Introduction/Statement of Need

Diseases of the Ear, Nose and Throat

Conditions and Diseases of the Ear, Nose and Throat (ENT) are broad and include but are not limited to Allergies, Dizziness and Vertigo, Deviated Septums, Hearing Loss, Ear Infections, Eardrum Perforations, Sinusitis, Facial Paralysis, Snoring, Dysphagia, Tinnitus, Taste and Smell Disorders and Tonsil and Adenoid Problems (U.S. National Library of Medicine, 2015). Head and Neck Cancer is also categorized as a type of ENT disease and includes cancers of the mouth, nose, larynx (throat), lips and salivary glands (National Cancer Institute, 2013).

Head and Neck Cancer accounts for roughly 3% of all cancers in the United States, with an estimated 59,340 individuals developing the disease and 12,290 individuals dying from the disease each year (National Cancer Institute, 2013). There is no standard or routine screening test currently in place for Head and Neck Cancer (National Cancer Institute, 2013). There is also a limited amount of focus on secondary prevention when it comes to cancers of the head and neck (National Cancer Institute, 2013). Currently only 14% of the National Cancer Institute's research funds for Head and Neck Cancer go towards Early Detection, Diagnosis and Prognosis (National Cancer Institute, 2013). When diagnosed at an early stage while the cancer is localized and not spread, treatments for Head and Neck Cancer have a higher probability of success (National Cancer Institute, 2013).

Factors that Contribute to Disease Burden

Tobacco and alcohol use are the two leading risk factors associated with cancers of the head and neck (National Cancer Institute, 2013). In addition, Human Papillomavirus (HPV), a type of sexually transmitted disease, has been identified as a cause of over half of all cases of Oropharyngeal Cancer, a type of Head and Neck Cancer (National Cancer Institute, 2013).

Race, socioeconomic status, age and locality are also all significant determinants of Head and Neck Cancer diagnosis and survivorship. According to a 2013 retrospective cohort study that analyzed treatment patterns and survivorship among low-income Medicaid patients with Head and Neck Cancer in Georgia and California, fewer than one-third of Medicaid patients received a diagnosis at an early stage (Subramanian et al., 2013). In addition, black patients were less likely to receive timely treatment and more likely to die than their white counterparts, even after controlling for all other factors (Subramanian et al., 2013). This disparity was also seen among older patients, who faced higher mortality rates than their younger counterparts (Subramanian et al., 2013). The study also found that Georgia Head and Neck Cancer patients had approximately double the odds of dying within a 24 month period compared to patients in California (Subramanian et al., 2013).

Organizational Background and Community Being Served

Grady Memorial Hospital is the premier safety net hospital in Atlanta and considered by many as the backbone of metro Atlanta's healthcare system. Grady Memorial Hospital predominately serves low-income and uninsured African American residents of Fulton and Dekalb county and serves for many as the only means of accessing specialty and diagnosis services. Grady has a full service ENT Clinic that evaluates, diagnoses, and treats a wide range of otolaryngological conditions and diseases, including Head and Neck Cancer. Grady's ENT Clinic currently serves roughly 2500 patients each year, with approximately 15% of those patients having Head and Neck Cancer. Due to the volume of late stage Head and Neck Cancer patients and patients with other advanced ENT diseases, the current wait time within Grady's ENT Clinic exceeds 8 weeks.

While ENT specialty care options are limited for low-income metro Atlanta residents, primary care services through community health centers are more prevalent and easily accessible for these residents. One of their community health center options is the Healing Community Center. Healing Community Center is a Federally Qualified Health Center located in Northwest Atlanta that provides primary care services for low-income adults, as well as a range of other services spanning from behavioral health to pediatrics. Healing Community Center accepts all patients, regardless of income or insurance status, and follows a Sliding Fee Scale model for payments. Healing Community Center currently services 3500 adult and child patients per year, with approximately 35% of those patients suffering from ENT issues. While Healing does provide ENT services and has an Otolaryngologist visit the center every month, the specialist is only able to see 10-15 patients per visit, which has resulted in current wait times of over 2 months.

