Creating a Framework to Support Measure Development for Telehealth

FINAL REPORT

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NATIONAL QUALITY FORUM

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EXECUTIVE SUMMARY

Telehealth offers tremendous potential to transform the healthcare delivery system by overcoming geographical distance, enhancing access to care, and building efficiencies.[1] The Health Resources and Services Administration (HRSA) defines telehealth as "the use of electronic information and telecommunications technologies to support and promote clinical healthcare, patient and professional health-related education, public health and health administration."[2] Although it does not represent all existing definitions for this important area of health information technology (health IT) across both the private and public sectors,[3] there is general consensus that telehealth supports a range of clinical activities, including:

- Enhancing interactions among providers to improve patient care (for example, consultation with distant specialists by the direct care provider);
- Supporting provider-to-provider training;
- Enhancing service capacity and quality (for example, small rural hospital emergency departments and pharmacy services);
- Enabling direct patient-provider interaction (such as follow-up for diabetes or hypertension; or urgent care services);
- Managing patients with multiple chronic conditions from a distance; and
- Monitoring patient health and activities (for example, home monitoring equipment linked to a distant provider).[4]

The U.S. Department of Health and Human Services (HHS) called upon the National Quality Forum (NQF) to convene a multistakeholder Telehealth Committee to recommend various methods to measure the use of telehealth as a means of providing care. The Committee was charged with developing a measurement framework that identifies measures and measure concepts and serves as a conceptual foundation for new measures, where needed, to assess the quality of care provided using telehealth modalities.

This report and the conceptual framework herein serve as the foundation for future efforts by measure developers, researchers, analysts, and others in the healthcare community to advance quality measurement for telehealth. By identifying some of the highest-priority areas for measurement, this report may support the development of measures that incorporate into a telehealth environment as part of an iterative development process. Measurement based on iterative and continuous learning will successfully inform future telehealth quality improvement efforts, including emerging areas such as patient empowerment and care coordination.

INTRODUCTION

Telehealth offers tremendous potential to transform the healthcare delivery system by overcoming geographical distance, enhancing access to care, and building efficiencies.[5] Telehealth is a different method of healthcare delivery that provides similar or supplemental services to in-person encounters. The Health Resources and Services Administration (HRSA) defines telehealth as "the use of electronic information and telecommunications technologies to support and promote clinical healthcare, patient and professional health-related education, public health and health administration."[6] Although it does not represent all existing definitions for this important area of health information technology (health IT) across both the private and public sectors,[7], there is general consensus that telehealth supports a range of clinical activities, including:

- Enhancing interactions among providers to improve patient care (for example, consultation with distant specialists by the direct care provider);
- Supporting provider-to-provider training;
- Enhancing service capacity and quality (for example, small rural hospital emergency departments and pharmacy services);
- Enabling direct patient-provider interaction (such as follow-up for diabetes or hypertension; or urgent care services);
- Managing patients with multiple chronic conditions from a distance; and
- Monitoring patient health and activities (for example, home monitoring equipment linked to a distant provider).[8]

These activities are especially useful in communities where access to appropriate healthcare services is limited. Compared to residents of urban communities, residents of rural and frontier communities are more likely to be older and to have more risk factors associated with their health conditions. The supply of healthcare professionals to treat these conditions can be scarce in many of these areas, and existing providers may have more limited training in specialized areas of care. To address these challenges, some rural hospitals and other healthcare settings have adopted telehealth, including video communication between providers and the sharing of information, such as radiological and imaging reports.[9] Similar strategies adopted in urban and suburban settings, especially for specialties where there are significant workforce shortages and/or maldistribution (e.g., dermatology, neurology, clinical genetics, and psychiatry) or long delays to schedule new patient appointments, show improvement in these areas.

Telehealth can provide needed services in a variety of settings, including home and community-based settings, schools, hospitals, post-acute and long-term care settings, office-based settings, and community health centers.[10] The most significant needs in home and community-based care relate to chronic care management.[11] Traditionally, chronic diseases managed through an episodic, office-based approach require frequent patient contact and regular physiologic measurement. The use of telehealth for chronic disease care management has been associated with reductions in hospitalizations, readmissions, and lengths of stay, as well as improvements in some physiologic measures such as pulmonary function or body temperature.[12] Incorporating telehealth into a care management program that offers remote monitoring and feedback at home by a chronic care management team—like one program instituted by the Department of Veterans Affairs (VA) over a decade ago—has led to improvements in chronic disease management. This includes the management of hypertension, congestive heart failure, and diabetes.[13]

The types of care delivery that are facilitated via telehealth continue to expand, and Medicare currently reimburses for a number of these telehealth-provided services in rural settings, such as consultations, office or other outpatient visits, and diabetes self-management training and individual psychotherapy.[14] However, while the use of telehealth in the Medicare program has grown rapidly in recent years, particularly in rural areas, its overall use by Medicare providers in the treatment and management of their patients remains relatively low. In part, this is due to restrictions in how telehealth is reimbursable.[15] The Medicaid program, in contrast, allows states to reimburse providers for telehealth as long as the service satisfies federal requirements for efficiency, economy, and quality of care. States have more flexibility to leverage their own laws, rules, regulations, and policies to reimburse for telehealth as appropriate.[16]

The U.S. Department of Health and Human Services (HHS) initiated this project, explicitly for the National Quality Forum (NQF) to convene a multistakeholder committee to recommend various methods to measure the use of telehealth as a means of providing care. The Committee was charged with developing a measurement framework that identifies measures and measure concepts and serves as a conceptual foundation for new measures, where needed, to assess the quality of care provided using telehealth modalities. This project followed previous work completed by the Agency for Healthcare Research and Quality (AHRQ) described in *Telehealth: Mapping the Evidence for Patient Outcomes from Systematic Reviews*.[17] This AHRQ report created an evidence map of systematic reviews that assess the impact of telehealth on clinical outcomes, utilization, and cost. The report summarized the distribution and diversity of findings on telehealth by clinical area and telehealth modality. This NQF report includes a measurement framework that should inform future evaluation work on the impact of telehealth on cost and quality of care, as well as create a foundation for the measurement of outcomes attributable to the use of telehealth.

METHODOLOGY

NQF conducted a comprehensive environmental scan to inform the development of the telehealth framework. The primary purpose of the environmental scan was to identify existing measures and potential measure concepts related to telehealth. Information was gathered through a multitude of sources such as PubMed, JSTOR, and Academic Search Premier. Grey literature and web searches through Google identified reports, white papers, and other documentation related to telehealth. These include documents published by operating divisions within HHS and other federal departments, such as the VA and Department of Defense (DoD). These also include vendor-based white papers and reports issued by nonprofit organizations such as the American Telemedicine Association (ATA), the National Association for Community Health Centers, the National Association of Rural Health Providers (NARHP), and the Health Information Management and Systems Society (HIMSS). Papers reviewed from various divisions of HHS—such as the Assistant Secretary for Planning and Evaluation (ASPE), AHRQ, HRSA, and the Office of the National Coordinator for Health Information Technology (ONC)—included several published telehealth documents, such as ASPE's 2016 *Report to Congress: E-health and Telemedicine* and the 2016 *Federal Telehealth Compendium*. NQF reviewed over 390 titles and abstracts from an electronic search, as well as other briefings and reports from the grey literature. NQF identified and used 68 studies on the impact of the various modalities of telehealth (e.g., mobile health, remote monitoring, store-and-forward telehealth, and videoconferencing) on specific clinical areas.

TABLE 1. CLASSIFICATION AREAS OF INFORMATION FOR THE ENVIRONMENTAL SCAN

Domains	Potential Information
Access to Care	Timely receipt of health services; access to health services for those living in rural and urban communities; access to health services for those living in medically underserved areas; access to appropriate health specialists based on the need of the patient; increased provider capacity; access to patients that need specialized healthcare services.
Cost	The costs of telehealth for public and private payers; efficient use of services for the patient; difference in cost per service and/or episode of care.
Cost Effectiveness	Effect of telehealth on patient self-management; reduction in medical errors; reduction in overuse of services; cost savings to patient, family, and caregivers related to travel and time away from work.
Patient Experience	Appropriateness of services; increase in patient's knowledge of care; patient compliance with care regimens; difference in morbidity/mortality among specific clinical areas; shared decision making; whether the care provided is safe, effective, patient-centered, timely, efficient, and equitable.
Clinician Experience	Diagnostic accuracy of telehealth applications; ability to obtain actionable information (enough to inform decision making); comfort with telehealth applications and procedures; quality of communications with patients; satisfaction with delivery method; impact on practice patterns.

The environmental scan included an assessment of specific telehealth modalities and their impact on access, cost, and quality. The four modalities of telehealth NQF examined are:

- Live video (synchronous): A live two-way interaction with a patient and provider using audiovisual telecommunications technology.
- Store-and-forward (SFT) (asynchronous): Transmission of videos and digital images through a secure electronic communications system.
- Remote patient monitoring (RPM): Personal health and medical data from an individual in one location, transmitted to a provider in a different location.
- Mobile health (mHealth): Smartphone apps designed to foster health and well-being.[18]

After a thorough review, NQF classified the varying types of information gathered in the environmental scan into five domains listed in Table 1.

NQF classified each study it reviewed by the type of telehealth modality and domain of information. Appendix A includes a full description of the methodology NQF used, including the scoring rubric and criteria for selecting articles to include in the report. Appendix B includes the environmental scan findings.

DEVELOPMENT OF THE MEASUREMENT FRAMEWORK

The breadth of the literature, which covered numerous randomized studies and use cases in the areas of mental and behavioral health, dermatology, care coordination, stroke, intensive care, chronic disease management, and other conditions, informed the development of the framework. The framework is a conceptual model for organizing ideas and provides high-level guidance and direction on telehealth measurement priorities and their impact on healthcare delivery and outcomes. The Committee developed this conceptual framework beginning with three distinct categories:

- **Domains** – a categorization/grouping of high-level ideas and measure concepts that further describes the measurement framework;
- **Subdomains** – a smaller categorization/grouping within a domain; and
- **Measurement Concepts** – an idea for a measure that includes a description of the measure, including planned target and population.

The measurement concepts identified in this report are intended to inform future work that all health IT stakeholders may undertake.

The Committee determined that a four-domain model provided the best combination of utility, simplicity, and accuracy in identifying and covering the main components of telehealth. This model framed the Committee's thoughts and ideas about the measurement and evaluation of key telehealth elements.

The central organizing principle of the framework developed by the Committee was that the use of various telehealth modalities provides healthcare services to those who may not otherwise receive them in a timely, effective manner. The use of telehealth does not represent a different type of healthcare, but rather a different method of healthcare delivery that provides services that are either similar in both scope and outcome or supplemental to those provided during an in-person encounter. Continual assessment of access to clinical services, the effectiveness of the telehealth technology, the overall experience of receiving care through a mediated electronic environment, and the financial impact and cost of telehealth services ensures that various modalities of telehealth provide effective, efficient, and essential care. Encounters between a patient or family member and a provider or care team member through telehealth potentially enable the integration of telehealth services into a healthcare setting in a way that minimizes impact on workflow. Quality of care appears in each of the framework's domains and subdomains, as each of these affect the quality of a health outcome or process. For example, an individual who is unable to receive healthcare services because of geographical constraints would have a poor quality outcome. Table 2 summarizes the domains and subdomains determined by the Committee.

TABLE 2. DOMAINS AND SUBDOMAINS OF THE TELEHEALTH MEASUREMENT FRAMEWORK

Domain	Subdomain(s)
Access to Care	• Access for patient, family, and/or caregiver • Access for care team • Access to information
Financial Impact/Cost	• Financial impact to patient, family, and/or caregiver • Financial impact to care team • Financial impact to health system or payer • Financial impact to society
Experience	• Patient, family, and/or caregiver experience • Care team member experience • Community experience
Effectiveness	• System effectiveness • Clinical effectiveness • Operational effectiveness • Technical effectiveness

Domain 1: Access to Care

The first domain of the framework addresses access to care: specifically, whether the use of telehealth services allows remote individuals to obtain clinical services effectively and whether remote hospitals can provide specialized services such as emergency and intensive care. The Committee stated that the domain, as well as its proposed subdomains, should consider five components:

1. **Affordability** – Are both patients and members of the care team willing to accept the potential costs of telehealth as opposed to the alternative of not receiving or delivering traditional care at all, or receiving delayed care? For providers, what is the cost of providing telehealth services, and what is its effect on their practice?
2. **Availability** – Does a telehealth modality provide access to a provider that specializes in the type of care required by the patient, when it is required or desired by the patient?
3. **Accessibility** – Is the technology necessary for a telehealth consultation accessed and used by members of the care team?
4. **Accommodation** – Do the various modalities of telehealth accommodate the diverse needs of patients? Are patients able to access members of the care team through telehealth when requested?
5. **Acceptability** – Do both patients and members of the care team accept the use of telehealth as a means of care delivery?

With these overarching guidelines, the Committee developed three subdomains for 'access to care,' including access for patient, family, and/or caregiver, access for care team, and access to information:

- Access for the patient, family, and/or caregiver refers to the ability of patients to receive services from providers they could not access otherwise because of geographical barriers and other logistical difficulties (such as transportation and travel costs). These limitations lead to potential underutilization of necessary services and attrition among those patients who do not have enough visits with an appropriate provider or do not initiate treatment at all.
- Access for the care team means that the providers and other clinical staff have appropriate access to telehealth technologies to provide treatment when needed. For example, in specialties such as behavioral health, the access to a modality such as video-teleconferencing provides a method for the care team to assess and provide specific treatment to patients with conditions such as post-traumatic stress disorder (PTSD).
- Access to information refers to both the patient and the care team having access to information pertaining to care. For patients, it means access to clinical information which allows them to be active and informed in their care, and for the care team, it means access to sufficient "actionable information" to aid them in decision making and management, such as images of specific skin conditions, electronic health records (EHRs), health information exchanges (HIEs), and direct secure messaging (DSM). Through this subdomain, the care team uses the information they receive or other relevant data to diagnose a patient and develop a treatment protocol.

Domain 2: Financial Impact/Cost

The second domain of the framework addresses the financial impact/cost of telehealth services. While the telehealth literature base overall has grown over the last few years, the amount of specific research on financial impacts/costs is still sparse. Therefore, the Committee divided this domain into four distinct subdomains: financial impact to patient, family, and/or caregiver; financial impact to care team; financial impact to health system or payer; and financial impact to society.

- The financial impact to a patient, family, and/or caregiver accounts for the potential cost savings and benefits of telehealth such as less travel time to see a provider, less time lost at work, and less out-of-pocket cost, including the financial costs associated with investment

in specialized equipment and internet access if the patient does not have it.

- The financial impact to the care team and individual includes the opportunity costs and both direct and indirect costs associated with providing care using a telehealth modality.
- The financial impact to payers and health systems is the net financial impact including cost avoidance and opportunity costs.
- The financial impact to society includes the impact of telehealth on healthcare workforce shortages, the impact on hospitals of services provided at a distance, the overall health status of a community, economic productivity, patient-provider convenience, and averted care.

Domain 3: Experience

The third domain focuses on the experience of telehealth, which represents the usability and effect of telehealth on patients, care team members, and the community at large, and whether the use of telehealth resulted in a level of care that individuals and providers expected. The Committee divided this domain into three separate subdomains: patient, family, and/or caregiver experience; care team member experience; and community experience.

- For patients, family, and/or caregivers, experience refers to their ability to use the technology, the provision of a mechanism to connect with their providers, and whether the care delivered through various telehealth modalities is comparable to the quality of the care services they would receive during an in-person encounter.
- The care team subdomain reflects the use of telehealth services to facilitate teamwork and the ongoing care of a patient, as well as the utility of the technology to provide necessary information to assist in the provision of care.
- For the community at large, the acceptance and consistent use of telehealth as provided to patients and their families, administrators, and executive leaders are critical to its ongoing use.

Domain 4: Effectiveness

The fourth domain focuses on effectiveness, which represents the system, clinical, operational, and technical aspects of telehealth.

- System effectiveness refers to the ability of a telehealth modality and the overall system to assist in the coordination of care across various healthcare settings; to assist providers in reaching targets for population-based care; and to facilitate the sharing of information between providers to aid in decision making.
- Clinical effectiveness refers to the impact of telehealth on health outcomes or process measures of quality (e.g., confirmed diagnosis of melanoma or improved control of anxiety or depression using cognitive behavioral therapy through telehealth) as well as the comparative effectiveness of services provided in person.
- Operational effectiveness revolves around how clinically integrated telehealth is within a hospital, provider practice, community health center, or other care settings.
- Technical effectiveness refers to the ability of the telehealth system to record and transmit images, data, and other information accurately to patients and members of the care team, as well as the system's ability to exchange information between stakeholders seamlessly.

Because of the complex interactions between the implementation and use of various telehealth modalities, multiple aspects of this framework likely apply to multiple telehealth issues. The assessment, evaluation, and effectiveness of telehealth is multidimensional, and thus quality measurement of telehealth requires multidimensional approaches. For example, the assessment of a measure concept regarding travel time saved per patient by using telehealth services likely affects multiple domains, including access to and availability of care to a patient, financial impact to the patient, and system effectiveness of the telehealth modality to meet the patient's needs.

EXAMPLES OF PROPOSED MEASURE CONCEPTS

A measure concept describes the idea for a measure, including the planned target and population. The Telehealth Committee engaged in a process of identifying and then prioritizing measure concepts over a two-day in-person meeting in Washington DC, as well as through several conference calls and webinars; all of these convening activities included opportunities for public comments.

The in-person meeting to delineate domains, subdomains, and measure concepts was held on March 7-8, 2017 and included a presentation of the environmental scan, a general discussion of the significant telehealth concepts, and a discussion of how to translate those ideas into specific measure concepts. The Committee discussed how the measurement framework could assist in both the development and categorization of measure concepts, which would ultimately serve as the foundation for the development of measures that objectively assess telehealth. The Committee engaged in a brainstorming exercise to identify potential measure concepts. This process yielded 67 initial measure concepts, which NQF refined and combined, where appropriate, to yield a final list of 53 measure concepts (included in Appendix C).

The Committee worked collectively to identify measure concepts that aligned to each of the domains and subdomains they created as part of the framework. Through consolidation and refinement of the concepts under consideration, the Committee initially identified 10 key measurement areas, each of which included several measure concepts that could reflect performance in those areas. Committee members each identified the measure areas that they deemed to be of the highest priority and provided additional feedback about measurement issues and challenges for each area. NQF staff reviewed this information along with additional written comments provided by the Committee and consolidated the measure concepts into a final list of six key areas for measurement:

1. Travel
2. Timeliness of Care
3. Actionable Information
4. Added Value of Telehealth to Provide Evidence-Based Best Practices
5. Patient Empowerment
6. Care Coordination

The Committee recommends these six areas as having the highest priority overall for measurement in telehealth, but the Committee does not suggest that the order of presentation implies a ranking of importance. Details of the Committee's discussion of each area are included below. At the end of each section, tables demonstrate the domains and subdomains that each key area would fall under, as well as some potential measure concepts that may provide the foundation for future measure development in this area.

Travel

The Committee stated that one of the primary benefits of telehealth is avoiding travel by patients, their caregivers, and members of their care team because of geographical distance. The Committee also expressed that the use of telehealth can reduce the cost and time of any travel required; reduce the amount of time taken off from work, school, or other commitments; and lead to faster delivery of medical services. A team of researchers at the University Of California Davis, Division of Pediatric Critical Care Medicine, looked at data from the years when the organization has offered telehealth options for specialty care. Its telehealth program offers services across 30 specialties, with centers in 150 locations in 56 out of California's 58 counties. For individual patients who received care through these services, the use of telehealth resulted in an average 278 fewer miles travelled and $156 in travel cost savings per individual patient.[19]

The element of patient preferences is an important consideration in measurement. Assessing decreases in travel time and overall cost savings would need to take into account the type of care provided through telehealth and the availability of specialty services. For example, synchronous video communication between a patient and a provider to measure and evaluate peak flow and spirometry readings. The results of these readings may indicate that the patient is not experiencing an acute asthma exacerbation, and therefore existing medications would provide enough control; alternatively, the readings may indicate that the asthma is severe enough that an in-person visit is essential. Measures should provide a basis on which a patient and care team can make informed decisions.

Finally, the Committee emphasized that measurement of travel should not be considered as just an accrued benefit for cost savings and convenience, but also be used to determine if the use of telehealth led to the correct diagnosis and appropriate follow-up care, which mitigated the need for further travel. The time that the patient saves on the initial visit is measured, but should factor in the results, as a negative diagnosis would eliminate the need for an in-person second visit.

Primary Framework Domains	• Effectiveness • Financial Impact/Cost
Applicable Framework Subdomains	• System effectiveness • Financial impact to health systems or payers
Measure Concepts	• The duration of the visit through telehealth compared to in-person care • The amount of time for a patient to check in for a visit

Timeliness of Care

Numerous studies demonstrate the association between timely care and health outcomes. Some of the factors that lead to worse survival rates with conditions such as cancer included delayed diagnosis and treatment, missed abnormalities that showed on a screening, and patients with correctly identified abnormalities who did not have a follow-up with a physician. Furthermore, delayed diagnosis after an initial screening leads to worse survival rates among patients with specific types of cancer (e.g., lung cancer) and complications because of chronic disease. One study focused on efforts to improve communication between specialists and thoracic surgeons with respect to the care of cancer patients by using multidisciplinary meetings via videoconferencing.[20] This led to a significant improvement in timeliness for both diagnosis and interventions.

Because reducing the time between an initial request for care and a consultation is an important area for telehealth, the Committee agreed that timeliness of care is an important area for measurement. In the past, NQF has also recognized this as a crucial concept, having endorsed measures that discuss the need for timeliness of care in the areas of neonatal care, stroke, heart failure, and chronic disease.

