



From Policy to Practice: Assessing the Impact of Staging Policies for Recording Cancer Stage across Canada

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Abstract

In 1998, a survey of all hospitals in Canada by the National Cancer Institute (NCI) of Canada found that only 17% reported that stage was routinely recorded. Closely following the methodology of the 1998 study, an online questionnaire was sent to the chief executive officer of 201 institutions in Canada. Since the study in 1998, it was found that the staging rate in Canada has significantly increased from 17 to 36%. The implementation of a staging policy has had a significant impact on the practices of recording stage, but further policy initiatives, education and communication are required to improve institutional staging practices.

Before any treatment plan for a patient's cancer can be developed, it is essential to know the pathology, site of origin and extent of disease. The globally recognized standard for describing extent of the majority of cancers is the tumour-node-metastasis (TNM) classification (Greene et al. 2002; Sobin and Wittekind 2002). TNM staging is not only essential to help plan a patient's treatment; it also gives an indication of prognosis, assists in the evaluation of treatment and research and is an inval-

able component of cancer surveillance and resource planning (Brierley 2006; O'Sullivan et al. 1998a). Despite this, little is known about how often TNM stage is recorded in the hospital record of patients with cancer. In the United States, the recording of stage is essential for accreditation as a Cancer Center by the American College of Surgeons (Fleming et al. 1996). Although there is a requirement by Statistics Canada to report cancer incidence and mortality data, there is no requirement to report on the stage of the cancer at diagnosis. In Canada, a significant number of patients with cancer are treated outside cancer centres. It is not known how often stage is recorded, if at all, across all hospitals that care for patients with cancer.

A previous survey of a sample of all hospitals in Canada performed in 1998 by the National Cancer Institute of Canada (NCIC) found that only 17% reported that stage was routinely recorded in their records of new cases of cancer admitted in their hospital (Mackillop 1998). Since then, the NCIC Board of Directors, the Canadian Council on Health Service Accreditation (CCHSA) and the Canadian Association

of Provincial Cancer Agencies have all endorsed a national staging policy (O'Sullivan et al. 1998b). The policy states that recording of the TNM stage in the medical record by the treating physician should be a standard of care for every cancer patient in Canada. The purposes of this study are to assess whether there has been a significant change in the recording of cancer stage and to identify additional strategies for increasing the rate of recording stage.

Methods

In the 1998 study, two separate surveys were mailed to chiefs of Surgery and managers of Health Information Systems at a sample of general and acute care hospitals in Canada. Based on these two surveys, a single questionnaire was created. Additional questions were added to take into account the changes in health record management and practices. The questionnaire was administered using an online tool rather than traditional mail. The questionnaire was composed of 40 questions, most of which were closed response, divided into five sections:

1. Demographic information about the

hospital, such as the number of beds in the hospital and whether or not surgery was performed

2. The general use and awareness of staging systems in the hospital/institution
3. The recording of stage information at each institution
4. Reporting and utilizing of staging reports
5. Possible strategies for improving the recording/reporting of staging in Canada

E-mails were sent to the chief executive officers (CEOs) of 201 institutions representing all 346 Canadian general and acute care hospitals (excluding regional cancer centres) identified from the Canadian Medical Directory (2005 Edition). The CEOs were asked to forward the survey to the heads of surgery and informatics, or the most appropriate person. Hospitals that did not perform surgery were excluded. Hospitals were classified as small (<100 beds), medium (100–400 beds) or large (>400 beds). Each survey was sent twice. The survey was posted online using QuestionPro (www.questionpro.com), a web-based survey tool, allowing for electronic submissions. Approval for this study was sought and received through the Research Ethics Board at the University Health Network, and informed consent was obtained from all subjects.

Statistical Methods

The staging rates from this survey were compared with the staging rates from the 1998 survey using the chi-square test. Univariate analyses were performed for potential independent variables. Associations between independent variables and the outcome, staging status, were tested using the chi-square or

Fisher exact test, as appropriate. The Cochran-Armitage trend test was used for testing associations between ordinal independent variables and staging status. All the variables collected were tabulated as frequency and proportions. All reported *p* values are two sided. The statistical significant level was set at .05. All analyses were performed using SAS v9.1 (SAS Institute Inc., Cary, North Carolina).