Both Grady Memorial Hospital and Healing Community Center are located and serve almost exclusively Medically Underserved Areas and Populations. Medically Underserved Areas and Populations are defined by

HRSA as areas or populations that have too few medical providers, high infant mortality rates, high poverty rates and/or a high elderly population (HRSA, 2016). The majority of patients that visit Grady and Healing live in zip codes such as 30314 that are designated by HRSA as underserved areas (HRSA, 2016).

Access to Care Issues Among the Community being Served

Another obstacle that low-income ENT patients in the metro Atlanta area confront beyond limited financially-viable ENT specialty care options is lack of reliable private transportation. A 1994 cross-sectional study that looked at obstacles in seeking care among 3,897 Grady Hospital patients found that walking or using public transportation to receive medical care was a significant predictor of not having a regular source of care (Odds Ratio of 1.44), and patients who did not use private transportation were more likely to delay care (Odds Ratio 1.45) (Rask et al., 1994). For many Grady Hospital and Healing Community Center patients, the only means of accessing care is via the Metropolitan Atlanta Rapid Transit Authority (MARTA). Grady Hospital is located across the street from the Georgia State MARTA station and Healing Community Center is located nearby the H.E. Holmes MARTA station.

Increasing Access to Care through Telemedicine

Telemedicine, or Telehealth, is defined as the delivery of healthcare information and services via telecommunication to a patient from a provider located in a remote location (American Telemedicine Association, 2015). Telemedicine can be used as a means of expanding access to secondary preventative services such as ENT screenings for patients living in medically underserved locations (Berkeley Research Group, 2015).

The Telemedicine program under Emory School of Medicine's Urban Health Initiative (UHI) is a new, student-led program that works with healthcare organizations across Atlanta to increase access to quality care for medically underserved populations. The program (under the guidance of Dr. Charles Moore, who is the Co-Director of UHI) has been working with Grady Memorial Hospital and Healing Community Center over the past several months to develop a strategic plan for implementation of a store-and-forward telehealth program for ENT patients at both health organizations. Through this program, at-risk patients at the Healing Community Center will have images of the inside of their ear, nose and throat taken via a video otoscope and have those images stored and forwarded electronically to an Otolaryngologist at Grady Memorial Hospital's ENT Clinic for review and potential referral.

Funding Proposal

UHI's Telemedicine Program is requesting $5,000 to help launch our Ear, Nose and Throat Telehealth Screening program at the Healing Community Center and Grady Memorial Hospital's ENT Clinic. The funds will be used to purchase the equipment and software necessary to set up a clinically compliant store-and-forward telehealth system at the two locations.

Goals and Objectives

The Urban Health Initiative Telemedicine Program's primary goal is to increase equitable access to ear, nose and throat medical care services to medically underserved populations in Atlanta, Georgia.

The project's objectives are to:
1. Install telehealth equipment and software within the primary care clinic at Healing Community Center and the ENT clinic at Grady Memorial Hospital.
2. On-board and train the appropriate staff members on how to use equipment and software and how to appropriately run the program.
3. Initiate screening of patients at Healing Community Center and forward their results to Grady's ENT clinic for review and referral.
4. Monitor and Evaluate patient and provider satisfaction of telehealth program.

Project Objective 1: Purchase and Installation of Telehealth Equipment and Software

Objective 1 will involve purchasing and installing the telehealth equipment and software needed for the project. The UHI Telemedicine program has already contacted and gotten a quote from AMD Global Telemedicine, the world's leading supplier of telehealth software and equipment, and will be working with them for any technical needs. The UHI Telemedicine program also has a relationship with GA Partnership of Telehealth to ensure appropriate and compliant installation of all equipment and software.

