An Optimal Care Coordination Model for Medicaid Patients with Lung Cancer:
Results from Beta Model Testing

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Lung cancer continues to be the leading cause of cancer mortality in the United States, with an estimated 142,670 deaths in 2019.[1] Gaps in the quality of care remain in many areas, contributing to the suboptimal outcomes.[2-6] A key component of high-quality cancer care delivery systems is an adequately staffed and well-coordinated multidisciplinary team to support the delivery of evidence-based, patient-centered care that is accessible and affordable to all.[7]

In 2016, the Association of Community Cancer Centers (ACCC) initiated a three-year multiphase project to develop an Optimal Care Coordination Model (OCCM) for Medicaid patients with lung cancer that would help assess and strengthen care delivery systems by facilitating and expanding access to multidisciplinary coordinated care. The rationale for and development of the OCCM (i.e., Phase I) are described in a companion publication.[8] The target population was Medicaid patients diagnosed with lung cancer. These patients often have less favorable outcomes than non-Medicaid patients, such as significantly lower median overall survival, which may be attributable to the prevailing social determinants of health, including socio-economic disparities between these groups.[5,9-11]

OCCM design was adapted from the multidisciplinary care assessment tool of the National Cancer Institute Community Cancer Centers Program.[12] The OCCM beta framework comprised 13 independent care delivery areas and spanned elements from patient access to care to supportive care and survivorship. This framework allows cancer programs to identify locally relevant barriers to access and use of care, with a focus on Medicaid patients, and therefore enables optimal care coordination. The primary aim of beta testing was to understand how cancer programs utilize the OCCM to improve their lung cancer care delivery systems, especially for Medicaid patients. In addition, it was important to ensure that the Model could offer practical and easy-to-use guidance to cancer programs interested in advancing multidisciplinary coordinated care for Medicaid patients with lung cancer.

Testing Sites

Phase II of the initiative included a request for applications, open to most ACCC Cancer Program Members in the United States, and the subsequent selection of testing sites between

March 2017 and June 2017. Selection criteria allowed for adequate representation of cancer programs (rural/urban, private practice/hospital-based, and across U.S. geographic regions). ACCC Cancer Program Members in eight U.S. states (Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, South Carolina, and West Virginia) were excluded from participation under the terms of the grant to avoid overlap with a separate initiative funded by the same foundation.

As part of the application process and the first step in using the beta OCCM, testing sites conducted initial program self-assessments to identify baseline and anticipated target levels of OCCM assessment areas using ranking levels from 1 (fragmented care) to 5 (optimal care coordination with a patient-centered focus). Use of quantitative metrics, where available, was encouraged to support these baseline assessments. Sites received feedback on the assessments, developed quality improvement (QI) projects for their Medicaid patient populations using at least 1 of the 13 OCCM assessment areas (Figure 1, right), and identified their ranking goals for the 12-month performance period (e.g., moving from Level 2 to Level 4 for a specific assessment area).

Support during the project period included two on-site meetings with clinical consultants (fall 2017 and summer/fall 2018) and biweekly calls between the ACCC QI team and testing site staff. The ACCC QI team comprised lung cancer and health services researchers, including one medical oncologist, two epidemiologists, one biostatistician, one hospital administrator, one QI/qualitative researcher, two program coordinators, and two graduate assistants with public health training. This team had oversight from the project's Advisory Committee and Technical Expert Panel, comprising experts in medical oncology, disparities research, and community outreach (Table 1, page 84).

OCCM Beta Testing

Phase III involved beta OCCM testing through the implementation of QI projects from October 2017 to September 2018. A mixed-methods approach was used to understand how testing sites applied the beta OCCM, using at least 1 of the 13 OCCM assessment areas. Quantitative data on patient demographics, baseline disease and care pathway characteristics, and established, measurable quality benchmarks specific to each OCCM assessment area (e.g., "adult current smoking prevalence" as part of tobacco cessation) were collected. We established a centralized Data Coordinating Center at the University of Memphis School of Public Health, managing data from each testing site using Research Electronic Data Capture

(REDCap®).[13,14] REDCap is a secure, web-based software platform designed to support data capture for research studies. Data were analyzed at the Data Coordinating Center using SAS® version 9.4 (Cary, N.C.).[15]

Qualitative information on successes, challenges, key transferable lessons, and sustainability plans for the OCCM was collected via site-specific quarterly progress reports to complement quantitative findings. These reports were reviewed manually to extract emerging themes using inductive reasoning. Each testing site submitted a signed attestation confirming that their institutional review board determined that the OCCM project was designated as exempt.

Statistical Analysis

Data were collected for four payer groups, namely, Medicaid, Medicare, commercial, and other (i.e., military insurance, none, or self-pay). Patients who were "dual-eligible" for Medicaid and Medicare were evaluated as a separate group in some analyses. Summary statistics were computed, with continuous data reported as mean ± standard deviation or median (first quartile, third quartile) and categorical data reported as frequency (percentage). Associations between categorical variables were compared using chi-square or Fisher's exact tests (expected cell counts less than five). Continuous outcomes were compared across payer groups using analysis of variance, t-test, the Wilcoxon-Mann-Whitney test, or the Kruskal-Wallis test. Statistical significance was assessed at an alpha level of 0.05, with no adjustments for multiple comparisons.[16]

Results

In July 2017, seven community-based cancer programs in six states across the United States were selected as testing sites. A total of 926 patients were enrolled; 27.8 percent (*n* = 257) had Medicaid insurance or dual eligibility and 72.2 percent (*n* = 669) had non-Medicaid insurance. Sites conducted self-assessments of at least 1 of the 13 OCCM assessment areas, supported by evidence-based, measurable quality metrics, to identify the current level of care coordination and a corresponding target level (achievable or aspirational) to facilitate improvements over the implementation period. Each assessment area was mapped to established quality measures, and some testing sites worked with the ACCC QI team to develop internal measures.

The preparedness of the sites had implications for the subsequent implementation of QI projects. Our qualitative needs assessment identified operational challenges, including:

- Decentralized research leadership structures
- Changes in leadership and supporting roles
- Lack of or limited patient navigation services to assess barriers and needs
- Timing of patient recruitment for a targeted intervention in relation to the cancer care continuum
- Inadequate and transient staff resources to implement project work
- Lack of formalized plans for transitioning project tasks to new staff
- Limited availability of existing data sources or the need for further data collection efforts as part of OCCM quality metrics reporting.

Across the seven testing sites, 8 of 13 OCCM assessment areas were selected for QI projects (Figure 1, below).

Site participation in beta testing appeared beneficial to both cancer programs and the patient populations they serve. Key successes were enhanced collaboration and improved lung cancer programming, such as patient navigation services, that may address low rates of psychosocial distress screening.

