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The Use of Hedge Phrases in Histopathology Reports by Filipino Pathologists and Clinicians' Interpretation of Them

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ABSTRACT

Introduction. When communicating uncertainty in histopathology reports, pathologists often use hedge phrases (HPs) to qualify their diagnoses, assuming that clinicians understand their meaning. However, Western studies have shown that these phrases have remarkable variations in intended and perceived certainty, which may impact the next steps of patient care.

Objectives. For seven commonly used HPs, we aimed to determine: how frequently these are used and encountered in histopathology reports in the Philippine setting; if there are differences in certainty among the phrases as well as between the intended and perceived certainty by pathologists and clinicians, respectively; the frequency of seeking clarification for each phrase, the preferred mode of communication, and the frequency that the next steps of patient management are taken for each phrase.

Methodology. Through snowball sampling, 57 pathologists and 111 clinicians from different geographic regions in the Philippines were recruited for an online survey. For each HP, participants reported the frequency of use of or encounter, rated percentage certainty, and answered questions regarding frequency of clarification, next step of management, and preferred mode of communication. Differences between intended and perceived certainty were determined by the Mann-Whitney U test. Differences in certainty among HPs were determined by the Kruskal-Wallis H test with the post-hoc Dunn test.

Results. The phrases "consistent with" and "diagnostic of" were the most and least frequent HPs, respectively. Certainty was perceived to be lower than intended for the phrase "cannot rule out" and for when no HP is used. Differences in certainty were found among most of the HPs. "Diagnostic of" and "consistent with" showed high certainty, "compatible with" and "favor" showed moderate certainty, "suggestive of" and "suspicious for" showed fair certainty, and "cannot rule out" had low certainty.

Conclusion. The variability of intended and perceived certainty for different HPs may warrant standardization of usage in reporting to prevent potential miscommunication and misinterpretation.

Key words: communication, diagnostic uncertainty, hedge phrases, histopathology reports, pathology reports, uncertainty

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INTRODUCTION

Uncertainty in the practice of medicine is often conveyed using hedge phrases (HPs), defined as "any term or phrase that is ambiguous or lacks clear precision."[1] HPs are also known as qualifying, modifying, waffling, diagnostic, descriptive, and uncertainty phrases.[1-6] Pathologists commonly use HPs in their written histopathology reports to convey varying degrees of certainty in their diagnoses. These HPs may be inserted in the line diagnosis section of the report where the diagnostic summary is written, and in the free-text comment section that often follows it.[3,7,8]

Pathology reports are how pathologic diagnoses are communicated to clinicians, and it is implicitly assumed that if an HP is included, the clinician is aware of the pathologist's intended level of certainty. For a minor subset of pathology reports, such as those using a standardized diagnostic category scheme like the Bethesda System for Reporting Thyroid Cytopathology,[9] this assumption may be valid since HPs are included in some of the

diagnostic categories, with a corresponding established risk of malignancy per category. However, for reports on histopathology (i.e., non-cytopathology), no such standardization yet exists. Therefore, use of HPs in these reports may be subjective. This is supported by many studies that have shown considerable variation in the level of certainty ascribed to different HPs as used by pathologists and as interpreted by clinicians.[3-7]

While these studies have been performed in North American and British settings, similar studies from non-Western countries where English is the main language of medical practice are lacking. Our study aimed to fill this gap by providing baseline information on the prevalence of HP use in histopathology reports in our setting, and document if there are variations and differences in their level of diagnostic certainty.

Specifically, we aimed to determine:

1. The frequency of usage of the different HPs by Filipino pathologists in their histopathology reports.
2. The frequency of HP encounters by Filipino clinicians who read histopathology reports.
3. The mean/median/mean-rank differences in the intended level of certainty among the HPs used by Filipino pathologists.
4. The mean/median/mean-rank differences in the perceived level of certainty among the HPs encountered by Filipino clinicians.
5. Significant mean/median/mean-rank differences between the level of certainty as intended by Filipino pathologists and the level of certainty as perceived by Filipino clinicians for each HP.
6. The frequency of triggering extra communication and clarification of diagnosis by pathologists to clinicians, and vice-versa, for when each HP is used or encountered.
7. The frequency of clinicians proceeding with patient management for each HP encountered.
8. The frequency of preferred mode of communication for extra communication and clarification of diagnosis by pathologists to clinicians, and vice-versa, for when each HP is used or encountered.