The Committee suggested that related measure concepts focus on timeliness for appropriate decision making because the use of telehealth services may provide a quicker diagnosis, which leads to faster delivery of interventions and better outcomes. One example provided was that of stroke, comparing telestroke patients in their likelihood of timely access to an expert assessment for tissue plasminogen activator (tPA), the delivery of which may help to avoid a poor outcome.[21]

Primary Framework Domains	• Access • Effectiveness • Experience • Financial Impact/Cost
Applicable Framework Subdomains	• Access for patient, family, and/or caregiver • System effectiveness • Experience of patient, family, and/or caregiver • Cost to patients, families, and/or caregivers
Measure Concepts	• What is the availability of information delivered using telehealth for those specialty providers that consult with the primary care provider? • What is the overall amount of a patient's time spent during a telehealth consultation not directly related to care?

Actionable Information

The use of telehealth technologies must provide actionable information for members of the care team to use during an initial encounter. This information may include data that allow a provider to diagnose and treat the patient, as well as provide any needed follow-up care. Furthermore, the Committee pointed out that understanding this area may assist in redefining a visit through telehealth. Current quality measures assess structure, process, or outcomes based on an in-person encounter. This encounter constitutes a visit, as a member of the care team can obtain and view information to provide a diagnosis and treatment. If a telehealth visit provides actionable information through a specific modality, then the care team member can still ascertain the health status of the patient and provide a diagnosis and treatment, which would then constitute a visit. Therefore, for each of the quality measures that may pertain to a clinical area that employs telehealth services, there is little need to modify the measure if a telehealth modality provides the same actionable information gathered through an in-person visit.

Primary Framework Domain	• Effectiveness
Applicable Framework Subdomains	• Clinical effectiveness • System effectiveness
Measure Concepts	• The instructions for care were clear to the patient • The system was able to effectively provide the care that was recommended • Comparative effectiveness of telehealth vs. in-person provision of care

Added Value of Telehealth to Provide Evidence-Based Best Practices

For some telehealth modalities, the patient uses the equipment to both self-monitor and maintain consistent communication with providers. This active collaboration may enhance active management of symptoms and possibly reduce emergency department visits and hospitalizations. Specifically, the use of telehealth demonstrates the ability to reduce costs, hospitalizations, and readmission rates in the area of chronic disease.[22] For example, heart failure is one of the most prevalent chronic illnesses; it affects more than 6 million Americans and costs approximately $39.2 billion annually in the United States, with hospitalization accounting for 70 percent of those costs. Thirty-day readmissions rates for heart failure patients are 24 percent nationwide and rise to 50 percent by 90 days, though half of those may be preventable. One systematic review to assess the effectiveness of telehealth in managing patients with chronic heart disease found that the use of telehealth led to reductions in hospitalizations and readmissions, and improvements in mortality and cost-effectiveness.[23]

Using telehealth devices within the home allows more visits by nurses or other members of the care team, increases in patient access to care through remote monitoring, and working with patients to transmit data on a regular basis. A study conducted by the University of Pennsylvania School of Nursing showed that patients using telehealth at home to allow nurses to monitor their conditions remotely and to consistently send in data were readmitted to the hospital 3 percent less often than usual care patients.[24] After 60 days, the overall readmissions rate was 6 percent less for telehealth patients. Cost estimates based on these findings showed that decreasing readmissions by just 5 percent could save Medicare over $5 billion annually. Among heart failure patients, the use of telehealth monitoring decreased the rate of readmission from 46 to 21 percent.

The Committee determined that one of the major measures of telehealth should be the ability to access healthcare services, through one or more telehealth modalities, compared to the inability to receive needed care. Other related significant areas for measurement include the use of telehealth services to deliver appropriate and needed care at the time of the encounter and the avoidance of adverse outcomes.

Primary Framework Domains	• Effectiveness • Financial Impact/Cost
Applicable Framework Subdomains	• Clinical effectiveness • Financial impact to patients, families, and/or caregivers • Financial impact to health systems or payers
Measure Concepts	• Decrease in the length of stay in the hospital • Telehealth services prevented urgent or emergency care being delivered to a patient • Avoidance of an adverse outcome and subsequent medical malpractice lawsuits

Patient Empowerment

As the telehealth field expands across the healthcare spectrum, it can potentially affect patient engagement. Patients can track their medical conditions, outcomes, and overall wellness through a variety of tools, and remain in contact with their physicians to engage more fully with their medical status. The Committee articulated that the use of telehealth, particularly specific modalities such as remote monitoring, assists with adult learning and cognitive behavioral theories to promote patient self-efficacy and disease management. Patients can empower themselves to learn about improving health-related behaviors, and providers can learn how to use these technologies to improve communication with their patients and their patients' overall satisfaction with care.

As an example of efforts to improve communication and disease management, Banner Health, an Accountable Care Organization in Arizona, allows patients to use telehealth to connect to a series of providers and to view their own data.[25] The ability of the care team to interact with patients to communicate their diagnosis and treatment plans helps improve compliance and overall outcomes.

In addition, a recent study of hip and knee replacement patients at a hospital in Virginia found that the patients who participated in the telehealth program experienced improved benefits. This included shorter hospital stays, discharging directly to their home, and responses to post-discharge surveys at a higher rate (79 percent as opposed to 18 percent) as compared to those who did not participate in the program. Additionally, there were no hospital readmissions of the telehealth program participants within 30 days of their surgeries, and 90 percent stated that telehealth improved their episode-of-care experiences, assisted them in better understanding their care and setting their expectations, and improved their satisfaction with the care they received.[26]

Primary Framework Domain	• Experience
Applicable Framework Subdomain	• Patient, family, and/or caregiver experience
Measure Concepts	• Patients demonstrated increased confidence in care plan • Patients demonstrated increased understanding of care plan • Patients demonstrated compliance with their care plan

Care Coordination

The Committee viewed the coordination of care for patients with complex care needs (e.g., patients with multiple chronic conditions, patients in need of rehabilitative services, and patients in need of specialty care) as a vital component of care. Telehealth may facilitate communication, information sharing, and joint decision making in the transition of care from the outpatient to inpatient setting, from the inpatient setting to a long-term care nursing facility, and between other clinical settings. An objective assessment of telehealth's ability to facilitate such coordination would be a precursor to determine the success of a telehealth program and its impact on health outcomes.

As articulated in the literature review, the Department of Veterans Affairs (VA) uses telehealth services and leverages a variety of tools to coordinate care among different healthcare providers.[27] One of the areas in which the VA uses telehealth to strengthen care coordination is with traumatic brain injury (TBI) patients. With this population, there is ongoing and consistent communication among families, caregivers, patients, and medical experts. The use of telehealth modalities to support telerehabilitation involves TBI screening, assessment, consultation, and care to patients and remote military medical centers, as well as sites in which demand for specialized care fluctuates with mobilizations. Additionally, the use of video and remote monitoring technologies assists in identifying TBI through electronic cognitive assessment systems; provides real-time video visits with family members; shares information among clinical care teams to collaborate on TBI care; and provides interactive video programs and web-based courses to train medics, physician assistants, nurses, and other providers in both civilian and military settings.[28]

Primary Framework Domains	• Experience • Effectiveness
Applicable Framework Subdomains	• Patient, family, and/or caregiver experience • Care team member experience • Patient, family, and/or caregiver effectiveness • Community effectiveness • Clinical effectiveness
Measure Concepts	• The amount of care coordination needed due to the use of telehealth services • Overall number of multidisciplinary visits • Overall improvement in quality of life because services are received at home via telehealth

CASE STUDIES TO ILLUSTRATE POTENTIAL USE CASES OF PROPOSED MEASURE CONCEPTS

One of the points that the Committee wanted to emphasize within the framework was the usefulness of case studies to help provide context for the proposed measure concepts, and demonstrate how to turn these into measures in the future. Case studies can portray the experience of patients using telehealth and show how their experience may differ from those who receive care through in-person encounters. The Committee put forth the following case studies to illustrate the use of telehealth for both provider-to-patient interactions, as well as provider-to-provider interactions. These potential use cases are not exhaustive, but provide illustrative examples of how the framework is applicable in certain situations in which telehealth modalities are applied.

One: Managing Mild to Moderate Heart Failure Symptoms

Frances is a 63-year-old retired teacher with mild to moderate heart failure. She notices one morning that she is a little more winded than usual and texts her doctor's office. The office responds with a text link to 10 different time slots for a video visit later that day. She selects one and later that day has a 10-minute video chat with her doctor, who suggests some alterations to her medications. She feels reassured and goes to bed, but awakens in the middle of the night with shortness of breath. She gets frightened, and uses a mobile health application on her phone where she connects with an emergency physician within minutes. The emergency physician assesses her respiratory rate and recommends that she take an additional dose of diuretic. The on-demand doctor schedules an early-morning visit by the community paramedicine team who check her blood pressure, heart rate, oxygenation, and weight. She then participates in a five-minute check-in to review her medication plan with her primary care physician (PCP). The team leaves her a Bluetooth-enabled scale that communicates with the office of her PCP, and they discuss a plan for diuresis to achieve a five-pound weight loss over the next few days.[29]

Primary Framework Domains	• Experience • Effectiveness • Access • Financial Impact/Cost
Applicable Framework Subdomains	• Patient, family, and/or caregiver experience • System effectiveness • Clinical effectiveness • Technical effectiveness • Access for patients, families, and/or caregivers • Financial impact to health plans or payers
Potential Measure Concepts	• Patients demonstrated increased understanding of care plan • Technologies were in a satisfying condition for providers to do their job • The instructions for care were clear to the patient • Able to provide care without admission into the ER

Two: Resuscitation and Transfer

Bill presents as hypotensive and febrile when he arrives at a community emergency department (ED) where he meets an emergency physician who recognizes that Bill is septic. The physician orders several tests including laboratory blood tests, blood cultures, and a chest x-ray; establishes large-bore intravenous access; orders a fluid bolus and antibiotics; and then asks the nurse to have the virtual resuscitation service engaged so that they can maximize Bill's resuscitation while the single coverage provider maintains control over the rest of the busy department. After about an hour, Bill's condition worsens despite aggressive resuscitation, and he starts on vasopressors ordered by the resuscitation service. The resuscitation expert and the ED doctor agree on a plan to intubate Bill and transfer him to the referral center. The resuscitation expert travels virtually with Bill and smoothly transitions his care into the intensive care unit at the receiving hospital by giving a virtual face-to-face report to the receiving team.[30]

Primary Framework Domains	• Effectiveness • Access • Financial Impact/Cost • Experience
Applicable Framework Subdomains	• System effectiveness • Clinical effectiveness • Financial impact to patients, families, and/or caregivers • Access for patient, family, and/or caregiver • Access for care team members • Financial impact to health system or payer • Financial impact to society • Patient, family, and/or caregiver experience • Care team member experience
Potential Measure Concepts	• Telehealth services allowed urgent or emergency care to be delivered to a patient • The system was able to effectively provide the care that was recommended • Avoidance of an adverse outcome and subsequent medical malpractice lawsuit

Three: Knee Surgery and Related Health Encounters

After suffering from chronic knee pain for years, Mike decides to have the bilateral knee replacement his doctor recommended. Because of his comorbid conditions, the local providers suggest that the orthopedic team at the downtown referral center should perform the procedure. Mike is reluctant to travel downtown but calls the orthopedic team to ask about logistics. They report that his primary medical doctor can do the blood and stress tests, that the anesthesia team will interview him using a video chat, and that he can have a virtual postoperative visit from his home. Going to the referral facility only once for the surgery makes it easy for Mike to move forward with the surgery at the more appropriate site of care.[31]

Primary Framework Domains	• Effectiveness • Access • Financial Impact/Cost • Experience
Applicable Framework Subdomains	• System effectiveness • Access of patients, families, and/or caregivers • Cost to patients, families, and/or caregivers • Cost to society • Experience of patients, families, and/or caregivers
Potential Measure Concepts	• Patients can conduct visits using a telehealth modality on their own • Providers were able to see complex patients more efficiently • Was travel eliminated or travel time reduced for a specific patient encounter because of telehealth services? • Amount of patient's time spent during a telehealth consultation

Four: Assisting Veterans with Chronic Conditions

A significant number of United States Veterans have chronic diseases, such as diabetes mellitus, congestive heart failure, hypertension, posttraumatic stress disorder, chronic obstructive pulmonary disease, and depression. The Department of Veterans Affairs developed a Care Coordination/Home Telehealth (CCHT) program that supports the care for the veterans in their homes as they age. A veteran patient is enrolled in the program and is assessed by a designated care coordinator. The appropriate home telehealth technology is then selected, and both the patient and caregiver are trained on the appropriate use of the equipment, how to review monitoring data, and provide active care or case management services (including communicating with the patient's physician). The modalities of telehealth include videophones, messaging devices, biometric devices, digital cameras, and telemonitoring devices. The information from these devices is communicated to a national technology platform that is run by the VA and provides care coordinators with vital signs and other disease management data. Each patient is risk-stratified each day according to preset thresholds (e.g., out of range blood pressure), and at-risk patients are provided an intervention by care coordinators, such as assisting with the patient's self-management of the condition or providing transportation to the emergency department, if needed.[32]

Primary Framework Domains	• Effectiveness • Access • Experience
Applicable Framework Subdomains	• System effectiveness • Access of patients, families, and/or caregivers • Access for care team • Access to information • Experience of patients, families, and/or caregivers • Clinical effectiveness • Operational effectiveness • Technical effectiveness
Potential Measure Concepts	• Patients can conduct visits using a telehealth modality on their own • Providers were able to see complex patients more efficiently • Was travel eliminated or travel time reduced for a specific patient encounter because of telehealth services? • Telehealth services prevented an elevated amount of care to a patient • Increased likelihood for a patient to access the telehealth modality for an encounter

IMPACT OF MACRA ON THE TELEHEALTH FRAMEWORK

Each of the case studies above demonstrates the use of various modalities of telehealth in healthcare delivery and the potential ways in which it may be measured. This is significant as the Medicare Access and CHIP Reauthorization Act (MACRA) represents a new mechanism of reimbursement for telehealth services for Medicare providers. The repeal of the sustainable growth rate (SGR) led to the streamlining of multiple quality reporting programs into the new Merit-based Incentive Payment System (MIPS), which is part of the overall Quality Payment Program (QPP). A major component of MIPS is an improvement activity (IA), defined as improving clinical practice or care delivery.

The proposed activities for each IA divide into nine subcategories corresponding to CMS' stated goals:[33]

1. **Expanded practice access**: IAs include expanded practice hours, telehealth services, and participation in models designed to improve access to services.
2. **Population Management**: IAs include participation in chronic care management programs, participation in rural and Indian Health Services programs, participation in community programs with other stakeholders to address population health, and use of a Qualified Clinical Data Registry (QCDR) to track population outcomes.
3. **Care coordination**: IAs include use of a QCDR to share information, timely communication and follow-up, participation in various CMS models designed to improve care coordination, implementation of care coordination training, implementation of plans to handle transitions of care, and active referral management.
4. **Beneficiary engagement**: IAs include use of EHRs to document patient-reported outcomes, providing enhanced patient portals, participation in a QCDR that promotes the use of patient engagement tools, and use of QCDR patient experience data to inform efforts to improve beneficiary engagement.
5. **Patient safety and practice assessment**: IAs include use of QCDR data for ongoing practice assessments and patient safety improvements and use of tools such as the Surgical Risk Calculator.
6. **Participation in an alternative payment model (APM) including a Medical Home Model**: An APM can be an innovative payment model, a Medicare Shared Savings Program under an Accountable Care Organization (ACO), or a Medicare Demonstration Model. In all three cases, providers are eligible for bonus payments as long as they use quality measures under MIPS, use certified EHR technology, and assume more than a "nominal financial risk" or they are a medical home expanded under the Center for Medicare and Medicaid Innovation (CMMI). Only certain APMs qualify for full credits, whereas certain other APMs only give half credit.
7. **Achieving health equity**: IAs include seeing new and follow-up Medicare patients in a timely manner and use of QCDR for demonstrating performance of processes for screening for social determinants.
8. **Emergency response and preparedness**: IAs include participation in disaster medical teams or participation in domestic or international humanitarian volunteer work.
9. **Integrated behavioral and mental health**: IAs include tobacco intervention and smoking cessation efforts, and integration with mental health services.

The statute allows for the incorporation of telehealth in coordinating patient care and includes telehealth use in MIPS scoring. The MIPS score determines payment adjustments to

clinicians based on performance. By statutory definition, telehealth encompasses "professional consultations, office visits, and office psychiatry services" and any additional service specified by the Secretary of HHS. Telehealth was included in the final rule in two ways:

1. **Expanded practice access**: The use of telehealth services and data analysis for quality improvement, such as participation in remote specialty care consults or teleaudiology pilots. The weight of this subcategory in the MIPS overall score lists as "Medium."
2. **Population management**: MIPS eligible clinicians prescribing warfarin must attest that 60 percent or more of their ambulatory care patients receiving the medication are managed by one or more clinical practice IAs. One of these activities will be telehealth that involves systematic and coordinated care for rural or remote beneficiaries. The weight of this subcategory in the MIPS overall score lists as "High."

Additionally, certain APMs also facilitate the use of telehealth such as the Next Generation ACO Model.[34] These models have the flexibility to waive "originating site" coverage restrictions as well as the requirement that beneficiaries be located in a rural area for telehealth services. For example, Medicare's originating site restrictions require that beneficiaries be located at specific settings, such as rural health clinics, critical access hospitals, federally qualified health centers, community mental health centers, or physician offices, when receiving telehealth services. The telehealth waiver gives Next Generation ACOs the flexibility to allow patients to be at other settings, including their home. For Medicare beneficiaries, this opens up new ways of engaging with their care team that would not require travel or increase burden. Another model is the Medicare Shared Savings Program (MSSP), which recognizes telehealth services as a clinical practice improvement activity (CPIA) and allows physicians who provide patients with equipment for remote patient monitoring to be eligible for fraud and abuse waivers, specifically, the programmatic waiver for telehealth.[35]

INITIAL MEASURE SELECTION

The Committee examined a list of initial measures included in the framework, including ones identified in the literature that demonstrate a positive effect on a specific clinical condition with the use of telehealth, as well as ones that could potentially be used in CPIAs under the MIPS regulation and potentially an APM. The scan reviewed measures from the AHRQ National Quality Measures Clearinghouse (NQMC), the NQF Quality Positioning System (QPS), and those proposed measures used to evaluate physicians under MIPS. Table 3 identifies the total number of measures per clinical area identified in the environmental scan.

The Committee determined that the initial selection of measures for inclusion into the framework should be limited to NQF-endorsed measures. This ensures that each measure has gone through a rigorous evaluation process, has a strong evidence base indicating its need, and has been independently assessed by a committee of experts in that clinical area to be feasible, reliable, and valid. Appendix D shows the initial measures that the Committee chose.

TABLE 3. TOTAL NUMBER OF QUALITY MEASURES PER CLINICAL AREA

Category	Number of Measures
Mental and behavioral health	13
Dermatology	2
Chronic disease	26
Rehabilitation	15
Care coordination	17

RELATIONSHIP TO OTHER NQF PROJECTS

NQF also reviewed two prior projects related to providing care to both adults and children across clinical specialties. These projects highlight the potential use of telehealth to capture individuals' and providers' goals, preferences, and desired outcomes.

In **Essential Attributes of a High-Quality System of Care: How Communities Approach Quality Measurement**, NQF examined methods used by communities to ensure a high-quality healthcare system for adults with complex care needs. This project developed case studies based on a SCAN Foundation report, **What Matters Most: Essential Attributes of a High-Quality System of Care for Adults with Complex Needs**, which described the four essential attributes of a well-functioning system of care. In this system, individuals are able to live their lives with services and support reflecting their values and preferences in the least restrictive, most independent setting possible. The four essential attributes are:

1. Each individual has identified a range of needs and goals, both medical and nonmedical, as well as for family/caregivers, that drive care plans while undergoing consistent review and evaluation.
2. Each individual's needs characterize a compassionate, meaningful, and person-focused method that is incorporated into a care plan that is tailored, safe, and timely.
3. Individuals have a cohesive, easily navigable delivery system so that they can get the services and information they want by themselves or with support when needed, and avoid the services they do not need or want.
4. Individuals and their family/caregivers continually inform the structure of the delivery system to ensure that it is addressing their needs and providing resources tailored to them.

These attributes align with the benefits of telehealth, particularly in the area of care coordination, as telehealth provides a means of delivering care to individuals where access to specific services may not be readily available. In addition, family members and/or other caregivers can be included to document the appropriate medical information and patient preferences and ensure that they inform the prescribed care plan.

NQF's report **Performance Measurement for Rural Low-Volume Providers** highlights the challenges that rural providers face when delivering care and engaging in performance measurement. The report states that geographically isolated areas have fewer healthcare settings and providers than less isolated areas, and patients in these very rural areas may experience difficulties accessing care due to lack of transportation and lack of information technology capabilities. Furthermore, the report shows that rural areas have a disproportionate number of vulnerable residents and often do not have enough patients to participate in performance improvement activities. As the literature review highlights, the use of telehealth has increased access to care for individuals living in rural or underserved areas. Each one of the modalities of telehealth effectively provides services and treatment for a variety of conditions and helps coordinate care between providers. The use of telehealth can potentially increase the number of patients seen and included within specific quality measures. This can improve performance and quality improvement activities within rural communities and improve individual health.

FUTURE CONSIDERATIONS FOR THE DEVELOPMENT OF THE FRAMEWORK

It is important to consider the following points as the development and identification of measures related to telehealth commences.

1. **The use of various telehealth modalities demonstrates a positive effect on quality health outcomes, processes, and costs.** The use of telehealth (across a variety of clinical conditions) may have a positive impact on quality outcomes and processes of care; can lead to increased access to services; may provide a cost-effective means of delivering care; and has generally been well-received by both providers and individuals.
2. **Existing quality measures to evaluate the effectiveness and benefits of telehealth must be widely accepted and impactful.** While a number of measures identified by AHRQ, NQF, and CMS relate to telehealth, it is difficult to ascertain which measures would suffice to assess whether telehealth is comparable to, or an improvement over, in-person care. Additionally, the use of existing measures to assess telehealth should not add any additional burden to the collection and reporting of data from providers, and should contain data that match the specifications of the measure.
3. **Consistent definitions through proposed measure concepts and existing measures.** Consensus to define terms and measures for proposed measure concepts or existing measures for which there are no common definitions remains essential. Without a standard, uniform definition for measures, it will be difficult to synthesize findings and assess telehealth's impact.