Results

Two hundred and one surveys were sent out, representing 346 hospitals; 57 responses were received, representing 156 hospitals – an overall response rate of 28% (57/201), though 45% (156/346) of all hospitals were represented in the responses. Thirty-one responses were completed by physicians (54.4%), and 26 were completed by other professionals such as health records professionals and administrators (45.6%). The response rate by region is tabulated in Table 1. The differences among response rates of each region were statistically significant ($p = .01$), mainly due to the low response rate of Quebec.

Of the institutions surveyed, 36.4% routinely document stage in their patients' health record. Compared with the staging rate of 17% in the 1998 survey, the difference between the two studies was statistically significant ($p < .01$). Only 15 of the 57 respondents

(26%) indicated that they were not aware of the national staging policy. There was not a statistically significant association between staging rate and region or between staging rate and bed size. Of those institutions that record stage, only 44.4% of respondents reported using the Sixth Edition of *TNM Classification of Malignant Tumours* (Sobin and Wittekind 2002).

Twenty-nine institutions (50.8%) indicated that they had mechanisms in place to ensure the completeness of cancer stage recording. Overall, 83.3% of responses indicated that physicians are responsible for recording stage. However, only 9.6% of institutions have a mechanism in place to ensure the accuracy of the TNM stage recording. Of the institutions surveyed, 29.1% routinely compile a yearly report of the number of new cases of cancer by primary cancer site; only 5.5% of institutions routinely compile a yearly report of new cases of cancer by stage. Table 2 illustrates how institutions currently or would in the future use site and stage information.

Respondents to the survey identified several challenges or barriers to routinely recording TNM stage in health records, both in terms of policy and practice. These barriers are shown in Table 3 and include staging not being a requirement of the Canadian Institute for Health Information (CIHI) (63.6%) or a hospital requirement (81.8%), and

Table 1. Response rate by region

Region	No. of Surveys Sent	No. of Responses (%)
Atlantic provinces	23	4 (17.4)
British Columbia	14	7 (50)
Ontario	93	33 (35)
Prairie provinces	39	10 (25.6)
Quebec	32	3 (9.4)

Table 2. Institutions' current or future use of site and stage information*

Does your institution, or would your institution, use the site and/or stage information to ...	
Describe the management of cancer at your institution?	41.2%
Audit adherence to your institution's treatment policies or guidelines?	35.3%
Describe the outcome of cancer at your institution?	37.3%
Monitor accrual to clinical trials?	29.4%
Plan resources?	39.2%
Contribute to a cancer registry?	62.8%

n = 51 institutions.

Table 3. Challenges and barriers to routinely documenting TNM or other staging classification in health records at the institutions*

	Percent Agree
Challenges in policy (33 responses)	
Not a hospital requirement	81.8
Not a CIHI requirement	63.6
Not aware of national policy	45.5
Challenges in practice (32 responses)	
Existing practice patterns	65.6
No incentives in place	53.1
Inadequate knowledge of TNM staging system	43.8
Lack of simple recording mechanism	56.3
No follow-up mechanism	25
Pathological reports not available	34.4
Imaging and other staging information is incomplete at the time of assessment	43.8

CIHI = Canadian Institute for Health Information; TNM = tumour, node, metastasis.

*Responses were elicited from respondents who indicated that they do not routinely stage.

the lack of a simple recording mechanism (56.3%). To overcome these barriers in policy and practice, the survey respondents identified several suggestions. On the policy side, 37.8% of survey respondents agreed that an institutional policy that clinical TNM stage must be recorded in the perma-

nent medical record of all new cancer patients at their institutions would be most useful; 40.5% of institutions agreed that there should be an institutional policy that clinically completed TNM worksheets accompany surgical specimens to the pathologist; and 40% found that a policy that pathological

TNM stage must be recorded in the permanent medical record for all new cancer patients who have undergone cancer surgery would also be helpful. Table 4 outlines suggestions to overcome barriers in practice to TNM staging. These are broken into educational initiatives such as in-house lectures and rounds (59.1%) and materials such as TNM tick-off staging forms to facilitate the capture of TNM stage (88.2%).

