National Cancer Institute

A Study to Determine How to Improve the Dissemination and Implementation of Evidence-Based Practices in Cancer Care

Report of Practitioner Survey Findings

Findings of a nationwide survey of health care practitioners along the continuum of cancer care.

Conducted under contract by the
University of Massachusetts Donahue Institute

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Contents

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Cooperating Professional Societies and Organizations

American Society of Clinical Oncology (ASCO)
Oncology Nursing Society (ONS)
Association of Oncology Social Work (AOSW)
American Society for Therapeutic Radiology and Oncology (ASTRO)
Cancer Patient Education Network (CPEN)
Health Resources and Services Administration (HRSA)

Summary of Key Findings

Following are the key findings of a nationwide survey of 2,864 health care practitioners, administered by the National Cancer Institute's (NCI) Office of Education and Special Initiatives (OESI). In November 2003, NCI contracted with the University of Massachusetts Donahue Institute to conduct a study titled *NCI Practitioner Satisfaction and Needs Analysis: Supporting Implementation of Evidence-Based Practice through Improved Dissemination*. This research was intended to inform NCI's program plan for increasing the awareness and implementation of evidence-based practices among health practitioners involved in cancer care through the identification of system- and practitioner-level leverage points that promote implementation. The study consisted of three phases: a review of relevant literature, an expert interview process, and a nationwide survey of cancer care practitioners.

The NCI Practitioner Survey, which was administered in spring 2005, engaged practitioners from primary care (physicians and nurse practitioners) and selected cancer care specialists (oncologists, nurse oncologists, and oncology social workers). These practitioners served economically and racially/ethnically diverse patient populations within a variety of practice settings, including cancer centers, university-affiliated teaching hospitals, community hospitals, community clinics, private offices, and Veterans' Administration facilities, among others. The survey sample was well balanced in terms of practitioners' number of years in practice and geographic distribution. Full population survey frequencies were weighted to adjust for sample size differences among practitioner groups. As a result, each group's responses have the same proportional impact on survey findings.

Key Findings

1. Information Access and Resources

A set of survey items related to the accessibility and use of information and information resources were developed based on knowledge derived from foundation research.[1] These survey items focused on practitioners' perceptions of the gap between cancer care research and practice, their response to research findings in their application in practice, and the relative accessibility of the information they need to maintain competence in practice. The survey also probed practitioners' use of 14 common sources of practice-related information, focusing on both the frequency of use and the relative importance of each source.

- **Practitioners confirm that a gap exists between research and practice in cancer care.**

Overall, 64% of respondents agreed that "There is a gap between the cancer care patients receive and the care indicated by current research", substantiating the concern that prompted this study. At the same time, the intensity of this response was somewhat muted, as only 12% of respondents strongly agreed with this statement. This mixed response suggests that while most practitioners perceive a gap between research and practice, they may not necessarily believe the problem has a pervasive effect on the quality of patient care. Among respondents, nurse practitioners (72%) most frequently agreed with this statement, while oncology nurses least frequently agreed (57%). There was less variation observed within other sub-group's responses.

- **Practitioners generally have access to the information they need to keep their practice current; however, they lack the time to retrieve that information.**

Overall, 83% of respondents reported that they have adequate access to the research needed to keep their practice current. However, only 33% agreed that they have adequate time to access the research needed to support their

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[1] Foundation research included an extensive review of literature, a nationwide practitioner and expert interview process, and participation in NCI's Dialogue on Dissemination discussion series (August 2004 – January 2005).

practice. This highlights a critical obstacle to the integration of new research into practice. Among respondents, oncologists least frequently (51%) cited a lack of time to access research and this challenge was observed to be more pronounced within primary care settings, in general.

- **Nearly half of all respondents indicated that when their professional experience is in conflict with research findings, they tend to rely on that experience as the basis for clinical decision-making.**

Among respondents, 46% agreed that "When research findings contradict my professional experience, I tend to rely on my experience as a basis for cancer care." Among practitioners, oncologists and family physicians most frequently favored research findings as the basis for clinical decision making, while oncology social workers (65%) most frequently relied upon professional experience. Further analysis revealed that 53% of respondents from community hospitals tend to rely on experience, compared to 40% of community clinic staff. There is a modest tendency for practitioners to rely more on experience as the number of years in practice increases.

- **Practitioners access a variety of information sources, but most frequently rely on organizational colleagues, peer-reviewed journals, and professional society events. Professional and organizational characteristics strongly influence source reliance.**

The survey probed for practitioner reliance on 14 sources of research and practice-related information. Responses to these questions were analyzed through factor analysis and clustered statistically into four broader categories of resources. Among them, practitioners most frequently (44%) relied on "intramural" resources—available within a practitioners' workplace or professional society. They exhibited lesser reliance on "external traditional" (32%), "web-based" (24%), and "market-based" (14%) information resources. Sub-group characteristics interact to create significant variation in response to each resource. The most consistent trend was a comparatively limited reliance among family physicians on 10 of these 14 information sources.

Within the intramural resources category, respondents most frequently reported that they rely on colleagues or experts from within their organization (60%) and professional society meetings/conferences (50%). Internal trainings, meetings, and other events were also commonly cited. Reliance on intramural resources was generally highest among cancer care specialists. In comparison to primary care providers, these specialists are more likely to work in large hospital settings, which often have greater internal resources from which to draw than would a clinic or private office.

Within the external traditional resources category, reliance on peer-review journals (57%) and colleagues from outside organizations (38%) was most common. Only 21% of respondents reported that they rely on evidence summaries—perhaps due to limited availability—and there was little reliance on journals that lack peer review. Oncologists and oncology nurses most frequently rely on peer reviewed journals, while family physicians, oncology social workers, and nurse practitioners more frequently utilize colleagues from outside their organizations. Respondents practicing in small settings were most likely to engage external colleagues.

Practitioners less frequently reported reliance on the web-based resources described in the survey. Frequency of reliance ranged from 29% (professional society sites) to 17% (federal agency sites). Among organizations, respondents from community hospitals reported the greatest reliance on these resources. Practitioner sub-group trends generally varied by measure; however, practitioners with zero to five years experience more frequently utilize these resources than do their more experienced peers (the differences were generally modest).

Overall, practitioners did not rely extensively on the market-based resources included in the survey. A range of factors may explain these results. For example, interviews suggested that conflict of interest concerns may limit reliance on information provided by pharmaceutical and medical device company sources, on-line educational offerings may typically focus less on cutting edge clinical topics with established demand, and HMO guidelines might tend to emphasize "tried and true" treatment over newer, more experimental options. Among practitioners, oncology nurses and, to a lesser extent, nurse practitioners most frequently relied on industry sponsored programs and on-line courses for information regarding current research-indicated practices.

2. Factors Affecting the Translation of Research into Practice (TRIP)[2]

Foundation research suggested a range of factors that might potentially support or impede practitioners' acquisition and implementation of current research. The practitioner survey included six questions intended to ascertain whether organizational factors that are considered supportive of research dissemination and implementation were present in respondents' organizations. Potential barriers were assessed through ten questions reflective of specific concerns identified through a nationwide practitioner interview process that preceded survey development. Finally, an open-ended question asked practitioners which factor they believe is most critical to the successful implementation of a change in practice.

Organizational Factors Affecting TRIP

- **Most organizations are at least somewhat committed to implementing new practices and allow for practitioner autonomy to make changes in practice. However, many organizations do not disseminate new practices effectively and lack adequate staffing and systems to support implementation.**
- **Organizational factors that support TRIP are less frequently in place in smaller clinic and private office settings than in larger settings, such as community hospitals, teaching hospitals, and cancer centers.**

Factor analysis revealed a strong correlation among four questions related to the effectiveness of change management practices within respondents' organizations. In this context, change management refers specifically to supporting research-indicated changes in cancer care practice. Overall, 66% of respondents either somewhat (40%) or strongly (26%) agreed that their organizations exhibit effective change management practices. Data reveal substantial variation by practitioner group, with specialty cancer care practitioners more frequently indicating agreement than practitioners engaged in primary care.

Reviewing responses to the four questions that comprised this scale, 72% of respondents agreed that their organization's leaders are committed to implementing research-indicated practices and 81% agreed that they have the autonomy to make needed changes in practice. Overall, this is a positive indicator of organizational support and individual autonomy to revise practices to meet new research-indicated standards of cancer care. However, only about one-third of respondents strongly agreed with these statements, suggesting that these conditions may not be consistently embedded in organizational structures and may be subject to situational decision-making.

Respondents less frequently agreed that dissemination and implementation are supported effectively within their organization. In total, 56% of respondents agreed that their organization effectively disseminates new research-indicated practices to staff. This suggests that a communication bottleneck exists at the organizational level, which is of particular concern given the difficulty practitioners have making time to access research findings. In addition to problems with dissemination, 52% of practitioners reported that their organizations' information management system effectively supports the implementation of new research-indicated practices.

Substantive differences exist within sub-group responses to these questions. On three of the four measures, the responses of primary care practitioners—family physicians and nurse practitioners—stood in contrast to those of other respondents. In each case, findings suggest that primary care respondents operate within organizations that are less prepared for change than do their peers in specialty cancer care. It is also notable that while most practitioners agreed that they have the autonomy to alter practice as new evidence becomes available, oncology nurses less frequently agreed (62%) that this is the case.

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[2] The term, TRIP, or translation of research into practice, is often used to describe the broader process of which research dissemination and new practice implementation are components. It is important to note that the lexicon associated with this field of study is not in all cases clearly or consistently defined.

Viewing these data by sub-group, it appears that larger, relatively well-resourced organizations—such as cancer centers and university-affiliated teaching hospitals—are positioned to provide greater organizational support for TRIP than are smaller or presumably less well-resourced environments, such as community clinics, private offices or community hospitals. This appears to manifest in terms of both supportive infrastructure and leadership commitment to TRIP. *This finding confirms the need for any comprehensive national TRIP support strategy to account for the varying needs and capacities of practitioners in a range of organizational settings, to the extent that those organizations will be relied upon as a conduit for practice-related information.*

The survey contained two other questions focused on the organizational infrastructure to support dissemination and implementation. Only 43% of respondents reported that their organizations have a member of staff who is responsible for the development, update or implementation of practice guidelines, while 50% have a member of staff responsible for identifying patients who are eligible for clinical trials. Again, sub-group analyses show that large, relatively well-resourced hospitals are more likely to have staff with specialized responsibilities to support cancer research, dissemination or implementation than are community clinics or private practices.

Implementation Cost and Economic Considerations

- **Implementation costs and other economic considerations form a substantial barrier to the translation of research into practice, particularly for primary care practitioners working in smaller organizational settings. Cost factors manifest in multiple forms, including staffing levels, insurance rules, and conflicting organizational priorities.**

Factor analysis showed a strong correlation among five survey questions that gauged the extent to which economic factors (costs) impact practitioners' ability to integrate new research-indicated approaches into cancer care into practice. Mean responses to this survey scale show that 58% of respondents agreed that implementation costs were a barrier, with 19% reporting that they strongly agreed. Primary care providers and staff of small organizations (clinics and private offices) more frequently agreed that the cost of implementation creates barriers to TRIP than did cancer specialists and staff of larger organizations (hospitals).

A review of responses to the individual questions that comprise this survey scale highlight concerns that providing state-of-the-art care is often not possible for under-insured patients. Overall, 62% of practitioners expressed some agreement with this statement, with 30% indicating that they strongly agreed. A larger proportion (69%) agreed that implementation of new practices is often hindered by a lack of staff time; although a smaller percent (23%) indicated strong agreement.

Respondents were also asked to reflect on the extent to which the policies of third party payors discourage the implementation of new practices and whether their organization's quality improvement efforts are driven by the need for cost reduction. Approximately 58% of respondents agreed with these statements, with relatively small proportions reporting strong agreement (18% and 15%, respectively). Overall, 42% of respondents identified the lack of specialized medical equipment or devices as a barrier to the implementation of new practices, with primary care providers far and away the most concerned on this point.

Practitioner sub-group findings are mixed within this set of survey items. It is perhaps most notable that the responses of practitioners from small settings (community clinics and private hospitals) and large, generally well-resourced settings (cancer centers and university teaching hospitals) continued to stand in contrast to one another, with respondents from smaller settings more frequently noting cost factors as a barrier to the implementation of new research-indicated practices. It is important to note that the responses of staff from community hospitals—relatively large institutions that frequently operate with substantial financial resource constraints—did not track consistently across survey items with either of these two groups.

Characteristics of Information

- **Although the characteristics of information can present substantial barriers to TRIP, concern for such was less consistent than for other factors identified on the survey.**

As previously noted, practitioners generally reported that they have access to current research findings, but lack the time to gather and use that information. Factor analysis showed a strong correlation among four questions related to the characteristics of information—cancer care guidelines and related literature—intended to support and inform cancer care. Overall, 49% of respondents agreed that inadequacies in the content or format of information present barriers to the implementation of new research-indicated practices, although only 7% agreed strongly. Among practitioners, agreement ranged from a high of 59% (family physicians) to a low of 37% (oncology nurses). There was limited evidence to suggest a split in the opinions of primary and specialty cancer care practitioners at the scale level.

Responses to the individual questions that comprised the inadequacies of information scale were consistent with the overall results, with the exception of a lower level of agreement (35%) with the statement "Guidelines for cancer care are generally too broad and complex to be implemented effectively." Some variation did exist among sub-group responses to these questions. Data suggest that oncology nurses are more comfortable—and family physicians less comfortable—with existing guidelines and literature than are other practitioners. Organizational effects on response to these questions were generally unremarkable.

Implementation Decision "Tipping Points"

- **Organizations must be willing and able to change, which requires that clear and compelling evidence of efficacious new practices is readily available. Even with these conditions satisfied, financial and related time constraints are a threat to implementing new research-indicated practices.**

Respondents were asked "In general, what factor is most likely to determine whether you succeed in making a change in practice? That is, what is the one thing that most helps or hinders making a change?" Sixty-seven percent of respondents answered this open-ended question, which sought to identify the critical decision-making "tipping points" that determine whether new practices are implemented or not. Responses suggest that organizations are both willing and able to change. Willingness to change is in part a cultural issue, but can be increased through access to clear and compelling evidence (information) of efficacious new practices. Financial constraints and limits on available staff time were other critical factors noted to influence organizations' ability to implement new research-indicated practices.

Organizational factors, the most commonly cited tipping points in the decision-making process, were identified by 48% of all respondents who offered a comment. Oncology nurses and social workers most frequently offered comments related to organizational factors, in contrast to oncologists, who least frequently focused on these topics. Exploring the sub-themes that comprise this factor, practitioners noted that an organizational culture and leadership that is open to change is imperative. Along with this, organizational consensus, as well as collegial and institutional support, was deemed essential. Consensus is reinforced by previous success implementing new practices and by clarity regarding the perceived benefit and efficacy of the changes being proposed.

Characteristics of information were cited by 30% of respondents, including 47% of oncologists. Decisions to implement new practices are built upon the quality and availability of the information that supports those practices. Among respondents, oncologists most frequently noted the critical role of the underlying information. The sub-themes that comprise the characteristics of information category focused on bias and trust, data strength and quality, the applicability and relevance of findings, the method of presentation and whether and how information is shared.

Financial factors were cited by 24% of practitioners, most commonly by oncologists and nurse practitioners. Finance-related comments reflected the concern that although the implementation of new practices may be desirable, it is not in all cases affordable at the patient or practitioner/institutional levels. Common finance-related sub-themes included inadequate reimbursement levels, gaps in insurance coverage, the cost of treatment, and the complex process of weighing relative cost against benefit on a practice- and individual-level basis.

Finally, 14% of respondents cited time-related factors as pivotal to successful implementation. Time was identified as a tipping point by 24% of oncology social workers, but only 5% of oncologists. The concerns associated with time were broad, but most frequently centered on the lack of the time to acquire and evaluate new research, the lack of staff and training time to support the new practice, and the lack of time to actually implement the practice into a clinical setting.

3. Possible Action Steps to Support TRIP

Survey respondents were asked to rate eleven suggestions based on their potential to positively impact the adoption of research findings into practice. These suggestions were selected by NCI from a broader list developed through key informant interviews, the Dialogue on Dissemination discussion series, and conversations with cooperating professional societies. In addition to these rating questions, this survey section contained questions related to respondents' satisfaction with NCI's efforts to support research dissemination, as well as the extent to which they agree that professional organizations and the National Cancer Institute must increase their efforts to support dissemination and implementation.

A Need for Action

- **Most respondents were satisfied with NCI efforts to support dissemination; however they issued a clear mandate for NCI and other national organizations to increase efforts to support the uptake of research in clinical practice settings.**

Approximately 80% of respondents reported they were somewhat (65%) or very (16%) satisfied with NCI's efforts to support the dissemination of new research findings that impact cancer care. In this way, they offered a generally positive assessment of NCI's dissemination practices, while also highlighting the opportunity for further improvement. The perceived opportunity for improvement was greatest among oncologists, of whom 60% reported they were somewhat or very satisfied.

Overall, 97% of respondents agreed that professional organizations and NCI must further increase efforts to support the dissemination and implementation of evidence-based practices. Within this response, 57% indicated strongly agree and 40% indicated somewhat agree. Significant variation was observed among practitioner sub-groups. Oncology nurses, oncology social workers and nurse practitioners most frequently reported strongly agree (62% to 65%), compared to 44% of family physicians.

Make Relevant Information More Accessible

- **Respondents embraced suggestions to utilize the web to streamline access to more comprehensive and efficient stores of clinically relevant information.**

Practitioners' needs for *timely* access to *the right* information were clearly outlined during the practitioner interview process and the Dialogue on Dissemination. The practitioner survey included four suggestions targeted to these concerns, which combined statistically to form the Make Relevant Information More Accessible scale. In fact, this was the highest rated group of suggestions on the NCI survey, with 84% of respondents offering a positive (good or excellent) rating.

Responses to individual questions highlight the wide acceptance of the role the Internet can play in knowledge dissemination. Among these suggestions, the most popular was the development of a free, comprehensive collection of up-to-date cancer-related clinical guidelines and research studies, rated as a good or excellent suggestion by 89% of respondents. Similar interest exists for increased availability of summary evidence reports. Smaller, but still large, proportions (about 80%) of respondents would like to leverage web capabilities to create greater opportunities to “look behind” research summaries and guidelines to the original studies upon which they are based, or to create an email subscription service that creates a constant “push” of relevant new research findings based on user-defined information needs.

Among practitioners, family physicians offered the lowest ratings on three of these four suggestions, perhaps due to their role in cancer care, which may create a premium on quick and efficient evidence summaries and reduce their need for searchable information archives and breaking research, which may be more in the domain of cancer specialists. Survey data show that there is a slight tendency for practitioners to rely more on experience as the number of years they have in practice increases.

Support and Prioritize Changes in Practice

- **Practitioners want practical tools that facilitate the implementation of new practices. Given the costs of implementation and the wealth of new practice-related information, a more targeted approach to dissemination may be beneficial to implementation.**

With resources limited, it is imperative that practitioners and their organizations have the necessary tools and systems to support an efficient implementation of new practices. The Support and Prioritize Changes in Practice scale summarizes responses to four suggestions that would create additional knowledge resources to support implementation and a fifth suggestion to focus national dissemination efforts on a select number of new practices. Among respondents, approximately 87% offered a positive rating of the suggestions that comprise this scale.

Overall, 86% of practitioners embraced the suggestion to provide tools (such as patient flow charts and PDA reminders) to help organizations adapt clinical guidelines and research findings for use at the point of patient care. Seventy-nine percent approved of a suggestion to increase the availability of successful implementation plans that can serve as models for other practitioners/organizations trying to adopt a change in practice. Other suggestions, including one to increase access to “facilitators” who are trained to support the implementation of new practices (75% positive) and another to increase implementation-oriented train-the-trainer programs (71% positive), were also well received. The suggestion to focus national dissemination efforts on a selected number of new treatments based on their potential to improve patient outcomes and quality of life was rated positive by 77% of respondents.

Nurse practitioners, oncology nurses, and oncology social workers offered the most positive ratings of suggestions for tools and training to support implementation. Oncologists were decidedly less interested in facilitator-based implementation support strategies. Interest in a more focused national dissemination agenda was consistent across sub-groups. This suggests widespread agreement that dissemination should be targeted toward high-benefit practices and that this narrower focus could benefit practice implementation.

Increase Practitioner Input to Research Priorities

- **Nursing and social work professionals, in particular, feel that an increase in practitioner input to research priorities would positively impact TRIP, and emphasize the need to increase the focus on symptom management in cancer care.**

The relevance of available research to practice is a vital concern that may be affected by a range of factors. Among these factors is the alignment between funded research designs and the practical information needs of field-level practitioners. Fundamentally, this is a question of whether available research “fits” the needs of the field. The practitioner survey included two suggestions that grouped statistically to form the Increase Practitioner Input to Research Priorities scale. Among respondents, 72% offered a positive rating. Response to the two suggestions—to increase the availability of research focused on symptom management and to increase practitioner input into cancer research priorities—was very similar.