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APPENDIX A:
Methodology

The primary purpose of the environmental scan was to identify issues applicable to telehealth through literature to facilitate consideration of what measure concepts should be included in the measure framework, and how to classify telehealth through specific domains. NQF used resources such as PubMed, JSTOR, and Academic Search Premier, as well as grey literature and web searches through Google to identify reports, white papers, and other documentation related to telehealth.

Additionally, NQF constructed the environmental scan to use the following literature and information to inform pertinent stakeholders:

- Reports issued from the AHRQ (such as the Evidence Map, a 2016 Report to Congress issued by the Department of Health and Human Services on E-Health and Telemedicine) and reports from HRSA.
- Reports developed by organizations such as the American Telemedicine Association (ATA) and the NARHP to provide information on different facets of telehealth and its benefits to those in rural health areas, medically underserved areas, and general patient populations.
- Published studies by researchers who have examined the utility and benefits of telehealth on outcomes of care. These reports focus on the use of various delivery methods of telehealth and their effect on clinical processes and outcomes.
- A review of reports published by NQF on rural health, care coordination, population health, home and community-based services, and health and well-being to discuss how telehealth can intersect in both the measurement framework and measures considered for endorsement.
- A review of the legislation and proposed rules under the Medicare and Children's Health Insurance Program Reauthorization Act (MACRA) and the parameters that define a clinical practice improvement activity so that the multistakeholder Telehealth Committee can determine how telehealth could fit within the framework.
- An analysis of the Merit Incentive Payment System (MIPS) to examine those activities as compared to those of Alternative Payment Models (APMs) and APMs in general, given that telehealth is included in these models by statute.

NQF used an initial set of key search words that were both general and specific to a modality of telehealth such as telehealth, telemedicine, mobile health (mHealth), electronic health (eHealth), telepathology, teleradiology, telestroke, eICU, telepsychiatry, teledermatology, teleophthalmology, telemental health, quality of care, home health monitoring, telecommunications, rural health, and others. NQF formulated the aforementioned key terms into simple queries to generate the largest number of results, such as "telehealth" and "quality of care." Given the need to keep the information as current as possible, NQF excluded all articles older than the year 2000. NQF reviewed the titles, keywords, and abstracts of the identified articles to determine if the information aligned with the key domains listed above. Numerical scoring assisted in the classification and ranking of the papers using the following criteria:

1. The content of the paper aligned with one of the domains listed in Table 1.
2. Results followed from vigorous and scientifically sound methodologies with a strong evidence base that generated the analysis. (i.e., statistical

analysis, case studies, interviews with experts, randomized controlled studies, mixed method analysis). Studies that were descriptions of telehealth in general, broad descriptions of telehealth modalities, or telehealth studies not yet concluded were not included.

3. The degree to which the study helped address one of the aforementioned research questions.
4. The paper had a well-articulated scientific method and well-defined research scope and did not broadly discuss telehealth or undertake any study to determine its impact on outcomes.
5. The published results validated the research study.

If the research study completely satisfied an identified criterion, NQF gave a score of 2; semi-satisfactory agreement with criteria[a] incurred a score of 1; absence of study content meeting criteria led to a score of 0. All papers that had a score below 7 were excluded from this study. The results were documented in a chart similar to the one in Table A1.

TABLE A1. AN EXAMPLE OF THE NQF SCORING MATRIX FOR EVALUATING TELEHEALTH LITERATURE

Domain	Paper	C1	C2	C3	C4	C5	Total
Access to Care	A Review of Telehealth in Rural Areas Daigle, Azara, et al. (2008)	2	1	2	0	2	7

From the selected papers, NQF extracted general data such as the title, authors, publication year, keywords, and other publication criteria. NQF abstracted any other information that assisted in rating the study by quality assessment metrics such as research methodology definition, contributions of the study, research questions, and the overall discussion. NQF staff reviewed and scored each of the papers, with a second review from the project senior director.

Because of the variability in modalities of telehealth, outcomes, and the clinical setting in which telehealth was assessed, NQF determined that a meta-analysis was inappropriate. Instead, an evidence table displayed the study characteristics and the outcomes, and how they aligned to both the appropriate research question, the telehealth modality, the nature of the intervention, and the primary/secondary outcomes for each study. NQF summarized findings for each modality to determine general themes or ideas to incorporate into the measurement framework, as well as guide the initial selection of existing quality measures. This varied slightly from the AHRQ Evidence Map, which developed a guiding framework that focused on the current research on the effectiveness of telehealth interventions, as well as current gaps in the research. The information gathered for the NQF report did not focus on the breadth and detail of the research, but rather on how each individual study informed the development of measure concepts to assess telehealth on outcomes of care.

NQF reviewed over 390 titles and abstracts from the electronic search, as well as other briefings and reports from the grey literature. From this, NQF identified 180 papers that scored a seven or above based on the scoring model and alignment with the research criteria and telehealth modalities. It was possible for a paper to address more than one criterion or apply to more than one modality. All of the papers NQF reviewed focused on the use of telehealth and its relationship to patients' outcomes with an emphasis on specific study types, such as randomized controlled trials (RCTs), in order to understand the relationship between telehealth and patient care. Further review of the articles after scoring indicated that some articles were not appropriate for inclusion in this report because:

- Some discussed the methodology for the initiation of studies that had not been concluded;

a Semi-satisfactory results were those that met most of the criteria, but not did not fully satisfy each of the objectives (e.g., the study had articulated a comprehensive research method, but the research scope was perhaps too broad).

- Several did not present enough conclusive evidence to appropriately evaluate the effectiveness of telehealth on a clinical condition;
- A few articles did not discuss a specific modality of telehealth; or
- The articles presented a general discussion of telehealth that provided limited value to this report.

As a comparison, the AHRQ Evidence Map identified 1,494 citations of which 58 met the inclusion criteria for the study.

APPENDIX B:
Environmental Scan Findings

The environmental scan focused on several different telehealth modalities including mobile health (mHealth), remote monitoring, store-and-forward communication, and videoconferencing/ Internet-based technologies. Further, the scan examined the impact of each of the modalities on the process and outcomes of care, access to care, cost efficiencies, and the experience of care for both patients and clinicians. NQF focused on the type of study conducted, the results of the study, and how it could inform the development of concepts for use in measure development.

Access to Care

Three studies examined the impact of mHealth on patients' increased access to healthcare services through mobile technology to monitor, self-assess, and report their findings back to providers. One six-month study[1] recruited patients with moderate to severe psoriasis to use mobile monitoring to increase compliance with psoriasis therapy. All of the 155 adverse events to therapy reported by patients came through feedback text messages or with an additional phone call. More than 88 percent of patients assessed this system as a "very good idea" and would use their own mobile phones for this procedure in the future. Another one-year study involved children and adults with atopic dermatitis receiving care in medically underserved areas, outpatient clinics, and the general community. Through a randomized controlled trial (RCT), patients would receive either in-person care or direct-access care using an online model.[2] The investigator found that the online model resulted in improvements in clinical outcomes equivalent to in-person care. Other advantages to this approach included direct and expedient clinical interactions as well as removing the need to travel to a facility.

Researchers at the Children's University Hospital in Dublin, Ireland, developed a smartphone application to address adolescent obesity.[3] Children participating in the 12-month study that were between 12 and 17 years of age with a body mass index (BMI) greater than the 98th percentile. Those in the mHealth group had a smartphone application that incorporated evidence-based behavioral change tools such as self-monitoring, goal setting, and peer support. Patients were also encouraged to set daily goals and monitor their progress. The study results demonstrated improvements in self-management habits using mHealth.

Six studies described the use and impact of remote monitoring on increasing access to care for cancer, diabetes, asthma, and stroke. Three of the six studies described the use of remote monitoring among United States veterans. One study examined the utility of the VA's inpatient and outpatient Care Coordination/Home-Telehealth (CCHT) program to provide remote management of symptoms using home-telehealth technologies.[4] The CCHT consisted of 43 patients, while the control group that received regular in-person treatment consisted of 82 patients. After a six-month period, patients in the CCHT had significantly fewer preventable complications, bed days of care for hospitalization (all-cause), chemotherapy-related hospitalizations, and bed days of care for chemotherapy. The program demonstrated successful management of complex cancer symptoms in the CCHT without using in-person inpatient or outpatient services. A study of CCHT to support veterans with chronic conditions conducted over a four-year period showed a 25 percent reduction in bed days of care and a 19 percent reduction in the number of hospital admissions.[5] A final study of the CCHT program examined 400 veterans with

type 2 diabetes mellitus (DM) who were at high risk for multiple inpatient and outpatient visits.[6] The CCHT group employed a messaging device wherein nurse care coordinators answered patients' questions about DM; if needed, the nurse coordinators would arrange for an additional 15- to 30-minute phone call with a physician. After a two-year period, the analysis demonstrated a statistically significant reduction in the likelihood of all-cause and DM hospitalizations and a lower likelihood of having care-coordinator initiated primary care clinic visits.

Researchers at the University of Edinburgh developed a telemetric monitoring program to assess glycemic control, blood pressure, and weight among individuals with poor diabetes control. Individuals with type 2 DM and a confirmed HbA1c >7.5 percent used wireless technology to transmit blood glucose results, blood pressure readings, and weight to a remote server. Advanced practice nurses accessed these data to develop customized care plans for patients and determine if an in-person visit to a physician or hospital was necessary.[7] Similarly, a telehealth program developed in Australia known as Management of Asthma with Supportive Telehealth of Respiratory Function in Pregnancy (MASTERY) used a mobile application (*Breathe-easy)* to monitor lung function twice daily and record asthma symptoms and medication usage on a weekly basis.[8] This intervention allowed for earlier identification of worsening asthma and prevented exacerbations.

Researchers from the University of Pennsylvania and the Philadelphia Department of Public Health examined the use of store-and-forward teledermatology for outpatient diagnosis and management and its impact on access to dermatologic care in a resource-poor primary care setting.[9] A prospective study of 11 underserved clinics in Philadelphia occurred for a period of 10 months in 2013. During the study period, primary care physicians (PCPs) used a mobile store-and-forward platform to send more than 190 consults covering more than 206 dermatologic conditions to dermatologists at the University of Pennsylvania. The results showed the median time to consult completion was 14 hours, and 77 percent of all consults occurred by teledermatology alone. The overall conclusion was that this form of teledermatology was impactful in delivering care to resource-poor primary care settings.

The VA Puget Sound Healthcare System implemented a three-year project using store-and-forward technology for dermatology care and tracked completion of recommendations from dermatologists.[10] Twenty-seven rural outpatient clinics and centers in the Pacific Northwest that did not have access to a full-time dermatologist participated. More than 5,000 veterans participated with an evaluation of approximately 370 major dermatologic cases. The initial consultation involved the PCP taking photographic images and sending them to a teledermatologist at the Teledermatology Coordinating Center (TCC) in Seattle, Washington, who made an evaluation and alerted the PCP to the recommended treatment plan for the patient. Despite the difficulties in effectively using store-and-forward as a means of tracking follow-up procedures, the pilot study eventually led to better patient care and greater quality assurance because of the tracking features of the TCC.

Ophthalmologists at the Albert Einstein Medical Center studied the impact of store-and-forward telehealth, including the quality of imaging, on the accuracy and reliability of a diagnosis of retinopathy of prematurity (ROP). This team of doctors examined 67 infants over a one-year period. Initially, a trained neonatal nurse used wide-angle retinal imaging on infants between 31 to 37 weeks postmenstrual age (PMA).[a] A web-based telemedicine system uploaded the data as three retinal experts examined it to determine the risk and/or presence of ROP and to prescribe

a Postmenstrual age – gestational age plus chronological age.

treatment. The researchers concluded that the diagnostic accuracy using telehealth for infants between 35 and 37 weeks PMA was consistent with the diagnostic accuracy of an in-person assessment, and the reliability of the ROP diagnosis for infants between 35 and 37 weeks PMA was 89 percent.[11]

Several articles identified during the environmental scan illustrate the impact of videoconferencing on access to services for hepatitis C, COPD, mental health, stroke, and HIV/AIDS. The University of New Mexico (UNM) created the Extension for Community Health Outcome (ECHO) model to improve care for underserved populations with health problems such as hepatitis C virus (HCV) infection.[12] Despite the advances in treatment and improvements in cure rates, the number of patients receiving needed treatment or medications has been decreasing since 2002. The ECHO program assisted in training remote providers to treat complex diseases. Using a prospective cohort study, researchers compared treatment for HCV infection at 21 ECHO sites in rural areas and prisons against treatment provided at a UNM HCV clinic. The study cohort included 407 patients who had received no previous treatment. The major outcome measure was a sustained virologic response. At the end of the study, 58.2 percent of patients who received treatment at the ECHO sites saw a sustained viral response, and only 6.9 percent of the patients had an adverse event.

Patients in rural areas continue to face significant barriers in accessing appropriate and needed mental health treatment.[13] Individuals who present to critical access hospital emergency departments (EDs) with mental health conditions often do not receive timely evaluations and are, at times, unnecessarily admitted for observation or discharged before a trained professional is able to see them. Researchers at the University of Indiana conducted retrospective data collection to study patients presenting in the ED for 212 days prior to telemedicine interventions and for 184 days after. The intervention was the use of interactive videoconferencing between nurses at the hospital and trained mental health staff in community health centers. After a 13-month study period, the use of telehealth led to significant reductions in length of stay and time to initial consultation.

Another study at the Oregon Health and Sciences University used Skype videoconferencing to deliver behavioral health services to rural adolescents who had poorly controlled type 1 DM. Seventy-one patients received up to 10 sessions of a family-based behavioral health intervention through Skype, and the results demonstrated overall adherence to DM regimens. Additionally, the therapeutic relationship between the patient and the therapist was similar to that of in-person care.[14]

The VA Medical Center in Charleston, South Carolina, used telehealth to reach veterans in rural areas suffering from post-traumatic stress disorder (PTSD). The concept was to use videoconferencing as a modality for evidence-based psychotherapy (EBS), which has been shown to be an effective treatment for PTSD. After studying 59 combat veterans over an eight-week period in which they received EBS, their symptoms of both PTSD and depression decreased significantly.[15] A similar VA study in the Pacific Islands Healthcare System used videoconferencing to deliver cognitive processing therapy—cognitive only version (CPT-C)[16]—to a group of rural veterans with PTSD. Over a period of four years, 62 veterans each received 12 sessions of CPT-C with assessments taken at baseline, mid-treatment, immediately after post-treatment, and at three- and six-month intervals. Clinical and process outcomes demonstrated no noticeable differences to in-person treatment, while reductions in PTSD symptoms occurred immediately after post-treatment.

Thrombolytic therapy for patients with stroke can be effective in reducing stroke disability if there is rapid and appropriate use of the therapy. One study evaluated whether telehealth assisted with quicker decision making in the

use of thrombolytics in the time-pressured circumstances of acute stroke.[17] Over a three-year period, a randomized distribution of 234 patients occurred—stratified to either a telehealth program or a telephone consultation—to assess suitability for thrombolytics. The telehealth group more often experienced a higher incidence of correct decisions, and patient data were more complete. Additionally, those in the telehealth group had a lower rate of intracerebral hemorrhage, low technical complications, and favorable time requirements to support the efficacy of making treatment decisions.

The delivery of comprehensive care for individuals with HIV infection in rural and low prevalence settings has consistently posed a challenge. Researchers at the Veterans Rural Health Resource Center in Iowa developed a telehealth collaborative care (TCC) program for persons with HIV in a rural area.[18] This program integrated videoconferencing with specialists for the provision of HIV care by primary care providers in seven Community Based Outpatient Clinics serving rural areas. The design of the TCC was to delineate roles between specialists and generalists in the care of the patient; to create processes to improve care coordination between specialty and primary care teams; and to use a patient registry for population management across sites. The performance measures used for this study were care for HIV infection and common comorbidities, patient travel time to obtain care, and patient satisfaction. Among the 24 patients who used the TCC program within a one-year period, 90 percent of all patients met each of the performance measures. Travel time decreased from 320 minutes per patient on average to 170 minutes, and there were high satisfaction rates among participants. Additionally, researchers from the University of Minnesota found that the use of videoconferencing could help develop a model of care coordination for children with chronic conditions who also have medical complexity.[19] This model included family-centered care with high use of telehealth services to coordinate care with children across providers and caregivers.

Cost/Cost-Effectiveness

Two studies demonstrated the value of mobile technology by showing overall reductions in transportation costs and reducing the number of in-person visits to a physician. One study conducted by the Medical University of Graz in Austria[20] examined the feasibility and acceptance of teledermatology for wound management among home care patients with leg ulcers. Specifically, the focus was on evaluating the reduction of costs and the acceptance of the technology by both patients and home care nurses. Sixteen patients submitted weekly digital images to a secure website that included 45 leg ulcers including images of the wound and surrounding skin. Expert physicians then made an assessment and provided therapeutic recommendations. After the study, more than 89 percent of the images graded as excellent or sufficient with enough data and information for experts to provide recommendations. Additionally, there was a reduction of 46 percent in transportation costs for both insurance companies and patients due to a significant decrease in the number of visits to general physicians or wound care centers.

Another study examined the real-time use of teledermatology through mobile phones for the diagnosis and management of skin conditions in the emergency department (ED).[21] Over a two-year period, physicians in the ED used mobile phones to take images of more than 100 patients transmitted to a dermatologist through a secure text. The ED physician would make an initial recommendation, and the dermatologist would review and call the physician to determine the appropriate course of action. This type of videoconferencing improved the diagnostic performance in more than 68 percent of the cases seen, and the remote expertise of the dermatologists invalidated, enhanced, or clarified the ED physician's original diagnosis in 75 out of 110 cases. Given that the smartphones came with videoconferencing hardware installed, there was a

reduction in overall costs and general practitioner investment time.

Three studies identified cost-benefits as well as the cost-effectiveness of remote monitoring by ensuring both the provision of appropriate services to patients and the reduction of inpatient visits and/or hospitalizations. The Health Buddy Program was a care coordination approach that integrated a telehealth tool to provide care management for chronically ill Medicare beneficiaries.[22] A cohort of high-risk, high-cost patients with COPD, congestive heart failure, and DM who received care at two clinics in the Northwestern U.S. participated in a two-year study. The Health Buddy Device was a handheld device with four buttons and a high-resolution color screen located in a patient's home and linked via telephone to a case manager. On a daily basis, patients received questions tailored to their diagnosis that asked about symptoms, vital signs, knowledge, and health behavior. Patient responses were uploaded to a web-based application that risk-stratified responses to identify those who had deteriorating vital signs and symptoms. Patients at high risk were contacted by care managers to ensure they received appropriate services. Upon the conclusion of the study, there were significant savings per beneficiary for those who used the Health Buddy Program. Spending decreased between 7.7 and 13.2 percent per quarter ($312 to $542) per beneficiary.

In another study, researchers at the London School of Economics implemented a remote monitoring telehealth program for individuals with social care needs. More than 550 participants obtained a telecare system that included personalized sensors, home environment sensors, and other stand-alone devices for monitoring. The primary outcome was reduced incremental cost of services provided per quality-adjusted life year, with secondary outcomes including improved physical and mental health status, psychological well-being, and state-trait anxiety. The conclusion of the study indicated that the overall outcomes in care increased and that the cost-effectiveness of the telehealth intervention did not vary from traditional health and social care services.[23]

Another study conducted by the VA examined the CCHT program's impact on preventable hospitalizations for veterans with DM at four VA medical centers.[24] Using a matched-treatment control design, the researchers reviewed ambulatory-care sensitive conditions by applying criteria from the AHRQ to inpatient databases from the VA to determine preventable hospitalization. Patients in the CCHT program procured a home telehealth device in which they answered scripted questions about their symptoms and health status. During the study, patients in the CCHT program were less at risk for a preventable hospitalization than their nonenrollee counterparts.

Several studies described the cost savings and cost-effectiveness of store-and-forward technology by describing the use of the technology in increasing productivity, removing the need for in-person referrals, and reducing travel costs. A study by the Department of Defense (DoD)[25] examined cost minimization of store-and-forward teledermatology as compared to a conventional dermatology referral process. By focusing on healthcare utilization over a four-month period, the researchers examined variables such as clinic visits, teledermatology visits, laboratories, preparations, procedures, radiological tests, and medications. They estimated the direct medical care costs by combining utilization data with Medicare reimbursement rates and wholesale drug prices, and factored in productivity loss for seeking treatment as an indirect cost. Teledermatology patients incurred greater than $103,000 in total direct costs as compared to usual care patients, who incurred just over $98,000 in total direct costs. However, the indirect costs were much more significant. Teledermatology patients incurred $16,359 in lost productivity costs, while usual care patients cost almost twice as much

($30,788). The DoD concluded that the store-and-forward teledermatology was a cost-saving strategy for care delivery when it accounted for productivity loss. A case study from King's College in Canada described the encounter of a PCP with a Caucasian male in his fifties who had an enlarged nevus on his chest.[26] The PCP used store-and-forward teledermatology to send several images to a specialist who determined that the nevus was benign and required no further treatment. Given that the patient lived in a remote area, the use of the technology removed the need for a logistically difficult and expensive in-person referral.

Researchers at both the Alaska Native Medical Center and the Alaska Native Tribal Health Consortium conducted a study using store-and-forward electronic consultations with an otolaryngologist.[27] An audiologist traveled to remote parts of Alaska and took images of the appropriate parts of the otolaryngology exam to create telemedicine case studies. These studies included clinical histories, images, audiograms, tympanograms, optoacoustic emission testing and/or other documents. The otolaryngology consultants received these case studies, and made treatment and triage recommendations. Within a period of almost five years, the study generated 1,458 patient encounters. Approximately 26 percent of the cases were referred for surgery or special diagnostic testing, 23 percent were referred for monitoring, 15 percent were referred to a regional ear/nose/throat clinic (ENT), and 27 percent did not need to see an otolaryngologist and were triaged out of the specialty clinic. Because of this technology, 85 percent of the encounters required no travel for the patient, resulting in a cost avoidance of $496,420.

