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Urologic Oncology: Seminars and Original Investigations 34 (2016) 384–387

UROLOGIC ONCOLOGY

Using implementation science to improve urologic oncology care

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Received 1 March 2016; received in revised form 16 May 2016; accepted 17 May 2016

Abstract

There are many gaps between recommended urologic cancer care and real-world practice. Although we increasingly define these quality gaps because of our growing health services research capacity in urologic oncology, we often fall short in translating these findings into effective interventions and strategies to reduce gaps in care. In this article, we highlight implementation research as a logical next step for translating our health services research findings into effective individual and organizational behavior change strategies to improve quality of care. We explain how implementation research focuses on different, upstream outcomes from our clinical outcomes to get the right care to the right patient at the right time. Lastly, we share information about resources and training for those interested in learning more about this emerging, transdisciplinary field. Published by Elsevier Inc.

Keywords: Implementation; Dissemination; Translation; Oncology; Voltage drop

There are many gaps between recommended urologic cancer care and real-world practice. Examples range from underuse of effective care (e.g., smoking cessation [1–3] and physical activity [4,5] counseling, neoadjuvant chemotherapy for muscle-invasive bladder cancer [6], and adjuvant radiation therapy for prostate cancer [7]) and misuse of preference-sensitive care (e.g., failure to include patient values and preferences into treatment [8]) to overuse of supply-sensitive care (e.g., imaging for cancer surveillance [9] and overtreatment [10]). Although we increasingly define these quality gaps because of our growing health services research capacity in the specialty, we often fall short in translating these findings into effective interventions and strategies to reduce gaps in care. In this article, we highlight implementation research as a logical next step for translating our health services research findings into effective individual and organizational behavior change strategies to improve quality of care. We explain how implementation research focuses on different, upstream outcomes from our clinical outcomes to get the right care to the right patient at the right time. Lastly, we share information about resources and training for those interested in learning more about this emerging, transdisciplinary field.

Trends in urologic health services research show a steady rise in peer-reviewed literature over the past decade. Thanks to many in the *Urologic Oncology* readership, we appear to have reached a critical mass in capacity for examining cost, quality, and access in urologic care. Nonetheless, our research does not directly improve patient care in a timely way. This is due, at least in part, to what has become a typical agenda in urologic health services research: first, we identify gaps in oncology care either through clinical experiences, our prior research, or findings from other fields. This motivates further research agendas. Next, we generate hypotheses, design studies to test these hypotheses, interpret the findings, and publish the results; increasingly in high-impact journals. However, our research often stops here. Sometimes we complete the cycle by indicating further research is warranted given our new findings.

Dr. Skolarus is supported by a VA Health Services Research and Development, United States Career Development Award-2 (CDA 12-171) and Mentored Training for Dissemination and Implementation Research in Cancer (MT-DIRC), National Cancer Institute, United States, 1 R25 CA171994-01A1, Washington University in St. Louis, St. Louis, MO.

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http://dx.doi.org/10.1016/j.urolonc.2016.05.022
1078-1439/Published by Elsevier Inc.

Table
"Voltage drop" at the population level for interventions found to have efficacy in randomized clinical trials: an illustrative example for neoadjuvant chemotherapy for muscle-invasive bladder cancer with methotrexate, vinblastine, doxorubicin, and cisplatin (MVAC) [25]

Dissemination	Concept*	Impacted (%)
50% Clinics use MVAC	Adoption	50
50% Practitioners recommend MVAC	Adoption	25
50% Patients accept recommendation/attempt MVAC	Reach	12.5
50% Follow MVAC regimen correctly	Implementation	6.2
50% Implementing MVAC have substantial benefit	Effectiveness	3.1
50% Continue to benefit/adhere to MVAC protocol (e.g., go on to radical cystectomy) after 6 months	Maintenance	1.6

*Based on the RE-AIM Framework by Glasgow et al. [26].

But, where is the translation to improving urologic oncology practice to fill these gaps, and how do we translate the best of our research findings into improvements in urology practice? Many are familiar with the National Institutes of Health roadmap outlining a "bench-to-bedside" translation pipeline. As highlighted in a corresponding Journal of the American Medical Association commentary, a third translational step involves dissemination and implementation (D&I) research [11]. For most urologic oncology investigators, these aspects are an afterthought once the hard work of a clinical trial is over; for example, after a phase 3 clinical trial of a novel agent is completed, the findings are published, and the weekly challenges that occurred during enrollment, treatment, and follow-up are long forgotten. This is also often accompanied by the unrealistic hope that we would get from published trial results to improved clinical practices and better outcomes for our patients without addressing the challenges of ensuring that new findings are adopted into practice. The lack of appreciation for the work required to change clinical practice is, at least in part, the reason it takes 17 years, by some estimates, for a minority of new scientific discoveries to enter day-to-day clinical practice [12]. We argue that more needs to be done to accomplish translation of important research findings, and that this requires new capacity building and training among urologic oncologists.

Dissemination and implementation sciences are rapidly evolving, transdisciplinary fields of considerable relevance to the urologic oncology community. Growing our expertise in these fields would be critical in translating research findings into clinical practice improvements. As defined by the National Cancer Institute and their team dedicated to implementation research—*dissemination* is "the targeted distribution of information and intervention materials to a specific public health or clinical practice audience" and *implementation* is "the use of strategies to adopt and integrate evidence-based health interventions and change practice patterns within specific settings" [13].

Changing provider behavior and practice patterns across different settings and contexts is complex, and requires rigorous methods from a variety of disciplines including the social sciences, behavioral psychology, operations and human factors engineering, business, marketing, and policy and organizational change [14–19]. Systematically approaching provider behavior change efforts (e.g., increasing the use of a one-time instillation after endoscopic surgery, not ordering a bone scan for low risk prostate cancer, American Urological Association *Choosing Wisely* recommendations) using implementation research techniques can help prevent real-world delivery challenges, such as the "voltage drop" experienced when products from efficacy trials are put into routine practice [20].

Why we need implementation research to help us affect urologic health at a population level is shown in the Table. Although this "voltage drop" could happen in any recommended clinical intervention in urologic oncology, we would use the example of a breakthrough chemotherapy combination that improves bladder cancer survival (e.g., neoadjuvant methotrexate, vinblastine, doxorubicin, and cisplatinum). After the publication of this breakthrough treatment in a high-impact journal, let us suppose half of clinics have access to the drugs or are aware of the new findings, half of practitioners actually recommend the treatment, and half of patients accept the recommendation. Half of patients receive the correct regimen based on the clinical trial, perhaps less effective agents such as carboplatin are substituted or there are missed doses. Because the patients treated with the regimen are not exactly like the patients from the clinical trial and because of heterogeneity of therapeutic effects, half of treated patients have substantial benefits, and so on. The "voltage drop" demonstrated here is what would typically happen in real-world practice, despite breakthrough clinical findings, if we continue to be naïve to the importance of conducting implementation research alongside our clinical trials in preparation for broader population impact.

Unlike common clinical trial outcomes (e.g., patient function, symptoms, survival, and satisfaction), or Institute of Medicine service delivery outcomes (e.g., safety, timeliness, and patient centeredness), implementation research focuses on outcomes that are further upstream to achieve these clinical and delivery system outcomes [21]. As illustrated in the Fig., implementation outcomes include the acceptability, adoption, appropriateness, costs, feasibility, fidelity, penetration, and sustainability of an evidence-based clinical intervention in real-world practice. For example, implementation research might (1) investigate whether a recommended clinical intervention is acceptable