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Developing an Evaluation Process for Telehealth in a COPD Clinic

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ABSTRACT

Developing an Evaluation Process for Telehealth in a COPD Clinic

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Background: Telehealth was broadly implemented as a care modality in response to a worldwide pandemic in 2020. Before the COVID-19 pandemic, while telehealth was not new, it was not widely utilized at the project site location, and a uniform method of evaluating its effectiveness was needed. This quality assurance project developed and piloted a uniform process to evaluate telehealth in a Chronic Obstructive Pulmonary Disease (COPD) clinic, then evaluated stakeholder perceptions about the process used in developing the evaluation tool.

Methods: The telehealth evaluation tool was developed using the National Quality Forum (NQF) framework and Global Obstructive Lung Disease (GOLD) best practice recommendations. A modified Delphi technique was used to survey the stakeholder team to develop measures for the telehealth evaluation tool. The tool was piloted for one cycle of evaluation, then the process used to develop the tool was evaluated by the stakeholders using qualitative and quantitative data.

Results: This project occurred from June 4, 2021, to December 10, 2021 and included 77 patients. The telehealth evaluation tool was piloted retrospectively for one cycle or six weeks. Two of the three quality measures met the level of satisfactory. The stakeholders were satisfied/very satisfied with the process used to develop the COPD telehealth tool.

Discussion: The COPD telehealth evaluation tool should continue with further evaluation cycles and additional measurement criteria. This process can be applied to other specialty or primary care clinics and the tool could be transferrable to other service lines within the healthcare system.

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Developing an Evaluation Process for Telehealth in a COPD Clinic

The COVID-19 pandemic required extensive and abrupt adjustments to healthcare delivery on a global scale and in February 2020, the United States experienced disruptive public health, emergency actions (Koonin et al., 2020). Many states implemented stay-at-home orders to decrease the spread of the virus and these actions impacted all sectors of commerce, including healthcare. At the project site, healthcare provider appointments were canceled unless urgent medical attention was necessary. The healthcare system saw its financial viability threatened as elective surgeries, procedures, and face-to-face visits plummeted. During the early phase of the pandemic, the project site's ambulatory care centers rapidly pivoted to utilizing telehealth as a primary modality to deliver care. The Centers for Disease Control analyzed the use of telehealth services from four of the largest telehealth providers in the United States and documented a 154% increase in telehealth visits in the last week of March 2020 compared to the last week of March 2019 (Koonin et al., 2020). From January 2020 to March 2020, most telehealth visits were for conditions other than COVID-19 (Koonin et al., 2020). Due to the accelerated use of telehealth, there was no formal process at the project site for evaluating the quality of telehealth visits. This project developed a new process for the healthcare system to evaluate the care delivered by telehealth.

Background

During the COVID-19 pandemic, the Centers for Medicare and Medicaid Services (CMS) temporarily loosened Health Insurance Portability and Accountability Act (HIPAA) restrictions making it easier for providers to contact patients through devices of their choice (Health Resources & Services Administration, 2022). The Office of Civil Rights at the Department of Health and Human Resources allowed digital technology like Facetime, Google Duo, Facebook Messenger, and Zoom applications to communicate without penalty for HIPAA non-compliance (U.S. Department of Health and Human Services, 2021). The regulatory changes made through executive orders removed the requirement for complex HIPAA-compliant platforms and

provided consumer convenience using personal devices (Weigel et al., 2020). Clinicians

subsequently met the healthcare needs of patients using telehealth during the COVID-19

pandemic (Weigel et al., 2020). Telehealth improves access to care in underserved populations,

allows patients to access specialist consultations, eliminates travel time, and increases

healthcare resources for patients in rural areas (Yang, 2016). The Health Resources & Services

Administration (2022) endorsed the expansion of telehealth to deliver critical services in rural

areas that lack adequate health care.

Before the COVID-19 pandemic, telehealth was underutilized by healthcare providers,

and multiple barriers were in place, including varying reimbursement by payers, lack of support

from senior healthcare leaders, and lack of evaluation criteria to measure telehealth outcomes

(Ellimoottil, 2018; Weigel, 2020). HIPAA restricted the ability of healthcare providers to contact

patients without having a secure digital platform, creating a significant barrier to provider-patient

encounters (Weigel et al., 2020). As the barriers were lifted through emergency legislation by

federal and state governments, telehealth was rapidly adopted to facilitate healthcare for

Chronic Obstructive Pulmonary Disease (COPD) and other patient populations during the

COVID-19 pandemic, as healthcare systems led a paradigm shift in care delivery to

accommodate stay-at-home orders (Health Resources & Services Administration, 2022).

Because of the continued use of telehealth, it is essential to develop a standardized process

using quality measures to evaluate the efficacy of care delivered by telehealth.

Problem Description

Telehealth was rapidly adopted to provide access to care during the COVID-19

worldwide pandemic. Due to the emergent need and rapid pace at which the transition to

telehealth occurred in 2020, there was little opportunity to develop a process for systematically

evaluating telehealth for its effectiveness and impact, using standardized quality measures.

Healthcare systems and clinicians have become more familiar with telehealth services due to

the number of telehealth visits that have been completed since the start of the COVID-19

pandemic (Koonin et al., 2020). Because providers, patients, and healthcare systems have accepted and adopted the use of telehealth services, telehealth will likely continue to be used after the pandemic is over. Unlike telehealth visits, other care modalities, such as face-to-face visits, are continuously evaluated by healthcare systems and national organizations like National Quality Forum (NQF) (National Quality Forum, 2017).

Problem Statement

The problems in need of a solution were that limited studies were available in the literature evaluating telehealth's effectiveness for patients with COPD that include providers in the interventions, and there was no existing standardized process to measure the effectiveness of telehealth. This Doctor of Nursing Practice (DNP) project sought to contribute to evidence-based practice by developing a standardized approach (tool) for evaluating the efficacy of telehealth in a COPD clinic, piloting the developed tool, and assessing the development process used with the stakeholders for acceptability and transferability to other service lines in the healthcare system where the project was implemented.

Literature Review and Synthesis

To develop the search questions, a literature search was initiated using the population, intervention, comparison, and outcome (PICO) process (Fineout-Overholt & Stillwell, 2019, pp. 39-41). Two questions were developed to guide the project. The first PICO search question was: In patients with COPD (P), is telehealth (I) compared to standard face-to-face medical care (C) an effective means of providing quality care in a COPD clinic (O)? The first search yielded few results relevant to the project, but they were over five years old; the academic institution preferred research less than five years old, therefore, a second PICO was developed.

The second PICO search question guiding the project was: In healthcare systems (P), how is the process of telehealth (I) compared to current face-to-face encounters (C) evaluated for its effectiveness using quality measures (O)? A critical appraisal was performed on the

literature using the Rapid Critical Appraisal checklist to test validity, reliability, and applicability

of the literature to the identified project (Fineout-Overholt & Melnyk, 2019, pp. 710-711).

SQUIRE guidelines (Ogrinc et al., 2016) were used to establish a framework for reporting

information in the manuscript.

Multiple databases were searched using the West Virginia University (WVU) Libraries

website for the first PICO question. These databases were MEDLINE (PubMed), Science Direct,

CINAHL, EbscoHost, and the Cochrane Library. Keywords used in the search were COPD,

telehealth, effectiveness, chronic disease, and quality framework. Studies on pulmonary

rehabilitation, telemonitoring, and self-management were excluded because the project aim was

to concentrate on telehealth when the clinician provided the intervention. Inclusion criteria were

met when a clinician provided the intervention, and the comparison group used face-to-face

encounters. The initial search for literature from 2017 to 2021 did not yield satisfactory results

because search results used remote monitoring equipment or patient self-management

interventions without clinician intervention. Therefore, the search criteria were expanded to

include literature from 2010 to 2021. Using keywords COPD, telehealth, and effectiveness, 120

results, were identified. However, only two (Ringbaek et al.,2015 and McLean et al., 2011) met

the search criteria. The remaining studies were excluded because they focused on pulmonary

rehabilitation or self-management. An additional search utilizing the keyword chronic disease

instead of COPD yielded 100 results. Of these, only one (Cruz et al., 2014) was relevant once

duplicates were removed.

The results of the search previously described yielded only three studies for review: a

meta-analysis (McLean et al., 2011), a systematic review (Cruz et al., 2014), and a randomized

control trial (RCT) (Ringbaek et al., 2015). Providing telehealth care in a COPD clinic is

relatively novel; there is limited data available in the literature related to the evaluation of care,

the care process, and developing a uniform process to evaluate the effectiveness of telehealth.

Critical Appraisal of Literature Related to the First PICO Question

McLean et al. (2011) conducted a meta-analysis that included ten RCTs and 1,004 patients. The purpose of the review was to determine if telehealth had positive outcomes by measuring total exacerbations, quality of life using the St. George's Respiratory Questionnaire (SGRQ), emergency department visits, hospitalizations, and deaths. Interventions were compared with face-to-face visits and comprised video, telephone, or internet-based communications. The technology used via real-time or store and forward data providing objective information including vital signs and spirometry (McLean et al., 2011). Results over 12 months with 449 participants showed a reduction in emergency room visits and hospitalizations with telehealth visits using video, telephone, or internet-based communications when compared to face-to-face visits, [95% confidence interval (CI) of 0.11 to 0.66 and an odds ratio (OR) of 0.27] (McLean et al., 2011). McLean et al. (2011) also reported an odds ratio of 0.46 of having one or more admissions to a hospital over one year. The RCTs showed that patients in the telehealth intervention groups were less likely to seek emergency medical care at a hospital when compared to face-to-face visits but were seen more frequently on an outpatient visit [95% CI 0.11 to 0.66 and OR 0.27] (McLean et al., 2011).

