

Open camera or QR reader and
scan code to access this article
and other resources online.



Society for Education and the Advancement of Research in Connected Health Abstracts SEARCH 2022 – The National Telehealth Research Symposium November 16–18, 2022 Virtual Meeting

Please note that abstract numbering is not consecutive.
There are no missing abstracts.

SEARCH PRESENTATIONS

1. Disparities in Video Care Use Among Veterans with Cardiovascular Disease

Rebecca Tisdale MD MPA^{1,2}, Claudia Der-Martirosian PhD³,
Caroline Yoo MPH³, Karen Chu MS^{3,4}, Donna Zulman MD MS^{1,5},
Lucinda Leung MD PhD^{3,5}

¹Veterans Affairs Palo Alto Healthcare System/Center for Innovation to Implementation (Ci2i), Palo Alto, CA

²Department of Health Policy, School of Medicine, and Stanford Health Policy, Freeman Spogli Institute for International Studies, Stanford University, Stanford, CA

³Veterans Affairs Greater Los Angeles Healthcare System/Center for the Study of Healthcare Innovation, Implementation, & Policy (CSHIIP), Los Angeles, CA

⁴Veterans Emergency Management Evaluation Center (VEMEC), North Hills, CA

⁵Department of Medicine, Division of Primary Care and Population Health, Stanford University School of Medicine, Stanford, CA

⁶Department of Medicine, Division of General Internal Medicine & Health Services Research, UCLA David Geffen School of Medicine, Los Angeles, CA

Primary Email: rtisdale@stanford.edu

Background: Video care expanded rapidly in the Veterans Health Administration (VA) at the onset of the COVID-19 pandemic and remains a significant proportion of all VA care. Prevalence of cardiovascular disease (CVD) in Veterans is high, and ensuring access to care for CVD will likely require continued virtual care use. However, there remains a lack of evidence regarding which patients with these CVD conditions are more likely to receive video care. We sought to characterize use of video care for Veterans with two common cardiovascular diseases, heart failure and hypertension.

Methods: This retrospective cohort study included Veterans established in VA primary care with diagnoses of heart failure and/or hypertension between 3/11/2019 and 3/10/2022, i.e., in the calendar year prior to the novel Coronavirus (COVID-19) pandemic and for the first two pandemic years. We identified individual-level predictors of one or more video-based visits, accounting for patient- and site-level clustering with a two-level mixed-effects logistic regression model adjusted for sociodemographic and clinical covariates and time.

Results: Our analytic cohort comprised 3,807,820 Veterans with diagnoses of heart failure, hypertension, or both with 52 million visits. 456,901 Veterans had both heart failure and hypertension, 50,753 had heart failure only, and 3,300,166 had hypertension only. Veterans with heart failure and hypertension had an average baseline age of 71.6 years and mean Charlson Comorbidity Index of 3.0. 2.9% were female at birth, and 34.8% lived in a rural or highly rural setting.

In our multi-level logistic regression model, odds of using video care were highest during the first year of the pandemic, then declined in the second (AOR 15.3, 95% CI 15.1-15.4 and 11.5, 95% CI 11.3-11.6, respectively, compared to the pre-pandemic year). Male patients had lower odds of ever using video care than female patients (adjusted odds ratio [AOR] 0.73, 95% confidence interval [CI] 0.72-0.74). Age showed a gradient: patients 75 years or older had an AOR of 0.38 compared to those aged 18-44 years (95% CI 0.38-0.39). Rural-dwelling Veterans had lower odds of using video care than urban-dwellers (AOR 0.71, 95% CI 0.70-0.71). Veterans with heart failure had slightly higher odds of video care use than those with hypertension only (AOR 1.06, 95% CI 1.05-1.07).

Discussion: Veterans with CVD had a 15-fold increase in odds of use of video-based care in the first year of the COVID-19 pandemic. Male, older, and rural-dwelling Veterans had lower odds of using video care than their respective reference groups. Video care remains an important proportion of care delivered to Veterans with cardiovascular disease. Given lower odds of

video care among certain veteran groups, continued expansion of video care could make CVD services increasingly inequitable. As VA expands virtual care for CVD, these insights can inform equitable and effective triage of patients to virtual versus in-person care.

2. Telehealth-Assisted Home BP Monitoring for In-Center Hemodialysis Patients: A Pragmatic Implementation Study

Yoshitsugu Obi MD PhD¹, Yunxi Zhang PhD¹, Saurabh Chandra MD PhD²,
Maria Clarissa Tio MD MPH¹, Catherine Wells DNP¹, Neville Dossabhoy MD¹,
Tariq Shafi MBBS MHS^{1,3}

¹University of Mississippi Medical Center

²Center for Telehealth, University of Mississippi Medical Center

³Division of Kidney Diseases, Hypertension & Transplantation, Houston Methodist Hospital

Primary Email: yobi@umc.edu

Background: Home BP monitoring is essential to guide BP management for in-center hemodialysis (HD) patients but is exceedingly difficult to obtain in clinical practice. We designed a pragmatic feasibility study of a telehealth-assisted protocolized home BP monitoring program (TH-BP) at an academic dialysis clinic.

Methods: From 02/03/22 to 05/13/22, we referred 37 in-center HD patients to the TH-BP program, of which 25 started monitoring. All patients were provided a BP monitor with an appropriately sized cuff and a connected iPad. We averaged pre-HD sitting systolic BP (preSBP) over 30 days before and after TH-BP initiation and compared them with home SBP from the TH-BP.

Results: Patients had a mean age of 50 years and had been on dialysis for 6.5 years; 52% were females. The median (IQR) number of antihypertensives was 2 (1, 3). During a median follow-up of 63 days, the mean $\pm$ SD frequencies of TH-BP measurements (/day) were 1.1 ± 0.4 and 1.4 ± 0.9 on HD days and non-HD days, respectively. After TH-BP initiation, the 30-day preSBP was 146 ± 15 mmHg ($p = \text{NS}$ vs. the pre-TH-BP period). Home SBP was significantly lower than preSBP by 12 ± 18 mmHg ($p = 0.005$). Consistent results were observed with diastolic BP. Baseline patient characteristics did not predict patient willingness to participate in the TH-BP or the differences between preSBP and home SBP.

Discussion: This is the first report to demonstrate successful pragmatic implementation of home BP monitoring for in-center HD patients in a routine clinical setting. Our findings of lower home SBPs suggest that BP management based on dialysis BPs alone may overtreat.

This study is supported by the Office for the Advancement of Telehealth, Health Resources and Services Administration, U.S. Department of Health and Human Services under cooperative agreement award no. 2 U66RH31459-04-00. The information, conclusions, and opinions expressed are those of the authors and no endorsement is intended or should be inferred.

3. In-Person Versus Telehealth: Comparison of Behavioral Health Outcomes in Rural America

James Marcin MD MPH¹, Carly McCord PhD², Fred Ullrich BA³,
Kimberly Merchant MA³, Divya Bhagianadh MD³, Knute Carter PhD⁴,
Eve-Lynn Nelson PhD⁵, Kari Beth Law MD⁶, Jonathan Neufeld PhD⁷,
Annaleis Giovanetti MA⁵, Marcia Ward PhD³

¹UC Davis Health

²Department of Psychiatry and Behavioral Sciences and Educational Psychology, Texas A&M University

³University of Iowa

⁴Department of Health Management and Policy, University of Iowa

⁵University of Kansas

⁶Department of Behavioral Medicine and Psychiatry, West Virginia University, Morgantown, WV, USA

⁷University of Minnesota - Great Plains Telehealth Resource & Assistance Center

Primary Email: jpmarcin@ucdavis.edu

Background: Two large federally funded grant programs supported the evaluation of behavioral health outcomes in the United States: the Evidence-Based Tele-Behavioral Health Network Program (EB THNP) funded from September 2018 to August 2021 and the Substance Abuse Treatment Telehealth Network Grant Program (SAT TNGP) funded from September 2017 to August 2020. We sought to evaluate outcomes in symptoms of depression and anxiety across the 17 grantee programs and 95 associated sites, with each program providing data from patients receiving behavioral health care in-person or via telehealth. The aim of this study was to compare changes in objectively measured symptoms of depression and anxiety over time between the two cohorts.

Methods: The study design was a nonrandomized convenience sample across in-person and telehealth cohorts from sites with similar rural characteristics and during the same time period. Patient characteristics were to be collected at treatment initiation, and clinical outcome measures were to be collected at baseline and subsequent visits on patients where clinically appropriate. The validated clinical outcome measure instruments included the Patient Health Questionnaire-9 (PHQ-9) for depression symptoms and the Generalized Anxiety Disorder-7 (GAD-7) scale for anxiety-related symptoms. Changes between baseline and one-month scores were analyzed using multivariable, hierarchical regression analyses.

Results: For the in-person cohort, there were 752 patients with PHQ-9 and 652 patients with GAD-7 data. For the telehealth cohort, there were 770 patients with PHQ-9 and 638 with GAD-7 data. The improvements from baseline to one-month scores were similar between the in-person and telehealth cohorts for both the PHQ-9 and GAD-7 scores. Individuals with higher baseline scores on both measures demonstrated the greatest decrease (improvements) in scores. Upon adjusting for baseline scores, patient demographics, insurance status, and clustering within grantee program, the modality of care was not found to be significantly associated with change in anxiety or depression symptoms.

Discussion: In our very large pragmatic study comparing behavioral health treatment delivered to a population of patients in rural, underserved communities, we found no clinical or statistical differences in improvements in depression or anxiety symptoms as measured by the PHQ-9 and GAD-7 between treatments delivered in-person or via telehealth.

4. Pediatric Versus Non-Pediatric Trained Providers and Their Antibiotic Prescribing Practices in the Setting of Telemedicine

Kathleen Jackson MD¹, Amanda Price MD¹, Shana Bondo MD MSPR¹, Carrie Busch MD MSCR¹, S. David McSwain MD MPH²

¹Medical University of South Carolina

²UNC Health

Primary Email: jackkath@musc.edu

Background: Telemedicine research has shown that virtual visit encounters provide different prescribing rates for antibiotics and diverse antibiotic management in infectious processes for pediatric and adult patients (1,2). Recent literature does not directly approach differences in providers' training as it relates to diagnoses and prescriptions for pediatric patients. A unique retrospective comparison was made from November 1, 2019 – January 31, 2021 at the Medical University of South Carolina, a National Telehealth Centers of Excellence designated by the Department of Health and Human

Services. An analysis of diagnoses that routinely require a hands-on physical exam or laboratory test were evaluated along with providers' credentials. Standard of care for evaluation of infections utilized in the study were vital signs, rapid strep swab, oropharynx exam, lung auscultation or tympanic membrane visualization (3).

Methods: Our objective was to assess whether being pediatric trained decreased the likelihood of prescribing antibiotics for pediatric infections on a telemedicine platform. A retrospective review was completed for virtual pediatric visits categorized by ICD-10 codes as bronchiolitis, otitis media (OM), pharyngitis, sinusitis, and upper respiratory infections (URIs) of patients less than 18 years old. The pediatric providers were labeled based on being general pediatricians or pediatric nurse practitioners by state credentialing. The non-pediatric trained providers were physician assistants completing an emergency medicine fellowship at the given institution. A total of 5,035 visits were identified with the ICD -10 codes described with 3,858 visits completed by non-pediatric trained providers and 1,177 by pediatric trained providers.

Results: During the time 667 (13%) antibiotic prescriptions were written. Less than 25% of the visits were completed by pediatric trained providers, which was adjusted for in the analysis. Patients diagnosed with OM were given a prescription for every visit without a difference based on the provider's training. Non-pediatric trained providers were more likely to prescribe antibiotics for sinusitis ($p=0.04$), pharyngitis ($p<0.005$), and URIs ($p=0.02$) compared to their counterparts.

Discussion: Pediatric telemedicine visits for common infections that could require antibiotic management showed majority of cases did not receive antibiotic. If antibiotics were prescribed, they were more likely to be prescribed by non-pediatric trained providers for pharyngitis, sinusitis, and URIs. Although pediatricians prescribed antibiotics at a lower rate, training did not change prescriptions for otitis media. The general push for antibiotic stewardship over pediatric telehealth has shown improvement but getting both present and future medical providers to routinely utilize guideline-concordant antibiotic management is essential.

5. New Frontiers in Telehealth Research: A National Telehealth Data Warehouse

Jason Goldwater MA MPA¹, Yael Harris PhD MHA¹, Yunxi Zhang PhD², Saurabh Chandra MD², Richard Summers MD²

¹Laurel Health Advisors

²University of Mississippi Medical Center

Primary Email: jgoldwater@lh-advisors.net

Background: The University of Mississippi Medical Center, under a Telehealth Center of Excellence Grant funded by the Department of Health and Human Services' (HHS) Health Resources and Services Administration (HRSA) is working with Laurel Health Advisors to coordinate and standardize telehealth data to create a National Telehealth Data Warehouse. The purpose is to establish a central data repository that enables access to data related to telehealth services from multiple, diverse sources including payers, providers, and systems. Collectively, the Telehealth Data Warehouse will allow organizations to extract useful information that can inform program operations, financial decisions, and policy.

Methods: UMMC developed a data dictionary to standardize the format for the data files that would be stored in the Warehouse. The data dictionary was based on the format developed by the Center for Telehealth and eHealth Law (CTEL), which undertook this activity in 2020 to collect data to support their national cost-benefit analysis of telehealth during COVID-19 study that was released in 2021. CTEL gathered data from several synchronous telehealth programs that provided data elements, including: patient demographics, patient diagnoses, patient procedures, patient medical history, insurer, and the amount

SEARCH PRESENTATIONS

reimbursed to the healthcare provider. The Warehouse will be created in Microsoft Azure with the data being initially stored and loaded through Azure Synapse. Validation checks will be present as the data is loaded to ensure fidelity to the data dictionary format. The Warehouse will follow a top-down approach that synergizes the various data files that are submitted and provide a single source of telehealth encounter data for analysis. UMMC will also create a public-facing website that provides information regarding the warehouse in addition to a dashboard that provide the latest statistics on telehealth utilization.

Results: The use of a standardized national telehealth data set can assist researchers will exploring how telehealth was leveraged to support health-care delivery during the public health emergency and provide preliminary data to support future research on telehealth efficacy across the healthcare delivery system not only during a national emergency but for sustained utilization post-pandemic as well. Newly adopted and modified telehealth training modalities were assessed as essential components of the effective implementation of telehealth programs. It can also provide information on the various characteristics that affect an individual’s likelihood of accessing and utilizing telehealth services, and how telehealth can be measured in terms of quality outcomes. There are an unlimited number of research topics suitable for the warehouse, and that will provide a means of conducting objective and comprehensive research.

Discussion: Access to the warehouse will require potential users to submit a data request with the following: the intent and scope of the research, the specific data elements requested, how the data will be secured; and plans for discarding the data once the research is complete. The request will have to be approved by a governing board led by UMMC and the request is only valid for the specific scope of the research in which the data is needed. The warehouse will follow federal guidelines to ensure that data cannot be traced to a specific individual, and access to the data will be free.

6. The Use of Telehealth To Meet Network Adequacy Requirements

Jason Goldwater MA MPA, Yael Harris PhD MHA

Laurel Health Advisors

Primary Email: jgoldwater@lh-advisors.net

Background: The Affordable Care Act (ACA) currently requires Qualified Health Plans (QHPs) offered through the Federally Facilitated Marketplace (also termed Health Marketplaces) to ensure a sufficient choice of providers and provide information to enrollees and prospective enrollees on the availability of in-network and out-of-network providers. Network adequacy standards are based on provider availability, the anticipated enrollment of the Medicare and Medicaid programs, and care delivery patterns. They must include an “adequate network of primary care providers, specialists, and other ancillary health care providers.” One potential care delivery method that could help insurers meet their network adequacy requirements in both urban and rural areas and assist them in delivering care more efficiently is telehealth. Through telehealth, patients and providers living in rural or underserved areas have better access to specialists, which increases their ability to ensure accurate, timely care

Methods: This research began with a comprehensive literature review, that was conducted in accordance with a prescribed review protocol that focused on the evaluation of network adequacy for Qualified Health Plans (QHPs), Medicare, and Medicaid, the use of telehealth services before and during COVID-19, and the use of telehealth on mental and behavioral health, cardiology, and rheumatology. Three electronic databases were used: Google Scholar, Academic Search Premier, and EBSCO, as well as news articles and issue briefs by organizations such as the Robert Wood Johnson Foundation and McKinsey and Company. The search focused on material published between 2008 and 2022. Geographic Information System (GIS) analysis was used to determine the geolocation of mental and behavioral health pro-

viders, and primary care providers within the states used for the study. Providers were clustered within specific regions of a state and were geocoded using their given practice address. To get an appropriate count within each census tract, the points representing the providers were joined to the shape-file containing the census tracts’ geographic boundaries and demographic conditions.

Results: The study showed a paucity of providers across the United States, particularly in areas designated as Micro, Rural, or CEAC (C (Counties with Extreme Access Considerations)). The seven states used in the analysis: Maine, Texas, Mississippi, Kentucky, Arizona, South Dakota, and California, had a lack of cardiologists, rheumatologists, and mental health professionals, despite higher than average rates among their population of conditions that would require these specialties. The analysis of the data led to a proposed methodology for network adequacy that incorporates the use of telehealth that employs a tiered-based approach that includes variables such as the use of broadband versus a 5G network, the CMS geographic classification for a county, the need for remote patient monitoring, and any other specific state requirements that should be added. Adjustments to network adequacy are derived by four distinct variables that account for the type of telehealth modality used, whether a high-speed network is available, the current CMS classification of their county, and any additional state requirements that need to be considered.

Discussion: The focus of this analysis was to understand the various components of network analysis, the mandated requirements as issued by both CMS and state legislatures, and how different telehealth modalities could be used to help issuers meet network adequacy requirements. The proposed model developed from this analysis is comprised of the following elements:

1. The percentage of credit given to an issuer for using telehealth should be based on the utilization and intensity of the service and whether telehealth can adequately substitute for an in-person visit.
2. In most cases, using telehealth as an on-demand service when needed by a patient will meet the appointment waiting time requirements as issued b CMS.
3. The use of remote monitoring devices should be given additional credit because there is more continuous care between a patient and a provider than videoconferencing or asynchronous modalities
4. Additional credit should be given to Micro, Rural, or CEAC-designated counties.

7. Using Remote Standardized Patients to Train Interprofessional Learners in Telehealth Care

Tina Gustin DNP CNS RN¹, Steven Haimowitz MD²

¹Old Dominion University

²Healthcourse, Inc./SP-ed

Primary Email: tgustin@odu.edu

Background: The pandemic induced rapid growth of care delivered through telehealth without critical consideration of provider training. Educators were challenged to prepare students from multiple disciplines and practicing practitioners on the nuances of a telehealth visit necessary for a safe and effective encounter. While online module-based learning proved to be effective, end users did not have the opportunity to practice their new skills in a safe, supportive, and real-time environment.

The use of standardized patients (SPs) is an established training technique in clinical education that can be useful for this type of experiential training and feedback. The collaboration between C-TIER, who provided all training, and SP-ed, specializing in remote SP-based education, was able to leverage this successful methodology into a digital offering that allowed all partici-

pants to engage in an authentic telehealth simulation from their connected devices.

Methods: Prior to participating in the SP session, learners completed a self-paced, asynchronous module-based training. Throughout the course learners participated in immersive experiences aimed at preparing them for telehealth practice: narrated PowerPoints, videos, evaluation tools, and group work. At course completion, learners were directed to select a pre-determined SP based on their profession: Pediatric Primary Care, Adult Primary Care, Social Work, Mental Health, Physical Therapy, Pharmacy, Anesthesiology. SP cases were built to include social determinants of health, with different genders, ages, and ethnicities. The SP experience was designed to assess learner competency in assessment, physical examination, medication reviews, patient education, and telehealth etiquette, each unique to the learner's profession. SP evaluations were completed using validated tools embedded in the course, including the Teaching Interpersonal Skills for Telehealth Checklist (TIPS-TC) which consists of 12 items on a five-point rating scale.

Results: To date, 204 digital SP sessions have been completed within two weeks of the online telehealth certification course. SP scenarios were purposefully developed for crossover, but were divided as follows:

- Adult Primary Care-education and prescribing (N=18)
- 2 abdominal pain cases: 1-adult (N=23); 1-pediatric (N=49)
- Physical Therapy-ankle pain (N=50)
- Social Work-rule out anxiety and suicidal ideation (N=29)
- Mental Health-prescribing (N=21)
- Anesthesiology-pre-operative (N=14)

94% of learners found their digital SP session to be more helpful / as helpful as face-to-face SP sessions. Initially the SP case was built for a 20-minute experience. Many learners requested additional time and the sessions have been extended. All students agreed / strongly agreed that the digital session was helpful in improving their overall telehealth skills. All participants agreed or strongly agreed that the remote session was helpful in improving their overall telehealth skills. Data from the TIPS-TC includes quantitative results on the five-point scale for the 12 items and qualitative data from coaching comments added by participants as available. The research will report results from the TIPS-TC evaluation instrument at the session.

Discussion: The incorporation of the SP experience into the certificate course has proven to be effective. Due to the national outreach of the certificate program learners from different time zones have been able to schedule their sessions at times that fit their schedule easily. Early data suggests that this type of telehealth training can be effectively and conveniently delivered through digital SP sessions which may easily integrate into onsite, online, or distance learning courses, and provide the ability to increase the scale of online graduate education to meet the current demands for telehealth training. It offers a simple and affordable way for universities who don't have access to SPs or are burdened by large class sizes and hybrid teaching models, to tap into a reliable and validated program. We will review SP recruiting, training, case design specific to telehealth encounters, as well as learner preparation, SP/learner scheduling, and learner outcomes in the presentation.

8. Examining Telehealth Use Among Hispanic Communities

Cynthia Williams PhD MHA PT¹, Di Shang PhD²

¹University of Central Florida

²University of North Florida

Primary Email: cynthia.williams@ucf.edu

Background: During COVID-19, through policy and reimbursement initiatives, telehealth was strongly encouraged to promote safe access to health-

care services. Difficulties in accessing healthcare services is a long standing challenge in the United States healthcare system and adding a telehealth platform can potentially exacerbate inequities. Health inequities are often delineated by races, ethnicities, geographic regions, socioeconomic status and other social determinants of health. While there were significant increases in telehealth use across racial and ethnic groups, the Hispanic community did not share this trend. The purpose of this study was to investigate demographic, socio-economic, education, and behavioral causes for low telehealth utilization among Hispanic communities.