A retrospective, noncomparative consecutive case series conducted by researchers at the University of Alberta evaluated the clinical outcomes of a teleopthalmology program linking optometrists to retina specialists in Alberta, Canada.[28] Over a two-year period, more than 170 patients underwent stereoscopic, mydriatic digital photography in which a secure web server captured digital images to transfer over to a retinal specialist. The study period included 190 patients in which the wait time between a telehealth referral and a teleophthalmology review of the images was 1.9 days, as opposed to the wait time between a telehealth referral and an in-person evaluation, which was 25.1 days. This form of teleophthalmology also reduced travel distance and time, and reduced office visits to the retina specialist by 48 percent while improving the efficiency of clinical examination, testing, and treatment.

One study discussed depression as a common and significant health problem among older adults, with few of them accessing treatment, which affects their long-term health and adds cost to the healthcare system.[29] Researchers at Macquarie University conducted an RCT to examine the efficacy, long-term outcomes, and cost-effectiveness of Internet-based cognitive behavioral therapy. Within a cohort of 54 patients aged 60 or older with symptoms of depression, 27 patients used Internet therapy, while others formed the control group. Over an eight-week period, with five sessions of Internet therapy and weekly contact with a clinical psychologist, the participants in the Internet group had significantly lower scores on the Patient's Health Questionnaire 9-item (PHQ-9), a measure of symptoms and severity of depression. The scores maintained consistency at both three months and 12 months after treatment. The researchers concluded that the treatment was cost-effective according to the commonly used willingness-to-pay threshold of $50,000 in Australia for improved quality of life.

Patient/Provider Experience

Researchers at the Prince Charles Hospital in Australia[30] integrated mobile phones and web services into a comprehensive home-based care model for outpatient cardiac rehabilitation. Sensors would measure physical exercise, and an accessible web-based wellness diary collected

information on a patient's physiological risk factors and other health information. The built-in video and teleconference features of the phone allowed "mentors" to talk to patients about behavior modifications and to develop weekly and monthly goals. Patients also viewed educational multimedia content on cardiac rehabilitation on demand.

Investigators designed a pilot study in which there was sharing of medical data between a patient and a health professional for use in treatment during chemotherapy for skin cancer.[31] Specifically, the focus was on patients with cancer receiving chemotherapy at infusion centers in the metropolitan area of New York City. An offsite center provided easier access for patients and allowed them to reduce commuting time to the city, as well as avoid parking fees. Staff implemented an information system designed with a wireless telemedicine cart placed at the offsite center. In particular, the study looked at patients who had a dermatologic condition resulting from chemotherapy or biotherapy identified during a pre-chemotherapy nursing assessment. Nursing staff submitted images of these skin assessments to the main center in New York City, where a dermatologist was able to see the images of the affected area in real time and recommend treatment. Overall, both patients and clinicians were very satisfied with the use of the technology; all of them agreed that it made it easier to get medical care, and they would not have received better care in person at the dermatologist's office.

Researchers at Maastricht University in the Netherlands developed the *It's LiFe* feedback and monitoring tool as part of a self-management support program (SSP) to stimulate physical activity in people with COPD or type 2 DM.[32] Random placement of 24 family practices using a three-armed cluster randomized trial included those that used the tool and the SSP, used the SSP only, or received care as usual. The tool consisted of a three-dimensional activity monitor, a mobile application, and a web application. Patients wore the activity monitor on a daily basis so that they could see their progress on the web or mobile application and measure it against a personal goal. Patients participated in "diary sessions," and answered questions on a dialogue session built into the mobile application. Participants received regular feedback messages and tailored recommendations through the web and mobile application. After nine months, the group that used the tool plus the SSP had higher levels of physical activity directly after the intervention, and that increased level of physical activity remained consistent at three months after the intervention concluded.

An additional study discussed the satisfaction of providers with the use of store-and-forward telehealth in the area of dermatology. Researchers in Spain conducted a three-year study to determine the level of provider satisfaction with store-and-forward telehealth by comparing the concordance rates for the use of the technology and in-person consultations to ascertain a diagnosis.[33] Dermatologists performed more than 120 teleconsultations during the study period, with concordance rates of 76 percent for pediatric patients with inflammatory dermatoses and 75 percent for adults with infections and infestations. Overall, physicians were very satisfied with the high degree of diagnostic accuracy with the use of store-and-forward telehealth, as well as the ability to screen patients for necessary dermatological referrals.

A similar study occurred over a four-year period in California, with 17 teledermatology participants from a variety of practices.[34] More than 47 percent of the providers served at least one Federally Qualified Health Center (FQHC), and more than 75 percent of the patients seen during the study were at or below the 200 percent federal poverty level and lived in rural regions without dermatologist access. While providers varied in their views on image quality of the store-and-forward system as well as the system's ability to obtain a detailed medical history of the patient, most agreed that it increased access to specialty care for those patients.

Several studies discussed patient satisfaction with mental health services provided through video, a greater motivation for self-management and engaging in healthier behaviors, and increased satisfaction with the quality of services. The Northern Arizona Regional Behavioral Health Authority (NARBH) conducted a satisfaction survey[35] of telepsychiatry patients at a rural community mental health clinic that had been providing these services through telehealth for 10 years. The survey focused on individuals who had been using the services over multiple sessions with an emphasis on the quality of the services. Over a four-month period, 230 patients were surveyed and 76 responded (33 percent return rate). Among respondents, satisfaction was very high with the belief that mental health services mediated through telehealth were no different from services provided in person. Another study out of Arizona examined the effectiveness and satisfaction rate of telepsychiatry among underserved Hispanics. Patients reported a significant improvement in depression symptoms and stated that the technology helped close the gap in access to linguistically and culturally congruent specialists.[36]

Finally, both physicians and researchers view comprehensive multidisciplinary pulmonary rehabilitation as vital in the management of COPD.[37] A barrier to participating in this type of rehabilitation is the distance from the patient's home to a rehabilitation center and the lack of transportation. One study evaluated patients' acceptance of a home-based online and videoconferencing program for patients who have less severe COPD, but still need of comprehensive rehabilitation services. Ten participants enrolled in a nine-week program, with five patients engaged in exercises and an online self-management program that included online consultations. The results indicated that the patients using the online platform felt that the program provided an environment that facilitated health-enhancing behaviors and social interactions among similar individuals. Another 14-month study from the North Florida/South Georgia Veterans Health System examined functional outcomes, health-related quality of life, and satisfaction in a group of 26 veterans who received physical therapy via an in-home video telerehabilitation program, the Rural Veterans Telerehabilitation Initiative (RVTRI). Assessment of the veterans occurred through a variety of standardized instruments, including the Functional Independence Measure (FIM), the Montreal Cognitive Assessment (MoCA), and the two-minute walk test. Upon conclusion of the study, the veterans' functional independence and cognitive abilities significantly improved, and they noted increased satisfaction due to the avoidance of travel time and easier access to trained specialists.[38]

Identification of Clinical Areas for Potential Inclusion in the Framework

The literature provided a significant amount of information about how various modalities of telehealth intersect with clinical outcomes or processes of care. Closer examination of the evidence indicates the effect of telehealth on specific clinical areas and functions and provides insight into determining the impact of telehealth on both patient populations and providers. In developing a framework for using and creating measures to assess telehealth, it is important to understand the clinical areas in which the use of this technology has affected outcomes in a positive manner. This understanding informs guidance for selecting current quality measures and identifying the gaps for the future development of measures to evaluate the use of telehealth on a particular clinical area. During the review of the literature, NQF identified the modalities of telehealth and their relationships to different clinical areas, as well as the number of studies found within each clinical area to identify those areas in which telehealth may have had the most significant impact. Based on this analysis, the top five areas in which there was a preponderance of literature as well as a high number of patients studied were:

- Dermatology
- Mental health
- Rehabilitation
- Care coordination
- Chronic diseases (includes asthma, COPD, obesity, hypertension, diabetes, and congestive heart failure)

The next step in determining potential measures to include within the framework was to evaluate the impact of the telehealth intervention on the clinical outcome. For those outcomes associated with a positive impact, the quality measures that correspond to these clinical areas would be under consideration for potential inclusion in the framework. Each study pertaining to the five clinical areas referenced above determines the effect of the telehealth intervention on the outcome. In addition, the multistakeholder Telehealth Committee developed a framework to organize the proposed measure concepts around domains and subdomains that classify the concepts into specific categories; these categories serve as a reference within telehealth for future measure development.

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APPENDIX C:
Initial Measure Concepts

The measure concept tables are arranged based on the proposed domain(s) and subdomain(s).

- **Domain** – A categorization/grouping of high-level ideas developed by the Committee that further describes the measurement framework
- **Subdomain** – a smaller categorization/grouping within a domain
- **Measure Concept** – an idea for a measure that was proposed by the Committee that includes a description, a planned target, and population

Domain	Subdomain	Measure Concept
Experience	Patient, family, and/or caregiver	Patient demonstrated increased confidence in care plan
Experience	Patient, family, and/or caregiver	Patient demonstrated increased understanding of care plan
Experience	Patient, family, and/or caregiver	Patient demonstrated compliance with their care plan
Experience	Patient, family, and/or caregiver	Overall improvement in quality of life because services are received at home
Experience	Patient, family, and/or caregiver	Repeat use of services because of satisfaction with the services providers
Experience	Patient, Family, and/or caregiver	Patients are able to interpret diagnosis and treatment instructions through the telehealth modality
Experience	Patient, family, and/or caregiver	Decrease in wait times for patients
Experience	Patient, family, and/or caregiver/care team member	Satisfactory visit for both the patient and provider
Experience	Community, care team and patient, family, and/or caregiver	Impact of telehealth services on the workforce shortage
Financial Impact/Cost	Financial Impact to health system or payer	The duration of the visit is measured versus in-home care
Financial Impact/Cost	Financial Impact to care team	Decrease in no-show rate
Access to Care	Access for care team	In-person visit was agreed to after a telehealth consultation
Access to Care	Access for care team	Frequency of remote visits a provider imports
Access to Care	Access for care team and for patient, family, and/or caregiver	Overall number of multidisciplinary visits
Access to Care	Access to information	What is the data access in telehealth for those who consult to the primary care provider? What is the data access in telehealth for patients?
Access to Care	Access to information	What is the data access in telehealth for those who treat the patient?

Domain	Subdomain	Measure Concept
Effectiveness	System effectiveness	The amount of time it takes to schedule a visit
Effectiveness	System effectiveness	The amount of time to check-in for a visit
Effectiveness	System effectiveness	How closely the system meets the scheduled time of the appointment versus the actual appointment time
Effectiveness	System effectiveness	How many store-and-forward touches were in the technology
Effectiveness	System effectiveness Technical effectiveness	Amount of time it took to log off of the visit
Effectiveness	System effectiveness Operational effectiveness	Telehealth services facilitated transitions of care
Effectiveness	Clinical Effectiveness	Relationship of the telehealth modality to the therapeutic need of the patient
Effectiveness	Clinical effectiveness	The system was able to effectively provide the care that was recommended
Effectiveness	Operational effectiveness	Can telehealth offer the same quality of services across a population of similar patients?
Effectiveness	Operational effectiveness	A defined and specific process flow per diagnosis?
Effectiveness	Operational effectiveness	Amount of provider's time used during a telehealth consultation
Effectiveness	Operational effectiveness	Time interval from when information is received to when it is acted upon
Experience **Effectiveness**	Care team member including clinical provider Operational effectiveness	Technologies were in a satisfying condition for providers to do their job
Experience **Effectiveness**	Patient/Family and/or Caregiver System effectiveness	Patients can conduct visits on their own using a specific telehealth modality
Experience **Effectiveness**	Patient, family, and/or caregiver and Care team member including clinical provider Technical Effectiveness	Connectivity is clear and timely for both the provider and patient
Experience **Effectiveness**	Care team member System effectiveness	Satisfaction in telehealth capturing the appropriate clinical variable
Experience **Effectiveness**	Community Clinical effectiveness	The amount of care coordination needed due to the use of telehealth services
Experience **Effectiveness**	Experience of patient, family, and/or caregiver Technical effectiveness	Initial visit is connected to the appropriate provider
Effectiveness **Access to Care**	System effectiveness Patient, Family, and/or Caregiver	The instructions for care were clear to the patient

Domain	Subdomain	Measure Concept
Effectiveness **Access to Care**	Technical Effectiveness Patient, family, and/or caregiver	Increased likelihood for a patient to access the telehealth modality for an encounter
Effectiveness **Access to Care**	Clinical effectiveness Access for care team	Are providers able to see complex patients more efficiently
Access to Care **Financial Impact/Cost**	Access for patients or families Cost to patients, family, and/or caregiver	Was there any travel to a medical facility because of a telehealth diagnosis?
Access to Care **Financial Impact/Cost**	Access for patients or families Cost to patients, family, and/or caregiver	Was there any travel involved because telehealth facilitated transitions of care?
Access to Care **Financial Impact/Cost**	Access for patient, Family, and/or caregiver Financial Impact to Society Financial Impact to patient, family, and/or caregiver	The lack of telehealth led to a delayed diagnosis
Access to Care **Financial Impact/ Cost**	Access for patients or families Financial Impact to patient, family, and/or caregiver	Able to provide care without admission into the ER
Financial Impact/Cost **Effectiveness**	Financial impact to society Clinical effectiveness	Increase in diabetic exams with retinal screens
Financial Impact/Cost **Effectiveness**	Financial impact to society Clinical effectiveness	Increase in preventive visits
Financial Impact/Cost **Effectiveness**	Financial impact to health system or payer Clinical effectiveness	Increase in medication adherence
Financial Impact/ Cost **Effectiveness**	Financial Impact to patient, family, and/or caregiver and to health system or payer Clinical Effectiveness	Decrease in the length of stay in the hospital
Financial Impact/Cost **Effectiveness**	Financial Impact to patient, family, and/or caregiver and to health system or payer Clinical effectiveness	Telehealth services prevented an elevated amount of care to a patient
Effectiveness **Experience** **Financial Impact/Cost**	System effectiveness Experience of patient, family, and/or caregiver Cost to patient, family, and/or caregiver	Amount of patient's time used during a telehealth consultation
Experience **Effectiveness** **Financial Impact/Cost**	Patient, family, and/or caregiver; and community Care team member including clinical provider Clinical effectiveness Cost avoidance	Reduction in diagnostic errors and avoidance of an adverse outcome because of telehealth

Domain	Subdomain	Measure Concept
Experience **Effectiveness** **Financial Impact/Cost**	Patient, family, and/or caregiver Technical Effectiveness Financial Impact to health system or payer	Increased use of services
Access to Care **Effectiveness** **Experience**	Access for patients or families System and Technical effectiveness Patient, family, and/or caregiver	Percentage of patients enrolled in a telehealth program for at least three months
Access to Care **Effectiveness** **Experience**	Access for care team Access to patient, family, and/or caregiver Clinical effectiveness Experience for members of care team	Removing geographic limitations increased the volume of specialty providers
Access to Care **Experience** **Financial Impact/Cost**	Access and Experience for patients, family and/or caregiver Financial impact to society Financial impact to patients, family, and/or caregiver	Was travel eliminated for a specific patient encounter because of telehealth services?

APPENDIX D:
Initial Measures

The table below presents the initial measures chosen by the Committee to assess the use of telehealth as a means of care delivery and its impact on quality of care. The table is broken down into the following components:

- **NQF Number** (only NQF-endorsed measures were considered)
- **Measure Name** – Name of the measure
- **Measure Description** – Description of the measure including intended target and population
- **NQS Domain** – Applicable domain from the National Quality Strategy
- **Measure Type** – Outcome, Process, or Structural
- **Data Submission Methods** – Claims, Registry, EHR, CMS Web Interface
- **Primary Measure Steward** – Organization responsible for the endorsement and maintenance of the measure

NQF #	Measure Name	Measure Description	NQS Domain	Measure Type	Data Submission Method	Primary Measure Steward
0102	Chronic Obstructive Pulmonary Disease (COPD): Long-Acting Inhaled Bronchodilator Therapy	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 an long-acting inhaled bronchodilator	Effective Clinical Care	Process	Claims, Registry	American Thoracic Society
0091	Chronic Obstructive Pulmonary Disease (COPD): Spirometry Evaluation	Percentage of patients aged 18 years and older with a diagnosis of COPD who had spirometry results documented	Effective Clinical Care	Process	Claims, Registry	American Thoracic Society
0018	Controlling High Blood Pressure	Percentage of patients 18-85 years of age who had a diagnosis of hypertension and whose blood pressure was adequately controlled (<140/90mmHg) during the measurement period	Effective Clinical Care	Intermediate Outcome	Claims, CMS Web Interface, EHR, Registry	National Committee for Quality Assurance
0066	Coronary Artery Disease (CAD): Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy - Diabetes or Left Ventricular Systolic Dysfunction (LVEF <40%)	Percentage of patients aged 18 years and older with a diagnosis of coronary artery disease seen within a 12 month period who also have diabetes OR a current or prior Left Ventricular Ejection Fraction (LVEF) <40% who were prescribed ACE inhibitor or ARB therapy	Effective Clinical Care	Process	Registry	American Heart Association
0089	Diabetic Retinopathy: Communication with the Physician Managing Ongoing Diabetes Care	Percentage of patients aged 18 years and older with a diagnosis of diabetic retinopathy who had a dilated macular or fundus exam performed with documented communication to the physician who manages the ongoing care of the patient with diabetes mellitus regarding the findings of the macular or fundus exam at least once within 12 months	Communication and Care Coordination	Process	Claims, EHR, Registry	Physician Consortium for Performance Improvement

NQF #	Measure Name	Measure Description	NQS Domain	Measure Type	Data Submission Method	Primary Measure Steward
0576	Follow-Up After Hospitalization for Mental Illness (FUH)	The percentage of discharges for patients 6 years of age and older who were hospitalized for treatment of selected mental illness diagnoses and who had an outpatient visit, an intensive outpatient encounter or partial hospitalization with a mental health practitioner. Two rates are reported: The percentage of discharges for which the patient received follow-up within 30 days of discharge. The percentage of discharges for which the patient received follow-up within 7 days of discharge	Communication and Care Coordination	Process	Registry	National Committee for Quality Assurance
2624	Functional Outcome Assessment	Percentage of visits for patients aged 18 years and older with documentation of a current functional outcome assessment using a standardized functional outcome assessment tool on the date of the encounter AND documentation of a care plan based on identified functional outcome deficiencies on the date of the identified deficiencies	Communication and Care Coordination	Process	Claims, Registry	Centers for Medicare & Medicaid Services
0427	Functional Status Change for Patients with Elbow, Wrist or Hand Impairments	A self-report outcome measure of functional status (FS) for patients 14 years+ with elbow, wrist or hand impairments. The change in FS assessed using FOTO (elbow, wrist and hand) PROM (patient reported outcomes measure) is adjusted to patient characteristics known to be associated with FS outcomes (risk adjusted) and used as a performance measure at the patient level, at the individual clinician, and at the clinic level to assess quality	Communication and Care Coordination	Outcome	Registry	Focus on Therapeutic Outcomes, Inc.
0424	Functional Status Change for Patients with Foot or Ankle Impairments	A self-report measure of change in functional status (FS) for patients 14 years+ with foot and ankle impairments. The change in functional status (FS) assessed using FOTO's (foot and ankle) PROM (patient reported outcomes measure) is adjusted to patient characteristics known to be associated with FS outcomes (risk adjusted) and used as a performance measure at the patient level, at the individual clinician, and at the clinic level to assess quality	Communication and Care Coordination	Outcome	Registry	Focus on Therapeutic Outcomes, Inc.

NQF #	Measure Name	Measure Description	NQS Domain	Measure Type	Data Submission Method	Primary Measure Steward
0428	Functional Status Change for Patients with General Orthopaedic Impairments	A self-report outcome measure of functional status (FS) for patients 14 years+ with general orthopaedic impairments (neck, cranium, mandible, thoracic spine, ribs or other general orthopaedic impairment). The change in FS assessed using FOTO (general orthopaedic) PROM (patient reported outcomes measure) is adjusted to patient characteristics known to be associated with FS outcomes (risk adjusted) and used as a performance measure at the patient level, at the individual clinician, and at the clinic level to assess quality	Communication and Care Coordination	Outcome	Registry	Focus on Therapeutic Outcomes, Inc.
0423	Functional Status Change for Patients with Hip Impairments	A self-report measure of change in functional status (FS) for patients 14 years+ with hip impairments. The change in functional status (FS) assessed using FOTO's (hip) PROM (patient-reported outcomes measure) is adjusted to patient characteristics known to be associated with FS outcomes (risk adjusted) and used as a performance measure at the patient level, at the individual clinician, and at the clinic level to assess quality	Communication and Care Coordination	Outcome	Registry	Focus on Therapeutic Outcomes, Inc.
0422	Functional Status Change for Patients with Knee Impairments	A self-report measure of change in functional status for patients 14 year+ with knee impairments. The change in functional status (FS) assessed using FOTO's (knee) PROM (patient-reported outcomes measure) is adjusted to patient characteristics known to be associated with FS outcomes (risk adjusted) and used as a performance measure at the patient level, at the individual clinician, and at the clinic level to assess quality	Communication and Care Coordination	Outcome	Registry	Focus on Therapeutic Outcomes, Inc.

NQF #	Measure Name	Measure Description	NQS Domain	Measure Type	Data Submission Method	Primary Measure Steward
0425	Functional Status Change for Patients with Lumbar Impairments	A self-report outcome measure of change in functional status for patients 14 years+ with lumbar impairments. The change in functional status (FS) assessed using FOTO (lumbar) PROM (patient reported outcome measure) is adjusted to patient characteristics known to be associated with FS outcomes (risk adjusted) and used as a performance measure at the patient level, at the individual clinician, and at the clinic level to assess quality	Communication and Care Coordination	Outcome	Registry	Focus on Therapeutic Outcomes, Inc.
0426	Functional Status Change for Patients with Shoulder Impairments	A self-report outcome measure of change in functional status (FS) for patients 14 years+ with shoulder impairments. The change in functional status (FS) assessed using FOTO's (shoulder) PROM (patient reported outcomes measure) is adjusted to patient characteristics known to be associated with FS outcomes (risk adjusted) and used as a performance measure at the patient level, at the individual clinician, and at the clinic level to assess quality	Communication and Care Coordination	Outcome	Registry	Focus on Therapeutic Outcomes, Inc.
0650	Melanoma: Continuity of Care - Recall System	Percentage of patients, regardless of age, with a current diagnosis of melanoma or a history of melanoma whose information was entered, at least once within a 12 month period, into a recall system that includes: A target date for the next complete physical skin exam, AND A process to follow up with patients who either did not make an appointment within the specified timeframe or who missed a scheduled appointment	Communication and Care Coordination	Structure	Registry	American Academy of Dermatology
0028	Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention	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	Community/ Population Health	Process	Claims, CMS Web Interface, EHR, Registry	Physician Consortium for Performance Improvement

APPENDIX E:
Telehealth Committee and NQF Staff

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APPENDIX F:
Public Comments

Executive Summary

American Optometric Association

If telehealth is to be effective, it must provide a comparable patient experience and equivalent outcomes to in-person care. Anything less than this is to offer a patient inferior care.