Figure 1. OCCM Assessment Areas Selected by Testing Sites for QI Projects

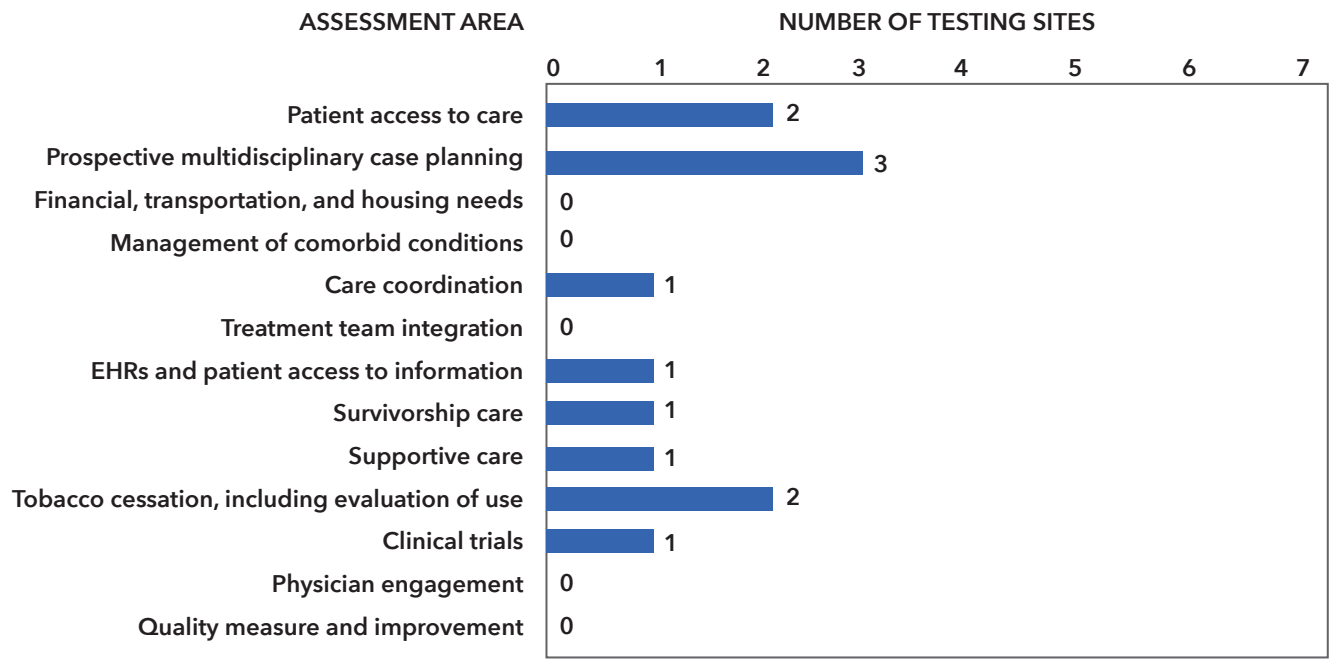| ASSESSMENT AREA	NUMBER OF TESTING SITES
Patient access to care	2
Prospective multidisciplinary case planning	3
Financial, transportation, and housing needs	0
Management of comorbid conditions	0
Care coordination	1
Treatment team integration	0
EHRs and patient access to information	1
Survivorship care	1
Supportive care	1
Tobacco cessation, including evaluation of use	2
Clinical trials	1
Physician engagement	0
Quality measure and improvement	0

Table 1. OCCM Advisory Committee and Technical Expert Panel

OCCM Advisory Committee Co-Chairs
Christopher S. Lathan, MD, MS, MPH, faculty director for cancer care equity, Dana-Farber Cancer Institute; medical director, Dana-Farber at St. Elizabeth's Medical Center; assistant professor of medicine, Harvard Medical School, Boston, Mass.
Randall A. Oyer, MD, medical director, Oncology Program, Penn Medicine Lancaster General Health, Lancaster, Pa.
OCCM Advisory Committee Members
Thomas M. Asfeldt, MBA, RN, BAN, (former) director, Outpatient Cancer Services and Radiation Oncology, Sanford USD Medical Center, Sioux Falls, S.D., and Sanford Health Cancer Center, Worthington, Minn.
John V. Cox, DO, MBA, FACP, FASCO, professor of internal medicine, medical oncologist, UT Southwestern Medical Center, Dallas, Tex.
Becky DeKay, MBA, (former) executive director, Oncology Service Line, University Health Shreveport, Feist-Weiller Cancer Center, LSU Health Shreveport, Shreveport, La.
Andrea Ferris, president and chairman of the board, LUNGevity, Bethesda, Md.
Lovell Jones, PhD, professor and associate dean for research, Prairie View A&M University College of Nursing, Corpus Christi, Tex.
Matthew J. Loscalzo, LCSW, Liliane Elkins Professor in Supportive Care Programs; executive director, Department of Supportive Care Medicine, City of Hope National Medical Center, Duarte, Calif.
James Mulshine, MD, professor, internal medicine, Rush Medical College; vice president for research, Rush University Medical Center, Chicago, Ill.
Kathleen Nolan, MPH, regional vice president, Health Management Associates, Washington, D.C.
Shawn M. Regis, PhD, patient navigator, associate research scientist, Lahey Hospital & Medical Center, Burlington, Mass.
Maureen Rigney, LICSW, director of support initiatives, GO2 Foundation for Lung Cancer, Washington, D.C.
Cardinale B. Smith, MD, PhD, associate professor of medicine, Division of Hematology and Medical Oncology, Bookdale Department of Geriatrics and Palliative Medicine, Icahn School of Medicine at Mount Sinai, New York, N.Y.
Mark S. Soberman, MD, MBA, FACS, senior safety officer, Ethicon, Inc.
Technical Expert Panel Chair
Thomas M. Asfeldt, MBA, RN, BAN, (former) director, Outpatient Cancer Services and Radiation Oncology, Sanford USD Medical Center, Sioux Falls, S.D. and Sanford Health Cancer Center, Worthington, Minn.
Technical Expert Panel Members
Karyl Blaseg, MSN, RN, OCN, practice manager, University of Arizona Cancer Center/Dignity Health, Phoenix, Ariz.
Richard Deming, MD, medical director, MercyOne Cancer Center, Des Moines, Iowa
Nancy Johnson, MSM, executive director/administrator, Nancy N. and J.C. Lewis Cancer & Research Pavilion at St. Joseph's/Candler, Savannah, Ga.
Lead Clinical Research Consultant
Raymond Uyiosa Osarogiagbon, MD, FACP, director, Thoracic Oncology Research Group; director, Multidisciplinary Thoracic Oncology Program, Baptist Cancer Center, Memphis; research professor, University of Memphis School of Public Health, Memphis, Tenn.

