
RESEARCH REPORTS

Evaluating the status of “translating research into practice” at a major academic healthcare system

M. Hasan Rajab, Frank J. Villamaria, J. James Rohack

The Texas A&M University Health Science Center College of Medicine and Scott & White Healthcare

Objectives: The aim of this study was to assess the status of translating research findings into practice at a major academic healthcare system in Central Texas.

Methods: We conducted a cross-sectional survey addressing knowledge of and participation in translational research of physicians, residents, nurses and third- and fourth-year medical students in a major academic healthcare system in Central Texas.

Results: Out of 508 respondents, 428 (84.3 percent) completed all questions. A total of 68.9 percent of faculty reported having sufficient education and training to conduct research versus 44.4 percent of residents and 35.6 percent of nurses. Fifty-eight percent of faculty, 53 percent of residents and 9 percent of nurses reported current involvement in research activity. A total of 55.6 percent of residents reported that their departments provide them with protected time for research versus 18.4 percent of faculty and 10.3 percent of nurses. In addition, 33.9 percent of nurses reported interest in participating in research but do not know how to start. There were 86.4 percent of faculty, 77.8 percent of residents, and 58 percent of nurses who indicated they were familiar with translational research. However, only 42.7 percent of faculty, 46.7 percent of residents and 35.6 percent of nurses indicated they were aware of any changes in the delivery of care that resulted from research projects.

Conclusions: The study results suggested failure to leverage members of the healthcare team in a systematic process to ensure translation of research findings into practice. Results highlighted the need to merge culture of safety and quality improvement with research while dealing with the daily pressures of patient care.

Keywords: Translational research, NIH Roadmap, Survey, Academic healthcare system

Translating research findings into sustainable improvements in patient outcomes remains a challenge to medical professionals responsible for improving the quality of clinical care (7). The National Institution of Health (NIH) Roadmap for Medical Research has resulted in the development of new fundamental themes (6). In particular, the roadmap advo-

cated the reengineering of the clinical research enterprise, in part by fostering physician-scientist interactions, clinical research training, and promoting translational research (4). This requires educating and training clinicians and investigators who will participate and promote translational research (2;3). To that end, recruiting, mentoring, training and retaining clinical and translational researchers is a challenging task (7). It requires the assessment of institutional ability to conduct and support translational research.

We thank Dr. Ronald Hogg, Dean Kjar, Melody Ivy, Christie Cummings, Glen Cryer, Jason Ettliger, Matthew Wright, and Scott & White staff for their contribution to this work.

Academic healthcare systems are excellent environments for translational research. Such healthcare systems provide a unique setting for developing effective models for translating research findings into diverse applied settings and, eventually, to our communities. These translational models work in two directions—from bench to bed where bench and clinical researchers deliver new ideas to practicing clinicians for improving healthcare, and bed to bench “reverse translation,” where the work of practicing clinicians taking care of patients provides ideas that can stimulate new scientific investigations (1;5).

The main objective of this survey was to assess the status of translating research findings into practice at a major academic healthcare system that has been recognized by Thompson Healthcare as a top 100 major academic teaching hospital.

METHODS

We conducted an anonymous cross-sectional survey from January 10 through February 10, 2008 of all clinicians (MDs, DOs, RNs, PharmDs, PhDs, etc.), residents, and third- and fourth-year medical students. The main aim of this survey was to assess the status of translational research into practice. An additional objective was to gather baseline data for future research that will help us find opportunities to improve the extent to which research findings are translated into practice.

We developed the survey using SurveyMonkey[®], SurveyMonkey.com and distributed it by means of email. Our target population was all physician faculty, residents, nurses, and medical students at our institution. All employees as well as medical students at our institution have email accounts and have access to their accounts either by means of personal or institutional computers.

We initially contacted the physician and nursing leadership at our institution to solicit their support, and all expressed interest. We then formed a team of physicians, nurses and other professionals who represent the target population to participate in the survey design, data analysis, results interpretation, results presentation, and publication. We designed the survey to be short, simple, and easy to understand and interpret by study participants. In addition, the survey was designed based on our understanding of our organizational culture. We included a short introduction statement that explained its objectives, and most importantly, assured its confidentiality. We made all attempts not to communicate our expectations of this survey in advance to study participants.