Cruz et al. (2014) a systematic review, reported that telehealth for COPD patients was associated with a significant reduction in hospitalization rates and clinical improvements in exacerbation rates compared to the face-to-face visits with a relative risk (RR) = 0.72; 95% CI=0.53-0.98; p = 0.034. This review included nine studies and a total population of 587. The intervention group included COPD patients with home telehealth, including vital signs, communication, and assessment by clinicians, compared to the control group, who experienced the usual care. Seven studies were RCTs. Cruz et al. (2014) also reported that patients with home telemonitoring had fewer hospitalizations and exacerbations in COPD. Using the St. George Respiratory Questionnaire (SGRQ) to survey the quality of life in both groups, Cruz et al. (2104) showed that the home telemonitoring group (HTMG) had a 17.74% reduction in

SGRQ scores, indicating a better quality of life. Although not statistically significant, the clinical significance of improved quality of life in patients with COPD should not be underestimated.

Ringbaek et al. (2015) conducted a RCT with 281 participants who had moderate to severe COPD and were at high risk for exacerbation if they had experienced a hospitalization for it within the past three years. The RCT showed that telehealth may benefit patients seeking treatment for frequent exacerbations as an alternative to face-to-face visits. For those who used telehealth, 58.2% of patients were treated for at least one exacerbation of COPD not requiring hospitalization compared to the control group of 37.1% (Ringbaek et al., 2015). This RCT concluded that patients with severe COPD who participated in telehealth and weekly consultations were treated more frequently for non-hospitalized exacerbations than the control group.

Critical Appraisal of Literature Related to the Second PICO Question

A comprehensive literature search sought to identify mechanisms to evaluate the effectiveness of telehealth. The CINHAL database was accessed using the WVU Libraries website. Keywords included research design, evaluation, and telehealth. The criteria were narrowed for studies between 2016 and 2021, and 492 results were available. Inclusion criteria consisted of evaluations and models. Criteria for exclusion were studies related to mobile health applications and those where a healthcare provider was not part of the intervention. Only one review was identified, the Model for Assessment of Telemedicine (MAST): A Scoping Review of Empirical Studies (Kidholm et al., 2017).

The Model for Assessment of Telemedicine (MAST): A Scoping Review of Empirical Studies by Kidholm et al. (2017) examined 22 studies that applied MAST as an evaluation framework. Studies from 2013 to 2017 that used the first step of the model or studied the effectiveness and consequences of telehealth were included in the review. The MAST identified lessons from the empirical studies that used it to evaluate telehealth (Kidholm et al., 2017).

The three steps of MAST include: 1) preceding assessment, 2) multidisciplinary assessment that includes seven domains, and 3) transferability assessment. The preceding assessment reviews the purpose of the telehealth application, technology, and maturation of the organization. The multidisciplinary assessment includes the examination of seven domains: 1) health problem and characteristics of the application, 2) safety, 3) clinical effectiveness, 4) patient perspectives, 5) economic aspects, 6) organizational aspects, and 7) socio-cultural, ethical, and legal aspects (Kidholm et al., 2017). The transferability assessment includes cross-border scalability, and generalizability.

To further explore the use of MAST (2017) as an applied framework, a search using the keyword MAST was completed yielding 384 results. The inclusion criteria consisted of MAST, and the exclusion criteria consisted of non-provider studies. This search yielded one review (Kidholm et al., 2017) and one validity study (Kidholm et al., 2018). Both evaluation studies reviewed research that was completed using MAST.

Kidholm et al. (2018) assessed the face validity of MAST by asking a group of European healthcare decision-makers about their perception of the information included in MAST. A workshop was conducted with 19 European decision-makers and experts in telemedicine. The participants were asked to assess the importance of MAST's different domains on a 0-3 Likert scale. Respondents completed two rounds utilizing a modified Delphi process. More than 80% of participants considered the seven MAST domains moderate or highly important in assessing telehealth.

A review of gray literature was also completed using Google Chrome and Google search to identify other possible models that evaluated the efficacy of telehealth. Keywords included quality, framework, telehealth, and evaluation. Inclusion criteria consisted of frameworks for quality evaluation and development. Exclusion criteria consisted of mobile health applications. The search yielded 13 results, and of those, one expert source was identified that provided a framework to evaluate the efficacy of telehealth, the NQF (National Quality Forum, 2017).

The NQF (2017), Creating a Framework to Support Measure Development for Telehealth, is a framework that provides domains, subdomains, and examples of measurement concepts, to organize for program development. Domains of the Telehealth Measurement Framework are:

- access to care

- financial impact/cost

- experience

- effectiveness

An example of subdomain selection for access to care includes access for patient/family/caregiver, the care team, and access to information. Examples of measurement concepts for access to care are services patients received that they could not access otherwise because of geographical barriers and other logistical differences such as, lack of reliable transportation and cost of travel.

Operational Framework

The Plan, Do, Study Act (PDSA) model was applied in this project. The PDSA Cycle is a continuous, systematic process for project management, implementation, and evaluation (Agency for Healthcare Research and Quality, 2020). The PDSA cycle begins with the Plan step. In this step, an overview of the project was presented by the project leader to the initial stakeholders, the executive director of the ACO and population health data analyst. In the Do step, actions were implemented using a modified Delphi technique to select additional stakeholders, select domains and measurement criteria, and select time for one cycle of evaluation. Then the tool was piloted for one cycle of evaluation and the process used to develop the evaluation tool was evaluated by the stakeholders. The Study step analyzed data collected from the quality measures during the pilot and the process used to develop the tool was evaluated using quantitative and qualitative data. The Act step consisted of completing the

pilot evaluation for one cycle defined as a six-week retrospective review. Final results from the pilot using the developed telehealth evaluation tool and the process evaluation were then presented to the stakeholder team. Lastly, the completed evaluation process for telehealth used at the COPD clinic was adopted by the healthcare system.

A modified Delphi technique was used throughout the development of the evaluation tool. A modified Delphi technique is a systematic survey method using questionnaires to obtain consensus from a group on a specific topic of interest. Stakeholders gave input via questionnaires developed by the project leader, and face-to-face meetings were not required when making group decisions. The modified Delphi method allows for a clear representation of the group's opinions, making decision-making more efficient by eliminating long meeting times used for discussion.

Specific Aims

The purpose of this Quality Assurance project was to develop a uniform process for tool development that would evaluate the efficacy of telehealth in a COPD clinic, then pilot the developed tool, and evaluate the process used to develop the tool for system adoption and transferability to other service lines. The project had two aims. The first aim consisted of the tool development and determining the length of the pilot. The second aim was to evaluate the tool during the pilot (one cycle of evaluation) and the process used to develop the tool.

Methods

Context

The project was implemented in an Affordable Care Organization (ACO) in West Virginia, which consists of an academic medical center, an ambulatory care clinic, and two community hospitals. The pilot of the designed evaluation tool occurred in a COPD clinic that is part of the health system. The ACO was interested in the project because telehealth is being considered for permanent adoption in the COPD clinic as an alternative care modality to

increase patient access to healthcare. Telehealth was first used in the COPD clinic as a response to the COVID-19 pandemic beginning March 2020. The care modality of telehealth was new to the healthcare system and was implemented abruptly without a uniform way to measure the effectiveness of telehealth.

Surveys were developed using criteria from the NQF framework and Hickey's (2017) Health Care Teams in Evaluation of Healthcare Quality for DNPs. The tables listed in the chapter Health Care Teams were used as a guide to create the evaluation questions in the Objective 2b Process Evaluation seen in Appendix I (Hickey, 2017).

Since clinical effectiveness was selected as the only measurement domain of the telehealth evaluation tool, Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2020 best practice recommendations were used to guide the development of clinical outcome measures. GOLD 2020 recommendations include a global strategy for diagnosing, managing and preventing COPD (GOLD, 2020). The best practice recommendations include a formal plan to care for patients with COPD. A letter of support from the healthcare system was obtained, and permission was given to access the records needed to pilot the evaluation tool. (See Appendix A).

Intervention/ Process

A team of stakeholders developed the pilot tool to evaluate care delivered via telehealth to patients in a COPD clinic where the project leader practices. The stakeholders were the director of healthcare innovation/executive director of an ACO and the population health data analyst. This group was queried using a questionnaire that was administered via Survey Monkey (an online polling application) regarding the inclusiveness of key participants in this project, and another stakeholder was identified. A data architect was added to the team to assist with data extraction from the data warehouse. The final team of four stakeholders included the project leader, director of healthcare innovation/executive director of the ACO, population health

data analyst, and data architect. Stakeholders were then presented their charge by the project leader.

A modified Delphi technique was used to survey the stakeholders with questionnaires administered via Survey Monkey. The NQF framework, and GOLD guidelines were frameworks used that all stakeholders were familiar with and aligned with the clinic site's existing operational procedures for the implementation and evaluation of projects. Due to the project's scope, the project leader pre-selected the domains/subdomains to be included in the telehealth efficacy evaluation tool. They were:

- effectiveness/clinical

- access to care/access for patient

- experience/patient or experience/ care team

The complete NQF framework (2017) consists of four measurement domain/subdomains. Of those four were the three domains/subdomains listed above in addition to the fourth measurement, financial impact/cost (NQF, 2017). Because the project was focused on developing a clinical tool to evaluate the effectiveness of telehealth, financial impact/cost was excluded from the development tool.

The team chose one or more pre-selected domains/subdomains for the pilot evaluation tool. The team was then asked to define three to five measures applicable to the selected domain/subdomains in the pilot telehealth evaluation tool. Since effectiveness/clinical was chosen as a domain/subdomain, the measures were based upon GOLD guidelines (GOLD, 2020). Values for satisfactorily meeting the measures were established by the stakeholders for each measurement. The stakeholder team then determined a proper estimate of time considered "one cycle" to pilot the newly developed tool.

