

ASSOCIATION OF COMMUNITY
CANCER CENTERS

IMPROVING THE QUALITY
OF CARE FOR PERSONS
WITH ADVANCED
EPITHELIAL OVARIAN
CANCER



BY PREMAL H. THAKER, MD, MS; MATTHEW P. SMELTZER, PHD; MONIQUE DAWKINS, EDD; LEIGHA SENTER-JAMIESON, MS; STEPHANIE V. BLANK, MD; DESTIN BLACK, MD; MOLLIE FINKEL, RN, MSN; ANNA YEMELYANOVA, MD; LEIGH M. BOEHMER, PHARM D, BCOP; AND SARAH TEMKIN, MD

More than 20,000 women are diagnosed with ovarian cancer each year in the United States, most with advanced stage disease.¹ With five-year cause-specific survival of 47 percent, ovarian cancer is the fifth leading cause of cancer death among women in the United States.^{2,3} However, outcomes vary significantly by tumor stage, histologic type, and socio-demographic factors. Disparities in outcomes may be attributable to many factors, including sub-optimal quality of care.⁴⁻⁶ In the United States, fewer than one third of patients with this disease currently receive guideline-concordant care.⁷ Recent advancements in curative intent therapeutic options for patients with ovarian cancer put a renewed emphasis on the need for high-quality care delivery.^{8,9}

Improvement in overall outcomes and eliminating disparities in outcomes require proactive delivery of quality care. This necessitates a firm definition of quality and effective strategies to deliver evidence-based care. The National Comprehensive Cancer Network clinical practice guidelines provide an evidence-based standard for care.¹⁰ However, non-adherence to National Comprehensive Cancer Network guidelines is associated with disparities in outcomes for persons with ovarian cancer.¹¹ More resources are needed to guide the implementation of evidence-based standards and quality improvement (QI) initiatives in ovarian cancer.

To address these gaps, the Association of Community Cancer Centers (ACCC) launched a multi-phase initiative to improve care delivery for ovarian cancer in the United States in 2019. The project was guided by an expert multidisciplinary Steering Committee, which included gynecologic oncologists, pathologists, genetic counselors, nurse navigators, social workers, and cancer program administration. In this article, we describe the process and outcomes from this QI initiative.

Our Approach and Methodology

The education project had three primary components, including an application survey, recruitment and execution of three QI workshops, and the curation of a comprehensive resource library dedicated to patient- and provider-specific ovarian cancer educational resources.

The ovarian cancer workshop application was developed to survey a diverse group of ovarian cancer programs across the United States. The goals were two-fold: first, to ascertain areas of greatest need for QI initiatives and, second, to identify ACCC member programs for participation in the QI projects. After completion of the survey, the project Steering Committee and ACCC staff evaluated the results and identified areas to target and cancer programs to include in the QI projects.

Three cancer programs were selected based on the Steering Committee review of the workshop application results. The ACCC team conducted one-day on-site workshops with the care delivery teams at each cancer program. The workshops included guided discussion to identify challenges and specific barriers the teams

faced in optimal care delivery and develop a problem statement for the project. Based on the problem statements, QI interventions were determined and QI metrics were developed to quantify progress during the study period.

Application Survey

The QI workshop application survey was designed to collect clinical information about each cancer program and to provide information on the key challenges and opportunities for improving ovarian cancer care. The survey was designed with multi-stage input from the Steering Committee. The final version included 20 items and was administered online using the Qualtrics platform.¹² The survey was distributed to ACCC, Oncology State Societies at ACCC, and Society of Gynecologic Oncology members via email promotion and was open for participation for four weeks.

Steering Committee Guidance

The Steering Committee provided guidance on the scope of the project, including the content of the application survey, site selection, defining quality care, and development of each site's QI project. Interactions occurred via email, quarterly conference calls, two in-person meetings, and one follow-up web-based conference with the three cancer programs who participated in the QI workshops. Additionally, several subject-matter experts from the Steering Committee participated in the in-person site QI workshops. The Steering Committee created content for a didactic session in each workshop, covering multiple aspects of quality care for patients with ovarian cancer.

Through this comprehensive educational process, the Steering Committee developed an ovarian cancer quality care document. This document served to provide evidence-based guidance on best practice in ovarian cancer care by identifying quality-directed program components, implementation barriers, and recommendations. Upon finalization, the quality document will be widely disseminated as a resource to ovarian cancer programs across the cancer care continuum.

Workshop Methodology

After the application survey was closed for responses, sites for the QI projects were selected by a two-stage process. First, the Steering Committee independently ranked the applications and selected a group of finalists. The finalists were then stratified by geographic region and type of cancer program. The committee then convened to discuss the finalists, cancer programs were ranked, and the three participating cancer programs were selected based on committee consensus.

Each QI workshop was preceded by conference calls with the cancer program and ACCC teams, where the topic for the QI initiative was determined and key stakeholders were identified.

On-site workshops were scheduled for a full day, with key stakeholders who represented the multidisciplinary care team from each cancer program scheduled to attend. In addition to project development, the workshops included didactic sections led by a content expert from the Steering Committee. The didactic sessions were customized to meet the needs and interests of each cancer program. QI workshops included robust discussion to obtain feedback on "pain points," challenges, and concerns from key stakeholder groups. Discussions were facilitated with custom discussion guides, created by the ACCC team, intended to employ a grounded theory approach. Development of each QI project utilized the Plan-Do-Study-Act (PDSA) methodology.^{13,14}

After robust stakeholder discussion, development of a consensus problem statement from each cancer program was guided by BiteSize QI.¹⁵ Stakeholders then worked together to build consensus around the changes that could be made that would address the identified problem, strategies to implement change, and potential barriers to success. A specific intervention(s) was selected and stakeholders defined metrics of success. Measures of improvement were delineated, which included both quantitative data benchmarks and qualitative process-level information.

