completed their diagnostic interpretations on the cases and the remaining 20 were thus excluded.

Most of the pathologists were 50 years or older (53%), male (61%), not affiliated with an academic medical center (72%), not board certified and/or fellowship trained in dermatopathology (60%). In addition, most had ≥10 years of experience interpreting melanocytic skin lesions (60%), had a ≥10% usual caseload of melanocytic skin lesion cases (58%), interpreted <60 MSL cases per month (52%), requested a second opinion for <4 MSL cases per month (51%), and had never been named in a malpractice suit (67%), (**Table 1**).

Among the 187 participating pathologists, when asked about whether or not they agreed with the statement "Interpreting melanocytic skin lesions is enjoyable," most said that they agreed (131/187; 70%), (**Figure 2**). Pathologists who reported enjoying interpreting MSL were more likely than those who did not enjoy to be board certified and/or fellowship trained in dermatopathology (*P*=0.008), have ≥10 years of experience interpreting MSL (*P*=0.010), and interpret a total MSL caseload volume of ≥60 cases per month (*P*<0.001). These factors were identified as confounders of the association between enjoyment of MSL interpretation and diagnostic accuracy. Self-reported level of enjoyment when interpreting MSL was not associated with the following: pathologist's age at time

of the survey, gender, affiliation with an academic medical center, percent of caseload interpreting MSL, or number of second opinions they requested per month. Enjoyment also did not correlate with whether or not they had ever been named in a medical malpractice lawsuit (**Table 1**).

Agreement with the reference standard diagnosis - The unadjusted association between pathologists' report of enjoyment when interpreting MSL and their diagnostic accuracy compared to the reference standard diagnosis was positively correlated and statistically significant (OR 1.25; 95% CI 1.07, 1.45). After adjustment for pathologists' board certification and/or fellowship training, number of years' experience, and total MSL caseload volume per month, we found no significant association that pathologists' enjoyment of interpreting MSL influences their accuracy with the reference standard diagnosis (OR 1.07; 95% CI 0.94, 1.22).

Discussion

Most pathologists in the study indicated that they agreed that interpreting melanocytic skin lesions is an enjoyable part of their clinical practice. Pathologists reporting enjoyment in their interpretation of MSL were more likely to be older, male, and affiliated with an academic medical center. They had more years of experience with interpreting MSL cases compared to the pathologists who did not enjoy interpreting these lesions. After adjustment, there were no differences in agreement with the reference standard diagnosis according to enjoyment of interpreting MSL.

Given the increase in skin biopsies and subsequent increasing workload demands on pathologists who interpret skin cases, which could create the potential for job dissatisfaction, it is reassuring to know that enjoyment of interpreting MSL is not independently associated with diagnostic accuracy. There is also

evidence of a workforce shortage for pathology in the United States, leading to deficiencies in pathologists' abilities to provide effective health care to patients [20]. Therefore, it is important that future pathologists who are entering the workforce be satisfied with their choice of specialty and continue to work in the field. Our result of a high frequency of enjoyment among pathologists who interpret skin cases is consistent with other studies [8, 12].

A similar study on enjoyment of breast pathology interpretation also found no association with diagnostic performance but did similarly identify number of cases interpreted per week as statistically significantly associated with enjoyment [21]. It is likely that indicators of caseload volume and training or experience have an impact on job satisfaction and diagnostic accuracy owing to the resulting increase in skill and confidence. Radiologists who reported higher confidence or less uncertainty in their mammographic assessments had higher positive predictive values for detecting cancer and lower recall rates, especially among low-volume readers [22-24]. The clinical experience level and training of dermatologists or dermatopathologists has also been shown to have an impact on diagnostic accuracy of malignant melanomas [4, 25]. Board certification and/or fellowship training in dermatopathology among pathologists is associated with greater diagnostic accuracy, particularly when providing second opinions, which can have major implications for patient treatment [4].