Table 2. Patient Demographics and Baseline Clinical Characteristics for All Testing Sites Combined by Medicaid/ Dual-Eligible Versus Non-Medicaid Payer Status (*n* = 926)

Characteristic n (%)	Medicaid/Dual-Eligible n = 257	Non-Medicaid[a] n = 669	p Value
Sex Female Male	124 (48.2%) 133 (51.8%)	345 (51.6%) 324 (48.4%)	0.3655[b]
Age group < 90 years ≥ 90 years	256 (99.6%) 1 (0.4%)	656 (98.1%) 13 (1.9%)	0.1289[c]
Race White Black or African American Other[d]/not reported Missing = 2	176 (68.8%) 21 (8.2%) 59 (23.0%)	593 (88.8%) 19 (2.8%) 56 (8.4%)	<0.0001[b]
Ethnicity Hispanic/Latino Not Hispanic/not Latino Not reported	9 (3.5%) 209 (81.3%) 39 (15.2%)	12 (1.8%) 608 (90.9%) 49 (7.3%)	0.0003[b]
Employment status Currently employed Retired Unemployed Unknown	37 (14.4%) 67 (26.1%) 87 (33.9%) 66 (25.7%)	144 (21.5%) 347 (51.9%) 57 (8.5%) 121 (18.1%)	<0.0001[b]
Median (range) age at diagnosis (in years)	61 (39 to 88 years)	70 (39 to 89 years)	<0.0001[e]
Median (range) duration of Medicaid enrollment (in years)	2 (0, 144)	1 (1, 10)	0.2866[e]
Smoking status Active Former Never Not reported	122 (47.5%) 113 (44.0%) 19 (7.4%) 3 (1.2%)	191 (28.6%) 400 (59.8%) 53 (7.9%) 25 (3.7%)	<0.0001[b]
Type of smoking: cigarettes Yes No	208 (80.9%) 49 (19.1%)	472 (70.5%) 197 (29.5%)	0.0014[b]
Type of smoking: cigars Yes No	6 (2.3%) 251 (97.7%)	6 (0.9%) 663 (99.1%)	0.1038[c]
Type of smoking: pipes Yes No	1 (0.4%) 256 (99.6%)	3 (0.5%) 666 (99.5%)	1.0000[c]
Type of smoking: hookah Yes No	0 (0) 257 (100)	0 (0) 669 (100)	N/A
Median (range) duration of smoking (in years)	40 (2 to 67 years)	40 (3 to 69 years)	0.8927[e]
Median (range) pack-years	44 (4 to 220 packs)	40 (1 to 240 packs)	0.5577[e]

Table 2 (continued). Patient Demographics and Baseline Clinical Characteristics for All Testing Sites Combined by Medicaid/Dual-Eligible Versus Non-Medicaid Payer Status (*n* = 926)

Characteristic n (%)	Medicaid/Dual-Eligible n = 257	Non-Medicaid[a] n = 669	*p* Value
Use of smokeless tobacco Yes No Missing = 84	5 (2.2%) 225 (97.8%)	8 (1.3%) 604 (98.7%)	0.3577[c]
Median (range) number of comorbidities	2 (0 to 6 comorbidities)	2 (0 to 5 comorbidities)	0.0115[e]
Patients with any prior cancer(s) Yes No	224 (87.2%) 33 (12.8%)	528 (78.9%) 141 (21.1%)	0.0041[b]
Patient has caregiver support Yes No Missing = 136	119 (58.6%) 84 (41.2%)	396 (67.5%) 191 (32.5%)	0.0226[b]
T category[f] T0 T1 T2 T3 T4 Insufficient/not reported	10 (3.9%) 73 (28.4%) 55 (21.4%) 18 (7.0%) 46 (17.9%) 55 (21.4%)	17 (2.5%) 200 (29.9%) 122 (18.2%) 47 (7.0%) 110 (16.4%) 173 (25.9%)	0.5485[b]
N category[g] N0 N1 N2 N3 Insufficient/not reported	84 (32.7%) 26 (10.1%) 48 (18.7%) 33 (12.8%) 66 (25.7%)	252 (37.7%) 53 (7.9%) 111 (16.6%) 63 (9.4%) 190 (28.4%)	0.2501[b]
M category[h] M0 M1 Insufficient/not reported	124 (48.3%) 72 (28.0%) 61 (23.7%)	316 (47.2%) 145 (21.7%) 208 (31.1%)	0.0354[b]
Aggregate staging Stage 0 Stage I-IIA Stage IIB Stage IIIA Stage IIIB-IIIC Stage IV Insufficient/not reported	1 (0.4%) 61 (23.7%) 18 (7.0%) 25 (9.7%) 18 (7.0%) 72 (28.0%) 62 (24.1%)	2 (0.3%) 158 (23.6%) 41 (6.1%) 68 (10.2%) 34 (5.1%) 145 (21.7%) 221 (33.0%)	0.1456[b]