Each project was given a six-month prospective timeline consisting of three PDSA cycles, each two months in length. Data were collected retrospectively to define the ovarian cancer population at the cancer program and to define the baseline data benchmarks for each study. Data were evaluated at baseline, two months, four months, and six months to measure the success of the project in improving quality benchmarks in alignment with the PDSA cycles.

Application Survey Summary

Application survey responses were received by 26 cancer programs. After exclusion of five responding cancer programs that were not current ACCC members, 21 were eligible for selection into the QI workshops. Respondents included diverse program types, including National Cancer Institute (NCI)-designated comprehensive cancer centers (five), comprehensive community cancer programs (six), academic comprehensive cancer programs (five), integrated network cancer programs (three), and a range of other categories. The 26 responding cancer programs had a median of 51 annual new ovarian cancer cases (range, 22-190). The average reported stage distribution for patients with ovarian cancer across cancer programs was 30 percent Stage I/II and 70 percent Stage III/IV. The average race distribution across cancer programs was 80 percent white, 10 percent black or African American, 3 percent Asian, and 7 percent other. Eighty-five percent of cancer programs reported having a multidisciplinary team for ovarian cancer care. Programs reported 80 percent germline multigene panel testing on average, and 75 percent provided genetic counseling.

Each cancer program identified key areas for QI via free-text response. Genetic testing and counseling were the most frequently mentioned topic (12 of 26 programs). The second and third most frequent topics included clinical trial enrollment and availability and multidisciplinary team care, respectively (see Figure 1 below). After the two-stage selection process, three cancer programs were chosen for the QI initiatives: the Willis-Knighton Cancer Center, the Blavatnik Family—Chelsea Medical Center at Mount Sinai, and Duke Cancer Center.

The Willis-Knighton Cancer Center Experience

Willis-Knighton Cancer Center in Shreveport, La., is an ACCC member that serves as a site for the NCI Community Oncology Research Program and for Gynecologic Oncology Group clinical trials. The cancer center serves as a referral center for many rural communities and treats women diagnosed with ovarian cancer within a catchment area greater than 100 miles. For this project, the multidisciplinary ovarian cancer team decided to focus on improving genetic testing practices.

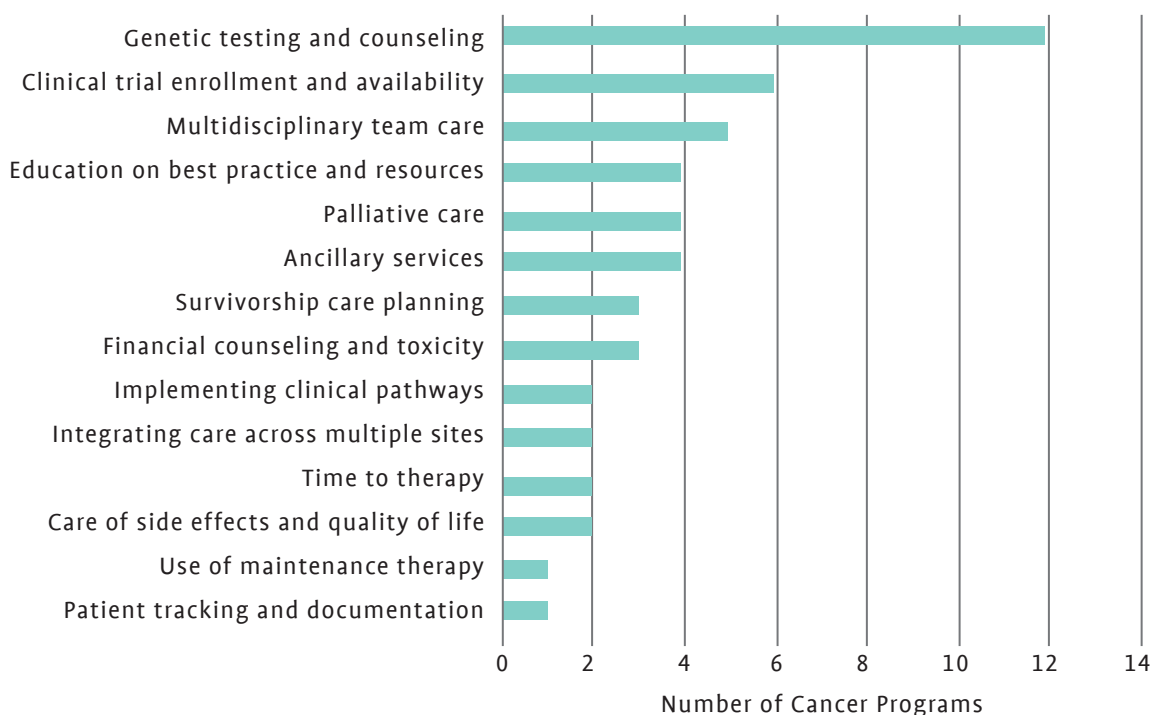
At the site visit, the ovarian cancer team self-assessed the strengths and weakness of its current program. Treatment of

ovarian cancer at Willis-Knighton Cancer Center improved greatly over the past 20 years, with most improvement initiated 12 years ago when the first gynecologic oncologist joined the cancer center. High-quality surgical care was a self-identified strength of the program, as well as a strong group of medical oncologists and cancer-dedicated obstetrician-gynecologists who were invested in providing quality care within the ovarian cancer program. The team had strong support from cancer center administration and information technology (IT).