Among nurses and oncology social workers, 85% to 90% offered a positive rating of the suggestion to increase symptom management research, compared to 48% of oncologists and 68% of family physicians. The suggestion to increase practitioner input to cancer research funding also resonated with nurses and oncology social workers, with 73% to 81% offering positive ratings, respectively; compared to 56% of physicians and 59% of oncologists. Respondents from hospitals offered more favorable ratings (68% to 71%) than did respondents from community clinics (60%), in particular.

Practitioner Suggestions to Improve TRIP

- **The content, dissemination method, and format of information that is intended to guide practice are of paramount concern to practitioners, and are frequently perceived to be within the domain of NCI and other national organizations to address.**

The practitioner survey included a final open-ended question, which asked respondents to "identify one thing that you would like NCI or other national organizations to do in order to improve the translation of scientific research into practice." In total, 49% of respondents answered this question, which sought to ascertain the priorities of practitioners with regard to national-level interventions to improve TRIP.

A thematic analysis of comments was conducted and 12 major categories of suggestions were identified. The most common themes included suggestions related to: the enhancement of available content (43%), the preferred modes of dissemination (30%), and the formatting and presentation of information (27%). It is appropriate to focus on this top-level finding—that the content, dissemination method and format of information that is intended to guide practice are of paramount concern to practitioners, and are commonly perceived to be within the domain of NCI and other national organizations to address.

Several other themes were observed and bear mention. These suggestions include the need:

- To exert policy influence and coordinate at the national level;
- For more accessible and better targeted information;
- For more "extension-style" resources that deliver national technical assistance programs through regional agents focused on the uptake and implementation of the practices that are critical to local populations;
- To develop funding to support practice implementation, particularly in low-resource environments;
- To improve and increase accrual in clinical trials and to expand dissemination research trials that may support development of more effective plans for research implementation (suggested by oncologists).

It is important to recognize that the potential value of each of the preceding suggestions to TRIP remains enormous, despite the range in relative frequency with which they were observed. In fact, frequency of occurrence may be a function not of the relative value of each suggestion to practice, but merely of respondents' perceptions of what they think can reasonably be accomplished by NCI and other national organizations or by respondent views on the appropriate role of these specific organizations in support of TRIP.

4. Sub-Group Response Analyses: Differences that Make a Difference

- **Strategies to support dissemination and implementation must be tailored to specific audiences. The needs of practitioners in different professions and organizations vary in many important regards.**

The NCI Practitioner survey contained several respondent profile questions focused on the attributes of practitioners, their organizations, and their clients. Survey responses were analyzed at the sub-group level to identify important trends in responses by profile attribute. Findings indicate the preeminence of practitioner role (profession) and organizational affiliation as the factors with the greatest impact on survey response. These factors resulted in significant—and frequently substantial—differences in response to most survey items.

It is also important to note that significant differences were observed among responses based on practitioners' time in practice, sex, and credentials, as well as the relative poverty or racial/ethnic composition of the clients they serve. However, analysis suggests that these attributes are often subordinate to professional role (e.g., most nurses are female) or organization (e.g., VA hospitals serve the highest proportion of economically disadvantaged clients). Professional role and organizational affiliation also frequently interact (e.g., private offices are generally staffed by primary care practitioners).

I. Introduction and Methodology

Introduction

This Report of Survey Findings was developed by the University of Massachusetts Donahue Institute on behalf of the National Cancer Institute (NCI) Office of Education and Special Initiatives (OESI). The NCI Practitioner Survey, a national survey of cancer care providers, is the third and final data collection phase of a study titled *NCI Practitioner Satisfaction and Needs Analysis: Supporting Implementation of Evidence-Based Practice through Improved Dissemination*. This research is intended to inform and direct NCI's program plan for increasing the awareness and implementation of evidence-based practices among health care professionals involved in cancer care, through the identification of system- and practitioner-level leverage points that might promote implementation.

Following are the core objectives and underlying research questions associated with this study. The NCI Practitioner Survey, completed by 2,864 practitioners involved in primary care (physicians and nurse practitioners) and selected cancer care specialists (oncologists, nurse oncologists, and oncology social workers) during spring 2005, was a key component in the research plan to identify answers to these questions.

1. **Identify barriers to practitioners' implementation of current evidence-based practices.** What barriers to dissemination and implementation exist at the practitioner, organizational and system levels?
2. **Identify factors that are supportive of practitioners' implementation of evidence-based practices.** What key attributes of individuals, organizations, and health care and health research-related systems impact practitioners' acquisition and implementation of new research findings? To what extent do practitioners see these factors as available or lacking within organizations?
3. **Provide direction to NCI as it seeks to better organize its internal resources in support of the implementation of evidence-based practices.** Understanding the individual, organizational, and systems-level issues affecting dissemination and implementation, what specific policies or practices might be pursued in order to improve the effectiveness of NCI dissemination and implementation support initiatives? What current NCI practices or policies are supportive of or detrimental to the transfer of efficacious research into cancer care practice?
4. **Identify ways in which NCI can enhance external partnerships and otherwise influence the national agenda to support implementation of evidence-based practices.** What, if any, role should NCI play in the support of dissemination and/or implementation? What complementary roles might NCI and other national organizations play in order to bridge the gap from research to practice for the purpose of improved cancer outcomes?

Research Design and Methods

Survey Development

The survey was developed in response to the core study objectives (above) and relied on a body of foundation research and other discussions conducted through and in parallel with this study, such that survey content could be developed with a full awareness of the salient issues confronting practitioners seeking to translate research into practice (TRIP).[3] This foundation research included a comprehensive review of literature and a national key informant interview process, and was supplemented by additional discussions with NCI staff, professional organization leaders, and through participation in NCI's Dialogue on Dissemination discussion series.

Foundation research revealed the need to address a broad range of topics in a time efficient manner. Through ongoing discussions with NCI OESI staff, it was decided to focus the practitioner survey on the following topics:

- Perceptions of the gap between research and practice
- The accessibility of practice-related research
- Preferred and most important information resources
- Staffing and other infrastructure to support TRIP
- Organizational commitment to TRIP
- Practitioner empowerment and decision-making re: TRIP
- The impact of specific economic factors on TRIP
- The impact of the form of research and practice guidelines on TRIP
- Open-ended comments regarding key factors affecting TRIP
- Specific suggestions for improving TRIP
- Satisfaction with NCI's support of dissemination
- The appropriateness of continued NCI and professional society support for TRIP
- Personal and organizational data for purposes of sub-group response testing and sample control

Discussions with professional society leaders revealed great concern regarding the willingness of members to comply with surveys and other data collection efforts. With this in mind, surveys utilized Likert scales to test agreement with, or relative approval of, statements and suggestions. The goal was to create a survey that could be completed in 10 minutes or fewer, while addressing the broadest range of salient issues possible. The final 47-item instrument was relevant to the range of practitioners to be engaged through the study. Each practitioner group received a unique survey version that featured only minor customization, which was contained within the profile question section of the instrument.

A draft of the survey instrument was presented for review by NCI and by a range of cooperating professional organizations that represented the cancer care specialists to be engaged through the survey, including the American Society of Clinical Oncology (ASCO), the Oncology Nursing Society (ONS), the Association of Oncology Social Work (AOSW), and the American Society for Therapeutic Radiology and Oncology (ASTRO). In addition to survey review, these organizations provided access to their membership and pledged to assist survey administration through member email distribution lists. Accordingly, a web-based survey was programmed and readied for piloting. At the same time, a print version of the survey was drafted, as NCI resources did not immediately allow for engagement with the representative organizations for family physicians and nurse practitioners. Survey administration for these groups was supported by purchased lists of postal addresses through Medical Marketing Services, Inc. Email lists were not available for purchase.

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[3] The term, TRIP, or translation of research into practice, is often used to describe the broader process of which research dissemination and new practice implementation are components. It is important to note that the lexicon associated with this field of study is not in all cases clearly or consistently defined.

In February 2005, a pilot survey instrument was fielded, in compliance with federal Office of Management and Budget (OMB) regulations. This instrument contained over 65 questions. The pilot survey was launched as a web-based instrument, which allowed testing of both content response and of the technical issues that might arise in the distribution of survey links via the professional organizations' email distribution systems. In addition to answering the survey questions, pilot respondents were asked the following questions at the end of each survey section: 1) Are there any questions or instructions in the previous section that are unclear? 2) Do you have any comments on the terminology or suitability of the content? 3) Did you experience any navigation errors in the previous section? and, 4) Are there any additional comments you would like to add concerning the previous section of the survey?

Researchers were limited by OMB regulations to a pilot response group of nine. In total, three nurses and six oncologists were surveyed, including staff that also played administrative roles within their organization. No substantial technical issues were encountered during the pilot; however, respondents did identify several formatting issues and share concerns regarding several questions that were later eliminated from the survey instrument. The median time to complete the survey was approximately 12 minutes.

Survey Administration Plan

This preliminary study plan called for the researchers to administer 400 surveys per practitioner group via telephone interview. However, it became clear during the interview phase that time-constrained practitioners would not generally be available to respond to telephone interviews. Practitioners generally indicated that they would prefer a web-based survey format, followed by mail and, lastly, telephone. Given the need to maximize response rates, the warnings of professional societies regarding generally poor survey response rates among their members, and the apparent preferences among practitioners to receive the survey via web, it was decided to use web-based surveys wherever possible.

Because email addresses were expected to be available for a majority, but not all, practitioner groups, researchers concluded that a mixed method approach using both web and postal mail would best serve the needs of the study. Ultimately, three of the five practitioner groups—oncologists (medical, surgical, radiation), oncology nurses, and oncology social workers—were engaged by email. Other groups for which email address information were not available, including nurse practitioners, family physicians, and a small number of oncology social workers (171 of 871 total), were contacted via US Post. Initially low response rates among family physicians resulted in a second mailing to this sub-group. This second mailing offered physicians the option of accessing a web address to complete the survey, but only a handful of physicians exercised this option.

In preparation for survey administration, the researchers also conducted a brief review of literature related to the effects of incentives on practitioner survey response rates. Several studies suggest that using a lottery incentive to improve survey response rates among physicians is effective.[4],[5],[6] Given the sometimes challenging process of recruiting practitioners for the study's interview phase, and the cautionary tales shared by some professional societies, the inclusion of an incentive was deemed worthwhile. The incentive prize structure allowed for the award of a total of twenty $50 gift certificates for Amazon.com. Winners were selected at random from among respondents. Participation in the contest was voluntary and required respondents to share email address or other contact information through the survey. Odds of winning were estimated at approximately 1 in 100, based on an estimated response of 2,000.

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[4] Robertson J, Walkom EJ, McGettigan P.; Response rates and representativeness: a lottery incentive improves physician survey return rates. Pharmacoepidemiolol Drug Saf. 2005 June 3.

[5] Comments on "Methodological and Analytic Issues in Multi-Level Studies of Quality and Cost of Healthcare" authored by Rob Santos and Paula Diehr; Danna Moore and Don A. Dillman, Washington State University

[6] Hall MF, Conducting Physician Surveys; Journal of Healthcare Materiel Management. October 1994, 28-31

Sampling

Target population

The original project plan was to survey six groups: family physicians, nurse practitioners, oncology social workers, oncology nurses, medical oncologists and radiation oncologists. These practitioner groups were chosen because of the key roles they play in the care and treatment of cancer, with no intention to diminish the importance of other disciplines that also play vital roles in the cancer care continuum. Ultimately, radiation and medical oncologists were combined into a single sample group—oncologists—and the category was expanded to include surgical oncologists and hematologists. This was done at the suggestion of ASCO, which serves these practitioner sub-groups, which vary markedly in membership size.

Sample size

Using Wasserman's random sample size calculation, it was determined that sub-group sample sizes at the 95% confidence level should be conservatively calculated to be 400. Therefore, the total recommended sample size, with five groups containing 400 respondents each, was 2,000. Although several studies indicated higher response rates, conversations with professional societies, including those listed previously and the American Association of Family Practitioners, suggested a response of about 10% should be expected. Using this figure as a basis for planning, the researchers conservatively anticipated a response rate of 7% when developing sample size criteria.

In order to achieve a sample of 400 for each group, approximately 5,800 potential respondents needed to be contacted per group, for a total sample population of 29,000. Because two groups' (AOSW and ASCO) have fewer than 5,800 members, the sample pool of 29,000 was not reached (see Table 1, next page for details). Ultimately, the overall response rate exceeded expectations and a minimum sample of 400 respondents per group was obtained for all sub-groups except AOSW, whose total eligible membership numbered 851, all of whom were sent surveys via the web or postal mail.

Random sample methodology

Each professional organization maintained member information consistent with its particular internal needs. Accordingly, the personal information that could be controlled for within the survey sample was limited. Variables such as sex and geographic location were universally available and were controlled for in the sampling process, as was practitioner sub-specialty within specific disciplines. Other factors governed which organizational members were considered eligible to participate in the survey. Eligibility required that these practitioners: 1) provided direct patient care as part of their practice 2) practiced in the United States and 3) were certified or otherwise qualified to practice within the discipline of the group in which they are members.

Controlling and accounting for these factors, random sampling was performed by each of the professional organizations and by Medical Marketing Service, Inc., the company that provided mail contact information for family physicians and nurse practitioners. The professional organizations and MMS, all of which routinely conduct member sampling, each ran the prescribed sampling protocol internally, as most have contractual restrictions regarding the sharing of member information with outside groups. All groups used computer-generated random lists to identify samples. It should be noted that AOSW did not participate in the sampling process, as all of its 871 eligible members were contacted through the survey.

Survey Response

Table 1, below, features information regarding the method of survey administration, survey sampling and survey response by practitioner group/professional organization. In total, 2,864 practitioners completed a survey for a combined response rate of 12.5%. Based on screening data, an additional 177 people who returned surveys did not fit the criteria of providing direct patient care and were, therefore, omitted from the survey sample and response rate calculations. (These respondents were instructed to terminate their survey after responding to this screening question, positioned at the front of the survey instrument.)

Table 1

Practitioner group	Web or Mail	Membership (sample pool)	Survey Sample	Returned Surveys	Response
Oncology Nurses (ONS)	Web	22,083	5,800	1,053	18.2%
Oncology Social Workers (AOSW)	Combined	871	871	305	35.0%
AOSW email	*Web*	*700*	*700*	*256*	*36.6%*
AOSW no email	*Mail*	*171*	*171*	*49*	*28.7%*
Oncologists (ASCO)	Web	11,582	4,788	462	9.6%
Nurse Practitioners	Mail	29,858	5,760	529	9.2%
Family Physicians	Mail[7]	148,809	5,615	515	9.2%
Total		213,203	22,834	2,864	12.5%

Individual practitioner group response rates varied widely, from a high of 35% of oncology social workers, to a low of 9.2% of both family physicians and nurse practitioners. Overall, the web survey response rate was 15.7% (1,779 respondents from a sample of 11,288), compared to a mail response rate of 9.2% (1,060 respondents from a sample of 11,546). Mail survey response rates may have been adversely affected by at least two factors: 1) cover letters for these surveys had the endorsement of NCI, but—unlike surveys administered via the web—were not endorsed by a professional society; and 2) these surveys were directed to primary care practitioners, who may or may not perceive themselves as actively engaged in the continuum of cancer care. This second point may be particularly true of some nurse practitioners.

Considering potential response bias, the factor that can most adequately be accounted for is respondent sex (male/female), as this information was available across all practitioner groups. The nurse practitioner respondent group includes 93% females, the oncology nursing group, 97%, and oncology social workers, 91%, none of which is statistically different than their respective sample groups. Therefore, there is no response bias related to sex within these groups. There is a potential bias among family physicians (29% of the sample and 35% of respondents were females; p=.005), and among oncologists (22% of the sample and 27% of respondents were females; p=.007). However, statistical testing indicates differences in male and female responses are quite limited and overall results are unlikely to be unduly influenced by sample variations of this magnitude.

Quantitative Data Analysis

Web and printed survey data from the five practitioner groups were combined to create a single master data file. In those instances where respondents answered "no" to question 1 ("Do you spend any of your time in direct patient care?"), cases were deleted from this file (N=177). This question was inserted to screen out potential respondents who did not meet this sample criterion.

Missing data

The use of web surveys inherently creates the potential for greater amounts of missing data than would typically be associated with printed surveys. This is due to the fact that in a web survey scenario, partially completed surveys are captured and stored in anticipation of the respondent's future completion of the survey record. In contrast, many incomplete printed surveys are never mailed, so partial records are more likely to be lost. This creates something of a dilemma to researchers, who must decide what constitutes a complete survey and which data should be retained for analysis.

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[7] 26 family practitioners utilized the web-survey option referenced in the cover letter of their follow-up mailing.

In the instance of the NCI Practitioner Survey, frequency distributions were computed for each individual item to determine whether a minimum threshold for completion should be established as a basis for inclusion in the analysis data set. In fact, there was no single point within the survey after which the completion rate substantially dropped, nor was there an obvious bias with regard to which practitioners tended to disengage early. Ultimately, the decision was made to retain all surveys, even those only partially complete, in the data set. Accordingly, the number of respondents varies based on the item or scale being examined. The number of respondents to every question is presented in the extensive sub-group analysis tables that appear in appendices to this report.

Weighting

Response rates among the five practitioner groups were highly variable (from 9% to 35%) as were the total number of respondents from within each organization (from 305 to 1,053). Accounting for this imbalance, a weighting formula was created to equalize each practitioner group's proportional influence on overall frequency distributions. Weighting was applied to all analyses of the full survey population (2,864). This was a critical decision, given the strong influence of practitioner group upon survey response. In most instances, weighting affects the final distribution of responses only very slightly (typically one or two percentage points, at most). All sub-group analyses are presented in their raw, unweighted form.

Statistical methods

A principal components analysis (PCA) was run on all survey items (excluding certain profile variables) to attempt to reduce the survey data set into a more manageable, interpretable set of outcome responses. A correlation matrix was used to standardize the scale responses for various items, eigenvalues over 1 were selected, Varimax rotation was used, and cases were excluded pair-wise to account for missing data responses.

There were no satisfactory interpretable solutions found as a result of the principal components analysis on the full survey, so a decision was made to explore solutions within sub-sections of the survey. The resulting scales that are shown in the report are based on principal components analyses (referred to throughout as "factor analysis") of each of the following sub-sections: Q7a-n (resources relied upon by practitioners), Q10-15 (staffing and organizational factors), Q16-25 (barriers to implementing research-indicated practices), and Q27-37 (suggestions to improve TRIP). The same criteria for running the PCA were used on each sub-scale and interpretability of the solutions was explored. Based on interpretability issues, Q20 was removed from the suggestion scale and the PCA was re-run without this item.

Table 2

Principle components analysis by item groupings

Survey Items	% Variance Explained
Q7a-n (Resources)	49%
Q10-15 (Staffing and organization)	63%
Q16-25 (Barriers)	50%
Q27-37 (Suggestions)	61%

Descriptive statistics (frequencies) were computed for all individual items and for the PCA scales. This analysis included all five practitioner groups combined using weighted values.

Descriptive statistics (cross-tabs) were computed for individual groups by each survey item and PCA scale. These analyses (and all subsequent analyses involving group and/or sub-group comparisons) were not weighted.

A Chi-Square (X^2) test was used to determine whether there were statistically significant differences between groups based on individual items. An analysis of variance (ANOVA) was used to determine whether there were significant differences between the groups based on the PCA scale items.

Various sub-group analyses were conducted and are provided in table form in Appendices 1 through 7. These include:

1. Practitioner group
2. Organization type
3. Practitioner role (oncology specialists v. primary care)
4. Practitioner credentials (MD v. Non-MD)
5. Years in practice
6. Geographic region
7. Secondary role (administrator, researcher, or both)

Discussion in this report generally, but not exclusively, focuses on differences in responses by practitioner group and organization type, which frequently were observed to drive differences that appear in other sub-group analyses. Other observations related to variables such as years in practice, secondary institutional roles, and credentials are also noted, though with less frequency. The appendices of sub-group findings are intended to serve as both a quick reference tool and a mine through which future research topics can be drawn.

In order to better assess the relationship between these two key attributes, cross-tabs were run on selected questions, using organization type as the dependent variable and controlling for practitioner type. This was to understand differences in responses by practitioner group across organizational settings. Logistic regression analysis was run on the survey items to further assess the impact of practitioner role and organizational setting on the responses provided by these sub-groups.

Most questions in the survey instrument include "don't know" or "don't know/not applicable" as a response option. It was determined that these responses generally distracted from, rather than enhanced, the knowledge generated through data analysis. Accordingly, these data were omitted from the analyses described in this section.