The original survey that the study team created contained twenty-seven questions. It was pilot tested with seventeen staff members of the Division of Research and Education with varied specialties including RNs, PhDs, and MS in addition to six physicians from different specialties, including department chairs and residency program directors. This group reviewed the instrument for content validity and provided appropriate feedback. Based on their feedback we reduced the

Table 1. Identifiable Gaps

-
- Variation in how new knowledge is communicated
 - Unfamiliarity with institutional resources and how to access them
 - Failure to leverage as a learning organization all members of the healthcare team
 - Awareness of changes in the delivery of care in work units that have resulted from research
 - Awareness of clinical observations/inquiries in work unit that have stimulated research
-

number of original questions to a total of fifteen, reworded some of the original questions and added two new questions.

The survey (see Supplementary Table 1, which can be viewed at www.journals.cambridge.org/thc) contained a total of seventeen questions. These questions were divided into three sets: (i) four demographic questions that included gender, specialty, degree, and position; (ii) five questions related to translating research; and (iii) eight questions related to current research activities and related education. The translational research questions were adapted from an in-house HMO Research Network survey (personal communication). Most of the questions were yes/no questions, and a few were multiple choice. The remaining questions were developed by the authors.

To increase the response rate we emailed the survey through our Chief Medical Officer’s (CMO’s) office. We initially targeted faculty physicians, a primary driver of the culture of the organization, and gave them a chance to respond. Then, we emailed the survey to the rest of the staff. We also sent two follow-up email reminders to staff encouraging them to participate. We believed that this approach would maximize our response rate as compared to reported (historical) response rates in similar hospitals.

Data were entered automatically in an electronic database by the Internet survey company SurveyMonkey[®]. Demographics and baseline characteristics including gender and specialty were summarized using descriptive statistics. Specific relationships between categorical variables were examined using the Pearson χ^2 test or the Fisher’s Exact test, as appropriate. Data management and statistical analysis were performed using SAS software, version 9.1.3 (SAS Institute Inc., Cary, NC). The designated level of significance was .05.

The study protocol and the survey instrument, the 2008 TRIP Survey, were approved by the Scott & White institutional review board.

RESULTS

Of 508 respondents, 428 (84.3 percent) completed all questions. Of the 428 complete responses, 279 (65.2 percent) were women, 103 (24 percent) were physicians, 45 (10.5 percent) were residents, and 174 (40.7 percent) were nurses. Few third- and fourth-year medical students completed the survey

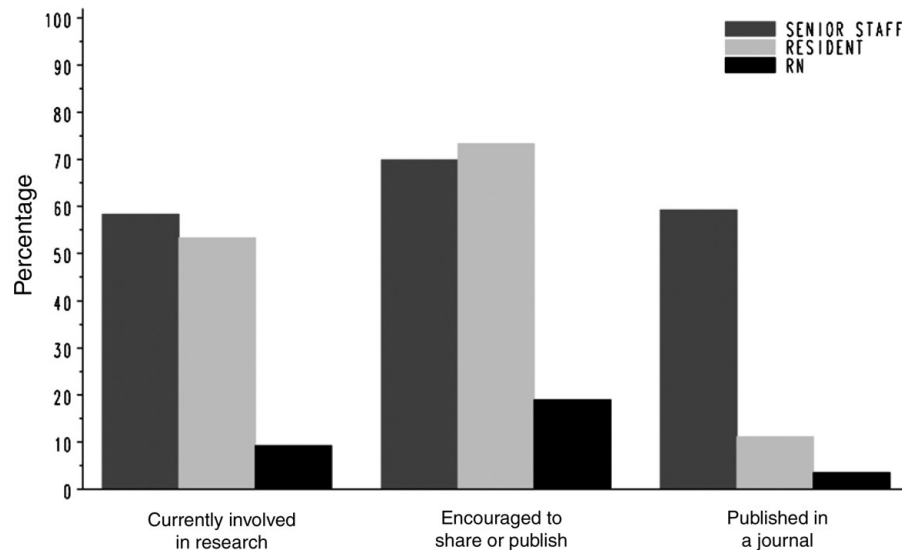


Figure 1. Faculty physicians, residents, and nurses reporting involvement in research and publication.

and their results were merged with a category called “other” that included all other medical professionals who responded to our survey. In this article, we focused on physicians and nurses, a total of 322 responses. Specialties included internal medicine, family medicine, psychiatry, surgery, pediatrics, emergency medicine, anesthesiology, and nursing. All nurses that responded were RNs. Most of the physicians who responded were MDs and only three were DOs.

One of the main assumptions of this analysis was that the sample we have is representative of target population, that is, S&W physician faculty, residents and nurses. To assess potential response bias in our survey, we compared the gender of physician, resident, and nurse responders to the gender of the target population groups and found no statistically significant differences. The percent female who responded versus percent female in the targeted population were 20.4 and 26.6 for faculty, respectively, $p = .18$, and 42.2 percent versus 36 percent, $p = .39$ for residents, and 94.3 percent versus 93 percent, $p = .53$, for nurses.

