

Routine Review of Surgical Pathology Cases as a Method by Which to Reduce Diagnostic Errors in a Community Hospital

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Abstract: When surgical pathology reports are discovered to contain errors after those reports have been released to clinicians, it is common practice for pathologists to correct and reissue them as "amended" reports. Measuring the rates with which surgical pathology reports are amended is a convenient quality assurance tool by which to gauge the frequencies of errors occurring in surgical pathology reporting. The purpose of this study was to determine whether routine review of surgical pathology case material before the release of surgical pathology reports would lower the rate with which surgical pathology reports were amended to correct misdiagnoses. In the yearlong periods before and after institution of this intervention, the annual rates of amended reports issued for the purpose of correcting misdiagnoses were 1.3 per 1000 cases and 0.6 per 1000 cases, respectively.

Key Words: error, misdiagnosis, routine case review, amended report, quality assurance, performance improvement

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When surgical pathology reports are discovered to contain errors after those reports have been released to clinicians, it is common practice for pathologists to correct and reissue them as "amended" reports. Measuring the rates with which surgical pathology reports are amended is a convenient quality assurance tool by which to gauge the frequencies of errors occurring in surgical pathology reporting.¹ Routine review of surgical pathology case material by second pathologists before the release of pathology reports may detect errors before those reports are released to clinicians.¹⁻⁴ The purpose of this study was to determine whether or not routine prerelease review of surgical pathology case material would lower the rate with which surgical pathology reports were amended to correct misdiagnoses.

METHODS

In October 2002, a third attending pathologist was added to the Department of Pathology in a 180-bed community hospital. This added manpower allowed the department to institute a policy requiring that all histologic material and surgical pathology reports be reviewed by a second pathologist before the release of the surgical pathology reports. Before this policy was inaugurated, its details and goals were presented to the hospital medical staff.

To the accession numbers of all surgical pathology reports that were reissued as "amended reports" (see definitions, Table 1) the letter "A" was added (eg, report number 2365 was amended to read as 2365A). In March 2004, all amended reports issued between October 1, 2001, and September 30, 2003, were culled from the Department of Pathology surgical pathology computer database. The reports were printed and sorted by 2 time periods encompassing the year before and the year after institution of the policy mandating routine review of all cases: October 1, 2001, to September 30, 2002, and October 1, 2002, to September 30, 2003.

Previous departmental policies had long required that all amended reports include comments stating how and why those reports were altered. Copies of the original reports retained in the Department of Pathology computer database were compared with the amended reports. From this information, the numbers of amended reports were tabulated by each category of errors, as listed in Table 1. The definitions of errors were derived internally and no attempt was made to duplicate definitions used by other authors. The numbers of amended reports were divided by the total numbers of reports issued during each time period and multiplied by 1000 to give the amended report rates per 1000 cases for each error category.

RESULTS

Table 2 shows the rate with which amended reports were issued by the Department of Pathology. The rates are sorted by categories demonstrating the types of errors that

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TABLE 1. Definitions of Terms and Categories of Errors

General Definitions	
Amended report	Any surgical pathology report reissued to reflect changes made to the original report
Essential historical information	Clinical information (eg, history, preoperative diagnosis, operative findings) that may be important for pathologists to know to arrive at diagnoses but that is first delivered to pathologists after reports have been released
Inadequate demographic information	Incorrect information required to identify patients and/or specimens (eg, patient date of birth, spelling of patient name, anatomic location of specimen, and so on)
Planned extradepartmental consultation	Cases sent by pathologists to "outside experts" for diagnostic consultations
Special studies	Procedures such as immunohistochemistry, which commonly require several days to complete
Testing phase, preanalytic	Interval of tissue processing occurring before pathologists receive specimens
Testing phase, analytic	Interval of tissue processing and evaluation commencing when pathologists receive specimens and terminating when pathology reports are released to clinicians
Categories of Errors	
Typographic errors	Errors of spelling, grammar, and so on, in gross and microscopic descriptions, final diagnoses, and report commentaries
Inadequate reports	Reports that lack information that is not essential to the diagnoses but may be important to clinicians and/or reports that lack information that is otherwise included routinely in surgical pathology reports (eg, Commission of American Joint Conference on Cancer tumor classification, tumor margin status, etc)
Misdiagnoses	Errors resulting from misinterpretation of histopathologic findings

TABLE 2. Amended Report Rates: Amended Reports per 1000 Surgical Reports Issued

Amended Reports Issued to Reflect Changes Following:	Measurement Periods			
	October 2001 to September 2002 (n = 7909 Reports)		October 2002 to September 2003 (n = 8469) Reports	
	No.	Rate	No.	Rate
Preanalytical phase of testing				
Correction of demographic information	12	1.5	54	6.5
Receipt of additional essential historical information	4	0.5	21	2.5
Analytical phase of testing				
Receipt of planned extradepartmental consultations	25	3.1	23	2.7
Interpretation of special studies (eg, special stains)	25	3.1	60	7.1
Correction of typographic errors	7	0.9	30	3.5
Correction of inadequate reports	7	0.9	30	3.5
Correction of misdiagnosis	10	1.3	5	0.6
Other	2	0.3	8	0.9
Total number of amended reports	92	11.5	231	26.8

were corrected and the testing phases (preanalytic and analytic) in which errors were believed to originate.