The tool was developed using a modified Delphi technique with a stepwise approach to facilitate the stakeholder team's decision-making. Stakeholder team decision-making occurred through communication via face-to-face, online meetings, and electronic means. Preselected

measures to arrive at a group consensus were used from the NQF framework and GOLD guidelines. Stakeholders were surveyed to identify measurement criteria important in the evaluation of the effectiveness of telehealth. After each survey round, results were reported to the team before proceeding to the next round. Then stakeholders were asked to evaluate the process used to develop the telehealth tool.

During the pilot, the developed evaluation tool retrospectively examined six weeks of data. This was labeled as one cycle of evaluation. Once one evaluation cycle was completed, the project leader evaluated the data with the previously selected measurement criteria. Results were analyzed, and a comparison was made to determine if each measure was above or below the defined level of satisfaction.

After the pilot of the evaluation tool, the results were presented to the stakeholder team, and the tool's usability was evaluated. The stakeholder team was surveyed to determine their satisfaction with chosen measures evaluating telehealth effectiveness in the COPD clinic (See Appendix I). Finally, the project's development process was evaluated by comparing the pilot results with the selected measurement criteria and results from the tool developed by stakeholders using the NQF framework, modified Delphi technique, and GOLD guidelines.

Feasibility Analysis

The organization's mission statement is "to improve the well-being of all we serve through understanding, respecting, and meeting their health needs" (Mountain Health Network, 2022). The identified health care system is "committed to improving the health and well-being of over one million children and adults in 23 counties in West Virginia, southern Ohio, and eastern Kentucky through understanding, respecting, and meeting their needs" (Mountain Health Network, 2022). The mission statement aligns with the proposed project and commitment to using telehealth to improve patients' health and well-being. The healthcare system rapidly accepted telehealth to provide care during restricted state lockdowns associated with the COVID-19 pandemic, with recommendations for social distancing and masking requirements.

The project leader was an Advanced Practice Registered Nurse (APRN) in a COPD clinic in which the developed tool was piloted and evaluated. The project leader saw patients in COPD clinics at two ambulatory care locations. The project leader confirmed with the population health data analyst that the appropriate technology was available to collect the data. Staff included a secretary and a registered nurse who assisted in scheduling and coordinating care for patients in the COPD clinic. Because telehealth was rapidly initiated in 2020, the healthcare system did not have a telehealth platform integrated with the electronic health record. Therefore, the APRN project leader used a smartphone to contact patients via the Doximity application approved by the organization. Additional resources were not required outside of what was already available at the medical clinic. The NQF telehealth framework was selected over the MAST model as the organization is currently utilizing the NQF and Healthcare Effectiveness Data and Information Set (HEDIS) quality metrics.

During the project, prior to determining how data would be collected, staff contacted patients with COPD and offered an alternative care option using telehealth. If patients agreed they were scheduled for a telehealth appointment; those who declined were seen using a face-to-face visit. The healthcare system had used telehealth to deliver healthcare since 2020, and all policies established by the organization for the use of telehealth were followed. Patients were selected from the established COPD clinic for follow-up visits. The staff was not required to complete any additional training related to this project to care for patients. The clinic staff obtained patient consent for a telehealth visit, required by the healthcare system and government before the telehealth visits, and documented in the health record using the Cerner electronic health record (EHR).

During the pilot (a six-week retrospective review), the population health data analyst and data architect collected data from the Cerner EHR and data warehouse. Results were reported to the project leader, and the data were validated by the project leader and population health data analyst. Results collected from the data warehouse were compared with the COPD clinic

schedule to ensure that all patients were inclusive to the APRN's COPD clinic. The APRN

project leader then presented results to the stakeholder team. After the pilot results were

presented to the stakeholders, the project leader completed the final step by surveying the

stakeholders, as seen in Appendix I, on the process used to develop the telehealth process

development tool and satisfaction with the results of the pilot. The final survey results were

presented to the stakeholders.

Measures and Analysis

Data collected using the modified Delphi technique were analyzed and presented to the

team throughout the process of evaluation measure selection using descriptive statistics such

as frequency, mean, and mode. Data were collected using the Survey Monkey application to

electronically send the survey questionnaires to the stakeholder team. Each survey round was

systematically sent after the results from the previous round were collected, as seen in

Appendices D to I. The measures selected to evaluate telehealth care delivered in the COPD

clinic dictated the descriptive statistics used during the tool's pilot. Both quantitative and

qualitative information related to process evaluation were collected through a final team survey

seen in Appendix I. Data were analyzed and presented to the team after the project to consider

whether to adopt the COPD evaluation tool for ongoing use. The transferability of the telehealth

evaluation criteria development process to other settings and service lines was also evaluated.

Evaluation Plan

The project leader identified organizational stakeholders as initial team members

developing the evaluation criteria for telehealth. All participating team members gave consent

verbally and voluntarily participated in the QA process. Questionnaires were created by the

project leader and included instructions for completion. As the modified Delphi technique

indicated, the project leader dispersed the surveys to the team members individually. Once the

surveys were completed, responses were summarized and presented to the stakeholder team.

If consensus was reached, the summarized responses and consensus decisions were shared with the team to confirm acceptability. A second or third questionnaire survey was conducted if there was no group consensus. The summarized responses from the first round were presented, followed by new survey questions to continue to work toward a consensus decision regarding the topic of interest. No more than three rounds of survey questionnaires were completed in seeking consensus. The project leader compiled the results and presented them in a final report to the stakeholders.

Budget

Organizational and personal contributions required for the project are outlined in the budget (see Appendix B). The budget was an estimated cost of the DNP student's project and no actual monetary funds were used. Due to delays with data collection, the project's timeline was six months instead of the proposed three months; in-kind contributions for the project leader were $7,500 over budget, and organizational contributions for stakeholder time were $4,800 over budget. Clinic staff time was budgeted for eight hours a week for 12 weeks during the pilot and the project delays did not change the budgeted amount; labor costs for clinic staff were unchanged. The project was budgeted to be $16,100. The total operating cost was $28,700 or $12,600 over the projected budget.

Timeline

The planned project was approved by the DNP student's project committee on April 2, 2021 and submitted to the West Virginia University Internal Review Board for approval to conduct the project within ethical boundaries on April 5, 2021. Data collection began on June 1, 2021, until December 4, 2021, and data analysis concluded on December 10, 2021. Results were presented to the group on December 17, 2021. A Gantt Chart with the project's timeline is included in Appendix C.

Measurable Project Objectives/ Detailed Methodology

The development of the uniform process to create an evaluation tool took place from June 1, 2021, to December 4, 2021. An initial in-person meeting was conducted to explain the aims and objectives of the project. Key elements applied in the process pilot included using a modified Delphi technique to collect data and facilitate decision-making efficiently. Reliance on the NQF Framework to Support Measurement Development for Telehealth (2017) organized ideas and provided structure and guidance on which telehealth criteria to evaluate. GOLD (2020) best practice guidelines were used for the domain of clinical effectiveness.

Aim One

The first aim of the project was to develop a uniform process for evaluating care delivered by telehealth. The modified Delphi technique was used, and survey questionnaires were delivered electronically to the stakeholder team by the project leader via Survey Monkey. Each questionnaire was prefaced with the results of the previous survey.

Objective 1a: Determining Team Adequacy identified the stakeholders on the team. The three initial stakeholders identified by the project leader included the project leader, the director of health care innovation/ executive director of the ACO, and the population health data analyst. (See Appendix D).

Objective 1b: Selecting Domains and Subdomains Using the NQF Telehealth Framework were presented to the team to choose for consideration of measurement for the pilot project. The Domain and Subdomain selection included 1) Access to Care/ Access for Patient, Family, or Caregiver, 2) Effectiveness/ Clinical Effectiveness, 3) Experience for Patient, Family, or Caregiver 4) Experience for Care Team. (See Appendix E).

Objective 1c: Selecting Measures for Domains and Subdomains included the team choosing concept measurements to assess the domains and subdomains selected in Objective 1b. Samples of concept measurements for each Domain and Subdomain were based upon the NQF Framework for Telehealth Evaluation Measure Development. For the domain and

subdomain of effectiveness/ clinical effectiveness, GOLD criteria were included as potential measurement concepts. (See Appendix F).

Objective 1d: Determining Satisfactory Goals for Selected Measures included the team defining satisfactory goals to meet each selected measure from Objective 1c. The stakeholders determined what percentage would meet the level of satisfactory of the concept measures selected in Objective 1c. (See Appendix G).

Objective 1e: Defining Cycle for Pilot used the modified Delphi technique, the team determined the length of time to conduct the pilot of the developed tool and whether the analysis would be done retrospectively, prospectively, or in combination. (See Appendix H).

Aim Two

The second aim of the project included two objectives. The first, Objective 2a, was to pilot the developed tool. Then, Objective 2b evaluated the process used to develop the evaluation tool for acceptability, consideration for system adoption, and transferability to other service lines.

Objective 2a: the Pilot included evaluating data from telehealth visits for the time defined per Objective 1e. Quality measure results were computed from the data. Descriptive statistics were used to compare each measure to the specified level of satisfaction determined by the stakeholders in Objective 1d.

Objective 2b: Process Evaluation was completed using a mixed-methods approach using quantitative and qualitative data. Survey questions included a Likert scale and narrative feedback to measure satisfaction with the process used to develop the tool, the efficacy of the pilot evaluation tool, and the potential for expanding the process to other clinics. Core Competencies for Interprofessional Collaborative Practice from Hickey (2017) were used to guide the development of qualitative questions used in the surveys. The evaluation criteria included team-based decision making, NQF Framework, utilization of the modified Delphi

technique, COPD telehealth evaluation tool, and overall experience with the telehealth evaluation development. (See Appendix I).

