The paradigm shift to include survivorship care as part of the cancer care continuum underscores the critical need for a change in nursing practice. One way to ensure that change in practice is delivered in a safe and efficient manner is through the use of clinical decision tools (CDTs). Such tools can be used to increase relevant knowledge and skills of nurses and patients. Despite the widespread recognition of their value, CDTs to educate providers on cancer survivors’ care are limited and, when available, often are not used. Clinical practice algorithms were developed for disease-specific survivorship clinics in a cancer academic center. This article reviews the conceptual framework of the survivorship algorithms, describes the application of the algorithms in multidisciplinary disease-specific survivorship clinics, and discusses the implementation strategies used to promote clinicians’ adoption and implementation of the algorithms.

At a Glance
• The authors found that algorithms can be successfully used as clinical decision tools (CDTs) to deliver survivorship care.
• Algorithms and other CDTs are powerful tools to enhance professional practice.
• Additional studies are needed to assess their effect on clinical practice and survivor outcomes.

The authors’ institution identified algorithms as an appropriate means to disseminate and implement evidence-based practice across the institution. The conceptual framework of the algorithms, describe the application of algorithms in multidisciplinary disease-specific survivorship clinics, and assess the adoption and implementation of the algorithms.

Framework of Survivorship Algorithms
The authors’ institution identified algorithms as an appropriate means to disseminate and implement evidence-based practice across the institution. The conceptual structure of the algorithms established a broad perspective for managing long-term survivorship care and

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August 2015 • Volume 19, Number 4 • Clinical Journal of Oncology Nursing
summarizing relevant tools and methods needed to address the complex issues of survivorship. The algorithms included components based on the Institute of Medicine’s (Hewitt et al., 2005) report From Cancer Patient to Cancer Survivor: Lost in Transition. These components included a treatment summary, a surveillance plan, lifestyle recommendations focused on screening and wellness, possible psychosocial issues to address, and referrals to available resources.

To ensure that the development of the algorithms were evidence-based, an extensive literature review was conducted by a team of clinicians, researchers, and medical librarians. The purpose was to identify relevant empirical research or preexisting professional or national models or guidelines appropriate for the delivery of multidisciplinary survivorship care. The review found limited evidence of cancer survivorship care guidelines appropriate for the institutional environment, resources, and context. Given the shortage of evidence-based survivorship guidelines, the team refined a framework previously used to create institutional consensus-based algorithms for multidisciplinary screening, treatment, and management of cancer.

The structure and clinical process shown in Figure 1 served as the standard foundation for the development of all algorithms regardless of disease site. Each algorithm had three main parts: (a) eligibility criteria; (b) clinical strategies, interventions, procedures, and recommendations (related to surveillance, risk reduction and early detection, monitoring for late effects, and psychosocial functioning); and (c) possible outcomes of a visit. A combination of narrative and graphic representation was chosen to facilitate knowledge acquisition and translation across different learning preferences.

All survivorship algorithms were designed to provide a consistent visual and written guide to support providers’ delivery of quality care. These tools were designed to be easily retrieved, stored, and displayed through institutional clinical information systems and printed sources. Algorithms were accessible through five means: clinic binders, pocket copies, stored electronic copies, web-based clinical portals, and the intranet and Internet. Survivors and community providers also were able to access the algorithms through a link provided on the survivorship program website.

Application of Algorithms in Multidisciplinary Survivorship Clinics

Transition From Patient to Survivor

Once a survivor’s curative treatment was completed, the treating oncologist informed the survivor about three options for follow-up care. Survivors who chose to return to their community for follow-up care were followed using a coordinated care approach between the treating oncologist and the primary care provider to provide continuity of care. Survivors with a more complex risk profile or those diagnosed with a less prevalent cancer (e.g., pancreatic cancer) were not transitioned to a disease-specific survivorship care program. These survivors continued to be followed by their treating oncologist in an acute care setting. Survivors who met the eligibility criteria were informed about the range of services provided in the clinic meant for their specific cancer diagnosis. Survivors who agreed to transition had their next follow-up visit scheduled in the appropriate clinic.

Survivorship Clinic Visit

Clinicians (i.e., oncologists, internists, family practice physicians, advanced nurse practitioners, and physician assistants) received educational inservice training on how to use the algorithms as a roadmap for the survivorship clinic visit. According to the conceptual framework of the algorithms, the first step was to confirm the survivor’s eligibility to be transitioned to the appropriate disease-specific survivorship clinic. The second step involved performing concurrent assessments, ordering specific tests or procedures, and tailoring education and counseling to the survivor’s needs. The last component of the algorithm focused on three possible outcomes of the visit: (a) referral to or consultations with other providers, (b) scheduling of the follow-up visit to the survivorship clinic or with the primary care physician, or (c) referral back to the primary oncologist if a new primary or recurrent cancer was discovered or suspected. These components were summarized at the end of the visit in a personalized follow-up care plan (print or electronic) for the survivor.