This study has several strengths and limitations. Data was gathered on enjoyment from a single self-reported question. Gathering more comprehensive information (e.g. income, mental health history, primary practice setting, work/life balance) and using it to develop a validated measurement of enjoyment may have resulted in a different distribution among the participants, which could have led to a more sensitive estimate of the exposure. It is also possible that those pathologists who responded to our study invitation were more interested in MSL interpretation. We were also not able to confirm the accuracy of the reference standard diagnosis owing to patient biopsy interruption of the biological course of the disease. However, the reference panel consisted of three internationally recognized dermatopathologists who participated in a rigorous review process of all 240 cases. Additionally, the cross-sectional design of the study prohibits causal inferences and residual or unmeasured confounding remains a possibility. It is difficult to determine the temporality of the associations between enjoyment and diagnostic accuracy; it may be that if a pathologist is more proficient in their diagnosis of MSL cases, then they are more likely to enjoy the outcomes of better patient care. However, as the first study to our knowledge to identify characteristics that are correlated with enjoyment of interpreting MSL and to estimate the association between enjoyment and diagnostic accuracy among pathologists who interpret MSL, this study provides context for future research to potentially replicate and expand upon our findings.

Conclusion

To conclude, most pathologists in this study reported enjoying their work related to interpretation of MSL. Pathologists who reported that they were board certified and/or fellowship trained in dermatopathology, had more years of experience, and had a higher MSL caseload per month were more likely to find their clinical practice enjoyable. These factors also have implications for diagnostic accuracy and patient care. Although we found no association between enjoyment and diagnostic accuracy, it is important to know that enjoyment of MSL interpretation among pathologists does not appear to be a significant driver of diagnostic discrepancy. More research on the underlying contributors to the job satisfaction of skin pathologists, including their workload, compensation, or work environment could provide a better understanding of how job satisfaction influences patient outcomes.

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Table 1. *Characteristics of pathologists responding to the baseline survey (N = 187), by self-reported enjoyment of interpreting melanocytic skin lesion pathology.*

		Interpreting melanocytic skin lesions is enjoyable, N (%)		
Pathologist Characteristics	**Total, N**	**Disagree[b]**	**Agree[b]**	**P-value[a]**
Total	187	56 (30)	131 (70)	
Demographics				
Age at survey (yrs.)				
<50	87	31 (36)	56 (64)	0.11
≥50	100	25 (25)	75 (75)	
Gender				
Male	114	29 (25)	85 (75)	0.093
Female	73	27 (37)	46 (63)	
Training and experience				
Affiliation with academic medical center				
No	134	45 (34)	89 (66)	0.084
Yes, adjunct/affiliated or primary appointment	53	11 (21)	42 (79)	
Board certified and/or fellowship trained in Dermatopathology				
No	113	42 (37)	71 (63)	0.008
Yes	74	14 (19)	60 (81)	
Years interpreting melanocytic skin lesions				
<10	74	30 (41)	44 (59)	0.010
≥10	113	26 (23)	87 (77)	
Percent of caseload interpreting melanocytic skin lesions				
<10%	79	26 (33)	53 (67)	0.45
≥10%	108	30 (28)	78 (72)	
Total melanocytic lesion case load volume[c]				
<60 per month	98	42 (43)	56 (57)	<0.001
≥60 per month	89	14 (16)	75 (84)	
In a typical month, for how many melanocytic skin lesion cases do you request a second opinion?				
<4	96	27 (28)	69 (72)	0.58
≥4	91	29 (32)	62 (68)	
Have you ever been named in a medical malpractice suit?				
No, never been sued	126	36 (29)	90 (71)	0.56
Yes, suit(s) related to melanocytic skin lesions or related to other pathology or medical cases [d]	61	20 (33)	41 (67)	

[a] P-value for agree vs. disagree from the Pearson's Chi-square test

[b] Dichotomized responses for enjoyment are defined as Likert responses 'slightly agree', 'agree' and 'strongly agree' and no enjoyment defined as Likert responses 'strongly disagree', 'disagree' and 'slightly disagree'.