Qualitative Data Analysis

The NCI survey included two open-ended survey items. These items offered respondents an opportunity to share their insights outside of the prescribed boundaries of close-ended survey items. All responses were catalogued and a thematic analysis was conducted to identify salient trends among comments. Top-level findings of this analysis are presented in the main body of this report. A more comprehensive review of these findings is available as a technical appendix to this report. Open-ended survey items included:

- Item 26: *In general, what factor is most likely to determine whether you succeed in making a change in practice? That is, what is the one thing that most helps or hinders making a change?*
- Item 40: *Please identify one thing that you would like NCI or other national organizations to do in order to improve the translation of scientific research into practice.*

Table 3 presents response rates to these survey items by practitioner group. These calculations omit non-valid responses such as "?", "n/a", and "don't know". Overall, 67% of respondents offered a valid response to item 26 and 49% of respondents offered a valid response to item 40. Item response rates were highest among oncologists.

Table 3

Respondent Group	Survey N	Item 26 Response N	Item 26 Response Rate	Item 40 Response N	Item 40 Response Rate
ASCO	462	346	75%	296	64%
AOSW	305	191	63%	130	43%
ONS	1053	688	65%	464	44%
Family Practitioner	515	339	66%	248	48%
Nurse Practitioner	529	359	68%	257	49%
Total	2864	1923	67%	1,395	49%

II. Profile of Respondents

This section provides a profile of respondents to the NCI Practitioner Survey, including the attributes of practitioners and their practices. This profile clarifies the range of specialties, experiences, and perspectives underlying survey responses. Certain attributes of respondents and the organizations for which they work are also the basis for sub-group analyses presented in this report.

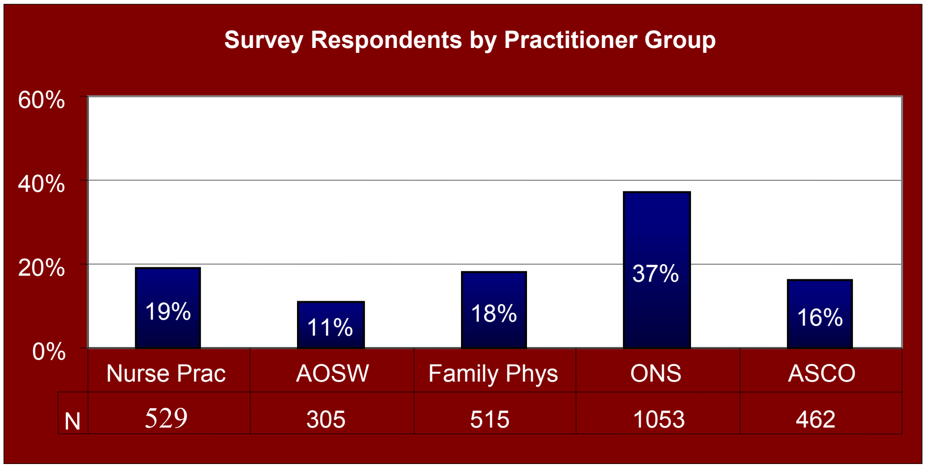
1. Practitioner Characteristics

Practitioner Group

This survey targeted five practitioner groups along the continuum of cancer care, including some of the key participants engaged in primary care (nurse practitioners and family physicians) and others involved in specialty cancer care (oncology social workers, oncology nurses, and medical, surgical, and radiation oncologists). Throughout this report, the acronym of selected professional societies that substantially supported the survey development and administration process is used to represent the cancer specialists. These include the Association of Oncology Social Work (AOSW), the Oncology Nursing Society (ONS), and the American Society of Clinical Oncology (ASCO).

Overall, 2,864 practitioners completed the NCI survey. The number of responses received from practitioners in each of these groups varied from a low of 305 oncology social workers to a high of 1,053 oncology nurses (see Exhibit 1). This variation is a result both of response rates ranging from 9% among oncologists to 32% among oncology social workers and of substantial size differences among the targeted practitioner groups. To illustrate, at the time of this study, AOSW served approximately 871 oncology social workers and ONS served about 22,083 oncology nurses (see Methodology for additional data). Each of these organizations is the largest U.S.-based professional society serving practitioners in its discipline. Accordingly, their memberships offer a reasonable estimate of the proportional size of the practitioner groups they represent[8].

Exhibit 1



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[8] Precise data regarding the number of licensed practitioners in the United States by group are not available. Professional society membership counts, trimmed to eliminate persons who are not practitioners, were determined to be the best available resource for group size estimation. In the case of family physicians and nurse practitioners, whose professional societies were not engaged through this survey, populations were estimated through third party mailing list distributors, which compile data from a variety of sources.

Pre-survey interviews with a range of practitioners on the continuum of cancer care demonstrated the importance of practitioner group as a factor in shaping respondent perspectives on the translation of research into practice—from the type and sources of practice-related information they rely on, to the relative autonomy afforded to practitioners from each group in their day-to-day practice, to the barriers they confront when attempting to integrate new research into practice.

Because practitioner group has a pervasive effect on respondent perceptions, the researchers elected to present charts throughout this report highlighting survey findings by practitioner group. Further, it was decided that survey data that present the responses of *all respondents* would be statistically weighted such that the responses of members of each practitioner group exert the same degree of influence on overall survey findings. (The profile data in this section were exempted from that weighting process.) In most instances, weighting affects the final distribution of responses only very slightly (typically one or two percentage points, at most). In addition, all sub-group data, including those included in the appendices to this report, are unweighted figures.

Professional Roles

The NCI Practitioner Survey included a screening question that eliminated any prospective respondents who do not spend at least a portion of their time in direct patient care. Overall, 6% of prospective respondents were eliminated from the survey pool through this question. Among the 2,864 respondents who provide patient care (Exhibit 2), 22% also identified themselves as researchers, 17% as administrators, and 13% noted some other role they play within their organization. Overall, 7% of respondents indicated that they are both researchers and administrators. The actual proportion of respondents who indicated that they play a second (or third) role within their organization in addition to direct patient care was 47%.

Exhibits 3 and 4 show that among these practitioners, oncologists (ASCO) most frequently act as administrators (36%) or as researchers/academics (58%). A table of survey responses by secondary role appears in Appendix 8.

Exhibit 2

Exhibit 3

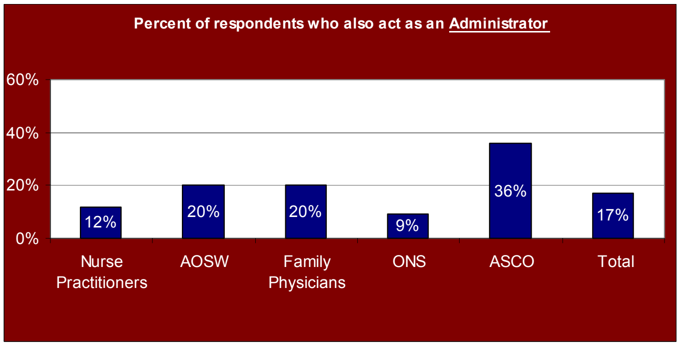
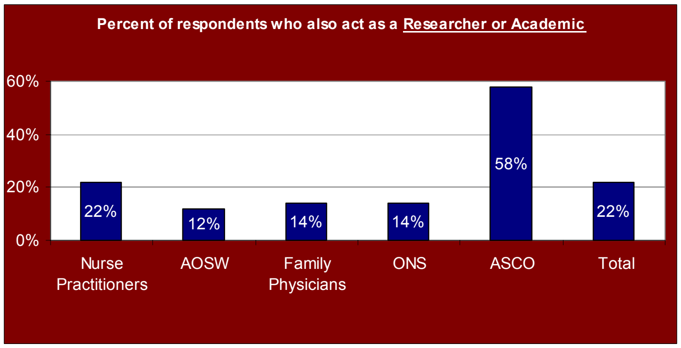


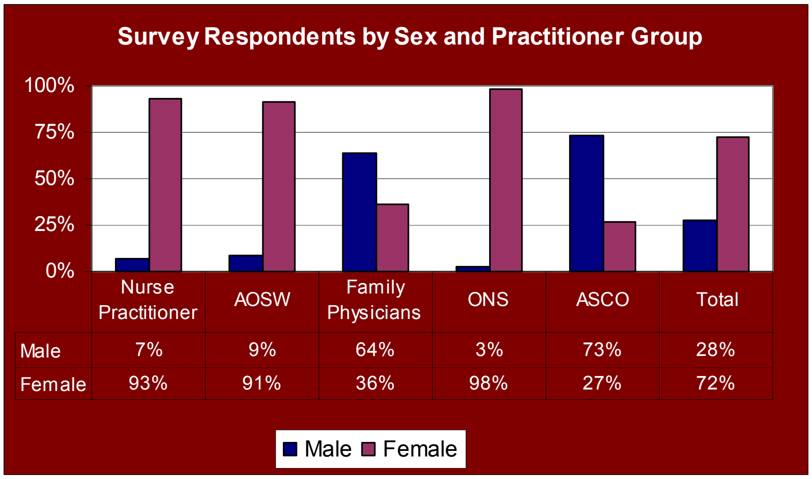
Exhibit 4



Other Personal or Professional Characteristics

As displayed in Exhibit 5, 72% of survey respondents overall and in excess of 90% of nurse practitioners, oncology social workers (AOSW), and oncology nurses (ONS) were women. In contrast, nearly two-thirds of family physicians and three-fourths of oncologists who responded were male. The likelihood of meaningful response bias based on sex was examined and determined to be inconsequential (see discussion in Methodology). A review of sub-group data suggests that respondent sex is generally subordinate to respondent practitioner group as a factor influencing survey response. A table of survey responses by sex appears in Appendix 6.

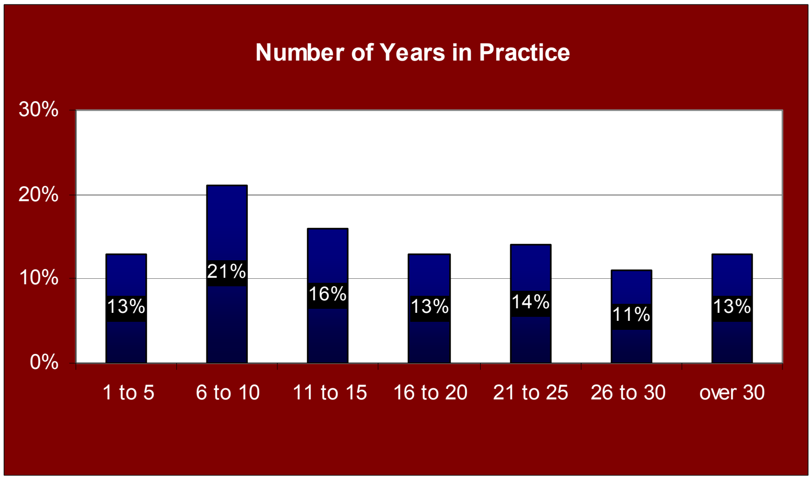
Exhibit 5



	Nurse Practitioner	AOSW	Family Physicians	ONS	ASCO	Total
Male	7%	9%	64%	3%	73%	28%
Female	93%	91%	36%	98%	27%	72%

Exhibit 6 displays the generally even distribution of survey respondents by years in practice, presented in five year increments. Reviewing practitioner sub-group differences, 61% of nurse practitioners reported that they have 0 to 10 years in practice. In contrast, the proportion of other practitioner groups who indicated 0 to 10 years in practice ranged from 17% (oncologists, oncology nurses, and family physicians) to 31% (oncology social workers). Overall, responding oncologists, oncology nurses, and family physicians exhibited the greatest number of years in practice, with more than 40% of each group reporting they have been in practice for more than twenty years. A table of survey responses by years in practice appears in Appendix 5.

Exhibit 6

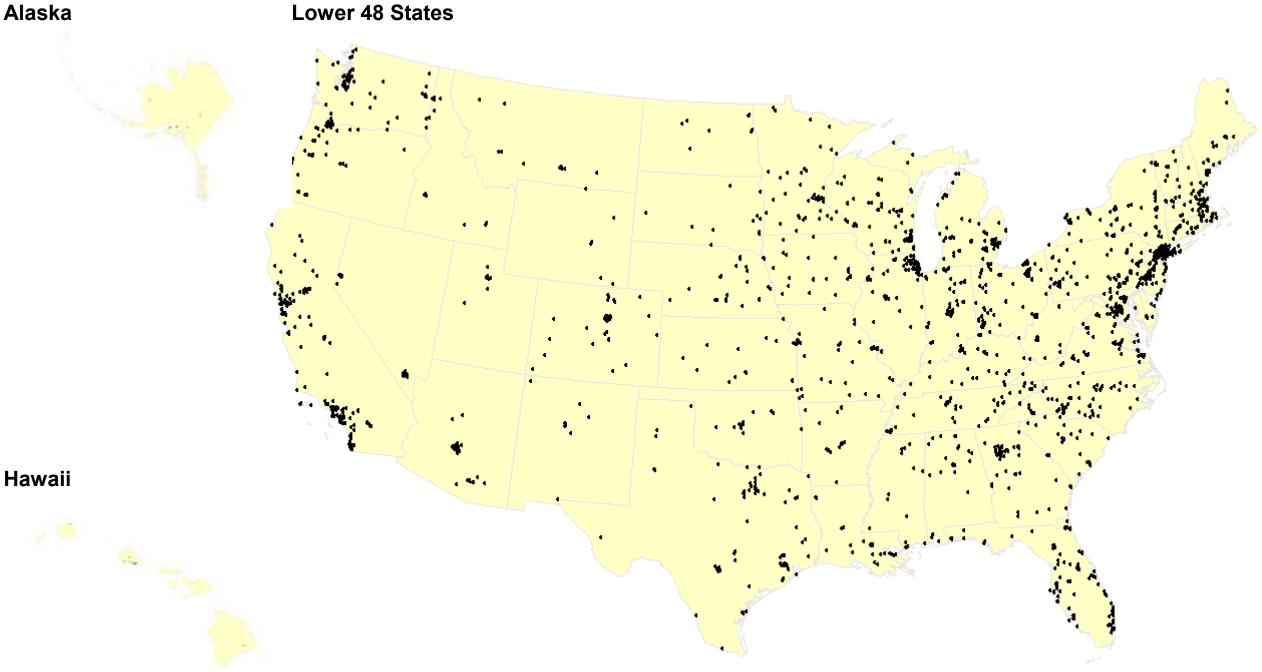


2. Practice Characteristics

Geographic Location

As presented in exhibits 7 and 8, responses were received from practitioners across the United States, including Alaska and Hawaii. A review of the distribution of respondents by region—as defined by the U.S. Census Bureau—demonstrates generally comparable representation by region, although the South, which ranges from the "West South Central" (Texas north to Oklahoma) to the "South Atlantic" (Florida north to Delaware) is somewhat over-represented, comprising 31% of the total sample. There are also some notable differences in the regional profile of respondents by practitioner group and institutional affiliation (organization type), which can be observed in Appendix 7. However, analysis suggests that geographic location generally is *not* a significant factor in survey response.

Exhibit 7

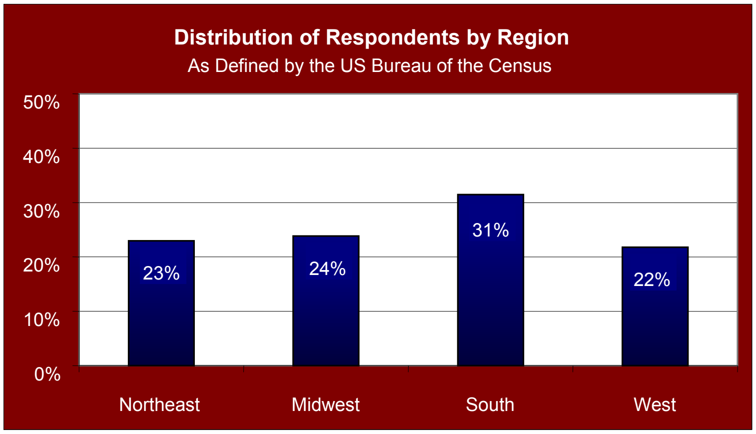


Alaska

Lower 48 States

Hawaii

Exhibit 8



Organization Type

Data analysis shows that the type of organization for which a practitioner works had a profound impact on survey response. This influence may be a manifestation of such varied influences as organizational mission, organization size, inherent resources, or client population. As displayed in Exhibit 9, respondents were employed by a range of institution types, most commonly including independent offices, cancer centers, university or teaching hospitals, community hospitals and community clinics. These five organization types, each of which has a cell count in excess of 200, form the basis for sub-group analyses presented later in this report. A complete table of responses by organization type appears in Appendix 2.

Exhibit 9

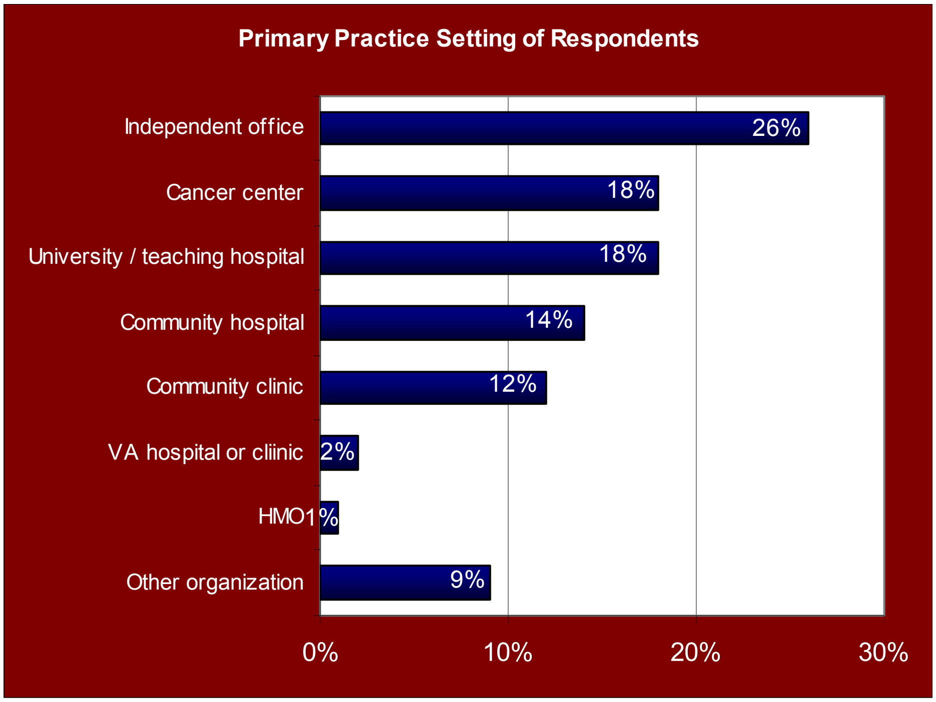


Exhibit 10 displays the distribution of practitioner groups by clinical setting. Among respondents, primary care practitioners (nurse practitioners and family physicians) most frequently indicated that they work in independent offices and community clinics, while oncology social workers most frequently reported that they work in cancer centers. Oncologists and nurse oncologists were more evenly distributed across the five most common organization types.

Exhibit 10

Primary clinical setting in which respondents practice by practitioner group *

	Nurse Practitioners	AOSW	Family Physicians	ONS	ASCO	All Respondents
Independent office	35%	6%	55%	13%	20%	26%
University-affiliated or teaching hospital	11%	19%	7%	23%	30%	18%
Cancer center	2%	39%	0%	28%	22%	18%
Community hospital	8%	16%	7%	25%	15%	14%
Community clinic	22%	1%	22%	4%	9%	12%

* Note: the figures in this table are unweighted. As a result, totals for “all respondents” may differ slightly from Exhibit 9.

Client Population

Among the concerns regarding the translation of research into practice (TRIP)[9] is the established gap between the quality of health care that is available to persons who are economically disadvantaged relative to persons who are not. Survey respondents were asked to estimate the proportion of patients they serve who are economically disadvantaged[10]. Exhibit 11 shows that 29% of respondents serve patient populations that are predominantly economically disadvantaged. Exhibit 12 shows that nurse practitioners most frequently served patient populations with a high concentration of economic disadvantage, while oncologists least frequently worked with these populations.