Project Objective 2: On-board and Train the Appropriate Staff Members

Objective 2 will involve onboarding and training of the appropriate staff members to familiarize all engaged parties with the operations component of the program. Appropriate staff includes all providers at Grady ENT Clinic and Healing Community Center that will be involved at any capacity with the project, as well as all current and new UHI Telemedicine team members.

Project Objective 3: Initiate Patient Screenings

Project Objective 3 will involve the introduction of Healing Community Center patients to the telehealth program. More specifically, this will involve the taking, storing, forwarding and interpretation of images of the ear, nose and throat. If image results present an urgent ENT issue, patients will then get referred to Grady Memorial Hospital's ENT Clinic.

Project Objective 4: Monitoring and Evaluation

Project Objective 4 will include the ongoing monitoring and evaluation of the telehealth program once implemented. This will occur quarterly and involve feedback from both patients and providers on the quality and performance of the program.

The timetable for the proposed objectives is presented below:

Table 1. Four Phases of UHI Telemedicine Project

Phase	Time Period	Objective
1	June 2016	Purchase and Installation of Equipment and Software
2	June 2016	On-Boarding and Training of Appropriate Staff
3	July 2016	Initiation of Patient Screenings
4	Ongoing	Monitoring and Evaluation of Program

Methods/Implementation Plan

In order to appropriately establish the activities necessary to increase patient access, the UHI Telemedicine Program referenced and built upon the four aforementioned program objectives of purchasing and installing equipment and software, on-boarding and training appropriate staff, initiating patient screenings and monitoring and evaluating the program. The activities done to achieve these objectives will be carried out in four primary phases over the Summer of 2016, with monitoring and evaluation occurring continuously throughout the process after implementation is complete.

Phase 1 Activities: Purchase and Installation of Equipment and Software

The UHI Telemedicine program will work with technicians at AMD Global Telemedicine to purchase, deliver and install the equipment and software necessary for the program. The UHI Telemedicine program will purchase one AMD 2000 Video Otoscope Camera from AMD Global Telemedicine, which will be installed in an exam room within the primary care department at the Healing Community Center. The program will also purchase AGNES Interactive Web-based software and Telehealth Consult software from AMD Global Telemedicine for both sites. We will use the technical assistance of a Health IT specialist at Grady Memorial Hospital and the Healing Community Center to ensure that the web-based and consult software is installed appropriately and in compliance with Grady, Healing and federal policy on computers at both work stations. In addition, UHI Telemedicine program team members will continuously work with Georgia Partnership of Telehealth to ensure that compliance is met.

Phase 2 Activities: On-board and Training of Appropriate Staff

In concurrence with installation of required equipment and software, all Grady and Healing providers and staff members involved with the project, as well as all current and new UHI Telehealth team members, will be properly on-boarded onto the project. More specifically, this onboarding process will include Otolaryngologists at Grady ENT Clinic, Mid-level providers within the primary care department at Healing Community Center, Health IT specialists at both sites, and clinic administrators at both sites. The onboarding will involve training on both how to use the purchased equipment and software, as well as all program implementation requirements. Providers and administrators will be trained on which patients will receive

screening, how to store images, and how quickly to forward and interpret images. In addition, the revenue cycle team at both locations will be informed on how to code and bill for the telehealth services.

Phase 3 Activities: Initiation of Patient Screenings

Phase 3 activities will be conducted in three sub-phases: Taking of Images, Storing and Forwarding of Images, and Interpretation of Images.

Taking of Images:

All Adult and Child patients presenting with an ENT-related issue will be screened once a year within the primary care department at Healing Community Center. This screening will take place in an exam room by a nurse practitioner or mid-level provider after the patient's vitals are taken and is projected to take approximately 2 minutes. According to data from the Healing Community Center, 35% of adult and child patients present with ENT-related issues each year, which will result in approximately 1,225 patients being screened per year in year 1 and 2,450 patients being screened by 2017 as Healing Community Center continues to expand.

