MHCC | MARYLAND HEALTH CARE COMMISSION

Long Term Care and Hospital Telehealth Project Grants

Brief and Final Reports

April 2016

Participating Grantees:

Atlantic General Hospital Corporation with Berlin Nursing and Rehabilitation Center
Dimensions Healthcare System with Sanctuary of Holy Cross and Patuxent River Health and Rehabilitation Center
University of Maryland Upper Chesapeake Health with Lorien Health Systems

Craig P. Tanio, M.D., Chair   **Ben Steffen, Executive Director**

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Introduction

In the fall of 2014, the Maryland Health Care Commission (MHCC) awarded three 12-month grants to qualifying organizations to assess the use of telehealth in improving transitions of care between long-term care (LTC) facilities and acute care hospitals (hospitals) in the State.[1] Grant recipients implemented telehealth projects with the goals of reducing unnecessary emergency department (ED) visits and hospitalizations, decreasing health care costs, and improving patient care, including the patient experience for residents of LTC facilities. Telehealth is the use of health information shared through two-way video and other forms of telecommunication technology with the goal of improving a patient's health status.[2, 3] Widespread adoption of telehealth has the potential to increase access to care, improve patient outcomes, and generate cost savings.[4] This information brief provides an overview of the grantees' implementation of telehealth and lessons learned from their telehealth projects. Findings are intended to help inform the future telehealth initiatives.[5]

Background

In 2010, the Maryland Health Quality and Cost Council (Council) created the Telemedicine Task Force (Task Force) to develop a plan for a comprehensive statewide telemedicine system of care. The Task Force submitted a report to the Council in September 2010 that identified the challenges to the widespread adoption of telemedicine in Maryland. A Leadership Committee was subsequently established in November 2010 and was tasked with developing recommendations to advance use of telemedicine in Maryland. The Leadership Committee established three advisory groups: Clinical; Finance and Business Model; and Technology Solutions and Standards. In December 2011, the Leadership Committee submitted a report to the Council with recommendations for broad implementation of telemedicine in Maryland.[6] The General Assembly later enacted legislation in 2013 requiring MHCC, in conjunction with the Council, to reconvene the Task Force, including the three advisory groups. The Task Force was required to identify

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[1] LTC facilities include nursing homes, comprehensive care facilities for elderly residents in need of skilled nursing, and hospital extended care facilities that provide rehabilitation services for individuals needing extended care after being released from a hospital. For more information, visit: http://dhmh.maryland.gov/ohcq/ltc/Pages/home.aspx.

[2] MHCC, *Maryland Telemedicine Task Force Final Report*, October 2014. Available at: http://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/tlmd/tlmd_ttf_rpt_102014.pdf.

[3] See Appendix A, Telemedicine Facts, American Telemedicine Association.

[4] Information Technology and Innovation Foundation, *Unlocking the Potential of Physician-to-Patient Telehealth Services*, May 2014. Available at: www2.itif.org/2014-unlocking-potential-physician-patient-telehealth.pdf.

[5] See individual grantees' Telehealth Grant Reports, which are referenced throughout this brief and provide detailed information regarding project implementation processes, challenges, assessment outcomes, among other things.

[6] MHCC, *Telemedicine Recommendations*, December 2011. Available at: http://mhcc.maryland.gov/mhcc/pages/hit/hit_telemedicine/documents/TLMD_TLMD_Recommend_rpt_20111201.pdf.

opportunities for using telemedicine to improve health status and care in the State, assess factors related to telemedicine, and identify strategies for telemedicine deployment in rural areas.[7, 8]

In October, 2014, MHCC released a report outlining 10 telehealth use cases that could be implemented as pilot projects to demonstrate the value of telehealth.[9] The Task Force recommended that pilot projects be funded to help accelerate diffusion of telehealth throughout the State.[10] The use cases were utilized by MHCC as the framework for initiating requests for proposals for telehealth grants (referred herein as "telehealth projects"). Since 2014, MHCC has issued three grants for telehealth projects to test the effectiveness of certain use cases and help inform future use of telehealth in the State.[11, 12] MHCC released an announcement for a fourth round of telehealth grants on March 7, 2016 to be awarded in May 2016 that will require grantees to demonstrate the impact of using telehealth technology to support value-based care delivery in primary care.

About the Telehealth Projects

The three grantees for the round one telehealth projects are: (1) Atlantic General Hospital Corporation (AGH) in partnership with Berlin Nursing and Rehabilitation Center (BNRC); (2) Dimensions Healthcare System (Dimensions) in partnership with Sanctuary of Holy Cross (Sanctuary) and Patuxent River Health and Rehabilitation Center (Patuxent); and (3) University of Maryland Upper Chesapeake Health (UMUCH) in partnership with the Bel Air facility of Lorien Health Systems (Lorien). A combined total of $87,888 was awarded to the grantees and required a dollar for dollar match. The grants were for a one-year period beginning October 30, 2014 and ending October 30, 2015. As part of the telehealth projects, grantees were required to use a nationally certified electronic health record (EHR) and services of the State-Designated Health Information Exchange (HIE), the Chesapeake Regional Information System for our Patients (CRISP).[13, 14]

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[7] 2013 Md Laws, Chap. 319, Available at:
http://mgaleg.maryland.gov/2013RS/Chapters_noln/CH_319_sb0776e.pdf.
[8] In response to the Task Force efforts, the legislature enacted a law (Md. Code Ann., Insurance §15–139) requiring insurers to cover health services provided through telehealth technologies comparable to health services provided in person. See Appendix B.
[9] MHCC, *Maryland Telemedicine Task Force Final Report*, October 2014. Available at:
http://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/tlmd/tlmd_ttf_rpt_102014.pdf.
[10] The Task Force recommended that the Maryland General Assembly allocate $2.5 million for use cases. The legislature did not allocate specific funding, however, MHCC was able to budget $90.000 in FY2014 from the Maryland Health Care Commission Funds and has allocated $90,000 for FY 2015 and FY 2016.
[11] See Appendix C – Round Two & Three Project Abstracts.
[12] Round two and three projects are still underway and results will be detailed in future reports.
[13] An EHR is a digital version of a patient's paper chart. EHRs are real-time, patient-centered records that make information available instantly and securely to authorized users. The Office of the National Coordinator for Health Information Technology Health IT Certification Program ensures that health IT conforms to the standards and certification criteria adopted by the Secretary of Health and Human Services. For more information, visit: https://www.healthit.gov/policy-researchers-implementers/about-onc-health-it-certification-program.
[14] In 2009, CRISP was designated as Maryland's statewide health information exchange by MHCC. HIE enables health care providers to transfer data through electronic networks among disparate health information systems. Information available through an HIE typically includes laboratory results, radiology reports, discharge summaries, consultation notes, history and physical notes, operative notes, and secure clinical messaging and referrals.

All three telehealth projects used audio-video equipment to facilitate remote consultations with hospital physicians when there was a change in a patient's condition at a LTC facility. Dimensions utilized mobile carts with tablets that were brought to a patient's bedside to support audio-video consultations between providers and patients at LTC facilities and ED physicians at the hospital. AHG also employed mobile carts and used an Electrocardiogram (ECG) glove and Bluetooth stethoscope device.[15, 16] AGH utilized attending physicians rather than ED physicians. UMUCH implemented a fully equipped exam room and diagnostic medical laboratory at the LTC facility to allow for audio-video consultations between patients and ED physicians. UMUCH also used peripheral technology to enable patient examination capabilities such as ECGs, pulse measurements, and ultrasounds that could be transmitted to ED physicians in real-time.[17, 18]

Overall, findings from the telehealth projects indicate there was a reduction in hospital encounters for patients whose non-emergency conditions were monitored remotely from a LTC facility, and estimated cost savings attributed to this reduction as a result of using the telehealth technology.[19] Dimensions observed a reduction in 30-day readmissions across both sites and a reduction in hospital admissions at Patuxent and ED visits at Sanctuary.[20, 21] UMUCH noted 42 avoided trips to the ED. Information on actual savings is unknown; however, the estimated financial savings equates to $128 for each ED visit avoided, $445 for each patient day avoided, and $650-750 per ambulance trip avoided.[22] AGH saw a reduction of 11 admissions per month, a 42 percent reduction in readmissions, and a 9 percent reduction in patient transfers. AGH estimated a financial savings of $157,400 per month from reduced admissions and $57,300 per month from reduced readmissions.[23]

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[15] An electrocardiogram (ECG) glove is a replacement for conventional 12-lead ECG devices used for capturing heart's electrical activity and allows for transmission of ECG readings with a digital connection (USB interface). For more information, visit: http://www.amdtelemedicine.com/telemedicine-equipment/physio-glove.html

[16] Bluetooth stethoscopes are "digitizing stethoscopes" that convert the audio sound to a digital signal. These stethoscopes can transmit serialized audio data that can be shared real time (synchronously) and/or in a store and forward fashion (asynchronously). For more information visit: http://telehealthtechnology.org/toolkits/electronic-stethoscopes/about-electronic-stethoscopes/technology-overview

[17] Peripheral equipment are devices used in conjunction with the audio-video technology to conduct specific clinical examinations.

[18] Telehealth can be divided into two general types of applications: real-time communication and store-and-forward. Real-time means the actual time during which a process occurs. Store-and-forward refers to the transmission of digital images that are saved and forwarded. Real-time sonogram images, are seen by the physician remotely at the time of the examination. For more information visit, http://www.hrsa.gov/healthit/toolbox/RuralHealthITtoolbox/Telehealth/whatistelehealth.html.

[19] The reported outcomes are not based on scientific methods and are only observational.

[20] See Dimensions Final Report, page 6.

[21] Dimensions did not report specific cost saving attributed to the reduction of 30-day readmissions, hospital admissions or ED visits.

[22] See UMUCH Final Report, page 9 for details on cost savings.

[23] See AGH Final Report, page 19 for details on cost savings.

Deploying Telehealth

Readiness Assessment

Each telehealth project conducted a readiness assessment of the hospital and LTC facility prior to determining the infrastructure, human resources, and workflows needed to ensure efficient implementation of telehealth. The readiness assessment included an evaluation of technology currently in use and staff willingness to adopt new processes into clinical workflows. Findings were fairly consistent among all three grantees concluding that LTC facilities would benefit from additional training and technical support. In general, hospitals are more advanced users of technology and have greater flexibility to undertake new initiatives as compared to LTC facilities. Hospitals also recognized the need to provide support in terms of technical assistance to LTC facilities.

In choosing the appropriate technologies to deploy, grantees assessed the existing infrastructure, including physical space, Internet bandwidth, and Wi-Fi signals, at both the LTC facilities and hospitals.[24, 25] UMUCH chose to implement the Lifebot system with a diagnostic medical laboratory allowing for a fully equipped exam room at the LTC facility that included fixed and mobile cameras.[26, 27] This required UMUCH's partner, Lorien, to have available space in its facilities for the exam room with the Lifebot system, as well as the ability to transport patients to the exam room. Dimensions and AGH chose to use mobile carts with mounted cameras, which allowed them to bring the exam room to the patient and did not require the allocation of additional space.

Assessment of the bandwidth and Wi-Fi signal strength at LTC facilities was necessary to ensure maximum functionality of the telehealth audio-video consultations. AGH discovered that enhancements to the Wi-Fi signal strength at BNRC were necessary.[28] Dimensions determined that some locations within the LTC facilities had better Wi-Fi signal strength than other locations. In rooms with less than optimal Wi-Fi connectivity, Dimensions used network cables to ensure there was no disruption in connectivity.[29]

Engaging Patients

Patient involvement, or buy-in, was necessary to ensure successful deployment of telehealth at the LTC facilities. Educating patients at LTC facilities and their families about telehealth early on, particularly how telehealth technology would be used during care delivery, was essential. Upon admission to a LTC facility, patients and their families were provided detailed information about the telehealth projects. Dimensions developed a marketing brochure about its project; UMUCH and

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[24] Internet bandwidth is the data speed supported by a network connection. The definition comes from the field of engineering where bandwidth represents the distance between the highest and lowest signals on a communication channel (band). Greater bandwidth indicates a greater capacity. For more information, visit: http://www.bandwidthplace.com/internet-bandwidth-measured-article/

[25] Wi-Fi is the name of a wireless networking technology that uses radio waves to provide wireless high-speed Internet and network connections. For more information visit: http://www.webopedia.com/TERM/W/Wi_Fi.html.

[26] In the exam room, fixed cameras are mounted to the walls in the exam room and mobile cameras are portable and used as needed by the LTC facility nurse to focus on particular area of the patient.

[27] More information about Lifebot available at: http://www.lifebot.us.

[28] See AGH Final Report, page 6.

[29] See Dimensions Final Report; pages 8.

AGH developed pre-recorded education videos. Prior to participation, patients reviewed the education materials, treatment options and asked any questions before providing written consent to participate in the telehealth project.[30] UMUCH noted that when patients and their families were appropriately informed about the technology and acclimated to its use beforehand, it helped build awareness and comfort, and many became more accepting of telehealth.[31]

Physician and Nurse Technology Champions

Physician champions are generally viewed as individuals that promote the use of technology by creating enthusiasm for the project; offering guidance to providers about the use of telehealth; bridging the gap between management, IT and clinical associates; and helping to remove policy and cultural barriers.[32] In these telehealth projects, the hospital leadership recruited physicians who they considered to be champions of telehealth. Nurse champions are very similar to physician champions and were equally as important for the success of the telehealth projects. The nurse champion was responsible for coordinating the training of the nurses that participated in the project, assuring families and patients of the value of telehealth, managing the telehealth equipment, and developing treatment protocols. Physician and nurse champions were an essential component of the telehealth projects.

Workflow and Training

The telehealth projects required some modifications to clinical procedures in order to integrate telehealth in a way that was least disruptive to clinical workflows. More expansive modifications to clinical procedures for hospitals working with multiple LTC facilities were made to accommodate the unique needs of each LTC facility.[33, 34] Changes in processes were well thought out and implemented to support the use of telehealth under certain conditions; for example, in a situation where a patient at Lorien required a clinical assessment, and the on-call physician was not able to fully assess and treat the patient in-person or remotely, Lorien nurses initiated a remote examination of the patient with the ED physician. This reduced the likelihood that on-call physicians would order a transfer to the ED.[35]

All hospital and LTC facility staff involved in the telehealth projects were required to undergo initial training and received periodic refresher training. Training helped build user confidence in deploying telehealth; UMUCH developed a YouTube video to demonstrate physicians using the technology.[36] Changes in staffing schedules were made to ensure that at least one telehealth trained and credentialed clinician was available on a 24/7 basis. All of the telehealth projects

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[30] See Dimensions Final Report, page 4; UMUCH Final Report, page 2; AGH Final Report, page 7.
[31] See UMUCH Final Report, page 7.
[32] Bob Wolverton, Ed D, Program Director, Northwest Regional Telehealth Resource Center, *Finding (or Developing) Telehealth Champions*. Available at: https://www.nrtrc.org/content/article-files/White%20Papers/Developing%20a%20Telehealth%20ChampionB.pdf.
[33] Clinical workflow is characterized as the pattern of actions clinicians utilize to perform routine tasks and generate results. Examples of clinical workflow actions include providing medical treatment (triage), recording patient history, examining and assessing patients, developing treatment plans, providing patient education, prescribing medication, and ordering procedures. For additional information, visit: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2966355/.
[34] See AGH Final report, page 3 & 4.
[35] See UMUCH Final Report, page 6.
[36] See UMUCH Final Report, pages 3.

implemented weekly system tests for the ongoing maintenance of the telehealth equipment being used to ensure the equipment would continue to be operational as needed.[37] Policies were implemented to allow LTC facilities with limited IT staff to obtain support from the hospital's IT department, and in some instances, to request support from technology vendors.

Privacy and Security Considerations

Grantees are considered to be covered entities under the Health Insurance Portability and Accountability Act of 1996 (HIPAA).[38] Prior to the implementation of telehealth, grantees completed a risk assessment to ensure compliance with HIPAA administrative, physical, and technical safeguards.[39] Following this, select workstations and tablets used in all three telehealth projects were customized to support telehealth, particularly the secure storage and transfer of electronic health information between devices. Dimensions users were provided with a unique access code to utilize the technology, and AGH established a private and secure location for physician telehealth consults in the hospital.[40, 41] As required by HIPAA, grantees entered into a business associate agreement (BAA) with their partners and telehealth technology vendors.[42] Among other things, a BAA outlines the security controls in place and makes clear the ownership of data and future access to the data once a contract ends.

Professional Liability Coverage

Professional liability insurance policies differ with respect to telehealth coverage. Some insurance carriers provide coverage for telehealth under certain conditions while others do not. Grantees utilized attending and contractual physicians and needed to confirm they had adequate and appropriate coverage for telehealth. Two of the grantees discovered telehealth may be excluded from their existing policies and needed to determine if supplemental coverage was available. AGH noted that liability coverage was an unexpected barrier that required significant time and resources to resolve.[43, 44] Attending and contractual physicians taking part in telehealth need to confirm that their professional liability insurance includes the appropriate coverage.

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[37] See Dimensions Final Report, page 8; UMUCH Final Report, page 3; and AGH Final Report, page 6.
[38] Public Law 104-191 and 42 CFR Parts 160 and 162.
[39] Health IT Security, *Telemedicine privacy, security considerations for providers*, January 23, 2014. Available at: http://healthitsecurity.com/news/telemedicine-privacy-security-considerations-for-providers.
[40] See AGH Final Report, page 7.
[41] See Dimensions Final Report, page 3.
[42] Under the U.S. Health Insurance Portability and Accountability Act of 1996, a HIPAA business associate agreement (BAA) is a contract between a HIPAA covered entity and a HIPAA business associate (BA). The contract protects personal health information (PHI) in accordance with HIPAA guidelines. For more information, visit: http://searchhealthit.techtarget.com/definition/HIPAA-business-associate-agreement-BAA.
[43] See AGH Final Report, page 7.
[44] See Appendix G, Fact Sheet on Telehealth Barriers.

Project Sustainability

After the pilot period, participating hospitals agreed to pay for physician telehealth services through the hospital's operating funds based on their projected savings.[45, 46, 47] Hospitals anticipate that the new Global Budget Revenue model adopted as part of Maryland's new Medicare waiver will help support funding of future telehealth projects as a means to generate savings for a hospital and improve care delivery to the patient population it serves.[48] Overall, grantees were pleased with the cost savings and reported plans to expand their telehealth projects. Dimensions has already begun working with additional LTC facilities including Genesis, Hillhaven and Manor Care.[49] UMUCH is in the process of implementing telehealth at Harford Memorial Hospital and two more Lorien facilities in Harford County, Lorien Riverside and Lorien BulleRock.[50] AGH is expanding its use with BNRC, making improvements to technology and exploring partnerships with other LTC facilities.[51]

Data Collection

The telehealth projects utilized services of the State-Designated HIE, CRISP, and other tools including the hospitals and LTC facility EHRs, to gather information about hospital admissions and transfers. The information was used for purposes of clinical tracking to help assess the project's effectiveness.[52] For example, access to information available through CRISP allowed the telehealth projects to proactively monitor if participating patients had been admitted to a hospital or had an ED encounter. Dimensions and UMUCH also utilized INTERACT (Interventions to Reduce Acute Care Transfers), an EHR module used by LTC facilities to collect baseline data and track patient hospital encounters.[53, 54]

The telehealth technologies used in the telehealth projects collected data on patients', such as heart rate and medications prescribed, and monitored their physical conditions on an ongoing basis, among other things. All three telehealth projects found limitations to using telehealth technology in regards to their ability to easily transmit data to the hospital EHR or to CRISP. To overcome this limitation, data was imported into Excel and was then merged with the hospital EHR or manually entered into the EHR by hospital staff. A long-term goal for the efficient sustainability of the

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[45] UMUCH agreed to a contract amendment that pays the ED provider for each telehealth visit. This puts the telehealth services on par with the in-person ED visits. See UMUCH Final Report, page 6.

[46] Limitations on Medicaid and Medicare reimbursements for telehealth services require grantees to seek other means of covering the cost of telehealth services. See Appendix D & E for more information on telehealth coverage for Medicare and Medicaid.

[47] Md. Code Ann., Health General §15–105 details what services are currently covered by the Maryland Medical Assistance Program. See Appendix F.

[48] Maryland All-Payer Model; Available at: https://innovation.cms.gov/initiatives/Maryland-All-Payer-Model/.

[49] See Dimensions Final Report, page 11.

[50] See UMUCH Final Report, page 9.

[51] See AGH Final Report, page 7.

[52] See Dimensions Final Report, page 2; UMUCH Final Report page 4 & 5; and AGH Final Report, page 12.

[53] INTERACT is a quality improvement program designed to improve the early identification, assessment, documentation, and communication about changes in the status of residents in skilled nursing facilities. The goal of INTERACT is to improve care and reduce the frequency of potentially avoidable transfers to the acute hospital. For more information, visit: http://interact2.net/

[54] See UMUCH System Final Report, page 4; and Dimensions Final Report, page 5.

telehealth projects is to enhance capabilities that better enable the electronic sharing of data between EHR systems, telehealth technologies, and CRISP.

Remarks

Deploying telehealth use cases is an important step in assessing the value of telehealth in care delivery.[55] The MHCC round one grants demonstrated the impact of telehealth when used during transitions of care between a hospital and LTC facility. The MHCC applauds AGH in partnership with BNRC, Dimensions in partnership with Sanctuary and Patuxent, and UMUCH in partnership with Lorien for their groundbreaking work in implementing telehealth to improve care delivery and reduce health care costs. The hard work of these early pioneer telehealth projects including the lessons learned will help inform future telehealth projects in other hospitals and LTC facilities.