Exhibit 11

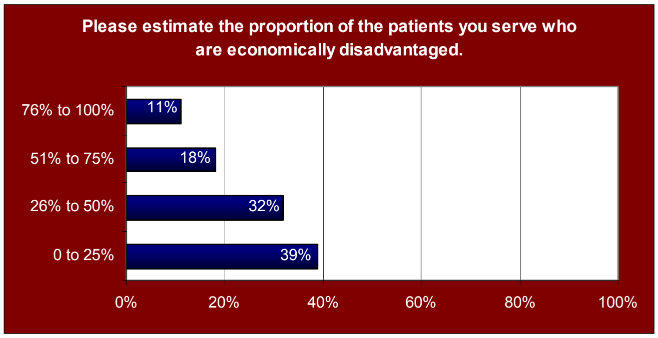


Exhibit 12

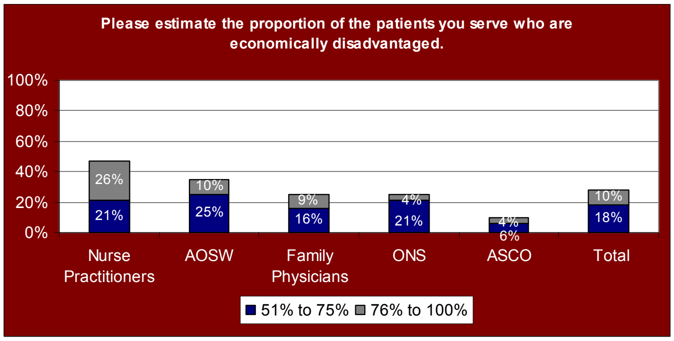


Exhibit 13 presents the proportion of respondents who serve client populations predominated by patients who are economically disadvantaged. These data are sorted from the highest incidence of client poverty to the lowest (the "> 50% Total" column). Respondents working for Veteran's Administration (VA) hospitals and clinics most frequently (78%) reported that a majority of the patients they serve are poor, followed by community clinics (48%), and university-affiliated teaching hospitals (33%). In contrast, respondents working in community hospitals, cancer centers, independent offices, or HMOs least frequently reported that a majority of the patients they serve are poor. Respondents working in community clinics (30%) and VA facilities (28%) most frequently reported that over 75% of the patients they serve are poor. (It should be noted that the number of respondents who worked in VA facilities or independent offices were quite small (59 and 30 respondents, respectively).

Exhibit 13

Proportion of Patients Served who are Economically Disadvantaged	51% to 75%	76% to 100%	> 50% Total
VA hospital or clinic	50%	28%	78%
Community clinic	18%	30%	48%
University-affiliated or teaching hospital	23%	10%	33%
Community hospital	16%	7%	23%
Cancer center	16%	3%	19%
Independent office	15%	2%	17%
HMO	4%	7%	11%

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[9] The term, TRIP, or translation of research into practice, is often used to describe the broader process of which research dissemination and new practice implementation are components. It is important to note that the lexicon associated with this field of study is not in all cases clearly or consistently defined.

[10] The term "economically disadvantaged" was not explicitly defined. Respondents were asked to make their best estimate of the proportional range (quartiles) of their patient population that was economically disadvantaged. This practical approach was a response to concerns that most respondents would lack access to more specific income and household data for comparison to a more explicit definition.

Concerns also exist that the quality of health care available to persons who are racial or ethnic minorities is sometimes lacking. Exhibits 14 and 15 show that some 20% of respondents served patient populations that are comprised predominantly of racial or ethnic minorities, with nurse practitioners and oncology social workers the most—and oncologists the least—likely to work with these patient populations. Sub-group responses by the proportion of patients who were reported to be racial or ethnic minorities are also presented in Appendix 9.

Exhibit 14

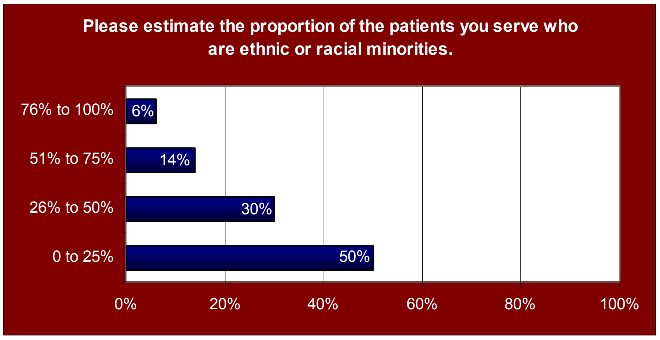
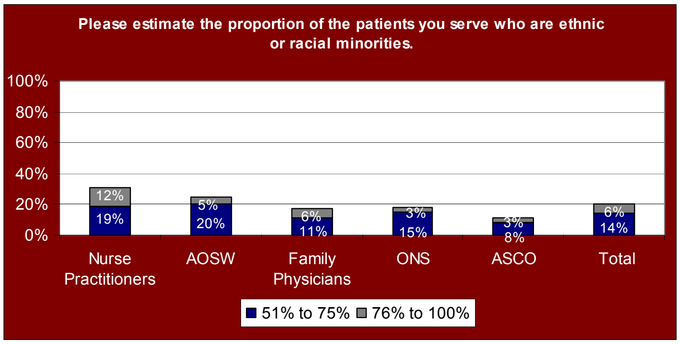


Exhibit 15



Viewing these data in the context of organizational setting, Exhibit 16 shows that more than one-fourth of respondents from VA facilities, community clinics, university-affiliated or other teaching hospitals, and health maintenance organizations served clients who were predominantly racial or ethnic minorities. Practitioners working for cancer centers and independent offices least frequently reported that their patient case loads were comprised predominantly of racial or ethnic minorities. Sub-group responses by the proportion of patients who were reported to be economically disadvantaged are presented in Appendix 9.

Exhibit 16

Proportion of Patients Served who are Racial or Ethnic Minorities

	51% to 75%	76% to 100%	Majority
VA hospital or clinic	30%	7%	38%
Community clinic	16%	13%	29%
University-affiliated or teaching hospital	21%	7%	28%
HMO	19%	7%	26%
Community hospital	13%	3%	17%
Cancer center	10%	3%	13%
Independent office	9%	2%	11%

III. Information Access and Resources

This section provides an overview of responses to questions regarding the acquisition and use of up-to-date research findings and clinical guidelines to inform the care and treatment of patients with cancer. All of these data are presented for the full population of 2,864 respondents, with statistical weights applied to ensure an even weighting of the input received from each of the five practitioner groups engaged through this study. Unweighted responses by practitioner group are also presented for all questions, while findings of other sub-group analyses, which appear in appendices 1 through 9, are discussed wherever relevant, statistically significant differences in response exist.

In this section and those that follow, multiple survey questions may be presented as aggregated "scales", which are groups of questions that have been shown through a statistical technique called principal component—or factor—analysis to be highly correlated, suggesting a common root or theme underlying responses to those questions (see discussion in Methodology section). Question "scales" are named according to the researchers' best interpretation of the theme underlying the group of questions. These scale-level data offer a simple, yet robust, view of responses to groups of questions that together may address important concepts that are too broad or complex to be addressed in a single question.

1. Perceptions of Research Access and Implementation

Following are responses to four questions that relate topically, but for which responses did not correlate with other survey questions. Each of these is most appropriately viewed as a separate measure of practitioner opinion or perception.

In an effort to identify the extent to which practitioners perceive a gap between research and practice, respondents were asked to indicate their level of agreement with the statement, "There is a gap between the cancer care patients receive and the care indicated by current research." Responses to this question, presented in exhibits 17 and 18, show that 64% of respondents indicated agreement—meaning that they either somewhat or strongly agreed. However, only 12% of respondents strongly agreed, compared to 14% who indicated that they strongly disagreed with this statement.

This mixed response suggests that while most practitioners perceive a gap between research and practice, they may not necessarily believe the problem has a pervasive effect on patient care. As this finding is considered, it is appropriate to note that practitioners' answers to some of the questions contained in this survey may exhibit some degree of social desirability bias, as past research has shown that survey respondents are often reluctant to offer responses that reflect poorly on themselves[11]. To minimize the effect of this bias, wherever possible, questions were asked in a broader frame of reference, in most cases the organization for which they work.

As displayed in Exhibit 18, agreement among practitioner groups ranged from a high of 72% (nurse practitioners) to a low of 57% (oncology nurses). There are no obvious groupings, such as primary v. specialty cancer care or medical doctor v. other practitioner, to explain the variation among practitioner groups with regard to this question. Further, there is little variation among responses associated with different organizational types or other factors that may commonly influence response.

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[11] Adams, A., Soumerai, S., Lomas, J., Ross-Degnen, D. Evidence of Self-Report Bias in Adherence to Guidelines. International Journal for Quality in Health Care, 1999: pp. 187-192.

Exhibit 17

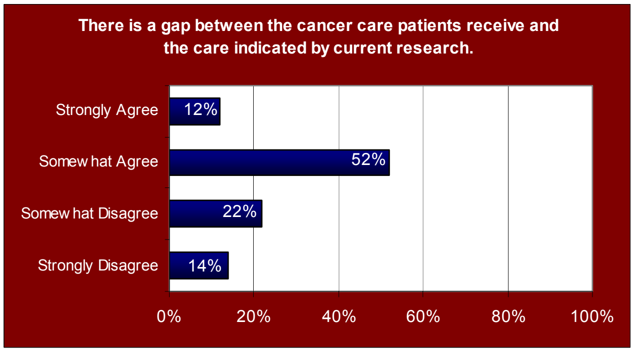
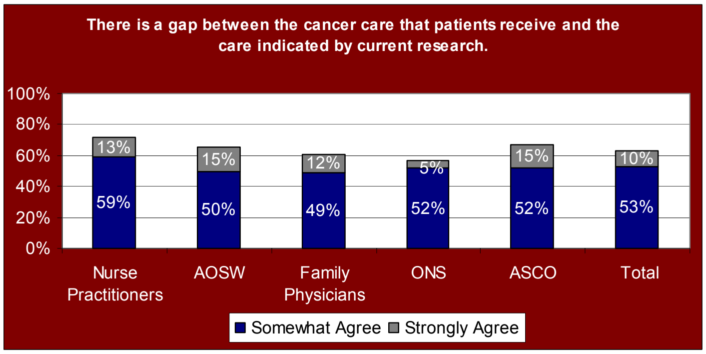


Exhibit 18



Information acquisition is generally among the first steps in the research translation process. The findings of an extensive review of literature, a national key informant interview process, and NCI's Dialogue on Dissemination discussion series suggest that an adequate—and possibly even overwhelming—pool of practice-related information exists. Unfortunately, making time to access that information may be a challenge for many practitioners. Survey findings presented in exhibits 19 and 20 generally substantiate the findings of this foundation research.

Overall, 83% of respondents reported that they have adequate access to the research they need to keep their practice current. Among practitioner groups, this sentiment is strongest among oncologists (94%) and oncology nurses (85%), while just over 75% of the remaining practitioner groups indicated "yes" in response to this statement. However, a wide majority of respondents reported that they lack the time to make use of these data.

In fact, only about 25% of family physicians, nurse practitioners, and oncology social workers reported that they have adequate time to access the research they need to support their practice. These figures improve somewhat for oncology nurses and oncologists (34% and 49%, respectively), but still underscore a critical obstacle to the integration of current research findings into clinical practice, particularly in primary care settings. Additional sub-group analyses did not generate other salient findings.

Exhibit 19

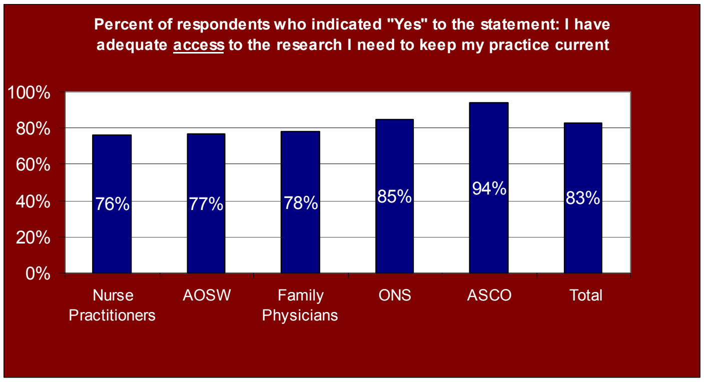
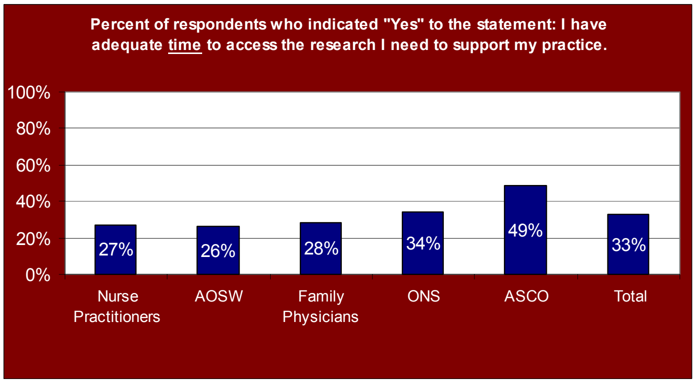


Exhibit 20

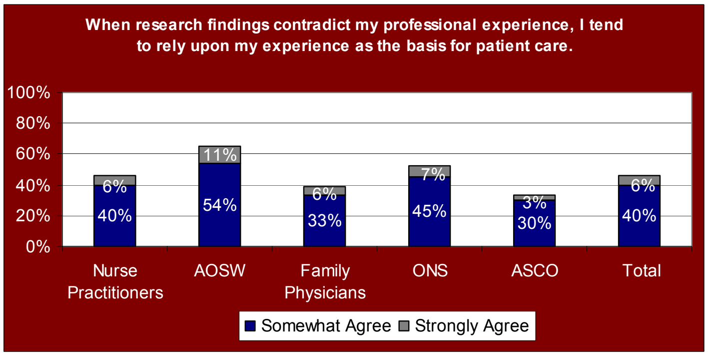


Ultimately, practitioners must make decisions regarding which new research-indicated practices to adopt and under what circumstances. The NCI Practitioner Survey sought to learn how practitioners react when new research appears to contradict tacit experience. Exhibits 21 and 22 show that respondents, on balance, favored the latest research findings, though only a small proportion (18%) strongly disagreed when asked whether they tend to rely on professional experience over new research findings.

Among practitioner groups, oncologists and family physicians appear to favor research findings most heavily in their clinical decision making, while oncology social workers most frequently (65%) reported that they tend to rely on professional experience in cases where that experience runs contrary to research findings. Additional sub-group testing revealed that among organization types, respondents from community hospitals most frequently (53%) rely on experience to make decisions, while community clinic staff least frequently (40%) tend to rely on experience. In addition, practitioners with 0 to 5 years experience less frequently responded affirmatively to this statement (41%) than did practitioners with more experience (47%).

Exhibit 21

Exhibit 22



2. Reliance upon Selected Information Resources

Foundation research identified at least 14 information resources that practitioners may commonly rely on for up-to-date practice-related information, including new research findings and clinical guidelines. The NCI Practitioner Survey asked respondents how frequently they utilize each of these resources to obtain information regarding current research-indicated practices in cancer care.

Exhibit 23 (next page) displays the responses of all respondents to these questions, grouped into survey scales (in bold), which were defined through factor analysis. In this table and throughout this report, scale level results present the mean distribution of responses to the questions that comprise each scale. To aid in interpretation, data within this table have been sorted at the scale level, with the most frequently relied on sources presented before those that are less frequently relied on.

Survey data show that "intramural" resources—those that are available within the context of their employer organization or professional society—are "frequently" utilized by 44% of respondents. This compares favorably to practitioners' reliance on "external traditional resources" (32%), "web-based resources" (24%), and "market-based resources" (14%). These mean results offer a useful summary of practitioners' relative reliance on each of the resource types, offering a robust top-level perspective on results. They also provide a useful framework for considering the underlying factors that may affect practitioner responses. However, it is also important to acknowledge that these mean scores can mask variations in response to individual survey questions, making a discussion of the individual elements that contribute to scale-level results essential.

Practitioners' reliance on Intramural Resources, which tend to be relationship-based and proximal to the practice environment, makes sense given that they lack adequate time to access research (Exhibit 20). Within this question scale, the most frequently relied upon resources included colleagues or experts from within their organization (60%) and professional society meetings/conferences (50%). These resources were also the second and third "most important" resources identified by respondents (Exhibit 24), appearing among practitioners' "top three" most important resources 49% and 52% of the time, respectively.

Exhibit 23

Reliance on Selected Information Resources – All Respondents	Frequently	Occasionally	Rarely or never
Intramural Resources Scale	**44%**	**42%**	**14%**
Colleagues or experts from within your organization	60%	30%	10%
Professional society meetings/conferences	50%	42%	8%
Trainings or meetings within your organization	39%	44%	17%
Other topic-specific events (e.g., Grand Round, research presentations, special speakers)	28%	53%	19%
External Traditional Resources Scale	**32%**	**45%**	**24%**
Peer reviewed journals	57%	38%	5%
Colleagues of experts outside your organization	38%	53%	10%
Systematic reviews & evidence summaries (e.g., Cochrane Collection, Journal Clubs)	21%	44%	35%
Non-peer reviewed journals or other publications	10%	46%	44%
Web-based Resources Scale	**24%**	**46%**	**30%**
Professional society web sites	29%	46%	25%
Clinical practice guideline websites	26%	49%	25%
Federal agency web sites	17%	43%	40%
Market-based Resources Scale	**14%**	**40%**	**46%**
Programs or publications sponsored by pharmaceutical or medical device companies	21%	52%	27%
On-line courses/program	16%	47%	37%
HMO provided guidelines	5%	21%	75%

Although reliance on the information sources included in the External Traditional Resource scale lagged that of Intramural Resources, peer reviewed journals (57%) were the second most frequently relied on individual resource, overall. Peer review is critical to perceived credibility, as illustrated by the fact that only 10% of respondents reported that they frequently rely on non-peer reviewed journals or other publications. Two of the resources associated with this survey scale were among the “most important” to practitioners (Exhibit 24). These included peer reviewed journals (1^{st} overall at 53%) and colleagues or experts from outside their organization (4^{th} overall, 30%).

Practitioners less frequently reported reliance on the Web- and Market-based Information Resources described in the survey. Among web-based resources, a relatively new tool that may require some practitioners to develop new research skills or overcome technological obstacles to access, respondents most frequently reported a reliance on professional society (29%) and clinical practice guideline (26%) web sites. The latter was fifth among "most important" resources, appearing among the top three of 21% of respondents.

Market-based Information Resources, which include content providers that may be assumed to have packaged information products or policies which they wish to disseminate, are less heavily relied on for current research-indicated practice information than are other resource types. Given the diversity of the resources represented by this scale, a range of factors may explain these results. For example, past interview results suggest that concerns regarding potential conflicts of interest may limit reliance on information generated by the pharmaceutical and medical device industries, while on-line educational offerings may focus more on less cutting edge clinical topics with broader demand and HMO-provided guidelines might tend to emphasize "tried and true" treatment over newer, more experimental options.

Exhibit 24

Please list the top three information resources in order of their importance to you

Table includes only resources identified among the top three "most important" by 20% or more of respondents	Most Important	2nd Most Important	3rd Most Important	Combined Total
Peer reviewed journals	19%	18%	16%	53%
Professional society meetings/conferences	17%	19%	16%	52%
Colleagues or experts from w/in your organization	28%	12%	9%	49%
Colleagues or experts outside your organization	11%	11%	8%	30%
Clinical practice guideline websites	7%	7%	7%	21%

3. Variation in Reliance on Information Resources among Key Sub-Groups

Analysis reveals statistically significant variation with regard to the reliance on various information resources among different sub-groups of practitioners. Following is a brief description of key differences observed within the practitioner and organization type sub-groups. Additional differences are presented in appendices 3 through 9.

Practitioner Group

Exhibit 25 (following page) displays the proportion of respondents from each practitioner group that indicated they "frequently" rely on the information resources described in the survey to obtain information regarding current research-indicated practices in cancer care. Differences among responses are substantial and suggest that no two practitioner groups are wholly alike or entirely unique in their reliance on these information resources. This may be due to the fact that cancer care specialists—oncology nurses, oncologists, and oncology social workers—share a focus on cancer care while nurse practitioners and family physicians are focused on primary care. However, nurse practitioners and oncology nurses, and family physicians and oncologists (both MDs), share common professional backgrounds and orientations, which may also drive their information needs and search behaviors.

Perhaps the most notable trend within Exhibit 25 is the fact that, among practitioners, family physicians least often reported frequent use of the resources identified in the survey. In fact, family physicians displayed the lowest degree of reliance on 10 of the 14 survey options. Other data show that family physicians are not unlike other practitioner groups in terms of their perception of the gap between research and practice or in terms of their perception of the adequacy of access and time to acquire new research findings (Exhibits 18, 19, 20). In fact, they are generally less likely than other practitioner groups to rely on personal experience in the face of new evidence (Exhibit 22).

