Treating More than the Tumour: The Role of Technology in Efficient Cancer Care

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ABSTRACT

A cancer diagnosis substantially impacts patients and their families, often disrupting life and work routines and intensifying psychological distress. It is becoming increasingly recognized that support, empowerment and communication are critical components of patient-centered care, and are particularly important within the field of oncology. Health care providers and researchers at the BC Cancer Agency seek to address both the physical and psychosocial aspects of the disease through the use of technology. This commentary summarizes the emerging clinical innovations of TeleOncology, brachytherapy, and Internet-based follow up, designed to support cancer patients in British Columbia.

KEYWORDS: *BC Cancer Agency, oncology, telehealth, brachytherapy, patient-centered medicine*

Cancer and its treatment impact more than one's body and physical appearance; it also takes a toll on the psychosocial well-being of patients and their loved ones.[1] Traditional measures of treatment success have emphasized cancer-free status and survival, with a limited focus on the patient's psychological well-being.[2] Although effective treatment regimens are essential, there is an increasing recognition that patient-centered approaches should be adopted in cancer care, encompassing both the physical and mental well-being of the patient.[3]

Recent technologies have been developed to improve the overall health of patients and their families, while minimizing time spent in treatment facilities. It is important for future health care professionals to recognize the role of technology in improving patient satisfaction and disease outcomes, as they may encounter these advancements in their future practices. This commentary aims to highlight three developing clinical innovations that promote patient-centered care across the continuum of diagnosis, treatment and follow-up. These advances include TeleOncology, brachytherapy, and Internet-based follow-up, all of which utilize novel technologies to alleviate the burden of cancer.

Telehealth and TeleOncology

For a patient, being diagnosed with cancer and facing a multitude of treatment options is an overwhelming process, often involving extensive communication with oncologists and other specialists. This life-changing period is mentally and physically exhausting, and sometimes requires numerous appointments to develop a feasible treatment plan. The diagnostic stage can be further complicated by British Columbia's expansive geography. For those living in rural locations, patients and families often travel extensively to consult with specialists. Frequently, this can result in significant out-of-pocket expenditures as well as the long-term loss of potential income.[4]

Provincial telehealth initiatives have enabled patients to videoconference with specialists virtually across the province. In the field of cancer care, this technology, termed TeleOncology, has become an irreplaceable service for those who are unable to travel due to limited mobility, inadequate funds, or circumstances surrounding family and work.[5] Recently, it has been demonstrated that TeleOncology significantly alleviates financial burden for rural patients in British Columbia by reducing travel costs and loss of income.[6] In addition, these remote encounters with health care providers do not necessarily compromise the quality of the patient-provider interaction. A study from Vancouver Island found that oncology patients were just as satisfied or even preferred telecommunication encounters when compared to face-to-face visits.[7] Although this technology has generally been embraced by patients, some medical oncologists still prefer meeting patients in their offices, particularly to perform physical examinations. With the growing use of TeleOncology in British Columbia, future studies should be done to identify barriers in uptake and ways of improving telehealth consultations from the oncologists' point of view.

Advances in Radiotherapy Delivery

While undergoing conventional cancer treatments, individuals often must set aside their lives for an extended period of time during active treatment and recovery. In recent years, substantial advances have been made in the administration of radiation therapies, particularly with the advent of brachytherapy. Brachytherapy delivers internal radiation directly to the tumor

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tissue by way of temporary or permanent radioactive implants, allowing patients to return home shortly following the procedure. For low- and intermediate-risk patients with prostate cancer, this technique is at least as effective in terms of disease-free survival as external beam radiotherapy.[8-12] When administered as the sole radiotherapy treatment, brachytherapy significantly reduces the amount of time patients spend at specialized radiation therapy centres from several weeks to approximately one week or less.[12,13] This, along with advances in tumour visualization, has promoted the acceptance and development of brachytherapy programs at cancer centres across British Columbia, with a focus on minimizing acute treatment complications. However, despite the reduction in treatment duration, the side effects are similar to conventional radiotherapy, and include bowel and urinary toxicity and sexual dysfunction.[14-16] In addition, several studies have found higher rates of genitourinary toxicity in low dose rate brachytherapy patients when compared to those treated with external beam radiation; this trade-off must be taken into account along with patient preference and disease characteristics.[8,14-17] As this field of radiotherapy expands, there will be a need to further assess long-term quality of life and disease outcomes in comparison with external beam radiotherapy.

Web-Based Long-term Follow-up of Cancer Patients

Now more than ever, individuals are living as long-term cancer survivors.[18] This is particularly true for prostate, breast and childhood cancers, with remission often spanning years to decades. Some oncologists continue to follow their patients several years after remission; long-term monitoring of patients allows physicians to track outcomes of treatment strategies and identify areas for improvement. However, each appointment to follow-up with otherwise healthy individuals takes time and resources that could be allocated to treating acute patients.

The Internet is a valuable tool that could potentially alleviate this problem, and is increasingly being utilized by health care professionals as a means to monitor patients post-treatment.[19] By using web-based platforms to administer long-term follow-up, patients in remission could complete the necessary but routine survey questions without having to schedule in-person appointments with their oncologist. This facilitates the monitoring of asymptomatic patients; any new concerns are flagged and brought to the attention of the oncologist. It has been identified that these dynamic web-based portals may need to be adapted for certain populations, such as those with limited knowledge of the English language or varying degrees of literacy.[20] Research into the practicality of utilizing such platforms for long-term follow-up is currently being conducted at the BC Cancer Agency.[21]

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CONCLUSION

Addressing patients' overall quality of life, in addition to their disease status, is an emerging shift in thinking for medical professionals and is transforming how medicine is practiced. Technological advances and a focus on patient-centered medicine are changing the dynamics of health care delivery, especially for rural and remote areas of British Columbia. This is demonstrated by the implementation of TeleOncology, brachytherapy, and web-based follow-up programs, which ultimately aim to improve the quality of life, mental health and disease outcomes for cancer patients and their families in British Columbia.

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