Column percentages may not add up to 100.0 percent due to rounding. N/A, not applicable.
[a]Commercial insurance, Medicare only, military insurance, none, or self-pay.
[b]p Value based on chi-square test.
[c]p Value based on Fisher's exact test.
[d]Asian, American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, Other, and Unknown.
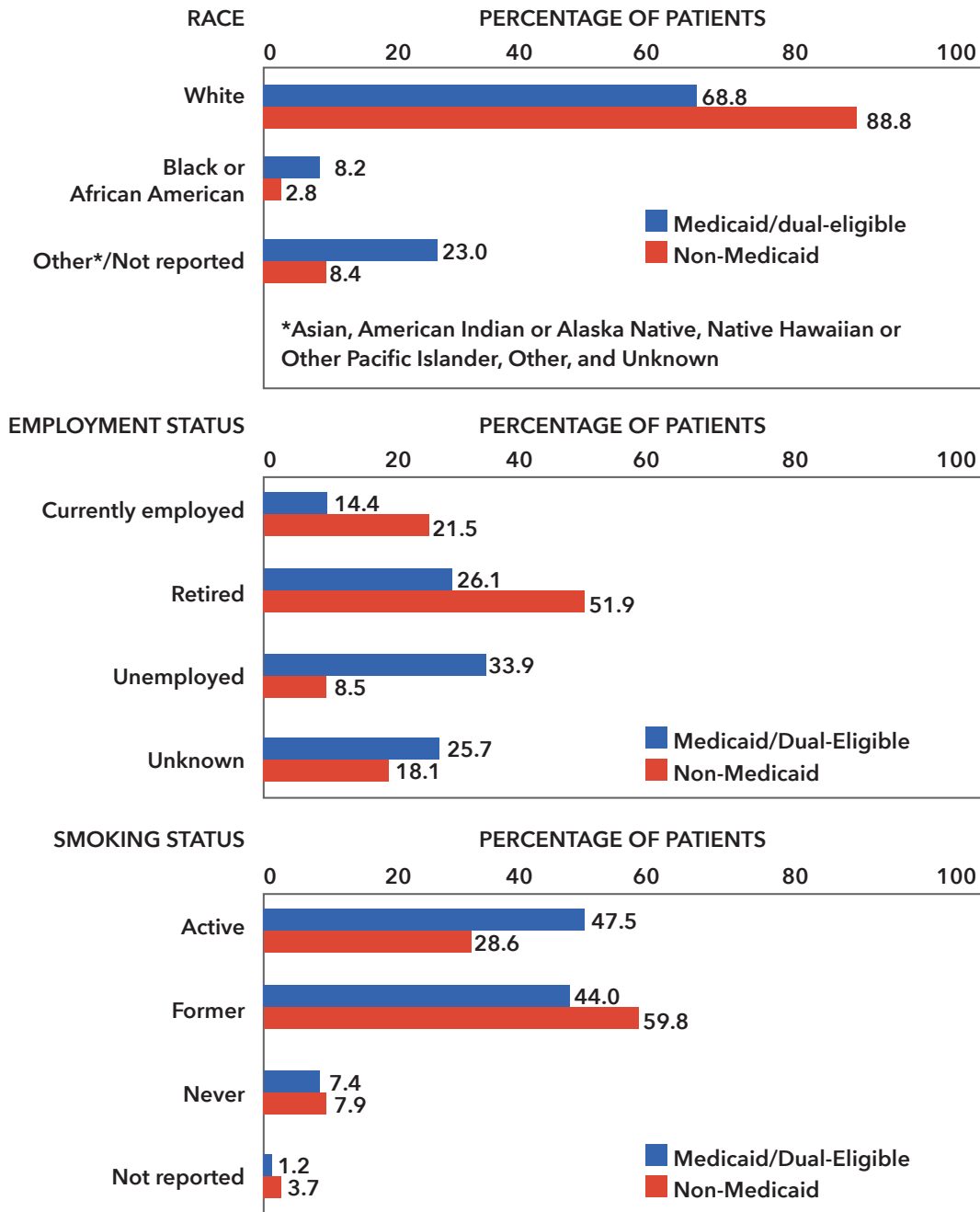[e]p Value based on median one-way analysis.
[f]T category, primary tumor.
[g]N category, regional lymph nodes.
[h]M category, distant metastasis.

Figure 2. Distribution of Select Patient Demographics Between Medicaid/Dual-Eligible and Non-Medicaid Patients Across All Testing Sites Combined

RACE — PERCENTAGE OF PATIENTS

White: Medicaid/dual-eligible 68.8, Non-Medicaid 88.8
Black or African American: Medicaid/dual-eligible 8.2, Non-Medicaid 2.8
Other*/Not reported: Medicaid/dual-eligible 23.0, Non-Medicaid 8.4

■ Medicaid/dual-eligible
■ Non-Medicaid

*Asian, American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, Other, and Unknown

EMPLOYMENT STATUS — PERCENTAGE OF PATIENTS

Currently employed: Medicaid/Dual-Eligible 14.4, Non-Medicaid 21.5
Retired: Medicaid/Dual-Eligible 26.1, Non-Medicaid 51.9
Unemployed: Medicaid/Dual-Eligible 33.9, Non-Medicaid 8.5
Unknown: Medicaid/Dual-Eligible 25.7, Non-Medicaid 18.1

■ Medicaid/Dual-Eligible
■ Non-Medicaid

SMOKING STATUS — PERCENTAGE OF PATIENTS

Active: Medicaid/Dual-Eligible 47.5, Non-Medicaid 28.6
Former: Medicaid/Dual-Eligible 44.0, Non-Medicaid 59.8
Never: Medicaid/Dual-Eligible 7.4, Non-Medicaid 7.9
Not reported: Medicaid/Dual-Eligible 1.2, Non-Medicaid 3.7

■ Medicaid/Dual-Eligible
■ Non-Medicaid

Note: Non-Medicaid includes commercial insurance, Medicare only, military insurance, none, or self-pay.

Table 3. Patient Demographics and Baseline Clinical Characteristics Across All Testing Sites Combined by Payer Type (*n* = 926)

Characteristic n (%)	Commercial n = 219	Medicaid only n = 139	Medicare only n = 443	Other[a] n= 7	Dual-Eligible n= 118	p Value
Sex Female Male	107 (48.9%) 112 (51.1%)	64 (46.0%) 75 (54.0%)	236 (53.3%) 207 (46.7%)	2 (28.6%) 5 (71.4%)	60 (50.9%) 58 (49.1%)	0.4449[b]
Age group < 90 years ≥ 90 years	219 (100%) 0 (0)	139 (100%) 0 (0)	430 (97.1%) 13 (2.9%)	7 (100%) 0 (0)	117 (99.1%) 1 (0.9%)	0.0057[c]
Race White Black or African American Other[d]/Not reported Missing = 2	190 (86.7%) 5 (2.3%) 24 (11.0%)	84 (60.9%) 13 (9.4%) 41 (29.7%)	397 (89.8%) 13 (2.9%) 32 (7.2%)	6 (85.7%) 1 (14.3%) 0 (0)	92 (78.0%) 8 (6.8%) 18 (15.2%)	<0.0001[b]
Ethnicity Hispanic/Latino Not Hispanic/not Latino Not reported	6 (2.7%) 194 (88.6%) 19 (8.7%)	6 (4.3%) 101 (72.7%) 32 (23.0%)	6 (1.4%) 407 (91.9%) 30 (6.8%)	0 (0) 7 (100%) 0 (0)	3 (2.5%) 108 (91.5%) 7 (5.9%)	<0.0001[b]
Employment status Currently employed Retired Unemployed Unknown	84 (38.4%) 70 (32.0%) 23 (10.5%) 42 (19.2%)	30 (21.6%) 21 (15.1%) 56 (40.3%) 32 (23.0%)	59 (13.3%) 273 (61.6%) 33 (7.5%) 78 (17.6%)	1 (14.3%) 4 (57.1%) 1 (14.3%) 1 (14.3%)	7 (5.9%) 46 (39.0%) 31 (26.3%) 34 (28.8%)	<0.0001[e]
Median (range) age at diagnosis (in years)	63 (39 to 86 years)	58 (39 to 74 years)	73 (43 to 89 years)	70 (50 to 83 years)	67 (47 to 88 years)	<0.0001[e]
Median (range) duration of Medicaid enrollment (in years)	1 (1, 10)	2 (0, 144)	N/A	N/A	2 (0, 144)	0.5642
Smoking status Active Former Never Not reported	80 (36.5%) 100 (45.7%) 24 (11.0%) 15 (6.9%)	68 (48.9%) 61 (43.9%) 9 (6.5%) 1 (0.7%)	109 (24.6%) 296 (66.8%) 29 (6.6%) 9 (2.0%)	2 (28.6%) 4 (57.1%) 0 (0) 1 (14.3%)	54 (45.8%) 52 (44.1%) 10 (8.5%) 2 (1.7%)	<0.0001[b]
Type of smoking: cigarettes Yes No	155 (70.8%) 64 (29.2%)	116 (83.5%) 23 (16.5%)	314 (70.9%) 129 (29.1%)	3 (42.9%) 4 (57.1%)	92 (78.0%) 26 (22.0%)	0.0134[b]
Type of smoking: cigars Yes No	2 (0.9%) 217 (99.1%)	3 (2.2%) 136 (97.8%)	4 (0.9%) 439 (99.1%)	0 (0) 7 (100%)	3 (2.5%) 115 (97.5%)	0.3036[c]
Type of smoking: pipes Yes No	1 (0.5%) 218 (99.5%)	0 (0) 139 (100%)	2 (0.5%) 441 (99.6%)	0 (0) 7 (100%)	1 (0.9%) 117 (99.1%)	0.7923[c]
Type of smoking: hookah Yes No	0 (0) 219 (100%)	0 (0) 139 (100%)	0 (0) 443 (100%)	0 (0) 7 (100%)	0 (0) 118 (100%)	N/A
Median (range) duration of smoking (in years)	40 (3 to 65 years)	40 (3 to 67 years)	40 (4 to 69 years)	37 (30 to 45 years)	45.5 (2 to 65 years)	0.0168[e]