Exhibit 25

"Frequent" Reliance on Selected Information Resources – by Practitioner Group

	Nurse Practitioners	Family Physicians	AOSW	ONS	ASCO
Colleagues or experts from w/in your organization	56%	44%	65%	74%	63%
Peer reviewed journals	46%	41%	43%	65%	88%
Professional society meetings/conferences	43%	33%	51%	56%	65%
Trainings or meetings within your organization	35%	24%	51%	48%	36%
Colleagues or experts outside your organization	40%	48%	42%	24%	34%
Professional society web sites	22%	14%	38%	44%	28%
Other topic-specific events (e.g., Grand Rounds, research presentations, special speakers)	20%	16%	40%	29%	32%
Clinical practice guideline websites	33%	19%	19%	32%	27%
Programs or publications sponsored by pharmaceutical or medical device companies	24%	9%	16%	48%	9%
Systematic reviews & evidence summaries (e.g., Cochrane Collection, Journal Clubs)	23%	27%	8%	19%	27%
Federal agency websites	24%	9%	23%	18%	10%
On-line courses/program	14%	10%	10%	32%	14%
Non-peer reviewed journals or other publications	10%	9%	12%	6%	12%
HMO provided guidelines	7%	7%	4%	5%	1%

Reading through Exhibit 25, numerous other observations might be made relative to which practitioner groups are most or least likely to use a specific information source to inform their practice of cancer care on a frequent basis. These observations may inform future strategies for dissemination to these unique practitioner populations. Some highlights include:

- All practitioner groups frequently rely on colleagues or experts from within their organization, although those in primary care settings are less likely to do so than are those in specialty cancer care.
- Peer reviewed journals and professional society meetings are also very commonly used information sources. Both are most frequently relied on by oncologists and oncology nurses.
- Although systematic reviews and evidence summaries, such as the Cochrane Collection, provide a convenient synthesis of research findings that would be assumed to streamline practitioners' research processes, only one-fifth of all practitioners frequently rely on them for information, and oncology social workers rarely (8%) reported their use of these resources. This may be a function of the relevance or breadth of the research available in these formats, or of accessibility problems.

- Oncology nurses (48%) and, to a lesser extent, nurse practitioners (24%), more frequently rely on programs or publications sponsored by pharmaceutical or medical device companies than other groups. Oncology nurses are also most likely to use on-line courses to acquire information.

Organizational Type

A review of sub-group data contained in Appendix 2 reveals additional trends in response. Among respondents of different organizational type sub-groups:

- Respondents from large or relatively well-resourced hospital organizations, such as cancer centers and university-affiliated teaching hospitals, reported the greatest reliance on Intramural Resources, such as colleagues, training programs, and other topic-specific events from within their organization.
- Respondents from relatively small or under-resourced organizations, such as community clinics and private (independent) offices reported the greatest reliance on colleagues from outside their organization. They also reported the least reliance on professional journals.
- Respondents from community hospitals reported the greatest reliance on professional organization and federal agency web sites. They also reported the greatest reliance on professional journals.

IV. Factors Affecting the Translation of Research Into Practice

Foundation research suggested a range of factors that might potentially support or impede practitioners' acquisition and implementation of information regarding current research-indicated practices in cancer care. This section presents the findings of questions designed to assess the presence and impact of these factors, as perceived by respondents.

As in the previous section, data are presented for the full population of respondents, with statistical weights applied to ensure an even weighting of the input received from each of the five practitioner groups engaged through the study. Unweighted responses by practitioner group are also presented for all questions. Findings of other sub-group analyses, which appear in appendices 2 through 9, are also discussed wherever salient and statistically significant differences in response exist.

1. Organizational Factors Affecting TRIP

A variety of organizational factors can exert either a positive or negative influence on practitioners' ability to translate research into practice. The NCI Practitioner Survey probed on several of these factors to determine their presence within respondents' primary practice settings. Factor analysis revealed that these questions group into two scales, which provide insight into practitioner perceptions of two important aspects of their organizations' support of TRIP—change management and staffing support. A third organizational factor is discussed under the heading "Staffing and Other Support."

Change Management Practices

Factor analysis revealed a strong correlation among four survey questions that relate to the effectiveness of change management practices within respondents' organizations. In this context, change management refers specifically to supporting research-indicated changes in clinical practice related to cancer care. Exhibits 26 and 27 present the mean distribution of responses to the questions that comprise the Effective Change Management scale.

Exhibit 26

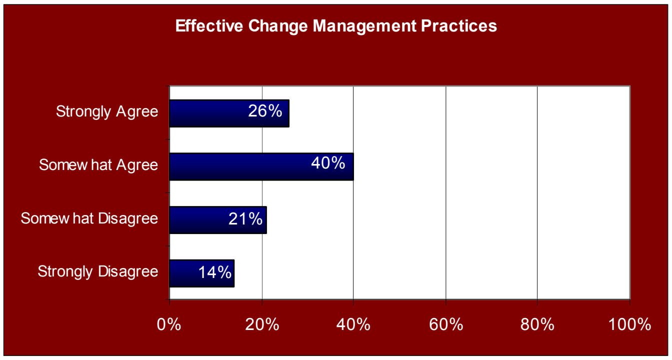
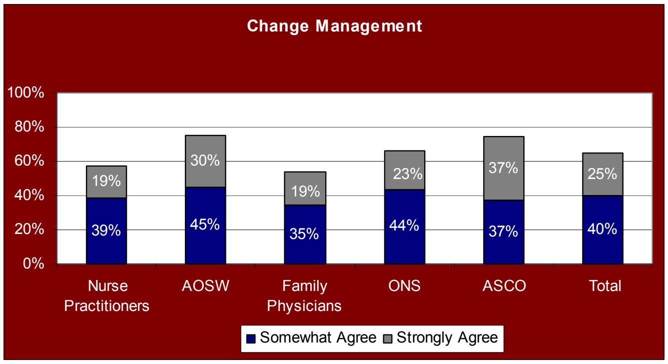


Exhibit 27



As presented in Exhibit 26, nearly two-thirds of respondents either somewhat (40%) or strongly (26%) agreed that their organizations exhibit effective change management practices. Data reveal substantial variation by practitioner group, with specialty cancer care practitioners more frequently indicating agreement than those engaged in primary care.

A review of responses to individual questions—Exhibit 28— reveals that 81% of respondents at least somewhat agree that they have the autonomy to make research-indicated changes in practice and 72% at least somewhat agree that their organization's leaders are committed to implementing research-indicated practices. Overall, this suggests a positive trend in both organizational support and individual autonomy to revise practices to meet new research-indicated standards of cancer care. However, only about one-third of respondents strongly agreed with these statements, which may indicate that these conditions are not guaranteed or are in place on a situational basis.

Respondents less frequently indicated agreement with two other statements considered in this survey scale. Only 56% indicated agreement with the statement, "My organization effectively disseminates new research-indicated practices to staff." This may indicate a bottleneck in the information pipeline to practitioners. This is of particular concern given the difficulty many practitioners have finding the time to access new research. One of the bottlenecks may be a lack of effective information management (IM) systems. Only 52% of respondents agreed that their organizations' IM systems effectively support the implementation of new research-indicated practices.

Exhibit 28

Change Management My Organization …	**Strongly Agree**	**Somewhat Agree**	**Somewhat Disagree**	**Strongly Disagree**
Allows me to decide whether to change my practices in response to new RI practices	38%	43%	12%	7%
Leadership is committed to implementing new RI practices	32%	40%	18%	10%
Has information management systems that effectively support implementation of new RI practices	18%	34%	27%	21%
Effectively disseminates new RI practices to staff	15%	41%	26%	18%

Exhibits 29 through 32 present the responses to each of these four questions by practitioner group. On three of the four measures, the responses of primary care practitioners—family physicians and nurse practitioners—stood in contrast to those of other respondents. In each case, findings suggest that primary care respondents operate within a less supportive change environment than do their peers. It is also notable that most practitioners agree that they have the autonomy to alter practice as new evidence becomes available, although oncology nurses less frequently agreed that this is the case.

Viewing these data by organizational sub-group, it appears that larger, relatively well-resourced organizations—such as cancer centers and university-affiliated teaching hospitals—provide greater organizational support to TRIP than do smaller or presumably less well-resourced environments, such as community clinics, private offices or community hospitals. This appears to manifest in terms of both supportive infrastructure and leadership focus on TRIP. *This finding confirms the need for any comprehensive national TRIP support strategy to account for the varying needs and capacities of practitioners in a range of organizational settings, to the extent that those organizations will be relied on as a conduit for practice-related information.*

- Exhibit 29: 62% of oncology nurses agreed that they have the autonomy to change their practices in response to new research, compared to 76% to 94% of other practitioners. Medical doctors reported the greatest autonomy in this regard. Among organizations, community hospital staff, which in our sample are predominated by oncology nurses, most frequently agreed with this statement (67% vs. 77% to 86%).
- Exhibit 30: 55% of family physicians and 63% of nurse practitioners agreed that their organizations' leadership is committed to implementing new research-indicated practices, compared to 77% to 82% of other practitioners. 86% of cancer centers and 82% of university-affiliated teaching hospital staff agreed; compared to 60% to 66% of respondents from other organizations.

- Exhibit 31: 34% of family physicians and 43% of nurse practitioners agreed that their organization has information management systems that effectively support TRIP, compared to 57% to 67% of other practitioners. 71% of cancer centers and 62% of university-affiliated teaching hospital staff agreed; compared to 38% to 45% of other respondents.
- Exhibit 32: 40% of family physicians and 47% of nurse practitioners agreed that their organization effectively disseminates new practice information to staff, compared to 63% to 71% of other practitioners. 72% of cancer centers and 63% of university-affiliated teaching hospital staff agreed; compared to 44% to 52% of other respondents.

Exhibit 29

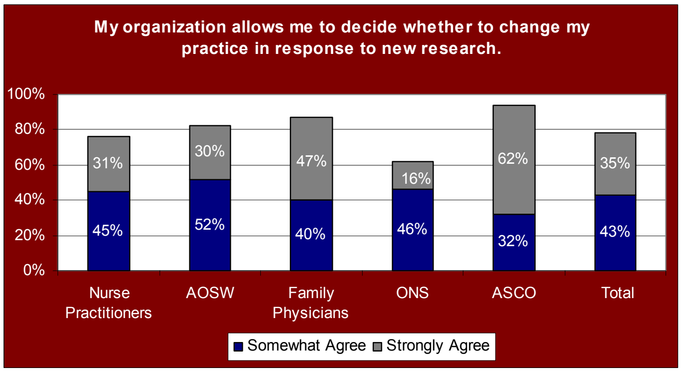


Exhibit 30

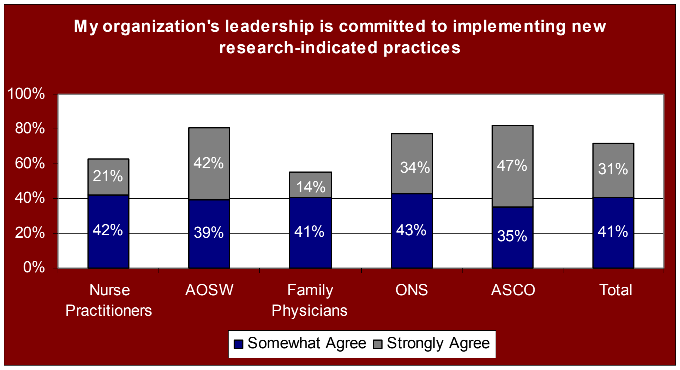


Exhibit 31

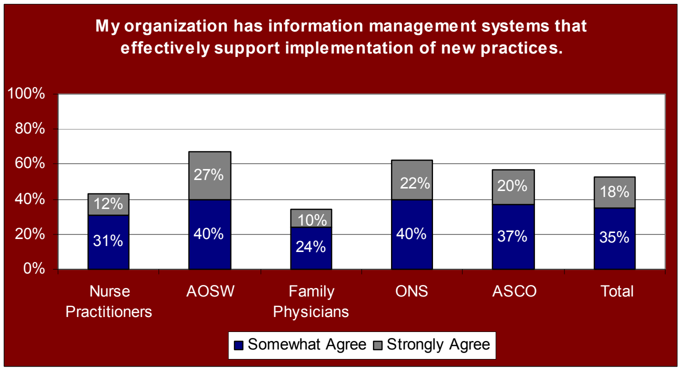
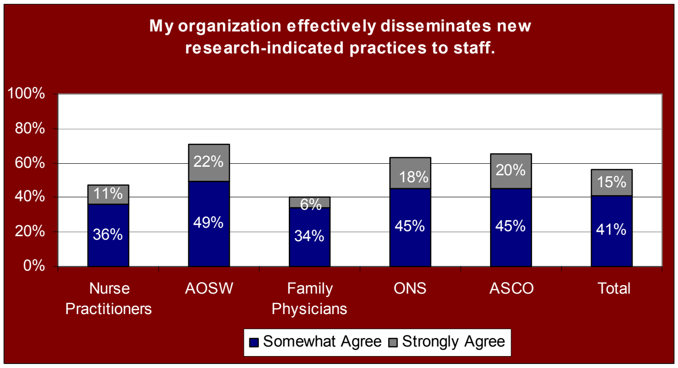


Exhibit 32



Staffing and Other Support

Factor analysis revealed a correlation among two questions that inquire as to the presence of cancer research-related staffing support within respondents' organizations. However, the substantive thematic difference between these questions makes it more appropriate to discuss them individually.

Overall, a minority (43%) of respondents reported that their organization has a member of staff who is explicitly responsible for the development, update or implementation of practice guidelines. Among practitioner sub-groups, oncology nurses (ONS) and oncology social workers (AOSW) most frequently indicated "yes"—66% and 60%, respectively. Fifty-one percent of respondents indicated that their organization has staff to support the identification of patients who are eligible for participation in clinical trials, with primary care practitioners far less likely to report the presence of such staff.

These findings correspond closely with organizational sub-group observations, presented in exhibits 33 and 34. Less than one-third of respondents who work in community clinics or private offices—which are predominated by primary care practitioners—reported a member of staff with responsibility for the development, update or implementation of guidelines, compared to greater than 50% of respondents from larger organizations. The differences between hospital and smaller organizational settings are even more pronounced with regard to the presence of staff to identify patients eligible for clinical trials. These findings would appear to reflect both the unique resources and, perhaps, missions of these different organizations

Exhibit 33

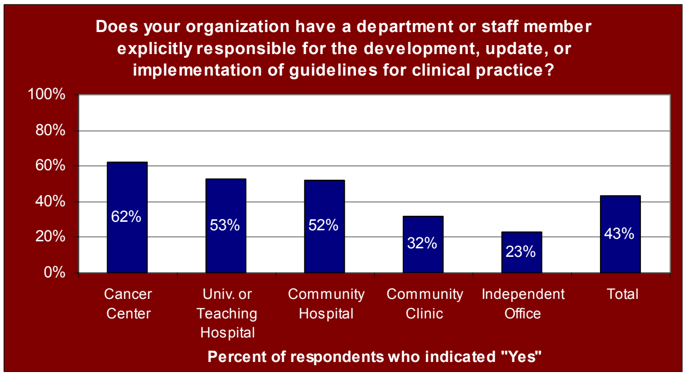
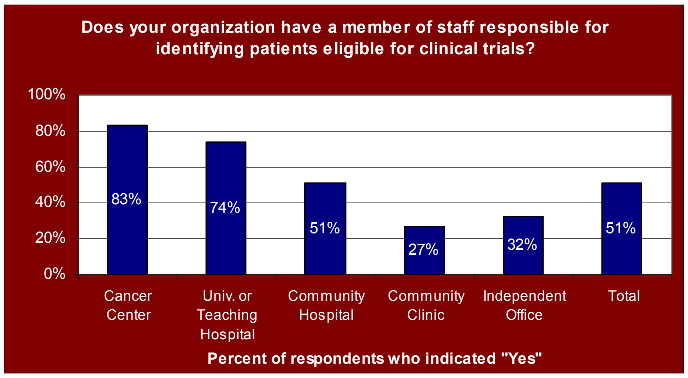


Exhibit 34



Exhibits 35 and 36 relate to a final organizational support-related question that did not group statistically with any other survey question. This question was not part of the original survey instrument, but was included as a question of interest to NCI. Overall, between 80% and 90% of each practitioner group surveyed agreed that "Within my organization, practitioners are encouraged to perform a diagnostic evaluation of any patient with an abnormal cancer screening test regardless of ability to pay."

Although the overall rate of agreement is fairly constant across practitioner groups (84% to 90%), significant differences exist in the intensity of agreement across practitioner groups. Among respondents, primary care practitioners and oncology social workers more frequently (60% to 63%) indicated "strongly agree" than other respondents. A comparison of responses by organization type reveals a generally consistent and unremarkable response profile across all types for which a sufficient sample size exists.

Exhibit 35

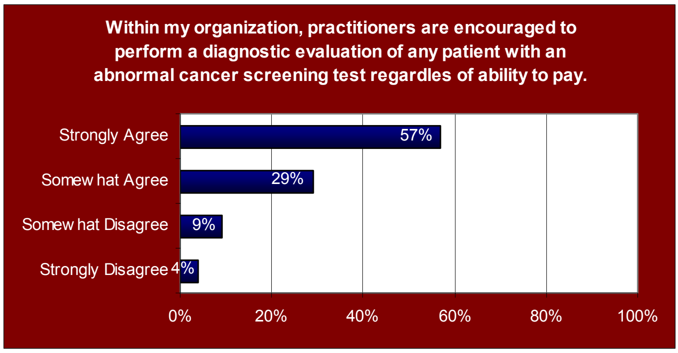
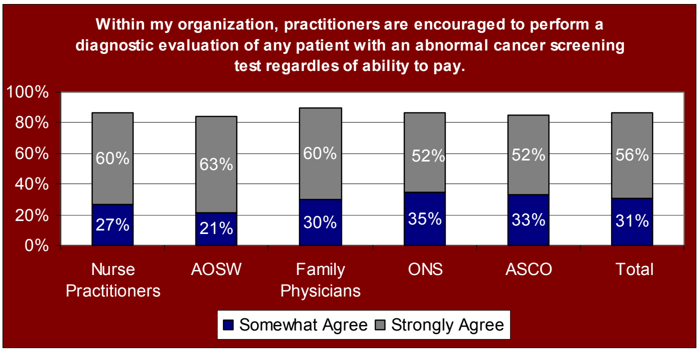


Exhibit 36



2. Implementation Cost and Economic Factors

Foundation research suggested that implementation costs and other economic factors stand as a barrier to the translation of research into practice. Factor analysis showed a strong correlation among five questions that gauged the extent to which economic factors impact practitioners' ability to integrate new research-indicated approaches to cancer care into practice. Exhibits 44 and 45 present the mean distribution of responses to these five questions.

Overall, 58% of respondents at least somewhat agreed that implementation costs create a barrier to the implementation of new research-indicated practices, with 19% reporting that they strongly agreed. Among practitioner groups, a statistically significant difference is apparent between the responses of those in primary and specialty cancer care. Approximately two-thirds of nurse practitioners and family physicians at least somewhat agreed that implementation costs create barriers. Again, similarities exist between the responses of primary care practitioners and respondents who work for community clinics and private offices. Staff of these organizations more frequently agreed that the cost of implementation creates barriers to TRIP than did staff of other types of organizations.

Exhibit 37

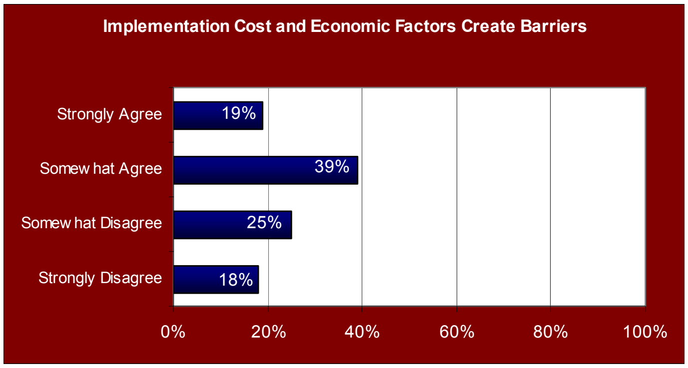
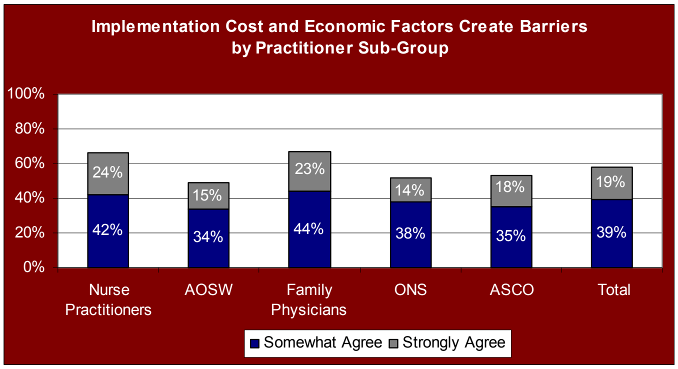


Exhibit 38



A review of responses to the individual questions that comprise the Implementation Cost and Economic Factors scale appears in Exhibit 39 (next page). This table, sorted in descending order by the proportion of respondents who indicated they strongly agree in response to each question, highlights concerns that "Providing state-of-the-art care is often not possible for under-insured patients." Overall, 62% of practitioners expressed some agreement with this statement, with 30% indicating that they strongly agree. A larger proportion (69%) agreed that "Implementation of new practices is often hindered by a lack of staff time," although a smaller percentage (23%) indicated strong agreement.