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[55] See Appendix H for a summary of telehealth implementation considerations discussed in this brief.

Acknowledgements

The MHCC acknowledges the work of the round one grantees and thanks them for their effort to implement and assess the use of telehealth. The MHCC also appreciates the contributions of the grantee evaluators who volunteered their time in reviewing requests for proposals prior to awarding the grants as well as providing ongoing recommendations to ensure the ongoing success of telehealth projects.

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Telehealth Grantees Final Reports

The following pages includes the final reports of the three grantees: (1) Atlantic General Hospital Corporation in partnership with Berlin Nursing and Rehabilitation Center; (2) Dimensions Healthcare System in partnership with Sanctuary of Holy Cross and Patuxent River Health and Rehabilitation Center; and (3) University of Maryland Upper Chesapeake Health in partnership with the Bel Air facility of Lorien Health Systems. Each report includes their own narrative sections and appendices. Please note, original report page numbers are maintained for reference purposes.

Atlantic General Hospital in Partnership with Berlin Nursing and Rehabilitation Center

Long Term Care / Hospital Telehealth Project

Final Report

Prepared for: Maryland Health Care Commission
October 30, 2015

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Introduction

In January of 2015 Atlantic General Hospital was one of three recipients of the Maryland MHCC grant which focused upon the use of telehealth technology to prevent avoidable transfers, admissions and readmissions to the acute care setting. This mirrors our 2020 strategic vision of integrating healthcare beyond the acute care facility to ensure patients are receiving the right care in the most appropriate setting.

Atlantic General Hospital (AGH) is a 62 bed acute care hospital, founded in 1993. Located in Worcester County, Maryland, AGH is comprised of a primary care network consisting of seven offices located in Maryland and Delaware and also includes a level II; NCQA accredited Patient Centered Medical Home.

An integral component of the grant project was the selection of the most appropriate community provider to collaborate on this endeavor. Realizing the significance of our referral patterns, it was very evident that our strategy should include Berlin Nursing and Rehabilitation Center (BNRC).

Berlin Nursing and Rehabilitative Center (a 5 star facility)[1] is comprised of 63 long term care beds, 38 short term rehabilitation beds, 35 certified Alzheimer/dementia beds and a 12 bed ventilator pulmonary care unit. The Rehabilitation Center is one of many organizations operated under Mid-Atlantic Healthcare, LLC which employs their own physician team in addition to coverage provided by 5 Star Physicians (a partnering medical group). Although the telehealth partnership focused exclusively upon short term rehabilitation units, the entire center has an average daily census of 137 patients.

Technology Infrastructure

The selected telehealth solution consisted of a basic compact, wireless, self-powered telehealth mobile cart available through MedVision[2] that is equipped with 2 pan tilt cameras; an articulating boom with HD camera and light source; as well as a PC mounted HD camera. The cart offered HIPAA compliant, codec-less audio, video and web based solutions all powered by Acano[3] operating off of a Windows 8 software platform. The set up was portable and user-friendly lending favor from both organizations. (Appendix A)

Existing infrastructure assessments were performed across both organizations. MedVision worked side by side with the respective IT teams at AGH and BNRC. It was established that the pre-existing infrastructure at AGH was sufficient to conduct telehealth consultations. However, there were modifications required within BNRC. Mock tests were conducted to evaluate the clarity of audio/visual operations to assure quality "real-time" assessments, aide in continued training as well as building physician and nursing buy-in. Administration at BNRC was committed to modifying their internal structures including the addition of access points and installation of high speed telecommunication wiring to improve the connectivity throughout the entire second floor.

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[1] 5 Star facilities: CMS created the Five-Star Quality Rating System to help consumers, their families, and caregivers compare nursing homes. Scored on a scale 0-5; 5 of which is the highest possible rating indicating above standard care.

[2] Telemedicine Equipment Vendor

[3] Acano: Founded in 2012, Acano is a fast-growing technology company with a fresh perspective on audio, web and video conferencing.

Another component of the infrastructure was the access to and integration of AGH and BNRC medical record systems. All three partners (AGH, BNRC and 5 Star physician groups) have well-established electronic medical record systems. Initial efforts focused upon providing access to BNRC records for AGH physicians so they could view information that was integral to their assessment and consultation.

There are many considerations to make when evaluating telehealth equipment. In our situation we needed a technology that was simplistic, appropriate for high traffic areas, easy to deploy and one that could be launched within the time parameters of the grant. Vendor selection was narrowed to the above criteria. Equally important, was the need to engage the participation by physician champions in the selection process. On-site demonstrations were provided and physicians from each facility determined which peripheral devices they believed were most ideal to render services, which included an EKG glove and blue tooth stethoscope.

Project Implementation Process

The development of the Telehealth consultative program was a collaborative effort. It was imperative to have all stakeholders at the table at least once a week initially, as well as meetings by administrative personnel on a bi-weekly basis. The work group was comprised of Medical Staff, IT, risk management, credentialing, inpatient clinical care coordinator, medical records staff, telemedicine coordinator, as well as representation from Berlin Rehabilitative and Nursing Center administration and personnel. Utilizing a systematic approach the team developed a working plan of deliverables, weighting each category according to time they needed to be completed. The team members are listed in the table below:

Name	Title	Organization
Michael Franklin	Chief Executive Officer	Atlantic General Hospital
Chuck Gizara	Director Clinical Operations	Atlantic General Hospital
Jennifer light	Telehealth Coordinator	Atlantic General Hospital
Jean Marx	Executive Data Analyst	Atlantic General Hospital
Lynne Snyder	Director Medical Records	Atlantic General Hospital
Gregory Stamnas	Medical Director – Hospitalist	Atlantic General Hospital
Stephanie Morris	Physician Practice Manager	Atlantic General Hospital
Bob Lanza	Administrator	Berlin Nursing & Rehab
William Robbins	Medical Director	Berlin Nursing & Rehab
Terry Dukes	Director Nursing	Berlin Nursing & Rehab
Michelle Shores	Nursing Supervisor	Berlin Nursing & Rehab

Our initial concept was to offer consultative services to patients who met a set criterion to prevent readmission to Atlantic General Hospital. The decision was made to only provide services to patients transferring from AGH to Berlin Nursing Home for rehabilitation services and excluded patients being placed in Long Term Care or the Ventilator Unit due to the significance of their medical condition.

In the initial launch of the program an evidence based algorithm was utilized. The algorithm specifically targeted CHF, Pneumonia, UTI, altered mental status. Nursing at BNRC adopted the algorithms into their daily practice. Education was provided to staff on the value of the newly developed tool and how it benefits the patient and the nurse's day to day flow.

Together, AGH and BNRC worked on developing an algorithm that was constructed around the INTERACT evidence based pathway. (Appendix B) Following the algorithm, if a patient did not respond to initial interventions provided by the nursing home and the patient was not in acute distress, the nurse at BNRC would request a telehealth consult order from a 5 Star Physician, prepare paperwork and transfer the portable telehealth equipment to the patients' room. The nurse at BNRC then would place a page to the AGH hospitalist team with an expected response time within twenty minutes. The hospitalist and nurse have a brief conversation prior to the telehealth encounter utilizing the SBAR format to facilitate a patient report. The hospitalist then performs the "real-time" consultation with the assistance of the nurse at BRNC to navigate the telehealth equipment. Documentation of the assessment and recommendations are dictated on a dedicated form by the hospitalist. Once the consultation recommendations are delivered and the nurse at BNRC has read back and verified understanding of recommendations they will obtain formal orders from the 5 Star Physician on call. (Appendix C) All documentation transcribed at AGH is to be added to the patient chart at BNRC and a copy retained by the medical records department at AGH.

Project implementation required development of multiple policies and procedures, training and evaluation of malpractice coverage. Representatives from AGH and BNRC developed multiple policies which transcended across both organizations. Considerations were given to the following domains:

- Goals and metrics
- Equipment
- Formal agreements
- Medical records / documentation
- Credentialing /malpractice
- Training
- Staff and community education
- Informatics / IT

Assessment Approach

A key aspect of any new program is to develop measurable goals and objectives that are both quantitative and qualitative in structure and in compliance with grant requirements as well as organization goals and values. Prior to establishing specific goals, baseline data was compiled to better understand historical trends. Reports were analyzed to assess AGH specific patient information such as transfers and re-admissions respective to the facilities to better understand our opportunities. Analysis of data from a one year period prior to project implementation guided the team to identify key metrics to reduce recidivism and establish our benchmark.

Once key metrics were established, meetings focused upon the data collection processes. Clearly, this was a challenge from the beginning as there were no automated systems to collect patient activity "real-time."

Members from both organizations were required to manually track the following information:

- Patient transfers from AGH to BNRC rehabilitation

- Patient's requiring protocol driven assessments at the nursing home

- Patient diagnosis

- LACE scores prior to transfer to BNRC (Appendix D)

- Volume of telehealth requests

- All transfers from BNRC resulting in an E.D. encounter, admission or re-admission

Data was compiled on a bi-monthly basis and reported to MHCC as opportunities were identified for process change which included further education and future expansion of telehealth services into the Long Term Care units. Qualitative data, (patient / provider surveys), were under-utilized for a number of reasons including limited telehealth encounters and the need to improve data collection processes for both patients and physicians.

Assessment Limitations

As noted earlier, this program focused upon the provision of telehealth services exclusively for patients being transferred from acute setting to inpatient rehabilitation. Patients in long-term care or the ventilator unit were excluded due to their pre-morbid conditions and limitations by physician comfort level managing these types of patients.

Long term impacts were not able to be evaluated due to the time constraints of this project. However, it became very evident of the need to expand future services to include long-term care patients as part of the program as they were at highest risk for return to the hospital setting. Unfortunately, there are additional infrastructure changes required within the nursing home before this can be accomplished.

Results of Telehealth Intervention

Although there were marginal telehealth encounters during the project, there were many successes related to the implementation of this program including integration of clinical protocols, patient / provider satisfaction, reduced recidivism and the potential for expanded services.

The most significant success of this program was the profound impact on reducing readmissions to the acute care setting. Over the nine month period, there were a total of three encounters in which telehealth services were rendered. However; the impact of this project was not derived from the patient volumes, rather the infrastructure that was developed which fostered care integration at the highest level.

Our benchmark data revealed a significant volume of readmissions (greater than 63%) from Berlin Nursing and Rehabilitation Center. Through the implementation of the telehealth program,

dedicated protocols and collaboration among the organizations, we observed great than 50% reduction in readmissions with in the skilled population. (Appendix E)

There was existing collaboration among the organizations; the project "strengthened" the intensity of the relationships, especially at the clinical level. There was an existing opportunity for the acute care hospital to assist the nursing home to enhance clinical knowledge and the telehealth project allowed this to occur through the development of treatment protocols. Furthermore, education and deployment of the protocols fostered relationships among clinical and medical staff.

Physician engagement and patient satisfaction are a major component of the telehealth experience. Initially, physicians were leery of the time requirements amongst their other responsibilities. However; they readily adapted once they understood the mechanisms by which services would be rendered and intrigued by the innovative technology. Patients were very receptive to the experience, appreciative of the individual attention and advanced technology. In fact, many patients likened the process to other communication platforms such as Skype and FaceTime.

Through the exposure of this grant, it has offered the introduction of telehealth services which has led to a care delivery paradigm shift and allowed healthcare providers and community members to understand the benefits of such a program. Future considerations are applicable to the nursing home and community environments. Potential expansions of services include, but are not limited to the following practices:

- Ortho post - surgical follow-up

- Wound care

- Dermatology

- Urology

- Alzheimer's / dementia / behavioral health services

- Specialty services (Oncology, Infectious Disease, etc.)

In an underserved, rural community such as Worcester County, the possibilities are not only endless, but a necessary component of the healthcare delivery system for all patient populations (infancy to gerontology).

Project Implementation Challenges

Physician Engagement
Engagement is a critical component of a telehealth services. The magnitude of the program resulted in many challenges for AGH as well as 5 Star physicians. Initially, the challenge of identifying which physician group should champion the project at the hospital level. Hospitalists did not believe they should be responsible for managing patients to prevent an E.D. visit. They believed this to be the sole responsibility of the E.D. physicians. However, they were later selected to take the lead on this project which resulted in another challenge. The nature of the Hospitalist role requires the physician to simultaneously manage a large group of inpatient clients while being available to perform telehealth consultations.

In addition to internal challenges faced by the Hospitalist, they also experience challenges communicating with 5 Star physicians who were located all over the State of Maryland. Although requested, it was not feasible to host a meeting among both physician groups due to logistics.

Long Term Care Environments

The current environment surrounding long term care could be viewed as volatile due to the ever changing climate. High turnover of physicians, clinical staff and administrators proves to be very challenging. With each new administrator, physician and nurse it requires re-engagement, re-education, and reinforcement.

Infrastructure (External / Internal and Costs)

Although broadband access was already present in the area, not all facilities/organizations in the area were prepared to invest with the requirements needed to take of advantage of this feature. Examples include not having the funding to connect to broadband services or upgrading internal wiring to support broadband capabilities. Another challenge, after updating the infrastructure, was limited band-width, during high peak activity at the hospital and nursing home.

Malpractice / Risk Assessment

This was an un-expected barrier as the hospital malpractice carrier had never been exposed to telehealth communications in the past and required a significant amount of time to resolve. Although this was an extremely invaluable experience there is a general lack of understanding of what telehealth is within the malpractice industry. It required an onsite evaluation of the project and full day assessment of policies and procedures.

Launching a New Telehealth Operation

There were many challenges implementing a new operation (from ground-up) with limited exposure to telehealth and within the limited time perimeters. There are numerous internal and external variables that need to be considered and analyzed before launching a telehealth program which place further time constraints.

Lessons Learned

- Involvement of Medical staff from both organizations from the inception of the grant to foster collegial relationships: With mutual collaboration at initiation of a project results in an instrumental understanding of value thus incentivizing all parties involved.

- Develop automated data collection methodologies (when possible) versus manual data collection: As previously stated we did not have an automated way to collect data. This was a very cumbersome process.

- Provision of education for patients prior to transfer to skilled facility to ensure patient/family understanding of program: Our responsibility in demonstrating the value of a telemedicine program originates at time of admission. Pre-recorded videos and educational handouts allowed us to capture the patient and family to access at their convenience for continued reinforcement.

- Performing weekly technology checks to ensure functionality and connectivity.

- Establishing the most appropriate environment for physicians to perform services to ensure patient privacy: The concept of telemedicine is to fluid. Initially we identified four dedicated areas for the hospitalists to conduct assessments. However, during our malpractice assessment it was suggested that we utilize only one of those four areas due to privacy concerns. This created a static environment one of which we are working on to improve upon.

- The need to develop a survey that is patient/provider user friendly: All telehealth encounters were reviewed however our survey tools were under-utilized. This is a current process that we are improving upon.

- On-going physician/clinical staff training on telehealth equipment and protocols: This is an important step to keep physicians and clinical staff engaged at times of low census or low utilization. This was instrumental in our situation during the initial implementation phase. We trained and performed mock testing until connectivity was resolved.

- Etiquette for those involved in the telehealth practices: Physicians have an obligation to inform the patient of what is occurring/who may be in the room during the assessment and give the patient an opportunity to decline if not comfortable. Camera placement, ambient noises and any distracting background activity needs to be carefully considered prior to initiation of a telehealth consultation. Physicians as well as clinical staff need to be cognizant of non-verbal gestures and seek patient understanding to what was discussed during the consultation.

Sustainability

The ability to sustain and promote telehealth services is very important in today's healthcare arena. Atlantic General Hospital adopted the Global Budget Revenue concept in line with the adaptation of our 2020 vision. Much of the sustainability of this project will be the savings netted from the reduction in admissions and readmissions. In addition to the savings in our operational budget further sustainability opportunities will continue to transpire through organizational commitments and funding provided through reimbursement of billable services at BNRC. Expansion of services to other healthcare environments will require additional funding and/or partnerships to support changes in practices and patient outcomes. At this time, future considerations include expansion to Long Term Care patients within the nursing home environment, provision of services to those in Assisted Living communities and expansion into our Patient Centered Medical Home. Presently we are evaluating other grant opportunities to assist in the continued growth of our telehealth network.

Closing

Our collaborative teams are extremely grateful for the opportunity to develop the telehealth environment at Atlantic General and BNRC. This experience has provided the foundation for growth in many domains; patient focused interventions, expansion of clinical services, collegial relationships as well as development of an infrastructure to support future endeavors. Although there were many challenges along the journey, this experience has brought forth many positive outcomes. Development of the infrastructure required to deploy telehealth services was a key contributor to the success of the program. Future efforts should focus upon regulatory changes,

expansion of connectivity, and increasing physician engagement to promote the cultural changes necessary to embed telehealth into everyday practice.

We feel we have demonstrated there does not need to be great distances between facilities to show value in telehealth consultations. Not all telehealth encounters have to be facilitated by an emergency room physician and in fact our goal is to bypass the ER if at all possible and facilitate a direct to bed admission if warranted. Our continued commitment to telehealth and our community does show opportunities. Changing the way we deliver health care through innovative projects does not happen overnight. We commend the Maryland Health Care Commission for their continue dedication in seeking out use cases to rally support and reinforce the value of such programs.

In the future we hope that such use cases will assist the healthcare industry to move forward with telehealth services through continued lobbying for regulatory changes as well as the expansion of Medicare / commercial insurance coverage, increased scope of practice for physicians, enhanced awareness, coverage by malpractice carriers, expansion of connectivity, as well as increasing physician engagement to promote the cultural changes necessary to embed telehealth into everyday practice.