Many patients were referred from outside the Willis-Knighton Cancer Center system, at different stages of care and diagnosis. Patients may have received sub-optimal surgery or experience delays in care before they reach Willis-Knighton Cancer Center. The ovarian cancer team identified several areas for potential improvement:

- Provider communication
- Survivorship care
- Previvor (persons with a high-risk of developing ovarian cancer) care
- Genetic testing as areas for potential improvement.

Figure 1. Key Areas of QI in Ovarian Cancer Identified from the Application Survey



Process of Care

Referral patterns and processes of care provided some challenges at the Willis-Knighton Cancer Center; approximately 75 to 80 percent of patients with ovarian cancer treated at the cancer center lived outside the Shreveport area. The cancer center received 60 to 100 referrals (all cancer types) per month, and patients with ovarian cancer sometimes arrived months after the suspected diagnosis, resulting in delays in care. Sub-optimal surgical resection performed by general surgeons prior to referral to Willis-Knighton Cancer Center was a particular concern. Given the referral patterns and rural setting, transportation was also identified as an issue for many patients with ovarian cancer. The ovarian cancer team is exploring strategic partnership with rideshare companies (i.e., Uber, Lyft) to address this barrier.

During treatment, patients with ovarian cancer at Willis-Knighton Cancer Center may have been seen by a gynecologic oncologist, obstetrician-gynecologist, and medical oncologist. Currently, provider-to-provider communication is fragmented. Though the care teams worked together well, additional structure around communication could improve care processes. Two potential solutions for communication were discussed, a virtual tumor board and a new communication tool within the electronic health records (EHR) system. An additional solution identified was the development of podcasts to educate patients and persons about ovarian cancer, to aid with both community awareness and patient understanding of the care process. The ovarian cancer team decided the lead gynecologic oncologist would move forward with the development of these podcasts.

Genetic Testing

The rates of germline and somatic testing in patients with ovarian cancer at Willis-Knighton Cancer Center were unknown. Due to the recent evidence regarding upfront maintenance treatment options for patients with ovarian cancer based on molecular profiles, the team would like to develop a clinical pathway for germline and somatic testing for every patient at the time of their ovarian cancer diagnosis.⁷ One barrier to reflex testing identified was the need for physician-specific order sign-off. It was determined that this barrier could be addressed by the cancer committee. Additional barriers to optimal testing included:

- Insurance reimbursement
- Referral timing
- Team communications as it pertains to current workflows and practice processes
- Patient logistics and transportation.

The ovarian cancer team at Willis-Knighton Cancer Center aimed to improve the rates and processes around genetic testing. The team also set goals to improve inter-team communications and

enhance patient education through a provider generated podcast. The problem statement, aims statement, and proposed solutions evaluated in three PDSA cycles are described in Table 1, page 41. Key measurements included the proportion of patients with ovarian cancer who:

1. Received germline testing within 60 days of first clinic contact.
2. Had a positive germline test.
3. Received somatic testing within 60 days of first clinic contact.
4. Had a positive somatic test.

Findings from Willis-Knighton Cancer Center

The cancer center increased the proportion of patients with ovarian cancer who received genetic testing during this study. During the pre-study retrospective period, 31 percent of patients did not receive genetic testing. In the three consecutive two-month periods of this project, the percentage un-tested dropped to 8 percent, 8 percent, and 15 percent, respectively (Table 2, page 42). Per post-study feedback, the QI workshop boosted collaboration between key players in cancer care at Willis-Knighton Cancer Center. The ovarian cancer team used this project to improve the care coordination of its multidisciplinary team. As a result of the workshop, the IT department provided a new opportunity to improve care in other disease sites by establishing genetic testing reminders in the EHR. The team also worked with IT to create a Health Insurance Portability and Accountability Act-compliant platform to efficiently communicate among team members. The ovarian cancer team started working with the cancer committee at Willis-Knighton Cancer Center to raise the bar, implementing tumor molecular profiling in conjunction with germline genetic testing to care for other cancers at the center.

The COVID-19 pandemic created unexpected challenges and opportunities during this QI project. The pandemic decreased the number of patient visits and reduced the amount of face-to-face contact between the ovarian cancer team and patients. However, during this time, the team's genetic educator utilized Zoom technology to conduct virtual meetings with patients. She educated patients on the value of genetic testing and conducted 190 genetic tests for patients and family members across all cancer types via mail-out home test kits.