Table 1. Hedge phrases of interest

"cannot rule out"
"compatible with"
"consistent with"
"diagnostic of"
"favor"
"suggestive of"
"suspicious for"

METHODOLOGY

Institutional review board approval was obtained from the UP-Manila Research Ethics Board (UPMREB). We used a cross-sectional study design utilizing a self-reported survey administered through the online survey tool, SurveyMonkey.com. Table 1 lists the HPs of interest in the study. The choice of HPs was based on our experience with writing histopathology reports, informal consultation with our pathologist colleagues, and common HPs gleaned from the available literature.

We used snowball sampling to recruit through our personal networks two groups of Filipino doctors practicing in various regions in the Philippines: (A) anatomic pathologists, and (B) clinicians who read histopathology reports which guide the management of their patients. Our personal networks included colleagues known from past medical training (medical school, medical internship, residency and fellowship training) and present working colleagues (medical school networks, different hospital and university affiliations, etc.), as well as secondary referrals thereof. Select regions from Luzon, Visayas, and Mindanao were included. The participants were sent the SurveyMonkey.com link via messaging apps and/or email over a period of ten days. When accessed, the link obtained their consent, collected basic personal and professional information, and asked a set of questions relating to common HPs tailored to pathologists and clinicians, as applicable (Tables 2 and 3).

The responses were exported to an MS Excel file (.xlsx). Respondents who failed to complete the survey were excluded from the data analysis.

Table 2. Survey questions for pathologists

Question	Type of response and/or options
If you write a diagnosis without a hedge/qualifying phrase in your histopathology report, what is your intended level of diagnostic certainty? (For example, the diagnostic line in the report plainly says "ADENOCARCINOMA.")	Sliding scale from 0% to 100%
Hypothetically, what is your intended level of diagnostic certainty if you use the phrase "X"?	Sliding scale from 0% to 100%
How frequently do you use the phrase "X" in your diagnosis when writing your histopathology reports (e.g., "X adenocarcinoma")? (Please do not include cytology reports and synoptic reports in your estimate)	Likert scale from 0 to 4: 0 – never* 1 – rarely 2 – sometimes 3 – often 4 – always or almost always
If you use the phrase "X" in your diagnosis, how frequently do you attempt to contact the clinician to explain or clarify the diagnosis (may be before or after issuing the report, and through any of the following: text, email, phone call, intermediary, in-person meeting, multidisciplinary tumor board)?	Likert scale from 0 to 4
When there is diagnostic uncertainty in your histopathology report as expressed by any use of hedge phrases, which mode/s of communication do you use to clarify your diagnosis? Please check all that apply:	• Text • Email • Phone call (may be audio or video) • Intermediary (e.g., through a secretary, medical technologist, resident, intern, etc.) • In-person visit/meeting • None of the above (I do not try to contact)

*If the respondent chose "0/never," the survey skipped the next question and proceeded to the succeeding HP.

Table 3. Survey questions for clinicians

Question	Type of response and/or options
What do you think is the level of diagnostic certainty if the diagnosis in the histopathology report does not have a hedge/qualifying phrase? (For example, the diagnostic line in the report plainly says "ADENOCARCINOMA.")	Sliding scale from 0% to 100%
Hypothetically, what do you think is the level of diagnostic certainty if the phrase "X" is used in a histopathology report?	Sliding scale from 0% to 100%
How frequently do you encounter the phrase "X" when reading histopathology reports (e.g., "X adenocarcinoma")?	Likert scale from 0 to 4: 0 – never* 1 – rarely 2 – sometimes 3 – often 4 – always or almost always
If you use read the phrase "X" in a histopathology report, how frequently do you attempt to contact the pathologist for clarification? (may be before or after issuing the report, and through any of the following: text, email, phone call, intermediary, in-person meeting, multidisciplinary tumor board)?	Likert scale from 0 to 4
When there is diagnostic uncertainty in your histopathology report as expressed by any use of hedge phrases, which mode/s of communication do you use to clarify your diagnosis? Please check all that apply:	• Text • Email • Phone call (may be audio or video) • Intermediary (e.g., through a secretary, medical technologist, resident, intern etc.) • In-person visit/meeting • None of the above (I do not try to contact)

*If the respondent chose "0/never," the survey skipped the next question and proceeded to the succeeding HP.