Methods: The COVID-19 Research Database Consortium provided data for the study. The study period was March 2020 to April 2021. Office Ally database provided access to U.S. claims data from 100 million unique patients and 3.4 billion medical claims. The Analytics IQ PeopleCore Consumer database provided individual level data across demographics, behaviors, and economic indicators. Analytics IQ PeopleCore consumer database is a national representation of 242.5 million U.S. adults aged 18 and older. Descriptive statistics used an analysis of variance and chi-squared test for continuous and categorical variables, respectively, to compare demographic, socioeconomic and health behavior characteristics. Multiple logistic regression was used to determine the odds of using telehealth services.

Results: We examined 3,478,287 unique Hispanic persons, 16.6% used telehealth; 56% were female. Results suggested that across age groups, Hispanic patients who had a primary care physician (Odds Ratio, OR 1.1), higher incomes (OR 1.34), full-time employment (OR 1.1), and private insurance (OR 1.2) were more likely to use telehealth. Patients across age groups who had unhealthy behaviors such as smoking (OR 0.69), high alcohol consumption (OR 0.63) and high school education or less (OR 0.96) were less likely to use telehealth. Hispanic females were more likely than males (OR 0.94) to use telehealth in persons aged 65 years and older.

Discussion: COVID-19 magnified the burden of telehealth inequities in the Hispanic community. Social determinants of health do not differ between traditional and digital means to access to healthcare. Factors that affect traditional means to access care also affect digital means to access care. While federal policies promoted telehealth use, and overall telehealth use increased, the Hispanic community did not share in this benefit. Community based interventions must support vulnerable communities. Increasing access to telehealth must go beyond federal policy promulgation and include local, actionable interventions that encourage Hispanic groups to use telehealth. Therefore we recommend the following strategies: increase access to health insurance, primary care, and instilling digital access as foundational in the public health infrastructure.

9. Telehealth Utilization Among Medicaid Recipients with Chronic Diseases

Cynthia Williams PhD MHA PT¹, Di Shang PhD²

¹University of Central Florida

²Univ of North Florida

Primary Email: cynthia.williams@ucf.edu

Background: Despite the growing demand for telehealth services, Medicaid beneficiaries have not experienced the increase in utilization as noted in other populations. People enrolled in Medicaid Insurance programs often reflect individuals who experience substantial inequities in the healthcare system. The use of telehealth among this population is substantially lower than other insured groups and federal legislation and reimbursement efforts have not significantly mitigated inequity in this population. In this project, we provide an analysis of telehealth inequity among Medicaid recipients who also have chronic diseases. We examine demographic, socioeconomic and behavioral factors that contribute to inequities in access.

Methods: This project was conducted in partnership with a State of Florida Medicaid Managed Care program who provides managed care services

SEARCH PRESENTATIONS

through Medicaid and Medicare Advantage Insurance Plans. The study period includes March 2020 to December 2020. Variables of interest include insurance (Medicare, Medicaid, and Dual Eligible: Medicaid and Medicare), modality (audio, video, in-person), demographics (age, gender), geography (zipcode), and diagnosis (diabetes, chronic obstructive pulmonary disease, heart failure). We retrieved data from American Community Survey Census to examine socioeconomic factors and included persons whose income status are similar to those who qualify for Medicaid. Zipcode classification (urban or rural) were based on Rural-Urban Commuting Area Codes Data. Multiple logistic and linear regression, using R software, were used to examine study objectives.

Results: We examined claim records of 52,904 unique patients, 31,999 females. Among the patients in the study, 49% had one or more telehealth visits during the study period. Among the 49% of patients, 22,667 patients utilized video for telehealth visits, 1,020 patients utilized audio for telehealth visits, and 2,441 patients utilized both video and audio for telehealth visits. Medicaid patients are 8% less likely to use telehealth, while patients that have both Medicare and Medicaid are 7% more likely to use telehealth, as compared to Medicare only patients. Male patients are 22% less likely than females to use telehealth. Patients with diabetes are more likely to use telehealth than persons with chronic obstructive pulmonary disease (-5%) and heart failure (-14%). Patients in rural areas are 43% less likely to use telehealth. Among vulnerable communities, multiple linear regression suggests that education and race were statistically significant contributors to telehealth use, p -value <0.01

Discussion: Healthcare providers should be keenly aware of characteristics that contribute to low telehealth utilization among Medicaid recipients. It is particularly concerning since the literature suggest that when vulnerable communities engage in telehealth disease management programs, there is little to no disparity in quality outcomes. We make several recommendations for providers and professionals who care for persons with Medicaid patients with chronic diseases to promote readiness of receive telehealth based care. Our recommendations include broadband internet access, education, and team approach that spans in-person and telehealth use.

10. Environmental Impact of Statewide University Telehealth Use for Ambulatory Services During COVID-19 Pandemic

Sristi Sharma MD MPH, Peter Yellowlees MBBS MD, Christine Gotthardt, Marie S. Luce MD MPH, Mark V. Avdaloovic MD MAS, James Marcin, MD

University of California, Davis

Primary Email: srsharma@ucdavis.edu

Background: Previous studies have documented patients' travel distances and time savings, reductions in out-of-pocket costs, and a positive environmental impact of using telehealth services for ambulatory care visits. However, these studies have focused on smaller programs prior to the expanded use of telehealth during the COVID-19 pandemic. Thus, the objective of this study was to calculate the travel distance, time, costs saved, and greenhouse gas emissions avoided following the increased use of ambulatory telehealth services within five large University of California (UC) healthcare systems during the COVID-19 pandemic.

Methods: We analyzed retrospective ambulatory telehealth data between 1st March 2020 and 28th February 2022 at the 5 UC healthcare systems. Travel distances and times saved were calculated using the round-trip distance that the patient would have traveled for an in-person visit. Travel costs saved were calculated using Internal Revenue Services' (IRS) 2022 annual standard mileage reimbursement rates. Greenhouse gas emissions were estimated using the U.S. Environmental Protection Agency (EPA) and the Bureau of Transportation's estimated average vehicle emissions rates in grams per mile per vehicle in the U.S. for 2021.

Results: 3,043,369 ambulatory telehealth encounters were included in the study. The total round-trip distance and travel time saved from these encounters were 53,664,391 miles and 1,788,813 hours or 204 years, respectively. Based on IRS's 2022 mileage rates, the total travel cost saved was \$33,540,244. These translated to 17.6 miles, 35.3 minutes, and \$11.02 per encounter. The use of telehealth for ambulatory services during this time eliminated 21465.8 metric tons of carbon dioxide, 14.1 metric tons of total hydrocarbons, 212.3 metric tons of exhaust carbon monoxide, and 9.3 metric tons of exhaust nitrogen oxides emissions.

Discussion: Telehealth use in a statewide university for ambulatory services during COVID-19 had a positive impact on patient travel distance, time, and costs, as well as greenhouse gas emissions. When determining telehealth as a service modality for a patient, the significant distance, time, and cost savings should be considered. Additionally, telehealth should be considered a mechanism to combat climate change.

11. The Role of Telehealth in Chronic Disease Management: A National Observational Study Comparing Primary Care Visit Modality for Veterans With and Without Type 2 Diabetes

Cynthia Hou MS,^{1,2} Lucinda Leung MD, PhD^{1,3}, Karen Chu MS^{1,6}, Caroline Yoo MPH¹, Rashmi Mullur MD^{4,5}, Claudia Der-Martirosian PhD^{1,6}

¹Center for the Study of Healthcare Innovation, Implementation & Policy, Veterans Affairs Greater Los Angeles Healthcare System, Los Angeles, CA, US

²Fielding School of Public Health, University of California Los Angeles, Los Angeles, CA, US

³Division of General Internal Medicine-Health Services Research, David Geffen School of Medicine, University of California Los Angeles, Los Angeles, CA, US

⁴VA Greater Los Angeles Healthcare System, Los Angeles, CA, US

⁵Division of Diabetes, Endocrinology & Metabolism, David Geffen School of Medicine, University of California Los Angeles, Los Angeles, CA, US

⁶Veterans Emergency Management Evaluation Center, US Department of Veterans Affairs, North Hills, CA, US

Primary Email: cynthiagh@g.ucla.edu

Background: The COVID-19 pandemic initiated a major shift from in-person to telehealth visits. Allowing for close remote monitoring, telehealth is particularly effective for managing patients with chronic diseases such as type 2 diabetes (T2D). The Veterans Health Administration (VA) cares for the Veteran population, where 1 in 4 have diabetes. It has invested heavily in telehealth services, demonstrating positive T2D-related outcomes such as stable A1C levels in short-term studies. Less is known about whether differential patterns of telehealth use exist among patients with and without diabetes across the entire Veteran population, especially after the onset of the pandemic. Our study compares the utilization patterns of telehealth services in primary care (PC) between T2D and non-T2D VA patients nationwide, 24-months post-COVID-19 onset in the U.S. (March 16, 2020-March 16, 2022).

Methods: This nationwide retrospective cohort study using VA administrative and clinical data compares the monthly percent of telehealth use between T2D and non-T2D patients, during the 24-month post-COVID-19 study period. A total of nearly 6.5 million VA patients with over 73 million PC visits were included in analyses. T2D patients were defined as having one inpatient diagnosis or two outpatient diagnoses of type 2 diabetes mellitus during the two years prior to COVID-19 onset (March 16, 2020). The non-T2D patient group was defined as PC patients without a T2D diagnosis during the two years prior to COVID-19 onset. Analysis of variance was performed to assess differences in telehealth use between the two patient groups.

Results: Compared to non-T2D patients, T2D patients were on average older (mean age: 69 vs. 59 years old), more likely to be male (95% vs. 89%), and more likely to have comorbidities (65% vs. 15% with 2+ Charlson Comorbidity Index). Despite greater age and comorbidity, monthly average percent telehealth use was similar among T2D versus non-T2D patients during the first year of the pandemic (77.7% vs. 74.2%, respectively; $p=.261$). However, during the second year of the pandemic, the same comparison was 58.2% (T2D) vs. 50.8% (non-T2D), which was statistically significant ($p<.001$). Additionally, the difference in percent telehealth use each year between T2D and non-T2D patients was statistically significant (first year: 3.5% vs. second year: 7.5%, $p<.001$), where T2D patients had higher percent telehealth use compared to non-T2D patients.

Discussion: Overall, veterans with and without T2D had similar monthly levels of primary care telehealth usage during the first year of the pandemic. However, in the second year, a higher percentage of T2D patients had telehealth visits compared to non-T2D patients in primary care. The sustained use of telehealth services among T2D patients compared to non-T2D patients during the pandemic indicates that telehealth may play and continue to play an important role in chronic disease management. As we move towards a post-COVID world, the VA can consider further expanding telehealth use to provide access to timely and necessary primary care for veterans with T2D and other chronic diseases.

12. Preliminary Results from a Pediatric Dentistry-focused Telehealth Training Curriculum

Elizabeth Carr DHA RDH¹, Sreenivas Koka DDS MS PhD MBA²,
Sara Jane McCrary DMD¹, Lakitha Hughes MS³

¹University of Mississippi Medical Center School of Dentistry

²University of Mississippi Medical Center

³Center of Telehealth, UMMC

Primary Email: ecarr@umc.edu

Background: Estimates range from 34 million to 51 million school hours are lost by children in the US annually because of dental caries. Furthermore, children from underserved and rural communities are at much higher risk of caries and the link between caries and socioeconomic status is strong and validated.

To assist in addressing the dental dilemma that children face, providers at The University of Mississippi Medical Center (UMMC) joined UMMC Center for Telehealth and Dr. Sanjeev Arora's Project ECHO tele-mentoring model to provide patient case-based information with a pediatric dentistry focus. In a needs assessment survey of rural Mississippi dentists, education in pediatric dentistry was a high priority area of need identified by the participants. Survey participants also noted they would be amenable to live online presentations. Planning sessions for the Pediatric Dentistry Project ECHO sessions focused on subjects related to the prevention, treatment or consequences of dental caries.

Methods: Depending on the session presented, a 16 to 19-question survey was created in RedCap capturing demographic data such as zip code of work location, level of education and licensure, years of professional service, types of services provided in work location, chief complaints of pediatric patients, and referral sources. At each Project ECHO session, the presenters asked a series of between 4-6 questions specifically related to the topic that was presented. Finally, the survey asked participants to select all reasons they believe contribute to poor oral health in their pediatric populations, along with an open-ended question asking how we can help with provision of pediatric care. Data captured was shared via RedCap and also downloaded into excel to evaluate responses. Descriptive statistics were used to describe the data captures.

Results: As of the submission deadline, the first three of twelve sessions of the Pediatric Dentistry Project ECHO series have been completed. A total of 36 people attended the first three sessions with 11 at session one, eight at session two, and 17 at session three. Preliminary results revealed 15.7 average years in provider experience with a range of participants from various backgrounds in dentistry. The majority of participants reside in more urban areas. A survey result of note showed that the most frequent response to the question "What are reasons that contribute to poor oral health of pediatric patients in your area?" was frequency of visit ($n=22$), followed by low education ($n=18$), and cost ($n=17$). Qualitative results to the question "How can we help you in provision of pediatric oral services" led to three themes. The first theme was education-related, with 6 respondents noting their need for more education and for patient education. The second theme was advocacy. Three responses noted the need for advocacy with capitation for dental pediatric procedures. The final theme regarded referrals; two responses noted the need for greater access to referral sources at UMMC.

Discussion: Preliminary results led the HUB team to deduce several conclusions. First, the plan for the telehealth curriculum is meeting its goals of providing requests from practitioners to offer education on pediatric-related topics. The HUB team notes that the first three sessions are not a strong predictor of how the final 9 sessions will proceed. More marketing of the events needs to occur, with a specific outreach towards primary care nurses and physicians, since we have had one participant from the nursing field so far. We plan to continue conducting ECHO sessions, gathering data on perceptions of participants, and reporting information as the curriculum proceeds.

This abstract was made possible by grant number U6631459 from the Office for the Advancement of Telehealth, Health Resources and Services Administration, DHHS

13. Community Outreach Stroke Awareness Education Reduces Patient Percentages of LKWT Past 4.5 Hours; A Report of the UAMS IDHI -Stroke Program's Experience

Aliza Brown PhD FAHA, Olivia Wilson MS CHES, Erin Wells MS CHES,
Lori Berry RN, Renee Joiner RN, Sanjeeva Onteddu MD,
Krishna Nalleballe MD

University of Arkansas for Medical Sciences, IDHI-Stroke Program

Primary Email: brownalizat@uams.edu

Background: Educating diverse populations with stroke awareness messages was investigated across a stroke belt state. Data from regional outreach during 2021 following COVID19 restrictions in 2020, observed longitudinal differences for #event locations. Stroke outreach provided by location and method types for education and attendance was evaluated for educational efficacy by the percent of stroke patients arriving within 4.5 hours from last known well time (LKWT).

Methods: The University of Arkansas for Medical Sciences (UAMS) IDHI -Stroke Program requires nurse facilitators at each tele-stroke spoke hospital to conduct monthly outreach education events in high-risk populations. A large tele-stroke program with 56 hospitals separated by geographical regions had regional population totals calculated. Outreach event locations included either a church, community/general, hospital/medical institution, school k-12, school post-secondary or workplace/business. Methods of outreach include community/general interaction, hospital interaction, public presentation or booth with educational items in each location. Population totals touched by outreach education were included. Education messages included recognizing stroke symptoms, importance of calling 911 and emphasized arriving in time (less than

SEARCH PRESENTATIONS

4.5 hours) to receive treatment. The %people educated at these event locations were compared to the percentage of acute stroke patients based on population totals who arrived greater than 4.5 hours past LKWT to receive tissue plasminogen activator (tPA).

Results: Calendar year 2021 saw 1,107 outreach events on stroke signs and symptoms. Event locations numbered 525, 361, 115, 64, 27 and 15 at hospital/medical institution, community/general, workplace/business, school k-12, church and school post-secondary, respectively. A total of 96,922 individuals were educated with stroke outreach messages. The majority of individuals attended community/general locations, with 48,755 attendees with 135±18 per location. Hospital/medical institutions had the highest #events; however, these events totaled 33,141 attendees with 63±9 individuals per location. Regions with more than 60% attendees at community location events saw a lower %patients arriving after 4.5 hours stroke-treatment-time window. The lower %patients arriving past 4.5 hour time occurred regardless of the educational method of booths, public presentations, mega brain, general community interaction or hospital in-house education methods used in the community.

Discussion: Nurse Facilitators from the telestroke's 56 hospitals will be encouraged to perform more stroke outreach events at community/general locations to lower the %patients arriving greater 4.5 hours past a stroke event.

14. Predictors of Electronic Health Record Utilization by Adults Living in Arkansas

Cari A. Bogulski PhD¹, Jennifer A. Andersen PhD², Don E. Willis PhD², Pearl A. McElfish PhD²

¹Department of Biomedical Informatics, College of Medicine, University of Arkansas for Medical Sciences, Little Rock, Arkansas

²College of Medicine, University of Arkansas for Medical Sciences Northwest, Springdale, Arkansas

Primary Email: cbogulski@uams.edu

Background: This study sought to examine disparities in the utilization of electronic medical records (EHRs) among adults living in Arkansas.

Methods: We analyzed data from 2,201 adult Arkansans who completed a phone survey between March 1st and March 28th, 2022. We fitted a logistic regression model to determine the likelihood of prior EHR utilization to securely contact a healthcare provider based on sociodemographic characteristics (age, gender, race/ethnicity, marital status, employment, social status, and educational attainment), nativity, healthcare access (having a personal health care provider, deferring health care because of cost, having a recent wellness exam), and self-rated health.

Results: Findings indicate there are disparities in EHR utilization among adults living in Arkansas. Individuals who self-identified as non-Hispanic Black or African American (OR=.72, p=.017) or Hispanic/Latino (OR=.69, p=.039) were less likely to report utilizing the EHR to message a provider within the past 12 months compared to those who self-identified as White. Arkansans over the age of 60 (OR=.67, p=.018) were also less likely to report utilizing the EHR to message a provider compared to Arkansans between the ages of 18 and 39. Compared to Arkansans who had a high school or less education, the likelihood of utilizing the EHR to message a provider increased for those with some college or an Associate's degree (OR=1.51, p=.003) or a Bachelor's degree or higher (OR=2.22, p<.001). Having access to a personal doctor or health care provider (OR=2.05, p<.001) or having had a general physical exam within the past two years also increased utilization (OR=3.52, p<.001).

Discussion: Findings indicate there are disparities in EHR utilization among adults living in Arkansas, particularly among racial/ethnic minorities, older adults, those with lower educational attainment, and those with more limited health care access.

15. Development of a Telehealth Geriatric Assessment and Caremodel in the Post COVID-19 Era: A Pilot Study of Community-Based Telecare Program in Taiwan

Kuan-Yuan Wang MD, PhD

Department of Geriatrics and Gerontology, National Cheng Kung University Hospital, College of Medicine, National Cheng Kung University, Tainan, Taiwan

Primary Email: wang.kuan-yuan@fulbrightmail.org

Background: Frailty increases the risk of poor health outcomes, disability, hospitalization, and death in older adults. Due to the impact of the COVID-19 pandemic, the medical system has been forced to reduce the chance of the elderly visiting the hospital in person. So, telecare intervention has become a tool to provide health care for this vulnerable group effectively. Comprehensive geriatric assessment can help health professionals to assess the physical, psychological, social, and functional health problems of the elderly. Therefore, we initiate a pilot tele-geriatric care program for the community-indwelling older adults at Taiwan's long-term care service station.

Methods: We recruited older adults aged over 60 years in the communities for the study, excluding subjects who could not cooperate with the assessment. A geriatrician performed an initial brief comprehensive geriatric assessment (CGA). The CGA included a clinical frailty scale, functional status, geriatric depression scale, short portable mental status, nutritional assessment, and quality of life questionnaires. The remote care services consisted of physiological data measurements such as blood pressure, heart rate, body temperature, oximeter, and body weight. These subjects had non-real-time follow-up care after regular recordings. The call center nurse provided 24-hour health consultation and education services at home or service station. They also received personalized nutritional consultation with exercise coaching after enrollment. Multidisciplinary health professionals can guide individually tailored interventions. A social worker coordinated regular follow-up through online technologies for interprofessional communication.

Results: Twenty-five older people (73.1±4.7 years old) were enrolled in our study. These subjects are well-educated with adequate economic sources, and about one-fifth lives alone. According to the CFS, they can be classified into robust (score 1-2, 16%), pre-frail (3-4, 76%), and frail (≥5, 4%). The average MNA and calf circumference scores are 12.1±1.7 and 32.7cm, while walking speed is 1.92±0.47 m/sec, and grip strength is 24.8±6.9kg. There are 16% of them have a depressed mood. After the geriatric assessment and telemonitoring of physiological data, we tailored the nutritional consultation and physical activity according to personal needs. The nutritionist calculated their caloric and protein intake requirements through the daily diet records and gave instructions for diet modifications. We also measured the health-related quality of life of EQ-VAS (visual analog scale), which improved significantly during the 3-month follow-up after the intervention compared to their initial enrollment (71.7 vs. 79, p=0.02).

Discussion: Improving nutritional status with adequate intake of nutrients and energy plays a pivotal role in reducing the frailty level and sarcopenia. The need for multidomain intervention for pre-frail and frail elders can be facilitated by telehealth applications such as health-related education and telemonitoring. The community-based telehealth program can significantly improve older people's quality of life, especially beneficial for those living alone.

16. Stroke Rehabilitation Access Inequities: Is Telerehabilitation the Solution?

Corey Morrow PhD MOT OTR/L¹, Michelle Woodbury PhD OTR/L², Annie Simpson PhD², Eyad Almallouhi MD², Kit Simpson DrPH²

¹Whitworth University

²Medical University of South Carolina

Primary Email: morrowco@mus.edu

Background: Clinical practice guidelines (CPGs) recommend community-based rehabilitation to improve stroke survivors' outcomes. However, equal access to therapy is unknown for rural and socially disadvantaged populations.

Telerehabilitation is an emerging solution aimed to improve access without compromising patient safety or rehabilitation quality. Several studies have demonstrated efficacy for telerehabilitation as noninferior to in-person therapy for stroke, but widespread use is limited.

The objective of this study was to explore the access and utilization of in-person, community-based rehabilitation for traditionally underserved populations. We compared differences in the frequency and types of rehabilitation evaluations via outpatient therapy and home health for Medicare Part B stroke survivors in rural and socially disadvantaged locations. Evidence of access disparities within the traditional care model may contribute to the expansion of telerehabilitation reimbursement and adoption.

Methods: We completed a retrospective cohort analysis using the 2018 and 2019 5% Medicare Limited Data Sets. Stroke survivors 65 and older admitted to acute care in 2018 were included. Patients who died in acute care or discharged to hospice were excluded. Next, we extracted rehabilitation Current Procedural Terminology (CPT) codes to identify stroke survivors who received therapy to examine differences in community-based rehabilitation access and treatment approaches for rural, nonrural, and socially disadvantaged (SDA) populations.