When asked about their current part-time or full-time involvement in research activities, 58.3 percent of faculty physicians, 53.3 percent of residents, and 9.2 percent of nurses reported some involvement in research (Figure 1). Most of these research activities were in clinical trials. When staff members were asked about being encouraged to share or publish their own research findings, 69.9 percent of faculty, 73.3 percent of residents, and only 19 percent of nurses reported that they have been encouraged to share research information or publish their own research findings (Figure 1). In addition, 59.2 percent of faculty reported publishing in a peer reviewed journal, versus 11.1 percent of residents and only 3.4 percent of nurses (Figure 1).

The majority (86.4 percent) of faculty, 77.8 percent of residents and 58 percent of nurses reported they were fa-

miliar with the concept of translating research into practice (Figure 2). However, less than half of all respondents in the studied categories (42.7 percent of physician faculty, 46.7 percent of residents and 35.6 percent of nurses) indicated they were aware of any changes in the delivery of care in their work unit that resulted from recent research projects conducted at this institution or elsewhere (Figure 2). Similarly, 44.7 percent of physician faculty, and 44.4 percent of residents and only 23 percent of nurses indicated they were aware of any clinical observations/inquires in their work unit that have stimulated or resulted in research investigation (Figure 2).

More than 80 percent of faculty and residents reported that they share research or conference findings with their patients and colleagues versus 52.3 percent of nurses. Fifty-nine percent of faculty reported sharing through personal contact or email, while 60 percent of residents reported sharing mainly through seminars, lectures, and newsletters (Figure 3). Most nurses (37.9 percent) reported sharing research findings by means of personal contact and email.

We also asked staff about their education and/or training to perform research. Sixty-nine percent of physician faculty reported having sufficient education and training to conduct research (Figure 4). In contrast, 44.4 percent of residents and 35.6 percent of nurses reported they had sufficient education and/or training to conduct research (Figure 4). Almost 40 percent of nurses reported not having sufficient education or training to conduct research, interpret research findings, or translate research findings into practice. At the same time, 33.9 percent of nurses reported a desire for being involved in research projects but they were not sure how to start.

Almost one-third of the staff respondents, faculty physicians, residents, and nurses, reported having not used any of

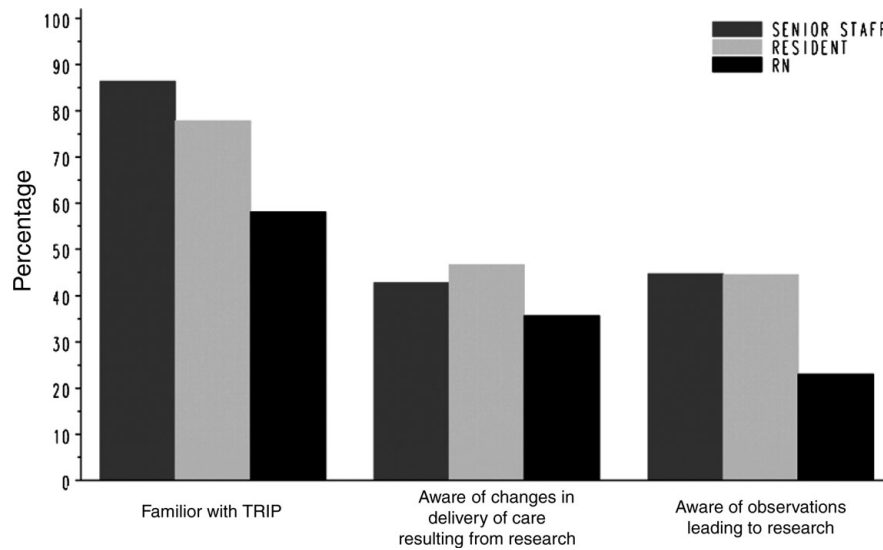


Figure 2. Faculty physicians, residents, and nurses reporting familiarity with the concept of translating research into practice and awareness of changes in the delivery of care resulting from research.

