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Genetic consultation embedded in a gynecologic oncology clinic improves compliance with guideline-based care

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HIGHLIGHTS

- Embedding genetic counseling in oncology improves access to genetics services.
- Removing barriers in scheduling process reduced the time to genetics consultation.
- Part time genetic counselor effort had widespread positive impact on access.
- Lessons from academic center can be translated to community practice.

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ABSTRACT

Objective. Analyze the impact of embedding genetic counseling services in gynecologic oncology on clinician referral and patient uptake of cancer genetics services.

Methods. Data were reviewed for a total of 737 newly diagnosed epithelial ovarian cancer patients seen in gynecologic oncology at a large academic medical center including 401 from 11/2011–7/2014 (a time when cancer genetics services were provided as an off-site consultation). These data were compared to data from 8/2014–9/2016 ($n = 336$), when the model changed to the genetics embedded model (GEM), incorporating a cancer genetic counselor on-site in the gynecologic oncology clinic.

Results. A statistically significant difference in proportion of patients referred pre- and post-GEM was observed (21% vs. 44%, $p < 0.0001$). Pre-GEM, only 38% of referred patients were actually scheduled for genetics consultation and post-GEM 82% were scheduled ($p < 0.00001$). The difference in the time from referral to scheduling in genetics was also statistically significant (3.92 months pre-GEM vs. 0.79 months post-GEM, $p < 0.00001$) as was the time from referral to completion of genetics consultation (2.52 months pre-GEM vs. 1.67 months post-GEM, $p < 0.01$). Twenty-five percent of patients referred post GEM were seen by the genetic counselor on the same day as the referral.

Conclusions. Providing cancer genetics services on-site in gynecologic oncology and modifying the process by which patients are referred and scheduled significantly increases referral to cancer genetics and timely completion of genetics consultation, improving compliance with guideline-based care. Practice changes are critical given the impact of genetic test results on treatment and familial cancer risks.

1. Background

Approximately 25% of women with epithelial ovarian, fallopian tube, and/or peritoneal cancers develop the disease because of a highly penetrant hereditary cancer syndrome [1] making it one of the most heritable cancers. The most common germline mutations associated with these malignancies are those in the tumor suppressor genes *BRCA1* and *BRCA2*. Mutations in these genes are associated with a 50–85% lifetime risk of developing breast cancer and a 25–45% risk of developing ovarian cancer [2] in addition to increased risks of other cancers in both women and men. The identification of *BRCA1/2* gene mutations in ovarian cancer patients can provide anticipatory cancer risk information and also has therapeutic implications given the availability of FDA-approved PARP-inhibitors.

Given the clear implications for treatment and cancer risk determination, there is widespread agreement among professional organizations like the Society of Gynecologic Oncology (SGO) [3] and the National

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Comprehensive Cancer Network (NCCN) [4] that all women diagnosed with epithelial ovarian, fallopian tube, and/or peritoneal cancers should be offered cancer genetic counseling and testing.

Despite the recommendations of professional organizations, [3,4] data suggest that less than half of women diagnosed with ovarian cancer receive genetic counseling [5,6].

There is no standard for the delivery of cancer genetics services in the United States. Given the increased demand for genetic counseling and genetic testing in oncology, the "traditional" model of in-person pre-test risk assessment and in-person post-test counseling in a specialized clinical cancer genetics program is often considered to be impractical. Modifications to this traditional model including the use of telephone and web-based technologies have been implemented in recent years to increase access to care and to allow clinical genetic counseling services to maximize their sometimes limited resources. As Buchanan et al. point out, however, studies comparing the effectiveness of these service delivery models are lacking [7].

Gynecologic oncology practices have reported how changes to clinical service delivery have improved access to cancer genetic counseling and testing and the incorporation of a genetic counselor as part of the gynecologic oncology care team has been suggested as a possible solution to less-than optimal referral rates since at least 2006 [5]. The Melbourne Australian group recently described their "mainstreaming" model in which a genetic counselor (GC) became part of the gynecologic care team [8]. Review of referral data indicated that in the year following implementation of this model, referrals of patients with incident ovarian cancers to the GC increased from 69% to 90% and that two years after implementation, their referral rate for these patients was 97%. However, the structure of gynecologic cancer clinics, clinic volume, and genetic testing strategies in Australia differ from those in the United States. For example, this group diagnoses roughly 35 new ovarian cancer cases per year and exists in a healthcare system that differs dramatically from the multi-payer system in place in the United States. It is also important to note that these patients had testing for mutations in *BRCA1* and *BRCA2* only. Given the likelihood of finding an actionable mutation and the reduced cost of next generation sequencing panels as an approach to hereditary ovarian cancer genetic testing, many providers utilize multigene panel testing in this population and with this option comes additional complexity.