Several barriers to genetic testing were identified during the QI project. For somatic testing, the need to obtain pre-authorization before testing emerged as a barrier to optimal timing of testing. In addition, the need for supplemental patient education remained a barrier to germline testing. Through this project, Willis-Knighton Cancer Center identified a future opportunity to eliminate this barrier by producing a germline testing-specific video for patient education purposes. After completion of the project, Willis-Knighton Cancer Center began using a video

Table 1. Problems, Aims, and Approaches by Cancer Center

Willis-Knighton Cancer Center	The Blavatnik Family—Chelsea Medical Center at Mount Sinai	Duke Cancer Center
Problem Statement		
<p>For the past five years, patients and their families at the Willis-Knighton Health System have not consistently received genetic testing and genetic counseling. This may have led to missed opportunities for appropriate therapies and potentially impacted care for their families.</p>	<p>Historically, newly diagnosed patients with ovarian cancer and family members at the Blavatnik Center have not had systematic genetic testing for somatic mutations or comprehensive genetic pre- and post-counseling. This could potentially impact their understanding of current or potential treatment plans and could have significant implications for their family members.</p>	<p>Historically, patients with ovarian cancer at Duke Cancer Center have been under-enrolled in clinical trials. This is preventing future advances and we are concerned about the diversity of our enrollment.</p>
Aim Statement		
<p>In the next six months, germline (and somatic if eligible) testing orders will be placed within 60 days of clinic encounter in the Willis Knighton Healthcare System, with the goal to achieve 100% for patients with a new diagnosis of ovarian cancer and a 15% improvement.</p>	<p>In the next six months pre- (video) and post-counseling efforts will be increased at the Blavatnik Center to ensure 100% of patients receive pre-counseling and 100% of all positive testing patients will receive post-counseling.</p>	<p>Within the next six months, enrollment of clinical trial candidates at Duke Cancer Center (both gynecologic oncology clinic locations) will improve by 20%. We expect that systematic identification of candidates will improve the overall diversity of enrolled subjects.</p>
Solution		
<p>We will utilize prospective tracking with data benchmarking, an EHR notification, and a backup verification of testing from gynecologic oncology associates at six- to eight-week follow-up.</p>	<p>The solutions identified include:</p> <ul style="list-style-type: none"> • Creating SmartSet in the EHR • Offering educational video to patients prior to testing • Providing and documenting family member letter for cascade testing <p>Additionally, the team will create a protocol for reflex somatic testing for all newly diagnosed patients with ovarian cancer.</p>	<ul style="list-style-type: none"> • Create a smart phrase in the EHR to prompt physicians to screen patients • Utilize the smart phrase in the EHR • Generate a clinical trials screening report • Utilize a medical student to review the screening report for potentially eligible patients • Provide feedback on the smart phrase • Provide feedback on clinical trials enrollment
Plan-Do-Study-Act Approach		
<p>Cycle 1: Prospectively track germline and somatic testing, record data.</p>	<p>Cycle 1: Prospectively track germline testing and genetic counseling pre-testing; document conversations about cascade testing.</p>	<p>Cycle 1: Develop the pre-screening process and add the smart phrase as a reminder for physicians to conduct their own screening.</p>
<p>Cycle 2: Utilize alert in the EHR to notify the provider that a patient with ovarian cancer needs genetic testing.</p>	<p>Cycle 2/3: Add “Smart Set” to EHR; implement genetic education video for pre-testing; utilize family member letter for cascade testing.</p>	<p>Cycle 2: Implement the new pre-screening system across the ovarian cancer program.</p>
<p>Cycle 3: Gynecological oncology associates will check each patient at six- to eight-week follow-up visit to ensure the genetic testing has been completed.</p>		<p>Cycle 3: Provide feedback to clinical trials team on pre-screening system and utilize the revised screening system. Provide additional feedback to providers on clinical trials screening and enrollment for patients with ovarian cancer.</p>

Table 2. Willis-Knighton Cancer Center QI Metrics by Study Period

Retrospective data	Metric		Cycle 1		Cycle 2		Cycle 3	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Testing to date	28		12		12		13	
Germline only	7	25	4	33	5	42	7	54
Somatic only	3	11	2	17	2	17	0	0
Both or optimal	12	43	5	42	4	33	4	31
Neither	6	21	1	8	1	8	2	15
Before or within 60 days of initial encounter	28		12		12		13	
Germline only	6	21	4	33	5	42	6	46
Somatic only	3	11	2	17	2	17	0	0
Both or optimal	10	36	4	33	4	33	4	31
No genetic testing	9	32	2	17	1	8	3	23

QI= quality improvement

tutorial on the risk and benefits of genetic testing and started providing additional virtual resources as needed.

Willis-Knighton Cancer Center identified several additional areas to target in future interventions. The most pressing areas included boosting patient access to clinical trials, expanded survivorship and previvor care, and patient transportation and logistics as a barrier to care, which could be addressed in a follow-up project similar to the current initiative. Additionally, Willis-Knighton Cancer Center would like to develop a gynecologic oncology fellowship in collaboration with Louisiana State University to train physicians in the area.

The Blavatnik Family—Chelsea Medical Center at Mount Sinai Experience

The Blavatnik Center is located in New York, N.Y., and is part of the Tisch Cancer Institute, an NCI-designated cancer center. It is part of a large referral system and provides cancer care to patients in and around New York City. The cancer program expressed interest in three target areas for the QI initiative:

1. Universal genetic evaluation for patients with ovarian cancer; determining best means of genetic/genomic triage
2. Developing a survivorship program
3. Improving patient access to interventional radiology for diagnostic confirmation and symptom management.

After pre-workshop planning meetings, the Blavatnik Center chose a QI project to address challenges around genetic testing and counseling in patients with ovarian cancer. The workshop's discussion focused on issues related to germline and somatic mutation testing, genetic counseling, and cascade testing of family members for patients treated for ovarian cancer at the Blavatnik Center. Based on this self-assessment, at baseline, germline testing was a standard of care for patients with ovarian cancer and testing rates were high. However, many (or most) patients with ovarian cancer were not receiving pre-test genetic counseling due to lack of availability of genetic counselors. Though the baseline practice of testing without pre-test counseling allowed for quicker return of genetic testing results, there was concern about adequacy of patient education and shared decision-making.