[c] total MSL caseload per month includes both melanoma (melanoma in situ and invasive melanoma) and benign MSL cases.

[d] Includes any suit filed and either dropped, settled out of court, or gone to trial

Appendix.

melanoma pathology study

Survey of Pathologists

Instructions: This survey takes < 10 minutes to complete. It asks about your background and important general issues related to research and clinical care in skin pathology.

General Professional Information

PART 1

1. In what year were you born?

(yyyy)

2. What is your gender?

- Male
- Female

3. Are you affiliated with an academic medical center?

- No
- Yes, adjunct/affiliated clinical faculty
- Yes, primary appointment

4. In which of the following disciplines have you completed a residency program? (check all that apply)

- Dermatology
- Anatomic/Clinical Pathology
- Other

5. In which of the following disciplines have you completed a fellowship program? (check all that apply)

- No fellowship
- Surgical Pathology
- Dermatopathology

- [ ] Other

6. In which of the following disciplines are you board certified? (check all that apply)

- [ ] Not board certified
- [ ] Dermatology
- [ ] Anatomic Pathology
- [ ] Clinical Pathology
- [ ] Dermatopathology
- [ ] Other

Next >>>

0%

melanoma pathology study

Melanocytic Skin Lesions

PART 2

7. The following questions are about your experience interpreting melanocytic skin lesions specifically.

7a. How many years have you been interpreting melanocytic skin lesions (not including residency/fellowship training)?

- < 1 year
- 1-2 years
- 3-4 years
- 5-9 years
- 10-19 years
- ≥ 20 years

7b. In your clinical practice, what percentage of your usual caseload are melanocytic skin lesions?

- <10%
- 10-24%
- 25-49%
- 50-74%
- >=75%

7c. In a typical month, how many cases of melanoma (including both melanoma in situ and invasive melanoma) do you interpret?

7d. In a typical month, how many benign melanocytic skin lesions do you interpret?

7e. In a typical month, how many melanocytic skin lesions do you receive from pathologist colleagues seeking a second opinion?

7f. In a typical month, for how many melanocytic skin lesions do you request a second opinion?

8. For what percentage of melanocytic skin lesions is your final assessment that the diagnosis is borderline or uncertain?

%

9. Do your colleagues consider you an expert in the assessment of melanocytic skin lesions?

- No
- Yes

10. In general, how challenging do you find melanocytic skin lesions to interpret?

- Very easy 1
- Easy 2
- Somewhat Easy 3
- Somewhat Challenging 4
- Challenging 5
- Very challenging 6

11. What are your thoughts on interpreting melanocytic skin lesions?

	Strongly Disagree 1	Disagree 2	Slightly Disagree 3	Slightly Agree 4	Agree 5	Strongly Agree 6
A. Interpreting melanocytic skin lesions is enjoyable	○	○	○	○	○	○
B. Interpreting melanocytic skin lesions makes me more nervous than other types of pathology	○	○	○	○	○	○
C. I am concerned about patient safety and potential harm to patients that may result from my assessment of melanocytic skin lesions	○	○	○	○	○	○
D. In general, too many melanocytic skin lesions are being biopsied	○	○	○	○	○	○
E. In general, pathologists are overcalling some benign lesions as melanoma	○	○	○	○	○	○

12. In general, how confident are you in the following types of clinicians interpreting biopsies of melanocytic skin lesions?