Ethical Considerations

This QA project developed a uniform process to identify criteria used to evaluate a telehealth efficacy tool in a COPD clinic. During the initially developed evaluation tool pilot for the COPD clinic, patient information was protected by HIPAA and Health Information Technology for Economic and Clinical Health (HITECH) regulations. The care delivery modality (face-to-face vs. telehealth), which was most appropriate for each patient, was utilized based on individual patient needs. Best practices and proper standards of care were adhered to regardless of care modality during the project phase in which the evaluation tool's pilot was implemented.

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Results

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This QA project led a system-level team in developing a method to evaluate care using telehealth in a COPD clinic. Specific aims included 1) developing a uniform process to select specific evaluation criteria to measure the quality of care delivered by telehealth and 2) piloting one cycle of evaluation using the developed tool to examine the results, the effectiveness and acceptability of the evaluation tool, and transferability of the process used in developing the evaluation criteria for adoption across the healthcare system. Data collection and decision-making occurred from June 4, 2021, through December 10, 2021.

Aim One

Objective 1a: Determining Team Adequacy was determined after two rounds of survey questionnaires using the modified Delphi technique, seen in Appendix D. The first survey was sent on June 4, 2021, collecting same-day results, and it was suggested that a data architect be added to the stakeholder team. Survey completion occurred on June 14, 2021, and the team

had a unanimous consensus to add the additional stakeholder. Including the APRN project

leader, the final stakeholder team included four members.

Objective 1b: Selecting Domains and Subdomains for Evaluation: surveys for this

objective were developed on June 1, 2021, seen in Appendix E. The first was sent to

stakeholders on June 21, 2021, and was completed on July 6, 2021. The Likert interest score

had a maximum score of five. Of the four domains/subdomains, Access to Care/Access for the

Patient, Family, or Caregiver and Effectiveness/Clinical Effectiveness were 3.5, and

Experience/Experience for the Patient, Family, or Caregiver and Experience/Experience for the

care team were 2.75.

Because consensus was not reached in Survey I, a second survey was created on July

7, 2021. All stakeholder team members completed the survey by July 9, 2021. In Survey II, the

stakeholder team members were asked to place three selections for Domain/Subdomain in rank

order. Frequency of rank ranked the Domain and Subdomain selection.

For Survey II, Access to Care/ Access for Patient, Family, or Caregiver was selected first

by 75% of the stakeholder team, and Effectiveness/Clinical Effectiveness was chosen second

by 75%. The stakeholders selected Access to Care/Access for Patient, Family, or Caregiver as

the second choice for 25%, and Effectiveness/Clinical Effectiveness was selected first by 25%

of the team. Experience/Experience for the Patient, Family, or Caregiver was chosen as the

fourth choice was 25% of the team, and Experience/Experience for the care team was selected

as the third choice for 25% of the team. Results from Survey II concluded that the stakeholders

preferred Access to Care/ Access for Patient, Family, or Caregiver and Effectiveness/Clinical

Effectiveness. All choices listed above including the results of the second survey round were

presented again to the stakeholders to choose with consideration of the results from the second

survey.

A third survey was required to confirm consensus as per the design of the modified

Delphi technique. The third survey was created on July 9, 2021 and was returned by all four

stakeholders on the same day. The project leader defined the consensus as greater than 50%, confirming the final domain and subdomain selection. The team selected Domains and Subdomains to measure 1) Access to Care/ Access for the Patient, Family, or Caregiver by 100% vote and 2) Effectiveness/ Clinical Effectiveness by 75% vote. All other domains had 50 % or 25% vote, and were excluded from further rounds.

Objective 1c: Selecting Measures for Domains and Subdomains decided on concept measures to include in the pilot telehealth evaluation tool in the COPD clinic, seen in Appendix F. To reach a consensus, each team member received a maximum of three surveys on this topic. Using the NQF Framework for Development of Telehealth Evaluation Measures, the GOLD standards for evidence-based practice in COPD care, the team was asked to select three to five concept measures in rank order, the first being the highest preference, to include in the pilot evaluation of COPD care delivered by telehealth. The measures and domains suggested were:

1) percentage of adult patients screened for tobacco use one or more times within 24 months AND who received cessation counseling if tobacco user (Clinical Effectiveness)

2) able to provide care without admission into ER (Access to Care)

3) percentage of patients with depression screening and follow up plan (Clinical Effectiveness)

4) percentage of adult patients with a diagnosis of COPD who had spirometry results documented (Clinical Effectiveness)

5) providers were able to see more complex patients more efficiently (Access to Care)

6) able to schedule telehealth visit sooner than office visit (decreased wait time) (Access to Care)

7) mileage spared due to saved office visit (Access to Care)

8) percentage of adult patients with a diagnosis of COPD (FEV-1/FVC <70) AND who have

an FEV-1 less than 60% predicated AND have symptoms who were prescribed a long-

acting inhaled bronchodilator (Clinical Effectiveness)

Results with a weighted mean score of less than 2.50 were removed from subsequent rounds. The project leader developed the first survey for this objective on July 11, 2021, and the results were collected on July 14, 2021.

The second survey for this objective was created on July 14, 2021, and the results were collected on July 14, 2021. The consensus was defined as those measures with a weighted mean of 2 or greater. The measures were defined using quality measurement criteria on how the measure would be calculated for the patient population using a numerator and denominator. Three measures were removed from the further selection: 1) "Domain: Access to Care/Measurement Concept: Providers were able to see more complex patients more efficiently (numerator)/ total number of patients seen via telehealth (denominator)," 2) "Domain: Clinical Effectiveness/Measurement Concept: Percentage of adult patients with a diagnosis of COPD (FEV-1/FVC <70) AND who have an FEV-1 <60% predicted AND who have symptoms who were prescribed a long-acting bronchodilator (numerator) / total number of patients seen via telehealth (denominator)," 3) "Domain: Access to Care/Measurement Concept: Mileage spared due to saved office visit (total miles round trip from patients home to clinic office)"

The summary of results from Objective 1c: Measures Selected for Domains and Subdomains Survey II all had a weighted mean score of three or greater and included 1) percentage of patients screened for tobacco use and received smoking cessation counseling, 2) percentage of patients who receive the appropriate level of care without requiring admission to the emergency room, 3) percentage of patients with depression screening and follow up plan, and 4) percentage of adult patients with a diagnosis of COPD who had spirometry results documented.

The third survey confirming consensus for this objective was developed on September 16, 2021, and data was collected from the stakeholder team from September 21, 2021, to September 26, 2021. The stakeholder team was given the top five concept measures identified in the second survey for this objective. The measures included:

1) percentage of patients screened for tobacco use and received smoking cessation counseling: total number of patients screened for tobacco use and cessation counseling (Clinical Effectiveness)

2) percentage of patients with depression screening and follow up plan (Clinical Effectiveness)

3) percentage of adult patients with a diagnosis of COPD who had spirometry results documented (Clinical Effectiveness)

4) percentage of patients who receive the appropriate level of care without requiring admission to ER (Access to Care)

5) able to schedule telehealth visit sooner than office visits. (Access to Care)

The team was asked to consider these results of the selected concept measures and provide a rank order of inclusion of the concept measures for evaluating the selected domain/subdomain (ranking 1-5). The stakeholder team was required to rank order a minimum of three and a maximum of five measures. The concept measures were ranked from highest to lowest mean selection score. Mean selection scores were calculated by multiplying the selection frequency by number of rank order, adding the individual results, then dividing the total sum by five.

Results of Objective 1c that were defined and agreed upon by the stakeholder team were all in the domain of Clinical Effectiveness:

1) patients who were screened for tobacco use and smoking cessation counseling as measured by the total number of patients screened for tobacco use and cessation counseling (numerator)/ total number of patients seen via telehealth (denominator)

2) patients with a depression screening and follow-up plan as measured by the

   percentage of patients with depression screening and follow-up plan (numerator)/

   total number of patients seen via telehealth (denominator)

3) patients who had spirometry results documented as measured by the number of

   patients with spirometry results documented (numerator) as /total number of patients

   seen via telehealth (denominator).

Objective 1d: Determining Satisfactory Goals for Each Measure defined the range of

satisfactory measures to evaluate the effectiveness of telehealth, seen in Appendix G. The first

survey questionnaire was completed on September 27, 2021. The range of responses for

satisfactory performance for 1) percentage of patients screened for tobacco use and received

smoking cessation counseling was 70 to 90%, 2) percentage of patients with depression

screening and follow-up plan was 50 to 80%, and 3) percentage of adult patients with a

diagnosis of COPD who had spirometry results documented was 50 to 80%.

Objective 1d: Satisfactory Goal Measures Survey II was developed by the project leader

on September 28, 2021 and completed by the stakeholder team on the same day. The

satisfactory measurement goals were as follows: 1) percentage of patients screened for tobacco

use and received smoking cessation counseling ranged between 70 and 75%, 2) percentage of

patients with depression screening and follow-up plan was selected as 60% by all team

members, and 3) percentage of adult patient with a diagnosis of COPD who had spirometry

results documented ranged from 70 to 80%.

Objective 1d: Satisfactory Goal Measures Survey III was developed on September 29,

2021 and completed by the stakeholder team on September 30, 2021. The stakeholder team

was surveyed to give a vote of approval of "Yes/ No" for Satisfactory Measurement Goals. For

the measurement of the percentage of patients with depression screening and follow-up plan,

the project leader determined that the proposed mode of 60% would remain the measurement

goal since it had remained the mode over the last two rounds, and 60% was the majority or 75%

vote in survey three. For the measurement goal, the percentage of patients screened for

tobacco use and received smoking cessation counseling, the proposed mean was 73%, and

there was 100% consensus. For the percentage of adult patients with a diagnosis of COPD who

had spirometry results documented, the proposed mean was 74%, and all team members voted

"yes," indicating 100% consensus.