Appendices on Subsequent Pages

A: Telehealth Equipment

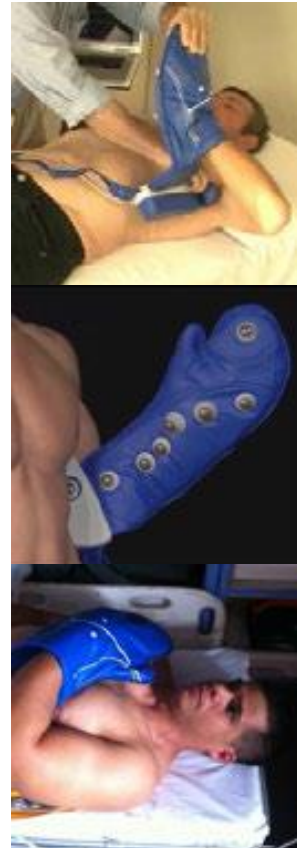B: INTERACT evidence based algorithms

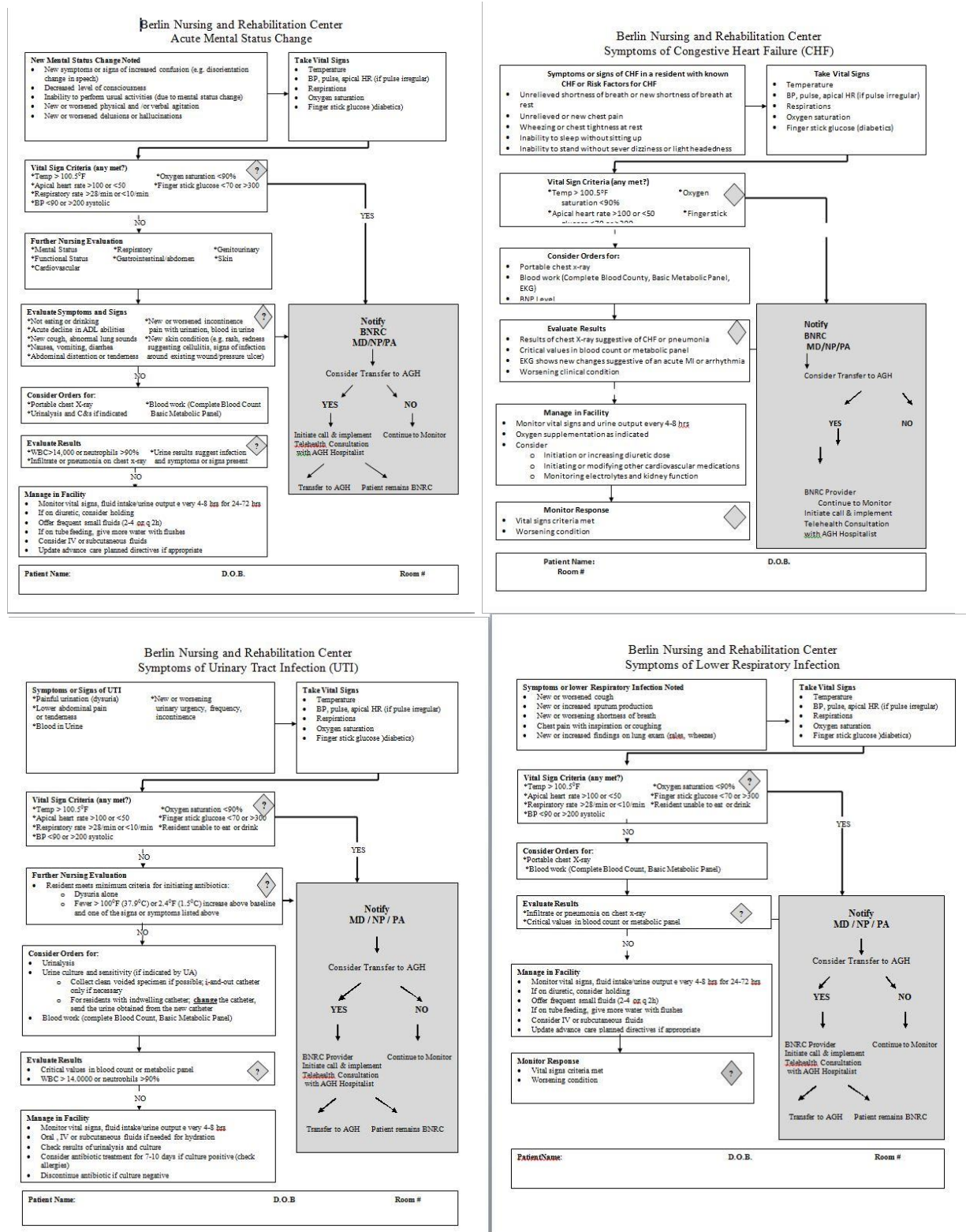C: AGH/BNRC call algorithm

D: LACE Tool

E: Final Clinical Goals Report

F. Atlantic General Hospital Slide Presentation
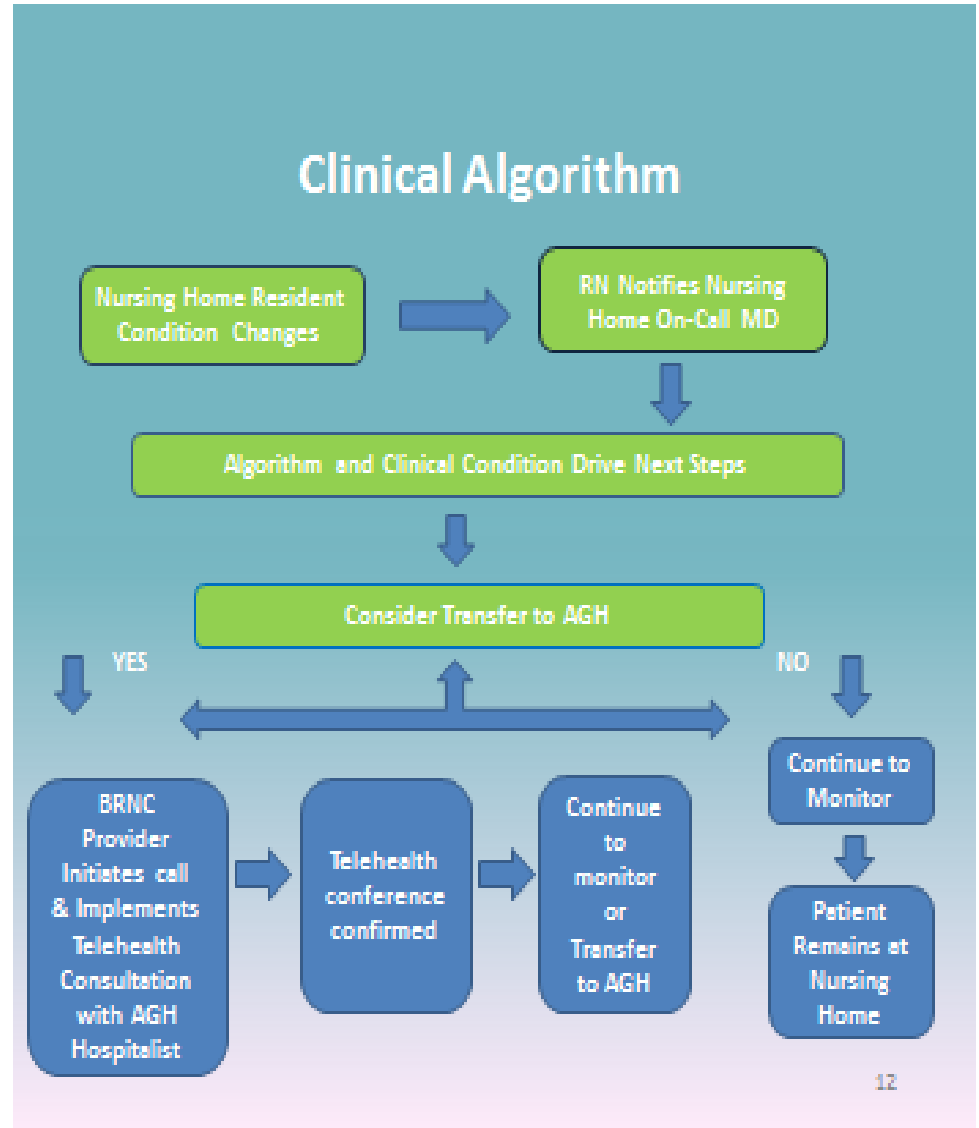
Appendix A: Telehealth Equipment

Appendix B: INTERACT Evidence Based Algorithms

Berlin Nursing and Rehabilitation Center — Acute Mental Status Change

New Mental Status Change Noted
- New symptoms or signs of increased confusion (e.g. disorientation change in speech)
- Decreased level of consciousness
- Inability to perform usual activities (due to mental status change)
- New or worsened physical and /or verbal agitation
- New or worsened delusions or hallucinations

Take Vital Signs
- Temperature
- BP, pulse, apical HR (if pulse irregular)
- Respirations
- Oxygen saturation
- Finger stick glucose)diabetics)

Vital Sign Criteria (any met?)
- *Temp > 100.5°F
- *Apical heart rate >100 or <50
- *Respiratory rate >28/min or <10/min
- *BP <90 or >200 systolic
- *Oxygen saturation <90%
- *Finger stick glucose <70 or >300

NO →

Further Nursing Evaluation
- *Mental Status   *Respiratory   *Genitourinary
- *Functional Status   *Gastrointestinal/abdomen   *Skin
- *Cardiovascular

Evaluate Symptoms and Signs
- *Not eating or drinking
- *Acute decline in ADL abilities
- *New cough, abnormal lung sounds
- *Nausea, vomiting, diarrhea
- *Abdominal distention or tenderness
- *New or worsened incontinence
- pain with urination, blood in urine
- *New skin condition (e.g. rash, redness suggesting cellulitis, signs of infection around existing wound/pressure ulcer)

NO →

Consider Orders for:
- *Portable chest X-ray
- *Urinalysis and C&s if indicated
- *Blood work (Complete Blood Count Basic Metabolic Panel)

Evaluate Results
- *WBC>14,000 or neutrophils >90%
- *Infiltrate or pneumonia on chest x-ray
- *Urine results suggest infection and symptoms or signs present

NO →

Manage in Facility:
- Monitor vital signs, fluid intake/urine output every 4-8 hrs for 24-72 hrs
- If on diuretic, consider holding
- Offer frequent small fluids (2-4 oz q 2h)
- If on tube feeding, give more water with flushes
- Consider IV or subcutaneous fluids
- Update advance care planned directives if appropriate

YES →

Notify BNRC MD/NP/PA

Consider Transfer to AGH

YES   NO

Initiate call & implement Telehealth Consultation with AGH Hospitalist → Transfer to AGH

Continue to Monitor → Patient remains BNRC

Patient Name: _____   D.O.B. _____   Room # _____

Berlin Nursing and Rehabilitation Center — Symptoms of Congestive Heart Failure (CHF)

Symptoms or signs of CHF in a resident with known CHF or Risk Factors for CHF
- Unrelieved shortness of breath or new shortness of breath at rest
- Unrelieved or new chest pain
- Wheezing or chest tightness at rest
- Inability to sleep without sitting up
- Inability to stand without sever dizziness or light headedness

Take Vital Signs
- Temperature
- BP, pulse, apical HR (if pulse irregular)
- Respirations
- Oxygen saturation
- Finger stick glucose (diabetics)

Vital Sign Criteria (any met?)
- *Temp > 100.5°F
- saturation <90%
- *Apical heart rate >100 or <50
- *Oxygen
- *Finger stick glucose <70 or >300

Consider Orders for:
- Portable chest x-ray
- Blood work (Complete Blood County, Basic Metabolic Panel, EKG)
- BNP Level

Evaluate Results
- Results of chest X-ray suggestive of CHF or pneumonia
- Critical values in blood count or metabolic panel
- EKG shows new changes suggestive of an acute MI or arrhythmia
- Worsening clinical condition

Notify BNRC MD/NP/PA

Consider Transfer to AGH

YES   NO

Manage in Facility
- Monitor vital signs and urine output every 4-8 hrs
- Oxygen supplementations as indicated
- Consider
  - Initiation or increasing diuretic dose
  - Initiating or modifying other cardiovascular medications
  - Monitoring electrolytes and kidney function

Monitor Response
- Vital signs criteria met
- Worsening condition

BNRC Provider Continue to Monitor Initiate call & implement Telehealth Consultation with AGH Hospitalist

Patient Name: _____   D.O.B. _____   Room # _____

Berlin Nursing and Rehabilitation Center — Symptoms of Urinary Tract Infection (UTI)

Symptoms or Signs of UTI
- *Painful urination (dysuria)
- *Lower abdominal pain or tenderness
- *Blood in Urine
- *New or worsening urinary urgency, frequency, incontinence

Take Vital Signs
- Temperature
- BP, pulse, apical HR (if pulse irregular)
- Respirations
- Oxygen saturation
- Finger stick glucose)diabetics)

Vital Sign Criteria (any met?)
- *Temp > 100.5°F
- *Apical heart rate >100 or <50
- *Respiratory rate >28/min or <10/min
- *BP <90 or >200 systolic
- *Oxygen saturation <90%
- *Finger stick glucose <70 or >300
- *Resident unable to eat or drink

NO →

Further Nursing Evaluation
- Resident meets minimum criteria for initiating antibiotics:
  - Dysuria alone
  - Fever > 100°F (37.9°C) or 2.4°F (1.5°C) increase above baseline and one of the signs or symptoms listed above

Consider Orders for:
- Urinalysis
- Urine culture and sensitivity (if indicated by UA)
  - Collect clean voided specimen if possible; i-and-out catheter only if necessary
  - For residents with indwelling catheter; change the catheter, send the urine obtained from the new catheter
- Blood work (complete Blood Count, Basic Metabolic Panel)

Evaluate Results
- Critical values in blood count or metabolic panel
- WBC > 14.0000 or neutrophils >90%

NO →

Manage in Facility
- Monitor vital signs, fluid intake/urine output every 4-8 hrs
- Oral , IV or subcutaneous fluids if needed for hydration
- Check results of urinalysis and culture
- Consider antibiotic treatment for 7-10 days if culture positive (check allergies)
- Discontinue antibiotic if culture negative

YES →

Notify MD / NP / PA

Consider Transfer to AGH

YES   NO

BNRC Provider Initiate call & implement Telehealth Consultation with AGH Hospitalist → Transfer to AGH

Continue to Monitor → Patient remains BNRC

Patient Name: _____   D.O.B _____   Room # _____

Berlin Nursing and Rehabilitation Center — Symptoms of Lower Respiratory Infection

Symptoms or lower Respiratory Infection Noted
- New or worsened cough
- New or increased sputum production
- New or worsening shortness of breath
- Chest pain with inspiration or coughing
- New or increased findings on lung exam (rales, wheezes)

Take Vital Signs
- Temperature
- BP, pulse, apical HR (if pulse irregular)
- Respirations
- Oxygen saturation
- Finger stick glucose)diabetics)

Vital Sign Criteria (any met?)
- *Temp > 100.5°F
- *Apical heart rate >100 or <50
- *Respiratory rate >28/min or <10/min
- *BP <90 or >200 systolic
- *Oxygen saturation <90%
- *Finger stick glucose <70 or >300
- *Resident unable to eat or drink

NO →

Consider Orders for:
- *Portable chest X-ray
- *Blood work (Complete Blood Count, Basic Metabolic Panel)

Evaluate Results
- *Infiltrate or pneumonia on chest x-ray
- *Critical values in blood count or metabolic panel

NO →

Manage in Facility
- Monitor vital signs, fluid intake/urine output every 4-8 hrs for 24-72 hrs
- If on diuretic, consider holding
- Offer frequent small fluids (2-4 oz q 2h)
- If on tube feeding, give more water with flushes
- Consider IV or subcutaneous fluids
- Update advance care planned directives if appropriate

Monitor Response
- Vital signs criteria met
- Worsening condition

YES →

Notify MD / NP / PA

Consider Transfer to AGH

YES   NO

BNRC Provider Initiate call & implement Telehealth Consultation with AGH Hospitalist → Transfer to AGH

Continue to Monitor → Patient remains BNRC

Patient Name: _____   D.O.B. _____   Room # _____

Appendix C: AGH/BNRC Call Algorithm

Appendix D: LACE TOOL

LACE Tool

Ottawa Hospital Research Institute
LACE Index Scoring Tool for Risk Assessment of Death and Readmission

Step 1. Length of Stay
Length of stay (including day of admission and discharge): _____ days

Length of stay (days)	Score (circle as appropriate)
1	1
2	2
3	3
4-6	4
7-13	5
14 or more	7

L

Step 2. Acuity of Admission
Was the patient admitted to hospital via the emergency department?
If yes, enter "3" in Box A, otherwise enter "0" in Box A.

A

Step 3. Comorbidities

Condition (definitions and notes on reverse)	Score (circle as appropriate)
CVA	+1
Uncontrolled diabetes	+1
Peripheral vascular disease	+1
Previous M.I.	+1
CHF/COPD	+2
Pneumonia	+2
Dementia	+2
Cancer	+2
Attempted Suicide / overdose	+4
Alcohol abuse	+4
Moderate liver disease	+4
Re-admission within 30 days	+4
Metastatic disease	+6
TOTAL	

C

Step 4. Emergency department visits
How many times has the patient visited an emergency department in the six months prior to admission (not including the emergency department visit immediately preceding the current admission)?
Enter this number or 4 (whichever is smaller) in Box E

Add numbers in Box L, Box A, Box C, Box E to generate LACE score and enter in the box below. If the patient has a LACE score that is greater than or equal to 10, the patient will be referred to PCMH and/or community based resources post discharge.

E

LACE

Appendix E: Final Clinical Goals Report

		Telehealth Pilot: Atlantic General Hospital **Monthly Clinical Goal Report**												
Measure	**Numerator/Denominator**	**Baseline** [Indicate timeframe]	**Goal**	**Jan-15**	**Feb-15**	**Mar-15**	**Apr-15**	**May-15**	**Jun-15**	**Jul-15**	**Aug-15**	**Sep-15**	**Oct-15**
Reduce all inpatient admissions from BNRC to AGH	Numerator: Current Month BNRC admissions to AGH	23 (12 months ending November, 2014)		22	11	17	11	7	11	11	6	7	11
	Denominator: Average Daily Census BRNC for Period	137 (CY 2014 ADC)		129	128	131	121	127	129	129	130	129	132
	Percent	17%	13%	17%	9%	13%	9%	6%	9%	9%	5%	5%	8%
Reduce all transfers from BNRC to AGH	Numerator: Monthly Transfers from BRNC to AGH	28 (12 Months ended 11/2014)		38	24	31	19	27	21	28	19	23	20
	Denominator: Average Daily Census BRNC	137 (CY 2014)		129	128	131	121	127	129	129	130	129	132
	Percent	20.4%	16%	29%	19%	24%	16%	21%	16%	22%	15%	18%	15%
Use telemedicine physician consultation as part of the pre-transfer protocol for BNRC patients	Numerator: Total Monthly Transfers from BRNC to AGH having Telemed Consult	N/A		N/A	N/A	N/A	N/A	1	N/A	N/A	1	1	1
	Denominator: Total Monthly Transfers from BRNC to AGH	N/A						27			19	23	20
	Percent	N/A	100%	0%	0%	0%	0%	4%	0%	0%	5%	4%	5%
Reduce readmissions from BNRC to AGH for patients initially discharged from AGH to BNRC	Numerator: Number of Patients transferred From BRNC to AGH admitted from AGH to BRNC within 30 days	108 (12 Months ended 11/2014)*		13	11	5	4	3	3	5	1	7	2
	Denominator: Total Monthly Admissions from AGH to BRNC	171 (12 Months ended 11/2014)*		48	39	38	26	28	26	26	17	37	28
	Percent	63%	53%	27%	28%	13%	15%	11%	12%	19%	6%	19%	7%
Identification of variation in LACE score for patients discharged from AGH to BNRC and those who are readmitted within 30 Days	Average LACE Score of Readmitted patients (at time of first transfer)	6 Months ended 12/2014** 11.9		16.2	15.1			11.3	8.3	15.6	14.3	13.6	13.0
	Average LACE Score of All Patients Transferred from AGH to BRNC	6 Months ended 12/2014** 12.7		13.7	10.0			10.9	11.0	10.8	11.0	13.0	10.0
	Difference in Average LACE Score -> Goal is 11% reduction	0.8	0.712	2.5	5.1	-	-	0.4	2.7	4.8	3.3	0.6	3.0
Transfer Details	# of patients that received telehealth intervention							1	0	0	1	1	1
	# patients who received telehealth and transferred to AGH							1	0	0	1	0	1
	# patients that received telealth and remained at BNRC							0	0	0	0	1	0

Implementation

- Administrative commitment
- Physician champions
- Comprehensive assessment of transfer and admission patterns
- Substantial wireless infrastructure
- Collaborative efforts among all stakeholders
- Clearly defined goals, protocols and guidelines

3

Project Goals/ Metrics

- Reduce admissions from BNRC to AGH
- Reduce 30-day readmissions from BNRC to AGH
- Reduce total transfers from BNRC to AGH for skilled patients with COPD, CHF, DM, and HTN
- Decrease E.D. utilization by directly admitting BNRC patients requiring higher level of care

4

16

Approach

Strategies

- **Community partnerships**
- **Information technology**
- **Selection of equipment**
- **Legal, credentialing, malpractice, consents, bi-directional policies**
- **Interact pathways**
- **Medical / clinical staff education**
- **Interact pathways**

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5

Results/ Outcomes

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%BRNC Patients Admitted to AGH
As a % of BNRC Avg Daily Census

Baseline = 17%

Goal = 13%

Actual Performance
2/15 - 11/15 = 8%

% of BNRC Patients Transferred to AGH for Admission
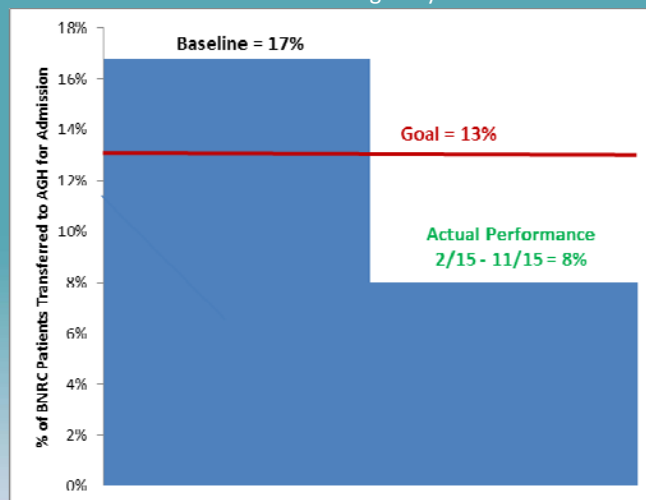
Notes:
Baseline data reflects 12 months ending November 2014

6

Results/ Outcomes

Reduction in Total Transfers from BNRC to AGH

Reduction in Transfers from BNRC to AGH as a % of BNRC Avg Daily Census from 2/15 - 11/15

Baseline = 20.4%

Actual Performance 2/15 - 11/15 = 17.6%

Goal – 16.4%

Y-axis (Transfers to AGH as % of BNRC Avg Daily Census): 0.0%, 4.0%, 8.0%, 12.0%, 16.0%, 20.0%, 24.0%
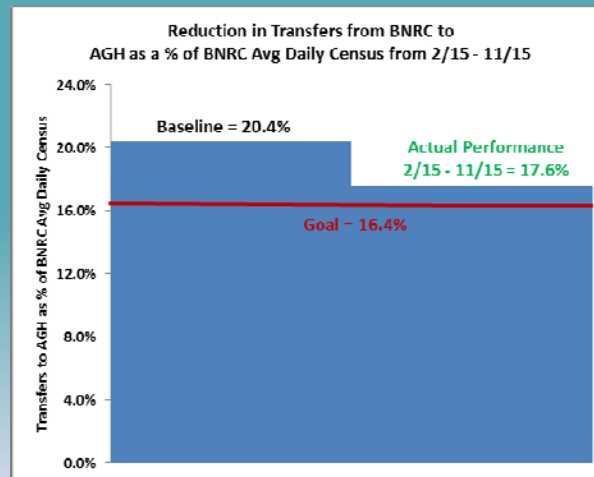
Notes:
Reasons for Transfers include: ER Visits, Hospital Observation, Acute Care Admission, etc.
Baseline data reflects 12 months ending November 2014.