Committee Response:

Thank you for your comment.

Connected Health Initiative (CHI)

NOTE: The following are intended to serve as general comments on the NQF framework. Further comments we provide under each section are specific to those sections.

The Connected Health Initiative (CHI - http://connectedhi.com/) appreciates the opportunity to provide input to the National Quality Forum (NQF) on its June 1, 2017 draft report for comment titled Creating a Framework to Support Measure Development for Telehealth. The CHI is the leading effort to accelerate connected health innovations in a responsible and secure manner throughout the continuum of patient care.

The CHI supports the NQF's efforts to develop a framework to serve as the foundation for future telehealth quality measures by developers, researchers, analysts, and others in healthcare. As evidenced by NQF's Environmental Scan Findings, we believe that ample evidence exists (and continues to grow) demonstrating that telehealth and remote monitoring (RM) of patient-generated health data serve as cornerstones for modern healthcare, particularly with respect to those suffering from acute and chronic illnesses.

The draft NQF report comes at a crucial time, as policymakers (namely, the Centers for Medicare and Medicaid Services [CMS]) are faced with transforming healthcare to value based systems. There are many outdated statutes and regulations that currently limit payment for telehealth and RM in the delivery of care. More pointedly, a perceived lack of evidence on the cost savings and clinical benefits of these connected healthcare technology innovations has stifled policy makers from considering telehealth and RM. A notable example of the outdated policy barriers to telehealth (and for that matter RM) reimbursement is Section 1834(m) of the Social Security Act which places significant restrictions on telehealth services [See 42 CFR § 410.78]; further, remote patient monitoring, independent of telehealth services, is unreasonably restrained by CMS' refusal to pay. Today Medicare coverage for telehealth and RPM does not align with clinical evidence [For example, according to the Centers for Medicare & Medicaid Services (CMS), Medicare telemedicine reimbursement totaled a mere $13.9 million in Calendar Year 2014. See http://ctel.org/2015/05/cms-medicarereimburses-nearly-14-million-for-telemedicine-in-2014/], and incorporation of patient-generated health data (PGHD) through RM is effectively non-existent. Meanwhile, private payers are increasingly utilizing connected health innovations, in some cases lapping the Medicare system that millions of Americans rely on.

NQF's effort is well-positioned to assist the federal government and other stakeholders in the benefits of telehealth and RM. We support NQF's effort and request that our views be fully considered as this framework is finalized.

Committee Response:

Thank you for your comment.

Dena Puskin

I wish to thank the NQF and the Department of Health and Human Services for supporting this work and soliciting public comment. As has been said, "Telehealth has come a long way, baby." This report builds upon years of effort to try and standardize the evaluation of telehealth services. As early as 1995, Rashid Bashshur and Jim Grigsby outlined several approaches to evaluating telemedicine,

and in that same year, the Joint Working Group on Telemedicine presented a conceptual framework to evaluate federal telemedicine programs [Bashshur, RL. On the definition and evaluation of telemedicine. Telemed J 1995, Vol. 1, 19-30; Gribsby, J, Schlenker, RE, Kaehny, MM. Shaughnessy, PW, Sandberg, EJ. Analytic framework for evaluation of telemedicine. Telemed J 1995, Vol. 1, 31-39; Puskin, DS, Brink, LH, Mintzer, CL, Wasem, CJ. Joint Federal Initiative for Creating a Telemedicine Evaluation Framework, Telemed J 1195, Vol. 4, 395-399]. At that time, it was noted that telemedicine projects throughout the United State encountered several challenges in conducting evaluation studies, including insufficient sample size. Since that time, telemedicine and telehealth applications have grown exponentially. However, outside of the VA and military studies, we are still often faced with the challenge of small sample size. By creating a well-structured evaluation framework and measures, we have the ability to look across studies and programs to more effectively synthesize findings and build a solid foundation for understanding the benefits of telehealth for individuals and society. I would suggest that in the Executive Summary and the Introduction, the Committee might wish to note this benefit of their current work and future efforts.

Committee Response:

Thank you for your comment.

Medtronic

Medtronic appreciates the opportunity to submit comments to the National Quality Forum (NQF) regarding NQFs Framework to Support Measure Development for Telehealth. Medtronic's Minimally Invasive Therapies Group supports efforts to alleviate pain, restore health, and extend life and is actively engaged in developing innovative technologies to assist in improving access and patient experience as well as demonstrating economic value and effectiveness of care.

We applaud the NQF Telehealth Framework committee for creating this body of work from which future measures can be implemented. In addition to the thorough work presented which focuses on the importance of Telehealth in rural and home settings, we encourage the committee to also consider urban settings as well. We suggest that Telehealth may also improve access and effectiveness of care even in existing inpatient settings and post-acute facilities. Not only can access be a factor in remote rural areas or home settings, but also in urban hospitals and post-acute facilities which may not always have the appropriate level of clinical support readily available. For this reason, we believe that urban hospitals can also benefit from Telehealth systems that provide patient data to providers in a more timely manner. This improved access leads to more effective care by enabling an earlier diagnosis and treatment plan.

A 2014 publication in Chest, "A Multicenter Study of ICU Telemedicine Reengineering of Adult Critical Care," by Lilly, et. al., supports this assertion.

The main finding of this study was that implementation of an ICU telemedicine program was associated with significantly lower mortality and shorter LOS in both the ICU and hospital setting. Significantly reduced hospital and ICU mortality and LOS were found in both crude analyses and analyses that were adjusted for potential confounding factors, including differences in acuity score, operative status, effects of time alone, and primary admission diagnosis. The association of the ICU telemedicine interventions with lower hospital mortality is notable because prior studies have not had adequate power to provide unequivocal evidence of this association.

In addition to supporting the existing body of work focused on rural and home settings as presented by the committee, we also encourage the committee or future committees to consider the application of Telehealth even in these urban situations as a means to improve access and effectiveness of care.

Thank you for your consideration.

Lilly C, McLaughlin JM, Zhao H, Baker S, Cody S, Irwin R. A Multicenter Study of ICU Telemedicine

Reengineering of Adult Critical Care. Chest. 2014; 145 (3): 500-507.

Committee Response:

Thank you for your comment. The Committee has decided to expand wording with regard to the application of telehealth in rural and urban settings instead of discussing issues that are specific to only a rural or urban setting.

Personal Connected Healh Alliance

On behalf of the Personal Connected Health Alliance (PCHAlliance), we are writing to comment on the draft report titled "Creating a Framework to Support Measure Development for Telehealth".

PCHAlliance comments represent our collective members' perspective with a focus on the need for expanded delivery of chronic care management to the beneficiaries of Medicare and Medicaid. PCHAlliance members provide clinical services; design, manufacture, and market devices that facilitate patient-centered health care delivery. In addition, our members operate the networks that enable the interoperable exchange of personal health data, increase the usability of clinical decision support, improve care transitions, and provide unified communications for providers. PCHAlliance member list can be found at http://www.pchalliance.org.

PCHAlliance urges robust and timely deployment of quality measures of remote monitoring AND telehealth services to promote high quality, patient-centric care using proven information technology. We appreciate the work done by the National Quality Forum (NQF) to support this goal. The identification and definition of the breadth of applications of information communications technology to deliver health care in this report matches the current evidence proven use cases. Further, the domains and subdomains identified for measurement in this report follow both the evidence base and the outcomes that are important to patients.

We would like to suggest that the report more clearly note that in the Medicare program remote monitoring and telehealth are distinct and different services. The report currently (page 5) implies that restrictions on Medicare reimbursement limit telehealth, yet the limitations or restrictions in Medicare are far more extensive than reimbursement. The Medicare statute combined with the program's regulatory definition of telecommunications system severely restricts Medicare telehealth to live face to face applications conducted between health care facilities or clinics. Use of the term telehealth in the context of Medicare refers to a mid-20th century version of telehealth and Medicare telehealth is extremely limited and cannot, because of legislative and regulatory language, include the accurate and full range of services identified in this report as telehealth. Interestingly, Medicare may cover remote monitoring through the physician fee schedule, as a part of chronic care management or in some cases via CPT codes that reimburse physicians for the reading of implanted device data. But, this Medicare remote monitoring coverage is not classified as telehealth and is sporadic at best.

Committee Response:

Thank you for your comment.

Qualcomm

Remove the reference to HRSA's definition of telehealth – In the Executive Summary, NQF references the Health Resources and Services Administration (HRSA) definition of telehealth as "the use of electronic information and telecommunications technologies to support and promote long-distance clinical healthcare, patient and professional health-related education, public health and health administration." We agree with NQF that there is no standard definition for this important area of health IT, which is why we urge NQF to remove the reference to HRSA's definition. Including said definition gives the impression that NQF endorses that sole definition. A particular issue with that definition is the reference to "longdistance."

Telehealth and remote monitoring occur at any distance whether down the hall of the same institution, or across the planet in a rural and remote area. In fact, we feel telehealth and remote monitoring are virtual healthcare delivered at any distance. We therefore recommend removing the entire second sentence from the Executive Summary.

Committee Response:

Thank you for your comments. The Committee has decided to keep the definition of telehealth broad and use HRSA's definition of telehealth as an example of a telehealth definition, instead of as the definitive definition of telehealth.

Social and Scientific Systems

I appreciate the opportunity to comment on the NQF draft report referenced above. I am submitting my comments on behalf of Social & Scientific Systems (SSS). SSS—an employee-owned company—has supported public- and private-sector health programs since 1978, providing technical, research, and program management services to NIH, AHRQ, CMS, and other clients. Specifically, SSS provides research, evaluation, and policy analysis for public health programs; management and operational support for clinical trials and bioscience research programs; specialized and integrated support for large epidemiologic studies; statistical programming and analysis; database and application development and data analysis; and health IT solutions for a wide range of programs. Of particular note, through multiple contracts, SSS supports the development and implementation of Alternative Payment Models (APM) and Value Based Payment (VBP) methodologies, including the effective assessment and application of health care quality measures.

We encourage NQF to expand the draft to specifically include definitions for telemedicine, remote monitoring, m-health, and e-health, as well as definitions for telehealth (p. 3). We make this recommendation to emphasize the differences between a face-to-face visit furnished via telehealth and other services such as analysis of remote monitoring activities. (We recognize that your draft contemplates both concepts, and that you give examples as "modalities" on page 6, but this does not recognize the importance of coverage and payment considerations when additional health services are furnished in conjunction with the telehealth service.)

Committee Response:

Thank you for your comments. The Committee has decided to keep the definition of telehealth broad and use HRSA's definition of telehealth as an example of a telehealth definition, instead of as the definitive definition of telehealth.

Social and Scientific Systems

SSS applauds NQF's recognition of the tremendous potential of telehealth in transforming the health care delivery system. Expanding the use of telehealth services will not only improve access, but will also control the cost and timeliness of care provided. The advancement of quality measures in this area is critical for patient safety. The replacement of a face-to-face physician visit with telehealth services will carry an extra burden for providers, who will now be responsible for oversite of approved technologies, accurate surveillance of reported remote data, and the application of predictive analytics for critical and chronic care models for remote patients. We share the opinion that the timing of telehealth measures is astute. While much of health care reform has fallen victim to a deeply divided political system, telehealth is nonpartisan and upheld by representatives of both parties as a "savior" for the health care system.

Committee Response:

Thank you for your comment.

The Gary and Mary West Health Institute

June 30, 2017

The Gary and Mary West Health Institute, a nonpartisan, nonprofit applied medical research organization, dedicated to enabling successful aging for seniors, appreciates the opportunity to provide comment to the National Quality Forum's 'Creating a Framework to Support Measure Development for Telehealth' draft report.

West Health supports the methodology in creating the measurement framework and the suggested measure concepts stated in the report. The report addresses the expansive nature of telehealth and provides a needed and pragmatic approach to developing measures. The report promotes measurements that can enhance current and future service development, quality initiatives, and research. Additionally, the report can serve to inform value propositions for delivering care which leverages the appropriate deployment of telehealth. The measures also successfully encompass what exists today and provides flexibility for an industry that adapts as new technologies and processes are developed.

West Health applauds National Quality Forum's successful model of conducting a multi-stakeholder review of existing and potential telehealth metrics, leading to the identification of measurement gaps, and the development of a measure framework

and set of guiding principles for future telehealth measurement and the possible need for telehealth measure development. The purpose of this work is to facilitate the identification of the most appropriate way to ensure clinical measures are applied to telehealth encounters in order to measure quality of care and to guide the future development of telehealth related measures. This is essential to the alignment of incentives for patients, payers and providers and the advancement of aging-in-place models for seniors.

We thank NQF for the opportunity to provide comments.

Committee Response:

Thank you for your comment.

University of Rochester Medical Center

Bulleted list:

The 4th bullet lacks a balance to parenthesis.

The direct patient care bullet (4th) is extremely vague about the scope of direct patient care, and it may be interpreted in a very narrow sense. Continuity of care is NOT mentioned.

Committee Response:

Thank you for your comment. Edits have been made per the suggested comment.

URAC

URAC, as an organization that promotes continuous improvement in the quality and efficiency of health care through the processes of accreditation and measurement, is pleased to provide feedback to the Committee. We support the work of NQF, particularly this project because telehealth has the potential to improve both access and the quality of care for currently underserved patient populations. URAC applauds the report's recommendation that telehealth be included as part of care delivery and that existing measures assessing patient outcomes can be appropriately applied to telehealth programs.

The adoption of telehealth services creates unique opportunities and challenges. Consistency of services, provider credentialing, HIPAA compliance, state-by-state regulatory compliance, reimbursement, and patient protection are just some of the issues that must be addressed by the industry. It is imperative that telehealth providers demonstrate that they can deliver quality health care to patients and contribute to overall health care system improvement while addressing these issues.

Cybersecurity is very important not just in telehealth but in health care. When most or all doctor-patient interactions move online, questions arise about HIPAA, patient information security and confidentiality. Providers need to reassure regulators and patients that critical data is properly secured, yet accessible. There is little or no mention of this issue in the draft report. URAC recommends that NQF review the issues associated with cybersecurity in telehealth and evaluate the appropriateness of measures to assess performance.

Measurement and reporting accountability is important not only for performance reporting to purchasers but also is imperative for internal understanding of the achievement and improvement record. Currently there are few performance benchmarks, thresholds and measures to help purchasers make decisions about telehealth services. Some aspects of telehealth are addressed by regulation, but there is currently a patchwork of inconsistent state regulations which creates a challenge for providers in demonstrating the value of telehealth services. Measures that address the quality of the telehealth program as evidence by patient outcomes should be strongly encouraged. However, care should be taken when developing measures as some concepts are better addressed through evidence-based standards rather than a metric. Historically, independent accrediting bodies have filled this crucial role by creating accreditation programs that validate the quality of an organization's operations based on evidence-based, nationally recognized best practices. This approach is an effective way to encourage quality in the performance of a telehealth program while avoiding unnecessary measure development that may contribute to "measures fatigue."

Committee Response:

Thank you for your comment.

Introduction

American Medical Association

Thank you for the opportunity to comment. The American Medical Association (AMA) strongly supports efforts that result in the adoption of digital medicine tools that improve the quality of care and improved patient health outcomes. We urge the National Quality Forum (NQF) to consider the following overarching recommendations supported by the detailed comments that follow thereafter:

- Utilize existing quality measures to the greatest extent practicable for virtual services.
- Improvement Activities under MACRA are intended to provide credit for ongoing or already established activities and are reported via yes/no attestation as opposed to evaluation against a threshold or benchmark; thus, we do not support the development of IA quality measures.
- Conform and correct inaccurate MACRA related statements in the draft report.
- Release the complete literature review including citations into the public domain to support digital medicine adoption consistent with clinical literature.

UNIFORM SET OF QUALITY MEASURES FOR IN-PERSON AND VIRTUAL SERVICES

The AMA appreciates the opportunity to provide comment on the structure, literature review, and recommendations related to existing quality measures that could be utilized for reporting on quality when services are delivered utilizing technologies that enable telehealth and remote patient monitoring and a proposed framework for new measure development that would account for relevant telehealth benefits and risk and would, presumably, apply to in-person care as well.

We recommend that existing quality measures should be utilized when reporting whether services are delivered virtually or in-person. While there will be a need to develop new quality measures that would capture additional quality considerations/ measurement where telehealth presents heightened benefit or heightened risk, in general services provided virtually should be subject to the same quality measures as in-person care and vice-versa.

At the outset, it was not clear that NQF was employing a two-step approach—namely identifying existing quality measures that should apply for in-person and virtual care and then creating a framework for future measure development. We would urge you to make this explicit in the introduction and move the summary of existing quality measures that you found appropriate for use when care is delivered virtually to the opening section after you discuss literature review methodology. The report can easily be misinterpreted to mean you are setting up a new measurement system for measures related to telehealth due to the concepts included in the different domains (pages 11-16), as well as those listed in Appendix C.

Committee Response:

Thank you for your comment. Edits have been made per the suggested comments. The Committee noted that the measures chosen as the initial measure list are not intended to be an exhaustive list, but as a starting point. The report is revised to add clarifying language on the reasons why some existing measures were chosen, and to emphasize the Committee's intention that the initial measure list is not meant to be exhaustive. In addition, the MACRA information has been revised based on information supplied by the Center for Medicare and Medicaid Innovation (CMMI). With regard to releasing the complete literature review, unfortunately a separate report focusing only on the environmental scan performed is out of the project's scope of work. However, the information can be found in Appendix B.

American Occupational Therapy Association

The American Occupational Therapy Association (AOTA) appreciates the opportunity to comment on the Telehealth Framework report by NQF. We agree that telehealth (including telerehabilitation and occupational therapy services) can be a valuable model of service delivery that allows clients or patients to develop skills; incorporate assistive technology and adaptive techniques; modify work, home, or school environments; and create health-promoting habits and routines.

While telehealth can be valuable for rural and frontier communities, there are many other situations where telehealth can be used to improve the health, well-being, and participation of people who otherwise

may not have access to services or may have to delay access. This includes people who do not have the functional ability to commute easily and those with limited disposable income needed for transportation.

Committee Response:

Thank you for your comment. The Committee has decided to expand wording with regard to the application of telehealth in rural and urban settings instead of discussing issues that are specific to only a rural or urban setting.

American Optometric Association

The American Optometric Association appreciates the opportunity to comment on this draft report. As NQF states, "telehealth is a different method of healthcare delivery that provides similar or supplemental services to in-person encounters." This is an especially important distinction given that many so-called telehealth service platforms and applications imply that it is possible to replace in-person care entirely with telehealth services. True telehealth services are used to supplement access to high-value, high-quality care. Eye and vision telehealth services, when used appropriately, can serve to improve patient care and coordination and communication among and between doctors of optometry and ophthalmologists, as well as other primary care or specialty care providers.

As the Committee states, telehealth activities can be especially useful in communities where access to health care services is limited. However, we would stress that it remains vital to continue efforts to improve access to local care providers and ensure that the use of telehealth services, when appropriate, is always the choice of the patient. The AOA supports patients' right to choose (at any point in the diagnosis and care continuum) in-person eye and vision health care provided by an eye doctor – a doctor of optometry or ophthalmologist.

It is also tremendously important to ensure that services provided by telehealth adhere to the same standard of care as in-person health care services, and that outcomes are comparable or better when telehealth services are used to enhance in-person care.

Committee Response:

Thank you for your comment.

Connected Health Initiative (CHI)

CMS remains constrained by statute defining telehealth as, in effect, a live voice or video call, which is further restricted by onerous requirements on geography and originating site locations. NQF should consider a technology neutral definition that assures an inclusive range of connected health technology innovations, be they "synchronous" or "asynchronous," touching urban, suburban, or rural areas. We therefore recommend that the Executive Summary discuss a simpler definition in relation to current definitions of telehealth, including HRSA's. However, HRSA's definition, too, is unduly constrained in restricting telehealth to communications over "long distances," an unjustified differentiation. We believe that NQF agrees with the CHI that telehealth may occur between any separate two locations, even if there are not "long distances" between them. Therefore, we request that NQF discuss this shortcoming of the HRSA definition, and ensure that it does not defer to it in a blanket fashion.

We also urge NQF to indicate telehealth's value to those suffering from acute conditions by making the following edit on page 4 (added text bold): "Manage patients with multiple acute and/or chronic conditions from a distance; and".

We appreciate the NQF's discussion of the growing use of telehealth in Medicare. Disappointingly, CMS has a limited definition of telehealth and the report's discussion in the first full paragraph on page 5 can easily be misread to mean that CMS is providing reimbursement for telehealth (as envisioned by NQF) widely, which is absolutely not the case. Using its extremely limited version of "telehealth," CMS provides, at best, scant reimbursement (e.g., in CY 2014 CMS provided a mere $13.9 million in reimbursement payments for telehealth services [http://ctel.org/2015/05/cms-medicare-reimburses-nearly-14-million-for-telemedicine-in-2014/]), and effectively no reimbursement for remote monitoring. The CHI strongly recommends that the NQF's discussion of CMS' telehealth and remote monitoring reimbursement practices be revised in this section to reflect the agency's practices.

Committee Response:

Thank you for your comments. The Committee has decided to keep the definition of telehealth broad

and use HRSA's definition of telehealth as an example of a telehealth definition, instead of as the definitive definition of telehealth. All other comments have been taken into consideration.