Respondents were also asked to reflect on the extent to which insurance rules discourage the implementation of new practices and whether their organization's quality improvement efforts are driven by the need for cost reduction. A majority of respondents did agree with these statements and relatively small proportions reported strong agreement (18% and 15%, respectively). Finally, most respondents did not identify the lack of specialized medical equipment or devices to be a major barrier to the implementation of new practices.

Exhibit 39

Implementation Cost and Economic Factors	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
Providing state of the art care is often not possible for under-insured patients	30%	32%	20%	18%
Implementation of new practices is often hindered by a lack of available staff time	23%	46%	21%	11%
Insurance reimbursement rules often discourage me from implementing new practices	18%	40%	24%	18%
My organization's quality improvement efforts are driven by a need for cost reduction	15%	42%	28%	15%
Implementation of new practices is often hindered by a lack of specialized medical equipment/devices	9%	33%	31%	28%

Exhibits 40-44 (below) present practitioner sub-group responses to each of these five measures. Practitioner sub-group findings are mixed within this group of questions. While no single, dominant trend is in evidence, the groupings in opinions of primary care practitioners remained generally intact. The responses of practitioners from small organizational settings (community clinics and private hospitals) and large, generally well-resourced settings (cancer centers and university teaching hospitals) continued to stand in contrast to one another. The responses of staff from community hospitals, which may be relatively large, but have limited resources, did not track consistently with either one of these two groups.

- Exhibit 40: Family physicians (80%), nurse practitioners (75%) and oncologists (67%) most frequently agreed that it is often not possible to provide state-of-the-art care to under-insured patients, compared to 41% to 43% of other practitioners. Among organizations, over 75% of respondents from community clinics and private offices agreed compared to approximately 50% from other organizations.

- Exhibit 41: 56% of oncologists and 65% of oncology nurses agreed that a lack of staff time hinders the implementation of new practices, compared to 71% to 79% of other respondents. 78% of community hospital staff agreed; compared to 63% to 68% of respondents from other organizations.

- Exhibit 42: 40% of oncology social workers agreed that insurance reimbursement rules discourage TRIP compared to 59% to 66% of other practitioner groups. Staff of private offices (72%), community clinics (63%) and community hospitals (60%) agreed more often than other organizations' staff (52% to 53%).

- Exhibit 43: 65% of nurse practitioners and oncology nurses agreed that organizational quality improvement efforts are driven by cost reduction, compared to 50 to 56% of other practitioners. No interesting trends were evident among organization-level comparisons.

- Exhibit 44: 61% of family physicians and 58% of nurse practitioners agreed that implementation of new practices is hindered by a lack of specialized medical equipment and devices, compared to 27% to 30% of other respondents. Approximately 50% of respondents from community hospitals, community clinics and private offices agreed that a lack of specialized equipment or devices was a barrier to changes in practice, compared to less than one-third of respondents from cancer centers and university-affiliated hospitals that agreed with this statement.

Exhibit 40

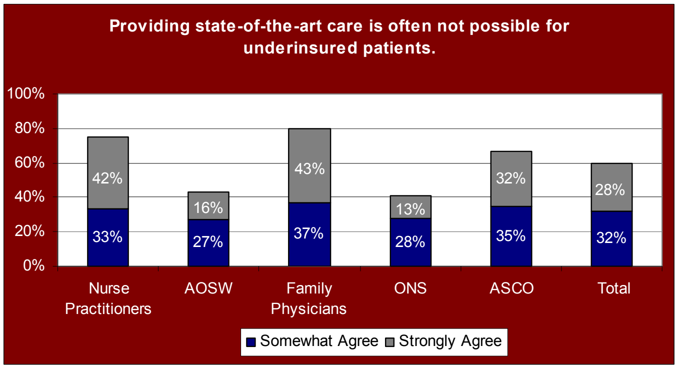

Providing state-of-the-art care is often not possible for underinsured patients.

Exhibit 41

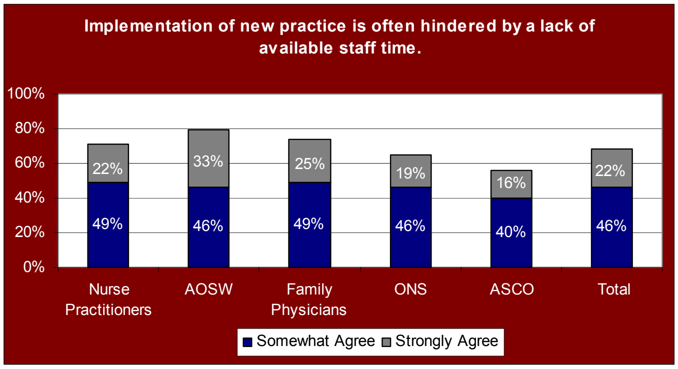

Implementation of new practice is often hindered by a lack of available staff time.

Exhibit 42

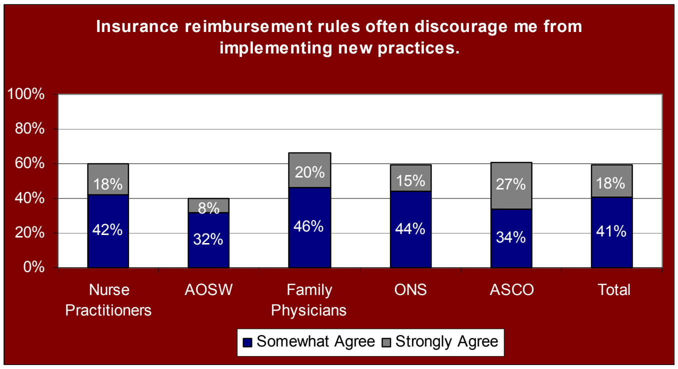

Insurance reimbursement rules often discourage me from implementing new practices.

Exhibit 43

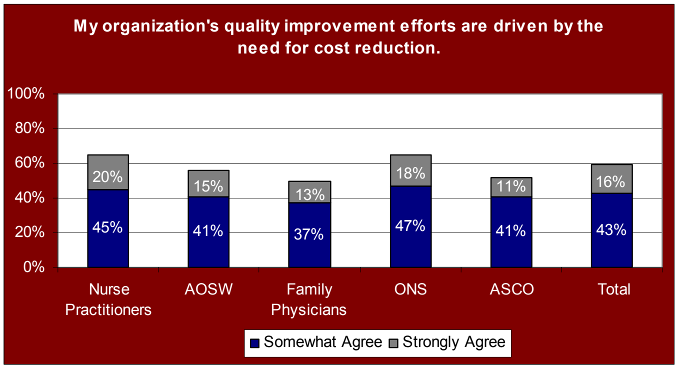
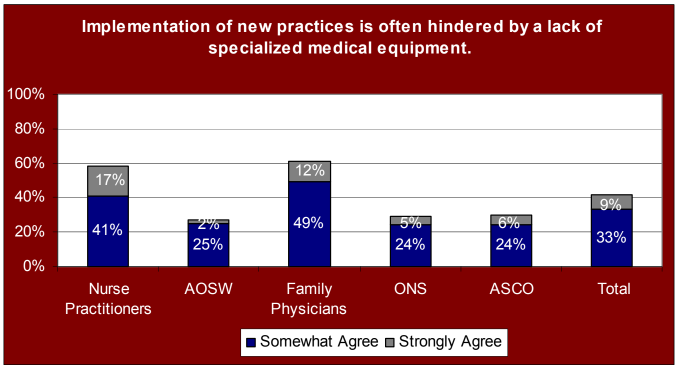

My organization's quality improvement efforts are driven by the need for cost reduction.

Exhibit 44


Implementation of new practices is often hindered by a lack of specialized medical equipment.

3. Characteristics of Information

In a previous section, we noted that 83% of respondents indicated they have adequate access to the research they need to keep their practice current (Exhibit 19). On the other hand, only 33% reported adequate time to access that research—a profound barrier to research acquisition. Foundation research suggested that the characteristics of information can also have a profound impact on practitioners' ability to translate the research they acquire into practice. Factor analysis demonstrated a strong correlation among four questions related to the characteristics of cancer care guidelines and related literature that are intended to support and inform clinical practice. These questions are summarized in the Inadequacies of Information scale presented in Exhibit 45.

Exhibits 45 and 46 present the mean distribution of responses to these four questions. Overall, 49% of respondents agreed that underlying inadequacies in the information they rely on to inform practice present barriers to TRIP, although few (7%) agreed strongly. The overall tendency within these data was toward neutrality, as large and near-equal proportions of respondents indicated that they somewhat agree and somewhat disagree. Practitioner sub-group comparisons show that the frequency of agreement ranges from a high of 59% (family physicians) to a low of 37% (oncology nurses). There is limited evidence to suggest a split in the opinions of primary and specialty cancer care practitioners at the scale level.

Exhibit 45

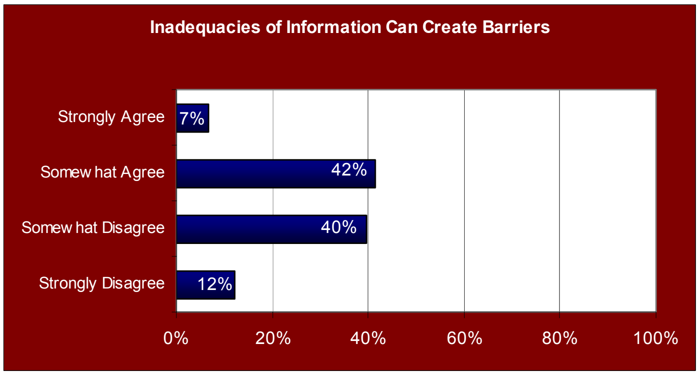
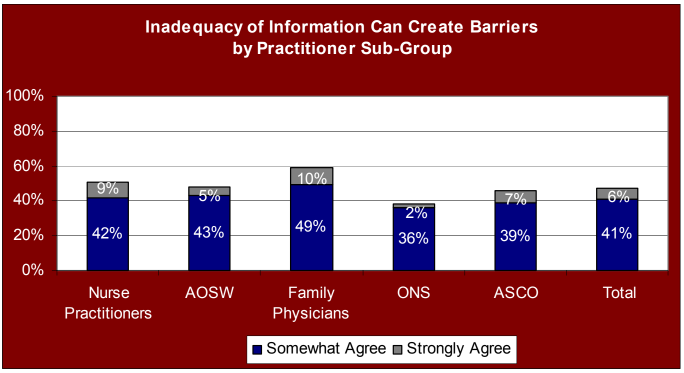


Exhibit 46



Responses to the individual questions that comprise this scale are generally consistent with the overall scale results, with the exception of a lower frequency of agreement with the statement "Guidelines for cancer care are generally too broad and complex to be implemented effectively."

Exhibit 47

Inadequacies of Information	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
Research findings are presented in a manner that makes them difficult to implement "at the bedside" or in the office	9%	45%	33%	13%
The value of guidelines is limited by their specificity when applied to a clinical setting	8%	47%	37%	9%
The cancer care literature is often contradictory, which discourages practitioners from changing practice	6%	43%	40%	11%
Guidelines for cancer care are generally too broad and complex to be implemented effectively	4%	31%	49%	16%

Some variation exists among practitioner sub-group responses to these questions. Bulleted highlights appear below. Taken as a whole, these data suggest that oncology nurses are consistently more comfortable with existing clinical guidelines and available literature than are other practitioners, while family physicians are most likely to show concern regarding these resources. Organizational effects on response are more muted for these questions than for many others. One explanation for this is that the characteristics of clinical guidelines and literature are less subject to the influence of organizational factors than are other topics explored through the survey.

- Exhibit 48: Family physicians (74%), nurse practitioners (59%) and oncology social workers (53%) most frequently agreed that research findings are presented in a manner that makes them difficult to implement. Among organizations, respondents from community clinics (66%), community hospitals (61%), and private offices (60%) most frequently agreed.
- Exhibit 49: 46% of oncology nurses agreed that the value of guidelines is limited by a lack of specificity, compared to higher levels of agreement (53% to 61%) among other groups. Little organizational sub-group variation was observed.
- Exhibit 50: 35% of oncology nurses agreed that the available literature is often contradictory, which discourages TRIP. Family physicians (59%), nurse practitioners (55%), and oncologists (51%) most frequently agreed with this statement. Among organizations, respondents from private offices (54%) and community clinics (50%) most frequently agreed.
- Exhibit 51: 27% of oncology nurses agreed that guidelines for cancer care are too broad and complex to be implemented effectively, compared to 35% to 41% among other groups. Little organizational sub-group variation was observed.

Exhibit 48

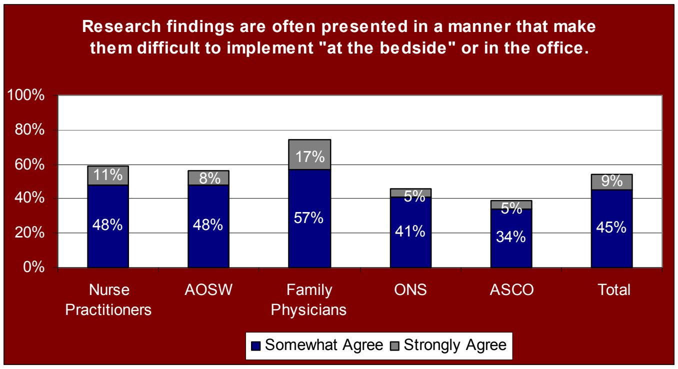


Exhibit 49

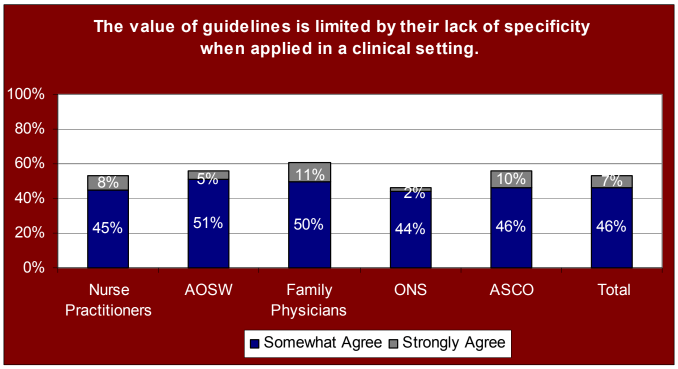


Exhibit 50

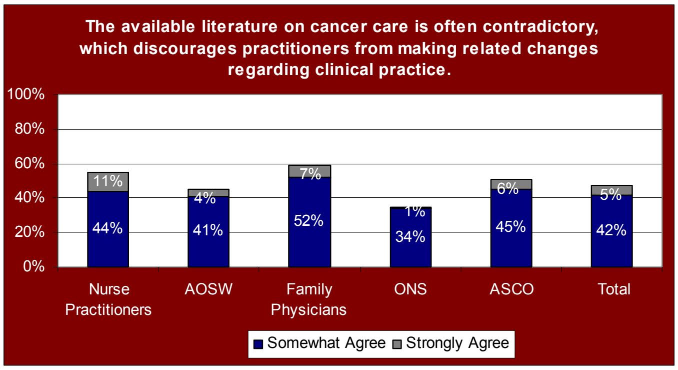
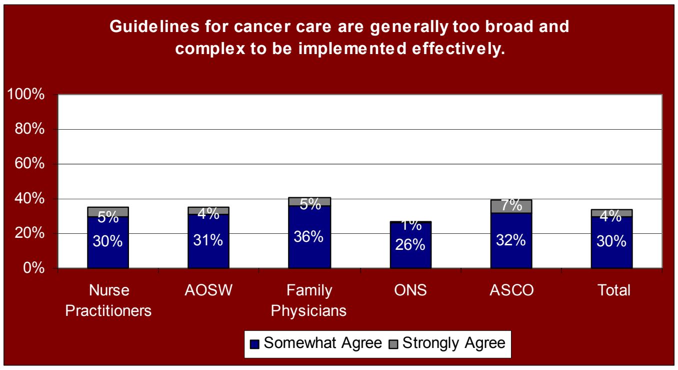


Exhibit 51



4. Factors that Determine whether Changes in Practice Succeed

The NCI survey included two open-ended survey items intended to provide respondents with an opportunity to share their insights outside the prescribed boundaries of close-ended survey items. Exhibit 52 presents top-level findings of a thematic analysis of the following question:

> *In general, what factor is most likely to determine whether you succeed in making a change in practice? That is, what is the one thing that most helps or hinders making a change?*

In total, 67% of survey respondents (1,923 of 2,864) provided a valid answer to this question, which sought to identify critical "tipping points" in the decision process associated with TRIP. Comments suggest that four major factors exert substantial influence on decision making, including: organizational factors, characteristics of the information, financial factors, and time factors. These decision factors are not mutually exclusive and comments frequently touched on multiple themes and were coded accordingly. Exhibit 52 shows the count and frequency with which each of these factors was addressed by practitioner sub-group. Each of the major factors discussed in this report is comprised of a set of more specific sub-themes. These sub-themes are discussed in greater detail in a technical appendix to this report.

Exhibit 52

Practitioner Group	Organizational Factors		Characteristics of Information		Financial Factors		Time Factors	
	n	%	n	%	n	%	n	%
ASCO	129	37%	163	47%	106	31%	21	5%
AOSW	101	53%	50	27%	29	16%	44	24%
ONS	425	62%	175	26%	134	20%	90	13%
Family Practitioners	114	34%	87	26%	81	24%	48	14%
Nurse Practitioners	134	37%	106	30%	102	28%	41	11%
Total	**904**	**47%**	**581**	**30%**	**452**	**24%**	**244**	**13%**

Organizational factors, the most commonly cited tipping points in the decision-making process, were cited by 48% of all respondents who offered a comment. Oncology nurses and oncology social workers most frequently offered comments related to organizational factors, in contrast to oncologists, who least frequently focused on this topic. Exploring the sub-themes that comprise this factor, practitioners noted that having an organizational culture and leadership that is open to change is imperative. Along with this is a need for organizational consensus, and collegial and institutional support. These factors are reinforced by previous successes implementing new practices and by clarity regarding the perceived benefit and efficacy of the changes being proposed.

The frequency of comments related to the characteristics of information (30%) show that this factor is also central to influencing decisions to implement new research-indicated practices into clinical care. Decisions to implement new practices are built upon the quality and availability of the information that supports those practices. Among respondents, oncologists most frequently noted the critical role of the underlying information. The sub-themes that comprise the characteristics of information category include issues of bias and trust, data strength and quality, applicability and relevance, method of presentation (how the data are organized to support implementation, e.g., clinical guidelines), and whether and how information is shared.

Financial factors were a third common theme found frequently (24%) among practitioner comments. Financial considerations were most commonly cited by oncologists and nurse practitioners, and least frequently mentioned by oncology social workers. Finance-related comments reflected the concern that although the implementation of new practices may be desirable, it is not in all cases affordable at either the individual or institutional level. At some point, costs that are out of balance with financial inputs become an obstacle to TRIP. Common finance-related sub-themes included inadequate reimbursement levels for some practices, gaps in insurance coverage, the cost of treatment, and the complex process of weighing relative cost against benefit on a practice and individual-level basis.

Finally, 14% of respondents who provided a response to this question cited time-related factors as pivotal to the successful implementation of new research-indicated practices. Time was most frequently identified as a tipping point by oncology social workers, in contrast to the very small proportion of oncologists who focused on time as a factor in response to this question. The concerns associated with time were broad, but most frequently centered on the lack of the time to acquire and evaluate new research, the lack of staff and training time to support the new practice, and the lack of time to actually implement the practice into a clinical setting.

These comments generally served to confirm the broader findings of this study. In general, organizations must be willing and able to change, which requires that clear and compelling evidence of efficacious new practices is readily available. However, even with these conditions satisfied, constraints on either financial or staff (time) resources threaten the process for translating research into practice.

V. Suggestions to Support the Translation of Research Into Practice

This section presents survey response to a range of potential actions that might improve the ability of practitioners to access and implement current, research-indicated practices into cancer care. Respondents were asked to rate—excellent, good, fair, or poor—eleven suggestions for action based on their potential to positively impact the translation of research into practice, which was defined briefly as "the process through which research is acquired and implemented in a clinical setting." These eleven suggestions in no way represent the full universe of viable actions steps, but were selected by NCI for inclusion from among a broader list of possibilities developed through the key informant interview process, the Dialogue on Dissemination discussion series and conversations with staff of NCI and cooperating professional societies.