7

Results/ Outcomes

Re-Admissions to the Acute Care Hospital

Readmissions from BNRC to AGH as a % of Total Monthly Patient Admissions from AGH to BNRC

Baseline = 63%

Goal = 53%

Actual Performance 2/15 - 11/15 = 15%

Y-axis: 0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%
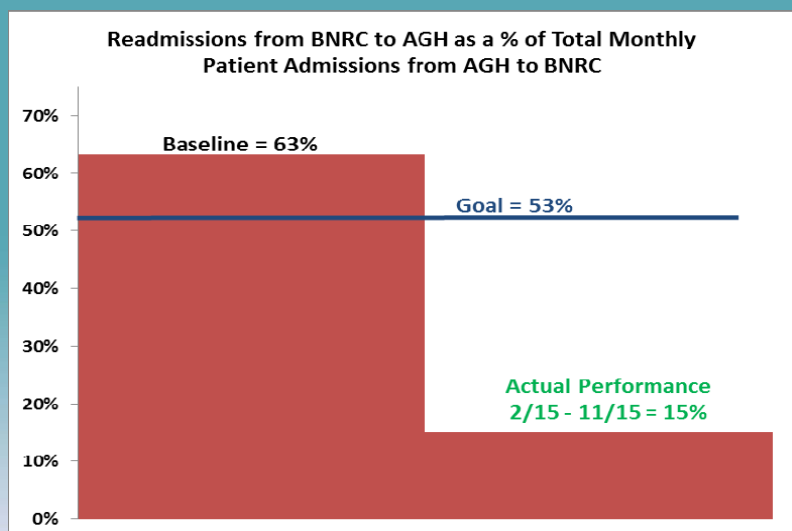
Notes:
Baseline data reflects 12 months ending November 2014

8

18

Estimated Cost Reduction

Hospital Estimated Costs / Savings

- The 9% reduction translates into a reduction of 30 transfers over the 12-month period.

- The reduction in admissions from BNRC resulted in a decrease of 11 admissions per month. An estimated cost of $14,313 per admission results in a savings $157,400 per month savings or 1.9 million over the 12-month period.

- The 42% reduction in 30-day re-admissions translates to a decrease of 4 readmissions per / month at a a savings of $57,300 or $687,000 over the 12-month period.

9

Sustainability

The Maryland "Waiver" Program for Acute Care Hospital Payment

- The new "Global Budget Revenue" system with the HSCRC in Maryland creates the incentives for hospitals to create programs like this telehealth initiative.

__Additional Means to Sustain Telehealth Services:__

- Reimbursement / billable services for physicians in Maryland

- Further extension of services into primary care, long-term care and assisted living facilities

- Grant funding

10

19
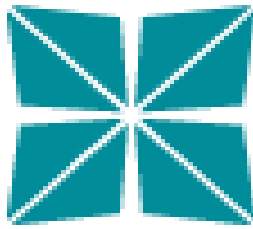
Bowie Health Center
Family Health and Wellness Center
Laurel Regional Hospital
Prince George's Hospital Center

in partnership with Sanctuary at Holy Cross and Patuxent River Nursing and Rehabilitation Center

Long Term Care/Hospital Telehealth Project

Integrating Virtual Visits and Remote Monitoring to Improve Transitions of care Between Dimensions Healthcare System Facilities and Comprehensive Care Facilities

Final Report

October 30, 2015

Prepared for: Maryland Health Care Commission

Table of Contents

Introduction

Overall purpose and goal of the project – The Long Term Care/Hospital Telehealth Project Pilot was designed to reduce hospital admission and 30 day readmissions for patients at comprehensive care facilities (CCF) by (1) improving improve care transitions for Medicare, Medicaid and dually eligible patients who were admitted to hospital and transferred to the CCFs or who are at risk for readmission to the hospital from the CCFs and 2) reducing unnecessary emergency department visits for Medicare, Medicaid and dually eligible residents of the CCFs. The DHS project involved two telehealth interventions. The first intervention was a post-discharge e-visit between the CCF and a DHS hospital to track a patient's status during the first 30 days of discharge. The second intervention was a pre-transfer e-visit between the CCF and a DHS hospital emergency department to determine if emergency transfer is necessary or provide support to the CCF to avoid emergency transfer. Expected outcomes were: (1) reduction in the hospitalization rate for Medicare, Medicaid and dually eligible patients who are CCF residents; (2) reduction in the 30 day readmission rate for CCFs and (3) reduction in the emergency department transfer rate for Medicare, Medicaid and dually eligible patients who are CCF residents; (4) improvements in patient experience.

Participating organizations – DHS, the largest not-for-profit provider of healthcare services in Prince George's County, was the lead applicant on the project. The Pilot sought to reduce hospital admission and 30 day readmissions at two DHS hospitals- Prince George's Hospital Center (PGHC) and Laurel Regional Hospital (Laurel)- for patients of Sanctuary of Holy Cross, a comprehensive care facility (CCF) in Burtonsville, Maryland and Patuxent River Nursing and Rehabilitation Center, a comprehensive care facility in Laurel, Maryland. Zane Networks, a State-Designated management service organization (MSO), provided the hardware and software necessary to achieve the project's aims and also served as the project's technical assistance provider and engaged the Chesapeake Regional Information System for our Patients (CRISP), the State-designated health information exchange (HIE) to facilitate information exchange between DHS acute care facilities and the CCFs.

Demographics – The population served by the participating healthcare providers and the target population for this effort are Medicare (27.4% -PGHC; 13.2% - LRH), Medicaid (40.2% - PGHC; 23.9% - LRH) and dually eligible beneficiaries (29.4% - PGHC; 21.7% - LRH). The racial ethnic composition of the patients served by the project is as follows: African American (76.6% - PGHC; 49.1% - LRH), whites (11.7% - PGHC; 30.5% - LRH), Latinos (8% - PGHC; 7.9% - LRH) and other (2.8% - PGHC; 10.4% - LRH).

Relationship between the hospital and nursing home – There has been an ongoing relationship of bi-directional referrals amongst the hospitals and the participating CCFs. The hospitals discharge patients requiring skilled nursing care to the CCFs and they, in turn refer residents needing acute care to the hospitals.

Technology Infrastructure

Description of the technology infrastructure – At the beginning of the project DHS procured four JACO telehealth mobile carts from JACO and Microsoft Surface Pro 3 tablets computing devices that were mounted onto the mobile carts. To conduct telehealth consults providers launched the

HouseCall telehealth software developed by Zane Networks using the Google browser on the tablet. There were no peripheral devices purchased for this project as the consults. During eVisits CCF staff and DHS physicians used the mobile carts and HouseCall to conduct and document eVisits. The eVisits primarily involved patient/provider and provider/provider consults and did not involve the use of peripherals or live monitoring.

Telehealth equipment – All project partners agreed that the proposed telehealth intervention should be mobile/portable, and wireless with touch-screen functionality that could easily facilitate a telehealth video-consult through a standard web browser. The clinicians wanted to continue charting clinical encounters within their EHRs and consent patients into the pilot during the existing DHS discharge process. Prior to conducting a consult with DHS, CCF nurses would document the encounter in the EHR using the standardized SBAR assessment form that was integrated into the EHR. The partners reviewed hardware and software systems from AMD telemedicine, Avizia and ZaneNet. The partners selected the ZaneNet HouseCall software because of its compliance with the project requirements; design features that would allow it to share data with the Prince George's County HIE; and its lower cost relative to the other options that were reviewed.

Electronic health record – Cerner is the electronic health record (EHR) for DHS hospitals and PulseCheck for their emergency departments (ED). Cerner connects to CRISP, Maryland's State Designated HIE. CRISP delivers encounter notification services (ENS) regarding ED, hospitalization admission and discharges to Maryland providers participating in the ENS service. Sanctuary utilizes Health Medx as their clinical documentation system and is a current ENS subscriber. Patuxent River uses Point Click Care as their clinical documentation system. Once a Sanctuary or Patuxent patient has been discharged from Dimensions, the CCF's nurse would review the discharge instructions provided by the acute care hospital prior to the scheduled post discharge eVisit within 14 days. For pre-hospital dispatch consults originating at the CCF, the consulting nurse could export the SBAR document form from the EHR and scan or upload it into HouseCall to make available to DHS providers prior to the e-visit with patient.

Health information exchange – CRISP was integral to the success of the pilot. CRISP ENS delivered to participating providers secure emails with real-time alerts of their patients' hospitalization status during the hospital stay and at the time of discharge. The alerts also included links to the CRISP portal where providers could retrieve more detailed patient information such as discharge summary, labs, medications prescribed if documented and available from the hospital information system. The Project's Technical Manager worked with the CCFs to orient them to CRISP, ensuring that they completed the CRISP participation agreement and complied with the Notice of Privacy Practice requirements.

Integration of Technology to Enhance Care Delivery – The pilot leveraged EHRs, HIE and Telehealth to allow hospital-based and CCF telehealth practitioners to schedule, manage and conduct video consults with patients; collect clinical data such as images and provider notes; exchange health information with other providers via DIRECT or through the portal; and import data into their EHR. Some providers who were previously not linked to CRISP now receive ENS alerts regarding their patients. The integration of telehealth and ENS increased coordination

between the hospital and CCFs and enhanced the quality and accessibility of clinical information need to inform quality care.

Project Implementation Process

Description of how the project was implemented – The pilot integrated virtual visits to improve transitions of care between two DHS acute care facilities (PGHC and) and two CCFs, Sanctuary and Patuxent. The desired impact was to reduce the rate of admissions and 30 day readmissions and emergency room utilization for the CCF residents. During the pilot patient data were exchanged among DHS and CCF providers via the HouseCall e-vist platform and JACO telehealth devices. HouseCall permitted virtual consultations and virtual encounters and image capture if necessary. The pilot served patients who are Medicaid, Medicare or dually eligible beneficiary residents of Sanctuary and Patuxent River and who are at risk for admission or readmission within 30 days or at risk of transfer to a hospital emergency room.

Clinical protocol development – The DHS project involved two telehealth interventions. The first intervention was designed to track patients post discharge from a DHS hospital. The second intervention was designed to reduce unnecessary transfer from the CCF to hospital emergency rooms. Clinical protocols for each of the selected interventions was developed by a multi-disciplinary committee of clinicians, clinical support staff and IT experts led by Dr. Carnell Cooper, DHS Chief Medical Officer and the project's Lead Physician Advisor. The committee reviewed hospital utilization data to determine the volume of transfers between the respective hospitals and the CCFs.

Workflow integration – The committee assessed DHS hospital practices and protocols to determine whether process changes would be required to accommodate the goals of the telemedicine pilot. The hospitals' past experience with a Care Transitions pilot equipped them to participate in the present pilot. The committee developed a Telehealth Workflow for the post-discharge intervention, outlining the processes related to pre-discharge, referral, discharge, initial post-discharge and 30-day follow-up post discharge (see Appendix). A separate workflow was developed for the ED Intervention which is initiated when there is a change in the CCF resident's condition which could lead to a transfer to the emergency department. The ED workflow terminated at the telehealth intervention with either appropriate treatment at the CCF or transport to the emergency department. (See Appendix).

DHS integrated its "One-call" call center service into the telehealth workflow. Under that process, the calls from the facilities come first to the One-Call provider. The One-Call provider fields the phone call and receives a copy of the demographic face sheet and SBAR pre-assessment on their fax. The One-Call provider then inputs a minimal amount of information into Pulsecheck (the specialized ED EMR) to allow the ED provider to document their consultation. In order to simplify the referral process, consults from Sanctuary were directed to the PGHC physician and consults from Patuxent were directed to the Laurel physicians. The One-call provider entered the patient into the Pulsecheck system for either PGHC or Laurel. Once the patient was entered into Pulsecheck there were two possible options. The One-call provider collated the demographic sheet and SBAR for Sanctuary patients and the patient and the related data were sent to the ED. The One-call provider then attempted to conduct a video conference with the ED provider. If the ED provider

was not immediately available, the One-call provider alerted the ED charge nurse to notify the provider to join the video conference. Patuxent patients will be referred to the appropriate coordinator at Laurel.

The committee determined that post discharge interventions would be managed by physician advisors at PGHC since physician advisors were deemed most likely to be available to respond in a timely manner to CCF requests for post discharge interventions. Generally, the Physician Advisor at PGHC, among other things, is responsible and accountable for optimizing quality and patient safety outcomes. The Physician Advisor works closely with hospital leadership, hospital and private physicians to optimize hospital strategic goals and objectives.

The Project Director provided support to the CCF leads to facilitate the integration of the project work flows, understanding of forms and processes and to respond to questions or concerns during the implementation phase of the project at the facility. Process documents were developed for project which included forms for: Patient pre-assessment, patient consent, evaluation (patient, family and provider).

Provider training – A group of DHS (PGHC) physician advisors was trained on the telemedicine tool and to manage the post-discharge intervention process. ZaneNetworks took the lead in training the hospitals' staff and providers as well as CCF staff and providers on the use of the telemedicine equipment and software. The project selected a standard tablet attached to a JACO cart as the hardware component. Most providers and staff were familiar with the use of a tablet device and were able to quickly complete the required training. Providers and staff were also able to quickly grasp the use of the HouseCall internet-based software after one or two training sessions. To maintain the competency of staff it is important to ensure that processes are established to provide needed ongoing support for technology use, including refresher training, access to technical support and password protocol.

The project's Technical Manage trained groups of four to five clinical staff, including a super-user, who would be performing the consults and their identified support personnel. The interactive, hands-on training session normally lasted approximately two hours and addressed topics such as basic elements of navigating the system; scheduling an e-visit; documenting information; conducting a patient encounter; and privacy and security protocols. DHS continued to provide on-going training and technology and workflow support to participating CCFs via telephone, and onsite. One of the key modifications that the team plans to institute is a monthly sprint meeting of all of the CCF super users regarding current processes to ensure that training gaps are identified early and corrective measures are communicated to the program participants.

Patient and family education – Hospital case managers and/or CCF staff explained the pilot to patients and families and obtained informed consent from interested patients prior to their being discharged from hospital or upon their (re)admission to the CCF. Particular attention was given to securing the participation of CCF patients who were seen at the ED. As the pilot progressed, the CCF would explain the pilot and obtain consent as part of the routine admission process and the consent was maintain as part of the resident's file at the CCF.

Assessment Approach

Brief description of how the telehealth project was assessed – The pilot utilized patient, family and provider surveys to assess the satisfaction with the telehealth invention and assess views on the value of the process. The pilot used a data collection template developed for the pilot by MHCC to capture the data elements. An independent evaluation consultant reviewed the final data collection sheet for each CCF and provided an analysis of the results. In addition a technical consultant assessed the effectiveness of the technology and IT elements of the project and provided a report of his findings and recommendations which are incorporated into this report.

Development of and rational for project measures selected – The pilot measured the percentage change in the 30-day readmission rate for all patients discharged to the CCFs; the percentage change in the utilization of ambulance transfers from the CCFs to acute care hospitals; participants' satisfaction with the telehealth intervention and the number of interventions (post-discharge and ED transfer). These measures were selected to determine if the interventions could impact the readmission rates of the CCFs to any hospitals and the number of transfers from the CCF to emergency rooms. The pilot did not focus exclusively on readmissions and transfers to DHS participating hospitals. Given the limited span of the pilot, it was decided that the telemedicine pilot would be used to avoid any readmission or transfer from the CCF. The goals were established to determine at a basic level whether telehealth interventions might influence provider behavior/decisions at the CCFs to reduce unnecessary admissions/readmissions and transfers to acute care hospital emergency departments.

Baseline data collection – Baseline data on the project's success measures were provided by each participating facility at the initiation of the pilot. Baseline data for each of the selected project measure represented the average performance for each measure over the prior three month period.

Development of project goals – The multi-disciplinary project team consisting of CCF and hospital providers and administrators as well as IT experts met and reviewed the baseline CCF data to identify which measures would be most likely to be impacted in the short-term by the proposed intervention without requiring a major workflow redesign at the participating institutions. Based on this review the team decided to focus on (1) reducing hospitalization rates; (2) reducing the 30 day readmission rate and (3) reducing the ED transfer.

Monthly data collection approach – During the pilot the Administrator at Sanctuary and Director of Nursing at Patuxent tracked data on a monthly goals sheet and reported data on a biweekly basis. At Sanctuary the data is maintained in INTERACT (Interventions to Reduce Acute Care Transfers), a quality improvement program that focuses on the management of acute change in resident condition. It includes clinical and educational tools and strategies for use in every day practice in long-term care facilities. At Patuxent the data was maintained in its EHR (Point Care Click) and its internal data system, Care Central. Although, data was discussed biweekly, data was not finalized for the month until approximately 30 days after the close of the month. The data points tracked at each facility is generally consistent with data the facilities tracked and reported on a routine basis as part of their internal quality review process.

Patient/family and/or provider feedback survey development – The DHS team developed patient and provider feedback surveys to assess the effectiveness of the telehealth intervention. (See Appendix). The Patient/Family and Provider feedback survey was adapted from samples provided by John Kornak, Director of Telehealth, University of Maryland Medical Center and Technical Consultant for the Pilot. The samples were based off a form developed by the American Telemedicine Association, the leading international resource and advocate promoting the use of advanced remote medical technologies. Under the pilot workflow, the surveys were to be administered by the CCFs at the conclusion of the telehealth intervention. The survey could be completed in HouseCall or by using paper copies. This process proved to be challenging under the pilot, resulting in a very limited number of completed surveys. Going forward, the workflow should be adjusted to require that the surveys be completed in HouseCall at the time of the intervention.

Assessment Limitations

Brief description of any limitations to the assessment approach – The pilot tracked three measures to assess the project's impact on readmissions and emergency department utilization at the CCFs. The measures were: hospital admissions, 30-day readmission rate and emergency department visit rate. Each CCF collected and/or extracted data to support these measures (see Table 1), and provided a biweekly report. Although the process of consenting patients upon discharge from Dimensions reached many patients, the document management process of consent document was inefficient and not very accountable. As a result, the project team decided to adjust the protocol and workflow to ensure that the patient consent form was accessible within HouseCall in the patient's account and that staff had the option of employing an electronic consent process to consent patients directly in HouseCall. The patient satisfaction survey was also incorporated directly into HouseCall and appeared as a link within the application view of the originating site (the CCF view) following the completion of the telehealth visit. This feature prompted nurses to invite patients to complete the surveys and increased the survey response rate.

Project Timeframe – The project timeframe proved to be problematic in terms of not allowing sufficient time for some of the key stakeholders both providers and patients to buy in to the new technology. As a result the assessment was not as informative as it otherwise might have been due to some potential respondents feeling they had not had sufficient involvement to comment freely. DHS recommends that future pilots will be of longer duration to allow for more comprehensive assessment.

Results of Telehealth Intervention

As the data in Table 1 below indicate the pilot was successful in reducing the hospital admission and 30 day readmission rate for the sample of CCF residents who participated in the study.

Table 1: DHS Long Term Care Hospital Telehealth Project Evaluation Findings						
Measures	**Patuxent CCF**			**Sanctuary CCF**		
	Baseline Rate	Goal	Endpoint Rate	Baseline Rate	Goal	Endpoint Rate

	(Jan-March, 2015)		(April – Oct, 2015)	(Jan – June 2014)		(Jan– Sept 2015)
Hospital Admissions Numerator =Number of patients that were admitted to an ACH from the CCFP Denominator= Total number of resident days for the month at the CCF	.44%	.36%	.41%	1%	0.70%	.38%
30 day Readmissions Numerator= Number of patients that were admitted from the CCF to an ACH and were re-admitted to an ACH within 30 days of hospital discharge date Denominator Number of patients that were admitted to the CCF from an ACH	66.6%	50%	18%	15.3%	12.5%	11.38%
ED visit rate Numerator=Number of residents that where transferred via ambulance to any ACH from the CCF Denominator= Total number of resident days for the month at the CCF	.52%	.42%	.29%	.24%	.19%	.42%

Despite some initial concerns among providers, residents and residents' families, respectively, ultimately the intervention was well received. Residents who were recently discharged from acute care facilities and transferred to a CCF expressed satisfaction with the telehealth intervention. They were reassured to learn that the intervention allowed a hospital physician to speak directly to the resident, CCF staff and CCF providers to make sure that the resident experienced a smooth transition and to actually participate in the virtual encounters. These exchanges eased patients' fears relative to the transfer to post-acute care. In addition, CCF providers appreciated being able to access important and comprehensive patient information directly and in a timely manner.

Providers and IT experts also gave recommendations for improving and expanding the use of telehealth in long term care. These include the following:

Telehealth Consent for Intervention – While the concept of getting a patient's consent is voluntarily, best practice for telehealth constitute that both the clinician and patient are obligated to know what they are opting into and out of for these types of services. Thus in the future CCFs and DHS need to enhance the process of incorporating the telehealth consent process into their clinical workflow prior to discharge of the patient. The clinical process will need to be audited after the pilot to see what happened during the pilot stage and when the consent process needs to take place so that all patients are provided the proper level of knowledge transfer of opting in or out of the telehealth intervention process. The process must also include automating the consent process to an electronic form within the HouseCall so that the patient can take a stylus and electronically complete the form online so that it can be saved to the DHS EMR and those nurses can be held accountable for completion of this form. These refinements can be facilitated by quarterly telehealth intervention programmatic review sessions where DHS and CCF managers can review t metrics can review the number of discharged patient, those who consented for telehealth intervention, those who opted out, and the totals of telehealth interventions completed.

Project Implementation Challenges

Description of key challenges related to technology infrastructure and project implementation process – There were some challenges encountered during the initial coordination efforts prior to the deployment of the system at the CCFs. The CCFs used outside contractors to manage their IT functions and at times representatives from these contractors were not readily available to assist in the coordination of certain technical tasks. Ultimately, however, the project's IT staff was able to work with their IT counterparts and comply with security protocols prior to connecting the telehealth technology onto the organizational LAN.
Another challenge arose because the project's IT team configured the system with user account access for each practice whereby the IT department at each practice facility was assigned with a super user account. While this process of creating local super users with administrative support appeared to be a desirable model, the project's IT team did not anticipate that the administrators did not configure remote access onto the devices. As a result, end-users encountered technical support challenges that they could not resolve quickly which led to frustration and sometimes the cancellation of a planned telehealth visit. The lesson learned from this challenge is that the project's IT team should coordinate with the CCF IT department to provide the project's technical team with remote access in order to respond quickly to technical support inquiries and resolve them in an efficient manner.