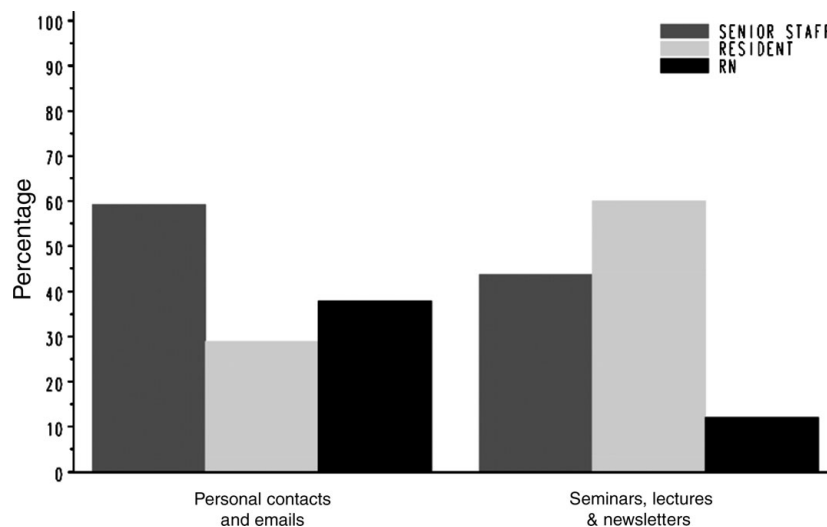


Figure 3. Faculty physicians, residents, and nurses reporting ways to share research findings.

the institutional services available through the Division of Research including the Department of Biostatistics and the Grant Administration Office. Fifty-six percent of residents reported that their department provided protected time to do research versus only 18.4 percent of faculty and 10.3 percent of nurses. A summary of identifiable gaps and opportunities are in Tables 1 and 2 .

DISCUSSION

The results of this study point out some problems with translating research into practice in an academic environment. One might assume an academic culture to be conducive to the concept of translating research into practice (TRIP). In an academic environment resident trainees learn from fac-

Table 2. Identifiable Opportunities

- Conduct structured orientation for new faculty on institutional resources as well as ‘refresher’ for current senior staff
- Work with nursing to incorporate front line nurses into clinical research as opposed to the notion that “the only nurses that can play are research nurses”
- Streamline ways to bring new knowledge to work units
- Merge culture of safety and quality improvement with research while dealing with daily pressures of patient care

ulty physicians many things, of which translating research into practice could be one of the most critical for a career of lifelong learning. It appears from the results of our survey that TRIP and sharing of research findings are occurring between faculty and residents. However, our results identify

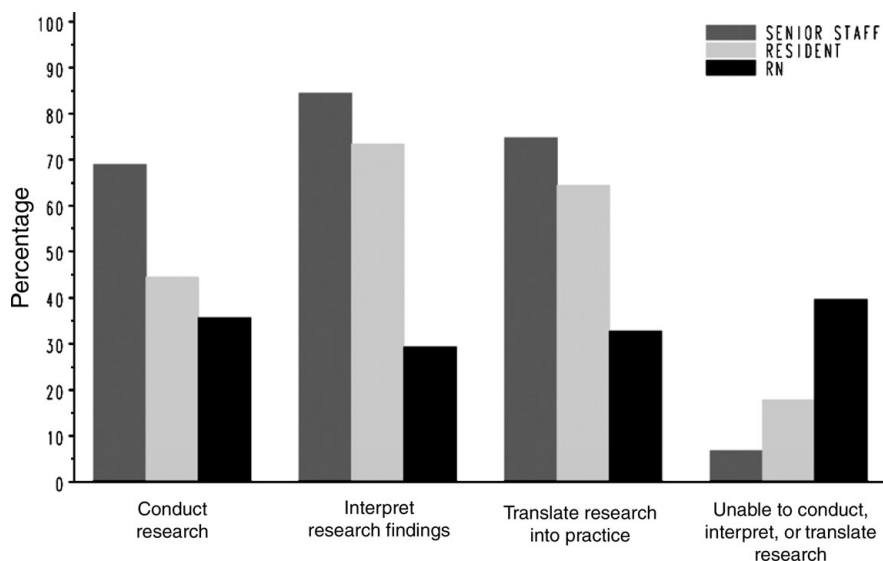


Figure 4. Faculty physicians, residents, and nurses reporting having sufficient education and training to conduct, interpret, and translate research findings.

a gap in TRIP knowledge between faculty and residents, and a critical component of the healthcare team: the nursing staff.

The study results indicated that the mechanism for sharing research findings varied between groups. For example, the use of electronic communication and sharing by didactic interactions varied between faculty, residents, and nurses. This study documents the variation in learning modalities based on level of training (faculty versus residents) and profession (physician versus nurse). The national initiative that NIH is sponsoring to improve TRIP must take that into consideration.