In addition to ratings of selected ideas to facilitate research dissemination and implementation, this section provides insight into respondents' satisfaction with NCI's efforts to-date to support research dissemination, as well as the extent to which they agree that professional organizations along with the National Cancer Institute must increase their efforts to support dissemination *and* implementation.

As in previous sections, data are presented for the full population of respondents, with statistical weights applied to ensure an even weighting of the input received from each of the five practitioner groups engaged through the study. Unweighted responses by practitioner group are also presented for all questions. Where relevant, the findings of other sub-group analyses, which appear in technical appendices 1 through 7, are also discussed.

1. Satisfaction with NCI's Support of Dissemination

Measurement of practitioner satisfaction with NCI's efforts to support the dissemination of cancer research findings was a key objective of the NCI Practitioner Survey. As presented in Exhibit 53, over 80% of respondents reported they were somewhat (65%) or very (16%) satisfied with NCI's efforts in this regard. This may be interpreted as a generally positive assessment of NCI's dissemination practices, but also shows that respondents see opportunity for further improvement. (However, interpretations of this finding are limited by the inability to determine what respondents considered to be NCI's "dissemination practices." It is likely that respondents considered an array of information channels and products in their assessment. NCI may or may not consider these information channels to be "dissemination practices.")

Reviewing the responses of practitioner sub-groups, it is notable that only 60% of oncologists reported they were somewhat (54%) or very (6%) satisfied. Oncology nurses, oncology social workers and nurse practitioners most frequently reported that they were very satisfied (17% to 26%). There were no substantial differences among responses by organization type.

Exhibit 53

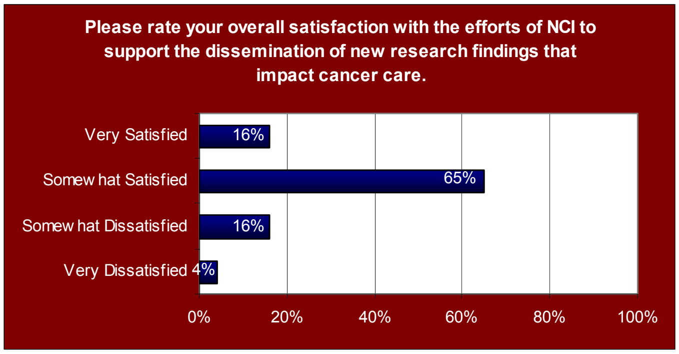
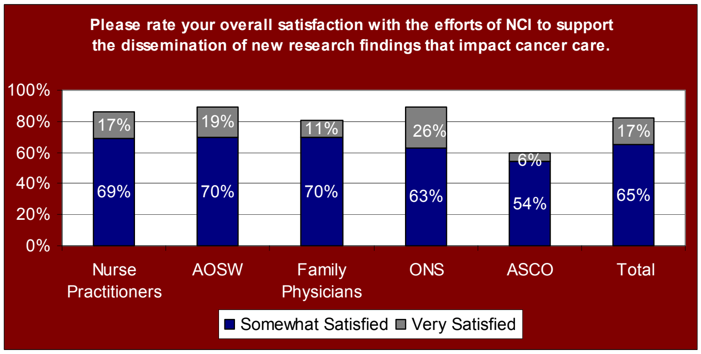


Exhibit 54



2. Interest in Increasing Efforts to Support TRIP

Overall, 97% of respondents agreed that professional organizations and NCI must further increase their efforts to support the dissemination *and* implementation of evidence-based practices. As displayed in Exhibit 55, 57% indicated strongly agree and 40% indicated that they somewhat agree. Significant variation was observed among practitioner sub-groups. Oncology nurses, oncology social workers and nurse practitioners most frequently reported strong agreement (62% to 65%), compared to 44% of family physicians. Some variation was also in evidence among responses by organization type.

Exhibit 55

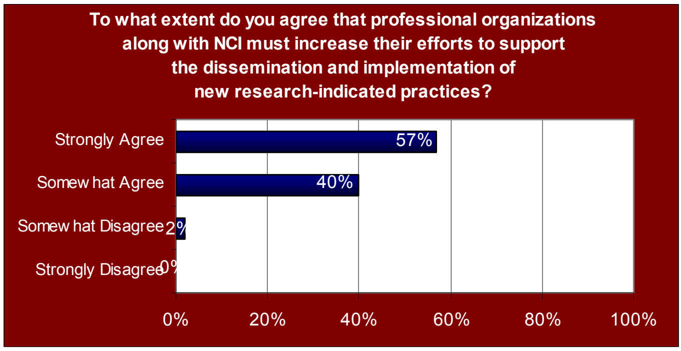


Exhibit 56

3. Make Relevant Information More Accessible

Practitioners' needs for *timely* access to *the right* information were clearly outlined during the practitioner interview process and through NCI's Dialogue on Dissemination series. Four suggestions targeted to these concerns were included on the NCI Practitioner Survey and factor analysis revealed a strong correlation among these questions.

Exhibits 57 and 58 present the mean distribution of responses to the questions that comprise the Make Relevant Information More Accessible scale. Among respondents, approximately 84% offered a positive (good or excellent) rating of the questions that comprise this scale. These suggestions appear to have resonated somewhat less strongly with family physicians than among their peers. Among physicians, 74% rated these suggestions good (38%) or excellent (36%), while ratings of excellent ranged from 45% to 48% among other groups.

Exhibit 57

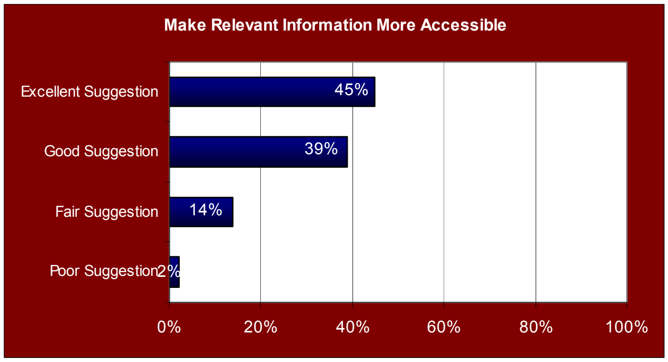
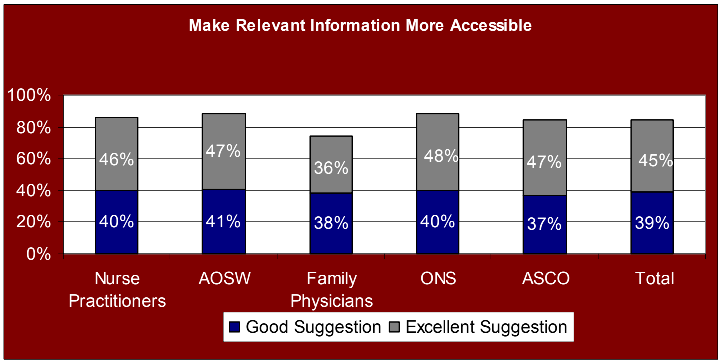


Exhibit 58



Responses to the individual questions that comprise the Make Relevant Information More Accessible scale appear in Exhibit 59. Responses to these questions highlight the wide acceptance of the role the Internet can play in knowledge dissemination. Among this group of suggestions, the most popular was the development of a free, comprehensive collection of up-to-date cancer-related clinical guidelines and research studies, rated as a good or excellent suggestion by 89% of respondents. A similar level of interest appears to exist for increased availability of summary evidence reports. Each of these suggestions would serve to streamline access to more comprehensive stores of relevant information. These are not new concepts and existing models may provide a basis for development of more robust systems in the future.

Smaller, but still large, proportions (about 80%) of respondents would like to leverage web capabilities to create greater opportunities to look behind research summaries and guidelines to the original studies on which they are based, or to create an email subscription service that creates a constant "push" of relevant new research findings based on user-defined information needs.

Exhibit 59

Make Relevant Information More Accessible	Excellent Suggestion	Good Suggestion	Fair Suggestion	Poor Suggestion
Develop a web site that offers a free, comprehensive collection of up-to-date cancer-related clinical guidelines and research studies	57%	33%	9%	2%
Increase the availability of summary evidence reports, such as systematic literature reviews that clarify current consensus regarding best practices	46%	42%	11%	1%
Provide web links to the original studies cited in clinical guidelines and evidence summaries	38%	43%	17%	2%
Develop a web site that allows practitioners to identify relevant research topics and sends email notification of breaking research in those topical areas	38%	39%	19%	3%

Exhibits 60-63 (below) present practitioner sub-group responses to each of these four questions. Looking across the charts, family physicians show a less positive response than any other group to three of the four suggestions. Each of these suggestions includes the use of the Internet to facilitate some aspect of dissemination. Among the first considerations was whether this represented an aversion to Internet use among older practitioners and the possibility that our sample of family physicians was disproportionately weighted toward older physicians; however, this was not the case. In fact, years in practice was found to have a significant effect on response, but that response was very modest, resulting, in most cases, in a difference of only about five percentage points. (Five percentage points is generally considered a large difference when assessing clinical outcomes differences, but may not be as noteworthy in social science research.)

In fact, it is more likely that the cause of this trend in suggestion ratings is a function of the role of family physicians in the continuum of cancer care. Family practitioners may place a premium on the availability of evidence summaries that provide efficient packages of information, but still be less embracing of highly specific searchable information archives and breaking news related to the latest trends, as they must maintain a working knowledge of an enormous range of health topics, work under tremendous time constraints, and rely on cancer care specialists to develop more advanced diagnoses and patient treatment plans.

- Exhibit 60: Oncology nurses (94%), nurse practitioners (93%) and oncology social workers (93%) most frequently gave a positive rating to the suggestion to develop a web site that offers a free comprehensive collection of up-to-date clinical guidelines and studies; while family physicians (82%) and oncologists (86%) less frequently embraced this idea. With regard to years in practice, 96% of those with 0 to 5 years embraced this suggestion, compared to 91% of those with 6 to 20 years, and 87% of practitioners with tenure of 21 years or more. This trend is modest, but statistically significant.
- Exhibit 61: There was relatively little variation in terms of practitioner sub-groups' ratings of the suggestion to increase the availability of summary evidence reports that clarify current consensus regarding best practices. A range of other sub-group tests were conducted, but none revealed a substantial difference in responses to this suggestion.
- Exhibit 62: Among practitioners, 89% of oncologists rated the suggestion to provide web links to the studies cited in guidelines and evidence summaries as good or excellent; compared to 65% of family physicians. Other groups' positive (good or excellent) rankings ranged from 82% to 84%. This suggestion was somewhat more popular among practitioners relatively new to practice (0 to 5 years, 85%; compared to 21+ years, 78%) and among staff of large organizations (84% to 88%; compared to 71% of community clinic and 75% of private office staff).
- Exhibit 63: Ratings of a suggestion to develop a web site that allows practitioners to identify relevant research topics and then sends them targeted email notices regarding emerging, relevant best practices were mixed. Oncology social workers (89%) and nurses (88%) most frequently embraced this suggestion, while physicians (59%) and oncologists (73%) were least positive. Staff of larger organizations were more positive (80% to 85%) than staff of smaller organizations (70% to 75%). Practitioners with 0 to 5 years experience were again modestly more positive than practitioners with greater experience.

Exhibit 60

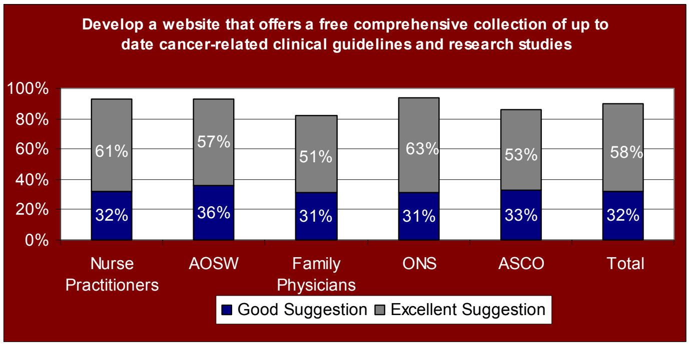


Exhibit 61

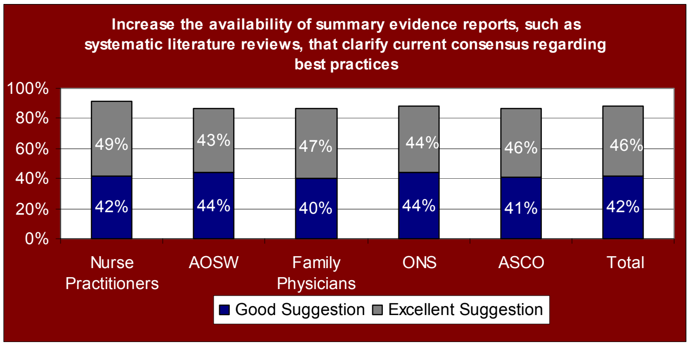


Exhibit 62

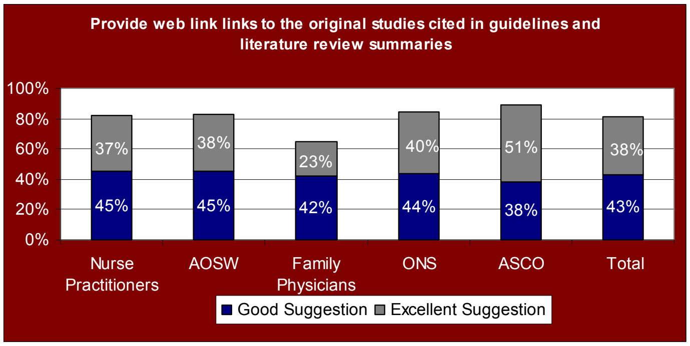
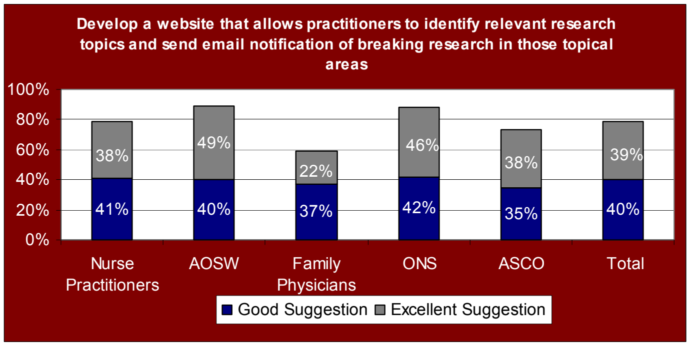


Exhibit 63



4. Support and Prioritize Changes in Practice

Interviews clearly indicated that as important as having access to the right information at the right time, practitioners also require a range of supports to the implementation of the new practices that they identify as beneficial to patient treatment. In fact, getting information to practitioners may be considered the easier task when weighed against the task of implementing lasting changes in practice at the individual practitioner and system levels. As data described in this report suggest, organizational infrastructure, staffing, and culture, as well as the characteristics of practice-related information, can all serve as barriers or supports to TRIP. While supportive factors are in place throughout the healthcare system, so too are barriers.

Interview and survey data suggest that financial resources are a critical tipping point in the decision-making process inherent to TRIP. With resources limited, it becomes imperative that practitioners and their organizations have the practical implementation aides required to support an efficient implementation of the most critical new research-indicated practices. Exhibits 64 and 65 present the mean distribution of responses to five questions that comprise the Support and Prioritize Changes in Practice scale, which was developed through factor analysis. This scale summarizes responses to four suggestions that would create additional knowledge resources to support practice implementation and a fifth suggestion intended to address whether a clearer national focus on selected new practices would be helpful to TRIP.

Among respondents, approximately 87% offered a positive (good or excellent) rating of the suggestions that comprise the Support and Prioritize Changes in Practice scale. On balance, oncologists (63%) and family physicians (72%) were less positive when rating these suggestions than were other practitioners.

Exhibit 64

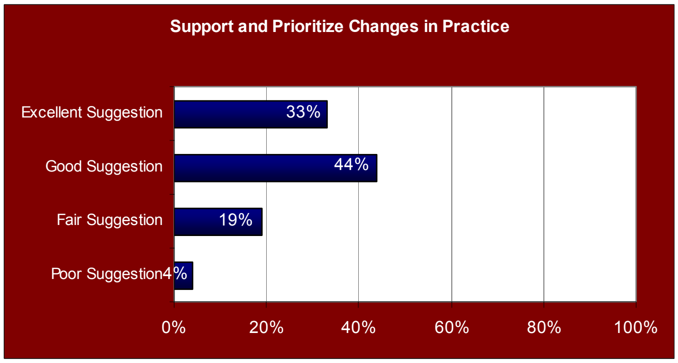
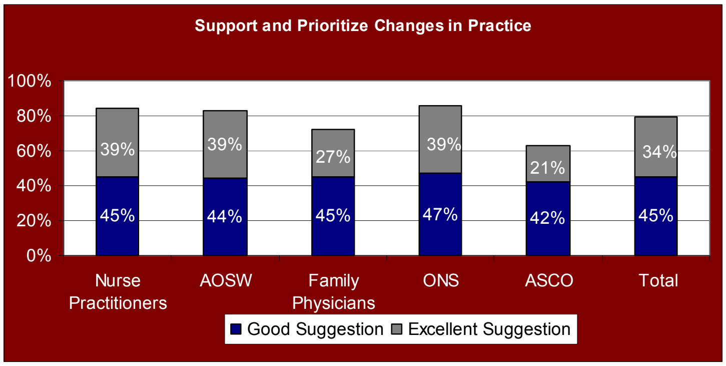


Exhibit 65



Among the individual suggestions for implementation support (Exhibit 66, next page), the highest rated suggestion (46% excellent; 40% good) was to provide tools to help organizations adapt clinical guidelines and evidence-based information for use at the point of patient care. Patient flow charts and reminders placed in patient charts or issued via PDA were cited as examples of possible tools. The second most positive response (32% excellent; 47% good) was to increase the availability of successful implementation plans that can serve as models for other practitioners/organizations trying to adopt a change in practice.

Other implementation support suggestions were almost as well received. A suggestion to increase access to facilitators who are trained to support the implementation of new practices received positive ratings from 75% of respondents, while 71% embraced an increase in implementation-oriented train-the-trainer programs.

The suggestion to focus national dissemination efforts on a selected number of new treatments based on their potential to improve patient outcomes and quality of life grew directly out of the practitioner interview process. Overall, 77% of respondents rated this strategy to focus resources and attention on a more limited universe of the most effective and broadly applicable practices as good or excellent. That it grouped through factor analysis with suggestions that focused on the practical tools needed to improve implementation success seems notable, particularly given the presence of another scale discussed later in this section that relates to practitioner input into research priorities.

Exhibit 66

Support and Prioritize Changes in Practice	Excellent Suggestion	Good Suggestion	Fair Suggestion	Poor Suggestion
Provide tools to help organizations adapt clinical guidelines and evidence-based information for use at the point of patient care (e.g., practice flow charts, reminders in patient charts or via PDA)	46%	40%	11%	2%
Increase the availability of successful practice implementation strategies or "how to" plans that might serve as models for other organizations/practitioners trying to adopt a change in practice	32%	47%	19%	3%
Increase the availability of train-the-trainer programs, through which selected practitioners are trained as facilitators and then return to their organizations to train others on the latest practices	30%	41%	23%	6%
Focus national dissemination efforts on a select number of new treatments based on their potential to improve patient outcomes and quality of life	28%	49%	20%	4%
Increase access to facilitators who are trained to assist practitioners as they try to implement changes in practice	28%	45%	21%	6%

Exhibits 67-71 (below) present practitioner sub-group responses to each of these five measures. Looking across these exhibits, the clearest trend in evidence is the positive disposition of nurse practitioners, oncology nurses, and oncology social workers to suggestions for additional tools and training to support implementation. In this same vein, oncologists are, on balance, decidedly less interested in facilitator-based implementation support strategies.

Notably, interest in a more focused national dissemination agenda was very consistent across all respondent sub-groups. This suggests a widespread sentiment that research dissemination should be targeted toward high-benefit practices and that this focus would be supportive of field-level practice implementation.