The profile of the study participants was described by descriptive statistics. Numerical variables (age, years of practice) were described as median and interquartile range. Categorical variables (medical specialty, and region of practice) were described as frequency and percentages.

For each of the HPs of interest: the frequency of use by the pathologists, frequency of encounters by the clinicians, frequency of triggering extra communication and clarification of diagnosis by clinicians to pathologists and vice-versa, frequency of clinicians proceeding with patient management, and frequency of preferred mode of communication were described as absolute and relative frequencies; the level of certainty intended by pathologists, and perceived by clinicians were described as median and interquartile range (IQR). Differences between the median/mean-rank level of certainty of each HP as intended by pathologists, and likewise, differences between the median/mean-rank level of certainty of each HP as perceived by clinicians were determined by Kruskal-Wallis H test with post-hoc Dunn test. Differences between the median/mean-rank level of certainty of the HPs as intended by pathologists and median/mean-rank level of certainty of the HPs as perceived by clinicians were determined by Mann-Whitney U test.

Data analysis was performed using Stata version 17. Missing values were neither replaced nor imputed. The normality of distribution of the numerical variables was assessed by the Shapiro-Wilk test of normality. All tests of the hypothesis were evaluated with a significance level set at $\alpha = 0.05$.

RESULTS AND DISCUSSION

The online survey was sent to 174 people, comprised of 58 pathologists and 116 clinicians. Of these, 57 pathologists (98.3%) and 111 clinicians (95.7%) consented to participate and complete the survey. The characteristics of these respondents are shown in Table 4.

The reported frequency of usage of the different HPs by pathologists and the reported frequency of encountering them by clinicians are shown in Figure 1. The reported frequency of HP usage by pathologists and the reported HP encounters by clinicians were similar. The phrase "consistent with" was reported as "often" or "always" used and encountered by the highest number of respondents, while the phrase "diagnostic of" had the lowest number of such ratings among respondents. Conversely, the phrase "consistent with" was reported as "never" or "rarely" used and encountered by the lowest number of respondents, while the phrase "diagnostic of" had the highest number of such ratings among respondents. We acknowledge that the actual real-life frequencies may be different because self-reporting may carry inherent recall bias. Only one prior study[4] counted the actual frequency by examining 1500 sequential surgical pathology reports in their institution which also showed that the phrase "consistent with" appeared the greatest number of times. Although the phrase "diagnostic of" was not included in that study, the phrase "cannot rule out" was the least frequently used phrase, which was the second rarest in our survey.

Figure 2 shows the median, IQR, and range of the level of certainty (%) of the different HPs as intended by pathologists

Table 4. Characteristics of the respondents

	Median/Frequency	IQR/%
Age, years	40	5
Specialty		
Pathologists	57	33.93%
Clinicians		
Medical specialties[a]	38	22.62%
General surgery and subspecialties[b]	23	13.69%
OB-GYN and subspecialties[c]	24	14.29%
Other surgical specialties[d]	26	15.48%
Length of practice, years	7	5
Area of practice		
NCR	74	44.05%
Non-NCR Luzon	43	25.60%
Visayas	26	15.48%
Mindanao	25	14.88%

[a] Includes endocrinology, gastroenterology, hematology, medical oncology, nephrology, pediatric hematology-oncology, pulmonology, and radiation oncology.
[b] Includes colorectal surgery, general surgery, hepatobiliary surgery, plastic surgery, pediatric surgery, surgical oncology, thoracic and cardiovascular surgery, and urology.
[c] Includes gynecologic oncology, obstetrics and gynecology, and urogynecology.
[d] Includes neurosurgery, orthopedic surgery, and otorhinolaryngology.