The presence/absence of a CPT evaluation code for home health (HH) or outpatient (OP) therapy enabled us to divide the cohort into two groups: stroke survivors who received community-based rehabilitation (Therapy Group) or did not (No Therapy group). Patients in the Therapy Group were analyzed further to the types of treatment approaches they received and were stratified by stroke severity, SDA versus non-SDA, and rural versus nonrural to examine differences in care.

Results: Of the 9,076 stroke survivors in this cohort, 44.2% did not receive any HH or OP therapy. For outpatient visits, 8.7% of stroke survivors received physical therapy (PT), 2.0% received occupational therapy (OT), and only 1.4% received both OT and PT. For HH, 44.1% received PT, 34.4% received OT, and 33.7% saw both PT and OT. For rural communities, a statistically significantly smaller percentage received OP physical therapy (5.7% rural vs. 9.1% nonrural) and HH for both occupational (27.0% rural vs. 35.6% nonrural) and physical therapy (38.0% rural vs. 45.1%). For SDA communities, a statistically significantly smaller percentage received OP (0.4% SDA vs. 2.1% non-SDA) and HH (29.0% SDA vs. 34.8% non-SDA) OT.

For severe stroke survivors, significant treatment approach differences included therapeutic exercise (28.5% nonrural vs. 42.8% rural), neuromuscular re-education (22.5% for nonrural vs. 13.5% rural), and gait training (5.2% nonrural vs. 0.9% rural) and self-care (2.9% nonrural vs. 0.5% rural).

For SDA stroke survivors, treatment approaches differed significantly for self-care (3.1% non-SDA versus 0.1% SDA), neuromuscular re-education (19.8% non-SDA vs. 15.0% SDA), and therapeutic exercise (31.2% non-SDA vs. 35.6% SDA).

Discussion: These findings describe differences and inequities for stroke survivors in traditionally underserved populations. Advancements in telerehabilitation may increase the access of rehabilitation evaluations and treatments for rural and SDA stroke survivors. The inequities in access for rural stroke survivors may be explained by a shortage of therapists in these locations. Rural therapists also tend to be highly skilled "generalists" as they treat a variety of diagnoses but may not have specialty stroke training. This may explain the high use of therapeutic exercise and low use of neuromuscular re-education. Linking rural outpatient clinics to consulting stroke rehabilitation specialists via telehealth could help improve therapist confidence and competency with specialty populations and improve adherence to CPGs for best practice. Telerehabilitation has the potential to improve therapy inequities, but barriers to widespread adoption such as technology literacy and cost need to be addressed.

18. Enhancing Virtual Learning Engagement: Challenges of Retention

James Izzo Ed.S¹, Mariana Rincón Caicedo MA¹, Ilana Engel MA¹, Annaleis Giovanetti MA¹, Philip Huang MA², Stephanie Punt PhD², E Zhang PhD², Eve-Lynn Nelson PhD²,

¹University of Kansas

²University of Kansas Medical Center

Primary Email: j215i964@ku.edu

Background: Virtual learning, such as Project ECHOs, links experts at academic medical centers with low-resource and geographically isolated communities. Using the Project ECHO telementoring model (Arora, et al., 2010), the Telehealth Rocks (THR) Program developed a virtual learning forum to foster connections with schools in low-resource areas in rural Kansas. Despite the convenience and accessibility of virtual learning, engagement barriers exist. Barriers include (a) internet issues, (b) lack of space, (c) hardware issues, (d) limited peer and instructor interactions, (e) personal challenges (Cavinato et al., 2021; Levin, et al., 2018; McRae, 2022), and (f) time (Shapiro et al., 2017). Since 2019, THR programs conducted 7 Project ECHO series related to student and school well-being. Registration was high, yet attendance varied. To understand engagement patterns, this study seeks to describe trends in registration and attendance data and report tangible steps toward improving engagement.

Methods: From 2019 to 2022, 7 ECHOs were advertised to staff at THR community partners, which include special education cooperatives, schools, school-based clinics, and early learning centers. Offered once a month through the school year, with some offered bi-weekly over the summer, ECHOs covered key topics such as self-care and psychoeducation tied to trauma-focused therapy. ECHOs provided attendees with psychoeducation, case consultation, discussion, and applied practice. Attendees shared experiences practicing learned strategies using a variety of videoconferencing features, and were able to provide feedback via a survey and in-session interactive activities including word clouds.

Registration and attendance data were collected for each ECHO. Registered attendees ranged from 42 to 374. Attendance ranged from 33 to 137 for initial ECHO sessions and 12 to 57 for last. Percent change between registration and those who attended, plus between session attendance, was calculated using a percent change formula. For example, the Ready to Learn Webinar had 42 registered participants, with 33 actually attending. Those values were used in the formula as follows: $(33 - 42) / 42 \times 100\% = -21.43\%$. Meaning roughly 79% of those who registered attended

Results: Percent change from registered to actual attendance revealed 61.5% of those who registered attended the first online session. One ECHO (Ready to Learn Webinar) had the highest percentage of initial attendance (79%). Another (Keeping Kids Safe) had the lowest (37%). As ECHOs progressed, the average attendance percent change from first to last session was 43%. Lowest loss of attendees was 21% (Ready to Learn Webinar) and highest was 81% (Resilience ECHO). Between ECHO session attendance indicated expected participant attrition, with higher drop off (of 43 attendees) for Keeping Kids Safe Webinar. Between session attendance increased (by 10 attendees) during the Resilience ECHO.

Loss of participants over time was expected given the difficulties of online learning retention, and timing/scheduling of ECHOs. The THR team utilized a variety of means to promote retention and engagement. Efforts included emails with session reminders, sending out key take-aways and session recordings. Active learning strategies included small-group case discussions, asking for feedback, drawing connections between participants to facilitate networking, offering certificates of attendance, and creating a welcoming environment for learners of all stages.

Discussion: Identifying registration and attendance drop off trends via data and feedback from participants allows for understanding of challenges in retention of participants (i.e., topic interesting, of value, and/or topical to

SEARCH PRESENTATIONS

attendees, busy schedules, etc.). A key factor to consider is ECHO timing. That is, when sessions were held (school year vs. summer), weekly, bi-weekly, or monthly sessions, and when sessions began throughout the scope of the program (earlier programs vs. later programs). However, one limitation of this data analysis is that multiple attendees may have used the same computer (i.e., several school staff in a small conference room) to attend sessions, which may skew registration attendance counts. Feedback from participants through interviews and surveys with these matters at the forefront could prove valuable in improving the impact and accessibility of future ECHO sessions.

19. Associations Between Physician Practice Factors and Perceptions of Telehealth Care Quality

Kevin Wiley PhD MPH, Ashley Pugh MSHI RN BSN

Medical University of South Carolina

Primary Email: wileykk@musc.edu

Background: Expanding telehealth services represents a solution to physical barriers in accessing clinical services and getting care to those who need it most. The COVID-19 pandemic highlighted the need to refine technological infrastructure to keep pace with the needs of providers and their patients. Telehealth tools and programs now complement traditional care delivery as more healthcare organizations sought to expand these services during the pandemic. Research indicates that patients report moderate-to-high levels of care quality provided via telemedicine. However, research examining physician practice factors associated with perceived telehealth care quality compared to in-person care quality after the pandemic is still developing. This study used self-reported survey data to examine associations between physician practice-level factors and perceived quality of care provided via telehealth compared to traditional in-person care.

Methods: We performed a cross-sectional analysis of the 2021 National Electronic Health Record Survey (NEHRS). NEHRS is a nationally-representative sample of non-federally employed, office-based physicians actively delivering patient care. Our sample included 1,866 unweighted, completed responses from physician practice organizations. Independent variables included six questions about broadband access and/or speed issues, hardware and hardware appropriateness, the reimbursement environment, patients' access to technology (e.g., smartphone, tablet, Internet), and patients' difficulty using technology/telemedicine platform. We selected two questions as dependent variables: 1) does your practice use telemedicine and 2) to what extent are you able to provide similar quality of care during telemedicine visits as you do during in-person visits? We controlled for physician practice factors, including size, care type, insurance status, ownership, and use of EHR. We described the sample using frequencies, percentages, and means. Bivariate relationships were examined using chi-squared tests. We performed generalized ordinal logistic regressions and clustered using robust standard errors.

Results: Of the physician practices that responded to the survey, approximately 87% reported using telemedicine. Physician respondents who indicated having used telemedicine were mostly male (84.7%), <50 years of age (85.2), worked in a practice of 11-50 physicians (31.4%), and provided medical care (51%) vs. primary (30.8%) and surgical care (18.2). Physician respondents indicated having limited broadband access and/or speed issues (35.4%), telemedicine platforms not meeting their needs (17.9%), platforms that were not appropriate for their patients/specialty (26%), limited patient access to technology, and patients experienced difficulty using telemedicine platforms (70.8%). Additionally, physician respondents reported improved reimbursement for telehealth visits (46.4%). Adjusted regression models indicate that physicians perceived similar quality care via telehealth compared to in-person care to a great extent, regardless of appropriateness for care

specialty (coef: 2.11; $p < 0.001$). Conversely, respondents reported being unable to provide similar quality telemedicine care as in-person care to a great extent due to the reimbursement environment (coef: -0.38; $p < 0.001$).

Discussion: Most physician practices reported using telemedicine during the survey period. However, respondents indicated various perceived organizational and environmental factors that affect the quality of care provided via telehealth. Notably, respondents indicated that patients had difficulty using telemedicine platforms because they were unnecessary or inappropriate for patient care, or the platforms failed to meet their needs. Prior research attributes these challenges to rapid growth in virtual tool access and use during the pandemic. Despite these issues, perceptions of care quality for telehealth care delivery compared to in-person care were unaffected. Conversely, the public health emergency declaration improved the reimbursement environment for telehealth and subsequently the perceived quality of care provided via telehealth. Limitations in this study include the self-reported nature of NEHRS survey data that may lead to social desirability and selection biases in selected questions.

21. Barriers to Implementation of Telephone and Telehealth Pre-Anesthesia Evaluation Visits in the Veterans Affairs Health System

Atilio Barbeito MD MPH¹, Sesh Mudumbai MD MS²,
Karthik Raghunathan MD MPH¹

¹Duke University and Durham VA Health Care System

²Stanford University and Palo Alto VA Health Care System

Primary Email: picabuey@hotmail.com

Background: Pre-anesthesia evaluations are conducted days or weeks before a scheduled surgical or invasive procedure involving anesthesia to assess patients' pre-procedure condition and risk, optimize their status, and prepare them for their procedure. Telephone-based (TV) and telehealth (TH) pre-anesthesia evaluation modalities have been in use for several years and have accelerated since the advent of the COVID-19 pandemic. Available evidence suggests that these non face-to-face (F2F) pre-anesthesia visits have similar surgery cancellation rates, improved patient satisfaction, and reduced wait times and costs when compared to F2F evaluations in many settings. Despite this, overall utilization of non-F2F modalities for pre-anesthesia evaluation visits at the Veterans Health Administration (VA) remains low. We sought to understand the barriers and facilitators to the adoption of any non-F2F pre-anesthesia evaluation modalities within the VA.

Methods: We surveyed 109 VA Anesthesiology Services on the use of non-F2F pre-anesthesia evaluation modalities. Surveys were administered using an electronic platform (Qualtrics, Provo, UT) and distributed via email. The first section collected demographic data and information about the structural organization of the service. For those using any non-F2F modality (TV and/or TH), a second set of questions referred to perceived ease of use of these modalities. For those not using non-F2F modalities, questions referred to perceived barriers to implementation.

Results: The final study sample included 55 responses from 50 facilities (response rate of 50.45%). Out of 50 facilities, 44 (88%) have a dedicated Pre-Anesthesia Evaluation Clinic; 23 (46%) use both TV and TH modalities, 11 (22%) use TV only, 5 (10%) use TH only, and 11 (22%) facilities use neither TV nor TH modalities. Figure 1 displays the comparison between TV and TH concerning how respondents rate their ability to perform different assessment tasks. The ability to perform a history and assess for comorbidities was rated positively (i.e., "good" and "very good") by a large majority of respondents. The ability to assess exercise capacity, nutritional status, and mental health pathology were also rated positively by a majority of respondents, although the number of respondents rating these tasks less favorably was larger. Figure 2 displays perceived barriers to implementation of TV and TH pre-anesthesia evaluation modalities. Bar-

riers that were rated as “significant” or “the biggest barrier of all” were the inability to obtain vital signs (77% for TV and 58% for TH) and the inability to perform a physical exam (85% for TV and 58% for TH). Patient-level factors such lack of equipment or patient preference were also cited as barriers.

Discussion: Almost half of the VA Anesthesiology services responding to the survey perform both non-F2F pre-anesthesia evaluation modalities and rate their ability to perform tasks positively. A significant number of facilities (22%) conduct the totality of their pre-anesthesia evaluations in person. Among these, the biggest perceived barriers to implementation of TV or TH visits included the inability to obtain vital signs and the inability to perform a physical exam. Respondents also referred to patient-level factors such as patient preference or a lack of telephone or computer as significant perceived barriers. Given available evidence on the safety and efficacy of non-F2F pre-anesthesia visits; and considering that 62–86% of veterans are estimated to own a smartphone device, further research is needed on the barriers to adoption of non-F2F pre-anesthesia evaluation modalities across the VA as a strategy for increasing access, reducing costs and increasing patient satisfaction.

22. Improving Access to Care Through a Centralized, Multi-Specialty Pediatric Remote Patient Monitoring Department

Kylee Denker MSN BSN RN CPN, DaVona Chapman MS, Abby Taylor MBA, Stephanie Oliveira MD CNSC, Micah Dean MBA, Sarah Riddle MD, Courtney Sump MD

Cincinnati Children's Hospital Medical Center

Primary Email: kylee.denker@cchmc.org

Background: Remote Patient Monitoring (RPM) is a form of telehealth that allows for transmission of patient and caregiver generated health data to a healthcare team for synchronous or asynchronous review. RPM allows for earlier identification of red flag symptoms or vitals reported from the home via completion of “pathways” which provide frequent and detailed data points to care providers. Pediatric RPM programs are growing in utilization and have shown promising trends in improving patient outcomes. While the majority of pediatric RPM programs exist as single-specialty programs, our institution implemented a novel multi-specialty RPM department with a centralized nursing team, now serving 15 unique patient populations (e.g. children requiring total parenteral nutrition (TPN) or peritoneal dialysis) across 9 different hospital divisions. Our RPM department manages over 300 patients/month after experiencing tremendous growth over the last two years.

Methods: A multi-disciplinary quality improvement team, including family members, was formed in 2021 to provide more equitable and family-centered care. We set smart aims to increase enrollment of eligible patients from 83% to 95% in the first year, and to increase patient/caregiver engagement from 68% to 80% in the second year. Engagement was measured as the percent of presented pathways completed per week. Key drivers of enrollment included early identification of eligible patients and reliable process ownership. Interventions for enrollment included process maps for individual programs and new patient enrollment, handouts to aid care teams, and dissemination of RPM information to key stakeholders. Key drivers of engagement included family buy-in and usability of technology. Interventions for engagement included upgrades to a more user-friendly scale and personalization of timing and delivery of patient outreach attempts by the RPM team. We also measured family satisfaction and are in the early stages of evaluating healthcare utilization associated with RPM participation.

Results: Our interventions increased enrollment from 83% to 91% over the first year. The most common failure was our inability to offer RPM to patients with limited English proficiency. Other failures included lack of defined eligibility criteria and inconsistency in offering RPM to eligible patients due to “social concerns” that were believed to limit caregiver en-

gagement with RPM. We recently began improving patient/caregiver engagement and have not yet seen a centerline shift. For family satisfaction, the overall experience rating is 9.1/10, with 98% of respondents agreeing that they would recommend RPM to others. Analysis of healthcare utilization demonstrated significant decrease in inpatient admissions in the 12 months after enrollment into RPM in infants with failure to thrive from 1.7 control group admissions (those eligible for RPM in the year prior to program launch) to 0.4 admissions in the RPM group ($p < 0.01$). In an intestinal failure program, one patient was able to wean off TPN two times faster than pre-RPM weaning rates, allowing expedited central line removal. Through alternative pain intervention education and opioid usage tracking in our post-op pain RPM program we have decreased prescribed opioid doses from 20 to 10.

Discussion: Developing a centralized RPM department has provided over 1,300 unique patients with an alternative method of care delivery. Staffing with a centralized RN team that maintains inpatient shifts has been beneficial by standardizing care delivery and providing a broad scope of knowledge to manage pediatric patients with chronic conditions and medical complexity. Success of the department has been demonstrated by high family satisfaction and improved clinical outcomes. Using QI has been integral in making RPM more equitable, efficient, and family-centered. We require that all eligible patients be offered RPM enrollment, despite any perceived “social concerns” and are focused on how we can utilize RPM to break down barriers to access to care. Our department is currently developing a workflow that will allow patients with limited English proficiency to participate in RPM, and we continue to work with family partners to prioritize user-friendly, family-centered care to improve engagement.

23. Factors Related to Interest in Remote Patient Monitoring Utilization

Jennifer Andersen PhD¹, Cari Bogulski PhD², Don E. Willis PhD¹, Pearl A. McElfish PhD¹

¹College of Medicine, University of Arkansas for Medical Sciences Northwest, Springdale, Arkansas

²Department of Biomedical Informatics, College of Medicine, University of Arkansas for Medical Sciences Northwest, Fayetteville, Arkansas

Primary Email: jaandersen@uams.edu

Background: Remote patient monitoring (RPM) utilizes digitally transmitted health-related data, with the goal of improving patient outcomes. However, little is known about which patient populations have less interest in sharing vital signs or other data through RPM. Understanding what patient-level characteristics predict a lack of interest in RPM utilization can inform educational and outreach programs to improve health care access and patient outcomes. This study sought to examine interest in RPM to share vital signs with health care providers among adults living in Arkansas.

Methods: We analyzed data from 2,201 adult Arkansans who completed a phone survey between March 1st and March 28th, 2022. We fitted a multinomial logistic regression model to explore the attributes associated with each level of interest in using RPM to share vital sign data with a healthcare provider. Categories of interest included not at all (base outcome), a little, somewhat, and very interested in sharing data using RPM. Attributes included sociodemographic characteristics (age, gender, race/ethnicity, marital status, employment, social status, and educational attainment), nativity, healthcare access (having a personal health care provider, deferring health care because of cost, having a recent wellness exam), and self-rated health.

Results: We found Hispanic/Latinx respondents were less likely to report being very interested ($RR = .574$, $p < .01$) in using RPM to share vital signs compared to non-Hispanic Whites. Non-Hispanic other races/ethnicity respondents were less likely than non-Hispanic Whites to report being somewhat interested ($RR = .477$, $p < .01$) in RPM. Respondents over 60 and those between

SEARCH PRESENTATIONS

the ages of 40 and 59 were less likely to report being somewhat ($RR=.498$, $p<.001$; $RR=.703$, $p<.05$) or very interested ($RR=.430$, $p<.001$; $RR=.667$, $p<.05$) in RPM compared to respondents between the ages of 18 and 39. Respondents who reported a higher self-perceived social class were more likely to report being very interested in RPM ($RR=1.063$, $p<.05$) compared to those who reported a lower social class. Relative to those with a high school education or less, respondents who had an Associate's degree or some college ($RR=1.780$, $p<.001$) were more likely to report being very interested in RPM. Respondents with a Bachelor's degree or more were more likely to report being somewhat ($RR=1.836$, $p<.001$) or very interested ($RR=2.094$, $p<.001$) in RPM compared to those with a high school education or less.

Discussion: The results indicate there is less interest in utilizing RPM to share vital signs with health care providers among minoritized populations, older adults, those with lower levels of education, and those with lower self-perceived social class. Further work is need to understand the reluctance to share data with providers using RPM among these populations, and to develop educational programs to address the lack of interest.

24. Use of Cellular-Enabled Remote Patient Monitoring Device for Hypertension Management in Pregnant Women: A Feasibility Study

Rebecca D. Jones MPH, M. Kathryn Allison PhD MPH, Heather Moody RN, Cheng Peng PhD MPA MS, Hari Eswaran PhD

University of Arkansas for Medical Sciences

Primary Email: rdjones@uams.edu

Background: Hypertension during pregnancy, a common indicator of preeclampsia, is a major health concern for mothers and their newborns. Chronic hypertension affects 5–10% of pregnancies in the United States and can have a significant impact on maternal and neonatal outcomes, especially in rural populations. Pregnancies complicated by hypertension are currently managed through frequent clinic visits or extended hospital stays. Cellular-enabled remote patient monitoring (RPM) devices provide an alternative treatment method as they support and promote long-distance clinical health care by enhancing quality of care, reducing costly emergency room visits, and keeping costs manageable for small, rural hospitals. This study aimed to measure the feasibility of and patient satisfaction with using an integrated model of cellular-enabled RPM devices for blood pressure supported by a 24/7 nurses call center.

Methods: In a mixed methods pilot study, twelve women with a history of chronic hypertension during pregnancy were given cellular-enabled BodyTrace™ blood pressure cuffs and weight scales for home use according to their healthcare providers' recommendation. One participant was lost to follow-up resulting in a total of 11 participants included in the final analysis. The devices use cellular data to transmit blood pressure readings to a website that their healthcare providers can access. Participants' blood pressures were continuously monitored by a nurse call center and if the participants blood pressure readings were outside of normal range, the call center would contact the patient to triage and provide further instructions as needed. Participants completed a survey and a brief semi-structured interview after two weeks of using the device. The survey contained six sections including a) demographic characteristics, b) perceived stress, c) anxiety, d) behavioral intention, e) system usability and satisfaction, and f) perceived benefits. The semi-structured interview was used to assess perceived advantages and disadvantages associated with device use.

Results: Sociodemographic characteristics of the 11 participants are reported and most participants were white (72.7%), non-Hispanic (100%), married (63.6%), had attended at least some college or technical school (63.6%), and reported an annual household income between \$25,000 – \$75,000 (63.6%). One out of four (27%) participants reported that this was their first pregnancy. Most participants had one or more children (81.8%). The majority of participants had previously delivered pre-term (62.50%) and reported this to

be their first pregnancy with blood pressure issues or preeclampsia (87.50%). Participants scored low on stress and anxiety with mean scores of 5.45 ($SD=3.56$) and 8.09 ($SD=3.56$), respectively. Participants scored high on behavioral intention, system usability, and perceived benefits with mean scores of 8.73 ($SD=2.53$), 75.91 ($SD=23.70$), and 19.64 ($SD=5.92$) respectively. Participants perceived benefits to using the device included increased monitoring by health professionals, increased self-awareness, decreased number of clinic visits, and convenience of use. Perceived disadvantages included higher readings when compared to clinical readings.