Awareness among participants (e.g., patients, families, providers, facility staff) regarding value/role of telehealth in care delivery – Raising patient awareness of and engagement with the program began with educating providers about the program's benefits. The program's staff conducted several orientation sessions for CCFs and their clinical staff to apprise them of how to inform patients about the program and obtain informed consent. Thereafter, DHS hospital case managers sought to obtain informed consent from patients as they transitioned to the CCF. Patients that did not commit to participating during the hospital discharge process were

offered a second opportunity to consent prior to scheduling a follow-up e-visit at the CCF by members of the CCF clinical care team.

Availability of providers to deliver telehealth consultations - DHS integrated their "One-call" call center service into the telehealth workflow. This service was offered by Dimensions to partnering institutions that refer to its facilities. The "One-call" service allows the CCFs to call a central number and request an appointment for a telehealth visit prior to dispatching the patient to an emergency room. This service allows access to provider practices at all of its health facilities. As part of the process, CCF providers would call the one call service to request a telehealth visit with the specialist/ED provider. This service offering was the primary tool utilized to schedule and confirm an e-visit with a DHS or CNMC contracted physician at its locations. Once a time was confirmed, the CCF staff would then log into the telehealth system to enter the visit information into the system.

Reimbursement for telehealth – At the start of the pilot the project team was required to address concerns raised by providers related to reimbursement. Physicians see telehealth as a new concept throughout the state and raised questions about its financial viability. In fact, some third party billing organizations expressed the view that telehealth will not be financially rewarding. ED providers also raised concerns that the pilot might take ED physicians off of the floor resulting in significant opportunity and liability costs. They stated that reasonable reimbursement for telehealth services must be established to ensure telehealth is a worthwhile endeavor from the provider's perspective. The ability to bill for the telehealth service is essential to its sustainability beyond the MHCC funding.

Lessons Learned

Identification of missed opportunities for use of telehealth – At the initial stages of the pilot, monthly reviews of the EHR data revealed that one of CCFs was transferring residents to the ED for care that could be handled more appropriately at the facility in question. Through the video consults DHS Physician Advisors were able to work directly with CCF staff to avert transfers in some cases. Patuxent's experience underscores that seamless, consistent communication between the acute care hospital and the CCF can result in a more in depth assessment of the resident's condition and facilitate on site interventions that eliminate the need for transfers. However, to maximize the utility of telehealth it is absolutely critical for there to be telehealth champions among the physician and nursing staff at all of the participating facilities. In retrospect, DHS believes that involving more of the staff from its own facilities and those of the CCFs in the development of the pilot would have created even greater buy in. In addition, going forward DHS leadership is aware that more needs to be done to sustain provider enthusiasm for the project so that telehealth becomes a natural part of the clinical workflow. One strategy to assure continued buy in is employing technology that as one IT expert who reviewed the pilot for DHS noted, "is simplistic and not stand in the way of patient care."

It is noted that the telemedicine pilot's success was impacted by a change in the provider group at Sanctuary. Despite the enthusiasm and encouragement of the Sanctuary administration and staff, the new group was unwilling to engage telemedicine for the patients under their charge. The data show that decision may have been a lost opportunity to impact the ED visit rate at Sanctuary.

Education for patients and their families regarding benefits of the telehealth intervention – The project team learned that often family concerns about a resident drive the decision to transfer. In some cases, contrary to the advice of the CCF providers, families have chosen to initiate a transfer independently. Integration of the telehealth process initially raised concerns that residents and families may perceive the new process as delaying access to care. The project team therefore needed to allay these concerns by providing clear, constant and consistent education to patients and their families regarding the benefits of the telehealth intervention. Additionally, once residents and families were able to use the telehealth device and speak directly with providers at the hospital during the intervention their confidence in the capability and advice of the CCF staff and providers was enhanced.

Ongoing training for physicians and facility staff regarding telehealth intervention and protocols – The pilot also revealed that ongoing training for physicians and facility staff as well as additional clinical support is necessary to reap the full benefits of telehealth interventions involving CCFs and acute care hospitals. The present pilot afforded the participating CCFs and the acute care hospitals with the opportunity to find and address the "low hanging fruit" related to ED transfers. However, if the full clinical impacts and the financial viability of this model are to be realized and sustained, CCFs will need to expand their capacity to monitor and manage sick patients on site. Some physician providers working with the pilot emphasized that the telehealth intervention protocols when fully operationalized will require facility staff to spend more time with patients and manage patients that are more acute, but who are not appropriate for an acute care setting. To facilitate this change, staff and providers must have the confidence that the clinical support and staffing resources will be available to ensure that they are able to clinically manage patients on site consistent with facility efficiency goals and in a manner that does not negatively impact the quality of care delivered to other residents. These views are captured by the opinion of one CCF provider who stated: "I feel very strongly that telehealth is a valuable and yet under-utilized tool in long term care. I think that hospital integration is needed to successfully utilize the technology. There are a lot of barriers among physicians and organizations surrounding legalities. When there is a connection between the organizations, I think that it will minimize the legal obstacles." To alleviate concerns related to the "legalities", there must be clearly defined policies that resolve the concerns raised by providers and staff at the CCFs and acute care hospitals related to malpractice coverage for telemedicine visits and risk management when providing care remotely.

Cost Effectiveness

Unfortunately the length of the pilot and volume of participants did not allow us to quantify the savings from averted hospital admissions/readmissions and transfers to the emergency room. However, there is indisputable research to support the conclusion that to the extent that where coordination between acute care hospitals and CCFs lead to reduced readmissions and emergency room visits Medicare costs and hospital expenses would be reduced. The pilot supports efforts at the national level and in Maryland to reduce readmissions and unnecessary hospital utilization. Anecdotally, the pilot demonstrated that the consults between the acute care hospital and the CCFs averted some transfers to the emergency room. The CCFs, with support from the hospital were able

to treat patients at the facility who prior to the pilot would have been transferred to the hospital emergency department for treatment.

Generally, we believe the pilot demonstrated there are benefits of telehealth intervention that justified the initial investment for this pilot. However, it is clear that a more expanded program would require the investment of additional resources for hardware, capital improvements and dedicated personnel to implement a more comprehensive telehealth program. To be viewed as cost effective, to the hospitals, CCFs, there must be a quantifiable return on investments (ROI). The participating providers have clearly stated that there must be appropriate reimbursement for telemedicine services as one element of the ROI. An effective program would also like result in definitive hospital savings and better healthcare outcomes for participants. To be effective, the telemedicine program must be integrated into the daily work processes of the acute care hospitals and CCFs to ensure broad utilization. Staff must be trained on the benefits of the programs and utilization of the tools. Internal resources in the form of dedicated staff and IT support must be part of the program. Additionally, to expand CCFs' capacity to care for sick patients through collaboration with acute care hospitals, there must be a nurse champion at each CCF and strong commitment by the CCF administration to provide the training and support needed by staff to expertly care for patients. With each of these components in place, a telehealth program would lead to quantifiable hospital savings that will more than justify the investment in technology and implementation costs.

Sustainability

It is noteworthy that the cost savings resulting from the decision to implement HouseCall allowed DHS to expand the telehealth transition of care model to three other CCFs that had expressed interest in the pilot at the outset but were unable to join the initial implementation. DHS also intends to include other DHS acute facilities beyond PGHC and Laurel Hospital to participate in telehealth. JACO, the mobile cart vendor, has expressed an interest in adapting their technology to incorporate other devices such as pulse oximeters and ECG Rhythm Strip Recorder that are used to monitor various chronic conditions.

 DHS plans to continue the telehealth interventions developed under the pilot to further explore the impact of effective post-discharge follow ups with CCFs and ED consults prior to a transfer to the emergency room. Two additional CCFs have agreed to join the project. DHS has also discussed exploring the use of telemedicine technology to expand access to specialty care services to CCFs and underserved communities such as the health enterprise zone. This will no doubt require the addition of hardware and certain diagnostic equipment to be used by providers at remote sites to relay patient data and provide live monitoring capability required by specialty providers. Based on lessons learned from this project and to increase opportunities for success, DHS will work more closely with CCFs and medical directors to: ensure provider engagement; refine and document protocols for smoother integration by staff at the CCF; and increase the level of technical support to facilitate adoption of technology and staff competency.

Closing

The proposed integration of a virtual consultation capability with a remote monitoring service creates a billable service, currently reimbursable by Medicare, Medicaid (Oct. 2014) and most commercial health plans. Thus all parties involved have both a quality care and financial incentive to expand and sustain the proposed project. DHS and the CCFs are committed to exploring the full value of a sustained project. We expect that with time the consultations will lead to effective and appropriate utilization of hospital resources and expand the capacity of the CCFs to manage patients at their facilities, thereby reducing the need to return residents to an acute care hospital or transfer for treatment at hospital emergency rooms.

Appendices

- *Final clinical goal report (Attached)*
- *Sample protocols – (Attached)*
- *Patient/provider survey- Include these if they were done (Attached)*
- *Acknowledgements*

Sanctuary Telehealth Pilot: Dimensions Healthcare System Monthly Clinical Goal Report														
Measure (suggested)	Numerator/Denominator (suggested)	Baseline January - June 2014 (avg)	Goal	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Cumulative
	Number of patients that were admitted to an ACH from Sanctuary	43		14	15	37	13	6	22	14	10	12		143
	Total number of resident days for the month at Sanctuary	4,131		4371	3948	4247	4200	4061	4080	4309	4154	4140		37510
	Percent	1%	1%	0.32%	0.37%	0.87%	0.00%	0.00%	0.00%	0.00%	0.00%	0.28%		0.38%
Percent change in 30-day readmission for all patients discharged from an ACH to Sanctuary	Number of patients that were admitted from an ACH to Sanctuary and were re-admitted to an ACH within 30 days of hospital discharge date	6 (33 total from Jan - June		6	6	13	3	4	11	8	6	5		62
	Number of patients that were admitted to Sancturay from an ACH	39		71	47	68	61	50	73	56	57	62		545
	Percent	15.3%	12.5%	8.5%	13.0%	19.0%	5.0%	8.0%	15.0%	14.30%	10.52%	8.06%		11.38%
Percent change in the ED utilization from ambulance transfers from Sanctuary to any ACH	Number of residents that where transferred via ambulance to an ACH from Sanctuary	10 (61 total from Jan - June)		22	16	27	17	8	24	17	11	14		156
	Total number of resident days for the month at Sanctuary	4131		4371	3948	4247	4200	4061	4080	4309	4154	4140		37510
	Percent	0.24%	0.19%	0.50%	0.40%	0.63%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		0.42%
	Number of Sanctuary patients hospitalized/readmitted/transferred, complete the SF36 and report an increase in overall score from baseline to follow up	0		0	0	0	0	0	0	0	0	0		0
	Number of Sanctuary patients who hospitalized/readmitted/transferred, and complete the SF36	0		0	0	0	0	0	0	0	0	0		0
	Percent	0%	0%	0%	0%	0%	0%	0%	0%	0.00%	0.00%	0.00%		#DIV/0!
	Number of patients that received telehealth intervention post-discharge			2	1	0	0	0	0	0	0	0		3
	Number of patients that received ED telehealth intervention			0	0	0	0	0	0	0	0	0		0
	Number of patients that received post-discharge telehealth intervention and transferred to an ACH			0	0	0	0	0	0	0	0	0		0
	Number of patients that received ED telehealth intervention and transferred to an ACH			0	0	0	0	0	0	0	0	0		0

Measure (suggested)	Numerator/Denominator (suggested)	Baseline January - March 2015 (avg)	Goal	April	May	June	July	August	Sept	October	Cumulative
	Number of patients that were admitted to an ACH from Patuxent	18			22	14	22	14	14	9	95
	Total number of resident days for the month at Patuxent	4,069			4092	3870	4123	4278	3960	2860	23183
	Percent	0.44%	0.36%		33%	36%	1%	0.30%	0.35%	0.30%	0.41%
Percent change in 30-day readmission for all patients discharged from an ACH to Patuxent	Number of patients that were admitted from an ACH to Patuxent and were re-admitted to an ACH within 30 days of hospital discharge date	12			18	6	5	8	2 - note 1 is a routine planned admission every 30 days for treatment	6	43
	Number of patients that were admitted to Patuxent from an ACH	18			51	47	66	36	20	19	239
	Percent	66.6%	50%		30%	14%	8%	22%	10%	32%	18%
Percent change in the ED utilization from ambulance transfers from Patuxent to any ACH	Number of residents that where transferred via ambulance to an ACH from Patuxent	21			18	13	14	10	10	3	68
	Total number of resident days for the month at Patuxent	4069			4092	3870	4123	4278	3960	2860	23183
	Percent	0.52%	0.42%		0.44%	0.33%	0.98%	0.23%	0.25%	0.10%	0.29%
	Number of Patuxent patients hospitalized/readmitted/transferred (to and from facility), complete the patient survey							4	0	2	4
	Number of Patuxent patients who hospitalized/readmitted/transferred (to and from facility)							14	3	9	17
	Percent		75%					29%	0	22%	
	Number of patients that received telehealth intervention post-discharge						0	9	0	2	11
	Number of patients that received ED telehealth intervention				2	2	0	1	0	0	5
	Number of patients that received post-discharge telehealth intervention and transferred to an ACH				0	0	0	0	0	0	0
	Number of patients that received ED telehealth intervention and transferred to an ACH					2		1	0	0	3

Telehealth Pilot: Dimensions Healthcare System
Patuxent River Nuring and Rehabilitation - Monthly Clinical Goal Report

Change in Resident Condition

Nurse notifies On-Call Physician

LRH/PGHC / Sanctuary Consultation Process

- On-Call Physician orders ED transportation
- On-Call Physician asks for telehealth consult
- On-Call Physician manages at facility

Nurse preparation for consultation
- Resident pre-assessment form completed
- Telehealth screen brought to patient room

Nurse places call to Dimensions One Call System

One-call coordinates consultation
- Review of volume and choice of facility
- Receipt of demographics, entry in Picis, ensure physicians have clinical material

ED provider interviews patient and reviews info

ED doctor orders interventions if indicated

ED physician makes decision, shares with nurse → Transport required. Facility notified.

Appropriate treatment at facility

Transport arranged

16

OneCall Quick Guide

Logging in:

1. Go to Google Chrome to log in. Type in the following address.
   https://communityproviderconnect.com/
2. Click 'Sign In.'
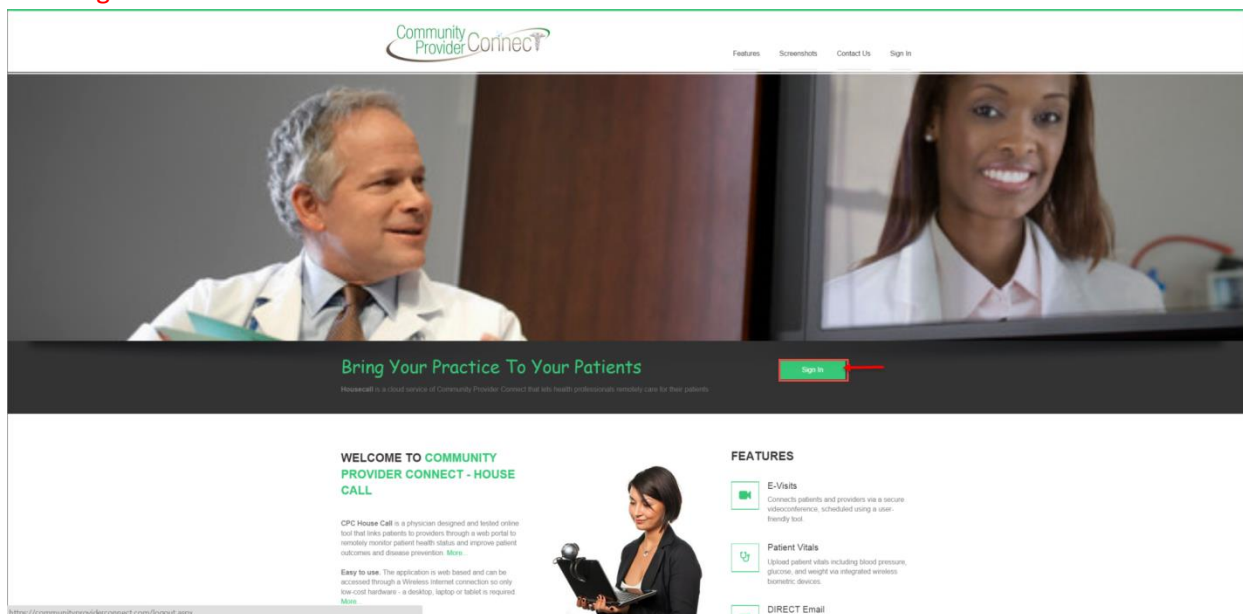
3. In Sign In box enter your username and password. Click 'Login.' (Ask Joyce Brooks for the password. Username: onecall@dimensionshealth.org

Conducting an e-Visit:

1. Go to click on the 'eVisit' navigation button on the top right hand corner of the page.
2. Click 'Begin' next to the visit that you want to start.

3. You will be taken to the 'eVisit Session' window. (Note: You will need to wait until the other provider has joined before the provider's video image will appear.)

4. Once the session is over, click 'End Session.'

Telemedicine Evaluation – Inter-Facility Transfer/Consult

PROVIDER Satisfaction Survey

Provider Type: Physician/RN/RT/NP/Other (specify) _____
Date of Evaluation: _____/_____/_____
Location: PGHC/LRH/SAHC/PR

Please provide us with feedback regarding your experience with Telemedicine as a means of patient assessment. We value you input and thank you for your time.

Please circle the numbered response that most accurately reflects how well you think we are doing in the following areas.	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
	5	**4**	**3**	**2**	**1**
Communication					
I feel the telemedicine audio-video conferencing is an effective tool for communication between the facility and the DHS team regarding patient evaluation and disposition.	5	4	3	2	1
Through the use of telemedicine video conferencing, I feel the patient's medical condition was communicated thoroughly to the DHS physician.	5	4	3	2	1
Communication between providers at the facility and hospital was augmented by use of the telemedicine-enabled video conferencing when compared to telephone communication alone.	5	4	3	2	1
Utility					
I feel telemedicine-enabled communication with video conferencing should be routinely used for assessment of patient's medical condition.	5	4	3	2	1
I feel telemedicine enabled communication with video conferencing should be a regular part of patient care prior to transfer of patient.	5	4	3	2	1
Logistics					
I could communicate easily using the telemedicine enabled video conferencing equipment/workstation.	5	4	3	2	1
The physicians at DHS/providers at the facility are easily available for discussion about patient care.	5	4	3	2	1
IT support is readily available, helpful and friendly.	5	4	3	2	1
The quality of the video was good.	5	4	3	2	1
The quality of the audio was good.	5	4	3	2	1

Comments:

_____
_____
_____
_____

Acknowledgements

University of Maryland Upper Chesapeake Health

in partnership with Lorien Health

Long Term Care/ Hospital Telehealth Project

Final Report

Prepared for: Maryland Health Care Commission
October 2015

Introduction

Improving coordination among care givers via telehealth programs can lead to increased quality and lower healthcare costs for patients in Continuing Care Facilities (CCFs). An unique partnership among Lorien Health Systems (Lorien), University of Maryland Upper Chesapeake Health (UMUCH), Maryland Emergency Medicine Network (MEMN) and LifeBot helped eliminate unnecessary trips to the hospital by remotely connecting patients with emergency medicine expertise using telehealth tools.

The Lorien Bel Air location includes 69 skilled nursing beds and 56 assisted living apartments located approximately three miles from Upper Chesapeake Medical Center. The skilled beds are nearly always filled to capacity and primarily occupied by residents aged 80 or greater (61% of the total population) with 90% of all patients having either Medicare or Medicaid insurance. Upper Chesapeake Medical Center (UCMC) is part of the University of Maryland Medical System serving the Harford and Cecil county communities. Each year the UCMC ED treats more than 60,000 patients with greater than 19,000 admissions to the hospital. During the baseline period, 509 patients discharged from UCMC to a CCF were readmitted within 30 days. While there is no formal relationship between the two organizations, they have collaborated on many initiatives both prior to and during this pilot program.

This partnership aimed to enable onsite assessment and treatment options for patients at Lorien Bel Air that would allow the clinical team to practice within the full scope of their license without requiring a transport to the hospital. In addition to telehealth technology the partners recognized the need for clinical testing equipment plus enhanced medications and IV fluids. Workflow processes that enabled the CCF to contact ED providers were established with the caveat the providers at either location could contact EMS for transport if either party was concerned about the condition of the patient. The resulting package of interventions, decision tools and clinical workflows should reduce the number of patient transfers from Lorien Bel Air to UCMC.

An overview of the pilot program can be viewed via the following link:
UMUCH - Lorien Telehealth Project Demonstration Video

Technology Infrastructure

To best support the clinical goals of the pilot, telehealth technology and supporting clinical testing tools were deployed in a new examination room at Lorien and the Emergency Department at Upper Chesapeake Medical Center. The partnership selected the LifeBot Dreams system for the telehealth component, after considering other options. The Dreams System offered clinicians the ability to gather vital signs, including EKGs, coupled with multiple camera angle video conferencing capabilities. This allowed the MEMN team in the ED to blend clinical data with a visual assessment of the patient to aid in clinical decision-making. The system uses touchscreens and a keyboard for nursing documentation at Lorien, while the ED physician manipulates the cameras remotely.