Based on the findings of the SOLO1,⁸ PRIMA,¹⁶ and PAOLA-1¹⁷ trials, gynecologic oncologists and gynecologic pathologists at the Blavatnik Center discussed initiating reflex somatic testing for patients with ovarian cancer with negative germline testing. After workshop discussions, the physicians determined a protocol for reflex testing, setting a goal of 100 percent somatic testing for germline negative patients with ovarian cancer. Additionally, there are ongoing discussions about which somatic tests will be used.

The process for ordering additional pathology slides for somatic testing at the time of diagnosis was identified as a barrier to testing. Gynecologic oncology and gynecologic pathology physicians identified a solution and plan of action during the workshop.

Genetic Counseling

The ovarian cancer team discussed barriers to achieving 100 percent genetic counseling rates for patients with ovarian cancer at the Chelsea location. An important barrier cited was the lack of a dedicated genetic counselor for patients with ovarian cancer on-site at the Chelsea location. An additional barrier identified was the current process for tracking receipt of genetic counseling in the EHR. Gynecologic oncologists cannot consistently determine whether a patient received genetic counseling using the EHR, and the ovarian cancer team tracked this information in a separate list. Finally, although a genetic counseling video was available to help with pre-test genetic counseling, it was not utilized by every patient.

The ovarian cancer team also expressed a desire to improve family member education after a patient had a positive germline test result. The practice has been to educate patients about family implications at the initial genetic counseling appointment (if it occurs) or initial physician discussion. When a patient had a positive germline test, the clinical team urged them to encourage family members to get tested and get follow-up at subsequent visits.

The ovarian cancer team identified cascade testing of patients' family members after a positive germline mutation as a high priority. However, several implementation barriers were identified. The first barrier is that family members are not the patients of the ovarian cancer team; therefore, the team cannot contact these individuals directly. Health Insurance Portability and Accountability Act and additional legal restrictions provide clear limits. A second barrier is when patients have family members who live outside of the Blavatnik Center catchment area and cannot come to the center. A third barrier is some patients' unwillingness or inability to contact family members. Finally, the language spoken by the family member can also be a potential barrier.

Several potential solutions identified included the clinical care team tracking all post-test counseling, providing patients with a

copy of test results, and a simplified letter for family members. The letter for family members would need to be available in at least three languages. There is also a need to provide resources for family members who are out of town to find genetic counseling resources in their area. Additionally, with improved EHR resources, automated patient lists could be generated and used to track pending and/or outstanding patients requiring genetic testing and counseling. Finally, the ovarian cancer team cited a desire to hire a new genetic counselor on-site, even though the genetic counseling services existed in other parts of the healthcare system.

Based on the workshop discussion, the Blavatnik Center decided to focus on confirming rates of germline testing and improving processes for somatic testing, cascade testing, and pre- and post-test counseling. The problem statement, aim statement, and proposed solutions for the Blavatnik Center project are presented in Table 1, page 41.

Findings from the Blavatnik Family—Chelsea Medical Center at Mount Sinai

QI metrics from the Blavatnik Center are shown in Table 3, page 44. Results from baseline data demonstrated that a high proportion of patients with ovarian cancer received genetic testing; however, the timeliness of testing and methods of obtaining testing varied widely. These data confirm assumptions from the workshop and justify the focus on universal testing, counseling, and cascade testing. Overall, the ovarian cancer team reported that the project improved the clinical workflow around genetic testing.

Data from the project follow-up demonstrate successful implementation of the educational videos on genetic testing. Patient feedback on this video was generally positive, but the Blavatnik Center plans to develop an in-house version of the video that is customizable to the site. They also plan to disseminate the video counseling method to the broader Mount Sinai network and to expand in additional languages (currently available in Spanish, Mandarin, and English). Additionally, the ovarian cancer team made progress with referrals for cascade testing and were able to pilot a program supplying notification via written letter for at-risk family members related to the patient's pathogenic test result. Future direction includes a scale-up of the counseling intervention to other sites within the healthcare system and development of a previvor clinic at the Blavatnik Center.

The Duke Cancer Center Experience

Duke Cancer Center is an NCI-designated comprehensive cancer center located in Raleigh-Durham, N.C. It is located in a region that is both urban and rural, serving as a referral center for a wide range of communities. The Duke Cancer Center QI project focused on improving clinical trial enrollment for patients with ovarian cancer.

Table 3. The Blavatnik Family—Chelsea Medical Center at Mount Sinai QI Metrics by Study Period

Measurements	Baseline	Prospective Study Period (Periods 1-3 combined)
Proportion of newly diagnosed patients with ovarian cancer who received germline testing.	27/27	14/14
Proportion of patients with ovarian cancer who are presented the educational videos on genetic testing.	N/A	14/14
Proportion of newly diagnosed patients with ovarian cancer who had a deleterious (positive) result from germline testing.	5/27	4/15
Proportion of newly diagnosed patients with ovarian cancer patients who had a VUS result from germline testing.	9/27	1/15
Proportion of newly diagnosed patients with ovarian cancer who received the family letter for cascade testing, of those who had a positive result from germline testing.	N/A	3/4

QI= quality improvement; VUS= variant of uncertain significance.