Table 3 (continued). Patient Demographics and Baseline Clinical Characteristics Across All Testing Sites Combined by Payer Type (*N* = 926)

Characteristic n (%)	Commercial n = 219	Medicaid only n = 139	Medicare only n = 443	Other[a] n= 7	Dual-Eligible n= 118	p Value
Median (range) pack-years	40 (1 to 180 packs)	40 (10 to 120 packs)	44 (1 to 240 packs)	35 (18 to 68 packs)	50 (4 to 220 packs)	0.0572[e]
Use of smokeless tobacco Yes No Missing = 84	3 (1.5%) 193 (98.5%)	1 (0.8%) 126 (99.2%)	5 (1.2%) 407 (98.8%)	0 (0) 4 (100%)	4 (3.9%) 99 (96.1%)	0.2329[c]
Median (range) number of comorbidities	1 (0 to 5 comorbidities)	2 (0 to 5 comorbidities)	2 (0 to 5 comorbidities)	0 (0 to 2 comorbidities)	2 (0 to 6 comorbidities)	<0.0001[e]
Patients with any prior cancer(s) Yes No	39 (17.8%) 180 (82.2%)	16 (11.5%) 123 (88.5%)	102 (23.0%) 341 (77.0%)	0 (0) 7 (100%)	17 (14.4%) 101 (85.6%)	0.0090[b]
Patient has caregiver support Yes No Missing = 136	134 (70.5%) 56 (29.5%)	58 (51.8%) 54 (48.2%)	257 (65.9%) 133 (34.1%)	5 (71.4%) 2 (28.6%)	61 (67.0%) 30 (33.0%)	0.0095[b]
T category[f] T0 T1 T2 T3 T4 Insufficient/Not reported	1 (0.5%) 61 (27.9%) 41 (18.7%) 11 (5.0%) 37 (16.9%) 68 (31.1%)	8 (5.7%) 33 (23.7%) 28 (20.1%) 12 (8.6%) 24 (17.3%) 34 (24.5%)	16 (3.6%) 138 (31.2%) 80 (18.1%) 36 (8.1%) 71 (16.0%) 102 (23.0%)	0 (0) 1 (14.3%) 1 (14.3%) 0 (0) 2 (28.6%) 3 (42.9%)	2 (1.7%) 40 (33.9%) 27 (22.9%) 6 (5.1%) 22 (18.6%) 21 (17.8%)	0.0693[b]
N category[g] N0 N1 N2 N3 Insufficient/Not reported	72 (32.9%) 17 (7.8%) 35 (16.0%) 23 (10.5%) 72 (32.9%)	36 (25.9%) 12 (8.6%) 30 (21.6%) 20 (14.4%) 41 (29.5%)	178 (40.2%) 36 (8.1%) 74 (16.7%) 40 (9.0%) 115 (26.0%)	2 (28.6%) 0 (0) 2 (28.6%) 0 (0) 3 (42.9%)	48 (40.7%) 14 (11.9%) 18 (15.3%) 13 (11.0%) 25 (21.2%)	0.0996[b]
M category[h] M0 M1 Insufficient/Not reported	91 (41.6%) 47 (21.5%) 81 (37.0%)	56 (40.3%) 49 (35.3%) 34 (24.5%)	222 (50.1%) 97 (21.9%) 124 (28.0%)	3 (42.9%) 1 (14.3%) 3 (42.9%)	68 (57.6%) 23 (19.5%) 27 (22.9%)	0.0006[b]
Aggregate staging Stage 0 Stage I-IIA Stage IIB Stage IIIA Stage IIIB-IIIC Stage IV Insufficient/Not reported	0 (0) 46 (21.0%) 11 (5.0%) 19 (8.7%) 14 (6.4%) 47 (21.5%) 82 (37.4%)	1 (0.7%) 22 (15.8%) 8 (5.8%) 14 (10.1%) 10 (7.2%) 49 (35.3%) 35 (25.2%)	2 (0.5%) 110 (24.8%) 30 (6.8%) 49(11.1%) 19 (4.3%) 97 (21.9%) 136 (30.7%)	0 (0) 2 (28.6%) 0 (0) 0 (0) 1 (14.3%) 1 (14.3%) 3 (14.3%)	0 (0) 39 (33.1%) 10 (8.5%) 11 (9.3%) 8 (6.8%) 23 (19.5%) 27 (22.9%)	0.0175[b]

Column percentages may not add up to 100.0 percent due to rounding. N/A, not applicable.
[a]Includes military insurance, none, or self-pay. This payer category was excluded from significance testing.
[b]*p* Value based on chi-square test.
[c]*p* Value based on Fisher's exact test.
[d]Asian, American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, Other, and Unknown.
[e]*p* Value based on median 1-way analysis.
[f] T category, primary tumor.
[g]N category, regional lymph nodes.
[h]M category, distant metastasis.