The LifeBot platform offered other advantages for this pilot program including its portability that allows the Lorien team to bring the system to patient rooms in the event of a decompensating health. Further, all clinical data entered into the system during the telehealth encounter is saved and made available to providers at both organizations. During the Pilot, the Dreams software was

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UPPER CHESAPEAKE MEDICAL CENTER

Lorien
Health Systems

LifeBot

MEMN

upgraded to include Ultra Sound capabilities and the new release of the platform will include a remote stethoscope and two-way video conferencing.

In addition to the LifeBot technology, Lorien also implemented iStat Point of Care testing in the new exam room. The availability of lab values was essential for establishing a baseline condition and determining if new treatments were effective during follow-up calls to the ED. The Lorien exam room also included a medication cart that was matched to include most of the medications and IV fluids that are at the ED physician's disposal at UMUCH. The combination of these IT and clinical testing components gave ED physicians both objective and subjective information to determine if the patient could continue at Lorien with a new treatment approach or needed to be transferred to UMUCH for an acute evaluation.

Project Implementation Process

After earning the grant from the Maryland Health Care Commission, the partners drafted a work plan to address the many components of the program. This included space planning, IT installation, workflow redesign, development of new protocols and a plan for training both the Lorien team and the UMUCH physicians. To achieve the aggressive timeline, a planning team consisting of key stakeholders from each organization met in-person and via phone at least weekly to determine the progress of each tactic. The team is described in the Table below:

Name	Title	Organization
Wayne Brannock	Chief Operating Officer	Lorien Health
Jim Hummer	Vice President	Lorien Health
Susan Carroll, R.N.	Vice President	Lorien Health
Cheryl Bayne, R.N.	Director of Nursing	Lorien Bel Air Location
Suresh Dhanjani, M.D.	Medical Director	Lorien Bel Air Location
Ed Walter	Administrator	Lorien Bel Air Location
Fermin Barrueto, M.D.	Chair- Emergency Medicine	UM UCH/ MEMN
Colin Ward	Vice President	UM UCH
Rick Casteel	Vice President	UM UCH
Kerry Fletcher	Chief Operating Officer	LifeBot

Section one of the project plan covered the Hardware Installation at both Lorien and UMUCH. A precursor to this work was the renovation of a former employee breakroom adjacent to a patient floor at the Lorien site. Once the room was outfitted with Lab space, a patient bed and ceiling mounted cameras, the LifeBot team delivered and installed the Dreams System. The self-contained unit is the size of carry-on luggage and mounted on a cart next to the patient bed. It was connected to the cameras and the internet then tested remotely by the Lifebot team. The dual-monitor work station in the Emergency Department was installed and the point-to-point connection between the sites was tested. Closer to the go-live date, it was determined that a portable option would be needed for the ED provider to allow for flexible assignment of the telehealth consultation role. The laptop enabled a single ED provider to be assigned to Telemedicine coverage even when not scheduled to work in the hospital that day. Tasks associated with the acquisition of both the laptop and a MiFi hotspot, required as a redundant internet connectivity mechanism were added to the plan. Mifi connectivity provided the flexibility for providers to connect when not at home or the

hospital and also served as a back-up in the event of an unforeseen internet outage at the provider's home.

The second section of the work plan pertained to the development of clinical work flows and protocols and was the most vital. The clinical representatives reviewed the medications available in the emergency department and created a cart at Lorien that included the same medications and IV fluids. This allowed the ED provider to order a course of treatment consistent with the capabilities at UMUCH. Further, a list of the point of care tests that would be available at the Lorien site was provided to the ED team. These tests provided critical information to physicians to aid in initial decision-making as well as follow-up comparisons to gauge the effectiveness of the treatment plan. Agreement on inclusion and exclusion criteria as well as the process for initiating use of the telehealth room and ED consult were also mutually agreed upon, as was a process by which EMS could still be contacted if the tele evaluation indicated a more serious issue.

Next the project plan addressed the process for training the clinicians at each site. The Lorien Nursing staff received an initial four hour training session with the Chief Operating Officer from LifeBot. The team was also trained on the use of the iStat lab system that was deployed within a dedicated space in the Lorien Exam room and instructed on the workflow for initiating a teleconsultation. The Dreams system is fairly intuitive and allowed the UMUCH physicians to be trained via two video demonstrations created by Dr. Barrueto and posted to YouTube. Initially nine ED providers were trained on the system and credentialed by Lorien to conduct a remote evaluation. The training videos can be viewed via the following links:

Sample Training Video Part I
Sample Training Video Part II

By credentialing ED providers at Lorien, the physician could order tests and treatments to be carried out and counter signed by the attending physicians at Lorien. Without these credentials, the ED provider would be limited to making *recommendations* to Lorien attendings who in turn would write the orders. The later would defeat the purpose and effectiveness of the ED provider availability.

Section four of the plan addressed the data gathering processes to support confirmation of baseline metrics and clinical goal setting. The improvement targets were mutually agreed upon and a process for reviewing the data twice per month was established. The final section of the project plan addressed ongoing administration of the program both immediately preceding the program launch and through the duration of the project. For example, the project team determined that an event summary of each case should be created to enable post case reviews. Changes to the manner in which patients and families were notified of the telehealth capabilities were also altered during the course of the pilot.

Assessment Approach

The partnership aimed to reduce the use of the emergency department and hospital for residents of Lorien- Bel Air. To that end, the leadership teams agreed to track three metrics: 30-day readmissions, total admissions and total ED visits for Lorien residents. Data was collected for the prior twelve month rolling period (October 1, 2013- September 30, 2014) to establish baselines and

allow for the development of improvement targets. The baseline performance was gathered via the INTERACT module of the Lorien Electronic Medical Record (EMR), Point Click Care. It reveal a 30-day readmission rate of 13.6%, a hospital admission rate of 4.2 and an ED visit rate of 6.8.

The project team agreed that significant improvement in these metrics was possible with better coordination among organizations. A 25% improvement in each measure was targeted and tracked each month. Beyond the clinical performance, the Lorien clinical team also reviewed cases of patients who by-passed the televisit program and were instead transported to the ED directly. The team sought to determine if there were candidate cases that were missed each month and the monthly dashboard reflected volumes of cases as well as the missed opportunities. The learning from this review was shared with the clinical team, including attending physicians, at Lorien each month.

During the Pilot, the Lorien team also developed and deployed patient and provider satisfaction surveys. This information was helpful in understanding ways to improve communication and set expectations about the new process.

Assessment Limitations

One major limitation with the assessment of the program is the understanding of volume equivalents from year to year. With the new program in place, it is possible that we now have a supply induced demand that would skew our performance relative to the volumes of transfers from previous years. In other words, a patient who may have previously never been sent to the hospital in previous years is now being evaluated via the telehealth program and that case included in the calculation of avoided utilization. However, it is difficult to know with certainty if every case seen via the new process would have been sent to the ED in prior years as there is not an easy way of determining patient acuity for each visit. As a result, the ROI must rely more on the clinical goal *rates* to determine volume reductions, as opposed to the counts of individual cases.

Results of Telehealth Intervention

The telehealth partnership tracked the clinical and volume metrics each month to gauge the success of the program. The 30-day readmission rate was targeted as the most critical measure as it can be the result of process issues at either the hospital or the CCF. The baseline 30-day readmission rate of 13.6% was established with a performance improvement target of 10.2%. During the 11 month pilot, there were six months in which the monthly performance exceeded the 25% reduction target. This will result in an annualized projection of 54 readmissions for the year, down from 83 in the baseline period. This equates to a reduction of approximately 33%, outpacing the goal established at the project outset.

Measure	Numerator/Denominator	Baseline Data 10/1/2013-9/30/2014	Goal	December	January	February	March	April	May	June	July	August	September	October		
Percent change in 30-day readmissions for all patients discharged from an ACH to Lorien Bel Air	Number of patients that were admitted from an ACH to Lorien Bel Air and were re-admitted to an ACH within 30 days of hospital discharge date	83		5	3	6	3	9	6	4	4	4			44	
	Number of patients that were admitted to Lorien Bel Air from an ACH	610		56	56	52	62	56	49	52	54	47	53		484	9.1%
	Percent	13.6%	10.2%	8.9%	5.4%	11.5%	4.8%	16.1%	12.2%	7.7%	7.4%	8.5%			%	

The second clinical measure was the total admission rate for Lorien residents defined as the count of admissions to any acute care hospital divided by the total number of resident days in the month. The rate at baseline was 4.2 with the established pilot target of 3.2. While the partnership did not meet this clinical goal overall, a rate of 2.4 was achieved in each of the final three months, good for a 43% reduction. Overall, the partnership recorded a performance of 3.6 or a 16% reduction.

Measure	Numerator/Denominator	Baseline Data 10/1/2013-9/30/2014	Goal	December	January	February	March	April	May	June	July	August	September	October		
Percent change in hospital admission rate for all conditions for residents admitted from Lorien Bel Air	Number of patients that were admitted to an ACH from Lorien Bel Air	105		10	11	8	7	7	7	11	5	5	5		76	
	Total number of resident days for the month at Lorien Bel Air	24,743		2,034	2,171	2,025	2,210	2,076	2,089	2,008	2,117	2,123	2,047		20,900	
	Rate	4.2	3.2	4.9	5.1	4.0	3.2	3.4	3.4	5.5	2.4	2.4	2.4			3.6

The final clinical measure was the ED visit rate calculated as the total count of patients transferred to an acute care hospital divided by the total resident days in that month. The partnership aimed to achieve a target of 5.1 from the baseline of 6.8. Like the second measure, the partnership demonstrated improvement but finished with an overall rate of 5.5. This resulted in an annualized reduction of ED visits of 42 cases or a reduction of 19%.

Measure	Numerator/Denominator	Baseline Data 10/1/2013-9/30/2014	Goal	December	January	February	March	April	May	June	July	August	September	October		
Percent change in ED Utilization from ambulance transfers from Lorien Bel Air to an ACH	Number of residents that were transferred via ambulance to an ACH	168		11	13	12	13	12	8	14	14	7	11		115	
	Total number of resident days for the month at Lorien Bel Air	24,743		2,034	2,171	2,025	2,210	2,076	2,089	2,008	2,117	2,123	2,047		20,900	
	Rate	6.8	5.1	5.4	6.0	5.9	5.9	5.8	3.8	7.0	6.6	3.3	5.4			5.5

In addition to the clinical metrics, the partnership recorded the number of successful uses of the new clinical process. This included room utilization where the remote ED consultation was not triggered but the patient monitoring and point of care testing were used by the Lorien Attending to assess and treat the patient. We found that only one in five uses of the room necessitated the ED consult because the change in patient condition occurred at a time when a CCF attending was present- frequently between 8 a.m. and 6 p.m. By installing the equipment and protocols, the CCF team is able to address many patient issues that formerly would have be sent to the hospital, even without connecting to the remotely available ED provider. This program has enabled Lorien Bel Air to "work at the top of license."

The partnership tracked the percentage of consultations, Lorien only vs. ED consults, as well as the number that required a transport to the hospital even after use of the exam room. The ED provider reviewed the case and requested that the patient be transferred over in 57% of the televisits compared to only 15% for the Lorien-only uses. This can be explained in part by the conditions that were being assessed by the different groups. The ED providers were 25% more likely to assess a cardiac issue where a conservative management approach is favored.

The Lorien team created and implemented a patient survey and a provider survey administered after each of the uses of the new exam room. The surveys asked residents to rate their experience in the program with regard to privacy, ease of communication, confidence in the process and overall experience. The survey indicated an overall satisfaction score of 3.5 on a 4.0 scale for the entire telemedicine process. Scores were also high for privacy, ease and confidence. Resident feedback included the request to be able to see the ED physician during the evaluation. This information lead to the development of a bi-directional video enhancement to the original program equipment. Additional comments included high satisfaction with convenience and avoiding a transport to acute care.

The physician survey assessed satisfaction with the diagnostic tools, confidence in using the system, and overall experience. The Lorien Attending's comfort with the system grew over the life of the pilot and overall satisfaction was high. Specifically, physicians scored the overall program at the rate of 3.75 on a scale of 4.0. Feedback included high satisfaction with the speed of laboratory results and well as avoiding transports to the ED where visits were managed remotely with the new process. A physician request for a stethoscope lead to the development and implementation of this peripheral by the LifeBot.

Project Implementation Challenges

The project team had to overcome some important challenges to successfully complete the pilot. Of most concern is the ability to compensate ED providers for the care that they provide during the virtual consult which is not typically reimbursable. The ED provider may feel the burden of new liability for these patients without receiving payment. For the first 90 days of the program, the Maryland Emergency Medicine Network physician group provided call coverage dollars to physicians assigned to the program each day even when not scheduled to work in the ED. This also allowed the ED team to prioritize "virtual" patients at Lorien in the same way that they would patients physically present at UMUCH because it gave the provider some reimbursement for cases that are not currently reimbursable. This removed a financial conflict for providers.

The MEMN call payments allowed the partnership to assign a single provider to the system each day such that physician coverage was always available. After the MEMN payment period ended, the ED schedule was more variable depending on when the nine trained physicians were present at UMUCH. This created some windows of time when the telehealth process could not be initiated since there were no trained providers on duty. As we move to expand the program, the partners have agreed to a payment methodology that creates patient parity and eliminates the need for physicians to choose if they can respond to a Lorien call. A contract amendment will be executed that pays the ED provider for each consultant undertaken by the ED provider and paid through the hospital operating funds. Agreement on the payment also allows the partnership to increase the physician coverage such that all ED physicians will be trained and available to respond to the consult request. This allows Lorien to once again have 24 hour coverage for these patients.

Another challenge for the Pilot program is a cultural challenge. In both locations, clinicians needed to gain comfort that the program did not delay or complicate care and that the patient was receiving a beneficial service not harm. This required training with the nursing team to recognize patient conditions that may now be suited for the telehealth process instead of requesting transport to the ED. A process change with the sequence of contacting the Lorien Attending was also important. If contacted prior to the activation of the Telehealth process, Attending and on-call providers were likely to recommend sending the resident to the hospital if he was not present to visualize the patient. Over time, the Attending providers were accepting of the new process as beneficial to patients and it became common that the Lorien physicians would avail themselves of the monitoring and testing capabilities of the exam room without ever triggering an ED telemedicine visit.

Another challenge for wider adoption of this telehealth program is the cost to renovate and equip the room with both the telehealth technology as well as the point of care testing system. As we look

to expand this package of interventions to other Lorien sites, we are facing implementation costs exceeding $80,000. The partnership views the combination of clinical information as important as the video calling capabilities when assessing the program success. For some organizations, this cost may present a barrier to entry.

Lessons Learned

The pilot program afforded the partnership the opportunity to conduct deeper analysis of CCF cases where the patient condition worsened. The clinical team at Lorien reviewed both telehealth cases and EMS transports that did not use the new system to help refine processes. This review included the Lorien Medical Director, COO and the Director of Nursing. The patient's condition was compared to the inclusion and exclusion criteria to conclude if the correct patients were sent to the new telehealth room. The results of these reviews were shared with the frontline nurses at Lorien as well as the physician at UMUCH to ensure that use of telehealth program was optimized.

Implementation of the new telemedicine protocol and tools resulted in increased physician involvement with the care delivery of the facility residents. Over the course of the 11 month program, the exam room was utilized 87 times. Each time the Attending Physician or ED physician was working with new information and tools in effort to aide clinical decision making.

In addition to the case reviews, a periodic analysis of the clinical conditions impacting the patients was also conducted. The data was divided into conditions treated exclusively at Lorien and those conditions that required the connection to the ED providers. The ED was contacted most frequently on Wednesday and all but one consultation occurred between 6 a.m. and 8 p.m. Cases addressed completely by the Lorien team were similarly dispersed during the day, but nearly 10 case occurred between 8 p.m. and 4 a.m. Clinically, the ED providers were contacted for Cardiac or Respiratory issues while Lorien was able to address issues relating to Neurologic and Genito Urinary issues.

One important operational lesson learned pertained to the patient and family expectation. Some family members initially resisted the notion of using telehealth to assess and treat their loved one. It is important to explain to patients what the process is and how the technology works prior to the stress of a worsening condition. As a result, Lorien included information about the program in the admission packet given to each patient and family.

Patient satisfaction with the system increased as the process gained traction. In one case, the patient was relived to avoid a trip to the emergency department on a day when UMUCH was experiencing capacity issues due to seasonal flu. The clinical team was able to adjust IV fluids and tract the patient's response hours later all while the patient remained at Lorien. Toward the end of the pilot, a Long Term Care resident experienced a worsening condition. The family requested that the telehealth process was implemented because they feared that the patient was near death already. In this case, the patient was able to remain at Lorien and passed peacefully in his residence surrounded by family members. This was a less stressful alternative to transferring the patient to the hospital where he might have passed without his family present.

Cost Effectiveness

In determining the return on investment for this program the partners consider several factors. The most important of which is the variable cost savings associated with avoided ED visits and inpatient or observation hospital stays. The finance team at UMUCH calculates that each avoided ED visit results in a cost savings of approximately $125, while an inpatient or observation day eschewed can save up to $450. Given the admission percentage and average length of stay, the savings to the hospital under the Global Budget Revenue payment methodology exceeds $70,000 annually. Including at-risk quality based incentives and penalties and each case may have a greater impact on the hospital finances that just the variable cost. Using conservative assumptions this program should meet the breakeven point near the end of the first year.

Another component of the cost effectiveness accrues to the payer. Each patient transport via private or EMS ambulance costs the Medicare between $600 -$750. By this measure, the Centers for Medicare and Medicaid saved approximately $25,000 as the result of reducing transports from Lorien to UMUCH.

Beyond the finances, this new process has reduced the amount of patients transferred to the hospital which can be beneficial to patients. Having the ability to monitor and alter treatment plans without a transfer alleviates the potential for repetitive tests, infection and other hospital complications. Further, patients with mental status issues or dementia can benefit from remaining in a single treatment environment. It is also perceived that the clinical teams at both institutions have elevated performance by having a better understanding of the continuum of care. The Lorien team has been eager to use this new clinical process and the ED providers have a greater understanding of the expectations when a patient is transferred to UMUCH.

Sustainability

Given the success of the pilot program the four participating organizations have agreed to expand this program to the remaining Lorien sites in Harford County, Lorien Havre de Grace and Lorien Riverside. Outfitting each room costs approximately $80,000 for the telehealth equipment, the point of care testing and routine exam room equipment such as the bed. The project is being jointly funded by Lorien and UMUCH recognizing that the program has a clinical impact on patients and helps reduce avoidable utilization from the hospital. The hospital will continue to compensate the provider group to provide the ED consultation which is not currently reimbursable through Medicare or Medicaid. UMUCH estimates that the cost of this investment will be covered through reduced volume and cost savings and break even no later than 18 months from implementation.

Lorien Health is also exploring additional applications of this telehealth system as part of their new Lorien at Home program. This program provides in home skilled nursing with dedicated nursing coverage connected to a provider via telehealth. Additional consideration is being given to a program developed in Assisted Living Facilities.
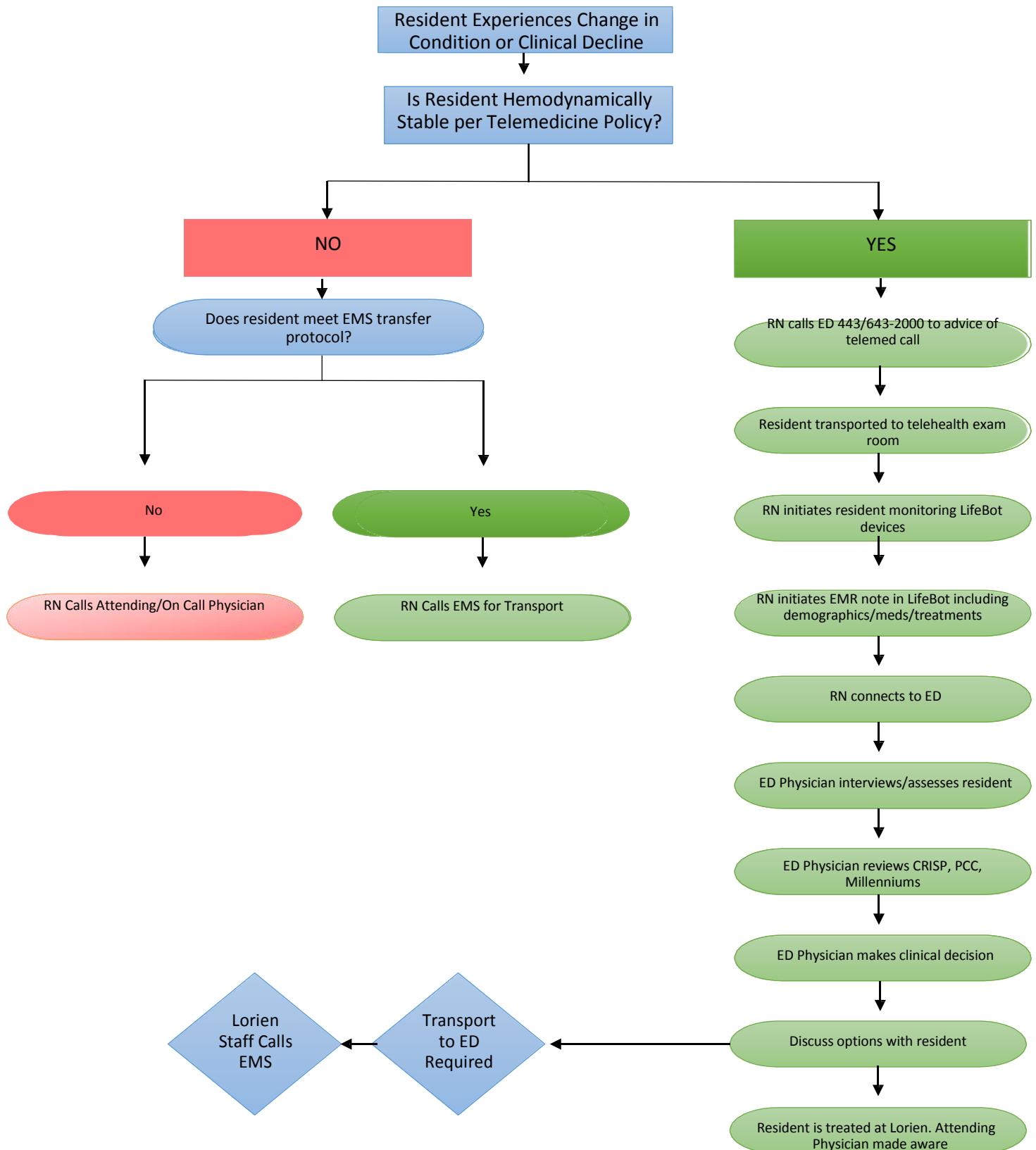
Closing

The successful telehealth program in Harford County required partnership that is atypical of healthcare providers. Alignment of interests is critical for any project, but this endeavor needed agreement on clinical workflows, service levels and the development of an alternate payment process for the emergency department physicians. A spirit of cooperation was evident from the first meeting and remained as the pilot progressed, allowing for a smooth refinement of process throughout. Organizations contemplating telehealth programs must be selective of the technology and your partners to ensure success.