The focused discussion at the workshop self-assessed the current state of the clinical trials program for ovarian cancer. The Duke Cancer Center team expressed concern that enrollment in clinical trials by ovarian cancer patients was low and racial disparities may exist. Processes for screening potential clinical trial participants in ovarian cancer have been physician dependent and not fully standardized. The Duke Cancer Center team agreed that additional quantitative work could help solidify numbers of patients with ovarian cancer and ovarian cancer clinical trial enrollees by race and other demographic factors.

A potential solution identified was universal pre-screening of all patients for trial eligibility by the clinical trials team. The prospective screening team would notify physicians on a patient's potential eligibility for an open trial before each appointment. There was agreement on the merits of this solution, but current staffing was an obstacle. An additional barrier identified was inadequate lead time in identifying potential patients who were eligible for a trial prior to their appointments. Providers do not always have advanced notice when a new patient with ovarian cancer is scheduled, limiting screening capabilities. Additionally, the type of visit characterization may not be standard across Duke Cancer Center sites. Potential solutions utilizing the EHR were also identified, including the creation of an automated list of

potentially eligible patients and adding an EHR smart phrase to remind physicians to discuss clinical trials with patients.

Based on the workshop discussion, the Duke Cancer Center team decided to implement the solution in stages. In a proof-of-principle stage, medical students will initiate the process improvement steps without hiring additional staff, thereby justifying the future addition of staffing should clinical trial enrollment increase.

An additional goal identified by the Duke Cancer Center cancer care team was to prospectively document pre-screening for clinical trials and establish benchmarks to track progress. The first phase sought to establish the benchmarks through a retrospective review of all new patients with ovarian cancer seen in the previous six months. Metrics identified included the number of new patients with ovarian cancer who were treated at the center, the percentage of those who were potentially eligible for an open clinical trial, the percentage who were offered a clinical trial, the percentage who enrolled in a clinical trial, the percentage who received germline genetic testing, and the percentage who received somatic mutation testing. The final two metrics related to genetic testing were included for planning a future QI project. These metrics may also help identify whether sub-optimal rates of genetic testing could be a barrier to clinical trial enrollment.

The solutions selected for the prospective QI project are as follows:

1. Create a smart phrase in the EHR to prompt physicians to screen patients for clinical trials.
2. Utilize the smart phrase in the EHR.
3. Generate a clinical trials screening report.
4. Utilize a medical student to review the screening report for trial eligible patients.
5. Provide feedback on the smart phrase.
6. Provide individual clinician feedback on clinical trial enrollment.

The problem statement, aim statement, and proposed solutions developed during the workshop at Duke Cancer Center are shown in Table 1, page 41.

Duke Cancer Center Findings

Baseline data were collected on a random selection of 400 patients treated for ovarian cancer at Duke Cancer Center from 2018 to 2019 (Table 4, page 46). Patients with ovarian cancer reported their race as white (71.5 percent), black/African American (11.5 percent), and other or not reported (17.0 percent). The stage distribution was 25.5 percent stage I, 12.5 percent stage II, 39.0 percent stage III, and 17.8 percent stage IV. Overall, there was documentation that 12.0 percent of patients discussed clinical trials with the provider. Thirty patients (7.5 percent) were documented to have consented or enrolled in a clinical trial.

Prospective data collection was planned for the time frame of the study. Due to unanticipated staffing delays and the COVID-19 pandemic, the two-month cycles could not be implemented as planned. However, three elements of the intervention were implemented, including creating a smart phrase in the EHR, utilizing the smart phrase in the EHR, and generating a clinical trials screening report. Prospective data from the study period are not currently available for this cancer program.

The Duke Cancer Center ovarian cancer team successfully implemented the smart phrase within the EHR to remind physicians to screen for trials. The retrospective data collection was completed and provided helpful information on the total number of patients enrolled and the numbers of patients eligible for each trial.

During this study, several barriers to patients with ovarian cancer clinical trial enrollment were identified, including both provider- and patient-based barriers. The Duke Cancer Center team was able to identify providers who were enrolling patients in clinical trials at the lowest rates and could thereby work to understand practice barriers and areas for improvement. From the patient perspective, a recurrent and major barrier to trial enrollment was transportation and travel time to Duke Cancer Center. It was determined that many patients decline enrollment because of lengthy travel times and a desire to avoid unnecessary

clinic visits. Given the complex nature of many clinical trials, they are not typically available in rural communities and clinics, and this system-level factor was identified as a barrier to trial access across the Duke Cancer Center catchment area.

In addition to the interventions implemented in this QI initiative, two potential solutions were identified. First, the clinical trials director will start recognizing the provider with the highest enrollment in ovarian cancer trials each month to provide awareness and visibility to the program. Second, the Duke Cancer Center team is exploring innovative ways to integrate telemedicine into clinical trials. Overall, Duke Cancer Center found the project to be helpful and plan to continue this work, possibly expanding to address disparities in patients with uterine cancer.

This project demonstrated that cancer programs of all types across the United States face similar challenges in providing quality care for women with ovarian cancer. Multiple stakeholders can contribute to QI solutions with a team approach and clear communication around quality gaps.

Discussion

Despite many advances in the treatment of ovarian cancer over the last two decades, the quality of care remains variable across geographic sites and hospital settings. The majority of women with this disease do not receive guideline-adherent care.^{5,7,18,19} The reasons may include access to sites with gynecologic oncologists, as well as disease-site prioritization within cancer centers.^{20,21} It has been recognized that thorough pathologic evaluation resulting in accurate diagnosis with histologic type and stage assignment is a mainstay of quality care programs.