Storing and Forwarding of Images:

Upon taking the ear, nose and throat images, the nurse practitioner or mid-level provider will immediately upload the images onto the AGNES Interactive Web-based and Telehealth Consult software on the computer in the exam room at the same time as they are entering in any other important patient information. The nurse practitioner or mid-level provider should then forward the images via the software to the Otolaryngology department at Grady Memorial Hospital. This entire process is estimated to take approximately 3 minutes per patient.

Interpretation of Images and Referral:

Once the images have been forwarded to the ENT clinic at Grady, an allotted timeframe each day will be set-aside for a specialist to interpret the received images. The length and time of this timeframe will be predetermined by Dr. Moore and any other project-affiliated specialist at the Grady ENT clinic. Once images are reviewed, the specialist will produce a recommendation based on the severity of the ENT issue, and if necessary, will notify Healing Community Center that the patient needs to be referred to the Grady ENT clinic. If no significant ENT disorder is presented, the patient will be seen back in a year for another screening at Healing if medically necessary. Notification of a referral decision will be made the same day as the images are taken.

Phase 4 Activities: Monitoring and Evaluation

Phase 4 activities will include quarterly monitoring of: patient utilization of the telehealth system, the number of patients being referred to Grady ENT clinic, the number of patients presenting with ENT diseases (and at what stage) and the timing of each encounter. Each quarter, benchmarking of provider and patient satisfaction with the program will also be conducted. Provider satisfaction will be evaluated by assessing work flow improvements, ease of device/software usage, and the quality of images being taken. Patient satisfaction will be assessed by evaluating experiences with provider interaction and encounter time. Quarterly monitoring will be conducted internally by a designated UHI Telemedicine Program student team member. Provider and Patient satisfaction will be assessed through qualitative surveys.

Anticipated Results and Impact on Healthcare Delivery

The anticipated results of the program can be broken down by anticipated short, intermediate and long term outcomes.

Anticipated Short Term Outcomes

The primary anticipated short-term outcome of the UHI Telemedicine program will be an increase in the number of patients being screened for conditions and diseases of the ear, nose and throat. Because no current screening program is in place at Healing Community Center or Grady, this result will not be difficult to achieve.

Anticipated Intermediate Term Outcomes

The primary anticipated intermediate outcome of the UHI Telemedicine program is decrease in wait times for ENT patients at both Healing and Grady. If Healing patients no longer have to rely solely on monthly visits by an affiliated Otolaryngologist and only patients with moderate to severe ENT-related are referred to Grady's ENT department, waitlist are projected to decrease for both health organizations.

Anticipated Long Term Outcomes and Overall Impact on Healthcare Delivery

There are two primary long-term outcomes for the UHI Telemedicine project. The first is to decrease the prevalence of late stage ENT diseases, particularly Head and Neck Cancer, among medically underserved individuals in the Atlanta area. Through ongoing monitoring and evaluation of the program, the UHI team will be able to track any changes in the number of late-stage ENT diseases that are presented at the Healing Community Center and Grady.

The second primary long-term outcome of this project will be expansion of the project to other Grady-affiliated community health centers. Healing Community Center is a perfect center to pilot this program due to Dr. Moore serving as both the Chief of Service of Otolaryngology - Head and Neck Surgery at Grady and as the CEO and Founder of Healing Community Center. If the UHI Telemedicine project proves to be successful at Healing Community Center (this success will again be regularly monitored and evaluated by the UHI Telemedicine student-led team), the program plans on expand the project to all seven of Grady's satellite community health centers.

By implementing a telehealth program at two health systems dedicated to serving medically underserved populations, the potential for successful population health management of this project is grand. In this case, telehealth services will be used to solve patient access issues revolving around lack of transportation, lack of insurance and lack of availability of specialty care services among medically underserved populations in the metro Atlanta area experiencing ENT complications. In addition, this program will address gaps in secondary preventative and early detection services, in addition to provider inefficiencies involving excessive wait times and poor patient flow that both healthcare institutions are currently experiencing.

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