Cancer Genetics: From Then to Now

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The impact of cancer genetics on the field of oncology has dramatically altered the care we provide our patients. In the early 1990s the discovery of BRCA1 and BRCA2 variants laid the framework for cancer genetic counseling and testing as we know it today. Over the last 25 years, the cancer genetics field has grown exponentially from single syndrome testing to the standard of care demanding the simultaneous analysis of over 50 cancer susceptibility genes by routine next-generation sequencing.

The field of cancer genetics has also expanded its purpose, from the simple process of determining individual cancer risks, to assisting patients and their healthcare providers with critical decisions related to surgical choice and treatment. Excitingly, this has led to advances in clinical care, evident through the earlier detection of cancer, decreased mortality due to personalized treatment, and the prevention of cancers that otherwise would have developed. However, due to the high number of individuals now eligible for genetic testing, greater demands are placed on exploring novel methods for the delivery of cancer genetic counseling, especially considering the limited number of trained professionals available. These new applications of genetic testing and the exploration of novel strategies related to cancer counseling are focal points in this everchanging era in oncology genomics. As a result, there are dedicated research efforts examining this constant fluctuation in cancer care, resulting in guidelines to assist practitioners in the translation and application of these complex genetic outcomes.

This issue of the *Rhode Island Medical Journal* (RIMJ) presents a variety of articles devoted to the past, present, and future of cancer genetics, advances in the field, and a glimpse of what to expect next. The manuscript by **JASMINE EBOTT** et al provides a historical background of cancer genetic testing, discusses the criteria necessary for testing referral, describes service delivery models, and provides insight regarding the challenges of insurance coverage.

SANDRA TOMLINSON-HANSEN et al begin with a review of well-established genetic cancer syndromes, including Lynch and Hereditary Breast and Ovarian Cancer Syndrome. This manuscript also describes novel hereditary oncology genes such as PALB2, BRIP1, RAD51C/D, and BARD1, as well as their everchanging, and often uncertain, associated cancer risks.

KATHERINE CRAWFORD et al begin with the intricacies of genetic counseling and testing interpretation and review national guidelines for identifying and screening patients who are at increased risk to develop breast cancer. Finally, they provide informative case studies to illustrate the genetic testing and counseling processes.

The current landscape of gynecologic cancer care is dependent on both somatic and germline genetic testing. **JESSICA DISILVESTRO** et al explain the difference between somatic and germline testing and the implications on current treatment algorithms with respect to FDA-approved or experimental targeted treatments and immunotherapies.

We hope readers enjoy this issue of RIMJ and that it provides cancer genetic updates that will be relevant for clinicians practicing in a wide variety of fields.

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