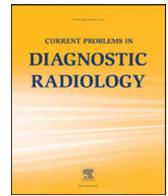




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Perception of Breast Oncologists and Physician Extenders on Imaging Consultation Service at a Tertiary Cancer Institute

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ABSTRACT

Objective: To evaluate the perception and ease of utilization of the imaging consultation service by different types of referring clinicians and physician extenders within the breast oncology disease center at our tertiary cancer institute using a survey-based questionnaire.

Methods: An institutional review board-exempted survey was created using a freely available online survey software and questionnaire tool. The survey was sent to 83 clinicians associated with the breast oncology disease center at our tertiary cancer center through an institutional e-mail list. The survey included 2 questions about demographics and 8 statements regarding various aspects of the consultation service scored on a 5-point Likert-type scale. "1" being "agree completely," "3" being "neutral/neither agree nor disagree," and "5" being "disagree completely." The survey was sent online and was answered anonymously. Responses were tallied and analyzed.

Results: A total of 56 responses (67%) were received. The weighted average of each Likert item ranged from 1.07 to 1.58. Highest positive concordance (95%) pertained to the access to the consult radiologist having a positive impact on patient care. The least concordant statement (78%), though still strong (with weighted average of 1.58% and 78% of respondents agreeing or agreeing completely) pertained to the role of direct consultation with radiologist in clinical management. Although there was variability of agreement to all statements (including responders feeling neutral), there was no one that disagreed with any of the Likert items. The mean Likert score for all the statements together was 1.23 (range: 1.07-1.58).

Conclusion: Presence of dedicated oncologic imaging consultation service is perceived positively by the breast oncology team at our tertiary cancer center.

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Introduction

In this era of precision medicine, radiologists play an active role in optimizing care of oncology patients.^{1,2} At our tertiary cancer center, there are presently 4 dedicated consultation areas embedded within clinics,³ providing easy access to radiologic consultation by clinical colleagues. Two sites are staffed by specialty-trained oncoradiologists, a third site is staffed by radiologists specialized in breast imaging, and the fourth site is staffed by dedicated neuro-radiologists. The radiologists in these consultation areas routinely provide guidance for diagnosis, staging, treatment decisions, biopsy/surgery/radiation planning, confirmation of trial eligibility, and in some cases, potential early detection of drug toxicities. This arrangement began over a decade ago, after a yearlong study analyzing the volume and impact of second-opinion consultations by radiologists showed an increased average daily work volume of 18%, with significant implications for workforce, finances and compensation for this unbilled service.⁴ Given the onerous and often unsuccessful reimbursement requirements, often suboptimal

outside study quality, and the time required to redictate studies imported from outside institutions, it was deemed inefficient to issue formal reports on all consultations. However, given the value and dependence of referring clinicians placed on these interactions, an arrangement was devised where a radiologist would be stationed at a consultation area in the clinic, and the imaging department would be compensated 1 full-time equivalent (FTE) salary for their presence.

Within the breast disease center, where there is access to a dedicated, breast imaging consultation service, Mallory et al. in a study of 153 patients showed that radiologic consultation changed surgical management of breast cancer in 11.7% of patients who underwent breast surgery.⁵ In another study, reinterpretation of outside breast imaging studies in a cancer center changed clinical management in 25% cases.⁶ Though both these studies evaluated the impact of breast imaging consultation service on clinical management, they did not take into account the perception of the oncologists and various physician extenders on the multiple other roles the consult radiologist plays in the care of breast oncology patients at all stages of disease, including the metastatic setting. To the best of our knowledge, no study has previously reported on utilization of radiology consultation services by nonphysician referrers. Accordingly, in this study, we chose to evaluate the perception and ease of utilization of the imaging consultation services by different types of referring clinicians and

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physician extenders including RNs, NPs, and PAs in the breast oncology disease center at our tertiary cancer institute using a survey-based questionnaire.

Materials and Methods

An institutional review board-exempted survey was created using a freely available online survey software and questionnaire tool. The survey was sent to all clinicians associated with the breast oncology disease center at our tertiary cancer center through an institutional e-mail list. The survey was sent to 83 clinicians affiliated with the Breast Oncology disease center, including attending medical, surgical and radiation oncologists, mental health professionals, research fellows, nurse practitioners, physician assistants, and nurses (both program and research RNs), who would potentially utilize the radiology consultation service.

The survey had 2 components—the first 2 questions gathering general demographic information, and 8 statements, with an additional entry for comments (Fig 1). The 8 Likert items were each based on a 5-point scale, “1” being “agree completely,” “3” being “neutral/neither agree nor disagree,” and “5” being “disagree completely.” These 8 statements make up our Likert survey, with scale ranging from 8 to 40, with an 8 indicating highest agreement. The survey was

sent online and was answered anonymously. Responses were tallied and analyzed.