An important finding was the desire of nursing staff to be more involved in research. Our academic healthcare system has participated in nursing education for over a century; however, it appears that a significant gap exists between bedside nurse interest in doing research and those actually participating in research. Research nurse specialists are currently involved in our Research and Education Division but the link to the nurse at the bedside is not well established.

There was a general lack of knowledge and familiarity among staff respondents with institutional resources related to research and how to access them.

A high percentage of faculty and residents believed they had sufficient training in research and TRIP to participate in research. In an academic setting, this particular finding is what would be expected. However, to efficiently conduct research in a practice where clinical care production pressures are ever-present, knowledge of how and where to access resources to support research is critical. In an environment of limited protected faculty research time, actual research production will falter unless research support is easily and readily available.

There was a general lack of awareness of changes in the delivery of clinical care in work units that have resulted from research and a lack of awareness of any clinical observations/inquires in the work unit that have stimulated or resulted in research investigation. With the volume of research being conducted in the profession of medicine and nursing, translational opportunities abound. Finding effective ways to systematically disseminate findings in clinical practice with a direct link that notes the change in process, diagnosis or treatment is due to research knowledge should be the focus for future investigations.

The results of this survey helped us identify several institutional opportunities. First, there is a need to conduct structured orientation for new faculty as well as a “refresher” for current senior staff on how to access and use research and education institutional resources. Second, there appears to be an opportunity to involve front line nursing staff in clinical research as opposed to the concept that only nurses who are hired to perform research can participate. Lastly, identifying ways to systematically streamline ways to bring new knowledge to work units is important to keep our clinical care processes current and up to date.

This was a nonprobability survey that had its limitations. The survey used language that was probably easy for many respondents to understand. However, it used a few terms including translational research, clinical trials, and retrospective and prospective research that may not have been understood by some respondents. In addition, the sample we obtained from this observational study may not represent the opinions of those who, for some reason, do not want to or are too busy to respond, have no personal computer at work, new staff with no email address, or were on vacation during study period.

Our survey demonstrated a difference between those staff who want TRIP education by means of didactic/face-to-face methods versus electronic format. It is our impression that the desire to have face-to-face TRIP education creates delay. Moving to Web-based updates with flashing icons when one starts their computer, or having embedded decision support tools and Computerized Physician Order Entry may allow a rapid TRIP experience. This is an area ripe for further study.

CONCLUSIONS

The study results suggest that despite national recognition as a Top 100 Teaching Hospital, there continues to be barriers for seamless adoption of new research findings into clinical practice by all members of the healthcare team. In addition, there is a need to merge culture of safety and quality improvement with research while dealing with daily pressures of patient care.

CONTACT INFORMATION

M. Hasan Rajab, MPH, PhD (mrajab@swmail.sw.org), Associate Professor, Department of Psychiatry, Texas A&M University Health Center College of Medicine; Director, Biostatistics, Scott & White Healthcare, 2401 South 31st Street, Temple, Texas 76508

Frank J. Villamaria, MD, MPH (fvillamaria@swmail.sw.org), Associate Professor, Department of Anesthesiology,

Texas A&M University Health Science Center College of Medicine; Senior Staff Physician, Department of Anesthesiology, Scott & White Healthcare, 2401 South 31st Street, Temple, Texas 76508

J. James Rohack, MD (jrohack@swmail.sw.org), Professor, Departments of Internal Medicine and Humanities in Medicine, Texas A&M University Health Science Center College of Medicine; Director, Center for Healthcare Policy, Scott & White Healthcare, 2401 South 31st Street, Temple, Texas 76508

REFERENCES

1. Baumann M, Bentzen SM, Doerr W, et al. The translational research chain: Is it delivering the goods? *Int J Radiat Oncol Biol Phys.* 2001;49:345-351.
2. Cripe TP, Thomson B, Boat TF, Williams DA. Promoting translational research in academic health centers: Navigating the "roadmap". *Acad Med.* 2005;80:1012-1018.
3. Crowley WJ. Translational of basic research into useful treatments: How often does it occur? *Am J Med.* 2003;114:503-505.
4. National Institute of Health. *NIH roadmap: Accelerating medical discovery to improve health.* <http://nihroadmap.nih.gov/>. Accessed July 30, 2008.
5. Peterson K. Practice-based primary care research—translating research into practice through advanced technology. *Fam Pract.* 2006;23:149-150.
6. Zerhouni E. The NIH roadmap. *Science.* 2003;302:63-72.
7. Zerhouni EA. Translational and clinical science—time for a new vision. *N Engl J Med.* 2005;353:1621-1623.