Here, we describe the genetics-embedded model (GEM) of service delivery in a large, high volume gynecologic oncology clinic in the United States.

2. Methods

Prior to August 2014, cancer genetic counseling at the The James Cancer Hospital and Solove Research Institute, the Ohio State University's (OSU) Comprehensive Cancer Center was available as an off-site ambulatory outpatient service in the Department of Internal Medicine. Once a referral was made in the electronic medical record, genetics clinic staff would contact the patient, send them family history collection paperwork, and schedule the patient upon receipt of the family history paperwork (Fig. 1). In August 2014, the GEM was implemented. A licensed GC was embedded in the outpatient Gynecologic Oncology (GO) clinic on two full days per week in one of two clinic locations. At least six full day outpatient GO clinics occur per week between two locations at OSU. When a referral is made in the electronic medical record, GO staff schedules the genetic counseling directly and does not require return of family history collection forms. An attempt was made to coordinate the genetic consultation appointments with other GO follow-up visits or treatments (e.g. chemotherapy infusion visits). A referral for genetic counseling was defined as the presence of a referral to cancer genetics placed in the electronic medical record any time after a GO physician saw an ovarian cancer patient who received her diagnosis during the study period. A "scheduled" appointment was defined as a documented appointment in the EMR on the clinical genetics schedule. "Completion" of counseling was defined as a closed encounter with the GO GC. Data were reviewed for all 737

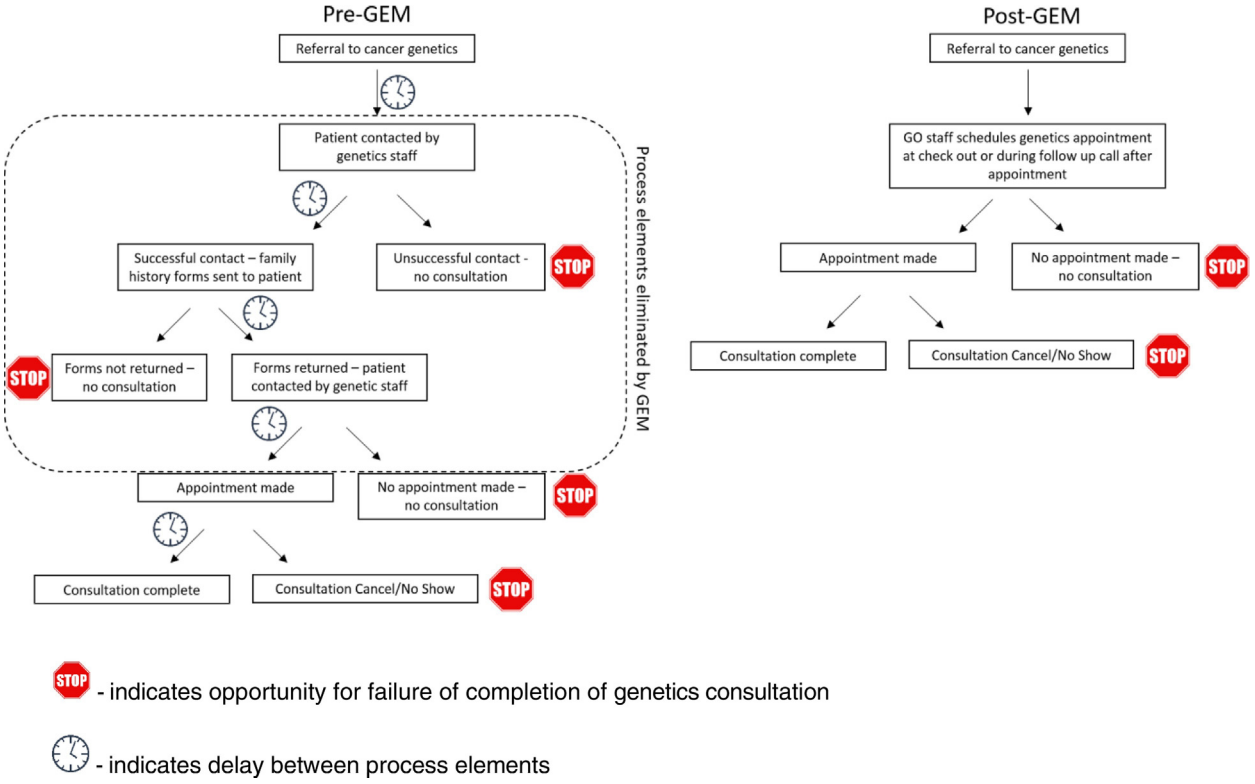

Fig. 1. Summary of process for scheduling gynecologic oncology patients in cancer genetics. - indicates opportunity for failure of completion of genetics consultation. - indicates delay between process elements.

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