Discussion: To our knowledge this study is the first to assess the use of a cellular-enabled RPM blood pressure device supported by a 24/7 nurse call center for hypertension in pregnancy. Previous studies on RPM devices for hypertension in post-partum women found high rates of patient satisfaction which aligns with the results of this study, where ease and convenience were frequently cited. Previous studies have also indicated that some variability in blood pressure readings when comparing RPM devices to clinical readings is common. The main limitation was that this was a pilot study with 11 participants. Despite the small sample size, the information found is valuable for future studies assessing cellular-enabled RPM blood pressure devices. In a second phase of this study, we aim to assess adherence to and satisfaction with the BodyTrace™ device as well as explore associations between device use and maternal outcomes for 38 participants who will use the device for eight weeks.

25. Assessing Telehealth and Virtual Service Experiences to Advance Health Equity for People with Disabilities in Georgia in a Post-COVID-19 Era

Mitchell Blount MPH¹, Rasheera Dopson MPH¹,
Natasha Dowell MPH MCRP², Denita T. Walston MS¹,
Alyssa Lee PsyD³, Megan Douglas JD¹

¹Morehouse School of Medicine

²ND Communications, LLC

³Georgia Council on Developmental Disabilities

Primary Email: mblount@msm.edu

Background: Since the start of the COVID-19 pandemic in March 2020, the use of telehealth and virtual services has increased by 52%. Nevertheless, with the expansion of these services, underrepresented population groups, such as those with intellectual and developmental disabilities, are presently experiencing barriers—limiting access to telehealth and virtual services being provided, as well as complications from healthcare providers in accommodating their disabled patients. This study aims to advance health equity through the assessment of people with disabilities in the state of Georgia and additional supports those with disabilities may require to access telehealth services in their healthcare setting.

Methods: The overarching goal of this study is to assess the usage and impact of telehealth and virtual services on people with disabilities in Georgia—identifying barriers to telehealth and virtual service access and analyzing those barriers through local and state level policy changes. We employ a multi-method approach using qualitative data analysis through (1) surveys and focus groups with disabled individuals throughout the state of Georgia; (2) informational listening sessions with key stakeholders within the disability population in rural Georgia and; (3) quantitative analysis using surveys—which were disseminated to disabled individuals through a series of networks affiliates within the disability community and throughout the state of Georgia.

Results: We conducted six focus groups with 16 people with disabilities and collected 109 surveys. 90% of respondents' providers offer telehealth services. Findings demonstrate significant use of telehealth by people with disabilities (88%). Respondents used audio/video via computer (76%) and phone (47%) and phone audio only (34%) during their visit. Most respondents used telehealth at home (93%) for primary and specialty care visits.

Services/supports due to difficulty hearing (24%) and seeing (14%) were required and 66% were able to obtain support services. However, some challenges exist, especially among those living in rural areas and the uninsured: digital literacy, the lack of additional audio/hearing services, and the lack of insurance coverage for services. Although, the survey did present evidence that showed challenges for people with disabilities, 83% reported being satisfied with telehealth and 72% were likely to use telehealth in the future. The respondents also reported feelings of positive engagement, support from their provider, as well ease in access appointments and time slots.

Discussion: People with disabilities were among the primary users of telehealth and virtual services during the COVID-19 pandemic. The level of accessibility and flexibility of time restraints and geographical restrictions enabled many people with disabilities to access healthcare with limited barriers. Policy and practice changes, including permanent expansion of telehealth and broadband access, access to needed support staff in-and-out of the practice setting, and supports to increase digital literacy and updates in technology, are needed to continue equitable access to telehealth and virtual services by people with disabilities in Georgia.

26. Caregiver University

Ashley Allen MSN AGNP-C, Kim Tarver MD, Denise Lafferty RN BSN

University of Mississippi Medical Center

Primary Email: asallen@umc.edu

Background: Caregiver University is a training program that provides information on essential topics for caregivers who are navigating the healthcare continuum for a loved one with Alzheimer's or related dementia. This training is a 9-day course of informational topics that are presented via Zoom so that caregivers are allowed to attend sessions from their homes. The sessions are 1-1.5 hours long with 1-2 sessions per day and Video-On-Demand technology available for additional information. All sessions are recorded so that participants may refer back to an informational session. These sessions are conducted quarterly with new participants each session. Providing the sessions in a live format via Zoom allows the participants to engage in an interactive learning experience with the medical team and other caregivers. A range of topics are covered to help the caregivers know what to expect while caring for someone living with Alzheimer's or a related dementia.

Methods: Caregiver University is a training and support program designed to alleviate caregiver stress and burden while providing care for their loved ones living with Alzheimer's and related dementias. The American Geriatrics Society's Caregiver Self-Assessment Questionnaire is administered prior to, 1 week post-session, at 3 months, and again at 6 months after session completion to monitor caregiver challenges and stress.

Results: The AGS Caregiver Self-Assessment Questionnaire was implemented with the May 2022 CGU session. 100% completed the survey prior to starting the May 2022 session. There was reduced participation in the 1-week post session survey. The 3- and 6-month post session surveys will be administered August and November 2022.

Discussion: Based on the responses to the Caregiver Self-Assessment Questionnaire, positive reviews were demonstrated with only 2 reports of areas that need improvement. One area was related to content complexity and the other to timing of video availability. In the positive reviews, qualitative responses were recorded to allow participants to express which sessions were most valuable to their learning experience and if there was information they would have liked explained further. Official metrics are pending review at this time.

This abstract was made possible by grant number U6631459 from the Office for the Advancement of Telehealth, Health Resources and Services Administration, DHHS.

27. Implementation of a Virtual Hernia Clinic at an Academic Medical Center

Nolan Bruce MD, Stacy Petty APRN, Donna Elrod RN, Kevin Sexton MD

University of Arkansas Medical Sciences

Primary Email: NBruce@uams.edu

Background: Abdominal wall hernias are common, affecting approximately 4% of all people older than 45 years. We designed a hernia clinic leveraging an APRN-led, direct-to-consumer, urgent care telemedicine platform. Specifications for operative candidacy were pre-defined and those patients not meeting criteria were referred to the appropriate clinical resources, typically for medical weight loss, smoking cessation, and diabetic optimization. We hypothesized that this clinic would have a lower no-show rate than typical surgical clinics.

Methods: Clinical protocols were designed to facilitate risk stratification of patients with inguinal, incisional, umbilical, ventral, and parastomal hernias. The protocol was approved by the hospital medical board. Patients were initially offered the opportunity to select in-person vs virtual care starting 4/1/2022. Patients were then followed throughout their clinical course. Visit completion rates were calculated and compared to historical controls using Fisher's Exact Test.

Results: The virtual hernia clinic team evaluated 70 patients through 76 encounters with 1 no-show visit for an overall completion rate of 98.6% compared to the historical clinic average of 91% (62 no-show visits out of 678 patient encounters) ($p < .0001$, Fisher's Exact Test). The average patient age was 54 (SD 14) years. Women accounted for 60% of the patient population. Racial and ethnic minorities comprised 11% ($n=8$) of the patients seen. The most common diagnosis was incisional hernia (60%) followed by umbilical hernia (30%), inguinal hernia (7%) and parastomal hernia (3%). 40 patients (57%) met criteria for surgical intervention and were referred to two surgeons within the center. Of the patients referred, 30 have been seen and 27 (90%) were immediately scheduled for an operation. 18 operations have been performed with no complications to date. For incisional hernia patients, accurate hernia dimension measurements were obtained in all patients with a telemedicine physical exam, confirmed at the time of in-person screening.

Discussion: Providing a virtual option for a surgical clinic focused on hernia led to increased visit completion rate compared to the standard clinic for 2 surgeons at an academic medical center. For hernia patients, telemedicine provided an accurate assessment of pathology and served a diverse patient population. Further work needs to be done to determine the overall impact of telemedicine on surgical patient outcomes. Given the initial success of this clinic, virtual consultation is now the primary entry point for patients suffering from hernia. More data is needed to see the overall impact on the patients not optimized for surgery that are participating in a virtual surgical optimization plan.

28. Overview of School-Based Telehealth Network Grant Program Services Delivered to Students in Rural Schools

Divya Bhagianadh PhD¹, Marcia Ward PhD¹, Fred Ullrich BA¹, Kimberly Merchant MA¹, Carlos Mena MS²,

¹University of Iowa

²Office for the Advancement of Telehealth, Health Resources and Services Administration

Primary Email: divya-bhagianadh@uiowa.edu

Background: School-based health centers (SBHCs) have been shown to increase access to health services for children and adolescents, improving health outcomes. They are available in only 10 percent of public schools in the U.S. and are more common in urban than rural locations. Telehealth can

SEARCH PRESENTATIONS

expand and enhance access to school-based health care. However, the use of telehealth and evidence regarding the application of telehealth in school-based settings, especially in rural areas, is limited. Recognizing that school-based health care is still not reaching many students, HRSA funded the School Based Telehealth Network Grant Program (SB TNGP) to expand telehealth in rural school-based settings. Grantees could choose which of seven telehealth services to provide (asthma, behavioral health, diabetes, healthy weight, oral health, primary care, urgent care). In this presentation, we provide an overview of the types of staffing and services offered, and the characteristics of students served.

Methods: Nineteen SB TNGP grantees delivered telehealth to over 200 schools across 17 states, choosing which services and methods they would deliver. The Rural Telehealth Research Center (RTRC) served as the data coordinating center for the program. RTRC identified a set of data elements and created the School-based Telehealth Evidence Collection (S-TEC) tool used by SB TNGP grantees to systematically collect data. The S-TEC included a module to collect information on the schools where telehealth services were offered and a module to collect basic student characteristic data (e.g., demographics). The S-TEC also included modules for each of the telehealth services provided through the SB TNGP. Since the context for data collection was the school setting, two measurement periods each year were defined to align with Fall and Spring school semesters. Data from each measurement period was collected separately so information on individual students may be reflected in more than one semester. Likewise, within a measurement period, a student may have received more than one telehealth service. Data were collected from July 2018 to June 2020.

Results: Across all services and semesters, data were collected on 12,853 students, although students may have received multiple services in multiple semesters. Students who received services were predominantly White (75%), non-Hispanic (71%), and evenly split between males and females. Most students had a primary care provider outside of the SB TNGP (73%). Altogether, students received 20,110 telehealth encounters. Across telehealth services, encounters were overwhelmingly technically successful (>98.7%). Some services - oral health, behavioral health, and healthy weight services - were delivered predominantly by service-specific clinicians, whereas nearly all the diabetes, primary care, and urgent care services were delivered by registered nurses or primary care providers. Encounters often involved more than one type of clinical service. Many encounters included an assessment, especially for primary care, urgent care, and asthma encounters. Medication management (diabetes), fluoride varnish applications (oral health), nutrition counseling (healthy weight) and individual therapy (behavioral health) were the most common clinical services provided.

Discussion: Given how different these telehealth services are in terms of clinicians involved and clinical services delivered, it is interesting that over half of the grantees delivered multiple telehealth services. Although the SB TNGP grantees were operating in rural schools with previously unmet needs, the telehealth services they provided were similar to on-campus services provided in schools with SBHCs. Telehealth likely met the needs of a greater number of students in the rural schools. Within each telehealth service, the number of grantees delivering services and the number of schools where telehealth services were available increased across semesters. This suggests that the grantees were expanding capability and reaching additional rural communities and students over time. This study adds to the literature by showcasing that telehealth in schools can address multiple clinical conditions through separate services using various combinations of clinicians providing different services.

29. Preferred Family Language and Telehealth Uptake for DBP Assessments: A DBPNet Study

Sarah N. Wozniak BA^{1,2}, Annie Kennelly MD³, Sansanee Craig MD⁴, Carina M. Flaherty BA¹, Katherine S. Kellom AB¹, Jaclyn Cacia MS⁵, Audrey Christiansen MD⁶, Lucero Cordero BA², Priscilla Ortiz PhD⁷, Kristen Stefanski MD⁸, Kate E. Wallis MD MPH^{1,2,5,9}

¹PolicyLab, Children's Hospital of Philadelphia

²Center for Autism Research, Children's Hospital of Philadelphia

³Baylor College of Medicine, Texas Children's Hospital

⁴Department of Biomedical and Health Informatics, Children's Hospital of Philadelphia

⁵Division of Developmental and Behavioral Pediatrics, Children's Hospital of Philadelphia

⁶Division of Developmental and Behavioral Pediatrics, Boston Medical Center, Boston University

⁷Division of Language Services, Children's Hospital of Philadelphia

⁸Division of Developmental and Behavioral Pediatrics, Akron Children's Hospital

⁹Perelman School of Medicine, University of Pennsylvania

Primary Email: wozniaks1@chop.edu

Background: Background: As a result of the COVID-19 pandemic, many developmental-behavioral pediatric (DBP) practices quickly adopted the use of telehealth for care delivery. However, telehealth access for families with a preferred language other than English (PLOE) is an equity concern.

Objectives: To compare rates of telehealth uptake by preferred family language among patients seen for DBP assessments during the COVID-19 pandemic, and to compare rates of completed and no-show visits, for telehealth and in-person appointments, including by preferred family language.

Methods: This descriptive chart review used electronic health record data at 4 academic DBP practices. We included visits for patients up to 5 years of age, seen for new-patient appointments between 4/2020 and 4/2021. We compared rates of in-person and telehealth visits by preferred family language and visit outcome (completed or no-show) using chi-square and logistic regression. Monthly rates of telehealth visits as a percentage of total eligible visits for English-speaking and PLOE families were calculated.

Results: There were a total of 3241 visits throughout the 4/2020-4/2021 study period; 48.2% were conducted in-person and 51.8% by telemedicine. Families reported the following primary languages: 90.5% English, 6.2% Spanish, and 3.3% other language. Incomplete (no-show) visits accounted for 7.6% of total visits. The relative percentage of in-person versus telehealth visits varied significantly by site ($p < 0.001$), and by preferred family language ($p < 0.001$, see Table 1). English-speaking patients had 1.80 times the odds of being seen by telehealth compared to patients with PLOE. Statistically significant differences were not found for visit completion by visit type (in-person or telehealth) ($p = 0.79$), even when accounting for preferred family language in multi-variable models ($p = 0.83$). Figure 1 depicts the proportion of telemedicine visits over time for families with and without PLOE.

Discussion: At the height of the pandemic, most English-speaking families were seen for new DBP evaluations by telehealth, but fewer families with PLOE were. No-show rates did not vary by visit type but accounted for a low overall percentage of new visits. Reasons behind low uptake of telehealth among families with PLOE should be further explored, and attention paid to promote language equity in access to DBP care overall.

30. Patient Satisfaction with Care Providers During the COVID-19 Pandemic: An Analysis of CAHPS® Survey Scores for In-Person and Telehealth Encounters at an Academic Medical Center

Christine Gotthardt MS¹, Sarah Haynes PhD MPH², James Marcin MD MPH¹, Sristi Sharma MD¹, Peter Yellowlees MBBS MD¹

¹University of California Davis Health

²University of California, Davis - School of Medicine

Primary Email: cjgotthardt@ucdavis.edu

Background: During the height of the COVID-19 pandemic, telehealth became an apparent necessity for providing safe outpatient care. There is concern

among patients and providers alike how telehealth will be used in conjunction with in-person care going forward. Previous studies have demonstrated high patient satisfaction with telehealth encounters; however, questions still remain as to the comparability of the two methods of care. Large-scale, systematic comparisons of telehealth and in-person care across specialties have not been sufficiently evaluated. Thus, the objective of this study was to compare patient satisfaction scores regarding their physician using the Consumer Assessment of Healthcare Providers and Systems (CAHPS®) surveys between in-person and telehealth encounters during the height of the pandemic.

Methods: We analyzed CAHPS® patient satisfaction survey data over 31 clinics and 16 departments within the University of California Davis Health system between August 2020 and February 2022. We included ambulatory visits for patients 18 years of age and older. We excluded patients in pediatric and surgical departments, as well as departments that made up less than 1% of both the telehealth and in-person patient populations or those with zero encounters. Using logistic regression models adjusting for age, race, gender, ethnicity, language, and department, we compared CAHPS care provider top box scores—a score of 4 or 5 on the 5-point scale—for five survey items to determine if there was a significant difference in the odds of giving a top box score for in-person versus telehealth encounters. These five questions were selected based on response rates and relevance to both in-person and telehealth care.

Results: We analyzed survey results from a total of 91,091 patients, 76,687 of which met with their care provider in-person, and 14,404 of which met with their care provider via telehealth. The questions analyzed dealt with the explanations given by the care provider during the visit, the concern they showed, their efforts to include the patient in care decisions, the likelihood of the patient recommending their care provider to others, and the discussion of proposed treatment by the care provider. For each of the five CAHPS questions analyzed, there was not a significant difference in the odds of giving a top box score by the type of encounter. Females and younger patients consistently had lower odds of giving a top box score. Different departments also had significantly different odds of top box scores.

Discussion: Throughout the pandemic, telehealth was a necessary replacement for in-person care for many individuals. Our findings indicate that patient experience and care provider ranking for in-person care and telehealth are comparable. This finding aligns with results from similar studies that focused on patient experience both before and during the beginning of the pandemic. Future studies should investigate patient satisfaction with in-person and telehealth encounters by diagnosis and specialty, for follow-up appointments, and for patients who are unable to visit their physician to receive regular care.

31. Provider Characteristics Associated with Telehealth Use in Primary Care at the US Department of Veterans Affairs

Claudia Der-Martirosian PhD, Caroline Yoo MPH, Cynthia Hou MPH, Karen Chu MS, Maia Carter MD, Leonie Heyworth MD MPH, Lucinda Leung MD PhD

US Department of Veterans Affairs

Primary Email: Claudia.Der-Martirosian@va.gov

Background: Given the increasing reliance on telehealth service delivery in the past two and a half years with the COVID-19 pandemic, much research has been done to understand patient characteristics associated with telehealth use. However, less is known about patterns of telehealth use among interdisciplinary primary care team members, such as in patient-centered medical homes. An examination into the Veterans Health Administration (VA), an early telehealth adopter for hundreds of primary care clinics nationally, may provide insights on exercised preference for visit modality among different primary care team members, which can inform successful hybrid (virtual/in-person) care coordination. This study examined provider

characteristics of telehealth use (phone/video) among interdisciplinary PC team members, including VA physicians, nurses, mental health specialists, social workers, and pharmacists, over the past three years.

Methods: We used VA administrative and clinical data to examine patient, provider, and site-level predictors of any video and phone-based primary care (PC) visit from 67 VA healthcare systems nationwide, which included both the highest and lowest video-using sites. The study sample consisted of 34,259 PC providers, 36,186,201 visits, and 2,789,064 patients during the 36-month study period (3/16/2019–3/15/2022). We used multilevel mixed-effects logistic regression models on repeated yearly observations, predicting any video and phone-based care visit. The regression models accounted for patient and provider-level clustering and adjusted for patient, provider, and site-level characteristics. Patient characteristics included: age, gender, self-reported race/ethnicity groups, marital status, non-VA health insurance coverage, rurality of residence, Charlson Comorbidity Index scores, and service-related disability/income status. Provider characteristics included: age, gender, and PC provider type: MD/NP/PA, nurses, social workers, pharmacists, and mental health clinicians (MH). Site characteristics included: site rurality, facility service complexity (based on patient characteristics, clinical services, admin complexity, etc.), site indicator.

Results: Overall, the mean age of providers was 45.2 (SD = 11.6); 23.8% were male. Younger providers (ages 18–29, 30–39, 40–49, 50–59 vs. 60+) were more likely to use video. Male PC providers were less (OR = 0.86, 95%CI: 0.85–0.86) likely to use video compared to female PC providers. MH providers (OR = 6.46, 95%CI: 6.31–6.61) and social workers (OR = 1.22, 95%CI: 1.20–1.25) were more likely to use video compared to MD/NP/PA, whereas nurses (OR = 0.67, 95%CI: 0.66–0.68) and pharmacists (OR = 0.79, 95%CI: 0.77–0.80) were less likely to use video. Facilities with higher service complexity were more likely to use video compared to sites with lower facility service complexity. Regarding phone use, male PC providers were less likely (OR = 0.82, 95%CI: 0.81–0.83) to use phone compared to female PC providers. Compared to MD/NP/PA, pharmacists (OR = 12.31, 95%CI: 12.06–12.57), social workers (OR = 4.93, 95%CI: 4.83–5.03), MH (OR = 2.41, 95%CI: 2.36–2.45), and nurses (OR = 2.30, 95%CI: 2.28–2.31) were more likely to provide phone-based care. Lastly, sites with high facility service complexity (compared with lower facility service complexity) and rural settings (compared to urban sites) were more likely to provide care by phone.

Discussion: Examining the characteristics of telehealth use among interdisciplinary PC teams provides the opportunity to better understand factors, beyond patient characteristics, that might be associated with the utilization and provision of telehealth services. Findings from this national study indicate that male PC providers, including physicians and nurses, are less likely to use telehealth (either phone or video) compared to female PC providers. Additionally, mental health providers and social workers are more likely to use video, while nurses and pharmacists are more likely to use phone. These findings might have several implications, including the provider's choice of visit modality, preference for teleworking, and appropriateness of telehealth use for the different types of PC services. A greater understanding of barriers and facilitators to provider telehealth use is critical for ongoing hybrid PC team models and to optimize patient and provider experience for complex care coordination.

33. COVID-19 Compelled Rapid Adoption and Use of Telehealth by Primary Care Clinicians in Southeastern U.S. States

Mitchell Blount MPH, Megan Douglas JD, Chaohua Li MPH, Denita T Walston MS, Anne Gaglioti MD, MS FAAFP, Dominic Mack MD MBA

Morehouse School of Medicine

Primary Email: mblount@msm.edu

Background: The COVID-19 pandemic highlighted, and in some instances exacerbated, existing barriers and inequities in the clinician workforce: burnout and frustration using digital health tools (DHTs), numerous work-

SEARCH PRESENTATIONS

flow challenges and barriers, and time taken away from patients. However, the rapid adoption and use of DHTs, which was accelerated by state and federal policy changes, served as the catalyst to reach many more patients who may not have been able to receive care prior to the pandemic.

Methods: We examined the types of DHTs used in response to COVID-19 and assessed the reasons for use and adoption of telehealth through surveys and focus groups with primary care clinicians across the southeast.