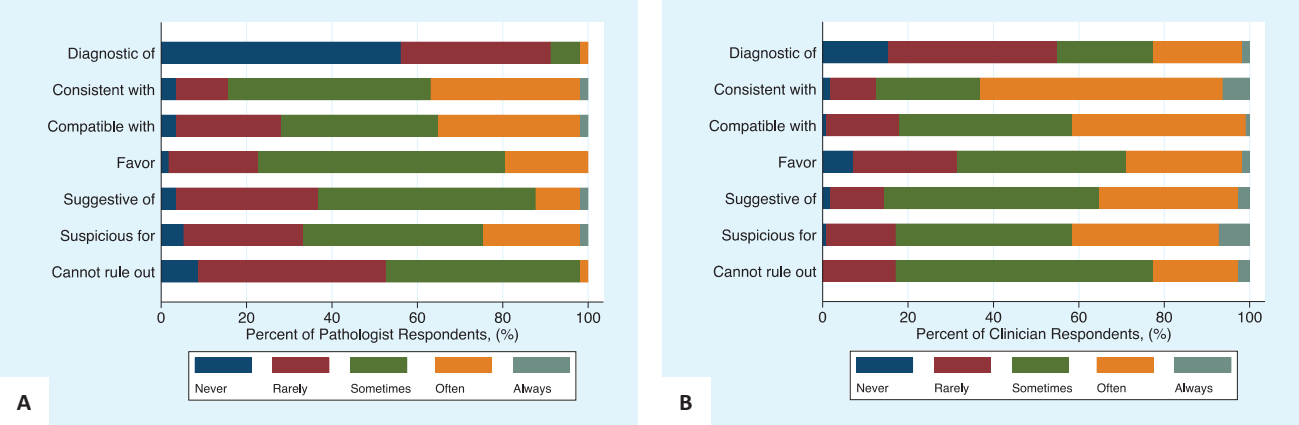

Figure 1. Frequency of hedge phrase usage by pathologists in their histopathology reports **(A)**, and frequency of hedge phrase encounters by clinicians who read histopathology reports **(B)**.

and as perceived by clinicians. For the phrase "cannot rule out," the intended level of certainty by pathologists (median = 50%, IQR = 10%) had a significantly higher mean-rank than the perceived level of certainty by clinicians (median = 50%, IQR = 23%) (p = 0.0087). When no HP was used, the intended level of certainty by pathologists (median = 100%, IQR = 5%) had a significantly higher median than the perceived level of certainty by clinicians (median = 99%, IQR = 20%) (p = 0.0023). There was no sufficient evidence to conclude that there was a difference in the intended level of certainty of pathologists and the perceived level of certainty by clinicians for each of the following HPs: "diagnostic of," "consistent with," "compatible with," "favor," "suggestive of," and "suspicious for" (p = 0.6376, 0.9562, 0.6170, 0.9083, 0.1730, and 0.2120).

The presence of a difference in intended versus perceived level of certainty for the phrase "cannot rule out" is unlike in previous quantitative studies that found no such difference.[2,7,10] For our pathologist respondents, the phrase "cannot rule out" appeared to bear the certainty of a coin toss, while our clinician respondents found its certainty to be even lower than that. Interestingly, this phrase was rated as having a lower level of certainty in prior studies, with means ranging from 20% to 43.75%[2,3,4,7] compared to this study's (with a mean certainty level of 54% for pathologists and 47% for clinicians). Perhaps the fact that these studies were from higher-income countries where further ancillary tests are more accessible and affordable allowed them more diagnostic uncertainty at the onset.

The slightly lower perceived certainty of a diagnosis containing no HP compared to its intended certainty as seen in our study has been suggested in one other prior study[4] but the latter did not test it statistically. Similar to the difference of certainty seen in the phrase "cannot rule out," it appears that clinicians harbored a slightly higher skepticism of pathologists' diagnoses even when no HPs were used.

For pathologists, the phrase "suspicious for" had the highest variability in expressing a level of certainty (IQR = 25%), while the other phrases had less than 20% IQR (Figure 2). For clinicians, the phrase "suspicious for" also had the highest variability in perceived level of certainty (IQR = 25%), followed by "cannot rule out" (IQR = 23%).