The application survey was successful in identifying commonly cited areas of need for QI in ovarian cancer care. The most frequently identified areas were genetic testing and counseling, clinical trial enrollment and availability, and multidisciplinary team care. The three cancer programs selected for QI projects chose to focus on genetic testing and counseling (two cancer programs) and clinical trial enrollment and availability (one cancer program). Guidance and involvement from the expert Steering Committee informed application survey development and site

Table 4. Retrospective Data from Duke Cancer Center

<i>N</i> =400	<i>n</i>	%
Patient race		
Asian	7	1.8
Black/African American	46	11.5
Caucasian/white	286	71.5
Multiracial	1	0.3
Two or more races	6	1.5
Not reported/declined	53	13.3
Stage at diagnosis		
Missing	21	5.3
I	102	25.5
II	50	12.5
III	156	39.0
IV	71	17.8
Is there documentation that the trial was discussed by the provider seeing the patient?		
Missing	316	79.0
No	36	9.0
Yes	48	12.0
Is there trial documentation by study personnel?		
Missing	316	79.0
No	45	11.3
Yes	39	9.8
Did the patient consent or enroll for a clinical trial?		
Missing	316	79.0
No	54	13.5
Yes	30	7.5

selection and enriched the projects at each cancer program. The Steering Committee's development of the ovarian cancer quality document was a significant contribution that will have a lasting impact on ovarian cancer care.

Project workshops proved beneficial for identifying barriers to delivery of quality care in patients with ovarian cancer and finding meaningful solutions. Bringing multiple stakeholders together from across each institution with external facilitation allowed for structured discussion and focused time. Each cancer program developed a problem statement and a specific plan to address the need and measure progress throughout the six-month study period.

Cancer programs reported benefits from the QI workshops, improved care for patients in the areas of focus for the study, and plans for long-term sustainability of study initiatives. Challenges from the COVID-19 pandemic during the prospective study period limited the ability of some cancer programs to execute the studies as planned and also provided some opportunity to improve care through the expanded use of technology.

Overarching Impact

This multi-stage QI project had a substantial impact in several areas. The needs assessment from the application survey identified several priority areas for QI initiatives, including genetic testing and counseling, clinical trial enrollment, and multidisciplinary team care. These areas of needed improvement were identified consistently across a wide range of hospital types from community cancer programs to NCI-designated comprehensive cancer programs.

A Steering Committee of gynecologic oncology care experts guided this project. The ovarian cancer care quality document produced as part of this project will be disseminated broadly and could have a lasting impact on care delivery. The committee also guided project selection and development at each of the three testing sites. All three cancer programs reported a meaningful impact on quality and process of care from the project.

The successful implementation of three unique QI projects across three diverse institutions serves as a proof of principle for QI in ovarian cancer care. Addressing a specific issue in ovarian cancer is feasible in a focused one-day multi-stakeholder workshop and was implemented with success. All three cancer programs felt that the project served as a catalyst to influence change by providing the QI structure, eliciting broad stakeholder perspectives, and building consensus around the issue.

The use of technology proved critical to the QI solutions implemented at each cancer program. These included better utilization of the EHR, audiovisual tools for patient education, and telehealth solutions. The QI project demonstrated that IT professionals are important members of the multidisciplinary teams and can play a vital role in quality improvement. When

Key Take-Aways from the ACCC Education Initiative

- Top priorities for QI in ovarian cancer include genetic testing and counseling, clinical trial enrollment, and multidisciplinary team care.
- A focused and structured QI approach, where consensus is built around a problem and solution, can address a specific quality issue in a relatively short time.
- Multiple stakeholders can contribute to QI solutions with a team approach and clear communication around quality gaps.

invited to the table and elevated as key team members, IT professionals were willing to invest in the projects and provide sustainable solutions to improve care for persons with ovarian cancer.

This project demonstrated that cancer programs of all types across the United States face similar challenges in providing quality care for women with ovarian cancer. Multiple stakeholders can contribute to QI solutions with a team approach and clear communication around quality gaps. A focused approach to QI, in which consensus is built around a specific problem and solution, can address a specific problem in a relatively short period of time. The approach was successful across the three diverse cancer centers in this project and could be similarly applied in other settings and in the context of other cancer types.

Premal H. Thaker, MD, MS, is professor at Washington University, Siteman Cancer Center, Saint Louis, Mo. Matthew P. Smeltzer, PhD, is associate professor in the Division of Epidemiology, Biostatistics, and Environmental Health School of Public Health, University of Memphis, Memphis, Tenn. Monique Dawkins, EdD, is assistant director, education, and Leigh M. Boehmer, PharmD, BCOP, is medical director at the Association of Community Cancer Centers, Rockville, Md. Leigha Senter-Jamieson, MS, is associate professor at The Ohio State University, James Cancer Hospital, Comprehensive Cancer Center, Columbus, Ohio. Stephanie V. Blank, MD, is professor and division director of gynecologic oncology, and Mollie Finkel, RN, MSN, is clinical program manager at the Blavatnik Family—Chelsea Medical Center, The Mount Sinai Hospital, New York, N.Y. Destin Black, MD, is director of gynecologic oncology at Willis-Knighton Cancer Center and Louisiana State University Health Shreveport, La. Anna Yemelyanova, MD, is professor of pathology at the Department of Pathology & Laboratory Medicine, Weill Cornell Medicine, New York, N.Y. Sarah Temkin, MD, is a gynecologic oncologist in Washington, D.C.