Results: We collected 1,215 surveys, conducted seven focus groups with 25 clinicians. 1160 participants who had complete demographic information and survey responses were included for analysis. 90% of clinicians used DHTs due to COVID-19. Respondents used the following DHTs: telemedicine (66%), electronic health records (66%), patient portals (49%), health information exchange (40%), prescription drug monitoring programs (39%), remote/home monitoring (27%), and wearable devices (22%). Telemedicine was most used by Family medicine medical doctors in FQHCs in the treatment of adult general medicine. 52% of clinicians used telehealth for the first time due to COVID-19. Clinicians are using telehealth for treatment of COVID-19 positive (63%) and negative patients (67%), training (39%), and other (10%): chronic disease management, follow-ups, therapy (substance use and mental health), school concerns, and to reduce risk of provider-patient exposure. Telehealth benefited patients by eliminating transportation barriers, especially in small, rural communities. Language barriers and cost of interpreter services were challenges to telehealth visits. Patients were also hesitant to receive care if they could not see their preferred provider.

Discussion: This study highlights the impact COVID-19 had on the timing and motivations for adopting DHTs by primary care clinicians. The findings identify opportunities to address social determinants of health as barriers to care delivery by clinicians and improve patient access to DHTs.

34. Improving Rural Health Through Telehealth-Guided Provider-to-Provider Communication: Insights from an NIH Workshop

Melissa Green Parker PhD¹, Kate Winseck MSW¹, Audie A. Atienza PhD², Fernando P Bruno MD MPH³, William England JD PhD⁴, Diane M Hall PhD MEd⁵, Carrie N Klabunde PhD, MBA MHS¹, Tom Morris MPA⁶, Antonello Punturieri PhD⁵, Sahira Rafiullah PhD⁶, Xinzhi Zhang MD PhD³, Robert McNellis MPH PA¹

¹Office of Disease Prevention, National Institutes of Health

²National Center for Advancing Translational Sciences, National Institutes of Health

³National Heart, Lung, and Blood Institute, National Institutes of Health

⁴Office for the Advancement of Telehealth, Health Resources and Services Administration

⁵Policy Research, Analysis, and Development Office, Centers for Disease Control and Prevention

⁶Federal Office of Rural Health Policy, Health Resources and Services Administration

Primary Email: bob.mcnellis@nih.gov

Background: Rural communities often face chronic challenges of high rates of serious health conditions coupled with inadequate access to health care. Increased use of telehealth technology is one strategy with potential to mitigate these problems. Telehealth collaboration among health care providers for consultation and other purposes—referred to as Provider-to-Provider Telehealth (PPT)—offers critical expertise that may not exist locally in rural communities. While PPT is a promising strategy for bringing needed expertise to rural healthcare delivery, evidence supporting its use is limited, including how patient access, satisfaction and outcomes, provider satisfaction and performance, and payment are affected. To better understand and address these issues, several Federal agencies collaborated to convene a workshop in October 2021 to assess the available scientific evidence on use

and effectiveness of PPT to improve health in rural communities. The pandemic increased the workshop's significance.

Methods: The workshop was designed to address four key questions (KQs). An independent panel of experts appraised several sources of information which included a systematic evidence review, an analysis of agencies' research portfolios, subject matter expert presentations, and public perspectives. KQs 1 and 2 considered the uptake and effectiveness of different types of PPT in rural areas. KQ 3 examined effective strategies and addressed barriers and facilitators to implementing PPT in rural areas. KQ 4 assessed methodologic weaknesses of PPT studies in rural communities and considered study design improvements for more impactful future research. Following the workshop, the independent panel developed a peer-reviewed report describing evidence gaps and recommendations for each KQ for moving the field forward. The systematic evidence review conducted by an AHRQ Evidence-based Practice Center is expected to be published to accompany the panel's report.

Results: The independent panel's findings and recommendations highlighted the need to examine definitional issues related to rural PPT, data and infrastructure to support PPT, uptake of PPT in the context of broadband availability, rural provider recruitment and retention, workforce training, payment policy, and methodologically complex study designs. The independent panel's recommendations, which are currently in press, along with a few implementation examples culled from a meeting of federal partners, will be shared to illustrate potential drivers for improving PPT communication and collaboration in rural settings.

Discussion: The COVID-19 pandemic and the resulting PHE has resulted in rapid adoption of direct-to-consumer telehealth and PPT. There is a unique opportunity to expand the role of PPT in addressing issues of health care access and health disparities chronically faced by rural populations, many of which have been exacerbated by the pandemic. The workshop findings have implications for enhancing training of rural providers, improving reach of effective evidenced-based practices to providers and patients, and informing policy issues related to telehealth. The independent panel report's findings and recommendations can guide research to fill PPT evidence gaps related to health care access and health equity. Future research combined with federal partners' efforts to implement the report's findings and recommendations has the potential to address some of the longstanding disparities of access to services, health care delivery, and health outcomes in rural communities.

35. Comparing Quality of Telemedicine & In-Person Provider Visits of Older Adults with Heart Failure During COVID-19 Pandemic

Sarah Rhoads PhD DNP WHNP-BC APRN FAAN¹, Jean McSweeney PhD RN FAAN², Heba Sadaka PhDc MSN RN CNE³, Jing Jin MPH², Song Ounpraseuth PhD², Joseph Sanford MD², Srikanth Vallurupalli MD², Claude Pirtle MD MS FACP FAMIA⁴, Heather Marshall BSN RN², Patty Reed MD², Judith Weber PhD RD²

¹University of Tennessee Health Science Center

²University of Arkansas for Medical Sciences

³University of Arkansas at Little Rock

⁴West Tennessee Healthcare

Primary Email: srhoads@uthsc.edu

Background: Use of telemedicine in homes increased exponentially during the first few months of the COVID-19 pandemic due to stay at home orders. Many health systems and outpatient cardiology clinics that had never conducted virtual visits implemented telemedicine visits for older adults living with heart failure for the first time. Characteristics of older adults and people living with heart failure put them at greater risk of illness and death during the COVID-19 pandemic. Eighty-two percent of older adults have at least one chronic health condition, such as HF, impaired mobility, diminished sensory awareness, and social and economic limitations. Under our

Patient Center Outcomes Research Institute-funded enhancement award, we compared telemedicine (TM) visits to in-person visits. The overall aim of the study was to determine what type of patient care visit was most effective and preferred by older adults living with heart failure.

Methods: Comparative effectiveness mixed method design that used an online survey, electronic health record data, and interviews. Study eligibility requirements included 55 years of age or older, a diagnosis of heart failure (HF), and a health care visit between September 1, 2020-May 31, 2021, at one of two participating health systems in the southern United States. One of the health systems primarily provided care for people who reside in rural areas and the other had an urban population.

Results: A total of 790 older adults living with HF completed the online survey. Of respondents, 125 had a TM visit, 665 had an in-person visit, and 421 agreed to the qualitative interview (66 TM, 355 in-person). Fifty interviews were conducted (22 TM and 28 in-person). The participants who had in-person visits were more likely to report higher quality of care regarding the follow-up notes after the visit compared to participants who had TM visits. The TM group also showed a significantly lower score of quality of physician-patient interaction compared to the in-person group after controlling for potential confounders. Patients who completed qualitative interviews about their TM experience identified many benefits to TM such as convenience, ability to have others participate (i.e., family member), and safety from exposure to COVID-19. Problems arose related to other health conditions such as visual impairment, arthritis, impaired cognition, and technology issues such as lack of broadband connectivity and inadequate equipment. Major recommendations were to provide written instructions for the TM visit, an accessible summary of the TM visit, extra time with new providers, desire to see their regular provider and not a new provider via TM.

Discussion: Participants with in-person visits reported better physician-patient interaction and higher quality of follow-up after visits compared to participants with telemedicine visits. Using TM was a new experience for most of the participants, providers, and cardiovascular clinics and necessitated overcoming a variety of issues. Despite these issues, most older adults who participated in the study were willing to continue to use TM and liked having the option of receiving healthcare in the safety of their own home with their usual provider.

36. The Evolution of Health System Planning and Implementation of Maternal Telehealth Services During the Public Health Emergency

Monisa Aijaz MD MPH¹, Burcu Bozkurt¹, Christopher Shea PhD^{1,2}

¹Department of Health Policy and Management, University of North Carolina at Chapel Hill

²Cecil G. Sheps Center for Health Services Research

Primary Email: monisa_aijaz@unc.edu

Background: Higher maternal mortality and morbidity have been reported among people who are Black and Indigenous, low-income, and living in rural and underserved areas. Factors such as poor access to care are associated with these adverse outcomes. For example, many rural counties have lost hospital obstetric services exacerbating disparities. Telehealth is one approach for improving access to maternal health services. Telehealth can benefit patients by reducing the time burden and opportunity cost. Although promising, health care systems have underutilized telehealth for maternal health services. Furthermore, little is known about the decision-making within health systems about when and how to use telehealth for maternal services. This study examines how health systems have approached decisions about using telehealth for maternal services before and during the COVID-19 public health emergency (PHE). We also identified support needed to sustain maternal telehealth services beyond the PHE.

Methods: We used a purposive sampling approach to recruit 15 health system leaders and providers representing each region of the country. We

developed an interview guide to identify types of maternal telehealth services provided before and during different phases of the PHE, key considerations for deciding which services to offer and when, strategies used to address challenges faced, and recommendations about types of policy and implementation support needed. Our sample included representatives from eight health systems and affiliated practices with equal academic and non-academic health system distribution. Semi-structured interviews were conducted between July and October of 2021 and June and August of 2022. All the interviews were recorded and transcribed. Our qualitative analysis used a directed content analysis called the rapid analysis approach. The research team first identified deductive codes based on the interview guide, first impressions of the data, and existing literature. The primary analyst coded the transcripts by health system and practice. Inductive codes not captured in the initial codebook were added during the analysis. The research team then reviewed and discussed discrepancies in coding and interpretation of data.

Results: Interviewees from five health systems reported that they did not provide maternal telehealth services before the pandemic due to reimbursement issues. Two health systems provided limited services as a research endeavor, and one had an integrated maternal telehealth service line. During the pandemic, all transitioned to telehealth, with the main consideration being patient and staff safety. At the time of the interview, seven health systems continued to provide maternal telehealth services, some with integrated hybrid models and others planning such integration. Key considerations had shifted to patient access, patient preferences, coverage of portable devices (e.g., blood pressure cuffs), and return on investment. However, some patient-level barriers impacted telehealth use, including internet access and English proficiency. These issues were common among underinsured, low-income, and rural patients. The health systems with advanced capabilities were working on approaches to fill access gaps for these patients, such as advocacy for coverage of devices. All interviewees were optimistic about telehealth being an equalizer for access to high-quality care but did not have outcome data, at least currently, to demonstrate that impact.

Discussion: Some health systems prioritized telehealth as a potential tool for improving access to high-quality maternal services for the patients at the highest risk of adverse outcomes. However, policy-level barriers to equitable implementation of these services exist. Policymakers and payers could support health systems by providing better access to blood pressure cuffs and other portable devices. Access to the internet and limited English proficiency are more common among underinsured, low-income, and rural populations who are known to have worse maternal outcomes. Hence, it is critical to evaluate the potential adverse effects of telehealth and find solutions to minimize them. Telehealth has the potential to expand to more robust consultations, remote monitoring (e.g., antenatal testing), integration of mental health services, and automation of clinical decisions. However, careful planning and implementation must be conducted to prevent unintended consequences for those needing it most.

38. Racial Differences in Substance Use Disorder Care via Telemedicine

Steve North MD MPH, Kira Riehm PhD

Eleanor Health

Primary Email: Steve.north@eleanorhealth.com

Background: Substance use disorder (SUD) is a long-standing public health crisis in the U.S. Historically marginalized populations are both more likely to experience negative consequences of SUD and less likely to access SUD care (Matsuzaka & Knapp, 2019). These disparities have widened since the onset of the COVID-19 pandemic. The relative change in overdose deaths between 2019 and 2020 was 44% in Black adults, compared to 22% in white adults (Kariisa et al., 2022) raising concerns that these disparities may extend to inequities in access to care stemming from telemedicine use. Mental health

and SUD visits decreased more sharply among Black compared to white adults during the first year of the pandemic (Yang et al., 2020). Less is known about engagement in care over time and into subsequent phases of the pandemic. This analysis examines racial differences in (1) engagement in virtual care and (2) retention in care using data from Eleanor Health, a system of SUD clinics located across the U.S.

Methods: Eleanor Health is a provider of whole-person SUD care delivered via brick-and-mortar clinics supported by virtual care in 6 states. Since the start of the pandemic, Eleanor has primarily seen patients (hereafter referred to as “community members”) via virtual care. Eleanor Health provides behavioral health, addiction medicine, psychiatric care and supports this through the use of community recovery partners (peer support specialists) and nurse care management. We collected demographic and clinical data via the electronic health record (Athena) over a two-year period from July 1, 2020 through July 31, 2022. Telemedicine visits across all disciplines (addiction medicine, psychiatry, behavioral health, nursing and peer support services) were included in this analysis. Using chi-squared tests, we analyzed racial differences (non-Hispanic white and non-Hispanic Black) in (1) use of virtual care and (2) retention in care, defined as having attended a visit within the last 60 days.

Results: From July 1 2020 through July 31, 2022, there were 148,526 unique telemedicine visits among 5,824 community members. Of these, 144,529 (97.31%) were completed virtually (either one or both participants were remote). The overall retention rate of community members in care was 50.12% across the study period. Further analysis demonstrated that 4,132 non-Hispanics Whites, 538 non-Hispanic Blacks and no Hispanics received care from Eleanor Health during this time period. Non-Hispanic Whites had a telemedicine utilization rate of 97.43% and an overall retention rate of 52.67% while non-Hispanic Blacks had a telemedicine utilization rate of 95.47% and an overall retention rate of 45.57% (both differences significant at $p < 0.01$).

Discussion: This analysis identified clear differences in telemedicine utilization rates and retention rates between non-Hispanic White and non-Hispanic Black community members at Eleanor Health. Clinical and policy initiatives are needed to ensure equitable access to care among racially diverse people accessing substance use and mental health care.

39. Addressing Disparities in Telehealth Access for Children on the Southside of Chicago

Carmelle Romain MD FACS², Karen Schaller NP³, Rachel Nordgren PhD⁴, Kathleen Webster MD MBA¹

¹Advocate Children's Hospital

²The University of Chicago Medicine & Biological Sciences

³Advocate Aurora Health

⁴Public Health Sciences, University of Chicago

Primary Email: carmelle.romain@aah.org

Background: Individual, social, racial, environmental, and economic factors have been termed social determinants of health (SDOH). Current data suggest that the rapid implementation of telehealth may be exacerbating the disparities known as the digital divide that creates an uneven distribution in the access to, use of, or impact of communication technologies between any number of distinct groups. These groups may be defined based on social, geographical, or geopolitical criteria. Existing healthcare disparities can be exacerbated when patients with limited digital literacy are asked to access care via telemedicine. The South Side of Chicago is ethnically and socio-economically diverse, with predominantly African-American and Latino communities. There is a great disparity of income across this region. The aim of this retrospective clinical study is to identify influencing factors and resource gaps impacting the ability to access care through telemedicine services in a pediatric specialty clinic.

Methods: During the COVID-19 pandemic, our pediatric surgery department converted most visits to telehealth visits using a secure live interactive audio video platform. This retrospective cohort study used survey methods and accompanying electronic health record (EHR) data to examine telehealth access.

Charts were identified for all patients scheduled for a pediatric surgery telehealth visit between March 2020 and March 2021. The patient's parent or guardian was contacted by telephone and consent obtained for the study. Parents/Guardians were asked to complete a study questionnaire by telephone or via email. The questionnaire addressed questions related to digital literacy and ability to access telehealth visits. Demographic information was collected from the EHR including date of the visit, age of the patient, visit type, visit diagnosis, race/ethnicity, zip code. Analysis was completed to assess the correlation between the patient/guardian variables and rate of visit completion.

Results: During the study time period, 193 patient encounters were identified and reviewed. 37 encounters were excluded due to not meeting study criteria or having incomplete information. 25 records were duplicates and were removed, leaving a final sample size of 131 encounters. Of these 102 were completed as telehealth visits and 29 were no-shows. 43 Parent/guardian surveys were completed. Of these, 37 had completed visits and 6 were no shows.

Demographic data revealed that patients with no-shows had a lower median age (3 years vs. 9 years), a higher proportion of Hispanic patients (32% vs. 19%), and a higher proportion of non-English speaking patients (8.1% vs. 2.6%). Analysis of zip code by median income showed that areas with lower median income were associated with higher no show rates (OR 0.725/\$10,000 increase).

Results of the parent survey results showed an association of no-show rates with parent guardian education high school or less ($p=0.007$), a primary language other than English ($p=0.0088$), difficulty accessing internet at home ($p=0.027$), and only available device for internet access is a smartphone (0.0016).

Discussion: Our goal was to identify influencing factors and resource gaps impacting the ability of patients to access telehealth. We found that Hispanic and non-English speaking patients were less likely to complete telehealth visits. Our telehealth platform, like many, has instructions primarily in English. Future work is needed developing patient instructions and access to information that is culturally and linguistically relevant to our patient populations.

We also identified that access to the internet and devices are a barrier to completing telehealth visits. Although our sample size was small and the number of represented zip codes diverse, this suggests a need for continued screening of patients to identify those neighborhoods and households where additional resources may be needed. Digital literacy and access are important components of social determinants of health and should be incorporated into these efforts.

40. Reductions in ED Visits and Inpatient Stays in Complex Care Pediatrics After a Year with Remote Exam Device

Anna Sibilia MD¹, Scott Callahan MD¹, Ken Tegtmeier MD¹, Katie Pulda¹, Lindsey Schiferl¹, James Odum MD², Marie Pfarr MD²

¹Cincinnati Children's Hospital Medical Center

²University of Alabama Medical Center

Primary Email: ajfrazier17@gmail.com

Background: Children with medical complexity (CMC), defined as children with chronic, functional limitations and technology dependence, represent a significant proportion of health care utilization (1). These patients require timely, accessible health care, and telehealth has potential to improve care delivery to this patient population. Patients and families within Cincinnati Children's Medical Center Complex Care Center (CCC) have been using a remote exam device since 2020. The device is an FDA approved and allows for the transmission of physical exam findings from the home to the pro-

vider. The device includes a thermometer, stethoscope, otoscope, tongue depressor, and built in camera. Since patients have now been using the device for over a year, we have been able to explore emergency department visits, in-person outpatient appointments, and inpatient admissions for patients both pre and post device acquisition.

Methods: Families within the CCC active registry (defined as patients who have had a CCC office visit within the last 3 years) were offered a device starting in September 2020. Those who chose to use the device were educated using a thorough onboarding process to ensure appropriate usage. Patients who had had the device for a minimum of 1 year were included in our analysis. We examined the demographics of the patients who received the device, specifically the patient's gender, ethnicity, race, and spoken language. We also examined the following health care usage data from 2 years pre-device, 1 year pre-device, and 1 year post-device: in person office visits, telehealth visits, inpatient stays (both planned and unplanned), and emergency room encounters. A planned inpatient stay was defined as an inpatient encounter that was created greater than 24 hours prior to the time the patient arrived.

Results: 578 patients were eligible to receive the device. 411 have received a device since September 2020, and 113 have had their device for over 1yr. Of these 113 patients, there was a decrease in total number of office visits from 2yr pre-device to 1yr pre-device (340 to 255), but an increase 1yr post-device (255 to 471). The number of telehealth visits precipitously increased from 2yr pre-device to 1yr pre-device (32 to 206) and continued to increase 1yr post device (206 to 249). The total number of inpatient days decreased from 2yr pre-device to 1yr pre-device (3092 to 1359) and continued to downtrend 1yr post-device (1359 to 1126). The number of unplanned inpatient days followed a similar pattern, down trending from 2851 2yr pre-device to 1114 1yr pre-device to 934 1 year post-device. The number of emergency room encounters decreased from 2yr pre-device to 1yr pre-device (121 to 104). It increased from 1yr pre device to 1yr post device (121 to 124). In terms of acuity of ED visits, triage level 2 encounters decreased from 78 2yr pre-device to 73 1yr pre-device to 74 1 year post-device. Triage level 3 encounters decreased from 29 2yr pre-device to 19 1yr pre-device and then increased to 30 1yr post-device.

Discussion: Office visits, inpatient days, and emergency room visits all decreased between 2yr pre-device and 1yr pre-device. This is around when the COVID-19 pandemic caused hospital-wide decreases in these areas. However, by 1yr post-device, the number of inpatient days continued to downtrend, even with the hospital being close to pre-pandemic census. While the number of ED encounters increased between 1yr pre- and 1yr post-device, the number of encounters 1yr post-device were similar to the number of ED encounters 2yr pre-device. The increase in ED visits also seemed to be lower acuity visits, as the number of triage level 2s decreased and the number of triage level 3s increased from 2yr pre- and 1yr post-device. The decrease in the number of inpatient days and decreased acuity of ED visits between 2yr pre-device and 1yr post-device may be indicative of the device safely enabling families to receive care at home rather than seek in-person care.

41. Integrating Oral Health Prevention Education in Virtual Patient Engagements

C Eve Kimball MD FAAP, Kelly Curtain-Hallinan DO FAAP,
Thomas J Maroon MD FAAP

PAAAP - PA Chapter, American Academy of Pediatrics

Primary Email: doceve1@gmail.com

Background: Oral health impacts the physiological, social, and psychological factors that are essential to quality of life. Evidence connects a healthy mouth. Oral health impacts the physiological, social, and psychological factors that are essential to quality of life. There is strong evidence for a healthy mouth underpinning the health of the entire body throughout the

life cycle. Despite its importance, many barriers exist to good oral health. Dental caries are 80% preventable with appropriate preventive measures. Despite the large burden of disease, its management remains a public health gap. As the public shifts to the use of more virtual media as its primary means of education, it is important that evidence based materials for diverse populations are widely available for non-healthcare related community groups, community health workers, and healthcare settings.

Methods: The Oral Health Framework for Telehealth (OHFT) project began in January, 2022. A core group of three pediatricians, a pediatric dentist, a public health dental hygienist and two part-time staff was assembled. A diverse Advisory Group, IRB exemption from WCG IRB Connexus, a script of questions for focus groups, and a list of 150+ potential focus group participants were created. Focus groups consisting of two-four persons were conducted on zoom. The first set of Oral Health Prevention Education Tools for virtual engagements is being created in the second half of 2022 using input from consultants, qualitative automated intelligence tools, piloting practices, and an ongoing Learning Collaborative composed of the Advisory Group and piloting pediatric practices. This Learning Collaborative will continue to function for the next five years to continue evaluating what works and what doesn't and which information needs updating.

During Years 2-6, a best practice guide will be created. OHFT and the Learning Collaborative will add virtual education tools, CPT/RVU code generation, Bright Futures/USPSTF recommendations. The Learning Collaborative will be expanded to include additional practices and groups piloting the tools.