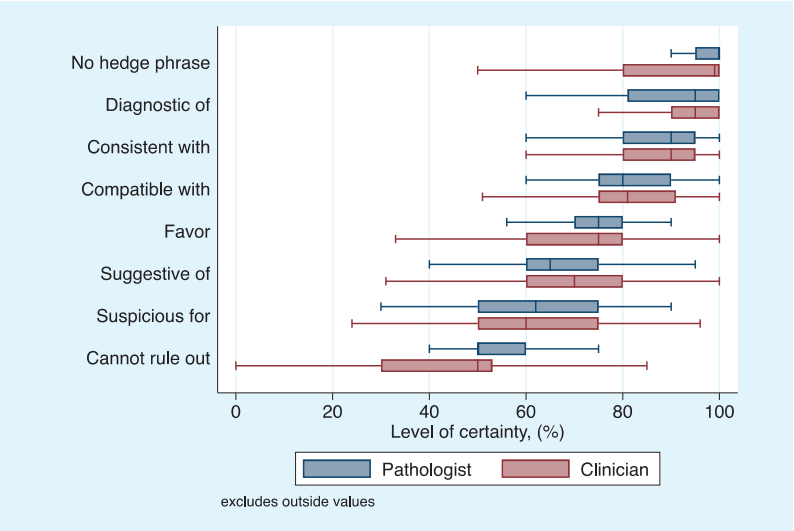

Figure 2. Comparison of the level of certainty intended by the pathologists and perceived by the clinicians among the different hedge phrases used.

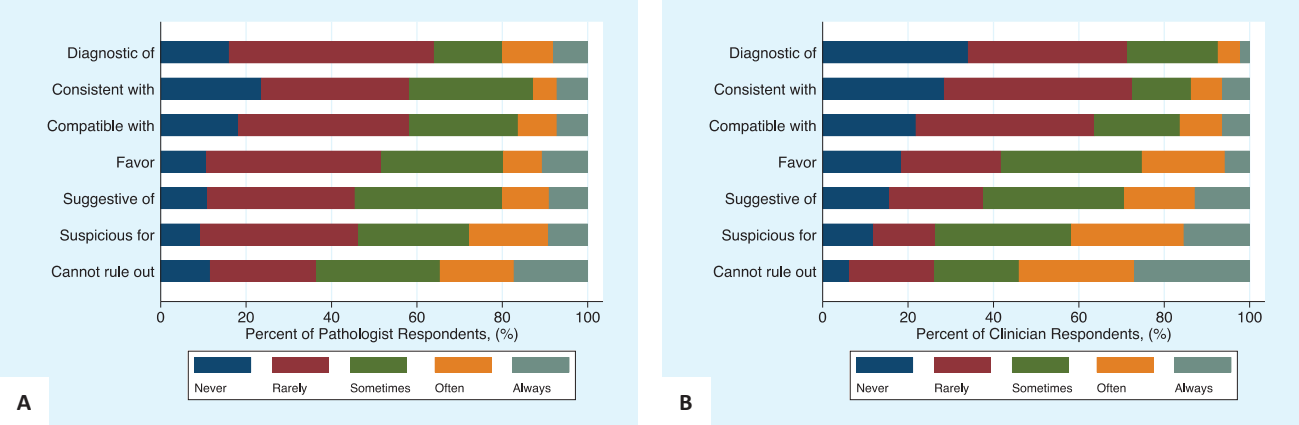

Figure 3. Frequency of triggering extra communication and clarification of diagnosis by pathologists to clinicians for each hedge phrase **(A)**, and frequency of triggering extra communication and clarification of diagnosis by clinicians to pathologists for each hedge phrase **(B)**.

Clinicians also showed high variability (IQR = 20%) in perceived certainty for "favor," "suggestive of," and for diagnoses that did not have HPs. The high variability of intended and perceived certainties for different HPs is consistent with prior studies.[3,4,7] That the phrase "suspicious for" had the highest variability for both pathologist and clinician respondents in our study is unexpected for two reasons: first, other studies did not find it to be the most variable in terms of certainty level; and second, it is a phrase that is already being used in certain systems of pathology reporting, specifically cytopathology of the thyroid[9] and salivary gland,[11] with established risks of malignancy. The expectation that knowledge of its relatively established level of certainty – by pathologists, at least – would be transposed to histopathology reports was unmet. In any case, when phrases such as "suspicious for," "cannot rule out," "favor," and "suggestive of" are encountered by clinicians in histopathology reports, they should be cognizant of the high variability of the certainty associated with such phraseology.