Figure 3. Beta Testing Successes, Challenges, Transferable Lessons, and Sustainability Plans

Successes	Site-Specific Challenges	Transferable Lessons	Sustainability Plans
Enhanced collaboration within programs Improved lung cancer programming, such as patient navigation services, to address low rates of psychosocial distress screening	Inadequate staffing throughout testing Lack of centralized data collection and coordination, especially for quality monitoring	Adopt data-driven approach to formulating QI project goals Leverage appropriate technologies to meet care coordination needs Understand special needs of patient groups and calibrate services to meet these needs	Use of existing OCCM framework Increased staffing, particularly for lung cancer navigation Expanded community outreach

Prospective multidisciplinary case planning (three testing sites), patient access to care (two testing sites), and tobacco cessation (two testing sites) were most frequently selected. Financial, transportation, and housing needs (limited scope); management of comorbid conditions; treatment team integration; physician engagement; and quality measurement and improvement were not selected by any sites.

Aggregate summaries of patient demographics and baseline clinical characteristics across all testing sites by Medicaid/dual-eligible and non-Medicaid payer status are presented in Table 2, page 85. Statistically significant differences ($p < 0.0001$) were observed by race, employment status, and smoking status (Figure 2, page 87). A statistically significant difference ($p < 0.0001$) was also observed in the median age at diagnosis between Medicaid/dual-eligible patients (61 years; range, 39 to 88 years) and non-Medicaid patients (70 years; range, 39 to 89 years). Aggregate summaries across all testing sites by five payer groups are presented in Table 3, page 88. Subsequent sections describe how the Model was used for QI projects, with a summary on each assessment area.

Prospective Multidisciplinary Case Planning: Three Testing Sites

This assessment area addresses factors related to multidisciplinary evaluation of the patient and inputs provided on the treatment plan, including contributing providers, process for treatment recommendations, and developing and disseminating a collaborative treatment plan.[17] The three sites utilized three different models for multidisciplinary case discussion, including traditional biweekly (in-person) tumor board, a virtual tumor board (dislocating time and space), and a multidisciplinary team huddle (time variable, in-person interactions facilitated and tracked by a lung cancer nurse navigator). For Medicaid/dual-eligible patients, presentation of eligible patients at prospective virtual tumor board or multidisciplinary team huddle were both at 100 percent (19/19 and 29/29, respectively) for the study period, and 23 percent (5/22) of eligible patients were discussed in the traditional in-person tumor board (p < 0.0001). Median time to presentation for newly diagnosed patients was 18 days (range, 13 to 23 days) for in-person tumor board, 14 days (range, 7 to 20 days) for virtual tumor board, and 9 days (range, 7 to 13 days) for multidisciplinary team huddle (p = 0.14).

Patient Access to Care: Two Testing Sites

This assessment area addresses factors related to the patient's entry into the lung cancer program, including referral sources and process, and the strength of the relationship between the program and referral source for the purpose of providing patient-centered and timely access to appropriate care.[17] Quality metrics on timeliness of care were evaluated. At one testing site:

- Median time from initial detection to positive diagnosis was 13 days (range, 5 to 46 days) for Medicaid/dual-eligible patients versus 15 days (range, 11 days to 26.5 days) for commercially insured patients ($p = 0.96$).
- Median time from the detection of a suspicious lesion to positive diagnosis was 16 days (range, 6 to 26 days) for Medicaid/dual-eligible patients versus 16 days (range, 10 to 24 days) for Medicare patients and 18.5 days (range, 8.5 to 44.5 days) for commercially insured patients ($p = 0.68$).
- Median time from diagnosis to initial treatment was 27 days (range, 18 to 41 days) for Medicaid/dual-eligible patients versus 27 days (range, 10.5 days to 38.5 days) for Medicare patients and 26.5 days (range, 10.5 to 43.5 days) for commercially insured patients ($p = 0.83$).

Tobacco Cessation, Including Evaluation of Use: Two Testing Sites

This assessment area addresses factors related to evaluation of tobacco use and provision of tobacco cessation interventions, such as counseling and medications.[17] Quality metrics related to tobacco use and cessation programs were evaluated. At one testing site that offered tobacco cessation services with referrals to national or state assistance programs, more than half of the active smokers among Medicaid/dual-eligible patients (55.6 percent, 10/18) expressed readiness to quit the use of tobacco products compared with 43.2 percent (16/37) of active smokers among all patients. At another site that offered the Freedom from Smoking® program,[18] more than half of the active smokers among Medicaid/dual-eligible patients (54.5 percent, 6/11) expressed readiness to quit compared with 21.3 percent (10/47) of active smokers among all patients. Among the Medicaid/dual-eligible patients, 66.7 percent (2/3) of patients who enrolled and completed the program quit smoking compared with 50.0 percent (3/6) of overall patients.

Care Coordination: One Testing Site

This assessment area addresses factors related to identifying patient needs, barriers to care coordination, and strategies to minimize gaps in service.[17] Among Medicaid-only patients who were offered navigation services, 92.5 percent (62/67) agreed to work with these services compared with 90.9 percent (80/88) of dual-eligible patients and 75.0 percent (3/4) of non-Medicaid patients who were offered these services.

Electronic Health Records and Patient Access to Information: One Testing Site

This assessment area addresses electronic health records (EHRs), which provide a platform for documentation of clinical care, including patient adherence to treatment plans, compliance with national standards and guidelines, billing support, and a mechanism for patients to access information regarding care delivery.[17] All patients (124/124, 100 percent), including Medicaid/dual-eligible patients (14/14, 100 percent), had EHRs for care coordination. Though the median time to initial treatment was 33 days (range, 3 to 36 days) for Medicaid/dual-eligible patients versus 15 days (range, 0 to 25 days) for commercially insured patients, this difference of 18 days was not statistically significant ($p = 0.23$).

Supportive Care: One Testing Site

This assessment area addresses factors related to the evaluation of physical, emotional, mental, and spiritual symptoms; program infrastructure and resources; and established processes to manage these symptoms throughout the continuum of care.[17] Among Medicaid patients with lung cancer, 33.9 percent (21/62) who were offered and agreed to work with patient navigation services were administered a psychosocial distress screening via a tool compared with 66.7 percent (2/3) of non-Medicaid patients.