Results: Input thus far has focused on education topics, suggestions for media development, embedding information into websites, and electronic vehicles for information transmission - among them QR codes and videos. Professional cohort participants have expressed concerns about minimizing time needed to transmit information. Groups involving parents have spoken about helping young children to incorporate oral hygiene measures and alternatives and strategies to sustain them. Common obstacles to delivering the messages have been described.

Focus group input is currently organized into four general categories: Education, Timing, Modalities, and Limitations to facilitate development of the best practice tools, find a sustainable location for them, and publicize them widely.

Discussion: To date, key topics that have appeared are:

- recommendations for nutrition education (avoidance of sugary beverages and sticky substances, water in sippy cups).
- age-appropriate alternative ways for brushing with/without appropriate amounts of fluoride toothpaste.
- the importance of fluoridated (if possible) tap water between meals.

We are seeking entertaining, instructional videos for piloting practices to use and give us feedback. Our emphasis for the focus groups for the second half of the year is on non-professional stakeholders.

Because access to a dental professional is difficult for many people across the US, prevention of disease is critical and educating the public in these strategies with entertaining and enlightening materials is key.

42. Asynchronous Telemedicine Pre- and Post-COVID-19: A Focus on the Quadruple Aim of Medicine

Nathan Culmer PhD, Todd Smith PhD, Abigail Fickel, Jet Tan,
Carlos "Trey" Clark

The University of Alabama

Primary Email: npculmer@ua.edu

Background: While the use of telemedicine has steadily increased over the past several decades, the COVID-19 pandemic, and subsequent changes in

SEARCH PRESENTATIONS

provider/patient perceptions of telemedicine and reimbursement for care via telemedicine, led to a tremendous growth in telemedicine over just the past two years. Asynchronous telemedicine involves non-simultaneous healthcare encounters between patient and provider which may include a web-based portal, text-messaging, a phone-based application, or other technological means. Two primary advantages of asynchronous telemedicine are reducing or eliminating the need to travel to a healthcare provider, and convenience in access to a provider without having to schedule a specific appointment time.

The aim of this systematic review is to evaluate the impact of the COVID-19 pandemic on asynchronous telemedicine in relation to the quadruple aim of medicine: improving care quality and satisfaction while reducing cost of care and improving provider well-being.

Methods: Using CINAHL, PubMed, and EmBase databases, and following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, we conducted a literature review on the use of asynchronous telemedicine and found 1,424 abstracts for initial review. Inclusion criteria involved journal articles that a) were in the English language, b) contained an abstract, c) involved an empirical design, d) were published between 2000 and 2021, e) described a patient-provider relationship via technological means, f) involved asynchronous interaction between patient and provider, and g) conducted an empirical analysis of primary data, and h) were peer-reviewed. From these articles, we extracted data to summarize the characteristics and findings from these studies. We also used the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool to analyze the methodological rigor of each included article. This tool examines rigor using six categories: Selection Bias, Study Design, Confounders, Blinding, Data Collection Methods, and Withdrawals and Dropouts.

Results: Initial review of abstracts resulted in the inclusion of 127 articles. Sixty-one of these were published prior to the pandemic, while 66 were published since the beginning of the pandemic indicating increased interest in asynchronous telemedicine. Proportions of asynchronous telemedicine publications addressing quality of care and patient satisfaction decrease from pre-pandemic to the time the pandemic emerged as a global health threat. There is a small increase in the percentage of studies discussing cost of care to the patient via asynchronous telemedicine. Overall, few studies discuss the relationship of asynchronous telemedicine to provider well-being or providers' costs of delivering care to patients via asynchronous telemedicine.

The majority of studies lacked strong methodological rigor overall and across the six categories of the EPHPP. It is worth noting, however, that certain categories of the EPHPP, such as blinding of participants to the test condition, can be difficult to control due to the nature of most studies of asynchronous telemedicine.

Discussion: The results suggest that asynchronous telemedicine is growing and diversifying in usage and can serve as an efficient alternative to traditional in-person care in many types of encounters. With the rapidity of adoption of asynchronous telemedicine as a method of healthcare due to the COVID-19 pandemic, we are beginning to see additional reasons for use and specialties implementing this technology. However, both more research and more methodological rigor are needed to fully explore its potential benefits, limits, and applications.

43. Impact of Telehealth on Healthcare Expenditures

Benjamin Rogers BS, Eric Wallace MD FASN, Kimberly Smith PhD, Tapan Mehta PhD

University of Alabama at Birmingham

Primary Email: brrogers@uab.edu

Background: Prior to the COVID-19 pandemic, expansion of telehealth was sought as a potential means for reducing healthcare expenditures. Further-

more, studies have identified decreased lost time at work for patients, increased clinician efficiency, and decreased trips to the emergency room, urgent care, and physicians' offices all as contributors to this decreased cost. Some research, however, has also shown that telehealth can increase cost of care by increasing access unnecessarily. Our research aims to evaluate the impact of telehealth on healthcare expenditures at an academic healthcare institution.

Methods: All claims billed by the UAB Health System to Blue Cross Blue Shield of Alabama between January 2021 and March 2022 were included in the analysis. Provider based claims were identified as telehealth versus in-person over this period using Evaluation and Management (E&M99) codes 99212-99214 and 99202-99204. Procedural claims were linked to each of these E&M service charges and analyzed separately. The number of services per claim and the overall cost per claim of telehealth vs. in-person visits was analyzed. Procedures that accounted for the top 50% of claims performed in-person but not over telehealth were identified. The provided E&M codes were used to estimate procedures per claim for in-person and telehealth visits for the top 10 telehealth utilizing specialties. The cost per claim of in-person vs. telehealth visits was also calculated.

Results: 189,216 claims were analyzed; 47,901 were telehealth and 141,315 were in person. The average cost per telehealth claim (\$86.08) was lower than that of the average cost per in-person claim (\$120.68). The average number of procedures per telehealth claim was 1.02 while the average number of procedures per in-person claim was 1.30. An analysis of the top 10 telehealth utilizing specialties showed that the largest reduction in procedures per claim between in-person and telehealth came from cardiology (1.93-1.00), internal medicine (1.34-1.01), family medicine (1.32-1.00), and rheumatology (1.21-1.00). Psychiatry was the only sub-specialty that increased the number of procedures for in-person as compared to telehealth resulting in 1.10 procedures per telehealth claim to the 1.05 procedures per in-person claim. Echocardiograms, fetal ultrasounds, and nasal endoscopies represented the largest cost savings by way of reduction in procedures ordered.

Discussion: These results convey that telehealth visits may yield substantial savings related to a decrease in utilization of procedures as compared to in-person visits. Future research is needed to determine whether the reduction in these procedures leads to increased morbidity and mortality or if they represent an over-utilization of each respective procedure. Either way, the reduction in procedures and associated cost savings should be taken into account by legislative bodies deciding upon the permanent coverage of telehealth after the end of the Public Health Emergency.

44. Evaluating a Project ECHO Community of Learning to Continue Telehealth Momentum and Best Practices

Eve-Lynn Nelson PhD¹, Molly Brown PhD, MPH¹, Tim Davis MS², Karen Edison MD³, Cara Lawlor BJ⁴, E. Rachel Mutrux BA⁵, Robert Stiles MPH, MA¹, Denna Wheeler PhD⁶

¹University of Kansas Medical Center

²Oklahoma State University Center for Health Sciences

³ShowME ECHO

⁴Health Communication Research Center, LLC

⁵Missouri Telehealth Network

⁶Oklahoma State University Center for Health Sciences

Primary Email: enelson2@kumc.edu

Background: A recent HHS Office of the Assistant Secretary for Planning and Evaluation report (2021) suggested a 63-fold increase in telehealth utilization during the pandemic based on Medicare fee for service data in 2019 and 2020, with increases also seen in Medicaid and privately insured populations. To meet pressing pandemic needs in 2020, the regional Heartland Telehealth Resource Center leveraged Project ECHO to rapidly

share telehealth best practices, providing 586 hours of CE. Based on needs assessment, the 2021-2022 Telemedicine ECHO prioritized operations and sustaining telehealth as a permanent solution, recruiting a 36-practice learning collaborative cohort. The 10-session ECHO series included monthly ECHO telementoring sessions aligned with the eSTART telehealth readiness tool and shared best practice updates and telehealth implementation “cases.” Participating organizations had access to QI coaching and practice facilitation through the tri-state telehealth resource center.

Methods: Telemedicine ECHO participants representing a range of organizations (e.g., FQHCs, RHCs, large academic institutions, tribal health organizations) completed pre and immediate post surveys developed using Moore et al.’s (2009) adapted framework for Project ECHO evaluation. Participants represented both rural and urban organizations. Metrics were drawn from the administrating ECHO superhub (ShowME ECHO), allowing comparison of process and self-efficacy metrics to other Project ECHO series.

Results: Interest in the Telemedicine ECHO remained strong in 2021 with an average of 35 learners per session. Of the 127 unique learners, 56 individuals (44%) participated in two or more sessions and 16 (13%) learners participated in 4 or more of the 8 ECHO sessions. In 2022 alone, the Telemedicine ECHO scored highly on all ECHO process measures (Overall Speed & pacing Opportunity for questions and discussion; Communication from organizers; Audio/video quality; Hub team’s knowledge; Overall management of session by the hub team), with the exception of lower than ECHO average case study presentations. With 31% of participants responding, the Telemedicine ECHO respondents reported pre-test to immediate post-test gains across all 8 self-efficacy questions (e.g., addressing technical issues; ensuring the clinical appropriateness of telehealth; creating protocols/processes; keeping up-to-date on telehealth policy/regulatory environment; understanding telehealth billing; evaluating and continuously improving telehealth; educating patients, staff, and providers in what to expect during a telehealth encounter; and serving as a local/regional expert). Qualitative responses suggest broadband access remained the highest barrier to implementation.

Discussion: Results suggest that the Project ECHO (Extension of Community Healthcare Outcomes) telementoring model provides an engaging, effective framework for supporting telemedicine implementation. Paired with other telehealth resource center training options (e.g., webinars, 1:1 consultation, podcasts), the approach fosters sustaining telemedicine and telehealth services across a wide range of organizations serving low resource communities. The Telemedicine ECHO approach has the potential to maximize limited resources, providing access to telehealth implementation expertise and peer-to-peer learning across geographies. Telehealth and telementoring resources will be shared, including the federally funded telehealth resource centers, telementoring training center, and ECHO Institute and superhubs. Future directions for evaluating the longitudinal impact of the Telemedicine ECHO within the evolving legal-regulatory environment will be addressed.

45. Improving Virtual Diabetes Care: An Exploration of Telemedicine Implementation Across Four Academic Medical Centers

Miriam Sarkisian ¹, Stephanie Crossen MD¹, Aaron Neinstein MD², Jenise Wong MD², Polly Fu Teng MD¹, James Marcin MD MPH³, Sarah Haynes PhD, MPH¹,

¹University of California, Davis - School of Medicine

²UCSF School of Medicine

³UC Davis Health

Primary Email: marsarkisian@ucdavis.edu

Background: For patients with diabetes mellitus requiring specialty care, access to routine care is essential for maintaining a high quality of life and avoiding adverse health outcomes. Telemedicine is one strategy for improving access to diabetes specialists and was rapidly adopted during the

COVID-19 pandemic. More than two years later, telemedicine use for specialty diabetes care remains common. We sought to understand how delivery of telemedicine can be optimized to improve patient access and quality of specialty diabetes care through examination of specific clinical practices. The purpose of this study was to describe the implementation of telehealth across four of the University of California health systems, with the goal of identifying system-level, clinic-level, and provider-level practices that facilitate high quality telemedicine diabetes care. We also aimed to identify multilevel contextual factors that influence the adoption, implementation, and sustainability of these practices.

Methods: In this qualitative study, we conducted semi-structured interviews with 26 healthcare providers and professionals involved in specialty diabetes care, including pediatric and adult endocrinologists, registered nurses, diabetes educators, and other staff members at four of the University of California health systems: UC Davis, UC San Francisco, UC Los Angeles, and UC San Diego. Interview participants were recruited by email using existing contacts at each health system and subsequently through snowball sampling. Interviews were conducted via Zoom and lasted approximately 45-60 minutes each. Each interview was audio recorded and transcribed. Two coders used line-by-line coding to generate a codebook of common themes, which were then sorted into overarching contextual categories for analysis. These categorical themes were used to develop a model of strategies for improvement of telemedicine in specialty diabetes care. Findings and interpretation of results were further discussed and refined during a review session with diabetes and telehealth researchers.

Results: We identified similarities and variations in the way that telemedicine has been implemented for specialty diabetes care across the four health systems. The ability to collect reliable diabetes device data from patients remotely was cited by all respondents as a crucial aspect of delivering high quality virtual care. Providers reported that the success of obtaining data increased when a designated staff person was assigned to this task. Where this was not the case, physicians reported spending a significant amount of visit time providing tech support. Respondents discussed additional challenges such as integrating multiple team members into virtual visits, lack of developed workflows for scheduling follow-up appointments after telemedicine visits, and facilitating visits when patients are in distracting environments. Providers expressed varying preferences regarding the frequency of in-person vs. telemedicine encounters, with most reporting that one in-person visit per year (out of the recommended four) would be sufficient, if device data was available. Respondents also emphasized the role of department and clinic leadership in promoting or discouraging telehealth visits, either through explicit policies or informal communication.

Discussion: To support a high quality, sustainable model for specialty diabetes care via telemedicine, implementation strategies should be examined and thoughtfully implemented to ensure that providers and patients are able to effectively engage in virtual care. A structured care model and corresponding workflows should be developed to optimize both patient and provider experience with telemedicine and promote a higher quality of care. Our findings suggest ways in which telemedicine care models can be improved for specialty diabetes care moving forward, including designating a staff person to ensure that device data is uploaded prior to the visit, creating guidelines for patients on expectations of the telemedicine visit, and improving workflows to ensure consistent and timely scheduling of follow-up visits. Developing telemedicine-specific operations and workflows, rather than attempting to duplicate in-person care models, may have the potential to make virtual care more efficient and effective.

46. Differences in Verbal and Gestural Communication Strategies Between In-person and Remote Medical Procedure Training Cohorts

Puja Sasankan MD(c)¹, Manuel Rebol PhD², Neal Sikka MD³, Claudia Ranniger MD PhD⁴, Colton Hood MD³, Krzysztof Pietroszek PhD MFA⁵, David Li MS(c)⁴

SEARCH PRESENTATIONS

¹George Washington School of Medicine and Health Sciences

²Graz University of Technology, American University

³GW MFA

⁴Department of Emergency Medicine, George Washington University Hospital

⁵Institute for Immersive Designs, Experiences, Applications, and Stories (the Institute for IDEAS)

Primary Email: pujasankan@gwu.edu

Background: Effective medical procedure training requires the learner to have a good understanding of each procedural step and for the instructor to guide the learner through such steps using necessary verbal and hand gestures. Remote medical training, through utilizing technologies like virtual reality (VR), augmented reality (AR), and mixed reality (MR), may offer cost effective methods for healthcare skills training. However, this shift in procedural training from in-person to virtual requires a better understanding of how verbal guidance and gesture use may change to convey the action that needs to be performed. We developed a mixed reality system to train students on how to perform ultrasound guided central venous catheter placement (US-CVC). In order to determine how mixed reality altered instructor communication techniques, we conducted an analysis of gestural and verbal communication in recorded MR and in-person training sessions.

Methods: Twenty trainees with limited US-CVC experience were assigned to training via in-person or mixed reality (MR) using the HoloLens 2. Instructors were emergency medicine physicians, some of which were part of the research team. After initial setup with a drape and procedural kit, the instructors provided training for the procedure starting from vessel identification to flushing the line. During the in-person training, instructors used the kit in front of them to demonstrate the procedural maneuvers. In the MR training, instructors used representations of virtual hands, needle, and US probe to demonstrate the correct orientation of the tools in the learner's field of view. The training sessions were video recorded and analyzed using a checklist. Each evaluated step was assigned a number one through five to indicate if instruction was completely gestural (1), mostly gestural with some verbal (2), half gestural half verbal (3), mostly verbal with some gestures (4), or completely verbal (5) by two reviewers.

Results: Recordings of ten instructors in each of the in-person and MR conditions were analyzed. One hundred and forty steps were scored in each group and a total of 15 steps were unable to be assessed. Five key training steps were identified after video analysis: A) how to position the ultrasound probe to acquire a transverse view of the vessel in the midpoint of the image and probe orientation mark to the left, B) tracking the needle tip as it advances through the blood vessel using dynamic imaging, C) advancing the wire, D) using a twisting motion to use a dilator and E) threading the catheter over a wire making sure to never let go of the wire. For in-person studies, the mode for the communication type utilized for steps A, B, C, and D is 4 (mostly verbal with some gestures), for step E it is 5 (completely verbal). In MR training, all five steps utilized communication type 5 (completely verbal) and 5 was the mode for all steps evaluated. In both groups, no step was rated completely gestural or type 1.

Discussion: The preliminary results of this data analysis suggest that instructors in the MR setting used completely verbal communication most often, whereas the instructors in the in-person training used mostly verbal communication with some hand gestures. Instructors were provided with brief training in the novel MR technology which may have limited comfortability in utilization of the MR system's virtual tools and gestures. There were additional identified steps in the MR setting found outside of the evaluation checklist. These may represent steps that are unique to the MR environment and require further investigation. A common theme discovered was that gestures in MR are often used in combination with augmented objects. Therefore, the presence of movable objects for demonstration encourages the use of gestural communication in MR. Future work should further analyze the specific verbal communication and enumerate the hand gestures used within each step as well as examine the effect of practice.

48. Hybrid use of Telehealth for Collaborative Outpatient Clinic Visits in the Pediatric Complex Care Clinic

Elise Gentile MS APRN CPNP¹, Kathleen Webster MD², Ruby Roy MD²

¹Advocate Children's Hospital Oak Lawn

²Advocate Children's Hospital

Primary Email: Elise.gentile@aah.org

Background: The Pediatric Complex Care (PCC) program at Advocate Children's Hospital provides primary and consultative care to children with medical complexity (CMC) including those with 3 body systems requiring subspecialty care and who are technology dependent or dependent on others for all activities of daily living. Due to our patients' complex medical needs, transportation to medical visits can be taxing on patients and families. The PCC coordinates outpatient clinic visits so that the patient can see the PCC team and their subspecialists in one trip. In the past, members of the PCC team would remain in the clinic room during the subspecialist visits to be able to better coordinate the patients' care. The clinic room allows for wheelchair access but for no more than 4 people to be socially distanced. During the COVID 19 pandemic, to limit the number of people in the room and thus decrease risk of exposure, the PCC team utilized technology to create a hybrid in person/telemedicine visit.

Methods: PCC clinic rooms were equipped with a computer, large monitor, integrated webcam/speaker, and several virtual exam peripheral devices. Upon arrival the patient would have their vitals taken and get settled in the exam room. The patient and family in the exam room would be logged on to the videoconferencing platform and members of the PCC team would also log on. The PCC provider would complete the medication reconciliation and history of present illness via the videoconferencing platform from their office. They would also be "present" via the platform for the subspecialist encounters that were taking place in the clinic and to have real time collaborative discussions regarding plan of care. Afterwards the provider walks to clinic to complete a physical exam, follow up on decision making discussion, complete any procedures, and wraps up the visit. The video conferencing platform was also utilized to integrate live interpretive services as needed as well to include subspecialists who were not physically in the same clinic space.

Results: The PCC team successfully used a videoconferencing platform to complete 155 hybrid in person/telemedicine visits with multiple subspecialists and ancillary care teams such as nutrition, rehab therapies, respiratory therapy, and audiology. Number of participants in the videoconferencing session ranged from 2-12. Typically, the subspecialists that would see our patients in person during our hybrid visits are Pulmonology, ENT, General Surgery, Cardiology, and Neurosurgery. Subspecialists that utilize the video component of our visit include Endocrinology, Nephrology, Neurology, and Sleep Medicine. Using this method, we are able to coordinate care effectively among multiple specialties while meeting parents' concerns about social distancing and safety.

Discussion: Using a videoconferencing platform, PCC implemented a hybrid model for coordinated clinic visits for CMC. In person care plus telehealth allows for collaboration and care coordination while maintaining safety and social distancing. Other benefits include seamless foreign language interpretation among all providers, decreased parent need to repeat history, and some interaction without masks. Limitations include technical difficulties with new technology, such as sound difficulty or connection issues. Family hesitation was overcome when rationale was explained. The dual format makes the visit slightly longer, but our multispecialty in person visits were scheduled for longer than a typical clinic visit so the difference was not significant to our families. In the future we would like to include more off-site providers. We also plan to use peripheral devices such as high-resolution camera and stethoscope, so those off-site can complete more thorough exams via telehealth.

49. Implementation and Sustainability of Pediatric Virtual Therapy Services

Wendy Perlin MACCC SLP/L, Barbara Butler MA CCC-SLP/L,
Kathleen Webster MD MBA

Advocate Children's Hospital

Primary Email: wendy.perlin@aah.org

Background: Advocate Children's Pediatric Therapy services are provided at 2 regional children's hospitals and 5 community hospitals in Illinois. Services include occupational therapy, physical therapy, speech language pathology and audiology. The scope of service includes inpatient, outpatient physician specialty clinics and outpatient therapy services. Beginning with the COVID 19 pandemic, transformation of our business service lines was required for scheduling and access to services remotely. Within a 2-week period, our team researched, collaborated, created resources and online access to support our new virtual health platform. Our objective was to maintain patient access during the pandemic, assess the value of telehealth and create a sustainable model. We will review our methods in creating and sustaining this model, demonstrate the success seen to date, and describe the current model for assessing and implementing the most appropriate model of care for each child.

Methods: With the onset of the COVID 19 pandemic, the Pediatric Therapy team had an urgent need to convert to remote visits. Our health system was implementing a new telehealth platform integrated into the EHR. The Pediatric Therapy leadership used a structured approach and created several multidisciplinary focus groups. Each group determined diagnoses which could be seen safely and effectively via telehealth. A treatment pathway was created. We created tool kits for the therapists, clinicians, schedulers, and patients on accessing and scheduling telehealth visits. Through regular reviews of effectiveness, the team revised both the appropriate diagnoses and visit types. For certain patients, a hybrid model including alternating in person and telehealth encounters was used. Concurrently, we converted our scheduling process to allow patients and referring clinicians the ability to schedule visits online. As the pandemic waned and in person encounters were re-opened, we incorporated telehealth into our family focused facilitation treatment approach. Families are now able to access therapy services and choose their preferred mode of service delivery. We have currently sustained this model for our department for the last 2 years.