Objective 1e: Defining the Cycle or Period for Piloting the Developed Evaluation Tool

was completed by the stakeholder team on October 8, 2021, seen in Appendix H. Fifty percent

of the team voted for six weeks, 25% for eight weeks, and 25% for 12 weeks. Fifty percent of

the team felt that data should be collected retrospectively, and 25% of the team felt data should

be collected prospectively or a combination of partial retrospective and partial prospective.

Pilot Cycle Definition survey two was created on October 8, 2021, and completed

between October 8, 2021, and October 18, 2021. The survey questionnaire presented the

results from Survey I and queried the stakeholder team with the same answer selections after

the stakeholder team had reviewed the team selection from Survey I. Seventy-five percent of

the team voted for six-weeks for the cycle of time for the use of the pilot tool and 25% voted for

12-weeks. Seventy-five percent of the team voted for data to be collected retrospectively, and

25% of the team voted for a combination of partial retrospective and partial prospective.

Pilot Cycle Definition Survey III was completed by the stakeholder team on November 2,

2021. The survey results were presented from Survey II. The stakeholder team voted with 100%

consensus for a six-week retrospective chart extraction from August 18, 2021, to September 29,

2021.

Aim Two

Objective 2a: The project leader used the developed evaluation tool and extracted data

with the population health data analyst as per the measurement criteria for a six-week

retrospective review of patient records from August 18, 2021, to September 29, 2021. Measure

results were computed from the data extracted, and descriptive statistics were used to compare

each measure and its relationship to the defined level of compliance. One clinic site included 34 patients and the second site included 46 patients, for a total population of 80 individuals meeting the criteria for evaluation. Data were analyzed and validated by the project leader and population health data analyst using Tableau; there were no duplicate entries. After reviewing the data by comparing results from the data warehouse with the APRN's clinic schedule, three patients were not screened for tobacco use, but met exclusion criteria, including one patient in Hospice and two pediatric patients assigned to other providers.

From August 18, 2021, to September 29, 2021, there were 77 telehealth encounters. The percentage of patients with tobacco use and who received smoking cessation counseling was 85%, exceeding the benchmark goal of 73%. The percent of patients with a documented depression screening and follow-up plan was 63.79%, meeting the criteria of the satisfactory measurement goal of 60%. Finally, the percentage of adult patients with a diagnosis of COPD with spirometry results documented was 73.33%, close to the satisfactory measurement goal of 74%,

Objective 2b: Process Evaluation was completed by the stakeholder team on December 10, 2021 seen in Appendix I. A total of 42 questions were queried. The evaluation criteria included: team-based decision-making, utilization of the modified Delphi technique, NQF framework, COPD telehealth evaluation tool, and overall experience with the telehealth evaluation development.

The stakeholder team evaluated the level of satisfaction with selecting domains/ subdomains and developed goal measures. All were satisfied/very satisfied with the domains/ subdomains and definitions/projections of "satisfactory" goals for each step and length of time or "cycle" defined by the team. All quality measurements were selected from the domain of clinical effectiveness, and the stakeholders reported no unexpected findings. Before data collection, the team did not predetermine a minimum number of patients to obtain an adequate sample size.

The total population of patients included in the pilot was 77, and the stakeholders were satisfied with the sample size.

Feedback from process evaluation regarding the modified Delphi technique showed that 75% of the stakeholder team had used the modified Delphi technique for previous projects. The team felt the usefulness of the modified Delphi technique as a method of collecting and sharing data to guide planning was important/ very important in measuring the quality of care delivered by telehealth. It was recommended to continue using the modified Delphi technique across the broader healthcare system to define evaluation measures for the quality of care of telehealth. The stakeholders described the usefulness of the modified Delphi technique with words including teamwork, time efficiency, collaboration, and timing saving.

Stakeholder feedback from the process evaluation demonstrated that all team members agreed/strongly agreed that utilizing the NQF framework for the selection of telehealth measures was effective and recommended continued use of the NQF framework for the selection of criteria used to evaluate the quality of telehealth in the broader health system. All stakeholders unanimously agreed that the NQF framework was the best selection for the process development framework and did not feel another framework would be more effective.

All stakeholder team members were satisfied/ very satisfied with the developed COPD evaluation tool, and stakeholders felt the tool should continue without changes. There were no recommendations to adjust, amend, or abandon the developed tool. The stakeholders felt that evaluating care delivered when utilizing telehealth as a delivery modality was very important/ extremely important and should be expanded to other service lines within the system.

Process Evaluation (Appendix I) included specific feedback from stakeholders on topics such as:opportunities to expand the use of the telehealth tool process to other service lines within the system, establishing a framework for reference, and providing greater access to care for high-risk populations. The stakeholders agreed/strongly agreed that the project placed the interest of patients and populations at the center of interprofessional healthcare delivery and

demonstrated high standards of ethical conduct and quality of care in one's contribution to team-based care, while respecting the dignity and privacy of patients and maintaining confidentiality in the delivery of team-based care.

The process used to develop the telehealth evaluation tool with the stakeholders demonstrated interprofessional practice that provided positive quality improvement opportunities for the healthcare system. Team satisfaction was positive, and the project leader was able to frequently engage with the stakeholder team. All stakeholder team members felt they could use the knowledge of their roles and those of other professions to appropriately assess and address the healthcare needs of patients with COPD. Survey rounds were applied to all team members to optimize patient care.

Discussion

Summary

Telehealth was rapidly adopted to facilitate care in a worldwide pandemic. This QA project was developed to define a uniform process to select specific evaluation criteria to measure the quality of care delivered by telehealth in a COPD clinic. The DNP project was intended for transferability to other healthcare settings and service lines. The project was the first telehealth quality evaluation process developed and evaluated in the healthcare system where the pilot was implemented.

Stakeholders gave input by completing survey questionnaires during the time available throughout the workday, and surveys did not interrupt other work responsibilities. The systematic stepwise approach using electronic surveys and the modified Delphi technique provided continuous progress to complete the project without requiring in-person meetings.

The advantages of using the modified Delphi technique, electronic survey questionnaires, and email communication included effective interprofessional collaboration between busy healthcare leaders who work for one multi-facility healthcare system with varying

office locations. Another advantage was sending out survey questionnaires with Survey Monkey, with responses automatically collected for the project leader to review in a centralized location.

The project was operationalized using the PDSA method and evaluated using the data from individual survey round questionnaires. The PDSA method provided a final evaluation of the tool developed and the effectiveness of telehealth in the population of patients from a COPD clinic. The stakeholders evaluated the tool development and pilot cycle process, determining satisfaction with the overall project. Stakeholders recommended that the tool development process be transferred to another service line to evaluate telehealth services.

Overall, the objectives defined for the project were met, as evaluated by the stakeholders, and there was buy-in to continue the use of the telehealth evaluation tool. The pilot met two of the three satisfactory measurement goals and the process evaluation also had positive feedback from the stakeholders. Clinical effectiveness and access to care were ranked as the top two choices in Objective 1b: Domain and Subdomain selection. However, when the stakeholder team selected Objective 1c: Measures for Domains and Subdomains, the stakeholders selected measures that were all from the domain of clinical effectiveness. Therefore, all quality measures evaluated were from the domain of clinical effectiveness.

Interpretation

This project developed a uniform evaluation tool for telehealth, piloted the tool, and evaluated the process used and the pilot's outcomes. Four stakeholders in the healthcare system participated in the DNP project. The stakeholders, including the executive director of the ACO, population health data analyst, and data architect participate in other quality improvement projects within the healthcare system using the NQF framework. Other project outcomes measured by the healthcare system are usually six-weeks in duration using the PDSA model with rapid cycle analysis. The pilot tool was a six-week retrospective study and aligned with the usual process analysis of other quality improvement projects within the healthcare system. In a

real-world clinical evaluation, to move forward in developing the process evaluation tool, the COPD telehealth evaluation process would continue with consideration for additional assessments.

The stakeholder group favored the process used to develop quality measures and established a satisfactory level of measurement using the modified Delphi technique. The pilot results demonstrated the efficacy of telehealth in a COPD clinic, and the stakeholder team was very optimistic about replicating the tool for another service line in the healthcare system. There was no negative feedback from the stakeholder team regarding the methods used for the project or the outcome of the project.

Limitations

The project's challenges included the project leader having to develop all surveys, organizing the information from the project proposal to Survey Monkey, and presenting data from each survey before proceeding to the next survey questionnaire. Challenges of using the modified Delphi technique included limitations to questions asked only by the project leader, stakeholders did not have input developing questions but had an opportunity to provide feedback. Another limitation was waiting on replies from all team members before proceeding to the next round of survey questionnaires. Developing survey questionnaires and presenting data in charts was time-consuming. Survey Monkey was very effective in calculating the results, but it was challenging to place the prior survey results as an image/graphic for the subsequent survey. Another challenge included transferring the data from Survey Monkey in image/graphic to a Word document; the formatting between the two software systems was complicated.

Another limitation is that only three quality measures were selected for evaluation. The measures selected were important clinical indicators, but they do not fully encompass the full range of indicators that might be used to evaluate the quality of telehealth care. The tool did not evaluate access to patient care or acceptability for patients or providers.

The total number of patients in the pilot was 77 for six-weeks, and the team felt that the number of patients in the population were acceptable for analysis. Only one six-week cycle of the pilot evaluation was completed. In the future, the stakeholder team should consider defining a minimum number of patients acceptable for the pilot using the selected quality metrics and consider additional cycles of evaluation for reliability of the results rather than a discreet period of time.

Conclusions

The NQF framework (2017), Creating a Framework to Support Measure Development for telehealth, guided the selection process development for the telehealth evaluation tool. The NQF framework was selected because of clarity and the healthcare system's familiarity with the NQF framework criteria for quality metric evaluation. The project was planned, implemented, and evaluated using the PDSA method. The stakeholders selected the Domain of Clinical Effectiveness, and GOLD (2020) best practice recommendations were used as clinical outcome measures. The GOLD guidelines formalize a written plan for treating patients with COPD and the evidence-based practice guidelines aligned with the healthcare system's recommendations for patient treatment.