Survivorship Care: One Testing Site

This assessment area addresses factors related to ongoing surveillance for recurrence of the original cancer, prevention and early detection of new health problems, management of toxicities associated with treatment, and overall wellness.[17] Among Medicaid/dual-eligible patients, all patients who were considered eligible received a survivorship care plan and treatment summary (7/7, 100 percent) compared with 97.1 percent (34/35) of overall patients. Most eligible patients—that is, Medicaid/dual-eligible (85.7 percent, 6/7) and overall (94.1 percent, 32/34)—received survivorship care plans within 90 days of their last active treatment visit.

Clinical Trials: One Testing Site

This assessment area addresses factors related to overcoming cultural, financial, and logistical barriers, such as lack of access to culturally competent research staff, inadequate assessment of patient eligibility, and insufficient support

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during the informed consent process.[17] Overall, more than half (58.1 percent, 72/124) of patients were provided education on clinical trials. This was lower for Medicaid/dual-eligible patients (35.7 percent, 5/14) compared with commercially insured patients (63.6 percent, 21/33).

Key Successes and Further Discussion

Across the seven testing sites, key successes included:

- Enhanced collaboration within cancer programs
- Improved lung cancer programming (e.g., instituting formal patient navigation services or forming a lung health leadership team)
- Organic changes to the cancer programs owing to engagement over the 12-month implementation period.

Key transferable lessons included the adoption of a data-driven approach to formulating QI project goals, leveraging of appropriate technology to meet care coordination needs, and understanding the needs of patients and calibrating lung cancer-dedicated navigation to meet these needs (see Figure 3, page 90).

OCCM beta testing highlighted the different approaches adopted by the seven testing sites to improve care coordination for patients with lung cancer using the Model. The selection process provided an opportunity to understand how cancer programs successfully utilized the OCCM for topics, such as multidisciplinary case planning and timeliness of care delivery, and identified specific areas to target for improvement. The OCCM provided an avenue for building consensus around quality benchmarks and the capacity to measure them.

Site participation in beta testing appeared beneficial to both cancer programs and the patient populations they serve. Key successes were enhanced collaboration and improved lung cancer programming, such as patient navigation services, that may address low rates of psychosocial distress screening. The overarching principles that guided the development of the OCCM—that is, a patient-centered focus and the reliance on data and evidence as an integral part of all assessment areas—emerged as key transferable lessons. During the initial site visits, many testing sites reiterated that patients are treated the same, regardless of insurance status; however, over the course of OCCM beta testing, the sites realized that Medicaid patients required special considerations to achieve clinical outcomes similar to those of non-Medicaid patients.

Some examples of institutional support received by testing sites during project implementation included opportunities for staff training and leadership commitment from other hospital departments to assist with improvements in lung cancer care delivery. Challenges in OCCM implementation were informed by the unique characteristics and context of each testing site; specific examples included inadequate staffing throughout testing and the lack of centralized data collection and coordination, especially for quality monitoring. Use of the existing OCCM framework; increased staffing, particularly for lung cancer navigation; and expanded community outreach were identified in the sustainability plans of the testing sites. The results indicate that the OCCM can serve as a valuable framework for cancer programs to evaluate current levels of care coordination and to identify areas of improvement toward achieving optimal care coordination. This has also been documented in evaluations of the multidisciplinary care assessment tool,[19] which was central to the design of the OCCM.

Though Medicaid patients were the target population, the observed distribution by payer status was evidence that many non-Medicaid patients at each testing site were able to participate in and benefit from QI projects for lung cancer care delivery. This includes beneficiaries eligible for both Medicare and Medicaid programs who often incur higher costs compared with non-dual-eligible beneficiaries owing to more complex care needs.[20, 21] This suggests future service- and policy-related implications for care delivery.

Strengths of the beta testing phase included adaptability of the OCCM tool to meet program and patient needs and real-world evidence on how a diverse group of community-based cancer programs utilized the framework to evaluate their lung cancer care delivery systems for Medicaid patients, identified areas for improvement, and implemented QI

projects. Limitations included the restricted generalizability owing to the unique characteristics and context of each testing site and the limited overlap in OCCM assessment area selection to understand how different testing sites addressed a common care delivery area. Further, site-specific quality measures may not have mapped perfectly with the OCCM quality measures.

Subsequently, the results of the OCCM beta testing were used to refine the framework and develop a final version of the Model. This included evidence that cancer programs can use the Model to objectively assess their care delivery capabilities for Medicaid patients diagnosed with lung cancer. Programs can also identify areas for improved care coordination and reduce the effects of disparities between Medicaid and non-Medicaid patients by facilitating and expanding access to appropriate care. Nationwide dissemination of the final Model, including a web-based benchmarking tool, can enable expanded use by cancer programs to advance multidisci-plinary coordinated care delivery and optimal outcomes for Medicaid patients. These details will be described in a separate publication.[22]

In conclusion, beta testing enabled seven U.S. cancer programs to assess their lung cancer care delivery capabilities for Medicaid patients, identify areas for improved care coordination, and implement these improvements, through varied approaches, in support of multidisciplinary coordinated care delivery. Consequently, it was apparent that prioritizing the unique care and treatment needs of Medicaid patients with lung cancer is an important step toward achieving health outcomes comparable to those of non-Medicaid patients.

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In reference to the Centers for Medicare & Medicaid Services' Oncology Care Model program, Dr. Patel said that, to date, the program's data show little impact on cost of care, even though it has helped improve care coordination. Calling it "extremely complex," Dr. Patel predicted that the Oncology Care Model program will soon end. "The program will not make the cut to be so compelling that it becomes permanent," she said.

COVID-19 Panel

A six-person panel consisting of physicians and nurses from cancer programs and practices across the country shared personal experiences at the intersection of cancer care and the ongoing pandemic. A point everyone quickly agreed on was the lasting impact of the rapid transition to telemedicine in the early months of the pandemic. Although several people said the provision of telehealth has slowed some because many programs are now open to in-person visits again, they agree that there is no going back to pre-pandemic levels. "Telehealth is here to stay," said Luis Isola, MD, director of cancer clinical programs at Mount Sinai Health System & Tisch Cancer Institute. "It has become part of the fabric of the care we provide."

David Dougherty, MD, MBA, medical director of the Dana Farber Cancer Institute Network, noted that aspects of telehealth have "given patients a higher degree of self-efficacy, allowing them to better manage their own care." Other panel members noted that telehealth has given them a new appreciation of the essential role that family members play in their loved ones' care, because many patients did not previously have the technological access or know-how to participate in telehealth on their own.