Results: Transitioning to telehealth visits occurred rapidly. Planning and implementation with the first round of team focus groups were completed in 2 weeks. In the first month of the program, 201 telehealth visits were completed, comprising 50% of total encounters for the department. As both patients and therapists became more comfortable with virtual visits, this number steadily grew. By the end of 2020, 1118 encounters (91.1% of total visits) were completed per month. One year after program implementation we were providing service at full scale with 1772 visits completed (77.5% of total) in Mar 2021. As clinics reopened and scheduling allowed patients and families to self-select the mode of service, we continue to provide to a hybrid model (in person/virtual visit care model) with a sustained rate of 35% of total visits completed via telehealth.

Our service area covers a large geographic region. By leveraging telehealth, each service area was able to expand the zip codes in which services were offered. Allowing patients and therapists from distant service areas to connect improved ease of scheduling for patients and allowed more patients to be seen. This also allowed flexible coverage during staffing shortages.

Discussion: Pediatric Therapies are typically "hands on" specialties. Remotely assessing and guiding families through treatment seemed daunting. Using a structured rollout and robust team engagement, we demonstrated rapid implementation and adaptation of a sustainable telehealth model. Key factors included careful consideration of diagnoses/visit types, reassessment of guidelines, education of staff/schedulers, and proactive offering and self-

selection of telehealth. Engaging the team allowed them to educate families during in person visits and set criteria and goals to encourage telehealth when appropriate. Online scheduling within determined guidelines allows patients to choose their preferred visit type. Telehealth is now fully embedded in our program with a consistent rate of visits. The program serves as a beneficial and sustainable asset to our department and patients whom we serve.

50. Evaluation of Patient Characteristics and Outcomes of Patients Receiving Medication Nutrition Therapy at a University Health Center in Mississippi

Elena Dent PhD RDN CDCES¹, Yunxi Zhang PhD¹, Lincy Lal PhD²,
John Swint PhD², Maria Pena MSc², Jennifer Reneker PT PhD¹

¹University of Mississippi Medical Center

²University of Texas School of Public Health

Primary Email: edent2@umc.edu

Background: The U.S. health system cares for many adults with diabetes, obesity, hypertension, and other nutrition-related chronic diseases, thus making what and how much we eat an integral component to combating rising rates of chronic disease. Medical Nutrition Therapy (MNT) is an evidence-based process administered by Registered Dietitian Nutritionists (RDNs) centered on individualized nutrition assessment, diagnosis, intervention, monitoring, and evaluation for patients with nutrition-related chronic conditions. One of many barriers to MNT that Mississippians face is access. Mississippi has the 4th largest population living in a rural region in the U.S. with more than 51% living in a rural area. Telehealth MNT is a tool that can help RDNs reach the underserved population of Mississippi suffering from diet-related chronic diseases. This study evaluated patients who received MNT services by one RDN via telehealth and/or in-person at the University of Mississippi Medical Center (UMMC).

Methods: We conducted a retrospective cohort study to evaluate the telehealth utilization among MNT patients and the subsequent hospital utilizations between June 1st, 2021 and June 30th, 2022 at UMMC. This study included adults who had at least one MNT encounter between June 1st, 2021 and December 31st, 2021 and at least one follow-up visit by June 30th, 2022. We extracted data from a self-service online application providing de-identified data from UMMC's Research Data Warehouse. The first encounter of each patient during the study period was the baseline encounter. We reported baseline characteristics including sex, race, age, as well as the subsequent utilization of ED admission and hospitalization during the study period. Mean (SD) and frequency (%) were used to describe continuous and categorical variables, respectively. Chi-squared tests, Fisher's exact test, and generalized linear models were employed to assess the association between hospital utilizations and patient baseline characteristics.

Results: Eighty patients had an MNT encounter with one RDN between June 1st, 2021 and December 31st, 2021 with at least one follow-up MNT visit by June 30th, 2022. Among them, 70 (88%) were female, 59 (75%) were Black, and 20 (25%) were White. Across all patients, the mean age at baseline was 47.7 (SD 15). The types of insurance presented at baseline were commercial insurance (n=33, 41%); Medicare (n=24, 30%), Medicaid (n=17, 21.25%), and other (n=6, 7.5%); however, MNT services were not submitted for reimbursement. A total of 64 patients (80%) completed their baseline MNT visit through telehealth and 16 patients (20%) completed the baseline MNT visit in person. Throughout the study period, all identified patients participated in-person visits related to their health (not limited to MNT) and 78 (98%) of them utilized telehealth for medical visits (not limited to MNT). During the follow-up period, 15 (19%) of patients who received MNT visited the ED, and 10 (13%) were hospitalized for an average of 2.4 days (SD = 2.2) at UMMC. No significant association was detected between the hospital utilization (ED admission and hospitalizations) and patient baseline characteristics at the 0.05 statistical significance level.

SEARCH PRESENTATIONS

Discussion: Most patients (98%) used telehealth services for medical-related visits throughout the study period, suggesting telehealth is widely utilized and accepted among this patient cohort with chronic disease and can be a valuable tool for providing MNT services. Due to the limited number of MNT encounters during the study period, it is difficult to determine the clinical and economic impact of MNT telehealth services separate from the in-person MNT services provided by one RDN. Further studies with appropriate control groups and a larger patient cohort are needed to determine the clinical and economic influence of MNT services provided via telehealth, in-person, or a hybrid approach.

This abstract was made possible by grant number U6631459 from the Office for the Advancement of Telehealth, Health Resources and Services Administration, DHHS.

51. Association Between Broadband Capacity and Social Vulnerability Factors in the United States: A County-Level Spatial Analysis

Mahip Acharya PhD¹, Catherine Shoults MPH²,
Corey Hayes PharmD PhD MPH^{2,3}, Clare Brown PhD MPH⁴

¹Institute for Digital Health & Innovation, University of Arkansas for Medical Sciences, Little Rock, Arkansas

²Department of Biomedical Informatics, University of Arkansas for Medical Sciences, Little Rock, Arkansas

³Center for Mental Healthcare and Outcomes Research, Central Arkansas Veterans Healthcare Systems, North Little Rock, Arkansas

⁴Department of Health Policy and Management, University of Arkansas for Medical Sciences, Little Rock, Arkansas

Primary Email: macharya@uams.edu

Background: Broadband access is integral to the effective use of telehealth; however, limited literature exists on the socioeconomic factors associated with broadband access. The objective of this study was to evaluate relationships between county-level social vulnerability and broadband access using spatial clustering and regression approaches.

Methods: A cross-sectional study design was used. The datasets used were secondary county-level broadband availability (Federal Communications Commission [FCC] and Microsoft; 2019–2020), social vulnerability (COVID-19 Community Vulnerability Index [CCVI]; 2020), and primary care access (Area Health Resource File; 2019–2020). We used two measures of broadband access: i) Microsoft system-reported proportion of county population with broadband, and ii) difference in FCC-reported and Microsoft-reported proportions of county population with broadband. The datasets were merged using county codes, excluding counties with missing FCC or Microsoft broadband data and counties with no bordering counties. Cluster maps were constructed using local moran's I, and spatial Durbin models were estimated using primary care Health Professional Shortage Area designation and CCVI themes (socioeconomic status, minority status, housing/transportation/disability, epidemiological risk, healthcare system, high-risk environment, and population density).

Results: Among 3,102 counties, county-level broadband coverage varied widely between Microsoft (0.39) and FCC (0.84), with greater coverage in East and West regions, and larger discrepancies between FCC and Microsoft data in the South and Appalachia regions. In spatial regressions, a one-point increase in socioeconomic status vulnerability (0-least; 10-most vulnerable), was associated with a 2.0 percentage points (pp) reduction in broadband access ($p < 0.001$). Similar inverse relationships were observed with housing, epidemiological, and healthcare system variables. There were greater divergence between FCC and Microsoft measures with each one-point increase in socioeconomic status (1.4 pp), epidemiological risk (0.6 pp), and healthcare system (0.7 pp) vulnerability.

Discussion: More vulnerable counties had lower broadband access and larger divergences between Microsoft data and commonly utilized FCC data.

Broadband access is necessary for access to telehealth and other services; careful considerations in measuring broadband access can facilitate policies that mitigate the digital divide and improve equitable access to care.

52. Association Between Broadband Capacity and Telehealth Utilization Among Medicare Fee-for-Service Beneficiaries During the COVID-19 Pandemic

Ambrish Pandit MS, Ruchira Mahashabde BPharm, MS, Clare Brown PhD, Mahip Acharya PhD, Catherine Shoults MPH, Hari Eswaran PhD, Corey Hayes PhD

University of Arkansas for Medical Sciences

Primary Email: aapandit@uams.edu

Background: Telehealth is a rapidly growing modality for expanding healthcare access, especially in the post-COVID-19 era. However, telehealth requires high-quality broadband, thus making broadband a social determinant of health. The objective of this study was to evaluate the association between broadband access and telehealth utilization across the United States during the COVID-19 pandemic.

Methods: Using a cross-sectional, ecological study design, we merged county-level data on broadband capacity (Microsoft's Rural Broadband Initiative), telehealth utilization among Medicare Fee-for-Service beneficiaries from January through September 2020 (CareJourney), and county-level socioeconomic characteristics (Area Health Resources Files). Multivariable linear regression was used to estimate the association between broadband capacity, county-level characteristics, and telehealth utilization.

Results: Among the 3,107 counties, those with the greatest broadband availability (quintile 5) had 47% higher telehealth utilization compared to counties with the least broadband availability (quintile 1). In the adjusted model, a 1 standard deviation (SD) increase in broadband access was associated with a 1.54 percentage point (pp) increase in telehealth utilization ($p < 0.001$). Rural county designation (-1.96 pp; $p < 0.001$) and 1 SD increases in average Medicare beneficiary age (-1.34 pp; $p = 0.001$), number of nursing home beds per 1000 individuals (-0.38 pp; $p = 0.002$), and proportion of Native Americans/Pacific Islanders (-0.59 pp; $p < 0.001$) were associated with decreased telehealth utilization.

Discussion: The association between broadband access and telehealth utilization and the decreased telehealth utilization in rural areas highlight the importance of broadband access for healthcare access and the need to continue investing in broadband infrastructure to promote equitable healthcare access across populations.

53. Caregiver Reports of Accessibility: Improving Telehealth Services Using Stakeholder Feedback

Mariana Rincon Caicedo BA, James Izzo EdS, Margaret Queen BA, Kim Vu NA, Ilana Engel MA, Annaleis Giovanetti MA, Philip Huang MA, Stephanie Punt PhD, E Zhang PhD, Eve-Lynn Nelson PhD

University of Kansas

Primary Email: m055r588@kumc.edu

Background: Improvements in technology, increased insurance reimbursement and support, growing federal and regional telehealth resources, and the societal shifts brought about by the pandemic have all contributed to the growth of telehealth services. Still, research on telehealth is needed, especially as it relates to connecting providers to clients in order to create lasting and impactful partnerships. Research underlines the importance of accessibility of telehealth services, which can alleviate the stress of geographic isolation and

limited resources and ensure services are being provided to those who need them. Our research team interviewed parents whose children were part of a rural school-based telebehavioral health (TBH) program and experienced the transition from school-based to home-based TBH services during the pandemic. The goal is to increase understanding of parents' experiences with TBH services, considerations, and challenges related to accessibility.

Methods: This quality improvement project examined caregiver perspectives and experiences of school and home-based TBH. The Telehealth ROCKS health service program currently services 19 counties across Kansas. Over the past three school years (2018-2022) this program completed an average of 400 TBH encounters per year. 64 caregivers of school-aged patients receiving TBH services this past year were contacted to participate in this study. Nine caregivers completed a semi-structured qualitative interview about their experiences with TBH. All caregivers were female, seven were parents of the child receiving services and two were grandparents. Six caregivers identified as White, one identified as Mexican American, and two did not report their race/ethnicity. Their children (M age=12.00, SD=3.46) were 88% male; 55.55% (N=5) received psychology services (e.g., behavioral health, ABA, etc.), 66.66% (N=6) received psychiatry services, and 22.22% (N=2) received a combination of services. Participants live between 252-303 miles from our academic medical center. Interviews were transcribed and themes were cross-checked by researchers. Themes were identified across interviews with thematic analysis and an inductive approach to coding.

Results: All interviewed caregivers reported increased access and positive experiences with TBH services. Across interviews, themes identified were accessibility to providers, reduced mileage driven, school facilitation of services, and financial constraints alleviated through TBH. For one interviewee, they "...don't live in Kansas City...[or] the surrounding areas...[so] to be able to [get services] over the computer... it's very convenient." For one interviewee, their commute for services would be "about a four-and-a-half-hour drive." Although they would have made the trip, others were unsure if they could do so given other obligations. Participants appreciated the resources offered by the schools, such as availability of devices and staff help in setting up connections. Across interviews, caregivers identified financial barriers which were alleviated by TBH services. One caregiver noted that "I don't know where I would have turned," and this sentiment was identified across interviews, suggesting that school-based telehealth services filled a significant need for these families. Across this qualitative analysis, it was apparent that telehealth is greatly valued as it circumvents barriers to healthcare access.

Discussion: With continued provision of telehealth services, feedback from caregivers about their experiences is vital as it provides grounded information that helps improve the process. More so, what caregivers express during an interview, be it affirmation that their options for services are limited due to geography, or simple gratitude for the support of an entire team of professionals, lends credence to the accessibility of telehealth. The need for services, and access to them, was also made starkly evident by the pandemic. For many caregivers, without telehealth they would be strained emotionally, financially, and logistically to find sufficient care for their children. Understanding the advantages that telehealth services provide caregivers and their children, while highlighting difficult alternatives to telehealth, allows providers to identify strategies to bring care and improve the services available to communities in need.

54. Caregiver Satisfaction with Infant Telehealth Assessments Following a Traditional In-Person Visit

Meagan Talbott PhD^{1,2}, Sarah Dufek PhD BCBA-D^{1,2}, Meghan Miller PhD^{1,2}

¹Department of Psychiatry, University of California Davis Health

²The UC Davis MIND Institute

Primary Email: mtalbott@ucdavis.edu

Background: Parents with early concerns about autism spectrum disorder (ASD) face multiple barriers when seeking developmental evaluations and subsequent services including long waitlists, provider shortages, and the absence of validated supports for infants with early ASD features 1,2. Telehealth-based services have the potential to increase families' access during this pre-diagnostic period, but more information is needed about the acceptability, feasibility, and validity of this approach in identifying infants who could benefit. We have previously demonstrated the feasibility and acceptability of the TEDI, a developmentally-focused telehealth-based assessment for infants ages 6-18 months, in a sample of infants with specific concern for ASD3-5. The current study extends this work by eliciting feedback from caregivers who participated in both a gold-standard, laboratory-based in-person assessment, and our TEDI telehealth protocol.

Methods: Participants included 30 infants who are enrolled in a separate ongoing longitudinal in-person study examining development infants with a family history of ASD, ADHD, or neither diagnosis. We invited participants to enroll in our telehealth study at three study visit ages: 6 or 9 months, 12 months, and 18 months. Telehealth visits occurred approximately 1 week following the in-person session. Consistent with the TEDI protocol, families were provided with a small kit of toys to use for the session, completed pre-visit electronic questionnaires, a one-hour synchronous telehealth session, and a brief post-session satisfaction survey using the Telehealth Usability Questionnaire⁶, adapted to reflect the TEDI protocol. TUQ items are rated on a 1-7 likert scale, with 7 representing strongly agree, 4 representing neutral, and 1 representing strongly disagree. For all analyses, we compared mean observed scores to a hypothesized mean score of 4 using a Wilcoxon signed-rank test. We examined the TUQ total score and 5 domains: Usefulness, Ease of Use, Effectiveness, Reliability, and Satisfaction. Finally, we examined scores on one specific target item, "I think the visits provided over the telehealth system are the same as in-person visits."

Results: Infants were an average of 10.29 (SD=3.4) months at the time of the telehealth visit. Median scores for total TUQ score, the target item, and the 5 domains were as follows: 6.4 (total score), 5.0 (target item), 6.1 (Usefulness), 6.8 (Ease of Use), 6.8 (Effectiveness), 5.5 (Reliability), 6.8 (Satisfaction). Each of these were significantly higher median scores than neutral, all p's <.001.

Discussion: In this preliminary study, we found that parents who participated in both in-person and telehealth visits with their infants were highly satisfied with the telehealth assessment procedure, rating it significantly more positive than neutral across a range of acceptability metrics. These findings will be strengthened by future work examining issues in a larger sample and by directly comparing the validity of behavioral scores obtained across the two contexts. However, these initial findings suggest that telehealth evaluations of infants' early development may be one route towards increasing the accessibility of early evaluations for parents with concerns about autism.

55. Emergency Nurses' Confidence with Sexual Assault Care and Perceived Utility of Sexual Assault Nurse Examiner Consultation via Telemedicine: A Formative Mixed Methods Study

M. Kathryn Allison PhD MPH¹, Wendy A Walsh PhD², Sherrie A Searcy BSN RN SANE-A¹, Melissa J Zielinski PhD¹

¹University of Arkansas for Medical Sciences

²University of New Hampshire

Primary Email: kallison@uams.edu

Background: Emergency departments are often the first point of entry to care for survivors of sexual assault, but most emergency nurses who care for these patients are not trained as sexual assault nurse examiners (SANEs). Many survivors of sexual assault, especially in rural areas, lack access to SANEs to perform forensic examinations. Live or real-time SANE consul-

SEARCH PRESENTATIONS

tation provided via telemedicine (known as “teleSANE”) offers an opportunity to close this gap in access and allows remote SANEs to provide consultation to non-SANE clinicians, as well as support the patient, during the forensic examination. More information is needed about emergency nurses' expectations and perceptions of teleSANE to inform implementation. This formative mixed methods study (1) examined the confidence of emergency nurses in providing forensic sexual assault exams, (2) examined beliefs about using telemedicine for sexual assault care, and (3) assessed perceptions of teleSANE utility and feasibility.

Methods: A total of 116 nurses across 14 sites, including 12 emergency departments and two crisis centers, in one mid-Southern state completed an online survey. Fifteen nurses from 13 emergency departments participated in semi-structured qualitative interviews.

Results: Approximately one-third of survey respondents did not feel at all confident with their ability to provide a quality forensic examination. Approximately three in four respondents agreed that telemedicine to treat sexual assault patients seems possible, welcome the chance to use it, and believe it would support their clinical decision-making skills. However, roughly one-third of respondents agreed that it would be challenging to use telemedicine for treating sexual assault patients and agreed that patients would feel uncomfortable with a nurse on a monitor throughout the exam. Among those who responded to open-ended questions about concerns with (51.7%, $n=60$) and advantages of (48.3%, $n=56$) using consultation via telemedicine during sexual assault care, respondents most cited concern was about the patient's comfort in an already difficult situation, and their most cited advantages included increasing access to care statewide and receiving expert advice. Similarly, interview participants believed teleSANE consultation would improve patient care and forensic evidence collection but had concerns for patient privacy and acceptability.

Discussion: Findings reveal that many emergency nurses lack confidence in providing quality sexual assault care but support access to expert consultation provided via telemedicine during forensic exams. TeleSANE has the potential to improve clinicians' access to SANE guidance and patients' access to quality sexual assault care.

56. Factors Associated with Telehealth Utilization Among 2019 Arkansas Medicare Beneficiaries

Cari Bogulski PhD, Mahip Acharya PhD, George Pro PhD, Mir Ali PhD, Maysam Rabbani PhD, Corey Hayes PhD, Hari Eswaran PhD

University of Arkansas for Medical Sciences

Primary Email: cbogulski@uams.edu

Background: Telehealth utilization increased dramatically at the onset of the COVID-19 pandemic. While utilization rates have declined, they still remain well above pre-pandemic levels. To date, very little is known about the characteristics of telehealth utilizers in rural Southern states such as Arkansas. As data collected during the pandemic are beginning to be available for researchers, having a better understanding of the characteristics of telehealth utilizers prior to the COVID-19 pandemic will be essential for understanding telehealth use among subpopulations.

Methods: We conducted an analysis of Medicare beneficiaries in Arkansas from the Arkansas All Payers Claims Database (2018-2019) to identify telehealth use and 30 different chronic conditions. We fit a logistic regression model using 2019 beneficiary data to identify factors associated with telehealth utilization, including beneficiary race/ethnicity, sex, rural/urban county, and the number and type of chronic conditions.

Results: Compared to urban Medicare beneficiaries, rural beneficiaries with any one of 29 chronic conditions were more likely to utilize telehealth (urologic cancer was not significant; $X^2=3.7$, $p=.055$). The odds of utilizing telehealth were increased for Medicare beneficiaries who were female (versus

male; $aOR=1.21$; $p<.001$), Black or African American (versus white; $aOR=1.6$; $p<.001$), rural (versus urban; $aOR=2.35$; $p<.001$), or had more chronic conditions ($aOR=1.29$; $p<.001$). Older beneficiaries were less likely to utilize telehealth ($aOR=0.94$; $p<.001$). However, we also observed an interaction between the number of chronic conditions and race/ethnicity, such that the increased odds of utilizing telehealth with more chronic conditions was strongest among White beneficiaries ($aOR=0.91$; $p<.001$).

Discussion: Prior to the COVID-19 pandemic, 2019 Arkansas Medicare beneficiaries were more likely to utilize telehealth if they were younger, female, rural, and Black or African-American, and if they had more chronic conditions. However, the increased likelihood of utilizing telehealth for those with more chronic conditions was not as strong among Black or African-American beneficiaries than for White beneficiaries. Future research should investigate the underlying drivers of this disparity.

57. Feasibility of Digital Stethoscopes in Telecardiology Visits for Interstage Monitoring in Infants with Palliated Congenital Heart Disease

Alyson Stagg CRNP, Therese Giglia MD, Monique Gardner MD, Rachel Shustak MD, Shobha Natarajan MD, David Hehir MD, Anita Szwest MD, Jonathan Rome MD, Chitra Ravishankar MD, Tamar Preminger MD

Children's Hospital of Philadelphia

Primary Email: premingert@chop.edu

Background: Infants with staged surgical palliation for congenital heart disease are at high-risk for interstage morbidity and mortality. In-home monitoring programs, in addition to frequent, in-person evaluations have been successful in decreasing interstage mortality. Interstage telecardiology visits (TCV) can decrease emergency visits and hospitalizations in this fragile cohort. We aimed to measure the feasibility of implementing digital stethoscopes(DS) during TCV and assess the potential impact on interstage care.