The MAST model was not used to develop the evaluation tool; rather the MAST method of data collection using the modified Delphi technique was used to survey stakeholders. The validity of the MAST was included in the Literature Review and Synthesis but was not primarily used to develop the telehealth evaluation tool. However, consideration of the MAST (2017) recommendations to establish a multidisciplinary assessment using the subdomain of clinical effectiveness was reflected on when developing the COPD evaluation tool. The domain/subdomain of clinical effectiveness also aligned with the NQF framework (2017) domain/subdomain clinical measures. Since the stakeholders selected to measure domains of clinical effectiveness, it would be beneficial in the future to evaluate other domains of MAST including safety, patient perspectives, and financial impact.

This project is sustainable in that it is transferable to other providers and other chronic care populations. Future implications include using the process of developing the evaluation tool to assess different domains of effectiveness with COPD telehealth visits as well as use of telehealth visits with patients having other chronic diseases. Results of this project can also be used to develop a more comprehensive evaluation of care, including all domains from the MAST model across the healthcare system's network. Since this tool has been planned, implemented, and evaluated by stakeholder team members of the healthcare system, the process is now familiar and can be developed and implemented more rapidly.

In the future, the project leader would recommend the same process development, use of the NQF framework, and use of Survey Monkey to send electronic questionnaires and collect data. It was suggested twice that having a quality manager to prevent care gaps would have been helpful to the stakeholder team. To follow a concise timeline, the project leader should set expectations of when surveys are due, follow up on pending surveys, and consider moving to the next round if more than 50% of the stakeholder team has submitted responses to stakeholder questionnaires. There should be consideration of developing an objective early in the process to obtain group consensus when the stakeholders agree to proceed when all survey questionnaires have not been received. Due to response delays, the project was three months longer than anticipated and was $12,600 over the projected budget. Also, consideration for a minimum number of patients to determine an adequate sample size is recommended for subsequent projects.

Since the project concluded there have been varying state-to-state regulations. When the executive orders were near expiration the project site organization communicated to staff that only audio-visual visits would be continued. The project leader had direct experience with the elderly population not being as savvy using technology and preferring telephone over audio-visual visits due to difficulties operating smartphone devices. Additionally, in rural areas of West

Virginia, many patients reported broadband and mobile phone services were not accessible, and telephone visits were the only option to provide care using telehealth.

In conclusion, the stakeholders felt the development process of the telehealth evaluation tool was effective. All stakeholders confirmed that the transferability to another service line could be quickly done using the method created to draft the tool piloted in the COPD clinic. The next steps for transferability of this process development tool will be application to the cardiology service line. The healthcare system has all the resources to implement this process except for labor costs; there are no other anticipated costs to implement this process across multiple service lines in the healthcare system. The Process Evaluation in Appendix I confirmed that stakeholders agree/ strongly agree that using the modified Delphi method to survey stakeholders was practical and would be favorable to continue in the development of additional evaluations of the effectiveness of telehealth in a health care system.

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Appendix A

Letter of Support

MHC+
ACO

March 15, 2021

Dr. Toni Dichiacchio
6400 Health Sciences South
Room 6402
Morgantown, WV 26506

Dear Dr. Dichiacchio,

Re: Letter of Support for Jodi Biller's Project (sent electronically)

I am providing this Letter of Support for Jodi Biller's Capstone Project, captioned "Developing an Evaluation Process for Telehealth in a COPD Clinic" to be conducted at Mountain Health Network's Cabell Huntington Hospital and Marshall Health is endorsed in full by myself and other leaders of MHC Accountable Care Organization, LLC. Our leadership team intends to provide full support and access to data needed by Ms. Biller to complete the project.

Sincerely,

David Campbell

Director of Health Care Innovation at Cabell Huntington Hospital
Executive Director of MHC-ACO

Appendix B

Budget

Budget Categories	Personal Funds	Organizational Contributions	Budgeted Cost	Actual Cost	Variance
ADMINISTRATIVE COSTS APRN time 12 hours a week for 12 weeks	$7,500, in kind contribution of APRN salary	$ 0	$7,500	$15,000	($7,500)
MARKETING	$0	$0	$0	$0	$0
EDUCATIONAL MATERIALS/ INCENTIVES	$0	$0	$0	$0	$0
HOSPITALITY (food, room rentals, etc.)	$0	$0	$0	$0	$0
PROJECT SUPPLIES (office supplies, postage, printing, etc.)	$0	$300	$300	$300	$0
TRAVEL EXPENSES	$0	$0	$0	$0	$0
OTHER: Clinic staff time 8 hours a week for 12 weeks	$0	$3,800	$3,800	$3,800	$0
Stakeholder time 4 hours a week for 12 weeks/ ACO executive director, population health data analyst, data architect	$0	$4,800	$4,800	$9,600	($4,800)
TOTAL	$7,500	$8,600	$16,100	$28,700	($12,600)

Appendix C

Project Timeline
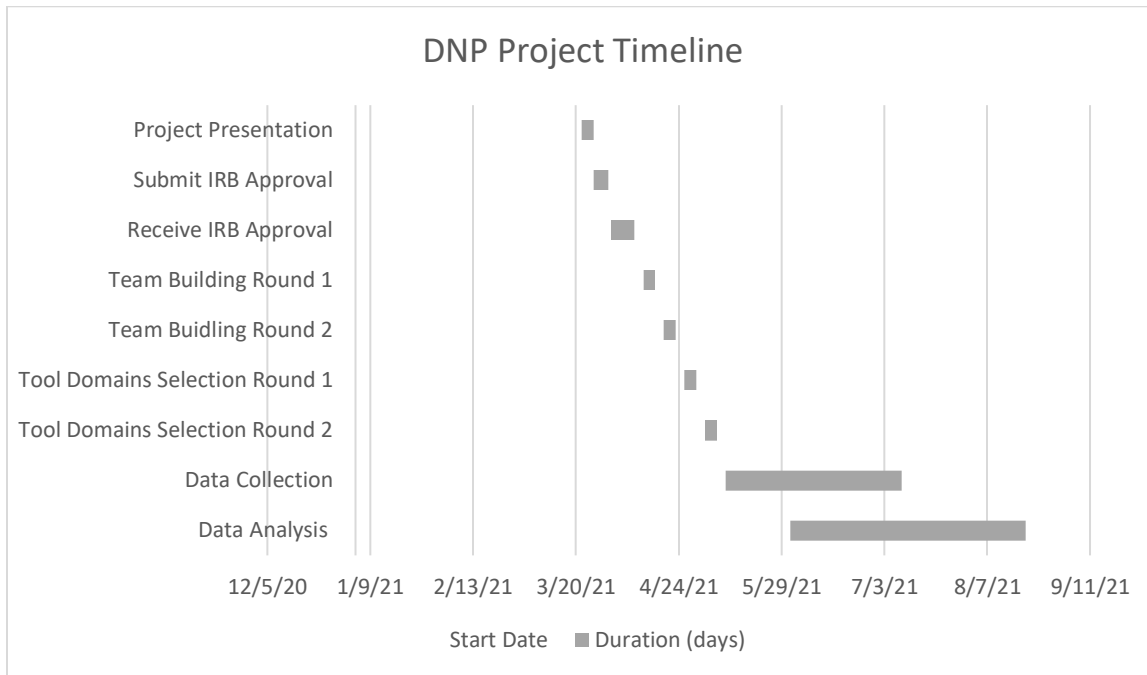
Appendix D

Objective 1a: Team Adequacy

Evaluation method: Delphi technique, maximum of 2 rounds. Results from each round will be collated and reported using descriptive statistics.

Survey I:

1. The initial team assembled to develop a method to monitor the quality of care delivered by telehealth consists of: the project leader, the executive director of the ACO, and population health data analyst.

    a. For purposes of this project, do the aforementioned team members include all the necessary perspectives, knowledge, skills and authority required for the development and pilot implementation of a tool to evaluate care using telehealth provided to patients of the COPD clinic? (a) Yes (b) No

    b. If no, what additional team members should be added (by position) and why?

If consensus [all answer (a) as Yes], no further action required; team is assembled, and team members will be informed of the consensus decision.

If no consensus,

Survey II:

2. The initial team assembled to develop a method to monitor the quality of care delivered by telehealth consists of: the project leader, the executive director of the ACO, and population health data analyst. For purposes of this project, it has been recommended that _____ be added to the initial team assembled for [the reason described in round 1].

    a. For purposes of this project, do you concur with the addition? (a) Yes (b) No

    b. If no, why?

Appendix E

Objective 1b: Domain and Subdomain Selection

Evaluation method: Delphi technique, maximum of 3 rounds. Results from each round will be collated and reported using descriptive statistics.

Survey I:

Using a Likert scale of 0-4 (0 = no interest, 1 = of little importance, 2 = of average importance, 3 = very important, 4 = absolutely essential), rank the following Domains/Subdomains for interest in measuring in the pilot telehealth evaluation tool for the COPD clinic:

1. Access to Care/Access for patient, family or caregiver: 0-1-2-3-4
2. Effectiveness/Clinical Effectiveness: 0-1-2-3-4
3. Experience/for patient, family or caregiver: 0-1-2-3-4
4. Experience/for care team: 0-1-2-3-4

Results:

Domain/Subdomain	Mean Likert Interest Score (max of 5)
Access to Care/Access for Patient, Family or Caregiver	
Effectiveness/Clinical Effectiveness	
Experience/Experience for Patient, Family, or Caregiver	
Experience/Experience for Care Team	

Survey II:

Summary of results from Survey I:

Domain/Subdomain	Mean Likert Interest Score (max of 5)
Access to Care/Access for Patient, Family or Caregiver	
Effectiveness/Clinical Effectiveness	
Experience/Experience for Patient, Family, or Caregiver	
Experience/Experience for Care Team	

Using this information and continuing to consider feasibility of measurement and organizational priority of the domains and subdomains, rank in order (1 = 1st choice) the 3 domains/subdomains you believe should be included in the pilot telehealth evaluation tool. You may select to only rank a first choice if you believe only one should be measured; you may select to only rank a first and second choice only if you believe only two should be measured in the pilot.