Dena Puskin

Page 4: In the introduction, the Committee notes that telehealth applications have been adopted in urban and suburban settings, especially for specialties where there are significant workforce shortages and/or maldistribution or long delays to schedule appointments. The Committee may also wish to point out that these technologies can play a critical role in helping low income urban and suburban residents receive care when transportation is a significant barrier. Although you reference maldistribution, for most individuals with cars or reasonable incomes, driving or taking a taxi to a doctor is not a challenge in urban and suburban communities. However, multiple sources of public transportation or begging a friend may be required for low income residents to reach a clinic or hospital that will serve them, often resulting in these individuals delaying or not seeking care. The impact of poor transportation options on access to health care for low income urban and suburban residents was well described in an Atlantic article that first appeared in 2015 [https://www.theatlantic.com/health/archive/2015/08/the-transportation-barrier/399728/].

Committee Response:

Thank you for your comment. The Committee has decided to expand wording with regard to the application of telehealth in rural and urban settings instead of discussing issues that are specific to only to a rural or urban setting.

Personal Connected Healh Alliance

More specifically, we suggest edits to ensure this report be applicable to Medicare:

Clear notation that Medicare's definition of telehealth is substantially different from the broad and modern understanding of telehealth. And, note that in the context of Medicare measurement both remote monitoring and telehealth must be identified as some remote monitoring is covered by Medicare and Medicare has authority to cover remote monitoring more robustly (even if it has not chosen to do so).

Committee Response:

Thank you for your comment. The Committee has decided to keep the definition of telehealth broad and use HRSA's definition of telehealth as an example of a telehealth definition, instead of as the definitive definition of telehealth.

University of Rochester Medical Center

2nd sentence: This is where we need to point out that to make a valid medical decision, one needs an appropriate information base whether the information is acquired in-person or using connected care tools. The word "similar" is sufficiently vague to invite obfuscation.

Regarding bulleted list, see comment on same list in the Exec.Summary.

Although geography, age and morbidity burden all heighten the value of connected care, time is a valuable commodity to all families and all individuals. Urban settings are an appropriate focus for connected care as well, as our research has amply demonstrated.

The following publications include summaries of much of this peer-reviewed research --

McConnochie KM. Pursuit of Value in Connected Healthcare. Telemedicine and e-Health 2015;21(11):863-869

McConnochie KM. Potential of telemedicine in pediatric primary care. Pediatrics in Review. September 2006, online edition. American Academy of Pediatrics, Elm Grove, IL

Top of p5, re: chronic disease management. Substantial positive impact has also been demonstrated in connected care for children with asthma. Behavioral health, an area where there is a substantial access problem in both urban as well as rural areas, also would benefit substantially from access via connected care.

Committee Response:

Thank you for your comments.

Methodology

American Medical Association

RELEASE COMPLETE ENVIRONMENTAL SCAN AND LITERATURE REVIEW

We appreciate the environmental scan of the applicable literature. We are requesting a release of the complete literature review with citations as opposed to the vignettes in the appendix and summaries of the literature review. This will greatly enhance our ability to assess the contents of the report. We also have a broader set of questions related to the focus on individual's case studies.

Committee Response:

Thank you for your comment. Unfortunately a separate report focusing only on the environmental scan performed is out of the project's scope of work. However, the information can be found in Appendix B.

Qualcomm

Elaborate on "remote monitoring" capabilities – NQF should elaborate on "remote monitoring" capabilities and services, and how that may affect measures. There is a large distinction between "synchronous" communications – i.e., face-to-face communications (either in person or via live voice and video) or non-face-to-face communications (voice only phone or internet calls); versus "asynchronous" data capture (non-face-to-face by medical devices and sensors) and communications (stored and forwarded/ transmitted to other medical targets in the healthcare ecosystem). This distinction is key in the formulation of existing and future measures. Remote monitoring informs care protocols, specific to conditions and use cases, while offering the ability to deliver scalable yet personalized care.

Committee Response:

For the purposes of the framework, the Committee opted not to focus on specific telehealth modalities with regards to quality measurement.

Social and Scientific Systems

I appreciate the opportunity to comment on the NQF draft report referenced above. I am submitting my comments on behalf of Social & Scientific Systems (SSS). SSS—an employee-owned company—has supported public- and private-sector health programs since 1978, providing technical, research, and program management services to NIH, AHRQ, CMS, and other clients.

We encourage NQF to draw clear delineations between the benefits of care coordination and the benefits of direct patient care when furnishing telehealth services. While we would support measures for both synchronous and asynchronous exchanges (p. 4), Medicare precedence would only consider patient interactions as telehealth services (unless part of a specific demonstration) and would make payment for care coordination services using management codes CPT 99487 and 99489 or G0506.[i] For why spread use of telehealth services CMS and other payers will need to consider payment for physician to physician exchanges.

[i] Centers for Medicare & Medicaid Services. (2017) Chronic Care Management Services. Retrieved from www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/ChronicCareManagement.pdf.

Committee Response:

Thank you for your comment. The foucus of the framework was to categorize and organize measure concepts in a manner that would allow developers to create measures applicable to the main areas of telehealth: access to care, cost, patient/cargiver engagement and effectiveness. The framework did not consider or include reimbursement as it was out of scope for this project. The meaure concepts themselves are broad enough to develop measures related to both care coordination and direct patient care that encompass a variety of telehealth modalities.

University of Rochester Medical Center

Page 6. The list of four modalities ignores a model in which BOTH live video and store-and-forward are used. We have amply demonstrated the value of a system in which BOTH are available and often used together to provide information acquisition and exchange that is essential for managing an illness episode.

Statement about store-and-forward ignores the transmission of recorded stethoscope sounds (lung sounds, heart sounds, abdominal sounds).

Committee Response:

Thank you for your comment. This has been noted.

Development of the Measurement Framework

American Medical Association

PRIORITIZE FRAMEWORK COMPONENTS

With regard to the second half of the charge—developing a framework that would account for considerations that are particularly relevant when care is delivered virtually (though presumably are equally applicable when care delivered in person generally), we are concerned with the sheer number of parameters outlined. We urge some prioritization. Some of the parameters rise to the level of importance for accountability uses, while others are fine for internal quality improvement purposes. But, the report does not differentiate between possible uses of the proposed parameters. We are concerned that there will be a move to develop measures for some of the concepts that really should not be used in accountability programs. For example, some concepts are relevant for customer experience optimization, but may not correlate with quality measures. For instance, utilization, such as the time to check-in for a visit or duration of a visit is not backed up by evidence supporting whether a longer visit equates to better care. Anecdotally, when it comes to patient preferences a patient may feel that a longer, not shorter, visit equates to better care. Furthermore, under the added value telehealth domain, the report discusses the potential to decrease readmissions as a result of leveraging telehealth, but fails to include readmissions in any of the measure concepts.

Committee Response:

The Committee noted that the current measure concepts are not intended to be an exhaustive list, but as a list of concepts that should be prioritized. The report is revised to reflect this intention.

American Medical Association

We also would like to note that telehealth can greatly enhance patient care and outcomes while improving cost, but it may also be implemented and utilized in a manner that fragments patient care, increases utilization without commensurate benefit, and could result in patients delaying or losing access to in-person care when it is needed. Just as in-person care, we should be prepared to address the following in the framework to account for the development of measures that apply to inperson and virtual services:

- for increasing use to unneeded services (antibiotics for sore throats that are just viral infections)
- for transparency within the patient experience section
- for actually collecting relevant medical history
- for using required lab studies rather than prescribing without them
- for care coordination
- for looking at local referrals when needed

Committee Response:

Thank you for your comment.

Avera eCARE

We appreciate the attention and effort the National Quality Forum has invested into developing a framework to allow for telehealth measure development. We support the use of the framework comprised of the outlined domains, subdomains and we also support the six key measurement areas of travel, timeliness of care, actionable information, added value of telehealth to provide evidence-based best practices, patient empowerment and care coordination. Our program has been monitoring specific quality measurements for the past two decades and would like to provide the following modifications and recommendations, based on our experience.

Under domain effectiveness, subdomain system effectiveness and measurement concept timeliness: Add - the amount of time it takes to connect with a provider for an urgent/emergent consult.

Under domain financial impact and/or effectiveness, subdomain financial impact to healthcare and/or operational effectiveness and measurement concept travel: Add - measure for quantifying telehealth staffing efficiencies, i.e., less windshield time, allowing specialists to use remote team care to care for a larger panel of patients.

Under domain access, subdomain access to information and measurement concept actional information: Change - “What is the data access in

telehealth for those who treat the patient" to reflect access to specific data, such as visual, auditory and other information required for a diagnosis.

Under domain effectiveness, subdomain clinical effectiveness and measurement concept actional information: See Avera eCARE comments under "Initial Measure Selection" - Whether telehealth offers the same quality of services across a population of similar patients (all settings and conditions).

Committee Response:

The Committee agreed that the current domains and subdomains already encompass any requests to add specific domains and subdomains. The Committee has decided to revise the report to add clarifying language that the domains and subdomains are broad enough to account for additional domains and subdomains requested.

Dena Puskin

Pages 8: The question under accessibility is somewhat confusing in that it introduces the concept of necessity, which is not consistent with standard definitions of accessibility. Generally, accessibility refers to the ability of an individual to use health services, whereas availability refers to the physical presence of services or the fact that services are available for use but not necessarily used. For example, according to the World Health Organization, "Access is a broad term with varied dimensions: the comprehensive measurement of access requires a systematic assessment of the physical, economic, and socio-psychological aspects of people's ability to make use of health services. Availability is an aspect of comprehensiveness and refers to the physical presence or delivery of services that meet a minimum standard"[www.who.int/healthinfo/systems/WHO_MBHSS_2010_section1_web.pdf?ua=1].

Committee Response:

The Committee agreed that the current domains and subdomains already encompass any requests to add specific domains and subdomains. The Committee has decided to revise the report to add clarifying language that the domains and subdomains are broad enough to account for additional domains and subdomains requested.

National Institute of Standards and Technology

Introduction

The NIST health IT Usability initiative is focused on establishing a framework that defines and assesses health IT usability. The initiative will examine the human factors critical to designing usable EHRs and will guide industry in usability engineering practices. The research findings will be used to support the development and evaluation methods for these standards.

Usability definition

International standards bodies (ISO 9241-11) define usability as follows: Usability is the effectiveness, efficiency, and satisfaction with which the intended users can achieve their tasks in the intended context of product use.

We suggest that effectiveness, efficiency, and satisfaction be considered the subdomains and the measure concepts tailored to these subdomains of the usability of exchanged electronic health information.

According to ISO/IEC TR 25062, usability is measured by three types of metrics: effectiveness, efficiency, and satisfaction. Thus, the measure concepts for interoperable Health IT needs to be listed and targeted towards these three metrics.

Definitions

effectiveness: the accuracy and completeness with which users achieve specified goals

efficiency: resources expended in relation to the accuracy and completeness with which users achieve goals

satisfaction: freedom from discomfort, and positive attitudes towards the use of the product.

Identified performance deficiencies/problems/potential improvements can be found in ISO/IEC 25064:2013.

Recommendations

User-centered design needs to be incorporated from the early stages of building telehealth systems. Safety-enhanced usability helps deliver safe patient care in addition to effectiveness, efficiency, and satisfaction for the users of the system. Usability is a broader concept and is not a part of experience, but experience/satisfaction is a part of usability. We

highly recommend a separate section on usability and usability measures for telehealth to be part of this framework.

Committee Response:

The Committee agreed that the current domains and subdomains already encompass any requests to add specific domains and subdomains. The Committee has decided to revise the report to add clarifying language that the domains and subdomains are broad enough to account for additional domains and subdomains requested.

National Organization of State Offices of Rural Health (NOSORH)

NOSORH Issue 1: Availability of specialty and subspecialty services in rural/frontier communities

The mix of services available in rural/frontier communities is generally narrower than the mix in urban communities. Many rural and frontier communities have more limited availability of specialty and subspecialty services than do urban communities. Residents are reliant on the local primary care and core specialist infrastructure for most health services.

Telehealth arrangements connecting rural health care providers to larger systems of specialists and subspecialists can play an important role in improving access to these services for rural/frontier residents. It should be noted, however, that the nature of telehealth practice in rural areas can be different than that in urban areas, as rural generalist providers could use telehealth to connect with specialists to whom urban providers would make a non-telehealth referral. The implementation of Project ECHO in several rural states models this type of arrangement. It will be important for telehealth measures to capture these rural and urban practice differences in the access domain.

NOSORH Issue 2: High travel costs facing rural/frontier patients

Many rural/frontier residents face longer distances to health services than do urban residents. This is true for both primary care and specialty/subspecialty services. Distance to behavioral health services is a particular problem.

The absence of adequate public transportation in non-urban areas makes rural/frontier residents more reliant upon private vehicles. The result, for many rural/frontier residents, is higher travel costs – including both the cost of travel and the cost of foregone work time. For households with a single vehicle the cost could be even higher, as more than one household member may need to forego work to help another get health care. Since many specialty/subspecialty services are not available locally, the cost of travel for these services, requiring trips to more distant cities, can be even higher.

This higher cost is part of the 'rural surcharge' on most health care use. Measures in the cost domain must accurately capture the full range of patient-borne costs. This will assure that any cost-benefit calculations for telehealth are accurate.

Committee Response:

The Committee has decided to expand wording with regard to the application of telehealth in rural and urban settings instead of discussing issues that are specific to only a rural or urban setting.

National Organization of State Offices of Rural Health (NOSORH)

NOSORH Issue 3: Limited rural/frontier broadband capacity

The broadband capacity in many rural/frontier a community is less than that in urban communities. This limited capacity will reduce the ability of rural/frontier providers and consumers to participate effectively in telehealth efforts.

The FCC established minimum broadband speed requirements for different telehealth functions in its National Broadband Plan. In an assessment of county level broadband capacity, the FCC identified many rural counties with broadband availability that was lacking for telehealth purposes. This assessment indicates that many rural/frontier communities may be limited in their ability to participate in a full range of telehealth services, particularly related to imaging and telemetry. This could have an impact on several measurement domains, including effectiveness and provider/patient satisfaction. Measures and performance standards must be developed which adjust for the broadband capacity in local communities.

NOSORH Issue 4: High rural/frontier broadband cost

The cost of broadband in rural/frontier areas is often higher than the cost of equivalent service in urban communities. This is the case even after subsidized service is figured in. The higher cost reflects the larger distances between connections in rural areas, the relatively low density of users per mile of connection and the higher last mile of connection costs to reach a lower density population. The higher cost of broadband will have an impact on both cost and cost-effectiveness measures

The higher cost of broadband affects both providers and consumers. The in-home use of telehealth poses a unique set of problems for rural and frontier residents. The limited availability of broadband in many rural/frontier communities prevents widespread use of in-home monitoring and communication. The relatively high cost of broadband in these areas compounds the problem.

The use of telehealth performance measures which rate, for example, the percentage of patients who access records online or the implementation of home telemetry would put rural patients/providers at a disadvantage. Measures of patient use of telehealth should reflect the differential availability/cost of home broadband.

NOSORH Issue 5: Low-volume health services

The NQF report on Performance Measurement for Rural Low-Volume Providers explored the special measurement/standard-setting concerns associated with rural/frontier health services. The issue of low-volume practices is particularly important when telehealth is considered. Even when the overall fixed cost of telehealth is the same, the telehealth fixed cost per service unit will be higher in low-volume rural practices than it will in higher volume practices. This impact will amplify the relatively high costs of broadband services in rural/frontier areas. Any measurement/standard-setting scheme must take these differences into account and make appropriate adjustments

Committee Response:

Thank you for your comment. The Committee has decided to expand wording with regard to the application of telehealth in rural and urban settings instead of discussing issues that are specific to only to a rural or urban setting.

NM Hospital Association

Encounters between a patient or family member and a provider or care team member through telehealth provide accurate care and the integration of telehealth services into a healthcare setting has minimal impact on workflow. Contributors did not agree with this statement and thought it should be re-worded. The question should be how do we establish it in our already established workflow; how do we set up greater access to care with less impact on our workflow. A measure of success would = minimal disruption/impact on workflow.

Committee Response:

Thank you for your comment. We have changed this in the report.

NM Hospital Association

Several comments arose re: outcome measures covered in the Effectiveness domain. Would outcomes be covered via the clinical effectiveness measure? This seemed to be of concern to most participants

The other question related to “empty room time”, which group felt could be measured in financial impact to care team.

A suggestion was made to improve the language for measures that related to patient outcomes and the use of telehealth (e.g. use a diabetes control group that doesn’t have telehealth support, and compare to patients who manage their HgA1C through telehealth)

Committee Response:

Thank you for your comment. The Committee agreed that the current domains and subdomains already encompass any requests to add specific domains and subdomains. The Committee has decided to revise the report to add clarifying language that the domains and subdomains are broad enough to account for additional domains and subdomains requested.

Personal Connected Healh Alliance

We appreciate the work done by the National Quality Forum (NQF) to support this goal. The identification and definition of the breadth of applications of

information communications technology to deliver health care in this report matches the current evidence proven use cases. Further, the domains and subdomains identified for measurement in this report follow both the evidence base and the outcomes that are important to patients.

Committee Response:

Thank you for your comment.

Philips

We at Philips appreciate the invitation the provide feedback on the Framework, and applaud the increased rigor in the evaluation of this emerging model of care.

One area for further consideration is that the framework seems very focused on ambulatory telehealth uses. The literature scan did not include important studies highlighting the clinical and financial benefits of inpatient telehealth, particularly teleICU. Such recent results are summarized below:

Abt Associates, "Evaluation of Hospital-Setting HCIA Awards" for Centers for Medicare & Medicaid Services (CMS), 2017

$1,486 reduction in Medicare spending per 60-day episode, saving $4.6M in the care of these federal beneficiaries over 15 months

4.9 % increase in the relative rate of discharges to home health care, while discharges to SNFs/LTACs declined by 6.9%, indicating the pts needed less intense care after discharge

2.1 % decrease in the rate of 60-day inpatient readmissions ($p<0.10$)

Lilly CM, Motzkus C, Rincon T, et al. ICU Telemedicine Program Financial Outcomes. Chest, 2016

An ICU managed by a teleICU:

improved case volume by 21%

improved contribution margins by 376%

improved case volume 38% when co-located with a logistical center

improved contribution margins by 665% when co-located w/ a logistical center and quality care standardization, ($60.6 million compared to $7.9 million)

allowed recovery teleICU capital costs in less than 3 months

Lilly CM, et al. A Multi-center Study of ICU Telemedicine Reengineering of Adult Critical Care. CHEST. 2014 Mar; 145(3): 500-7.

In this study of 119,000 patients over 56 hospitals, teleICU improved:

ICU mortality 26%

ICU LOS 20%

Med/Surg mortality 16%

Med/Surg LOS 15%

In general, the Framework seems to focus on the use of TH to manage a patients on a discreet, somewhat transactional basis, and seems to miss TH's power to manage disperse populations in a standardized, higher-quality manner. TH collects standardized vital sign and assessment data sets on broad populations of pts in both hospital (teleICU) or ambulatory (RPM) settings. These data sets are then processed through rule sets that present the most acute patient at any given point in time to the centralized clinical team for triage and intervention. Since broad populations spread across practices are managed by a central telehealth team, the telehealth model of care also increases the standardization of care across locations and practices, subsequently improving clinical and financial outcomes. This is supported by evidence in both the inpatient (Lilly) and ambulatory (Darkins) literature. This strategic capability of telehealth to fundamentally transform the practice and output of the care delivery process might be better explored by the framework.

Committee Response:

The Committee agreed that the environmental scan and literature review in its current form is comprehensive and supports the rationale of the measure concepts and domains/sub-domains recommended in this report. The results of the envrionmental scan can be found in Appendix B of the report.

University of Rochester Medical Center

Table 1. The cost domain needs refinement.
A thoughtful consideration of cost requires differentiation between charges and costs. Cost is the actual expense to deliver the service. Charges include a markup to ensure profit, and, essentially,

represent with "the market" will bear. These same, key distinctions are relevant to discussion of Domain 2: Financial Impact/Cost

Committee Response:

Thank you for your comment. The Committee agreed that the current domains and subdomains already encompass any requests to add specific domains and subdomains. The Committee has decided to revise the report to add clarifying language that the domains and subdomains are broad enough to account for additional domains and subdomains requested.

University of Rochester Medical Center

Re: Domain 2. A thoughtful consideration of cost requires differentiation between charges and costs. Cost is the actual expense to deliver the service. Charges include a markup to ensure profit, and, essentially, represent what "the market" will bear.

Committee Response:

Thank you for your comment. The Committee agreed that the current domains and subdomains already encompass any requests to add specific domains and subdomains. The Committee has decided to revise the report to add clarifying language that the domains and subdomains are broad enough to account for additional domains and subdomains requested.

University of Rochester Medical Center

An additional dimension of effectiveness is communication effectiveness. This is highly dependent on communication skills of the provider (nurse practitioner, physician, physician assistant), BUT capacity to communicate effectively is greatly constrained unless videoconference communication is part of the model.

Committee Response:

The Committee agreed that the current domains and subdomains already encompass any requests to add specific domains and subdomains. The Committee has decided to revise the report to add clarifying language that the domains and subdomains are broad enough to account for additional domains and subdomains requested.

University of Rochester Medical Center

An important dimension of quality of care is quality of communication. This should be addressed explicitly. Quality of communication is important both for the information that is provided and for its affective value; for example, for the peace of mind that reassurance provides when patients (and/or their family) are anxious, uncertain, or confused.

YES, "in-person equivalence" is an eminently sensible standard.

Committee Response:

The Committee agreed that the current domains and subdomains already encompass any requests to add specific domains and subdomains. The Committee has decided to revise the report to add clarifying language that the domains and subdomains are broad enough to account for additional domains and subdomains requested.

Examples of Proposed Measure Concepts

American Medical Association

Prioritize:With regard to the second half of the charge—developing a framework that would account for considerations that are particularly relevant when care is delivered virtually (though presumably are equally applicable when care delivered in person generally), we are concerned with the sheer number of parameters outlined. We urge some prioritization. Some of the parameters rise to the level of importance for accountability uses, while others are fine for internal quality improvement purposes. But, the report does not differentiate between possible uses of the proposed parameters. We are concerned that there will be a move to develop measures for some of the concepts that really should not be used in accountability programs. For example, some concepts are relevant for customer experience optimization, but may not correlate with quality measures. For instance, utilization, such as the time to check-in for a visit or duration of a visit is not backed up by evidence supporting whether a longer visit equates to better care. Anecdotally, when it comes to patient preferences a patient may feel that a longer, not shorter, visit equates to

better care. Furthermore, under the added value telehealth domain, the report discusses the potential to decrease readmissions as a result of leveraging telehealth, but fails to include readmissions in any of the measure concepts.