	Not at all Confident 1	Rarely Confident 2	Somewhat Confident 3	Moderately Confident 4	Very Confident 5	Extremely Confident 6
A. Dermatologists	○	○	○	○	○	○
B. Dermatologists with dermatopathology training	○	○	○	○	○	○
C. Pathologists (general pathologists)	○	○	○	○	○	○
D. Pathologists with dermatopathology training	○	○	○	○	○	○

13. In what way do the following influence your diagnosis when reviewing melanocytic skin lesions?

	Influence toward a less severe diagnosis	No influence on my diagnosis	Influence toward a more severe diagnosis
A. Areas of extensive tumor regression	○	○	○
B. Significant solar elastosis	○	○	○
C. Concern about the patient's future insurability	○	○	○
D. Concern about patient disfigurement (e.g., for lesions on the face)	○	○	○
E. Concern about medical malpractice	○	○	○
F. Patient is < 30 years of age	○	○	○
G. Patient is > 70 years of age	○	○	○

14. In general, how confident are you in your assessments of melanocytic skin lesions?

Very Confident 1	2	3	4	5	Not At All Confident 6
○	○	○	○	○	○

15. In what circumstances do you request FISH/CGH or other molecular analysis? (check all that apply):

- ☐ N/A - I do not use FISH/CGH or other molecular analyses
- ☐ I occasionally request FISH/CGH or other molecular analyses

- ☐ For most or all melanocytic lesions
- ☐ To improve the accuracy of melanoma diagnosis
- ☐ To help settle ambiguous cases

16. In what circumstances do you request IHC? (check all that apply):

- ☐ N/A - I do not use IHC
- ☐ I occasionally request IHC
- ☐ For most or all melanocytic lesions
- ☐ To improve the accuracy of melanoma diagnosis
- ☐ To help settle ambiguous cases

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Treatment Recommendations and Reporting

PART 3

17. In what percentage of your reports do you include treatment recommendations? (i.e. suggested margins)

% [ ]

18. If you were to include recommendations in your report, what would be some of the reasons? (check all that apply)

- [ ] To clarify treatment options for the patients' dermatologist or clinician
- [ ] To protect myself/my group from legal liability
- [ ] To improve patient care
- [ ] N/A - I never include recommendations in my reports
- [ ] Other [ ]

19. What are some of the reasons why you might not include treatment recommendations in your report? (check all that apply)

- [ ] My referring physicians do not want me to
- [ ] I do not have enough clinical information
- [ ] I do not feel that I have the clinical expertise needed
- [ ] N/A - I always include recommendations in my reports
- [ ] Other [ ]

20. Assuming positive biopsy margins, what treatment would you recommend for the following diagnoses if the provider asked your opinion?

	No further treatment required	Re-excise with <5 mm margins	Re-excise with ≥ 5 mm (but < 1 cm) margins	Re-excise with margins ≥ 1 cm
A. Dysplastic nevus, severe	○	○	○	○
B. Spitz nevus conventional	○	○	○	○
C. Dysplastic nevus, mild	○	○	○	○
D. Dysplastic nevus, moderate	○	○	○	○
E. Atypical spitzoid lesion	○	○	○	○
F. Melanocytic tumor of uncertain malignant potential (MELTUMP)	○	○	○	○
G. Melanoma, in situ (NOS)	○	○	○	○
H. Invasive melanoma	○	○	○	○

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42%

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Second Opinion By Another Pathologist on Melanocytic Skin Lesions

(either in-house or external review)

PART 4

21. Please consider the following hypothetical scenario: You are reviewing a skin specimen from a 45 year-old woman with no family history of melanoma. You are uncertain how to diagnose the lesion because it appears to be intermediate between melanoma in situ and invasive melanoma, but you favor diagnosing as melanoma in situ.

21a. In situations like this, in what percentage of cases would you get a second opinion (either in house or external review) ?

_____ %

21b. If you were to obtain a second opinion, would your second pathologist usually be blinded to your opinion on the case?

- ○ No
- ○ Yes

21c. If you were to obtain a second opinion on a case you considered to be melanoma in situ, and the second reviewer favored a diagnosis of invasive melanoma, how frequently would you use the following strategies to come to consensus?