**Appendices
(on the subsequent pages)**

Telehealth Workflow

```
                    ┌─────────────────────────────┐
                    │ Resident Experiences Change in │
                    │  Condition or Clinical Decline │
                    └─────────────────────────────┘
                                 │
                                 ▼
                    ┌─────────────────────────────┐
                    │  Is Resident Hemodynamically  │
                    │ Stable per Telemedicine Policy?│
                    └─────────────────────────────┘
```

NO	YES

NO branch:

Does resident meet EMS transfer protocol?

- No → RN Calls Attending/On Call Physician
- Yes → RN Calls EMS for Transport

YES branch:

RN calls ED 443/643-2000 to advice of telemed call

→ Resident transported to telehealth exam room

→ RN initiates resident monitoring LifeBot devices

→ RN initiates EMR note in LifeBot including demographics/meds/treatments

→ RN connects to ED

→ ED Physician interviews/assesses resident

→ ED Physician reviews CRISP, PCC, Millenniums

→ ED Physician makes clinical decision

→ Discuss options with resident

→ Transport to ED Required → Lorien Staff Calls EMS

→ Resident is treated at Lorien. Attending Physician made aware

New Lorien monitoring capabilities via LifeBot

- ◦ ePCR Electronic Patient Call Report

- ◦ ECG 12 Lead

- ◦ Peripheral Pulse

- ◦ Pulse Oximeter

- ◦ Respirations

- ◦ Two Temperatures

- ◦ NIBP and Mean Blood Pressure

- ◦ Heart Rate

- ◦ Ultra Sound

Medications common to both Lorien and UCMC

Cardiac Medications:

- Aspirin 81mg Chewable
- Heparin 10,0000 units/ml injection
- Atropine 1mg/ml injection
- Nitorquick (nitroglycerin)0.4mg tab

Metabolic Medications

- Dextrose 50% injection
- Intaglucose/ Glutose 15

Allergic Reaction

- Diphenhydramine 50mg/ml injection
- Epinephrine1:1000 (1mg/ml) injection
- Furosemide 10mg/ml 4ml injection

Antibiotics

- Vancomycin IV
- Ancef 1 gm
- Levaquin IV
- Rocephin IV
- Levaquin IV
- Zithromax IV
- Clindamycin IV
- Unasyn IV
- Zoysn

Asthma and Miscellaneous

- Decadron IV
- Albuterol

University of Maryland
Upper Chesapeake Medical Center

Lorien
Health Systems

LifeBot

MCMN

Exam Room Utilization Survey

Resident Name: _____

Date:

- ◦ Atrovent
- ◦ Haldol
- ◦ Vitamin K injection 10mg/ml
- ◦ Naloxone (narcan) 0.4mg/ml injection
- ◦ Ativan Injection

IV Fluids common to both Lorien and UCMC

- ◦ 0.9% Normal Saline 1000 ml
- ◦ 0.9% Normal Saline 250 ml
- ◦ 0.9% Normal Saline 50 ml
- ◦ D5W 1000 ml
- ◦ D50 50 ml
- ◦ Normal Saline Flushes 100 ml
- ◦ Heparin Flush 10 units/ml
- ◦ Dextrose 5% +.45% Normal Saline
- ◦ Dextrose 5% with 20 KCL
- ◦ Dextrose 5% +.45%NS with 20 KCL
- ◦ 0.9% Normal Saline with 20KCL
- ◦ Dextrose 5% with 40kcl
- ◦ Dextrose 5% + 0.45% NS with 40KCL
- ◦ 0.9% Normal Saline with 40KCL

Exam Room Utilization Survey

Resident Name: _____

Date:

Point of Care Testing at Lorien

- WBC (White Blood Cell)
- Hb (Hemoglobin)
- Hct (Hematocrit)
- Chem 7 (Basic Metabolic Panel)
- INR (International Normalized Ratio)
- Routine UA (Urine Analysis)

Exam Room Utilization Survey

Resident Name: _____

Date: _____

Time: _____

Lorien Nurse: _____

Consulting Physician: _____

Consulting Physician

How would you rate your experience of talking with the nurse and patient in the Exam Room?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
How would you rate your experience with seeing the patient in the Exam Room?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
How well did the LifeBot connection and peripheral equipment work?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
How well were you able to get diagnostic information to determine a treatment plan?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
How well equipped and supplied was the Exam Room to meet your needs?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
How would rate your confidence in using the Exam Room?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
How would you rate your overall experience using the Exam Room?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
Additional Comments:	

Exam Room Utilization Survey

Resident Name: _____

Date: _____

Time: _____

Lorien Nurse: _____

Consulting Physician: _____

Resident/Patient

Do you feel your privacy was maintained during your time in the Exam Room?	☐ Yes ☐ No
How would you rate your experience with talking to the physician at the hospital?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
How would you rate your experience with seeing the physician at the hospital?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
How would you rate your confidence in using the Exam Room?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
How would you rate your overall experience using the Exam Room?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
Additional Comments:	

Lead Lorien Nurse

How would you rate your experience with hearing the physician at the hospital?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
How would you rate your experience with seeing the physician and the hospital?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
How well did the LifeBot connection and peripheral equipment work?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
How well equipped and supplied was the Exam Room to meet your needs?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
How would rate your confidence in using the Exam Room?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
How would you rate your overall experience using the Exam Room?	☐ Poor ☐ Fair ☐ Good ☐ Excellent ☐ Not Applicable
Additional Comments:	

Acknowledgements

This partnership would not have been possible without the vision and leadership of the organizations.

We wish to thank the Maryland Healthcare Commission for support throughout the project. The grant award enabled the implementation of this use case at a time when health systems are working diligently to reduce unnecessary utilization. The Center for Health Information Technology and Innovative Care Delivery lead by David Sharp and supported by Lynn Albizo, Angela Evatt and Marya Kahn played a critical role in this program.

The Lorien Health System team under the direction of CEO Louis G. Grimmel, Sr. was creative and flexible, having the ability to alter workflows and implement changes required to ensure attainment of our goals. Wayne Brannock, Jim Hummer, Ed Walter, Cheryl Bayne, Susan Carroll and Suresh Dhanjani, M.D. provided the day-to-day direction throughput the pilot.

Lyle E. Sheldon, CEO of University of Maryland Upper Chesapeake Health provided the leadership and encouragement to pursue this program. He challenged the typical health system thinking and inspired the hospital team to "blur the lines" between the acute care setting and the continuing care facilities. The IT team of Rick Casteel and Rick Buchman was also vital to the success.

The Maryland Emergency Management Network, led by Brian J. Browne, M.D. provided funding support and enthusiasm for the pilot. Locally, Fermin Barrueto, M.D. Chair of Emergency Medicine at Upper Chesapeake and his team adapted to this new model of care delivery and extend their clinical expertise to the skilled nursing facility.

Finally, we must thank the technology vendors, Kerry Fletcher at Lifebot as well as Randall and Michael Citrano at Citrano Laboratories for providing the infrastructure required support clinical decision- making.

Appendices

Appendix A: Telemedicine Facts

The fact sheet below includes facts regarding telemedicine provided by the American Telemedicine Association. This information is available at http://www.americantelemed.org/about-telemedicine/what-is-telemedicine

What is Telemedicine?

Formally defined, telemedicine is the use of medical information exchanged from one site to another via electronic communications to improve a patient's clinical health status. Telemedicine includes a growing variety of applications and services using two-way video, email, smart phones, wireless tools and other forms of telecommunications technology.

Starting out over 40 years ago with demonstrations of hospitals extending care to patients in remote areas, the use of telemedicine has spread rapidly and is now becoming integrated into the ongoing operations of hospitals, specialty departments, home health agencies, private physician offices as well as consumer's homes and workplaces.

Telemedicine is not a separate medical specialty. Products and services related to telemedicine are often part of a larger investment by healthcare institutions in either information technology or the delivery of clinical care. Even in the reimbursement fee structure, there is usually no distinction made between services provided on site and those provided through telemedicine and often no separate coding required for billing of remote services. ATA has historically considered telemedicine and telehealth to be interchangeable terms, encompassing a wide definition of remote healthcare. Patient consultations via video conferencing, transmission of still images, e-health including patient portals, remote monitoring of vital signs, continuing medical education, consumer-focused wireless applications and nursing call centers, among other applications, are all considered part of telemedicine and telehealth.

While the term telehealth is sometimes used to refer to a broader definition of remote healthcare that does not always involve clinical services, ATA uses the terms in the same way one would refer to medicine or health in the common vernacular. Telemedicine is closely allied with the term health information technology (HIT). However, HIT more commonly refers to electronic medical records and related information systems while telemedicine refers to the actual delivery of remote clinical services using technology.

What Services Can Be Provided By Telemedicine?

Sometimes telemedicine is best understood in terms of the services provided and the mechanisms used to provide those services. Here are some examples:

- **Primary care and specialist referral services** may involve a primary care or allied health professional providing a consultation with a patient or a specialist assisting the primary care physician in rendering a diagnosis. This may involve the use of live interactive video or the use of store and forward transmission of diagnostic images, vital signs and/or video clips along with patient data for later review.

- **Remote patient monitoring**, including home telehealth, uses devices to remotely collect and send data to a home health agency or a remote diagnostic testing facility (RDTF) for interpretation. Such applications might include a specific vital sign, such as blood glucose or heart ECG or a variety of indicators for homebound patients. Such services can be used to supplement the use of visiting nurses.

- **Consumer medical and health information** includes the use of the Internet and wireless devices for consumers to obtain specialized health information and on-line discussion groups to provide peer-to-peer support.

- **Medical education** provides continuing medical education credits for health professionals and special medical education seminars for targeted groups in remote locations.

What Delivery Mechanisms Can Be Used?

- **Networked programs** link tertiary care hospitals and clinics with outlying clinics and community health centers in rural or suburban areas. The links may use dedicated high-speed lines or the Internet for telecommunication links between sites. ATA estimates the number of existing telemedicine networks in the United States at roughly 200 providing connectivity to over 3,000 sites.

- **Point-to-point connections** using private high speed networks are used by hospitals and clinics that deliver services directly or outsource specialty services to independent medical service providers. Such outsourced services include radiology, stroke assessment, mental health and intensive care services.

- **Monitoring center links** are used for cardiac, pulmonary or fetal monitoring, home care and related services that provide care to patients in the home. Often normal land-line or wireless connections are used to communicate directly between the patient and the center although some systems use the Internet.

- **Web-based e-health patient service sites** provide direct consumer outreach and services over the Internet. Under telemedicine, these include those sites that provide direct patient care.

Appendix B: Md. Code Ann., Insurance § 15–139

Code of Maryland

Article – Insurance

§15–139.

(a)   (1)   In this section, "telemedicine" means, as it relates to the delivery of health care services, the use of interactive audio, video, or other telecommunications or electronic technology by a licensed health care provider to deliver a health care service within the scope of practice of the health care provider at a site other than the site at which the patient is located.

(2)   "Telemedicine" does not include:

(i)   an audio–only telephone conversation between a health care provider and a patient;

(ii)   an electronic mail message between a health care provider and a patient; or

(iii)   a facsimile transmission between a health care provider and a patient.

(b)   This section applies to:

(1)   insurers and nonprofit health service plans that provide hospital, medical, or surgical benefits to individuals or groups on an expense–incurred basis under health insurance policies or contracts that are issued or delivered in the State; and ·

(2)   health maintenance organizations that provide hospital, medical, or surgical benefits to individuals or groups under contracts that are issued or delivered in the State.

(c)   An entity subject to this section:

(1)   shall provide coverage under a health insurance policy or contract for health care services appropriately delivered through telemedicine; and

(2)   may not exclude from coverage a health care service solely because it is provided through telemedicine and is not provided through an in–person consultation or contact between a health care provider and a patient.

(d)   An entity subject to this section:

(1)   shall reimburse a health care provider for the diagnosis, consultation, and treatment of an insured patient for a health care service covered under a health insurance policy or contract that can be appropriately provided through telemedicine;

(2)   is not required to:

(i)   reimburse a health care provider for a health care service delivered in person or through telemedicine that is not a covered benefit under the health insurance policy or contract; or

(ii)   reimburse a health care provider who is not a covered provider under the health insurance policy or contract; and

(3) (i) may impose a deductible, copayment, or coinsurance amount on benefits for health care services that are delivered either through an in–person consultation or through telemedicine;

(ii) may impose an annual dollar maximum as permitted by federal law; and

(iii) may not impose a lifetime dollar maximum.

(e) An entity subject to this section may undertake utilization review, including preauthorization, to determine the appropriateness of any health care service whether the service is delivered through an in–person consultation or through telemedicine if the appropriateness of the health care service is determined in the same manner.

(f) A health insurance policy or contract may not distinguish between patients in rural or urban locations in providing coverage under the policy or contract for health care services delivered through telemedicine.

(g) A decision by an entity subject to this section not to provide coverage for telemedicine in accordance with this section constitutes an adverse decision, as defined in § 15–10A–01 of this title, if the decision is based on a finding that telemedicine is not medically necessary, appropriate, or efficient.

Appendix C: Telehealth Round Two & Three Abstracts

The below includes abstracts that summarize round two and three telehealth grants awarded by MHCC that are currently being implemented in Maryland. Lessoned learned from round one grants are used to inform the implementation of round two and three grants.

Telehealth Technology Project – Round Two

In June 2015, the Maryland Health Care Commission (MHCC) awarded a second round of telehealth grants to study the impact of remote patient monitoring on hospital re-admission in various settings to reduce hospital encounters. Telehealth is the use of electronic information and telecommunications technologies such as video-conferencing to support clinical health care, patient and professional health-related education, public health, and health administration. A total of $80,000 was awarded in grant funds, and a 2:1 match is required of each grantee. In addition to telehealth technology, the grantees are required to use a nationally certified electronic health record and services of the State-Designated Health Information Exchange, the Chesapeake Regional Information System for our Patients (CRISP). The telehealth projects are scheduled for completion in the summer of 2016. A summary of each of the three projects and the current status is below:

Crisfield Clinic, LLC

Crisfield Clinic, a family practice clinic in Somerset County, is deploying telehealth mobile devices to help middle school and high aged patients manage chronic conditions, such as asthma, diabetes, childhood obesity, and behavioral health issues. Crisfield Clinic utilizes a Community Health Worker to facilitate care coordination. The project aims to improve clinical data indicators, reduce lost school days, reduce emergency department visits, and improve patient's perception of health.

Lorien Health Systems (Howard County)

Lorien Health Systems, a skilled nursing facility and residential service agency, is using telehealth to address hospital prevention quality indicator (PQI) conditions, including uncontrolled diabetes, congestive heart failure, and hypertension among patients that are discharged from the skilled nursing facility to home. The project provides 24/7 access to a care coordinator and installs telemonitoring devices in patients' home to improve care and avoid hospital admissions. Services are provided to patients discharged home from its Howard County facility.

Union Hospital of Cecil County

Union Hospital of Cecil County is using telehealth to address several hospital PQI conditions including diabetes, chronic obstructive pulmonary disease, hypertension, heart failure, and asthma among patients discharged from the hospital to home. The hospital provides chronic care patients with mobile tablets and peripheral devices to capture blood pressure, pulse, and weight, and provide patient education to facilitate patient monitoring. The use of telehealth technology is intended to improve access to care, enable early provision of appropriate treatment, and reduce hospital encounters.

Telehealth Technology Project – Round Three

In December 2015, MHCC awarded a third round of telehealth grants totaling approximately $90,000 to demonstrate the impact of using telehealth technology to improve the overall health of the population being served and the patient experience. Grantees are required to implement the technology in a meaningful way, including developing clinical protocols to demonstrate improved outcomes. Grantees are also required to use an electronic health record and the services of the State-Designated health information exchange, the Chesapeake Regional Information System for our Patients. A 2:1 financial match is required from each grantee.

Associated Black Charities

Associated Black Charities (ABC) of Dorchester County will utilize telehealth technology to facilitate remote video consultations with patients in real-time. ABC is a community association that assists minority and rural communities with navigating the health care system in Maryland's Mid-shore Region Health Enterprise Zone (HEZ).[56] Community health workers deployed by ABC will meet with patients in their homes and use mobile tablets to connect patients with a licensed nurse practitioner at Choptank Community Health System, Inc. (CCHS). The remote consultations will include primary care recommendations and behavioral health support. ABC will partner with Cyfluent, a Maryland-based vendor to provide technology services, including telehealth video software that will allow the remote consultations to be fully integrated into patient's electronic health record (EHR) at CCHS. The project goal is to improve the health of patients in the Mid-shore Region HEZ by providing timely access to care and helping reduce costly interventions during a crisis, such as emergency hospital visits and admissions.

Gerald Family Care

Gerald Family Care, LLC (GFC) will utilize telehealth technology to exchange images and provide remote video consultations between GFC family practices in Prince Georges County and specialists at Dimensions Health System (DHS) to connect patients in real-time with specialty care. DHS specialists will provide gastroenterology, orthopedics, neurology, and behavioral health services remotely from Laurel Regional Hospital and Prince Georges Hospital Center. One family practice location will also have a gastro scope peripheral device that will allow a gastroenterologists located at a Dimension's hospital to view patient's esophagus and stomach to conduct a remote gastroenterology exam. GFC will partner with a Maryland-based vendor, Zane Networks, to provide technology services. The project aims to reduce patient waiting times and remove distance and transportation barriers for patients in need of specialty care. The goal is to increase access to specialty services to help improve patient care and reduce hospital readmissions and costs.

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[56] Health Enterprise Zones are contiguous geographic areas designated by the Secretary of the Department of Health and Mental Hygiene in collaboration with the Maryland Community Health Resources Commission that have measurable and documented economic disadvantage and poor health outcomes. Five zones have been identified to receive targeted state resources to reduce health disparities, improve health outcomes, and reduce health costs and hospital admissions and readmissions in those zones. For more information, visit: http://dhmh.maryland.gov/healthenterprisezones/SitePages/Home.aspx

Union Hospital of Cecil County

Union Hospital of Cecil County (UHCC) will provide chronic care patients discharged to home with mobile tablets and peripheral devices[57] that allow UHCC to monitor the status of patients' condition. Use of this technology will allow patients to remotely share clinical information with the UHCC's care management team, including blood pressure, temperature, pulse, weight and glucose levels. The mobile tablets will enable the patient data being monitored to be integrated into reports that are shared with providers in primary care and emergency department settings and also provide on-demand patient education. The project expands upon the current telehealth grant UHCC received from the Maryland Health Care Commission in October 2014 by supporting additional data sharing with emergency department and primary care physicians and allowing practitioners to view monitoring data while signed into the hospital's EHR. UHCC will partner with AT&T and Vivify to provide technology services for the project. The project goal is to utilize telehealth technology to proactively monitor patients' health status in real-time and support patient education, helping to improve health outcomes and minimize the need for emergency department visits and/or readmissions.

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[57] Peripheral devices include blood pressure cup, thermometer, pulseometer and scale that synch with the mobile tablet and allow transmission of information to remote site.

Appendix D: Reimbursable Medicare Telemedicine Services

CMS released the below fact sheet on telehealth reimbursable services in the Medicare Fee-for-Service program. Available at: https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/downloads/telehealthsrvcsfctsht.pdf.

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Telehealth Services

RURAL HEALTH SERIES

Please note: The information in this publication applies only to the Medicare Fee-For-Service Program (also known as Original Medicare).

This publication provides the following information on calendar year (CY) 2016 Medicare telehealth services:

❖ Originating sites;
❖ Distant site practitioners;
❖ Telehealth services;
❖ Billing and payment for professional services furnished via telehealth;
❖ Billing and payment for the originating site facility fee;
❖ Resources; and
❖ Lists of helpful websites and Regional Office Rural Health Coordinators.

When "you" is used in this publication, we are referring to physicians or practitioners at the distant site.