Committee Response:

Thank you for your comments. The Committee agreed that the current domains and subdomains already encompass any requests to add specific domains and subdomains. The Committee has decided to revise the report to add clarifying language that the domains and subdomains are broad enough to account for additional domains and subdomains requested.

The Committee also noted that the current measure concepts are not intended to be an exhaustive list, but as a list of concepts that should be prioritized. The report is revised to reflect this intention.

American Occupational Therapy Association

AOTA agrees with the measure concepts included in the list. While it is important to consider measures that avoid an adverse outcome and improve the quality of life, we would also recommend that NQF consider adding one additional measure concept:

The ability to engage in meaningful activities including those that promote health and/or prevent illness or injury (e.g., activities of daily living, instrumental activities of daily living such as self-management of health). This area is particularly important for telehealth as the medium often allows a clinician to work with a client or patient in their own home or community context.

AOTA believes that telerehabilitation and occupational therapy services in underserved areas can make the difference in preventing falls, functional decline, costly emergency room visits, and hospital admissions/readmissions.

NOTE: I included this comment under "Initial Measure Selection" by mistake.

Committee Response:

Thank you for your comment. The Committee noted that the current measure concepts are not intended to be an exhaustive list, but as a list of concepts that should be prioritized. The report is revised to reflect this intention.

Dena Puskin

Page 11: The Committee noted that one of the primary benefits of telehealth is travel avoidance because of geographical distance. What was not noted is the benefit of telehealth services in addressing travel barriers posed by transportation challenges in urban and suburban areas [https://www.theatlantic.com/health/archive/2015/08/the-transportation-barrier/399728/].

Page 13: Under Measure Concepts in the table associated with Timeliness of Care, a key question that appears to be missing is how quickly a patient receives a consult via telehealth compared to receiving an in-person consult.

Page 13: Under Measure Concepts in the table associated with Actionable Information, a key dimension that appears to be missing is whether the quality of the information was sufficient to make an accurate diagnosis and appropriate treatment plan. It is also unclear what is meant by "the system was able to effectively provide the care that was recommended." Who is doing the recommending?

Page 14: Under Measure Concepts in the table associated with Added Value of Telehealth to Provide Evidence-Based Practices, the Framework cites a decrease in the length of stay in the hospital. This may be a reasonable measure for some conditions, but in other cases, the lengths of stay have become so short that this may not be a reasonable measure. The committee may wish to consider adding a decrease in preventable readmissions to the Measure Concepts in the chart.

Committee Response:

Thank you for your comment. The Committee noted that the current measure concepts are not intended to be an exhaustive list, but as a list of concepts that should be prioritized. The report is revised to reflect this intention.

National Institute of Standards and Technology

User-centered design needs to be incorporated from the early stages of building telehealth systems. Safety-enhanced usability helps deliver safe patient care in addition to effectiveness, efficiency, and satisfaction for the users of the system. Usability is a broader concept and is not a part of experience,

but experience/satisfaction is a part of usability. We highly recommend a separate section on usability and usability measures for telehealth to be part of this framework.

We hope you can find more information on Health IT Usability in our publications at: https://www.nist.gov/programs-projects/health-it-usability

Some of the aspects that can be considered for measure concepts are (Reference: NISTIR 7804 : Technical Evaluation, Testing, and Validation of the Usability of Electronic Health Records http://ws680.nist.gov/publication/get_pdf.cfm?pub_id=909701):

I. Use Error Root Causes—Aspects of the user interface design that induce use errors by users when interacting with the system. They are: patient identification error, mode error, data accuracy error, data availability error, interpretation error, recall error, feedback error, data integrity error.

II. Risk Parameters—These are attributes regarding particular use errors, i.e., their severity, frequency, ability to be detected, and complexity. They are: severity, frequency, detectability, and complexity.

III. Evaluative Indicators—Indications that users are having problems with the system. These are identified through direct observations of the system in use in situ, or through interviews with users. They are: workarounds, redundancies, burnout, low task completion rate, potential patient safety risk.

IV. Adverse Events—A description of the outcome of the use error, and standard classification of patient harm. They are: wrong patient action of commission, wrong patient action of omission, wrong treatment action of commission, wrong treatment action of omission, wrong medication, delay of treatment, unintended or improper treatment, substandard care, morbidity, and mortality.

Committee Response:

Thank you for your comment. The Committee agreed that the current domains and subdomains already encompass any requests to add specific domains and subdomains. The Committee has decided to revise the report to add clarifying language that the domains and subdomains are broad enough to account for additional domains and subdomains requested.

The Committee also noted that the current measure concepts are not intended to be an exhaustive list, but as a list of concepts that should be prioritized. The report is revised to reflect this intention.

NM Hospital Association

Contributors felt that there should be an applicable domain in App. C related to care coordination. Telehealth should not be a barrier to care coordination, and they desired to see more measure concepts that document how telehealth facilitates care coordination

Committee Response:

Thank you for your comment. The Committee agreed that the current domains and subdomains already encompass any requests to add specific domains and subdomains. The Committee has decided to revise the report to add clarifying language that the domains and subdomains are broad enough to account for additional domains and subdomains requested.

Qualcomm

Consider utilizing existing quality measures for virtual services – We recommend NQF identify and utilize existing quality measures that may be applicable to virtual services.

There should be no difference between some services that are delivered virtually or inperson.

Virtual services should be subject to the same quality measures as in-person encounters. It is unclear whether NQF is willing to endorse existing quality measures for inperson care, for the same services that are performed virtually. We recommend NQF specify its intent.

Committee Response:

Thank you for your comment. The Committee noted that the measures chosen as the initial measure list are not intended to be an exhaustive list, but as a starting point. The report is revised to add clarifying language on the reasons why some existing measures were chosen, and to emphasize the Committee's intention that the initial measure list is not meant to be exhaustive.

Social and Scientific Systems

We encourage NQF to address patient consent for receiving telehealth services in Domain 3: Experience (p. 9). The primary goal is to make health services assessable, but this does not negate the patient's choice if he or she prefers to seek in-person encounters and is willing to travel to a furnishing location.

We encourage NQF to address patient education for receiving telehealth services (p. 9), particularly in support of self-management and for reporting important health care information from approved devices. We note that many patients may also need skills for navigating and interpreting data from commonly used devices, such as iPads, when they have a compromised health status.

Committee Response:

Thank you for your comment. The Committee agreed that the current domains and subdomains already encompass any requests to add specific domains and subdomains. The Committee has decided to revise the report to add clarifying language that the domains and subdomains are broad enough to account for additional domains and subdomains requested.

University of Rochester Medical Center

Several of the chosen domains (#!, 2, 4) present opportunities to highlight advantages of connected care). The others (#3, 5, 6) provide opportunity for (or present a challenge to) connected care to demonstrate that is at least as good as usual in-person care.

I would strongly recommend the addition of Quality of Communication as a seventh "area for measurement". Reasons are:

(1) provider-patient communication is very important to quality;

(2) some types of connected care (eg, text only, phone only) limit capacity for high-quality communication;

(3) what gets measured gets done. If quality of communication is NOT measured, forms of connected care that often provide lower quality communication will be accepted as adequate, patient experience will be sub-optimal, and that experience will likely be generalized (unfairly) to forms that DO allow real-time video interaction.

Committee Response:

Thank you for your comment. The Committee agreed that the current domains and subdomains already encompass any requests to add specific domains and subdomains. The Committee has decided to revise the report to add clarifying language that the domains and subdomains are broad enough to account for additional domains and subdomains requested.

University of Rochester Medical Center

Re: Actionable Information, the following is a KEY point - "There is little need to modify the measure if a telehealth modality provides the same actionable information that is gathered through an in-person visit." Because this is such a key concept, a special label should be attached to it. I believe that the label, "in-person equivalence" is a compelling one.

Committee Response:

Thank you for your comment.

Case Studies to Illustrate Potential Use Cases of Proposed Measure Concepts

American Medical Association

Starting on page 17 it was hard to interpret the select number of case studies due to the focus on the individual patient. We believe NQF should be focused on measuring the impact and effectiveness of telehealth at the population level. Due to the focus on individual patient outcomes (albeit as part of group), the case studies demonstrate how you can leverage and evaluate the different concepts of telehealth but not how you can measure it for a broader population. Furthermore, due to many of the concepts focus on the individual patient, it is hard to take the concept and aggregate it into a population level measures that would be meaningful, evidence based, reliable and valid. Many of the concepts are also narrow in focus and look at structures and processes so the feedback to a physician, provider, payer or patient

is not that meaningful. If NQF evaluated a broader composite that assessed multiple components or the actual outcome of care it would be more relevant.

Committee Response:

The use cases are provided as illustrative examples of how to apply the framework to telehealth encounters. The Committee has decided to revise some of the current use cases to reflect comments received, as well as add another use case to illustrate how the framework can be utilized from a population perspective.

Connected Health Initiative (CHI)

The CHI appreciates the NQF's exploration of the other three key use cases in this section of the report. However, NQF should ensure that it explores "remote monitoring" capabilities and services, and how that may affect measures. There is a large distinction between "synchronous" communications – i.e., face-to-face communications (either in person or via live voice and video) or non-face-to-face communications (voice only phone or internet calls); versus "asynchronous" data capture (non-face-to-face by medical devices and sensors) and communications (stored and forwarded/transmitted to other medical targets in the healthcare ecosystem). This distinction is key in the formulation of existing and future measures. Remote monitoring informs care protocols, specific to conditions and use cases, while offering the ability to deliver scalable yet personalized care. CHI therefore urges the NQF to consider adding a fourth use case discussing population management of a diabetic population using telehealth and remote monitoring technologies.

Committee Response:

The use cases are provided as illustrative examples of how to apply the framework to telehealth encounters. The Committee has decided to revise some of the current use cases to reflect comments received, as well as add another use case to illustrate how the framework can be utilized from a population perspective.

Personal Connected Healh Alliance

Revise the heart failure case study to describe today's approach to heart failure remote monitoring. Heart failure is an important and vital use case for remote monitoring, but the case study in the report describes very, very old technology and an approach that would have been in deployed over 20 years ago. Modern remote management for heart failure patients involves the following upon diagnosis of congestive heart failure and determination that monitoring would assist in care management:

Patient is provided a remote kit that includes smart-communication device (for example a hug, phone, or tablet that can be used solely for communication with the provider), a BP cuff, a medical grade scale;

Patient uses the device a few times daily, following directions of the provider;

The care coordinator monitors the readings of blood pressure and weight in a dashboard;

The clinician contacts the patient on an as needed basis depending on the readings of the devices to adjust medications, discuss diet, and counsel on activity; and,

Patients may submit inquiries, questions and receive education material via the smart communication device.

We urge NQF to rely upon published pilots or clinical trials that use current methods of remote monitoring to revise this use case. Further, there are many additional complex chronic conditions that are similarly managed using remote monitoring (see appendix A for a current listing of remote monitoring pilots and publications – this listing will also provide helpful descriptions of 21st century remote monitoring technology for the heart failure use case).

Distinguish how the telehealth used as a tool to deliver care would be classified in the Medicare program in the case studies versus how it would be classified for private payers - i.e. it is telehealth for private payers, but it is remote monitoring and telehealth in the Medicare program.

Committee Response:

The use cases are provided as illustrative examples of how to apply the framework to telehealth encounters. The Committee has decided to revise some of the current use cases to reflect comments received, as well as add another use case to illustrate how the framework can be utilized from a population perspective.

Personal Connected Healh Alliance

Please see appendix in comments emailed to project staff. This appendix includes a list of pilots and case studies that may be helpful for modernizing the case study on heart failure.

Committee Response:

The use cases are provided as illustrative examples. The Committee has decided to revise some of the current use cases to reflect comments received, as well as add another use case to illustrate how the framework can be utilized from a population perspective.

Impact of MACRA on the Telehealth Framework

American Medical Association

NQF indicates on page 23 that the Committee examined a list of initial measures to include in the framework that could "potentially be used in CPIAs under the MIPS regulation." The IA component of MIPS is intended to provide credit for ongoing or already established activities and is reported via yes/no attestation as opposed to evaluation against a threshold or benchmark. Importantly, CMS has already created validation criteria (available at qpp.cms.gov). Duplicating CMS' efforts is unnecessary and would likely create confusion and additional burden for MIPS participants. We therefore strongly urge NQF to refrain from creating measures for the purpose of IA evaluation.

MACRA CONFORMITY

We also would like to highlight that the report makes the following inaccurate statements:

1. Information about APMs on page 24 is not accurate.

Participation in an alternative payment model (APM) including a Medical Home Model: An APM can be an innovative payment model, a Medicare Shared Savings Program under an Accountable Care Organization (ACO), or a Medicare Demonstration Model. In all three cases, providers are eligible for bonus payments as long as they use quality measures under MIPS, use certified EHR technology, and assume more than a "nominal financial risk" or they are a medical home expanded under the Center for Medicare and Medicaid Innovation (CMMI). Only certain APMs qualify for full IA credit, whereas certain other APMs only receive half credit.

The italicized language above describes the criteria for Advanced APMs, not APMs. Advanced APMs do not need to perform IAs. We request that the language be deleted from the report to avoid confusion.

Committee Response:

Thank you for your comment. Edits have been made per the suggested comment.

American Medical Association

2. Information about IAs on page 23 is not accurate

Expanded practice access: The use of telehealth services and data analysis for quality improvement, such as participation in remote specialty care consults or teleaudiology pilots. The weight of this subcategory in the MIPS overall score lists as "Medium."

Population management: MIPS eligible clinicians prescribing warfarin must attest that 60 percent or more of their ambulatory care patients receiving the medication are managed by one or more clinical practice IAs. One of these activities will be telehealth that involves systematic and coordinated care for rural or remote beneficiaries. The weight of this subcategory in the MIPS overall score lists as "High."

Both "Expanded practice access" and "Population management" are IA subcategories, not specific IAs. We suggest that those terms be deleted. In both instances above, the sentence following the terms is the actual IA. Further, IA subcategories contains IAs of different weights (medium and high); the subcategory itself is not weighted. As such, we recommend that the final sentence in both paragraphs indicate that the weights apply to the IA, not the subcategory. Finally, please note that the IA weight applies to the IA category score, not the overall MIPS score.

3. We also would like to note that the report contains multiple instances of using the acronym "CPIA" instead of "IA", which could lead to confusion. CMS finalized the category as Improvement Activities (IA), not Clinical Practice Improvement Activities (CPIA).

Committee Response:

Thank you for your comment. Edits have been made per the suggested comment.

American Occupational Therapy Association

While MACRA specifically identifie teleheath in various categories, Medicare statute limits the clinicians who are permitted to bill for telehealth services. However, many states do permit PT, OT, and SLP practitioners to furnish telehealth services which is reimbursed by other payer sources. Innovations in telehealth have incorporated incentives to improve care coordination and quality, and to reduce resource use as part of the Triple Aim. Proper application of telehealth rehabilitation and habilitation therapy services, particularly those with limited access to services, can have a dramatic impact on improving care and reducing negative consequences and costs of care.

In many ways telehealth facilitates key elements to community living: defining and enabling function within a specific context and environment, such as a patient's home.

The AOTA Telehealth Position Paper (www.aota.org/telehealth) includes research on the use of telehealth in rehabilitation or habilitation which include occupational therapy.

Telehealth can assist patients regain, develop, and build functional independence in everyday life. Such service availability alternatives may also address provider shortages and access problems, making necessary services available to underserved beneficiaries in remote, inaccessible or rural settings and to beneficiaries with limited mobility outside their home in any setting. The report may have too much of a focus on rural settings.

Committee Response:

Thank you for your comments.

Connected Health Initiative (CHI)

We recommend NQF identify and utilize existing quality measures that may be applicable to virtual services. We believe that NQF agrees with the CHI that there should be no difference between some services that are delivered virtually or in-person, and that virtual services should be subject to the same quality measures as in-person encounters. However, from the draft it is unclear whether NQF is willing to endorse existing quality measures for in-person care, for the same services that are performed virtually. We urge NQF to clearly articulate is vision of the equivalency of in-person services and virtual services for the purposes of this framework.

On pages 20-21, NQF discusses the extent to which telehealth has been addressed in the MACRA rules so far. We note that the MACRA statute text directs the inclusion of "telehealth or remote monitoring" to be used to facilitate Care Coordination. We believe it's important to explicitly note this detail, given how CMS defines telehealth. Further, CMS elected not to provide any context for Improvement Activities outside of the Improvement Activity table, which can be interpreted to restrict the use of remote monitoring to the use cases that CMS describes. We believe NQF agrees with CHI's vision of connected health innovations used throughout the continuum of care, across many chronic conditions. We urge the NQF to state this more clearly.

Further, the CHI notes that the final MACRA rule discussed by NQF featured a very significant discussion of APMs without a single mention of either telehealth or remote monitoring. We believe this omission to be a public disservice by CMS and urge that at minimum, NQF note in its discussion that CMS has completely omitted discussion of telehealth or remote monitoring's role in MACRA-enabled APMs (which makes this NQF report all the more important).

Committee Response:

Thank you for your comment.

Personal Connected Healh Alliance

Please clarify the MIPS/MACRA section remarks on APMs and ACOs. These are generally Medicare only payment models, and based on rules published by CMS. It is quite complex to navigate implementation of an APM or ACO in which telehealth or remote monitoring would be an included service. To date, CMS has issued very limited waivers of Section 1834(m), hence broad use of telehealth and/or remote monitoring lags compared to the private sector health coverage.

Committee Response:

Thank you for your comment. Edits have been made per the suggested comment.

Social and Scientific Systems

I appreciate the opportunity to comment on the NQF draft report referenced above. I am submitting my comments on behalf of Social & Scientific Systems (SSS). SSS—an employee-owned company—has supported public- and private-sector health programs since 1978, providing technical, research, and program management services to NIH, AHRQ, CMS, and other clients.

We encourage NQF to identify potential for other program savings—such as reduction in avoidable hospitalizations—as part of the cost effectiveness review (p. 9). Much of the recent bipartisan support for telehealth modalities is directly due to savings estimates projected by the Congressional Budget Office.

Committee Response:

Thank you for your comment. Is is not in the scope for this work. However, it is useful feedback for potential work in the future.

Social and Scientific Systems

We encourage NQF to note cost sharing requirements for services as "out of pocket expenses" for patients (p. 9). We also encourage NQF to focus less on rural/travel expenses, as many urban residents would also benefit from telehealth services and there is no clinical need to make a geographic distinction in the quality of the services.

Committee Response:

Thank you for your comment.

Initial Measure Selection

American Occupational Therapy Association

AOTA agrees with the measure concepts included in the list. While it is important to consider measures that avoid an adverse outcome and improve the quality of life, we would also recommend that NQF consider adding one additional measure concept:

The ability to engage in meaningful activities including those that promote health and/or prevent illness or injury (e.g., activities of daily living, instrumental activities of daily living such as self-management of health). This area is particularly important for telehealth as the medium often allows a clinician to work with a client or patient in their own home or community context.

AOTA believes that telerehabilitation and occupational therapy services in underserved areas can make the difference in preventing falls, functional decline, costly emergency room visits, and hospital admissions/readmissions.

Committee Response:

Thank you for your comment. The Committee noted that the current measure concepts are not intended to be an exhaustive list, but as a list of concepts that should be prioritized. The report is revised to reflect this intention.

Avera eCARE

In the draft report Creating a Framework to Support Measure Development for Telehealth report, under the measurement concept of actionable information, we noted this statement: "If a telehealth visit provides actionable information through a specific modality, then the care team member can still ascertain the health status of the patient and provide a diagnosis and treatment, which would then also constitute a visit. Therefore, for each of the quality measures that may pertain to a clinical area that employs telehealth services, there is little need to modify the measure if a telehealth modality provides the same actionable information gathered through an in-person visit." We absolutely believe telehealth visits should be held to the same standard as in-person visits, and nearly all existing NQF-endorsed quality measures from a variety of inpatient and outpatient settings should

be carried over to the telehealth framework. Doing so, would make telehealth care teams accountable to demonstrate, at a minimum, equal levels of quality as in-person care through benchmarking. Therefore, we urge the National Quality Forum to expand the list of quality metrics outlined in appendix D to include all existing NQF-endorsed quality metrics.

Committee Response:

Thank you for your comment. The Committee noted that the measures chosen as the initial measure list are not intended to be an exhaustive list, but as a starting point. The report is revised to add clarifying language on the reasons why some existing measures were chosen, and to emphasize the Committee's intention that the initial measure list is not meant to be exhaustive.

Federation of American Hospitals

Before finalizing the report, the FAH encourages the Committee to re-evaluate the measure concepts. A number of the concepts are narrow in focus and look at structures and processes rather than looking at outcomes. The feedback from a narrowly focused process measure may be less meaningful to the providers and patients.

The FAH also has reservations about the measure concept prioritization. The concepts included in the different domains on pages 11-16 as well as those listed in Appendix C, may not be unique to telehealth. The FAH would encourage the Committee in its final report to identify the highest-priority areas for measurement. Past experience indicates that a few targeted measures will focus attention on the most critical aspects of care delivery and lay a base for moving forward as telehealth matures. For example, several measure concept suggestions address utilization such as time to check in for a visit or duration of a visit. The FAH did not find reference to the evidence to support the appropriate length of a visit. How will the appropriate length of a visit be determined? Additionally, in the domain title "added value of telehealth," the report discusses the potential to decrease readmissions as a result of leveraging telehealth, however, a readmissions measure is not included in the measure concepts. Developing a readmissions measure might be a concept the Committee would wish to consider.

Additionally, while the case studies, starting on page 17, were informative, this section of the report raises a broader question for consideration. Should telemedicine measures be focused at the patient level or at the population level? Is this an opportunity to address how to assess the impact/effectiveness of telehealth at a population level?