Discussion

To the best of the researchers’ knowledge, this article is the first to examine and describe the conceptual framework, adoption, and successful implementation of long-term survivorship care algorithms as CDTs in any type of clinical setting. To date, 47 site-specific algorithms have been developed for 12 different survivorship clinics. All survivors’ visits are based on the standards of care recommended in the algorithm specific to their cancer diagnoses. The uniform approach described in this article offers meaningful guidance to oncology nurses and other clinicians who would use survivorship algorithms (Gaddis, Greenwald, & Huckson, 2007; Potosky et al., 2011).

The authors found that several of the strategies used in implementing the evidence-based survivorship algorithms were similar to those cited in the literature for implementation of other types of algorithms or guidelines (Gross & Pujat, 2001; Kastner, Estey, & Bhattacharyya, 2011; Simpson, Marrie, & Majumdar, 2005; Weinmann, Koesters, & Becker, 2007). First, clinicians in the authors’ institution reported that the survivorship
algorithms were accessible and easy to use. These advantages were supported in three reviews reporting that guidelines perceived to be tested, user-friendly, and easily understood enhanced providers’ adherence (Grilli & Lomas, 1994; Saillour-Glennisson & Michel, 2003; Simpson et al., 2005). Second, some studies suggest that program infrastructure, such as the involvement and support of executive leadership, administrators, and peers, increased guideline implementation (Saillour-Glennisson & Michel, 2003). The authors found that administrators and clinic leaders had a positive or negative influence on whether algorithms were followed. Early adopters of the algorithms tended to be in clinics in which leaders were openly supportive of survivorship care, actively encouraged providers to follow the algorithms, and provided the resources needed to implement the guidelines. These leaders also used the algorithms to educate nurses, oncology fellows, other providers, and patients on the importance of monitoring the health of long-term survivors.

Third, the authors used diverse implementation strategies to increase clinicians’ awareness and familiarity with the algorithms, including holding regular meetings with clinical staff, offering inservice workshops on how to use and personalize the algorithms, monitoring providers’ use and satisfaction with the algorithms, and developing a cadre of written and web-based resources for referrals within the institution and in the community. Grimshaw et al. (2004) reviewed 236 studies (including randomized, controlled trials and quasi-experimental trials) and found that effectiveness of guideline implementation increased when multifaceted implementation strategies, similar to those described, were used. Another positive influence was based on the researchers’ target population characteristics. The algorithms were specifically developed for midlevel providers specializing in the care of long-term survivors. Evidence also suggests that developing guidelines for a specific disease and group of providers will increase providers’ use of these tools. For example, a review by Sachs (2006) also concluded that evidence-based statements developed only for nurses increased their use of nursing standards.

Some barriers are worth noting in the use of clinical algorithms to deliver quality survivorship care. For example, Durso (2006) found that clinical characteristics, such as the presence of comorbid conditions of the patient, have been found to negatively influence providers’ adherence when the algorithms did not include alternative recommendations to address these concerns (Durso, 2006). Shekelle, Woolf, Grimshaw, Schünemann, and Eccles (2012) found that providers’ adherence also was influenced by how often the algorithms were updated to reflect changes in practice. To address this point in the authors’ program, newly released publications, guidelines, and other sources of evidence relevant to survivorship algorithms were reviewed and updated annually by a multidisciplinary panel of experts in the specific cancer. Clinicians were informed about the updates through diverse institutional communication channels. The updated versions also were accessible on the Internet so clinicians outside the institution could access the most current survivorship care algorithms.

The implementation experience described in this article, although it took place in an academic cancer center, could be used by advanced nurse practitioners and other providers to understand the benefits of using CDTs, such as algorithms, in the delivery of survivorship care. The authors’ experience also reflects the multiple and complex dimensions of clinicians’ adherence, adoption, and perceptions of guidelines to change their practice in any clinical setting, including community-based practices.

The reviews and studies previously cited focused on implementation of mental health guidelines (Weinmann et al., 2007), nursing standards (Sachs, 2006), acquired pneumonia (Simpson et al., 2005), or antimicrobial usage (Gross & Pujat, 2001). To date, no systematic reviews have examined factors that influence adherence to cancer survivorship practice algorithms or guidelines. This article is the first to describe the strategies, barriers, and facilitators to the use and implementation of clinical practice algorithms. The authors’ dissemination and implementation plan was based on clinical experience, review of published evidence on guideline use, and practical issues such as setting, resources, and affordability (Gagliardi, Brouwers, Palda, Lemieux-Charles, & Grimshaw, 2011; Kastner et al., 2011; Reames, Krell, Ponto, & Wong, 2013).

In this article, the authors have demonstrated that evidence-based algorithms can be used as CDTs to deliver survivorship care. The authors also provided innovative approaches for improving dissemination and implementation of algorithms. Additional work is needed to determine whether the algorithms can be used as CDTs in other settings. Algorithms are powerful tools to help nurses achieve best practice in care of survivors.

References


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