1. Access to Care/Access for patient, family or caregiver: 1- 2- 3
2. Effectiveness/Clinical Effectiveness: 1-2-3
3. Experience/Experience for Patient, Family, or caregiver: 1-2-3
4. Experience/Experience for care team: 1-2-3

Survey III:

Summary of results from Survey II:

	1st	2nd	3rd
Access to Care/Access for Patient, Family or Caregiver	Frequency of 1st rank	Frequency of 2nd rank	Frequency of 3rd rank
Effectiveness/Clinical Effectiveness			

Experience/Experience for patient, family caregiver			
Experience/Experience for care team			

Using this information, and further reflecting on feasibility of measurements and priority to the organization of each domain and subdomain, use an approval vote of "yes" if you believe the domain/subdomain should be included in the pilot tool for telehealth evaluation. Select "no" if you think the domain/subdomain should be excluded in the pilot tool.

1. Access to Care/Access for Patient, Family or Caregiver: yes, no
2. Effectiveness/Clinical Effectiveness: yes, no
3. Experience/Experience for Patient, Family, Caregiver: yes, no
4. Experience/Experience for Care Team: yes, no

No further rounds will be conducted. The project leader will use all information collected to determine the consensus of the team on which Domain(s)/Subdomain(s) to include for measurement in the pilot evaluation tool with a minimum of 1 and maximum of 3. The project leader will provide the results of approval vote and the final selection of the domains/subdomains.

Appendix F

Objective 1c: Measures Selected for Domains and Subdomains

Evaluation method: Delphi technique, maximum of 3 rounds. Results from each round will be collated and reported using descriptive statistics.

Survey I:

Using the chart below, the NQF Framework for Development of telehealth Evaluation Measures, the GOLD standards for evidence-based practice in COPD care (when considering clinical effectiveness) and the information session presented regarding the aim of this project at its outset, 3-5 concept measures/measurements for inclusion in the pilot tool to evaluate care delivered by telehealth to COPD patients will be selected. Using the aforementioned as guides and considering the feasibility of available data to extract for selected concept measures, select no less than 3 and no more than 5 measures, in rank order (1st being highest preference for selection) to include in the pilot tool for evaluation of COPD care delivered by telehealth.

Each of the domains/subdomains the team previously selected must have at least 1 concept measure/measure for evaluation. Examples of concept measures are provided in the table below however they table is not necessarily inclusive of all possible measures for the domain/subdomains the team elected to evaluate thus you may add any applicable concept measure/measure not otherwise noted if it relates to one of the domains/subdomains selected (final questionnaire will list the domain/subdomains selected from previous Delphi round for which a measure for evaluation must be selected):

1. X
2. X
3. X
4. X
5. X

Potential Concept Measures/Measures include (sample only; concept measures will only be presented for those domains/subdomains selected in previous Delphi round; if domain/subdomains were excluded on previous Delphi round sample concept measures for those will not be included in the questionnaire). The actual questionnaire will include only those

domains/subdomains and associated concept measures that may be selected as criteria for

evaluation for those domains/subdomains):

Domain/Subdomain	Concept Measure 1	Concept Measure 2	Concept Measure 3	Concept Measure 4
Effectiveness/Clinical Effectiveness	% of patients utilizing telehealth with pneumococcal vaccine	Percentage of patients aged 18 years and older with a diagnosis of COPD (FEV1/FVC <70%) and who have an FEV1 less than 60% predicted and have symptoms who were prescribed a long-acting inhaled bronchodilator	Percentage of patients aged 18 years and older with a diagnosis of COPD who had spirometry results documented	Percentage of patients aged 18 years and older who were screened for tobacco use one or more times within 24 months AND who received cessation counseling intervention if identified as a tobacco user
Access to Care/Access for Patient, Family, Caregiver	Mileage spared due to saved visit to office	Able to provide care without admission into the ER	Increased likelihood for a patient to access the telehealth modality for an encounter	Able to schedule telehealth visit sooner than in-office visit (wait time decrease)
Experience/Experience for Patient, Family, Caregiver	Amount of patient's time used during a telehealth consultation	The system was able to effectively provide the care that was recommended	Decrease in waiting room times for patients	Fuel cost saved due to spared office visit
Experience/Experience for Care Team	Technologies were in a satisfying condition for providers to do their job (visit completed without technological	No-shows for scheduled telehealth visits	Satisfaction in telehealth capturing the appropriate clinical variable	Satisfactory visit for the provider

	disruptions impeding visit)			

Results will be collated and scored based on frequency of selection (at any rank), and by mean selection score with measures ranked 1st receiving 5 points, 2nd 4 points, 3rd 3 points, 4th 2 points, and 5th 1 point.

Concept Measure/Measure	Domain/Subdomain	Frequency Selected	Mean Selection Score

Survey II:
Summary of results from Survey I:

Concept Measure/Measure	Domain/Subdomain	Frequency Selected	Mean Selection Score

Considering these results and reflecting on the ease of which any measures which are currently in concept format only can be objectively measured, provide an approval vote of "yes" for inclusion and a definition of how each approved concept measure will be collected/computed for those concept measures/measures you feel should be included in the pilot tool. (Example of "approved" concept measures are listed below; final questionnaire will provide (actual results will be presented per Survey 1):

1. Amount of patient's time used during telehealth consultation: time in minutes from virtual waiting room "check-in" to completion of the visit (yes/no)

   _____.

2. Percentage of patients screened for tobacco use and received smoking cessation counseling:
   total number of patients screened for tobacco use and cessation counseling (numerator)/total number of patients seen via telehealth (denominator) (yes/no)

   _____.

3. Percentage of patients 18 years and older who had spirometry documented: <u>total number of patients 18 or older with documented spirometry (numerator)/ total number of patients 18 or older seen via telehealth (denominator) (yes/no)</u>

    _____.

4. Mileage spared due to saved visit to office: using map application compute miles from home address to office address for those telehealth visits completed (yes/no)

    _____.

Summary of results from Survey II:

Concept Measure/Measure	Domain/Subdomain	Frequency Selected	Mean Selection Score

Survey III:

Considering these results of the selected concept measures, provide a rank order of inclusion of the concept measures for evaluation of the selected domain/subdomain (ranking 1 – 5); a minimum of 3 TOTAL concept measures will be selected and each domain/subdomain previously selected by the team must have at least 1 concept measure for evaluation. You must rank order a minimum of 3 measures and a maximum of 5. For the measures you select to rank, please also indicate "yes" for approval of the   method for which the measure will be calculated. If you do not agree with the method for which the measure is to be calculated, notate a suggested alternative method to calculate the measure for evaluation in the pilot tool. For the purpose of the project this will be the last round and results will be presented after selection. Results will be listed in the table as per results from Survey II

Concept Measure/Measure	Domain/Subdomain	Definition/Calculation of Measure	Rank Order	Approval of definition/calculation of measure (yes/no)
Mileage spared by avoiding office visit	Access to Care/ patients, caregivers	Mileage from home to office via map application x 2		

Appendix G

Objective 1d: Satisfactory Goal Measures

Evaluation method: Delphi technique, maximum of 3 rounds. Results from each round will be collated and reported using descriptive statistics.

Survey I:

The level of achieving a measure successfully on those selected for evaluation for the domains/subdomains chosen by the team for the pilot tool are to be established in the following questionnaire. Please define what level of meeting the definition or calculation of the following measures are satisfactory or anticipated. (Examples listed below may vary based on previous round selection of measures; questions will reflect selections from team in the previous rounds).

1. Percentage of patients utilizing telehealth with a pneumococcal vaccine. Satisfactory percentage _____.
2. Percentage of patients aged 18 years and older with a diagnosis of COPD and who have a FEV-1 less than 60% of predicted and have symptoms who were prescribed a long-acting inhaled bronchodilator. Satisfactory percentage _____.
3. Percentage of patients aged 18 years and older with a diagnosis of COPD who had spirometry results documented: number of telehealth patients with spirometry documented in chart (numerator)/total telehealth visits completed (denominator) Satisfactory percentage _____.

Survey II:

Summary of results from Survey I will be presented using descriptive statistics including range, median, mode and mean as applicable to each level of satisfactorily meeting the selected measures. Results of satisfactory measurement goals will be included from the previous survey

Measurement	Range of Satisfactory Measures	Satisfactory Mean	Satisfactory Median	Satisfactory Mode
1. Satisfactory percentage of	80 (low) – 100 (high)	90	90	NA

patients utilizing telehealth with a pneumococcal vaccine				
2. Satisfactory percentage of patients aged 18 years and older with a diagnosis of COPD and who have a FEV-1 less than 60% of predicted and have symptoms who were prescribed a long-acting inhaled bronchodilator	80 (low) – 90 (high)	87	90	90
3. Satisfactory percentage of patients aged 18 years and older with a diagnosis of COPD who had spirometry	80 (low) – 90 (high)	87	90	90

results documented				

Reflecting on the information summarized from feedback of all team members, what should be the defined level of satisfactorily meeting the selected measures be set for the pilot evaluation tool

1. Satisfactory percentage of patients utilizing telehealth with a pneumococcal vaccine? _____

2. Satisfactory percentage of patients aged 18 years and older with a diagnosis of COPD and who have a FEV-1 less than 60% of predicted and have symptoms who were prescribed a long-acting inhaled bronchodilator? _____

3. Satisfactory percentage of patients aged 18 years and older with a diagnosis of COPD who had spirometry results documented? _____

Survey III:

Below is a presentation of summary of Survey II selections, please give an approval vote of Yes/No for Satisfactory Measurement Goals.