	Never or almost never 1	Infrequently 2	About half the time 3	Frequently 4	Always or almost always 5
i. Discuss the case with the second reviewer until we agree	○	○	○	○	○
ii. Use the most experienced pathologist's opinion	○	○	○	○	○
iii. Get a third opinion or present at a consensus conference	○	○	○	○	○
iv. Diagnose the case as borderline between two diagnoses in a report	○	○	○	○	○
v. Diagnose as invasive melanoma to go with the more severe diagnosis	○	○	○	○	○
vi. Diagnose as melanoma in situ to go with the less severe diagnosis	○	○	○	○	○

21c vii. Optional comments on how you obtain second opinions.

_____

22. Policies requiring a second opinion may differ from our actual practices. Indicate the percent of cases in which your facility has a policy requiring a second opinion. (If you do NOT have a policy requiring a second opinion, enter 0.)Then, indicate the percent of cases in which you would request a second opinion in actual practice. If you do not know, leave blank.

Policy for Patient Care (% of cases in which I am required by policy at my facility	**Actual Practice** (% of cases for which I usually obtain a second

Initial Diagnosis	to get a second opinion)	opinion in actual practice)
Dysplastic nevus, severe	☐	☐
Spitz nevus conventional	☐	☐
Dysplastic nevus, mild	☐	☐
Dysplastic nevus, moderate	☐	☐
Atypical spitzoid lesion	☐	☐
Melanocytic tumor of an uncertain malignant potential (MELTUMP)	☐	☐
Melanoma in situ	☐	☐
Invasive melanoma	☐	☐
Melanocytic lesions in general	☐	☐

23. Please indicate your thoughts on requesting a second opinion on melanocytic skin lesions.

	Strongly disagree 1	Disagree 2	Slightly disagree 3	Slightly agree 4	Agree 5	Strongly agree 6
A. Improves my diagnostic accuracy	○	○	○	○	○	○
B. Takes too much time	○	○	○	○	○	○
C. Protects me from malpractice suits	○	○	○	○	○	○

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Medical Malpractice

PART 5

24. Indicate how medical malpractice concerns have affected your own practice with melanocytic skin lesions.

	Strongly disagree 1	Disagree 2	Slightly disagree 3	Slightly agree 4	Agree 5	Strongly agree 6
A. I order additional tests such as IHC and/or molecular tests	○	○	○	○	○	○
B. I recommend additional surgical sampling	○	○	○	○	○	○
C. I request additional slides cut from the block	○	○	○	○	○	○
D. I request second opinions	○	○	○	○	○	○
E. I am more likely to choose the more severe diagnosis in borderline cases	○	○	○	○	○	○

25. Have you ever been named in a medical malpractice suit (including any suit filed and either dropped, settled out of court or gone to trial)? (check all that apply)

- ☐ No, never been sued
- ☐ Yes, suit(s) related to melanocytic skin lesions
- ☐ Yes, suit(s) related to other pathology or medical cases

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84%

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Digitized Whole Slides

PART 6

26. In what ways do you use digitized whole slides in your professional work? (check all that apply)

- ☐ Clinical diagnosis - when performing primary interpretation
- ☐ Clinical diagnosis - when performing second review/ consultation
- ☐ Tumor board/clinical conference
- ☐ CME/Board exams/ Teaching in general
- ☐ When requesting a second opinion from an expert pathologist
- ☐ Other
- ☐ Not at all

27. What are your thoughts on the use of H & E digitized whole slide imaging for clinical diagnosis?
(We would like your opinions even if you have never used digital whole slide imaging)

	Strongly disagree 1	Disagree 2	Slightly disagree 3	Slightly agree 4	Agree 5	Strongly agree 6
A. Accurate diagnoses can be rendered using digital slides	○	○	○	○	○	○
B. Overall I think the benefits of digital whole slide imaging outweigh the concerns	○	○	○	○	○	○
C. Digital slides are too slow for routine use when interpreting a case	○	○	○	○	○	○
D. I would like to use digital whole slide imaging in my clinical practice if approved by the FDA	○	○	○	○	○	○

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92%

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