Only 7.4% of all institutions have been including the stage information in the abstracts submitted to CIHI. In order to meet the national policy, institutions considered a number of strategies and determined that the following are the most important: training courses for health records personnel on TNM staging (50%), provision of copies of the TNM atlas (55.3%), specific TNM reporting forms (62%) and software to generate institution-specific TNM reporting forms (58.7%).

Discussion

The previous survey in 1998, which was sent to a sample of general and acute care hospitals, yielded responses from 218 hospitals. The current survey was sent to all general and acute care hospitals and received 57 responses. The difference in response rate can be attributed to the ongoing reorganizations of hospitals and health-care centres into multi-site institutions. These institutions can sometimes have as many as 18 hospitals under their auspices or as few as two. While more

than half of the hospitals we surveyed were single hospitals, a significant number of multi-hospital institutions were surveyed as well. The CEOs of these institutions identified the appropriate people to respond, and their responses were representative of all the hospitals under their administration. Therefore, the 201 surveys we sent out actually represented 346 hospitals, and the 57 responses we received represented 156 hospitals (45%). The survey was completed on a volunteer basis, and some bias may have been introduced based on respondent engagement in the subject matter.

The response rates were lowest among hospitals with fewer than 100 beds and greatest among the larger hospitals (>400 beds). From e-mail correspondence with potential participants, we gathered that the reason some small hospitals did not reply is that little routine cancer surgery is performed at such centres – patients are referred elsewhere. For the 32 surveys sent to Quebec hospitals, only three responses were received, despite the fact that the survey had been translated into French. While there was a delay in sending the translated version of the survey to Quebec, thereby reducing the amount of response time given, this does not satisfactorily explain a 9% response.

The most encouraging finding of this study is that since the study in 1998 the

staging rate in Canada has significantly increased from 17 to 36%. We assume that this is due to an increased awareness in the importance of cancer staging as reflected by the adoption of the national staging policy. While response rates differed among hospital sizes and regions, we were unable to distinguish an association between staging rates and hospital size or region.

Despite this increased awareness, there remain a significant number of institutions in Canada (roughly 64%) that do not record stage. Even some of the hospitals that stated that they were aware of the national policy still do not routinely record TNM stage in their patients' charts. This is likely because nobody is actively requiring clinicians

or health records professionals to record stage. Although the CCHSA includes the need for documenting cancer stage in their accreditation survey for cancer facilities (O'Sullivan et al. 1998b), this requirement does not encompass acute care facilities. It is our understanding that the recording of cancer stage does not appear to play a major role in the review process.

Our survey discovered that of those who do not routinely stage, nearly 82% do not do so because it is not a hospital requirement – this is despite the value of recording stage to hospitals in planning resources (Mackillop et al. 1998). Nearly 64% of respondents said they do not stage because it is not a CIHI requirement. Only four of the institutions

Table 4. Improving the recording and reporting of staging

	Percent Agree
Educational initiatives that would be useful (44 responses)	
In-house lectures or rounds	59.1
In-house participatory workshops	38.6
Books and manuals	45.5
Interactive CD-ROMs	45.5
Web-based education	47.7
Initiatives to facilitate the capture of TNM stage on the health record (51 responses)	
Educational materials on TNM staging	62.8
Copies of the TNM atlas	58.8
TNM tick-off staging forms	88.2
Internet based drop-down menu	35.3
Separate form for clinical staging and pathological staging	33.3
Process to ensure all information required for staging is collected and forwarded to the physician with the appropriate staging form	52.9
Integration of electronic reports into medical records (e.g., e-path)	52.9
Introduction of synoptic reports of pathology reports, imaging reports or operative reports and/or electronic synoptic reports to medical records	43.1

TNM = tumour, node, metastasis.

that responded to the survey actually include staging information in abstracts submitted to CIHI. If staging were an assessed requirement for accreditation or for reporting to CIHI, hospitals would probably routinely record stage. Improved standards and guidelines at the hospital level and especially at provincial and federal levels would lead to an improved recording of staging. The increase in staging rates from 1998 to the present suggests that the national staging policy has been effective in promoting staging in Canada; but more needs to be done.