In the period between October 2001 and September 2002, 10 of 7909 reports were amended and reissued after those reports were discovered to contain misdiagnoses, resulting in a misdiagnosis rate of 1.3 per 1000 surgical pathology reports issued. During the period between October 2002 and September 2003, 5 of 8469 reports were amended to

correct misdiagnoses, resulting in a misdiagnosis rate of 0.6 per 1000 reports.

Of the 15 misdiagnoses occurring in the 2-year study period, all but 1 case was discovered on intradepartmental review. The circumstances leading to discovery of misdiagnosed cases included preparation of cases for conferences, researching past cases to assist pathologists in the diagnoses of current cases, and complying with requests by clinicians to

take second looks at cases. One misdiagnosed case was detected by pathologists practicing at a reference institution to which the patient journeyed for a second opinion.

The rate with which reports were amended after planned, extradepartmental consultations decreased in the second data collection interval. The amended report rates for the remaining types of errors increased in the second data collection interval.

One practice group submitted 4.6% and 6.1% of all surgical pathology specimens received into our laboratory in the first and second time periods, respectively. Of all reports amended to correct demographic information in the 2 time periods, approximately one third (33% and 31%, respectively) emanated from this group.

There were no significant associations among physician groups submitting specimens and amended report rates as a result of inadequate history. There were no significant associations among specific pathologists involved in signing out or reviewing cases and amended report rates.

COMMENT

Evaluating the true outcomes of errors occurring in the practice of anatomic pathology requires measuring the incidences of unexpected mortality and morbidity resulting from those errors. This is difficult, if not impossible, to do in community-based practices. Catastrophic outcomes occur too infrequently to allow accrual of enough data to provide meaningful statistics. For this reason, conclusions concerning medical errors often rely on studies of intermediary processes and outcomes. Measuring the rates with which surgical pathology reports are amended to correct mistakes discovered in the original reports is a convenient intermediary indicator by which to gauge the frequency of reporting errors occurring in pathology practices.

Misdiagnosis of tissue pathology is one of several types of errors that may necessitate amending surgical pathology reports.¹ The rates with which misdiagnoses occur are considered to be important parameters of quality.^{1,4-12} In this study, 1 technique designed to lower the rate of misdiagnoses was investigated, namely the review of surgical pathology case material by second pathologists before the release of surgical pathology reports. The indicator used to gauge the success of this intervention was the rate with which amended reports were issued to correct misdiagnoses. In the yearlong periods before and after institution of this intervention, the annual rates of amended reports issued to correct misdiagnoses were 1.3 per 1000 cases and 0.6 per 1000 cases, respectively.

The reported rates of surgical pathology misdiagnoses have ranged from 1 to almost 90 per 1000 cases examined.^{2-6,11,13-18} Unfortunately, none of these rates are comparable. The conditions under which these studies were performed have varied significantly, especially with regard to

the manner in which reporting errors and misdiagnoses were defined; the categories under which errors were tallied; the manner in which data were collected; the types of cases which were studied; and the practice settings in which the studies were performed. To the author's knowledge, only 1 study has expressed reporting errors in terms of amended report rates. In a College of American Pathologists' Q-PROBES study of 1,667,547 surgical pathology reports conducted in 359 pathology departments representing a wide range of practice sizes and settings, the mean rate with which reports were amended to correct misdiagnoses was 0.8 per 1000 cases.¹

The purpose of this study was not to compare rates of misdiagnoses occurring among various pathology departments or to provide benchmarks of pathologists' competencies. Data emanating from other studies that have focused on benchmarking and competency have been helpful in constructing departmental programs aimed at improving both the performance of pathologists and the service of pathology departments.^{1,5-12,16} This study focused on just 1 end product of pathology service, namely the surgical pathology report. It seems reasonable to expect that a quality surgical pathology report is one that is not likely to be recalled and amended to correct diagnostic errors. The data from this study suggest that routine prerelease reviews of case material advance that aspect of quality. It must be cautioned, however, that although routine prerelease review was shown to lower the amended report rate in this study, a larger sample size is needed to demonstrate the statistical significance of this reduction.¹⁰ Nevertheless, authors of other studies examining surgical pathology reporting errors have reached similar conclusions.^{1,3,4,11} Certainly, the practice of inspecting products before dispensing them is nothing new. Repeated inspections and redundant procedures are mainstays of industrial and retail quality control systems.