Satisfactory Measurement Goals (Mode primary choice; mean secondary if no mode)	Approval Vote (Yes/No) Satisfactory Measurement Goals
1. The telehealth Evaluation Team propose a satisfactory percentage of patients utilizing telehealth with a pneumococcal vaccine is greater than ____.	
2. The telehealth Evaluation Team propose a satisfactory percentage of patients aged 18 years and older with a diagnosis of COPD and who have a FEV-1 less than 60% of predicted and have symptoms who	

were prescribed a long-acting inhaled bronchodilator is greater than ____.	
3. The telehealth Evaluation Team propose a satisfactory percentage of patients aged 18 years and older with a diagnosis of COPD who had spirometry results documented: number of telehealth patients with spirometry documented in chart (numerator)/total telehealth visits completed (denominator) is greater than ____satisfactory number of telehealth visits with spirometry documented in chart ____.	

For purposes of the limited scope of this project, the project leader will make the determination if there is no consensus on the satisfactory level of acceptance measurement goals based on the feedback collected after 3 rounds. The final team will be notified of the final agreed upon satisfactory measurement goals.

Appendix H

Objective 1e: Pilot Cycle Definition

Evaluation Method: Delphi technique, maximum of 3 rounds. Results from each round will be collated and reported using descriptive statistics

Survey I:

For purposes of piloting the developed evaluation tools with the measures selected, a definition of a "cycle" time for evaluation requires selection. Some considerations for determining an adequate length of time to pilot the evaluation tool include adequacy of telehealth visits for which measurement data may be extracted and the typical time periods in which other quality measures for reporting are extracted and reported by the organization.

Select one option to define "one cycle" of evaluation for the project:

1. The appropriate length of time to represent a "cycle" for use of the pilot tool to evaluate the quality measures selected:

	4 weeks	6 weeks	8 weeks	10 weeks	12 weeks
X for selection					

Select one option for data collection:

2. Do you feel the data collected should be:
   a. Retrospective chart reviews
   b. Prospective chart reviews
   c. Combination of partial retrospective and partial prospective chart reviews

Survey II:

Summary of results from Survey I:

Considering the results from Survey I:

The appropriate length of time to pilot the evaluation tool as one "cycle" is:_____ weeks.

The appropriate method in which data should be extracted is:

Prospective _____

Retrospective _____

Using both prospective and retrospective data extraction starting on a date certain of _____

Survey III:

Summary of results from Survey II will be presented with descriptive statistics.

Using approval by voting "yes", please select which of the following is an acceptable length and method of a "cycle" for pilot of the evaluation tool developed:

1. 12 weeks with ½ being retrospective chart extraction and ½ being prospective chart extraction starting with the 12 weeks beginning 4/1/2021 and ending 6/30/21: _____

2. 6 weeks prospectively starting 5/1/2021: _____

3. 8 weeks prospectively starting 6/1/2021: _____

For purposes of the limited scope of this project the project leader will determine an adequate cycle for purposes of piloting the evaluation tool if consensus is not reached after 3 rounds.

Appendix I

Objective 2b: Process Evaluation

Evaluation Method: Mixed method using developed survey to evaluate the process of development of piloted evaluation tool.

Using a Likert scale of 0-4 (0 = strongly disagree, 1 = disagree, 2 = undecided, 3 = agree, 4 = strongly agree), consider and rank your satisfaction with the following aspects of the project utilized to develop criteria to evaluate telehealth care delivery

      a. Team-based decision making –For purposes of developing an evaluation tool to measure quality of care delivered by telehealth, was using team-based decision making appropriate? 0-1-2-3-4

      b. For the purposes of this pilot, was the team that developed the pilot evaluation tool inclusive of all stakeholders required for maximum efficiency and effectiveness?

         0-1-2-3-4

      c. Qualitative feedback: What additional stakeholders would you recommend to be included on the team that developed the pilot evaluation tool in retrospect?_____.

b. National Quality Forum Framework –

      a. For purposes of developing evaluation criteria to measure the quality of care delivered by telehealth, was utilizing the NQF Framework for Selection of telehealth Measures effective? 0-1-2-3-4

      b. How likely are you to recommend continued use of the NQF Framework to guide selection of criteria used to evaluate the quality of telehealth in the broader health system (5 being very likely)? 0-1-2-3-4

      c. What elements of the NQF Framework did you find limiting or negative?

      d. What elements of the NQF Framework did you find most useful?

      e. Are there other telehealth Evaluation Frameworks that would be more effective?

        _____

        _____

        _____.

c. Delphi Technique –

Using a Likert scale of 0-4 (0 = not important, 1 = slightly important, 2 = moderately important, 3 = important, 4 = very important)

    a. Have you used the Delphi Technique historically in other projects you have participated in? Yes, No

    b. For purposes of developing an evaluation tool for measuring the quality of care delivered by telehealth, how useful was the Delphi technique as a method of collecting and sharing data to guide planning? 0-1-2-3-4

    c. How would you rank the technique as to efficiency (time-saving/simplicity) 0-1-2-3-4

    d. How would you rank the technique as to effectiveness (adequate information collected to make decisions) 0-1-2-3-4

    e. How likely are you to recommend the continued use across the broader healthcare system to define evaluation measures for the quality of care of telehealth? 0-1-2-3-4

    f. What did you find most helpful about the technique?:
    _____.

    g. What did you find most limiting or negative about the technique?

d. COPD telehealth evaluation tool –

Using a Likert scale of 0-4 (0 = very dissatisfied, 1 = dissatisfied, 2 = neither, 3 = satisfied, 4 = very satisfied),

    a. Considering the pilot implementation and results of the developed tool, how satisfied are you with the domains/subdomains selected? 0-1-2-3-4

    b. In regard to the domains/subdomains selected for project, were there any unanticipated findings or events resulting from the selected domains (positive/negative feedback on domain/subdomains selected):
    _____

    c. Considering the pilot implement and results of the developed tool, how satisfied are you with the measurements selected? 0-1-2-3-4

    d. In regard to the measures selected for the project, were there any unanticipated findings or events resulting from the use of the measures (positive/negative feedback on measures selected)_____

   e. Considering the pilot implementation and results from the developed tool, how satisfied are you with the definition/projections of "satisfactory" goals for each measure? 0-1-2-3-4

   f. In regard to the definition/projects of "satisfactory" for each measurement goal, were there any unanticipated findings or events resulting from the definition of "satisfactory" (positive/negative feedback on goals set)_____

   g. Considering the pilot implementation and results from the developed tool, how satisfied are you with the length of time piloted or "cycle" time defined? 0-1-2-3-4

   h. In regard to the length of method of defining one "cycle" for evaluation, were there any unanticipated findings or events resulting from the term set for a "cycle" to pilot the tool (positive/negative feedback from the length of time and method for tool pilot)_____

   i. Overall, how satisfied are you with the developed COPD evaluation tool 0-1-2-3-4

      I. Should the tool continue as is

         _____.

      II. Should the tool be adjusted/amended and continue

          How if so: _____.

      III. Should the use of the tool be abandoned

           _____?

e. Telehealth Evaluation Development overall –

   Using a Likert scale of 0-4 (0 = no interest, 1 = of little importance, 2 = of average importance, 3 = very important, 4 = absolutely essential),

   a. How important do you feel evaluating care delivered when specifically utilizing/integrating telehealth as a delivery modality is? 0-1-2-3-4

   b. Do you believe the evaluation of telehealth as a delivery modality should be expanded to other service lines within the system? 0-1-2-3-4

   c. Do you recommend replication of the process used to develop the pilot tool for the COPD clinic be used for future development of telehealth care delivery? 0-1-2-3-4

    d. Qualitative: Positives/Improvement opportunities in expanding the use of the process to other service lines within the system?

_____

_____

_____

_____

f. Interprofessional Practice –

Using a Likert scale of 0-4 (0 = no interest, 1 = of little importance, 2 = of average importance, 3 = very important, 4 = absolutely essential)

    a. Do you feel this project places the interest of patients and populations at the center of interprofessional health care delivery? 0-1-2-3-4

    b. Do you feel this project demonstrates high standards of ethical conduct and quality of care in one's contributions to team-based care? 0-1-2-3-4

    c. Do you feel this project respects the dignity and privacy of patients while maintaining confidentiality in the delivery of team-based care? 0-1-2-3-4

    d. Qualitative: Positives/ Improvement opportunities?

_____

_____

g. Roles and Responsibilities –

Using a Likert scale of 0-4 (0 = strongly disagree, 1 = disagree, 2 = undecided, 3 = agree, 4 = strongly agree)

    a. Do you feel that you were able to use the knowledge of your individual role and those of other professions to appropriately assess and address the health care needs of patients with COPD? 0-1-2-3-4

    b. Do you feel the project leader engaged in continuous professional and interprofessional development to enhance team satisfaction? 0-1-2-3-4

    c. Do you feel the survey rounds were applicable to all members of the team to optimize patient care? 0-1-2-3-4

    d. Qualitative: Positives/ Improvement opportunities?

_____

_____

h. Interprofessional Communication –

Using a Likert scale of 0-4 (0 = strongly disagree, 1 = disagree, 2 = undecided, 3 = agree, 4 = strongly agree)

a. Do you feel the Delphi technique is the best way to organize and communicate information at a system level when facilitating interaction that enhances team function? 0-1-2-3-4

b. Do you feel this development of a telehealth evaluation process was the best way to perform effectively on a team and still able to maintain other team roles in a variety of settings? 0-1-2-3-4

c. Qualitative: Positives/ Improvement opportunities?

_____

_____