Table 1. Examples of Test Name Errors With Nonsensical Test Names

Test Performed	Test Name in Reports Before Correction
PAX-5	PAX-8 5
Ki-67	Ki-1-67 or K-67
Keratin 5	35
P120	Pp20
Ker 8/18	Ker 5/18
CD56	p56
TTF-1	TTF-
GATA-3	GAT3

Table 2. Examples of Test Name Errors Using Different Test Names

Test Performed	Test Name in Reports Before Correction
Estrogen receptor	Progesterone receptor
CD30	CD38
CK5	CD5
CD138	CD38
CD34	CD117
p63	p16
BCL-2	BCL-6
CD56	Chromogranin

Not all the effective tools are practical if they are burdensome to use, specifically if the users have to remember to use the tools or a nontrivial effort is required to use the tools. The advantage of computational monitoring is that it does not require pathologists to remember to use the tool. The program keeps a constant vigilance in the background and notifies the pathologists in a timely fashion when possible omission is noted.

R is not only strong in statistical computing and graphics, it is also powerful in dealing with texts/natural language. In surgical pathology, R has been reported to be used in statistical analysis,[2] information extraction from the report texts,[1,3] pathology report defect detection,[4] and deep learning using report diagnosis texts.[5]

The specific use example of R program in improving the reporting of ancillary tests demonstrates that computational approach can be an effective way to improve standardization in pathology reporting in general. R is a practical language that pathologists can learn and use to produce immediate positive impact in daily practice.

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Synoptic Report Response Options Directly Impact Patient Care

To the Editor.—It has previously been shown that the use of a checklist such as the one used in synoptic reporting can lead to a more complete surgical pathology report,[1–3] and that different methods of generating a synoptic report can also affect the completeness of that report.[4–6] The presence or absence of clinically significant data elements may impact the clinical management of a patient. Formatting of the synoptic report can also impact pathologists' ability to create a synoptic report and a clinician's ability to interpret that report.[4,5,7–15] To date, the impact of the choices that are presented to the pathologists as responses to any data element on the data in the report or the management of the patient has not been studied. In the Word-based synoptic reports offered by the College of American Pathologists (CAP) and its electronic Cancer Checklist, a discrete set of options is presented with limited use of qualifying terms.[8] However, previous studies suggest that many pathologists prefer to include qualifying terms (ie, "suspicious for," "extensive," etc) and they may use free-text entry to achieve this result when the choice is not offered to them.[8] To assess whether presenting qualified responses in a synoptic report has an impact on the report content or patient care, we compared the response for the data element "lymphovascular invasion" (LVI) in our laboratory from 240 consecutive cases (60 each from endometrium, colon, lung, and breast) using the CAP Word-based synoptic reports system ("no qualified choices," between January 1 and June 30, 2015) with a Web-based method that did include qualifying terms among the selection choices (between August 1, 2016, and December 31, 2019).[14]

Results are presented in the Table. Free-text options were used less than 2% of the time for both groups. Both "suspicious for LVI" and "extensive LVI" were entered as free-text options (once each) in the reports with no qualified options presented. Although there was no significant difference in the rate of LVI when cases in which LVI was either present or extensive (22% versus 26%; $P = .23$), there were significantly more cases identified as having LVI when cases diagnosed as suspicious for LVI were included and presented as an option (23% versus 34%; $P = .01$). There were also significantly fewer cases diagnosed as indeterminate when qualified responses were offered (17% versus 6%; $P = .001$, 2-tailed χ^2 test).

During this time period, whenever an endometrial carcinoma case was presented at Gynecologic Tumor Board in which the use of adjuvant therapy was not clear, the presence or absence of LVI was always discussed. Patients whose LVI status was reported as indeterminate were considered to have the same risk as patients whose LVI status was reported as not identified. However, patients who were labeled as suspicious for LVI were identified as at higher risk of recurrence than patients without LVI or those who were classified as indeterminate, and patients with extensive LVI were identified as having a higher risk of recurrence than patients who were labeled as LVI without any qualifier. In one case, the clinicians decided that they would treat the patient only if the LVI were extensive, and it was asked that the case be rereviewed to assess this. The findings were similar in the tumor boards for

Comparison of Qualified and Unqualified Response Options in Synoptic Reports for "Lymphovascular Invasion"

	No Qualified Responses Listed		Qualified Responses Listed	
Response Choices	Included in List of Data Element Responses?	No. (%)	Included in List of Data Element Responses?	No. (%)
Not identified	Yes	155 (65)	Yes	146 (61)
Indeterminate	Yes	33 (14)	Yes	15 (6)
Suspicious	No	1 (1)	Yes	18 (8)
Present	Yes	50 (21)	Yes	47 (20)
Present, extensive	No	1 (1)	Yes	14 (6)
Total		**240**		**240**

other sites, but these results were not specifically tracked.

There are limitations to this study. We compared consecutive series of cases and did not match them for grade, tumor size, or stage. However, there was no difference in the overall rate of cases with LVI when cases diagnosed as suspicious for LVI were excluded, suggesting that the cases were similar, and that the differences we observed are related to pathologists simply choosing "indeterminate" when "suspicious for LVI" was not offered as a choice. In addition, we compared the performance of the same pathologists at different times, and their performance may have changed over time.

In summary, we have shown that not only does the inclusion of qualified responses for LVI in synoptic reports result in increased reporting of LVI and decreased reporting of indeterminate cases, but reporting of LVI directly impacts patient care in a subset of patients with synoptic reports. Clinicians routinely include their own assessment of the significance of these qualifying terms in their recommendations for patient management. Further study to ensure that the response options that are presented in the CAP synoptic report protocols are evidence based seems warranted.

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