Medicare pays for a limited number of Part B services furnished by a physician or practitioner to an eligible beneficiary via a telecommunications system. For eligible telehealth services, the use of a telecommunications system substitutes for an in-person encounter.

ORIGINATING SITES

An originating site is the location of an eligible Medicare beneficiary at the time the service furnished via a telecommunications system occurs. Medicare beneficiaries are eligible for telehealth services only if they are presented from an originating site located in:

❖ A rural Health Professional Shortage Area (HPSA) located either outside of a Metropolitan Statistical Area (MSA) or in a rural census tract; or
❖ A county outside of a MSA.

ICN 901705 December 2015

The Health Resources and Services Administration (HRSA) determines HPSAs, and the United States (U.S.) Census Bureau determines MSAs. You can access HRSA's Medicare Telehealth Payment Eligibility Analyzer to determine a potential originating site's eligibility for Medicare telehealth payment at http://datawarehouse.hrsa.gov/telehealthAdvisor/telehealthEligibility.aspx on the HRSA website.

Entities that participate in a Federal telemedicine demonstration project approved by (or receiving funding from) the Secretary of the U.S. Department of Health & Human Services as of December 31, 2000, qualify as originating sites regardless of geographic location.

Each CY, the geographic eligibility of an originating site is established based on the status of the area as of December 31st of the prior CY. Such eligibility continues for the full CY.

The originating sites authorized by law are:

❖ The offices of physicians or practitioners;
❖ Hospitals;
❖ Critical Access Hospitals (CAHs);
❖ Rural Health Clinics;
❖ Federally Qualified Health Centers;
❖ Hospital-based or CAH-based Renal Dialysis Centers (including satellites);
❖ Skilled Nursing Facilities (SNFs); and
❖ Community Mental Health Centers (CMHCs).

Note: Independent Renal Dialysis Facilities are not eligible originating sites.

DISTANT SITE PRACTITIONERS

Practitioners at the distant site who may furnish and receive payment for covered telehealth services (subject to State law) are:

❖ Physicians;
❖ Nurse practitioners (NPs);
❖ Physician assistants (PAs);
❖ Nurse-midwives;
❖ Clinical nurse specialists (CNSs);
❖ Certified registered nurse anesthetists;

❖ Clinical psychologists (CPs) and clinical social workers (CSWs). CPs and CSWs cannot bill for psychiatric diagnostic interview examinations with medical services or medical evaluation and management services under Medicare. These practitioners may not bill or receive payment for Current Procedural Terminology (CPT) codes 90792, 90833, 90836, and 90838; and
❖ Registered dietitians or nutrition professionals.

TELEHEALTH SERVICES

As a condition of payment, you must use an interactive audio and video telecommunications system that permits real-time communication between you, at the distant site, and the beneficiary, at the originating site. Asynchronous "store and forward" technology is permitted only in Federal telemedicine demonstration programs in Alaska or Hawaii.

The chart on pages 3–4 provides the CY 2016 list of Medicare telehealth services.

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CY 2016 Medicare Telehealth Services

Service	Healthcare Common Procedure Coding System (HCPCS)/CPT Code
Telehealth consultations, emergency department or initial inpatient	HCPCS codes G0425–G0427
Follow-up inpatient telehealth consultations furnished to beneficiaries in hospitals or SNFs	HCPCS codes G0406–G0408
Office or other outpatient visits	CPT codes 99201–99215
Subsequent hospital care services, with the limitation of 1 telehealth visit every 3 days	CPT codes 99231–99233
Subsequent nursing facility care services, with the limitation of 1 telehealth visit every 30 days	CPT codes 99307–99310
Individual and group kidney disease education services	HCPCS codes G0420 and G0421
Individual and group diabetes self-management training services, with a minimum of 1 hour of in-person instruction to be furnished in the initial year training period to ensure effective injection training	HCPCS codes G0108 and G0109
Individual and group health and behavior assessment and intervention	CPT codes 96150–96154
Individual psychotherapy	CPT codes 90832–90834 and 90836–90838
Telehealth Pharmacologic Management	HCPCS code G0459
Psychiatric diagnostic interview examination	CPT codes 90791 and 90792
End-Stage Renal Disease (ESRD)-related services included in the monthly capitation payment	CPT codes 90951, 90952, 90954, 90955, 90957, 90958, 90960, and 90961
End-Stage Renal Disease (ESRD)-related services for home dialysis per full month, for patients younger than 2 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents (effective for services furnished on and after January 1, 2016)	CPT code 90963
End-Stage Renal Disease (ESRD)-related services for home dialysis per full month, for patients 2-11 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents (effective for services furnished on and after January 1, 2016)	CPT code 90964
End-Stage Renal Disease (ESRD)-related services for home dialysis per full month, for patients 12-19 years of age to include monitoring for the adequacy of nutrition, assessment of growth and development, and counseling of parents (effective for services furnished on and after January 1, 2016)	CPT code 90965
End-Stage Renal Disease (ESRD)-related services for home dialysis per full month, for patients 20 years of age and older (effective for services furnished on and after January 1, 2016)	CPT code 90966
Individual and group medical nutrition therapy	HCPCS code G0270 and CPT codes 97802–97804
Neurobehavioral status examination	CPT code 96116
Smoking cessation services	HCPCS codes G0436 and G0437 and CPT codes 99406 and 99407
Alcohol and/or substance (other than tobacco) abuse structured assessment and intervention services	HCPCS codes G0396 and G0397
Annual alcohol misuse screening, 15 minutes	HCPCS code G0442
Brief face-to-face behavioral counseling for alcohol misuse, 15 minutes	HCPCS code G0443

Service	Healthcare Common Procedure Coding System (HCPCS)/CPT Code
Annual depression screening, 15 minutes	HCPCS code G0444
High-intensity behavioral counseling to prevent sexually transmitted infection; face-to-face, individual, includes: education, skills training and guidance on how to change sexual behavior; performed semi-annually, 30 minutes	HCPCS code G0445
Annual, face-to-face intensive behavioral therapy for cardiovascular disease, individual, 15 minutes	HCPCS code G0446
Face-to-face behavioral counseling for obesity, 15 minutes	HCPCS code G0447
Transitional care management services with moderate medical decision complexity (face-to-face visit within 14 days of discharge)	CPT code 99495
Transitional care management services with high medical decision complexity (face-to-face visit within 7 days of discharge)	CPT code 99496
Psychoanalysis	CPT codes 90845
Family psychotherapy (without the patient present)	CPT code 90846
Family psychotherapy (conjoint psychotherapy) (with patient present)	CPT code 90847
Prolonged service in the office or other outpatient setting requiring direct patient contact beyond the usual service; first hour	CPT code 99354
Prolonged service in the office or other outpatient setting requiring direct patient contact beyond the usual service; each additional 30 minutes	CPT code 99355
Prolonged service in the inpatient or observation setting requiring unit/floor time beyond the usual service; first hour (list separately in addition to code for inpatient evaluation and management service) (effective for services furnished on and after January 1, 2016)	CPT code 99356
Prolonged service in the inpatient or observation setting requiring unit/floor time beyond the usual service; each additional 30 minutes (list separately in addition to code for prolonged service) (effective for services furnished on and after January 1, 2016)	CPT code 99357
Annual Wellness Visit, includes a personalized prevention plan of service (PPPS) first visit	HCPCS code G0438
Annual Wellness Visit, includes a personalized prevention plan of service (PPPS) subsequent visit	HCPCS code G0439

For ESRD-related services, a physician, NP, PA, or CNS must furnish at least one "hands on" visit (not telehealth) each month to examine the vascular access site.

BILLING AND PAYMENT FOR PROFESSIONAL SERVICES FURNISHED VIA TELEHEALTH

Submit claims for telehealth services using the appropriate CPT or HCPCS code for the professional service along with the telehealth modifier GT, "via interactive audio and video telecommunications systems" (for example, 99201 GT). By coding and billing the GT modifier with a covered telehealth procedure code, you are certifying that the beneficiary was present at an eligible originating site when you furnished the telehealth service. By coding and billing the GT modifier with a covered ESRD-related service telehealth code, you are certifying that you furnished one "hands on" visit per month to examine the vascular access site.

For Federal telemedicine demonstration programs in Alaska or Hawaii, submit claims using the appropriate CPT or HCPCS code for the professional service along with the telehealth modifier GQ if you performed telehealth services "via an asynchronous telecommunications system" (for example, 99201 GQ). By coding and billing the GQ modifier, you are certifying that the asynchronous medical file was collected and transmitted to you at the distant site from a Federal telemedicine demonstration project conducted in Alaska or Hawaii.

You should bill the Medicare Administrative Contractor (MAC) for covered telehealth services. Medicare pays you the appropriate amount under the Medicare Physician Fee Schedule (PFS) for telehealth services. When you are located in a CAH and reassigned your billing rights to a CAH that elected the Optional Payment Method, the CAH bills the MAC for telehealth services and the payment amount is 80 percent of the Medicare PFS for telehealth services.

BILLING AND PAYMENT FOR THE ORIGINATING SITE FACILITY FEE

Originating sites are paid an originating site facility fee for telehealth services as described by HCPCS code Q3014. Bill the MAC for the originating site facility fee, which is a separately billable Part B payment.

Note: When a CMHC serves as an originating site, the originating site facility fee does not count toward the number of services used to determine payment for partial hospitalization services.

RESOURCES

The chart below provides telehealth services resource information.

Telehealth Services Resources

For More Information About...	Resource
Telehealth Services	https://www.cms.gov/Medicare/Medicare-General-Information/Telehealth on the Centers for Medicare & Medicaid Services (CMS) website
	Chapter 15 of the "Medicare Benefit Policy Manual" (Publication 100-02) on the CMS website
	Chapter 12 of the "Medicare Claims Processing Manual" (Publication 100-04) on the CMS website
Health Professional Shortage Areas	Medicare Learning Network® (MLN) publication titled "Health Professional Shortage Area (HPSA) Physician Bonus, HPSA Surgical Incentive Payment, and Primary Care Incentive Payment Programs" on the CMS website
All Available MLN Products	"MLN Catalog" on the CMS website
Provider-Specific Medicare Information	MLN publication titled "MLN Guided Pathways: Provider Specific Medicare Resources" on the CMS website
Medicare Information for Beneficiaries	https://www.medicare.gov on the CMS website

Appendix E: Telehealth Maryland Medical Assistance Policy

Below is information regarding the Maryland Medical Assistance Program telemedicine reimbursement policy. For complete information on the telemedicine service model, provider and participant eligibility, covered services and reimbursement, and for online access to the Telemedicine Provider Addendum please refer to the 2014 Telemedicine Provider Manual at: https://mmcp.dhmh.maryland.gov/Documents/Telemed_Provider_Manual_Append_2014.pdf.

Maryland Medical Assistance Program Telemedicine Reimbursement

Effective October 1, 2014, the Maryland Medical Assistance Program began to reimburse approved providers for services rendered to Program participants via telemedicine statewide. Participants may be in the fee-for-service program, a managed care organization (MCO), or a long-term services and supports waiver program. Using "Hub-and-Spoke" models, providers mutually approved by DHMH may engage in agreements to both deliver care and bill Medicaid for approved telemedicine services, using fee-for-service reimbursement practices.

Billing Codes and Modifiers

Approved telemedicine providers must submit claims in the same manner the provider uses for in-person services (i.e., paper CMS 1500 forms or 832 electronic submission).

All telemedicine providers, both originating and distant, must bill the appropriate CPT code or revenue code with a -GT modifier when rendering services via telemedicine. The -GT modifier indicates the services were provided via an interactive audio and video telecommunication system.

Billing in the Telemedicine Program: Originating sites

Office Billers
- Using the -GT modifier, evaluation and management (E&M) codes 99201-99205; 99211-99215 for community outpatient services or 99281-99285 and 99288 for emergency room outpatient services; and
- If the service location is a physician's office: HCPCS code Q3014 for the telehealth originating site facility fee; or

Hospital Billers
- If the service location is a hospital: revenue code 0780 for the standard facility fee; or
- If the service location is a an out-of-state hospital: HCPCS code Q3014 for the telemedicine originating site facility fee

Billing in the Telemedicine Program: Distant sites
- E&M codes 99241-99245 99251-99255 for consultation services along with the appended –GT modifier.

Please note: distant site providers should NOT bill the Q-code or the 0780 revenue code.

For more information on Physicians' Services billing, you may consult the 2014 Physicians' Services Provider Fee Manual at: dhmh.maryland.gov/providerinfo.

Eligible Providers and Enrollment in the Telemedicine Program

Providers interested in participating in the telemedicine program must already be enrolled as Medicaid Providers. If you are not enrolled as a Medicaid Provider, visit: dhmh.maryland.gov/providerinfo

Interested providers enrolled in the Medicaid Program must complete and submit a Telemedicine Provider Addendum. Providers are expected to outline their plan for participation using this addendum.

Appendix F: Md. Code Ann., Health General §15–105

Code of Maryland

Article - Health - General

§15–105.2.

 (a) The Program shall reimburse health care providers in accordance with the requirements of Title 19, Subtitle 1, Part IV of this article.

 (b) (1) (i) In this subsection the following words have the meanings indicated.

  (ii) "Health care provider" means a person who is licensed, certified, or otherwise authorized under the Health Occupations Article to provide health care in the ordinary course of business or practice of a profession or in an approved education or training program.

  (iii) 1. "Telemedicine" means, as it relates to the delivery of health care services, the use of interactive audio, video, or other telecommunications or electronic technology:

   A. By a health care provider to deliver a health care service that is within the scope of practice of the health care provider at a site other than the site at which the patient is located; and

   B. That enables the patient to see and interact with the health care provider at the time the health care service is provided to the patient.

  2. "Telemedicine" does not include:

   A. An audio–only telephone conversation between a health care provider and a patient;

   B. An electronic mail message between a health care provider and a patient; or

   C. A facsimile transmission between a health care provider and a patient.

  (2) To the extent authorized by federal law or regulation, the provisions of § 15–139(c) through (f) of the Insurance Article relating to coverage of and reimbursement for health care services delivered through telemedicine shall apply to the Program and managed care organizations in the same manner they apply to carriers.

  (3) Subject to the limitations of the State budget and to the extent authorized by federal law or regulation, the Department may authorize coverage of and reimbursement for health care services that are delivered through store and forward technology or remote patient monitoring.

  (4) The Department may specify by regulation the types of health care providers eligible to receive reimbursement for health care services provided to Program recipients under this subsection.

  (5) The Department shall adopt regulations to carry out this subsection.

§15–106.

(a)   (1)   In cooperation with the professional organizations whose members provide health care under the Program, the Secretary shall establish a system of review for all health care that is provided.

(2)   The review shall include a study of the quality of care and the proper use of the services by the Program recipient or the provider.

(b)   A member of an appointed committee of any of these professional organizations or an appointed member of a committee of a medical staff of a licensed hospital shall have the immunity from liability described under § 5-628 of the Courts and Judicial Proceedings Article.

Appendix G: Barriers to Telehealth Implementation

The fact sheet below includes information compiled by MHCC regarding barriers to telehealth implementation. Sources for this information are included in footnotes within this document.

Barriers to Telehealth Adoption

Telehealth is the use of medical information shared through two-way video and other forms of telecommunication technology to improve a patient's health status.[58] There are many benefits to providing telehealth services that have the potential to result in reduced health care costs by addressing health issues before they require more costly interventions, reducing overhead costs associated with office visits, and allowing for immediate specialty consultations without the need for a separate appointment. However, there are also several barriers that result in a lack of adoption of telehealth initiatives.

Physician licensing

Regulations governing the provision of telehealth services vary by state; physician licensing regulations can vary depending on the state in which the physician and the patient are physically located. Some states require the physician to be licensed in both the state where they are located and the state in which the patient resides; in other states, the physician can pay a fee to practice across state lines. This lack of standardized guidelines can inhibit providers from providing telehealth services.[59]

Credentialing

In some instances, the credentialing process for telehealth services can be complicated and costly. The time and cost of administrative processes to credential providers to be able to provide telehealth services can be difficult for hospitals to initiate. [60, 61]

Liability

The law is unclear regarding liability and malpractice when providing telehealth services.[62] Liability insurance carriers define their own standards for coverage of telehealth practices, which may not be clearly outlined in the policy language. The physician must work individually with their insurance carrier to determine under what conditions, if any, they are covered for telehealth services.

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[58] Maryland Telemedicine Task Force, Final Report, October 2014. Available at:
http://mhcc.maryland.gov/mhcc/pages/home/workgroups/documents/tlmd/tlmd_ttf_rpt_102014.pdf.
[59] eVisit: Barriers to Telemedicine and How to Solve Them. Available at: http://evisit.com/barriers-to-telemedicine-and-how-to-solve-them/
[60] eVisit: Barriers to Telemedicine and How to Solve Them. Available at: http://evisit.com/barriers-to-telemedicine-and-how-to-solve-them/
[61] LeRouge, Cynthia and Garfield, Monica J. Crossing the Telemedicine Chasm: Have the U.S. Barriers to Widespread Adoption of Telemedicine Been Significantly Reduced?. Int. J. Environ. Res. Public Health 2013, 10, 6472-6484; doi:10.3390/ijerph10126472
[62] LeRouge, Cynthia and Garfield, Monica J. Crossing the Telemedicine Chasm: Have the U.S. Barriers to Widespread Adoption of Telemedicine Been Significantly Reduced?. Int. J. Environ. Res. Public Health 2013, 10, 6472-6484; doi:10.3390/ijerph10126472

Reimbursement

Reimbursement models are largely based on face to face encounters and reimbursement for telehealth services is limited. CMS will reimburse for telehealth services only if they meet specific eligibility criteria; though some commercial payers are beginning to cover telehealth services more broadly, blanket reimbursement for telehealth services does not exist.[63, 64]

Financial

The return on investment of providing telehealth services is still not clear. This coupled with the large up-front costs for technology, credentialing, and licensing and reimbursement issues can make it difficult to justify implementation of telehealth services.[65]

Technology

Interoperability of health technology still lacking; without widespread connectivity of health technology, physicians are unable to gain access to real-time medical data to inform clinical decision making.[66] In addition, lack of broadband access in the United States limits access of high demand video and store-and-forward services which require expansive health networks. Also, the integration and connectivity of health information required to provide telehealth services requires defined standards for data confidentiality and integrity when providing telehealth services. [67]

Organization Structure

Current organizational structures are set up to support face-to-face physician encounters. An organization must have a strategic vision and infrastructure that supports telehealth as part of the standard delivery of care and not as an adjunct project. An organization must also have access to a sufficient number of providers that are able and willing to provide telehealth services and are able to support the needs of the organization as they implement and grow their telehealth services.[68]

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[63] MHealth News: The top three barriers to telehealth adoption. Available at http://www.mhealthnews.com/blog/top-three-barriers-telehealth-adoption
[64] eVisit: Barriers to Telemedicine and How to Solve Them. Available at: http://evisit.com/barriers-to-telemedicine-and-how-to-solve-them/
[65] LeRouge, Cynthia and Garfield, Monica J. Crossing the Telemedicine Chasm: Have the U.S. Barriers to Widespread Adoption of Telemedicine Been Significantly Reduced?. Int. J. Environ. Res. Public Health 2013, 10, 6472-6484; doi:10.3390/ijerph10126472
[66] MHealth News: The top three barriers to telehealth adoption. Available at http://www.mhealthnews.com/blog/top-three-barriers-telehealth-adoption
[67] LeRouge, Cynthia and Garfield, Monica J. Crossing the Telemedicine Chasm: Have the U.S. Barriers to Widespread Adoption of Telemedicine Been Significantly Reduced?. Int. J. Environ. Res. Public Health 2013, 10, 6472-6484; doi:10.3390/ijerph10126472
[68] LeRouge, Cynthia and Garfield, Monica J. Crossing the Telemedicine Chasm: Have the U.S. Barriers to Widespread Adoption of Telemedicine Been Significantly Reduced?. Int. J. Environ. Res. Public Health 2013, 10, 6472-6484; doi:10.3390/ijerph10126472

Appendix H: Summary of Telehealth Implementation Considerations

The chart below summarizes key telehealth implementing considerations identified in this brief. Considerations are grouped by categories, such as legal, technology, financial, etc.

TELEHEALTH IMPLEMENTATION CONSIDERATIONS				
Deployment	**Organizational Change**	**Legal and Security**	**Technology**	**Financial Sustainability**
Cultural readiness • Comfort with use of technology • Coordinating with other facilities	**Adapting Workflow** • Develop flow chart • Changing physician and nurse routines • Seamless integration into routine	**Legal Considerations** • Professional liability insurance • Provider credentialing • Provider contracting	**Assessment of appropriate technology** • Project needs • Implementation setting • Integration of EHRs	**Provider Reimbursement** • Establish provider contract with hospital • Identify telehealth services that are covered by health insurance and carriers that provide coverage including Medicaid, Medicare and Tricare
Leadership • Administration commitment • Physician champion • Nurse champion	**Training Staff** • Hold educational training meetings • Develop online Videos • Training by mentor/champion	**Security Issues** • Data ownership • Privacy and security protections	**Technology Functioning** • Bandwidth and Wi-Fi connectivity • Weekly technology checks	**Sustainability** • Joint investment of hospital and LTC facilities • Include in hospital budget as investment in meeting global budget incentives
Assembling Resources • Existing technology • Clinical staff • Leveraging existing systems • CRISP			**Technology Staff** • Coordination with IT staff from each entity • Ability to train clinical staff • Ability to provide support hospital or LTC facility	
Educating Patients and Families • Marketing material • Videos • Family engagement • Meetings with case worker • Complete consent document				

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