Results

Of the 83 surveys sent, we received 56 responses (67%), including 34 of 51 physicians (67%), 11 of 14 nurse practitioners (79%), 4 physician assistants (100%), 6 of 14 registered nurses (43%), and 1 unspecified responder (Fig 2). Of the responders, 9 of 56 (16.1%) have been practicing medicine for 0–5 years, 8 of 56 (14.3%) for >5–10 years, 21 of 56 (37.5%) for >10–20 years, and 16 of 56 (32.1%) for greater than 20 years (Fig 3).

The weighted average of each Likert item ranged from 1.07 to 1.58, with no one disagreeing with any statements (Table 1). The statement with the highest positive concordance pertained to the access to the consult radiologist having a positive impact on patient care, where nearly 95% of respondents agreed completely. Over 91% of respondents agreed completely that the consultation service plays a role in patient management by providing guidance for interventional procedures, and approximately 89% agreed completely that accessibility of the consult radiologist in the clinic provides for more prompt decisions and significantly improves the daily workflow. Nearly 86% of referring clinicians using the service agreed completely

Please check one: MD ___ NP ___ RN ___ PA ___
Years in practice: 0-5 ___ >5-10 ___ >10-20 ___ >20 ___

Please rate the following statements on scale of 1 to 5 (1= agree completely, 3=neutral/neither agree nor disagree, 5=disagree completely):

1. Direct visualization of imaging studies with a consult radiologist gives me a better understanding of results and improves my ability to discuss findings with the patient.
1 2 3 4 5
2. Consultation with the radiologist is especially useful for imaging modalities with which I feel less comfortable.
1 2 3 4 5
3. In an era of precision oncology, direct consultation with a radiologist plays a role in clinical management (eg detection of immune-related adverse events).
1 2 3 4 5
4. The Radiology Consultation Service plays a role in determining eligibility for trial participation (re: response criteria, measurable disease, etc).
1 2 3 4 5
5. The Radiology Consultation Service plays a role in patient management by providing guidance for interventional procedures (eg biopsy/surgery planning).
1 2 3 4 5
6. The accessibility of the consult radiologist in the clinic provides for more prompt decisions and significantly improves the daily workflow.
1 2 3 4 5
7. When needed, the radiology consultation service provides guidance for a more tailored approach as to which imaging modalities should be used.
1 2 3 4 5
8. Access to the consultation radiologist has a positive impact on patient care.
1 2 3 4 5

Additional comments (optional):

FIG 1. Clinician survey of the radiology consultation service.

Professional title

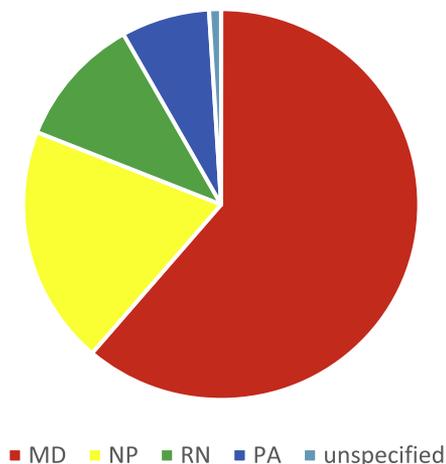


FIG 2. Distribution of responses according to professional title.

that it provides a more tailored approach as to which imaging modalities should be used. Over 85% of clinicians agreed completely that direct visualization of imaging studies with a consult radiologist gives them a better understanding of results and improves their ability to discuss findings with patients, and also agreed completely that consultation with the radiologist is especially useful for reviewing imaging modalities with which they are less comfortable. Over 75% of responders agreed completely (and over 96% agreed completely or agreed) that the radiology consultation service plays a role in determining eligibility for trial participation. The least concordant statement, though still strong (with weighted average of 1.58 and 78% of respondents agreeing or agreeing completely), noted: “In an era of precision oncology, direct consultation with a radiologist plays a role in clinical management” (and included the detection of immune-related adverse events as an example). This statement also had the highest number of “neutral” responses (ie, neither agreed nor disagreed) at 21.8%. Although there was variability of agreement to all statements (including responders feeling neutral), there was no one that disagreed with any of the Likert items. The mean Likert score for all the statements together was 1.23 (range: 1.07–1.58).