Kruskal-Wallis H test with post hoc Dunn test showed that there were significant differences in the level of certainty among the different HPs. The intended level of certainty according to pathologists was as follows: no HP > "diagnostic of" = "consistent with" > "compatible with" > "favor" > "suggestive of" = "suspicious for" > "cannot rule out." For clinicians, the perceived level of certainty was as follows: no HP = "diagnostic of" = "consistent with" > "compatible with" > "favor" > "suggestive of" > "suspicious for" > "cannot rule out." A hierarchical pattern appears to emerge: "diagnostic of" and "consistent with" have high certainty, "compatible with" and "favor" have moderate certainty, "suggestive of" and "suspicious for" have fair certainty, and "cannot rule out" has low certainty. This pattern is similar to prior studies that included all these phrases.[2,3,7,11] The low certainty of "cannot rule out" is also reflected in the finding that it was the phrase most likely to trigger extra communication and clarification by both pathologists and clinicians (Figure 3), and the phrase most likely to stop clinicians from proceeding with their next step of patient management (Figure 4). Curiously, when examining the low- to moderate-certainty phrases (Figure 2), clinician respondents demonstrated broader ranges of perceived certainty compared to pathologists. Therefore, a small subset of clinicians may be underestimating or overestimating the intended certainties of "favor," "suggestive of," "suspicious for," and "cannot rule out."

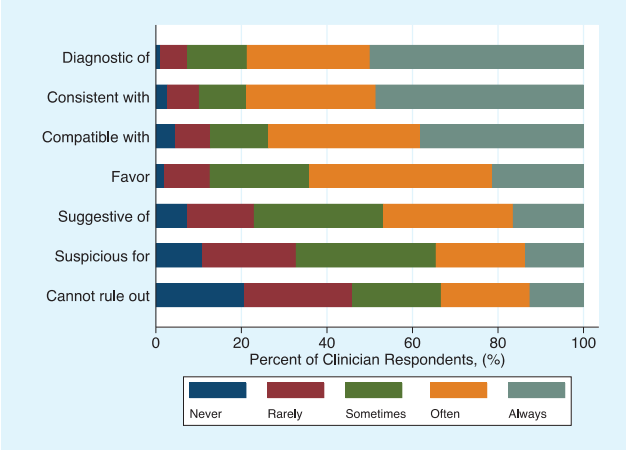

Figure 4. Frequency of clinicians proceeding with patient management for each hedge phrase used by pathologists.

Table 5. Preferred mode/s of communication of pathologists and clinicians when using/encountering hedge phrases

Mode of communication	Pathologists	Clinicians
	Frequency (%)	
Text	42 (73.68%)	74 (66.67%)
Email	3 (5.26%)	19 (17.12%)
Phone call	37 (64.91%)	71 (63.96%)
Intermediary	29 (50.88%)	35 (31.53%)
In-person meeting	18 (31.58%)	31 (27.93%)
Multidisciplinary tumor board	14 (24.56%)	36 (32.43%)
No communication	3 (5.26%)	4 (3.60%)

The preferred mode/s of communication of pathologists and clinicians when encountering HPs are shown in Table 5. For both groups, the most common modes of communication were via text, phone calls and intermediary. Compared to clinician respondents, pathologist respondents appeared to be slightly more inclined to text, use an intermediary, and – perhaps unexpectedly – meet the clinician in person.

Pathologist respondents also seemed less likely to email and attend a multidisciplinary tumor board. One possible explanation for the former may be that some pathologists prefer to provide an explanatory note in the comment section of the histopathology report, as was communicated to us by a few of the pathologist respondents after answering the survey. As for the latter, we surmise that it was the least available resource among the options. The lack of an open-ended response/comment field for each of the questions in our survey was a limitation in gathering more information.

CONCLUSION

The apparent hierarchical consistency in the levels of certainty suggests that for many pathologists and clinicians, there is an intuitive grasp of the levels of certainty for these HPs. The challenge would be for those whose intended and perceived level of certainty fall outside the interquartile ranges reported in our study. Perhaps a move to standardize the usage of these phrases in histopathology reports is warranted in this regard. Such a suggestion is not novel. Investigators from prior studies have proposed schemes such as providing formal training at a local institutional level as well as urging national medical organizations to reach a consensus on the levels of certainty of common HPs.[3,7] One group[2] has even proposed a classification system akin to the Breast Imaging Reporting and Data System (BI-RADS) used by radiologists and the Bethesda System for Reporting Thyroid Cytopathology used by cytopathologists, where the common HPs are categorized into five groups of decreasing certainty levels, along with the recommended steps of patient management per category. Applying a similar scheme in our setting can reduce ambiguity, miscommunication and misinterpretation, and avoid potential delays, errors, and unnecessary costs in patient treatment.

STATEMENT OF AUTHORSHIP

Both authors certified fulfillment of ICMJE authorship criteria.

AUTHOR DISCLOSURE

The authors declared no conflict of interest.

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