But on the flip side of telehealth's positive impact of being able to provide quality at-home care is the fact that many patients simply do not have the means to access telehealth services. Sibel Blau, MD, medical director at Northwest Medical Specialties and president and CEO of the Quality Cancer Care Alliance, said that her practice hired technology coordinators to visit nursing homes and give patients access to the technology they needed to receive remote care. "We need to give access to care to all patients, regardless of how remote they are," said Dr. Blau. Other panelists said they had patients whose socio-economic status made telehealth impossible. "It's essential to keep in mind social determinants of health," said Adam Riker, MD, FACS, chair of oncology at Anne Arundel Medical Center DeCesaris Cancer Institute. "We could not do telehealth with many of our patients because they do not have access to tools like Zoom or MyChart®."

The emotional and physical burden of patient care during the pandemic has had a huge impact on nursing staff, the panelists agreed. "Nurses are extremely stressed," said Mary Miller, MSN, RN-BC, OCN, nurse manager at Franciscan Health Cancer Center Indianapolis. As a result, she said, many have left their positions for less stressful work. "We have lost 14 of our nurses in the ICU [intensive care unit] alone who are now traveling nurses," Miller said. She added that she has found that frequent and open communication with nursing staff helps, to some extent, manage their fear of the unknown. "We hold regular video chats with staff to keep them updated on what we are doing and why we are doing it," said Miller. "It helps if they understand the reasoning behind our decisions."

Jody Pelusi, PhD, FNP, AOCNP, an oncology nurse practitioner at Honor Health Research Institute, said that it's important to remember that the stress factors affecting staff can extend far beyond those found in the workplace. "Nurses cannot come to work because they have children at home, and schools are closed," said Dr. Pelusi. "Some of them even have food insecurity issues. We need to take care of staff, so they can take care of patients."

All panelists agreed that the effects of the plunging cancer screening rates brought on by the pandemic will be felt far into the future. To bring people back in for their regular screenings, Dr. Riker said that the Anne Arundel Medical Center DeCesaris Cancer Institute has recorded a series of two-minute videos that teach patients the importance of maintaining their screenings and explain to them the actions the cancer center is taking to keep them safe. Fighting patients' fears to come in for screenings is crucial, said Dr. Isola: "The lack of screening for cancer due to the pandemic is going to become evident over the next few years."

While assessing the changed landscape of a healthcare system still in the throes of a global pandemic, Dougherty said it's important to consider how COVID-19 has been and can be a source of disruptive innovation—for good. "COVID-19 has not ignited new problems," said Dr. Dougherty. "It has exacerbated the issues already there. We need to think about how we can apply the innovations wrought of necessity into long-term solutions."

Dr. Isola agreed: "What we have learned from this crisis is that we can be problem solvers."

Telehealth and Revenue Optimization

Telehealth and revenue optimization and their intersection with COVID-19 were hot topics at sessions throughout the week. Speakers discussed the appropriate use of telehealth in cancer care, debated the continuation of such care as the pandemic recedes, and addressed persistent gaps in oncology services in diverse populations.

In the wake of many cancer programs across the United States being compelled to develop some version of telehealth due to COVID-19, session panelists shared their insight into the adequacy of the different platforms through which patient care is delivered remotely. "There is no one-size-fits-all solution," said Kelley Simpson, MBA, director

and practice leader at The Chartis Group. She explained that virtual care should be defined differently depending on where along the cancer care continuum it occurs. For example, the design and goals of telehealth differ depending on whether providers are conducting cancer screenings, discussing treatment options, or providing survivorship and follow-up care.

"The definition of telehealth itself is in dispute," said Feyi Olopade Ayodele, MBA, CEO of Cancer IQ, Inc. She emphasized that by understanding telehealth as simply providing the same in-office services virtually, providers do not take into account the unique capabilities of telehealth and thus sell it short. "Telehealth is not just a new way of conducting typical office visits," said Ayodele. "It can be transformative in the way it provides patient care."

One recurring topic running throughout AMCCBS *Virtual* was the uneven distribution of telehealth services in relation to geography, age, race, and socio-economic status. "We need to understand what the gaps in telehealth are, rather than assume we know them," said Frank Micciche, vice president of public policy and communications at the National Committee for Quality Assurance. "For example, there is an assumption that older people do not like telehealth, but some providers find that older adults accept it more than others, since they've recently needed to learn new technologies to stay in touch with their grandchildren."

"Since the ultimate goal of telehealth is to increase access to care," said Johanna Garzon, MHA, HBAT, cancer center director at Central Care Cancer Center, "it is a big topic of conversation in rural regions." Through Garzon's experience designing and implementing a telehealth program across the ten rural sites her cancer center services in Kansas and Missouri, she has found significant disparities in access to the technology that fuels remote care.

Twenty percent of the patients Central Care Cancer Center serves have a landline phone or non-smart cell phone, precluding them from participating in video-based telehealth visits. Even more surprising to Garzon was her discovery that some patients—and some providers—are unaware of the existence of telehealth. "Eliminating these barriers is key to implementing and effectively using telehealth in rural settings," said Garzon, adding that relatives and care teams can play important roles in providing access to geographically isolated patients.

Garzon has identified poor access to technology as the biggest barrier to the long-term provision of telehealth. "We don't have the same technology that our patients have, and vice versa," she explained. "This poses reimbursement challenges with coverage rules that preclude telephone-only visits."

But whether audio-only communication is appropriate for patient visits is up for debate. Michael Kolodziej, MD, vice president and chief innovation officer at ADVI Health, said that he believes audio-only visits are inferior to video interactions. "If you just do a telephone call, you are unable to visually evaluate the patient," said Dr. Kolodziej. "When you see patients in the office, watching them walk into the room can tell you so much about how they are doing and what treatment may be most appropriate. You don't want to lose that entirely."

Shelley Fuld Nasso, MPP, CEO of the National Coalition for Cancer Survivorship, agreed that though audio-only is inferior to video for patient visits, it's better than nothing. Even if patients have the necessary technology, Nasso said, that doesn't mean they know how to use it: "If you spend half of the visit struggling to talk to a patient who is having problems using the technology, it's better to just have a quality phone call."

In the end, though, telehealth is only as workable as it is reimbursable. Before the dawn of COVID-19, obtaining adequate reimbursement for providing care remotely was a rare feat. Providers fear that, as the pandemic recedes, so too, will coverage for telehealth. "We need an impartial assessment of when and where telehealth is comparable to in-person care," said Micciche. "It's not easy; it will require us to create processes that everyone can agree to."

Ayodele added that, like telehealth itself, reimbursement for telehealth should not take a one-size-fits-all approach. Having a regulatory body or process to impartially identify when telehealth services are superior to or comparable with in-person care will go a long way toward developing appropriate reimbursement guidelines. "If advocacy for telehealth comes from both patients and providers attesting to its value, and showing data proving its value, that is huge," Micciche said. "Show that your costs did not spiral out of control, show that deferred care is more costly. Document it, get patients to advocate for it, and show that to the decision makers."

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