- Exhibit 67: Interest in point-of-care implementation tools was overwhelming, particularly among nurse practitioners (93%) and oncology nurses (92%). Oncologists showed the least interest in such tools, with 79% offering a positive rating of the suggestion. No other noteworthy sub-group trends were in evidence.
- Exhibit 68: Oncology nurses, nurse practitioners, and oncology social workers more frequently (88% to 84% positive) offered positive ratings of the suggestion to increase the availability of “how to” and “model” implementation plans to facilitate implementation than did oncologists and family physicians (68%). This suggestion was modestly more popular among respondents from community hospitals (86% positive) than community clinics and private offices (75% and 76%, respectively).
- Exhibit 69: Oncology nurses, oncology social workers, and nurse practitioners, (87% to 80% positive) far more frequently offered positive ratings of the suggestion to increase the availability of train-the-trainer programs through which local TRIP facilitators could be trained than did oncologists (45%) and family physicians (62%). No other noteworthy sub-group trends were in evidence.
- Exhibit 70: There was little variation among practitioner groups with regard to their ratings of the suggestion to focus national dissemination efforts on a select number of new treatments based on their

potential to impact patient outcomes and quality of life. No other noteworthy sub-group trends were in evidence.

- Exhibit 71: Oncology nurses, nurse practitioners, and oncology social workers far more frequently (86% to 82% positive) offered positive ratings of the suggestion to increase access to facilitators who are trained to assist practitioners in TRIP than did oncologists (46%) or family physicians (70%). Respondents with 0 to 5 years experience more frequently (82%) offered a positive rating of this suggestion than did more experienced practitioners. 71% of respondents with 21+ years experience offered a positive rating.

Exhibit 67

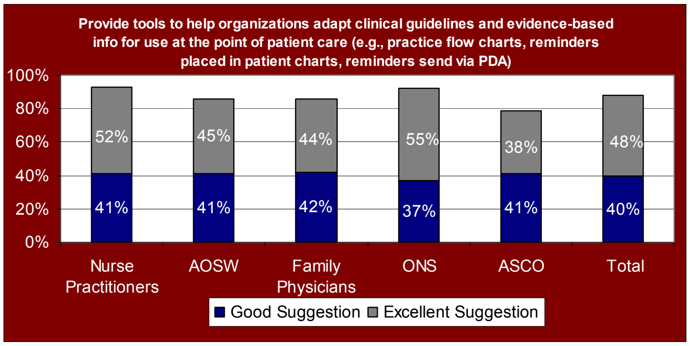


Exhibit 68

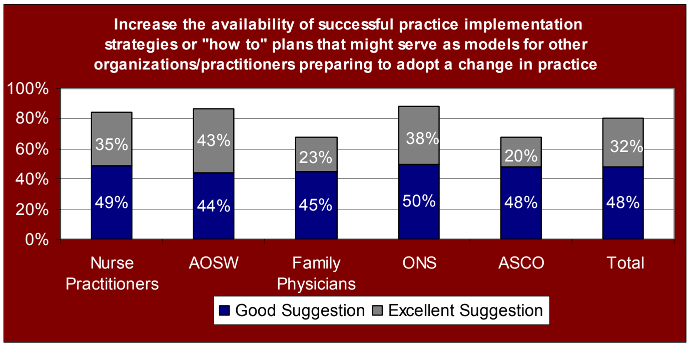


Exhibit 69

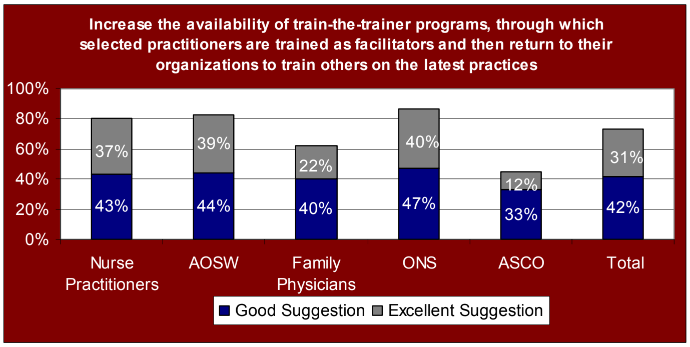


Exhibit 70

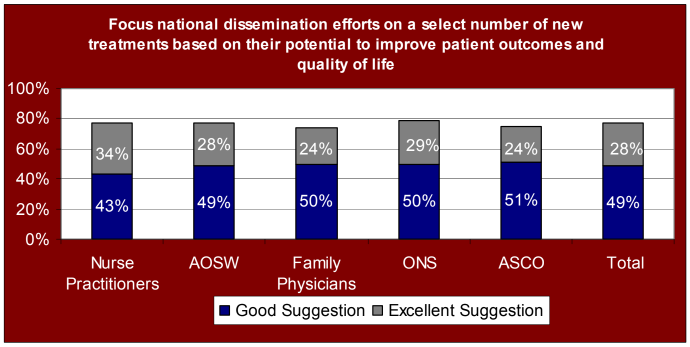
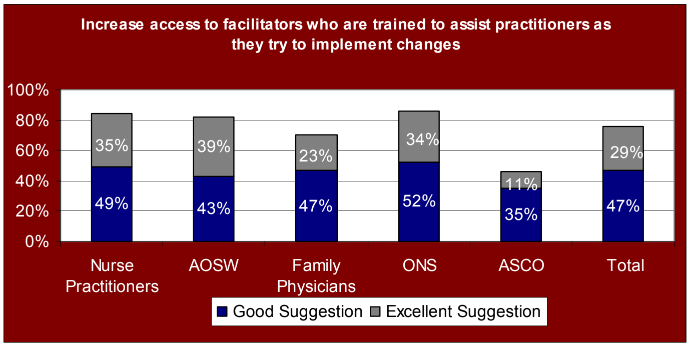


Exhibit 71



5. Increase Practitioner Input to Research Priorities

The relevance of available research to practice is a vital concern that may be affected by a range of factors. Among these, the alignment between funded research designs and the practical information needs of field-level practitioners stands out. Fundamentally, this is a question of whether the available research “fits” the needs of the field. This topic received considerable attention during both the practitioner interview process and NCI’s Dialogue on Dissemination series.

Accordingly, the NCI Practitioner Survey requested feedback to the suggestion: “Increase practitioner input into the process for establishing cancer research funding priorities.” A second question, testing interest in increasing the availability of research focused on symptom management in cancer was also included, at the suggestion of a collaborating professional society. Factor analysis revealed a strong correlation among responses to these questions. The mean distribution of responses to these questions is presented in the Increase Practitioner Input to Research Priorities scale, featured in Exhibits 72 and 73.

Among respondents, approximately 72% offered a positive (good or excellent) rating of the two suggestions that comprise this scale. These suggestions were most popular among oncology social workers (86%), oncology nurses (83%), and nurse practitioners (80%). They were far less popular among medical doctors, as 48% of oncologists and 63% of family physicians offered a positive rating on this scale.

Exhibit 72

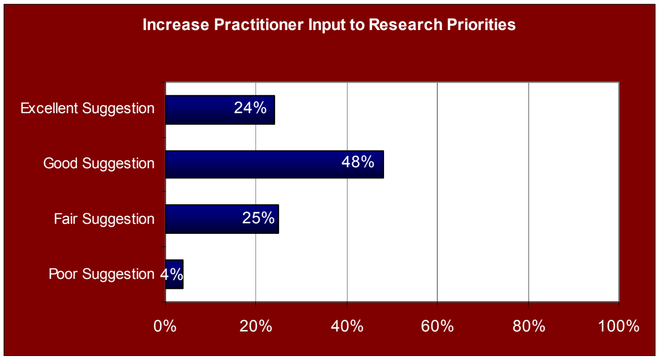


Exhibit 73

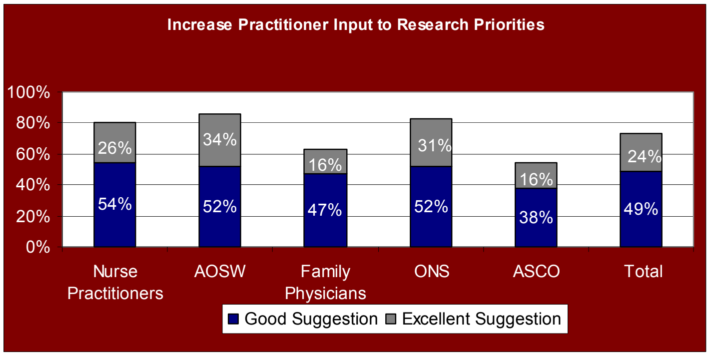


Exhibit 74 shows the generally consistent response to the two questions that comprise this scale. Overall, response to the suggestion to increase research focus on symptom management was more positive than the suggestion to increase practitioner input in establishing priorities.

Exhibit 74

Increase Practitioner Input to Research Priorities	Excellent Suggestion	Good Suggestion	Fair Suggestion	Poor Suggestion
Increase the availability of research focused on symptom management in cancer care	28%	48%	21%	4%
Increase practitioner input to the process for establishing cancer research funding priorities	20%	48%	28%	4%

Exhibits 75 and 76 clarify practitioner sub-group response to these questions. In step with practitioner interview findings, symptom management resonated most strongly with respondents in the nursing and social work professions, with 85% to 90% offering positive ratings and 40% of cancer specialists in these professions (oncology nurses and oncology social workers) rating this suggestion as excellent. In comparison, medical doctor interest lagged, as just 48% of oncologists and 68% of family physicians considered this a good or excellent suggestion. This would seem to reflect the primary roles and concerns of medical doctors with survival and of nurses and social workers with aftercare issues, including quality of life considerations. One additional sub-group difference bears mention. Respondents with 0 to 5 years tenure were generally more positive in their ratings (84%) than more experienced practitioners, with the gap widest at the 21+ years of experience group (75%).

With regard to the suggestion "to increase practitioner input into the process for establishing cancer research funding opportunities," Exhibit 76 shows that this suggestion again resonated most strongly with respondents in the nursing and social work professions, with 73% to 81% offering positive ratings. However, relatively few of these respondents rated this suggestion as excellent, as compared to ratings of increasing the focus on symptom management. Again, medical doctor interest lagged, as just 56% of family physicians and 59% of oncologists considered this a good or excellent suggestion. Respondents from hospitals offered more favorable ratings (68% to 71%) than did respondents from community clinics (60%), in particular.

Exhibit 75

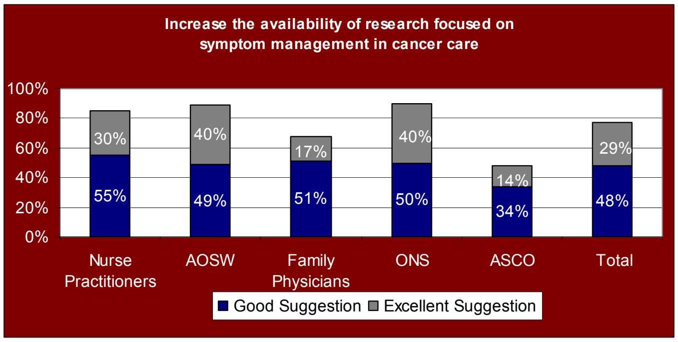
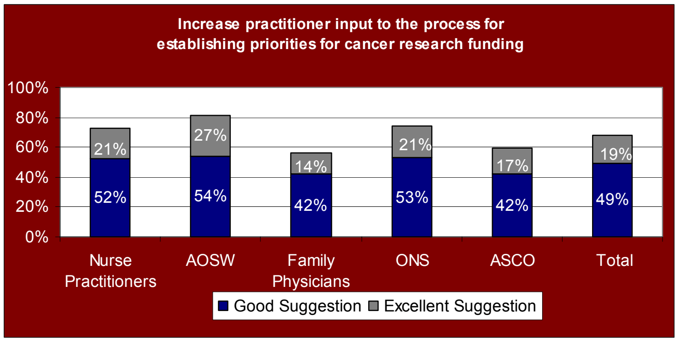


Exhibit 76



6. Practitioner Sub-Group Ratings of Suggestions

Exhibit 77 (following page) offers a summary perspective of respondents' ratings of each of the 11 individual suggestions tested through the NCI Practitioner Survey. This perspective focuses on ratings of "excellent suggestion" and uses those data as the basis for rank sorting suggestions from most to least favorably rated. Weighted responses of all respondents are used as the sort column, but practitioner sub-group details are also provided. Use of the weighted total ensures that no single practitioner group has a disproportionate impact on overall findings. Each individual practitioner group displays different preferences and TRIP support strategies could be customized to meet the needs of each particular group. A review of trends within the "all groups" column of this exhibit reveals:

- An upper tier of "excellent suggestions", which includes suggestions to: develop a free, comprehensive, and up-to-date research and guideline web site (57%); provide tools to help organizations adapt clinical guidelines and research for use at the point of care (46%); and increase the availability of summary evidence reports and tools to clarify current consensus regarding best practices in cancer treatment.
- A second tier including two suggestions for web tools designed to facilitate the acquisition of research findings, including: develop a web site that allows practitioners to identify relevant research topics and sends email notification of breaking research in those topical areas (38%), and provide web links to the original studies cited in guidelines and evidence summaries (38%).
- A third tier includes five questions, four of which relate to targeting and supporting implementation and a fifth that relates to the content of available research. Each of these suggestions were rated excellent by between 28% and 32% of respondents.

- The suggestion to increase practitioner input into the process for establishing research priorities sits as a final "group of one." This suggestion was rated excellent by fewer than 20% of respondents.

It is evident that suggestions that would streamline access to relevant information and—secondarily—support implementation resonated most strongly. Among implementation supports, there appears to be somewhat greater interest in practical tools and implementation models than in building external or internal training capacity. Finally, there appears to be less interest in substantively influencing research agenda. Note that individual practitioner and other sub-group findings are discussed earlier in this section.

Exhibit 77

Percent of respondents who indicated "Excellent Suggestion"

	Weighted All Groups	Nurse Practitioner	AOSW	Family Physician	ONS	ASCO
Develop a website that offers a free comprehensive collection of up to date cancer-related clinical guidelines and research studies	56.7%	60.8%	56.5%	50.8%	63.2%	52.6%
Provide tools to help organizations adapt clinical guidelines and evidence-based info for use at the point of patient care (e.g., practice flow charts, reminders in patient charts, reminders send via PDA)	46.4%	52.0%	44.7%	43.8%	54.6%	48.1%
Increase the availability of summary evidence reports, such as systematic literature reviews, that clarify current consensus regarding best practices.	45.9%	49.4%	43.0%	47.3%	43.5%	45.5%
Develop a website that allows practitioners to ID relevant research topics and send email notice of breaking research in those areas	38.4%	38.3%	48.8%	22.3%	46.4%	37.7%
Provide web link links to the original studies cited in guidelines and evidence summaries	37.8%	37.0%	37.7%	22.8%	40.2%	51.4%
Increase the availability of successful practice implementation strategies or "how to" plans that might serve as models for other organizations/practitioners preparing to adopt a change in practice	31.6%	34.8%	43.4%	23.2%	38.2%	19.6%
Increase the availability of train-the-trainer programs, through which selected practitioners are trained as facilitators and then return to their organizations to train others on the latest practices.	29.8%	37.1%	38.7%	22.0%	40.0%	11.7%
Increase access to facilitators who are trained to assist practitioners as they try to implement changes	28.4%	35.0%	39.2%	23.3%	33.6%	11.3%
Increase the availability of research focused on symptom management in cancer care	27.9%	29.8%	40.4%	17.0%	40.4%	13.8%
Focus national dissemination efforts on a select number of new treatments based on their potential to improve patient outcomes and quality of life	27.6%	33.6%	28.1%	24.3%	28.7%	23.5%
Increase practitioner input to the process for establishing priorities for cancer research funding	19.7%	20.7%	27.1%	14.4%	20.6%	16.6%

7. Practitioner Suggestions to Improve TRIP

The NCI survey included two open-ended survey items intended to provide respondents with an opportunity to share their insights outside the prescribed boundaries of close-ended survey items. Exhibit 78 presents top-level findings of a thematic analysis of the following question:

> *"Please identify one thing that you would like NCI or other national organizations to do in order to improve the translation of scientific research into practice."*

In total, 49% of survey respondents (1,395 of 2,864) provided a valid answer to this question, which sought to ascertain the priorities of practitioners with regard to national-level interventions to improve TRIP. Comments varied widely in focus; however, three categories of suggestions tended to dominate. These include suggestions related to the enhancement of available content (43%), preferred modes of dissemination (30%), and suggestions regarding the formatting and presentation of information (27%). *Although respondents offered many specific suggestions to improve TRIP, it is appropriate to focus on this top-level finding—the content, dissemination method, and format of information are of paramount concern to practitioners, and are perceived to be within the domain of NCI and other national organizations to address.*

Exhibit 78

Focus of Suggestion		ASCO	AOSW	ONS	Family Practitioner	Nurse Practitioner	Total
Enhanced content	n	109	46	197	135	119	606
	%	37%	35%	42%	54%	46%	43%
Preferred modes of dissemination	n	61	41	148	83	83	416
	%	21%	32%	32%	33%	32%	30%
Formatting & presentation of information	n	60	28	148	67	74	377
	%	21%	22%	32%	27%	29%	27%
Resources to support outreach and education	n	22	14	91	28	20	175
	%	7%	11%	20%	11%	8%	13%
Advocacy and policy	n	62	6	12	21	34	135
	%	21%	5%	3%	8%	13%	10%
Target information appropriately	n	21	16	52	20	22	131
	%	7%	12%	11%	8%	9%	9%
National-level collaboration	n	20	18	43	29	17	127
	%	7%	14%	9%	12%	7%	9%
Improving access to information	n	18	16	72	8	12	126
	%	6%	12%	16%	3%	5%	9%
Focus TRIP priorities	n	11	3	28	12	11	65
	%	4%	2%	6%	5%	4%	5%
Facilitate translation in rural, poor areas	n	9	4	27	9	5	54
	%	3%	3%	6%	4%	2%	4%
Remediate funding gaps that hinder implementation	n	15	9	12	9	8	53
	%	5%	7%	3%	4%	3%	4%
Clinical or translational trial-related	n	40	-	2	-	-	42
	%	14%	-	< 1%	-	-	3%

Suggestions to enhance content were the most frequently observed comments; both overall and among each individual practitioner sub-group. They were most frequent among those in primary care, particularly among family physicians. These comments covered a range of content-related sub-topics, including a desire for greater currency and scope within the body of available guidelines, evidence summaries, critical reviews, and education and training programs. The accuracy and credibility of findings are of great concern, particularly given the perceived power of corporate interests in the research and dissemination arena. The many requests for specific practice-related information suggest interest in creating a pool of available knowledge that is both broader and deeper, but other suggestions emphasize that more efficient dissemination modes and formats are also required.

Suggestions related to the mode of knowledge dissemination were frequent across all practitioner groups, though notably less so among oncologists. These comments reflect the broad acceptance of Internet-based storage and dissemination of practice-related information, including research studies, guidelines, evidence summaries, et cetera. At the same time, many respondents noted a continuing preference for printed publications, particularly peer-reviewed journals, and noted the value of traditional postal mail as a way to reach practitioners and organizations in remote regions. Other suggestions supported face-to-face communication among colleagues and through formal training programs or discussion groups. Finally, some respondents noted the value of sending targeted messages through mainstream media sources, particularly television and magazines.

The formatting and presentation of information rounds out the three most frequently observed themes among respondent suggestions to improve national-level support of TRIP. Again, interest was fairly balanced among practitioner groups, although less strong among oncologists and oncology social workers. Formatting suggestions encompassed a wide range of potential requirements, from the need for simple and clear direction in findings, to the need for language that is accessible to practitioners, to the need for "how to" translational formats as opposed (or in addition) to traditional clinical "why" formats. Ultimately, these research products must have end-users in mind, taking into account possible limitations on time to review findings, the range of disciplines likely to be affected during implementation, and the need for user-friendly features.

Following the "Big Three" suggestions to improve the content, dissemination, and the formatting of current, research-indicated practice guidelines and information are five themes that were observed among the comments of between 9% and 13% of respondents. These suggestions respond to a range of perceived needs, including the need: to exert policy influence and coordinate at the national level; for more accessible and better targeted information; and for more "extension-style" resources to aid in practitioner uptake and implementation of new methods into clinical practice. Broader discussion of these and other themes that emerged in the analysis of responses to this question appear in a technical appendix to this report.

Finally, four other comments bear mention, despite a relatively low frequency of occurrence (3% to 5%). These themes touch on critical concerns identified through other survey data and foundation research. Specifically, they reflect concern that funding to support new practice implementation is lacking, particularly in lower resourced environments, creating—or potentially exacerbating—inequities in clinical care. Further, they reflect concern that a lack of focus in the national translation agenda undermines efforts to implement critical new practices. Lastly, they show a particular interest among oncologists in the betterment of, and increased accrual in, clinical trials, and in the expansion of translational trials that may support the development of more effective plans for research implementation.

As a final note, it is important to recognize that the potential value of each of the preceding suggestions to TRIP remains enormous, despite the range in relative frequency with which they were observed. In fact, that frequency may be a function not of the relative value of each suggestion to practice, but of respondents' perceptions of what they think can reasonably be accomplished by NCI and other national organizations or by respondent views on the appropriate role of these organizations in support TRIP.