In this study, diagnostic errors were discovered by pathologists more often on intradepartmental review than on extradepartmental review. This method of discovery likely underestimates the true incidence of misdiagnoses because it requires that aberrant diagnoses surface at some point after final reports are released. Misdiagnoses contained in reports not so unearthed remain uncounted. The likelihood of discovering misdiagnoses may depend on the zeal and efficiency with which they are sought. In this study, there was no attempt to grade the severity of misdiagnoses or to investigate whether diagnostic errors discovered in pathology reports caused patients irreversible disability. The consequences of errors notwithstanding, any surgical pathology report reissued to correct a misdiagnosis, or to correct anything else for that matter, may be a needless advertisement of internal dysfunction in quality that has the potential of undermining clinicians' confidence in the abilities of the pathologist who authored it.

Although not specifically addressed in this study, the numbers of reports amended for reasons other than misdiagnoses were also tallied. Not only did routine prerelease review of surgical case material fail to reduce the numbers of reports requiring reissue, the amended report rate actually increased as much as 5-fold in all but 1 category studied. To some degree, control of practices causing errors, specifically those occurring in the preanalytic phase of testing, were beyond the influence of pathology department staff. Health-care workers may have failed to provide essential information on pathology requisition slips, or they may have written or transcribed information incorrectly. In this study, the majority of specimens and requisitions in which the demographic information provided was inadequate emanated from 1 practice group, suggesting a concentrated focus in a lack of attention to detail. However, control of other factors causing errors, specifically those occurring in the analytic phase of testing, were well within the influence of pathology department staff. Reporting typographic errors increased despite the use of gross, microscopic, diagnostic, and commentary templates, which were implemented in our department more than 2 decades ago.

Regardless of the phase in which errors occur, confirming that information contained in surgical pathology reports is accurate before those reports are released is the responsibility of the pathology department. During the second half of this study, the Department of Pathology secretarial staff experienced an inordinately high rate of turnover. It is likely that the training, education, and sensitivity to the nuances of report preparation were lacking among new employees, hence the propensity to overlook reporting inaccuracies. Of course, the ultimate responsibility for ensuring that reports are accurate and complete belongs to the pathologists whose names appear on those reports. In this study, it was apparent that proofreading was not the pathologists' strong suit, nor should it be. Performing clerical functions such as proofreading are not the most efficient use of a pathologist's time, especially when that time is already burdened with reviewing a colleague's daily caseload. Future investigations in our department will evaluate the effects of new employee training techniques, and of a new computer system designed to insert boilerplate error-free text directly into surgical pathology reports, on the rate of reports amended to correct nondiagnostic errors.

The rise in the amended report rate during the second time period as a result of interpretation of special studies resulted from the increased utilization of immunohistochemical staining among all department members. Immunohistochemical staining is performed for our department at reference laboratories. Individual studies may require as long as a week to complete. During this study, final reports were issued before, and amended reports issued after completion of immunohistochemical studies. Policies have since eliminated these amended reports by requiring that provisional reports be

issued before, and final reports be issued after receipt of immunohistochemical studies.

The number of reports amended after extradepartmental consultations during the second time period decreased slightly. This may have reflected the presence of an additional pathologist in our department. Previously, cases had been issued final diagnoses before being submitted for extradepartmental consultations. Alterations in diagnoses resulting from these consultations generated amended reports. An additional pathologist from whom opinions could be elicited reduced the apparent need for extradepartmental consultation. Policies have since eliminated these amended reports by requiring that provisional reports be issued before, and final reports be issued after receipt of planned consultations.

Although no specific data were collected, routine review of all surgical pathology cases did not appear to generate increased numbers of complaints or inquiries from physicians with regard to reporting turnaround times. Perhaps this reflected effective management of physicians' expectations by presenting the policy and its potential benefits to the medical staff well in advance of executing it. Although workload data were not collected, routine case reviews did not appear to prolong the lengths of pathologists' workdays significantly or incur additional departmental overhead expenses. It is the opinion of the author that by creating a work environment that maximized collaboration among pathologists, routine case reviews fostered a greater degree of cohesiveness and trust among us than might have been possible without it. It is also the opinion of the author that reducing the rate of misdiagnoses reduced the level of the daily work stress that so characterizes the practice of medicine.

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