Discussion

In 2014, the American College of Radiology (ACR) announced the Imaging 3.0 campaign, focusing on optimization of high-value imaging care, while emphasizing appropriateness, quality, safety, efficiency, and satisfaction, overseen by radiologists, who serve as imaging consultants and actively participate in patient care.^{7,8} The

Years in practice

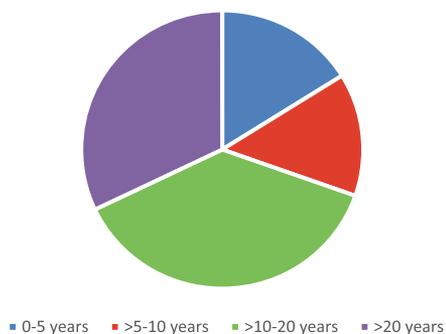


FIG 3. Distribution of responses according to years in practice.

TABLE 1
Likert scale scoring

Likert Item	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	Weighted average
1	85.71	7.14	7.14	0	0	1.21
2	85.71	5.36	8.93	0	0	1.23
3	63.64	14.55	21.82	0	0	1.58
4	75.47	20.75	3.77	0	0	1.28
5	91.07	7.14	1.79	0	0	1.11
6	89.09	7.27	3.64	0	0	1.15
7	85.71	10.71	3.57	0	0	1.18
8	94.64	3.57	1.79	0	0	1.07

active and critical role that radiologists play in a tertiary cancer center has been previously described.² Several groups have published on the clinical importance of subspecialty reinterpretation of outside studies at a tertiary cancer center.^{9–11} However, the subspecialty interpretation and review of our own and outside imaging studies is only one of the many services provided by the consulting radiologist at a cancer center.

The consult radiologist also provides clinical imaging decision support, determination of trial eligibility with respect to measurable disease, advice regarding biopsy and treatment planning, and may be the first to detect potential drug toxicities. We have previously reviewed the various consultation models, and our perception of their value.³ In this study, we assessed the opinion of breast oncologists, surgeons, radiation oncologists, and physician extenders on the multifaceted assistance provided by our imaging consultation service at a tertiary cancer center.

The overall response rate to our survey was relatively low at 67%; however, this was not unexpected, as the list serve used to send the survey was inclusive of all clinicians affiliated with breast oncology, including mental health professionals, research fellows, and research nurses, all who do not order imaging studies, and therefore would not be expected to utilize the consultation service. The majority of clinicians that responded were MDs (61%), as expected, given that physicians comprise the bulk of practitioners in the breast oncology division. However, they were actually outranked in utilization by PAs (100%) and NPs (79%), who often see patients at follow-up visits that necessitate review of their imaging studies. With respect to experience, nearly 84% have been practicing for greater than 5 years, and over 67% for greater than 10 years. Thus, the experience of the referring clinician did not affect their enlistment of the consult radiologist.

All responders agreed with the utility of the service, with the greatest percentage of absolute agreement pertaining to the positive impact on patient care, the role in patient management by providing guidance for interventional procedures, the ability to make more prompt decisions and significantly improve the daily workflow. Though there was no disagreement by any of the clinicians and/or physician extenders with any of the statements in the questionnaire, a significant proportion (nearly 22%) was neutral with respect to the role of direct consultation with radiologist in determining clinical management. This can be explained by the fact that in addition to radiological imaging, several factors including patient preferences determine specific treatment decisions. A similar argument explains the relatively low agreement with respect to role of radiology consultation in determining trial participation of patients.

When our consultation service began, a single radiologist was embedded in the clinic, and the imaging department was reimbursed the salary of a single FTE radiologist. Due to its overwhelming approval over the past 15 years, the service has now expanded to include 3.5 FTE consult radiologists. Each imager staffs a consult room within the oncology clinic that houses a Picture Archiving and Communications System (PACS) system and dictating system, thereby allowing for study interpretation between consultations. The

consult radiologist thereby assists staff radiologists assigned to interpret our daily imaging studies, meanwhile, minimizing interruptions to those radiologists by referring clinicians. In addition, referring clinicians seeking radiologic assistance (important to oncologic care) are more time efficient and productive as the consultation areas are housed within the clinic. Although difficult to precisely quantify non-RVU (relative value unit) value added by the consultation service, this arrangement has proved advantageous to both radiologists and consulting clinicians, by minimizing interruptions, increasing efficiency, and providing better workflow for oncologists. An additional non-quantifiable benefit is junior faculty development, whereby the close relationships built between referring clinicians and radiologists has helped foster the development of expertise in both clinical and research arenas.

In conclusion, medical, surgical, and radiation oncologists and physician extenders are the direct customers of the radiology consultation service. Quantifying their perception will help in improving the close interaction and exchange of knowledge between oncologists and radiologists, in turn, fostering a more collegial interaction facilitating research opportunities as well as optimized patient care. In this survey, we found that the presence of a dedicated radiology consultation service is perceived positively by the breast oncology team at our tertiary cancer center. Replication of such service can be considered at other institutions.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1067/j.cpradiol.2018.06.002.

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