References

1. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2020. *CA Cancer J Clin.* 2020;70(1):7-30.
2. Torre LA, Trabert B, DeSantis CE, et al. Ovarian cancer statistics, 2018. *CA Cancer J Clin.* 2018;68(4):284-296.
3. American Cancer Society. *Cancer Facts & Figures 2020.* Atlanta, GA: American Cancer Society; 2020.
4. Collins Y, Holcomb K, Chapman-Davis E, Khabele D, Farley JH. Gynecologic cancer disparities: a report from the Health Disparities Taskforce of the Society of Gynecologic Oncology. *Gynecol Oncol.* 2014;133(2):353-361.
5. Bristow RE, Powell MA, Al-Hammadi N, et al. Disparities in ovarian cancer care quality and survival according to race and socioeconomic status. *J Natl Cancer Inst.* 2013;105(11):823-832.
6. Temkin SM, Rimel BJ, Bruegl AS, Gunderson CC, Beavis AL, Doll KM. A contemporary framework of health equity applied to gynecologic cancer care: a Society of Gynecologic Oncology evidenced-based review. *Gynecol Oncol.* 2018;149(1):70-77.
7. Bristow RE, Chang J, Ziogas A, Campos B, Chavez LR, Anton-Culver H. Sociodemographic disparities in advanced ovarian cancer survival and adherence to treatment guidelines. *Obstet Gynecol.* 2015;125:833-842.
8. Moore K, Colombo N, Scambia G, et al. Maintenance olaparib in patients with newly diagnosed advanced ovarian cancer. *N Engl J Med.* 2018;379:2495-2505.
9. Banerjee S, Moore KN, Colombo N, et al. Maintenance olaparib for patients (pts) with newly diagnosed, advanced ovarian cancer (OC) and a BRCA mutation (BRCAm): 5-year follow-up (f/u) from SOLO1. *Ann Oncol.* 2020;31(suppl 4):S613.
10. Armstrong DK, Alvarez RD, Bakkum-Gamez JN, et al. NCCN Guidelines insights: ovarian cancer, version 1.2019. *J Natl Compr Canc Netw.* 2019;17(8):896-909.
11. Chen F, Bailey CE, Alvarez RD, Shu XO, Zheng W. Adherence to treatment guidelines as a major determinant of survival disparities between black and white patients with ovarian cancer. *Gynecol Oncol.* 2021;160(1):10-15.
12. Qualtrix XM. Available online at: <https://www.qualtrics.com>. Last accessed December 18, 2020.
13. Cleghorn GD, Headrick LA. The PDSA cycle at the core of learning in health professions education. *Jt Comm J Qual Improv.* 1996;22(3):206-212.
14. *Key Driver 2: Implement a Data-Driven Quality Improvement Process to Integrate Evidence into Practice Procedures.* Rockville, MD: Agency for Healthcare Research and Quality. Available online at: <https://www.ahrq.gov/evidencenow/tools/keydrivers/implement-qi.html>.
15. BiteSize QI. Available online at: <https://bitesizeqi.org>. Last accessed December 18, 2020.
16. González-Martín A, Pothuri B, Vergote I, et al., and the PRIMA/ENGOT-OV26/GOG-3012 Investigators. Niraparib in patients with newly diagnosed advanced ovarian cancer. *N Engl J Med.* 2019;381(25):2391-2402.
17. Ray-Coquard I, Pautier P, Pignata S, et al., and the PAOLA-1 Investigators. Olaparib plus bevacizumab as first-line maintenance in ovarian cancer. *N Engl J Med.* 2019;381(25):2416-2428.
18. Bristow RE, Chang J, Ziogas A, Anton-Culver H. Adherence to treatment guidelines for ovarian cancer as a measure of quality care. *Obstet Gynecol.* 2013;121(6):1226-1234.
19. Villanueva C, Chang J, Ziogas A, Bristow RE, Vieira VM. Ovarian cancer in California: guideline adherence, survival, and the impact of geographic location, 1996-2014. *Cancer Epidemiol.* 2020;69:101825.
20. Villanueva C, Chang J, Bartell SM, Ziogas A, Bristow R, Vieira VM. Contribution of geographic location to disparities in ovarian cancer treatment. *J Natl Compr Canc Netw.* 2019;17(11):1318-132.
21. Temkin SM, Rubinsak L, Benoit MF, et al. Take me to your leader: reporting structures and equity in academic gynecologic oncology. *Gynecol Oncol.* 2020;157(3):759-764.

This project is made possible by support from AstraZeneca and Merck.



A publication from the ACCC education program, "Barriers to Quality Care in Ovarian Cancer." [Learn more at accc-cancer.org/ovarian-quality-care](https://acc-cancer.org/ovarian-quality-care) or scan this QR code.

The **Association of Community Cancer Centers (ACCC)** is the leading education and advocacy organization for the cancer care community. Founded in 1974, ACCC is a powerful network of 28,000 multidisciplinary practitioners from 2,100 hospitals and practices nationwide. As advances in cancer screening and diagnosis, treatment options, and care delivery models continue to evolve—so has ACCC—adapting its resources to meet the changing needs of the entire oncology care team. For more information, visit acc-cancer.org or call 301.984.9496. Follow us on Facebook, Twitter, and LinkedIn; read our blog, ACCCBuzz; and tune in to our podcast, CANCER BUZZ.