The list of existing measures in Appendix D raises a similar concern. The Committee indicated that the measures could be used to assess clinical practice improvement activities ("CPIA") in the Medicare Merit Incentive Program System (MIPS). The FAH is concerned that many of these measures either are not specified to enable capture of telehealth (for example they may not be designed to use the approved CPT or HCPCS codes) or the measure in the quality component explicitly excludes use of the telehealth modifier. This tension between the quality and CPIA components is not addressed in the report, and the FAH is concerned that some of the measures may not demonstrate the effectiveness of telehealth. The Committee should consider clarifying the intent of the focus of the measures.

Thank you for the opportunity to comment. The FAH looks forward to the continued work of the Committee.

Committee Response:

Thank you for your comment. The Committee noted that the current measure concepts are not intended to be an exhaustive list, but as a list of concepts that should be prioritized. The report is revised to reflect this intention.

In addition, the Committee also noted that the measures chosen as the initial measure list are not intended to be an exhaustive list, but as a starting point. The report is revised to add clarifying language on the reasons why some existing measures were chosen, and to emphasize the Committee's intention that the initial measure list is not meant to be exhaustive.

The use cases are provided as illustrative examples. The Committee has decided to revise some of the current use cases to reflect comments received, as well as add another use case to illustrate how the framework can be utilized from a population perspective.

National Organization of State Offices of Rural Health (NOSORH)

NOSORH Issue 6: Appropriate sets of measures for rural/frontier telehealth

Under programs such as the Medicare Value-Based Purchasing Program and the Readmission Reduction Program sets of measures were established to assess the performance of hospitals. Many of the measures in these sets could not be used for rural facilities, due either to irrelevance or insufficient volume. For example, a measure related to success of joint replacements bears no relevance in a hospital that does not offer orthopedic surgery. In these instances CMS ignores the missing measures and rebalances the weights of the remaining reported measures.

The result of this approach is to have rural and urban facilities evaluated on a significantly different basis. It is a classic 'apples and oranges' problem. In the development of telehealth performance measures it will be important not only to develop appropriate individual measures but also to recommend sets of measures that are appropriate for both rural and urban providers. This will be needed for all measurement domains.

NOSORH Issue 6: Appropriate performance standards for rural/frontier telehealth

Telehealth measures will be used in assessing the performance of telehealth systems. Assessments will require that standards be established for each telehealth measure. Given the differences of telehealth practice in rural/frontier and urban areas, it will be important to establish performance standards which are appropriate. Appropriate standards will be particularly important in the effectiveness, cost/cost-effectiveness domains.

NOSORH Issue 7: Special consideration for First Nations telehealth arrangements

A significant number of Native Americans live in rural areas and small towns. This includes the individuals living both within and outside the boundaries of First Nations. Some First Nations, including Navajo and Lakota nations, have very limited utility infrastructure, including broadband service. This creates challenges for the provision of telehealth services for these populations.

Many Native Americans are served by the Indian Health Service (IHS) through direct provision of service by IHS facilities and personnel and through contracted service with non-IHS providers. There are unique problems created by these organizational arrangements and special challenges in securing reimbursement for services. Measures and standards for some First Nations telehealth services may need to be different than those used for other service environments.

Committee Response:

Thank you for your comment. The Committee has decided to expand wording with regard to the application of telehealth in rural and urban settings instead of discussing issues that are specific only to a rural or urban setting.

NM Hospital Association

Participants requested for the chronic disease category to be broken out, as it encompasses so many categories (e.g. the UNM Eye clinic). They also observed that with the growth of telehealth programs, opening the evaluation endeavor to all telehealth programs (such as neuro/neurosurgery as it has been so successful in NM), using Appendix C "measure concepts" – would broaden the volume of peer-reviewed research in the literature.

TCPI (Transforming Clinical Practice Initiative) is a CMS directive, with a milestone of alternatives to face-to-face encounters. Could any of these metrics support the TCPI initiative metric (TCPI metric available as a separate document).

Committee Response:

Thank you for your comment. The Committee noted that the measures chosen as the initial measure list are not intended to be an exhaustive list, but as a starting point. The report is revised to add clarifying language on the reasons why some existing measures were chosen, and to emphasize the Committee's intention that the initial measure list is not meant to be exhaustive.

University of Rochester Medical Center

The list of measures in Appendix D is applicable to only a very small proportion of problems that are amenable to connected care of high quality. Measures applicable to primary care pediatric and primary care internal medicine are particularly lacking.

Committee Response:

Thank you for your comment. The Committee noted that the measures chosen as the initial measure list are not intended to be an exhaustive list, but as a starting point. The report is revised to add clarifying language on the reasons why some existing measures were chosen, and to emphasize the Committee's intention that the initial measure list is not meant to be exhaustive.

University of Rochester Medical Center

In first sentence of this section - "included" not "include".

Committee Response:

Thank you for your comment, we have changed this in the report.

Future Considerations for the Development of the Framework

American Optometric Association

It is vital that quality measures be sufficient to "assess whether telehealth is comparable to, or an improvement over, in-person care." Care provided by telehealth means must be held to the same standards of care and outcomes as care provided in-person.

Committee Response:

Thank you for your comment.

Connected Health Initiative (CHI)

The CHI supports the NQF's three proposed factors as the development and identification of measures related to telehealth commences.

Committee Response:

Thank you for your comment.

Johns Hopkins University, Department of Psychiatry, Neuropsychiatry Division

This document and framework are much needed; thank your for all your hard work on it.

One area that is not mentioned here but is likely to influence the quality of telehealth delivery is infrastructure. Most of the programs discussed in this document use internet access via computers, desktops, etc. Mobile devices are not mentioned much, other than store-and-forward teledermatology. However, mobile telehealth may need to rely on smartphones or tablets and 4G networks where there is no internet access. In these areas, the quality and consistency of cellular network infrastructure may determine the quality of realtime telehealth encounters, particularly involving face-to-face videoconferencing. Therefore, we need a way to assess and monitor the capacity and quality of 4G LTE cellular networks in areas where these networks are the main conduit for the delivery of realtime telehealth.

Committee Response:

Thank you for your comment. Is is not in the scope for this work. However, it is useful feedback for potential work in the future.

National Organization of State Offices of Rural Health (NOSORH)

National Organization of State Offices of Rural Health

NOSORH Recommendation 1 – Create rural/frontier appropriate measures.

NOSORH recommends that the NQF, in its next phases of measure development, establish telehealth measures specific for rural/frontier systems.

The measures should be relevant to the operation of rural/frontier health services. They may, in part, include a subset of the measures used for all telehealth systems, but should also include additional measures unique to rural/frontier systems. It may be appropriate to establish measures specific for different health provider settings, including community health centers, rural health clinics, generalist private practices, Critical Access Hospitals, etc. The measures should clearly reflect the special challenges facing the rural/frontier telehealth operating environment.

NOSORH Recommendation 2 – Create rural/frontier appropriate measure sets.

NOSORH recommends that NQF take additional steps to identify the sets of telehealth measures which are appropriate for rural/frontier systems.

These sets should exclude measures extraneous to rural/frontier health services and be limited to

data elements for which rural/frontier providers can generate a sufficient number of events for reporting. In this way the collection of measures would be similar the special set of measures considered under the Medicare Beneficiary Quality Improvement Project (MBQIP). It may be appropriate to establish separate measure sets for different health provider settings. Identifying appropriate measure sets will assure that rural/frontier telehealth systems will not be asked to report on measures that are irrelevant to their operations.

NOSORH Recommendation 3 – Create specific standards for rural/frontier evaluation.

NOSORH recommends that NQF create specific performance standards for rural/frontier systems.

The aim of this effort should be to create appropriate peer performance comparisons for different types of rural/frontier providers as well as peer comparisons for telehealth systems in areas with limited broadband availability.

NOSORH Recommendation 4 – Create measures and standards appropriate for First Nations telehealth.

NOSORH recommends that NQF recognize the special circumstances of rural First Nations telehealth services and create appropriate measures and standards.

Committee Response:

Thank you for your comment. The Committee has decided to expand wording with regard to the application of telehealth in rural and urban settings instead of discussing issues that are specific to only a rural or urban setting.

Social and Scientific Systems

We support NQF in allowing telehealth services in the home. We believe that this would be most appropriate for individuals with compromised health status who are homebound, reside in long-term care facilities, or have no other means of traveling to and from a non-emergency health care appointment (p. 14).

We encourage NQF to define provider-to-provider exchanges differently (pp. 16–17), as care coordination payment and benefit policies are currently accounted for by CMS and other payors. What we are describing here is something new and should be defined.

We encourage NQF to include a patient consent measure for all telehealth services in the measures selection (p. 21). This measure should include a signed consent. Additionally, we encourage NQF to consider additional program-level measures for quality of life, depression screening, advanced care planning, obesity counselling, and other preventive services as appropriate.

Finally, we encourage NQF to note that provider training for telehealth services will be necessary for quality care. Physicians and other providers will no longer be dependent on blood pressure readings, body temperature, weight change, and other patient factors commonly collected during face-to-face patient visits (p. 22).

Committee Response:

Thank you for your comments. Edits have been made per the suggested comments.

The Committee noted that the measures chosen as the initial measure list are not intended to be an exhaustive list, but as a starting point. As a consensus-based entity and endorsement body of quality measures, NQF can offer specific guidance on measure development.

Zipnosis

We want to thank the NQF for requesting public comment and for taking these remarks into consideration. The efforts so far made by the Telehealth Committee are commendable and we are encouraged by the current draft framework. Zipnosis believes efforts such as these are necessary in creating a compelling, data-driven understanding of telehealth and its many benefits. The framework laid out is thoughtful and will, hopefully, set the standard from which to measure the various areas of success that telehealth offers.

Zipnosis would like to offer it's perspective and suggest ways in which the framework could be more inclusive and, in so, more representative of telehealth as a whole. It is clear that the framework has taken into account the many modalities available in telehealth. We are, however, concerned that the framework's view of store and forward is limited to its use in teledermatology. The success of store and forward in teledermatology cannot be overstated

and it belongs in this framework as an example of the store and forward modality. But, asynchronous store and forward technologies have advanced beyond its use in the transmission of video or photos.

Store and forward technologies in combination with best-practice based algorithms can be used as an effective care delivery tool. For example, Zipnosis uses a store and forward based technology known as an online adaptive interview. Our interviews are built using advanced algorithms and points of branching logic. They allow a patient suffering from mild acute conditions (e.g. sinusitis, UTI) to be treated—in many cases—completely asynchronously. In our interviews, patients are asked the same questions a clinician would ask, but through a text-based format. The information is then forwarded to a clinician who reviews the medical information and determines whether they can make a diagnosis. We are using the core of store and forward technology and applying it in new and effective ways. It is this perspective we hope will be taken into account as this important conversation continues.

Store and forward technologies are expansive in scope, and if the perspective of the framework is not widened, the view of telehealth is incomplete. The technologies employed by Zipnosis increase clinical capacity, heighten antibiotic stewardship, and facilitate the accurate diagnosis of minor acute conditions. Each of these attributes contribute value to the measurements of success espoused in the framework—with emphasis in the area of actionable information.

We understand that the framework is not meant to create an exhaustive understanding of every technology type. Zipnosis would likely to kindly suggest that in the consideration of the framework—and the ways in which telehealth is viewed and success measured—that a more nuanced perspective of the technologies that are currently in use be taken into account.

Committee Response:

Thank you for your comment. For the purposes of the framework, the Committee opted not to focus on specific telehealth modalities with regards to quality measurement.

Appendix B: Environmental Scan Findings

American Occupational Therapy Association

AOTA appreciates the rigor and effort that went into the environmental scan and literature review. We would also submit the following articles for the literature review:

Cason J (2009). A Pilot Telerehabilitation Program: Delivering Early Intervention Services to Rural Families. International Journal of Telerehabilitation, 2009;1(1):29-37.

Hoffmann T, Russell T, Thompson L, Vincent A, Nelson M. (2008). Using the Internet to assess activities of daily living and hand function in people with Parkinson's disease. NeuroRehabilitation, 23, 253–261.

Ng EM, Polatajko HJ, Marziali E, Hunt A, Dawson DR (2013). Telerehabilitation for addressing executive dysfunction after traumatic brain injury. Brain Inj. 2013;27(5):548-64.

Finally, we would also point NQF to the International Journal of Telerehabilitation which can be accessed at: https://telerehab.pitt.edu.

Committee Response:

The Committee agreed that the environmental scan and literature review in its current form is comprehensive and supports the rationale of the measure concepts and domains/sub-domains recommended in this report.

Connected Health Initiative (CHI)

The CHI greatly appreciates the efforts of the NQF in conducting this environmental scan. We urge the NQF to release the full literature review, instead of the summary it has provided.

Committee Response:

The Committee agreed that the environmental scan and literature review in its current form is comprehensive and supports the rationale of the measure concepts and domains/sub-domains recommended in this report.

NM Hospital Association

Discussion on the value of allowing state-specific outcomes (e.g. tele Peds and tele neuro/neurosurgery for NM). By allowing these smaller clinical areas, they could find their way into the mainstream. Contributors felt that state collected data are important.

Committee Response:

Thank you for your comment.

Qualcomm

Publish the entire review of medical literature in the Environmental Scan – NQF conducted a comprehensive environmental scan to inform the development of the telehealth framework.

"Appendix B: Environmental Scan Findings" is an informative resource but lacks important information that can only be reviewed if NQF publishes the entire literature review (along with the appropriate citations). We recommend NQF publish the entire literature and document review.

Committee Response:

Thank you for your comment. The results of the literature review are found in Appendix B of the report.

Appendix C: Initial Measure Concepts

Infectious Diseases Society of America

IDSA, in general supports the Initial Measure Concepts as outlined in Appendix C of the draft report. IDSA believes the committee has laid the foundation and urges the committee to continue to work on these measure concepts so that quality measures for telehealth are useful, reasonable, and actionable. There are measures concepts that we believe may be of particular value to the ID physician. We support the further development of the following measures concepts:

Decreased length of stay in the hospital: Studies have shown that the early involvement of an ID physician in the treatment of an infectious disease has been shown to decrease the length of stay in a hospital, and early ID involvement could be achieved through telehealth when no ID physician is available in house.

Telehealth services prevented an elevated amount of care to a patient: Similar to the rationale for decreased length of stay, the early involvement of an ID physician has been shown to decrease the cost of care for a patient by preventing an "elevated amount of care".

Can telehealth offer the same quality of services across a population of similar patients?: IDSA believes that our physicians are in a unique position to measure the quality of services provided by telehealth, as our physicians would have access to populations easily studied and measured, for example by looking at the care HIV/AIDS or Hepatitis C patients receive both in person or via telehealth.

Was travel eliminated for a specific patient encounter because of telehealth services? IDSA supports the development of this measure concept, as we firmly believe the provision of ID care is well suited for telehealth platforms. Given the ID physician's work is more cognitive in nature, and not procedurally oriented, the diagnosis and treatment of infectious diseases can be carried out using telehealth technologies. For example, long term care facility patients with multiple co-morbidities, and lack of mobility could be treated remotely by ID physicians for conditions such Clostridium difficile and urinary tract infections.

Impact of telehealth services on the workforce shortage: The specialty of infectious diseases continues to have a workforce shortage problem. IDSA sees the use of telehealth as a workforce multiplier; therefore we believe this measure concept could be further developed to measure the impact of the use of telehealth services to provide infectious diseases services to patients who might not otherwise have access to those services.

Thank you for the opportniuty to comment.

Committee Response:

The Committee noted that the current measure concepts are not intended to be an exhaustive list, but as a list of concepts that should be prioritized. The report is revised to reflect this intention.

NM Hospital Association

Feedback from contributors was extremely positive on these concepts. They felt that App C could be used as a guiding document for use in self-assessment and development of evaluation plans.

Committee Response:

Thank you for your comment.

Philips

Measure Concepts("Pt demonst…") Change to pt's conf to enact CP (CP)

Add "family". Essential to pt. outcomes

Clarify

"Clear and timely" implies A/V

("The duration…") Clarify

Redundant with #2?

Measure sat. rel. to "usual care"

"Increased use of services" unclear. Redundant w/ #10?

("How closely…") Change "system" to "service". System a function of service

"ER" gets all admissions? "Hospital" better? Should "reducing readmissions" be measured to align w/ VBC measures of CMS?

Clarify.

Cost, mortality differ by setting. Disaggregate "inpt" to ICU, Med Surg, and SNF

("In person…") Important? Perhaps TH avoided in-person visit, lowering util., incr. capacity.

Change "facilitated" to "improved"

If intent is value pt sees in TH, better captured via sat score and compl. w/ TH CP

Clarify. Intent may be total # of images captured, but might cause incr utiliz w/o efficacy

Perhaps standardize "elevated amount of care" as "admissions", although redundant with #16

Systems enable clinicians to deliver care. Change to reflect

Tactical?

Better captured through 2 meas?: (1) # of delays in diag that TH would have identified (2) # of accurate diag. based on TH use

Unique to complex pts? How to measure effcy?

Restate: "Can TH standardize/improve care across a pop. of pts vs. usual care?"

Redundant with #25? Also w/ "standards" in #29 above?

Why "no-shows" improved is unclear

Change to: "Is there sufficient integ btwn TH and EMR to enable decisions, efficient WF by PCP?"

(33 & 34 q's joined into 1)

Overlap with #24?

Travel good, bad? Perhaps TH identified need for elevated level of care

Change "volume of" to "access to"

Use consistent success indicators across conditions?

Redundant with #2?

TH causes increased care coord svcs after TH visit? Or, TH becomes effective form of care coordination? Refine

"TH provider has appropriate skills to treat pt?"

If time becomes measure, visits shorten and pts will have poor exp.

See #44

Clarify

Clarify

Better meas might be pts/clinician by setting (eg: ICU, HH, etc). Employ std definitions of activities the clinicians are/are not resp. for, to ensure comparability

If comparing btwn TH and non-TH, misleading. 1 TH provider might act in minutes, another in hrs. Negligible when comparing to "usual care", learning of pt's deterioration when admitted.

Committee Response:

The Committee noted that the current measure concepts are not intended to be an exhaustive list, but as a list of concepts that should be prioritized. The report is revised to reflect this intention.

Appendix D: Initial Measures

American Occupational Therapy Association

AOA supports the initially identified measures. We request that NQF consider the following measures as well:

Measures related to falls (NQF# 0101) as well as screening for depression and follow-up plan (NQF 418)

Thank you for the opportunity to comment on this framework. AOTA appreicates the work that NQF has accomplished with the group.

Committee Response:

The Committee noted that the measures chosen as the initial measure list are not intended to be an exhaustive list, but as a starting point. The report is revised to add clarifying language on the reasons why some existing measures were chosen, and to emphasize the Committee's intention that the initial measure list is not meant to be exhaustive.

Avera eCARE

Avera eCARE is a robust telemedicine network including a vast array of care settings across the United States, which equates to utilizing multiple originating site electronic health record (EHR) systems. In our business-to-business models, the originating site retains the ability to bill for the encounter and all billing and claims documentation is incorporated in the electronic health record by the care team at the originating site. Accessing and compiling telehealth electronic health record and claims data from originating site EHRs, to use for quality reporting, is contractually and logistically improbable. We are concerned that existing and proposed telehealth measures are almost entirely based off of electronic health record data elements and/or claims data. Avera eCARE collects quality data at the time of the encounter, using internally developed data collection systems. Consequently, our patient populations for quality metric inclusion are largely based on patient symptoms and clinical presentation, versus diagnosis codes. Therefore, we encourage the National Quality Forum to expand data sources, submission methods and definitions to include options outside of electronic health records and claims data.

In order to highlight our concern, we would like to provide a typical clinical scenario. Envision that a patient presents at a critical access hospital (CAH) that has Avera eCARE in their emergency department. The patient is complaining of shortness of breath, jaw pain and shoulder pain. This is possibly a cardiac event so an electrocardiogram is obtained. The telemedicine physician reviews the electrocardiogram via camera and notes ST-segment elevation. After an appropriate screening, the patient is determined to be eligible for fibrinolytics and it is administered within 30 minutes of the patient arriving at the emergency department. For Avera eCARE's quality reporting, this patient is included based on clinical presentation and diagnostic tests which support that the patient is likely having a ST-elevated myocardial infarction. In order to collect quality data, the telemedicine registered nurse documents key events (including: patient arrival and fibrinolytic administration time) on our internal electronic 'chest pain performance improvement' form. Our clinically relevant information for the encounter is electronically faxed to the originating site and scanned into the electronic medical record. The originating site provider documents in the electronic health record, including an ICD-10 code, and bills for the encounter, however, Avera eCARE does not have access to this information.

Committee Response:

The Committee noted that the measures chosen as the initial measure list are not intended to be an exhaustive list, but as a starting point. The report is revised to add clarifying language on the reasons why some existing measures were chosen, and to emphasize the Committee's intention that the initial measure list is not meant to be exhaustive.

Infectious Diseases Society of America

The Infectious Diseases Society of America (IDSA) would like to thank the National Quality Forum for the opportunity to comment on the draft report for creating a Framework to Support Measure Development for Telehealth. We offer the following comments for your consideration.

IDSA supports the use of the Initial Measures as outlined in Appendix D of the draft report. The initial

measures chosen by the committee to assess the use of telehealth seem to be a reasonable starting point.

IDSA appreciates the work NQF has done thus far and we believe a useful foundation has been set. We look forward to continued opportunities to comment and provide feedback as the project moves forward

Committee Response:

Thank you for your comment.

Personal Connected Healh Alliance

In Appendix D of the report, we appreciate the identification of a number of MIPS measures that are telehealth and/or remote monitoring relevant. However, it is unclear how the framework outlined in this report would be applied to these measures, and it is not clear how measuring use of telehealth and/or remote monitoring would be incorporated or distinguished from face to face delivery. Would it be possible for the report to provide clarity on how these measures should incorporate telehealth and/or remote monitoring?

Committee Response:

The Committee noted that the measures chosen as the initial measure list are not intended to be exhaustive, but as a starting point. The report is revised to add clarifying language on the reasons why some existing measures were chosen, and to emphasize the Committee's intention that the initial measure list is not meant to be exhaustive.

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