The most common reason Canadian hospitals cited for recording stage was to contribute to cancer registries – not to affect their delivery of services. While stage information is extremely valuable for compiling statistics at cancer registries and surveillance purposes, it can also help clinicians define disease extent, make treatment decisions, estimate prognosis and plan hospital resources (Brierley 2006; Mackillop et al. 1998). Therefore, the collection of staging data has important internal organizational value beyond fulfilling provincial requirements to supply data to cancer registries. Additionally, the majority of survey respondents indicated that their hospitals do not (and would not) use stage information to monitor accrual to clinical trials. In addition to policies and guidelines, it is clear that educational interventions could help institutions realize the potential to harvest staging data to improve clinical resources and should therefore contribute to increased staging rates across Canada. According to respondents, these educational initiatives would be most effective in the form of in-house lectures and rounds and web-based education.

While such initiatives combined with strengthened policies would undoubtedly contribute to increased staging rates, it is essential that individual, institutional and governmental barriers be addressed. Some of these

barriers, as identified by respondents, include existing practice patterns, a lack of incentives and a lack of a simple recording mechanism for TNM stage. These are the same barriers identified in a previous survey of Canadian doctors' attitudes to staging (O'Sullivan et al. 1998a). Many of these barriers can be addressed through the provision of educational materials and copies of the TNM atlas, training courses for health records personnel and the creation of standard, specific TNM-reporting forms. One of the major barriers identified in the 1998 study and in "Survey of Canadian Doctors' Attitudes to Cancer Staging" (O'Sullivan et al. 1998a) is a lack of pathological information. Today, more institutions are using synoptic reporting; if such pathological procedures continue to grow, the lack of pathological information will be less of an issue in the future.

In addition to the targeting of policy and initiatives to physicians, collaboration with health records professionals is needed to provide support and to aid physicians. We assume that all physicians involved in the care of patients with cancer stage the extent of the disease as it is impossible to determine the appropriate treatment without knowing the stage (O'Sullivan et al. 1998a); however, we did not inquire about this in the survey. Clinicians should but do not always record the stage in the patient charts. If collaboration with health records professionals is established, then a well-trained team of these professionals, who will have a familiarity with TNM staging, can help ensure that staging is collected on every new case of cancer seen at each hospital.

During the development and administration of the survey, the Canadian Association of Provincial Cancer Agencies (CAPCA), in association with the members of the Canadian Cancer Surveillance Alliance, completed a survey of the status of cancer staging activities across Canada (Robson and

Cowan 2005). Staging across all aspects of Canadian cancer care was reviewed at the national and provincial levels, not just for Canadian general and acute care facilities as was done in this survey. The scope and methodology of CAPCA's survey are broader and different than those used during the completion of the current survey of general hospitals in Canada. It included face-to-face meetings and consultations and led to broader recommendations for the development and support of a standardized system for staging patients with cancer for surveillance, at the provincial and national levels as well as for individual patient care. However, when they do pertain to acute care facilities, the recommendations reflect those of this report – both to strengthen policy at all levels of Canadian healthcare and to improve educational activities.

The current survey demonstrates that even the development of a national staging policy is not sufficient to ensure that the stage of patients' cancer is being recorded adequately. In the United States in accredited cancer centres, the policy that is regulated through accreditation results in over 90% of cancer stage being recorded, but it is uncertain what happens at the hospital level outside of designated cancer centres (Fleming et al. 1996). Having a national staging policy on its own without regulation and educational initiatives is unlikely to result in an adequate level of cancer stage recording by hospitals.

Conclusion

The implementation of a staging policy has had a significant impact on the practices of recording stage. Since the study in 1998, the staging rate in Canada has significantly increased, from 17 to 36%. However, the majority of institutions still fail to routinely record stage, and they do not utilize the most up-to-date edition of TNM stage. Further educational, communication and policy initiatives are required to

improve the institution practices with respect to the recording of stage.

Acknowledgements

We thank the NCIC for providing financial support. We thank Dr. William Mackillop for allowing us to use data from the 1998 survey, and Dr. Don Cowan and Miss Darlene Dale for their advice in designing the survey questions. We also thank Mr. Ben Roffey and Miss Erin Jones for their administrative assistance.

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