Methods: Our standard home monitoring practice for these high risk patients includes recording daily weights, saturations via pulse oximeters, specific red flag symptoms/parameters via an app, monthly or bimonthly telemedicine visits and at least weekly telephone communication with our infant single ventricle nurse practitioner. In addition to this established protocol, for this intervention, families were provided training on the use of the Eko digital stethoscope (Eko CORE attachment assembled with a Classic II Infant Littman stethoscope) for home use. We evaluated the feasibility, subjective sound quality compared with in-person visits and surveyed provider and parental satisfaction of the additional use of the DS during standard monthly TCVs by post-visit questionnaires.

Results: From 7/2021-6/2022 DS were used during 52 TCVs (1-8 TCVs/patient (pt)) in 16 pts including 7 patients with hypoplastic left heart syndrome. Median visits/pt were 3 (1-8V) with an average length/visit of 34.5 minutes (20-60 m), the latter which aligns with prior TCV. All scheduled TCV were completed with concurrent use of DS except one secondary to a technologic issue. The quality of murmur auscultation was equivalent to that of in-person findings with excellent inter-rater reliability (98%). All providers and parents reported satisfaction with use of the DS. Two TCVs during the intervention led to hospitalization; during 2 visits the DS discerned a significant change in a murmur in the setting of hypoxemia, prompting urgent surgical intervention. In 4 TCVs, the use of the DS provided reassuring findings to avoid ED visits and/or hospitalizations in the setting of concern for cyanosis, increased respiratory effort and/or intercurrent illness. There were no missed events or deaths.

Discussion: The concurrent use of DS during TCV was feasible in this fragile cohort with high rates of inter-rater reliability and high provider and parental satisfaction. TCV effectively identified clinical concerns with no

missed events. In 12% of TCV (6/52) DS provided additional significant information as compared to our routine TCV; in two cases these findings prompted expedited hospitalization and surgical intervention prior to clinical decompensation and was life saving. Longer term use of this technology will further establish its role in telecardiology.

58. Implementation of a Telehealth Lifestyle Intervention to Prevent Diabetes in Black Parent-Child Dyads

Abigail Gamble PhD MS^{1,2}

¹Department of Preventive Medicine, John D. Bower School of Population Health, University of Mississippi Medical Center

²Myrlie Evers-Williams Institute for the Elimination of Health Disparities, University of Mississippi Medical Center

Primary Email: agamble2@umc.edu

Background: Obesity and family history increase the risk for youth-onset type 2 diabetes mellitus (T2DM) disproportionately in Black youth. Critical questions about the feasibility and acceptability of family-based lifestyle interventions to prevent T2DM in youth remain unanswered.

Methods: This single-arm pilot trial evaluated the implementation of a parent-focused lifestyle intervention in a telehealth setting for Black families with children at risk for T2DM. Parent-child dyads (n=19) were recruited from a pediatric weight management clinic to participate in a 30-week intervention (15 sessions). Child (8- to 11-years) eligibility criteria included having a body mass index (BMI) ≥95th percentile and for parents (≥18-years), a BMI ≥25 and ≥5 on the American Diabetes Association risk test. The RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) framework guided the evaluation. Feasibility, acceptability, and satisfaction were assessed.

Results: Barriers and facilitators to RE-AIM were identified. The strongest facilitators to Reach included clinician buy-in and point-of-care referral. Complexity and time made screening arduous for clinicians, but with the help of study staff, 95% of the recruitment goal was met. Group-based sessions (n=3 groups; 5-8 parents per group) were delivered as planned. Group cohesion and lifestyle coach support encouraged attendance (82%), and Wi-Fi-enabled iPads made participation feasible. Parents reported high satisfaction (89%), requested a longer intervention (1- vs 0.5-year), and urged for a child-focused component. Estimated program costs were \$1,232 per dyad. Implementation was not maintained after the study period and 47% of families complied with follow-up clinical care.

Discussion: Strategies for care team coordination and family retention in clinical care are needed. Future studies should explore reimbursement models for sustainability. These findings contribute to addressing barriers to implementing lifestyle interventions to prevent T2DM in Black youth.

59. Paradigm for establishing a multidisciplinary Telehealth team for managing complex multi-system disorders like Post-acute Sars-CoV-19 Syndrome (PASC)

Andrew Wilhelm MD^{1,2}, Alexander Carlisle², Michael Mahoney², Lakitha Hughes MS^{1,2}, Yunxi Zhang PhD^{1,2}, Tearsanee Davis DNP APRN^{1,2}, Cheryl Lasource RN^{1,2}, Saurabh Chandra MD PhD^{1,2}

¹Center for Telehealth, UMMC

²University of Mississippi Medical Center

Primary Email: schandra@umc.edu

Background: Post-acute Sars-CoV-19 Syndrome (PASC) or Long-COVID 19 is a well-described phenomenon referring to the persistent symptoms patients experience >30 days after their initial infection. Though there is no

effective treatment, there is an abundance of literature outlining multi-system organ involvement in PASC. PASC presented the Division of Pulmonology and the Center for Telehealth at the University of Mississippi Medical Center a unique opportunity for the design and implementation of a multidisciplinary team that utilized a hybrid model to identify and manage the presence of long COVID symptoms.

Methods: We used EPIC EMR database to identify those admitted to the hospital with acute respiratory failure from COVID from May 2021 until July 2022. A nurse coordinator called and screened the patients for persisting symptoms and after obtaining consent scheduled identified patients for a Telehealth visit by a Nurse Practitioner (NP). Based on their initial assessment the patients were scheduled for an in-person visit by the multidisciplinary team (pulmonary physicians, pharmacy, physical and occupational therapy, psychiatry, and neurocognitive psychology) with option of subsequent visits via Telehealth using Audio-Video technology.

Results: We identified 277 patients admitted to the hospital with acute respiratory failure from COVID from May 2021 until July 2022. 86 of 277 (31%) patients underwent screening by the nurse coordinator. Majority of the patients complained of respiratory symptoms (24/44/54.5%) followed by movement and joint issues (8/44/18.1%), fatigue (6/44/13.6%), cognitive impairment (3/44/6.8%) and psychiatric symptoms (3/44/6.8%). 44/86 (51.1%) patients were subsequently scheduled for a telehealth visit by the NP. Till date, 29 visits have been completed by the Telehealth NP and 17 patients have been referred to the in-person multidisciplinary clinic of which 9 have been completed.

Discussion: Various COVID strains across the duration of our program highlighted that the need for long-COVID follow-up was not as significant as we expected across all COVID strains. It also highlights that many long COVID patients will have marked improvement in symptoms after 1 year.

Our findings did provide us with an effective workflow with potential applications to other established multi-organ system disease processes. The combined use of multidisciplinary teams and telehealth provided a simple, efficient, and effective workflow that successfully minimized several barriers encountered in traditional healthcare including ease of access and loss of follow up.

HRSA Acknowledgement: This abstract was made possible by grant number U6631459 from the Office for the Advancement of Telehealth, Health Resources and Services Administration, DHHS.

60. Quantitative Gesture Analysis for Central Line Training

Rohan Patil¹, Conor Schulte¹, Manuel Rebol PhD(c)², Neal Sikka MD³, Colton Hood MD³, Richard Amdur PhD⁴

¹GWU SMHS

²American University

³GW MFA

⁴GWU Department of Surgery

Primary Email: rohanpatil@gwu.edu

Background: Medical procedure training often requires constant feedback and different educational interventions. Analyzing gestures within the context of medical procedure training helps trainees better understand critical maneuvers that ensure the successful completion of a procedure. Most gesture feedback involves an instructor suggesting an alteration of the trainee's form or position.

This type of feedback is often difficult to convey within telehealth procedure education. For example, remote training of medical procedures is difficult for trainees when they do not have the same type of in-person interaction with the instructor. These challenges exist in various scenarios such as online physical exam education for medical students or medical procedure training for rural/disaster/wilderness scenarios. Since few tools exist to overcome this challenge, we developed a software program that uses

SEARCH PRESENTATIONS

data processing and OpenPose to quantify gestures to help remote trainees learn new procedural skills.

Methods: Novice healthcare providers were recorded during an ultrasound-guided central venous catheterization (US-CVC) training session. Each trainee was paired with one physician instructor, who modeled and helped assist with completing the procedure. For this feasibility study, various gestures throughout the training were analyzed using video data to identify which gestures might be especially useful for completing the procedure. With our software, a single frame capturing the precise moment at which each of the individuals physically placed the central line needle into the mannequin was then processed. Keypoint data from both arms were further processed to identify critical angles for the insertion of the syringe. Both, left and right, arm angles of the trainees were then compared to the instructor's respective angles to assess whether trainees were mirroring the instructor's gestures, indicating successful procedure completion.

Results: 7 trainees and 6 instructors were analyzed from the cohort consisting of 10 trainees and 10 instructors. A total of 13 frames were processed by the OpenPose algorithm and a total of 325 keypoints (25 keypoints per individual) were collected. The instructor's left arm angle was positioned at 163.1 degrees (SD=9.7), while holding the ultrasound probe and their right arm angle was 109.9 degrees, while holding the syringe. The mean of the trainee's left arm angles was 160.9 degrees (SD=12.7) and the mean of the trainee's right arm was 102.1 degrees (SD=18.4). For the left arm, the mean difference between trainee and teacher was 2.24 ± 20.31 degrees, (95% CI -16.54 to 21.03 degrees), $p=.78$. For the right arm, mean difference was 7.84 ± 14.88 (95% CI -5.92 to 21.60), $p=.21$. Since each trainee was matched to a particular teacher as that trainee's gold standard, we used 2-tailed paired t-tests to examine differences between trainee and teacher angles for each arm. In this pilot data, the trainees' arm angles did not differ significantly from their teachers' angles.

Discussion: This study's results suggest that trainees had similar arm angles to the instructor. The significance of these findings suggests that there is a way to quantitatively measure if a trainee successfully completes a procedure through a video.

Assessing whether trainees effectively perform the procedure is challenging, especially from a 2-D video. Yet, some of these limitations may be overcome with quantitative gestural analysis. Remote medical procedure training stands to benefit from this form of feedback as it is often difficult to convey to trainees how to alter their position over video conferencing alone. Instructors can suggest a change in the trainee's gestures with real-time data, allowing the trainee to adjust and successfully complete the procedure. Our findings illuminate the utility of quantitative gesture analysis to overcome the challenges of communicating qualitative gestures and help trainees learn new procedures and maneuvers through telehealth-related video platforms.

61. Rapid Implementation of a Virtual Critical Care Nursing Project in a Busy Emergency Department Staffed by 'Out of State' Tele ICU Critical Care Nurses

Kara Benneche MSN RN PCCN², Maria Buquicchio MSN RN PCCN CCRN-K², Sherry Rlser MBA BSN RN³, Laura Watrous RN³, Christina Wright BA¹, Saurabh Chandra MD PhD¹

¹Center for Telehealth, University of Mississippi Medical Center

²Northwell Health Telehealth Program

³University of Mississippi Medical Center

Primary Email: schandra@umc.edu

Background: The Delta wave of the COVID-19 pandemic exacerbated an existing nursing shortage across the country and stressed a workforce already battling physical and emotional burnout and exhaustion. This resulted in inadequate staffing of units in the hospitals leading to reduction in

number of available beds and increased volume and length of stay of critically ill patients in the Emergency Departments (ED). Thus many health systems turned to technology to provide rapid solutions by implementing virtual nursing care models especially in the Non-ICU settings. We present a proof of concept model for rapid implementation of a Virtual Critical Care Nursing Project staffed by 'out of state' Tele ICU critical care nurses to support bedside nursing team involved in the care of critically ill patients boarding in the ED of a busy academic medical center.

Methods: The process started by aligning all key stakeholders that included representatives from administration, nursing ED leadership, critical care, and bedside team members. We leveraged support from Northwell Health the largest healthcare provider in the State of New York comprising of 23 Hospitals, 40 ICUs (500 ICU beds) with a robust Tele-ICU program. 10 rooms in the ED at UMMC were equipped with hardwired equipment for Audio-Video Telehealth visits. Virtual private network (encrypted secure network connection), EMR access, and external vendor portal were provided to the Northwell team to connect to the hardwired equipment and mobile carts. The nursing leadership of the two health systems worked collaboratively to develop targeted workflows that focused on hourly rounding on critically ill patients, documentation in EMR and mentoring and support to bedside nurses.

PHE enabled Northwell Tele ICU RN's to apply for instant temporary nursing licensing in the State of Mississippi and 19 Northwell RNs were rapidly on boarded and trained on UMMC's EMR and rounding workflow. It took approximately 9 weeks for the multidisciplinary teams at both health systems to launch the project in mid-November of 2021.

Results: One Northwell RN was assigned up to 5 critically ill patients boarding in the ED prior to transfer to the ICU. Hourly rounding included 1-virtual assessment of the patients, 2-checking IV solutions and medications in the infusion pump with MAR for accuracy of administration, 3-checking ventilator readings with orders in the EMR for accuracy. Documentation in the EMR included vital signs every hour for all 5 patients assigned to the Tele-ICU and visually accessible Lines/Drains/Tubes. Northwell Tele ICU RNs acted as a resource/mentor to the UMMC RN when needed and assisted in documentation for assessments, Codes, or time-out procedures upon request. 24/7 monitoring by Northwell Tele ICU RNs for one month resulted in 1840 video encounters on approximately 250 unique critically ill patients boarding in the ED. A weekly list compiled by the Northwell RN team was shared with and validated by the UMMC ED leadership that demonstrated the value of the remote team in addressing patient concerns, responding to bedside nursing requests for support, and communicating any changes in status of the patients to the bedside nurses.

Discussion: The Virtual Nursing project ran from 11/15/21 till 12/14/21 when it was terminated because the end of the PHE in the State of Mississippi marked the termination of temporary nursing licenses for out of state nurses. Lack of interoperability between disparate EMRs, lack of reimbursement for virtual nursing care and lack of participation in the Nursing licensure compact by all states remain barriers to widespread use of technology to offset the existing nursing shortage.

However, in spite of the challenges and limitations, Telehealth remains a powerful modality for providing access to care as well as alleviating shortages in healthcare personnel and thereby decreasing the existing disparities.

HRSA Acknowledgement: This abstract was made possible by grant number U6631459 from the Office for the Advancement of Telehealth, Health Resources and Services Administration, DHHS.

64. The Effectiveness of Medication Teaching via Telemedicine on Knowledge Retention and Satisfaction Among Post-Pericardial Coronary Intervention Patients

Maria Buquicchio MSN RN PCCN CCRN-K, Christina Megerian MSN RN, Alice Cheng MSN RN

Northwell Health

Primary Email: mbuquicchio@northwell.edu

Background: Cardiovascular disease is a leading cause of mortality and disability in the United States. The effectiveness and treatment for prevention and management of cardiovascular disease relies heavily on patient knowledge and engagement in the implementation of current guidelines for care. The goal of patient and family education is to improve health outcomes and promote confidence in self-management abilities.

New medications prescribed post percutaneous coronary intervention (PCI) are universal among hospitalized patients. Compliance and knowledge of medications are essential for positive patient outcomes. Facilities face challenges with patient education and may seek additional nursing support via telemedicine to narrow the disparity for the post-PCI patient population. Telemedicine nurses can assess for understanding of new medications and the barriers that may limit self-management.

Methods: The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) is a standardized national survey of patients' perceived experience with their hospital care. Understanding of new medications at discharge is a question assessed on the survey. A partnership between Telehealth TeleICU and the community hospital ICU was formed to educate patients on their newly prescribed medication via audio-video call. Each day the bedside ICU nurse and the TeleICU identifies the PCI patients ready for discharge and establish a time for the education. Utilizing A-V technology, the TeleICU nurse reviews the newly prescribed medications with the patient and/or family.

Results: March 2022 marked the beginning of the partnership between the TeleICU and the bedside critical care team and the implementation of the virtual patient education for prescribed medications. A total of 31 patients have received the virtual medicine education. The HCHAPS survey question regarding medicine explanation resulted in a score of 50% for 2021. In 2022, year to date, the score is 83.3% with a 33.3% increase, exceeding the stretch target of 73.7%. The survey question regarding the staff described medicine side effects resulted in a score of 41.7% in 2021. For 2022, year to date, the score is 35.3, a 6.4% decrease with a goal of 46.2%. Upon evaluation of the results, the TeleICU will continue the education for the PCI patients as it is having a positive impact and ensure that side effects of medication are specifically addressed. The TeleICU nurse will allow for patient teach back demonstrate understanding of the education.

Discussion: Delivering adequate medication education is essential in preventing post-discharge complications, and telemedicine can bridge the gap to improve national patient outcomes. Utilizing telemedicine for discharge medication education may have a significant effect on patient outcomes.

65. Utilizing a Remote Certified Medical Assistant (CMA) Role to Increase the Efficiency of Telehealth Visits for Diabetic Patients

Debra Taylor NP², Lillian Lien MD², Charity Jenkins CMA¹, Tanya Tucker RN¹, Vanessa R. Trammell MS CFT¹, Saurabh Chandra MD PhD¹

¹Center for Telehealth, University of Mississippi Medical Center

²University of Mississippi Medical Center

Primary Email: schandra@umc.edu

Background: COVID-19 pandemic saw an exponential rise in outpatient Telehealth visits that provided much needed access to healthcare when in-person visits were largely shut down. However, there has been a widespread decline in the number of outpatient visits conducted via Telehealth (both audio and audio/video) in the last one year for multiple reasons that include payment parity with in-person visits, provider satisfaction in capturing adequate clinical information and ongoing challenges with available technology. However, for patients living in rural areas, Telehealth visits are a viable option for offsetting the significant time-related

and monetary costs associated with traveling for in-person visits. In collaboration with the Division of Endocrinology, we created a remote role for a CMA to increase the efficiency of Telehealth outpatient visits conducted by a Nurse Practitioner (NP) for both initial and follow up visits of diabetic patients.

Methods: The role of CMAs in the ambulatory clinic has evolved from capturing vital signs and office tasks to where they are increasingly integrated in the team based approach to healthcare delivery. We hired a CMA and developed a workflow and trained the CMA to accomplish the following tasks: 1. Call all patients scheduled for Telehealth visits one week prior to their appointment. 2. Inquire about their preference for and any barriers to completion of an audio only or audio-video visit. 3. Confirm pre-visit labs were performed and available in the EMR. If not, notify the patient and the referring PCP to order labs and reschedule the visit. 4. Facilitate remote downloads of blood glucose reports from currently available technology including continuous glucose monitors and insulin delivery pumps. These reports were made available for review by NP prior to the visit. 5. Document any changes in medication regimen and notify the NP to address during the visit.

Results: We performed a retrospective review of Telehealth outpatient encounters assisted by the remote medical assistant from April 6, 2022 through August 31, 2022 and compared them with Telehealth encounters by the same provider without assistance from October 21, 2022 through, March 22, 2022. Of the 293 Telehealth visits assisted by CMA as compared to 341 without assistance, CMA assisted Telehealth visits had a lower no show rate (8% vs 14%) and cancellation rate (13% vs 19%). The remote CMA enabled the availability of adequate clinical information for Telehealth visits and allowed the NP to focus on patient centered problems rather than assembling information and data gathering. The resulting high level of provider satisfaction including knowing that patient safety is enhanced by efficient data collection has led to an additional clinic day dedicated for Telehealth visits only. In addition, it has allowed for removal of the clinic RN from prepping the patients prior to their Telehealth visit.

Discussion: We demonstrate that innovative changes in clinical workflows can result in increased value for Telehealth visits for all stakeholders. Additionally, we demonstrate that training and integrating CMAs in Telehealth visits can enhance their role and act as a mechanism to alleviate the shortage of clinic RNS. We next plan to perform a comprehensive economic analysis that includes cost savings for the patients to develop a sustainability model for the paradigm.

HRSA Acknowledgement: This abstract was made possible by grant number U6631459 from the Office for the Advancement of Telehealth, Health Resources and Services Administration, DHHS.

66. Value of "Audio Only Telehealth Visits" in Enhancing Provider and Family Experience of Pediatric Surgery Patients

Michael Morris MD², Jennifer Russell RN², Ramona Sandlin RHIA², Saurabh Chandra MD PhD¹

¹Center for Telehealth, University of Mississippi Medical Center

²University of Mississippi Medical Center

Primary Email: schandra@umc.edu

Background: The declaration of a federal public health emergency (PHE) in response to the COVID-19 pandemic in March 2020 and the resulting loosening of restrictions allowed for an exponential growth in Telehealth visits that included both audio-video and audio only visits.

While there is widespread support for the continuation of audio-video visits beyond the PHE there is less enthusiasm for audio only visits. Payers in some state like Mississippi Medicaid do not recognize 'audio only' visit as a Telehealth covered service. While proponents of audio only visits showcase

SEARCH PRESENTATIONS

its value in bridging the gaps in digital divide, opponents argue about its limitations in delivering high quality clinical care.

We present data from a hybrid model that combines in-person visits with 'audio only' visits when clinically appropriate to deliver high quality clinical care for Pediatric Surgery patients and at the same time reducing unnecessary travel and associated costs for families.

Methods: We performed a retrospective review of Pediatric Surgery outpatient encounters performed via 'audio only' from August 25, 2021, through July 20, 2022 at University of Mississippi Medical Center by a single Pediatric Surgeon. Our aim was to determine the volume, visit types and geographic variable associated with 'audio only' visits.

Results: We identified 225 unique encounters scheduled for 'audio only' Telehealth visit during a dedicated half clinic day in the week, out of which 19 were 'no-shows'. The patient age ranged from 0-18 years. Out of the 205 'audio only' visits that occurred, 140 (68%) visits were for patients that lived more than 20 miles out of Jackson, MS the location of UMMC. The average round trip distance from the home location of the 140 patients was 199.67 miles that would require an average travel time of 3 hours and 29 minutes. The average cost of gas for round trip travel was \$24 (at \$3.00 per gallon of gas and mileage of 25 miles/gallon).

Some of the common diagnosis that were seen during the audio telehealth appointments included s/p umbilical/inguinal hernia repair, s/p chemoport placement/removal, s/p laparoscopy appendectomy, myopathy, Hirschsprung's disease, hereditary spherocytosis, s/p laparoscopy cholecystectomy, and s/p muscle biopsy. Most audio visits were for post-operative follow ups (126/205, 61%). However, 26 (12.6%) of encounters were for preoperative visits for elective surgery.

Discussion: Audio only Telehealth appointments have continued at the request of patients and families with the goal of eliminating the stress of travel to a physical clinic visit. These encounters remain a valuable resource to help limit investment of time and money to families that live in rural communities far away from specialized tertiary care. Policy makers and payers should continue to reimburse for clinically appropriate 'audio' only encounters beyond the PHE.

EB.1 Telehealth Research and HRSA's Office for the Advancement of Telehealth (OAT)

William England PhD JD

Office for the Advancement of Telehealth, HRSA

Primary Email: WEngland@hrsa.gov

Background: As the federal agency whose mission is "to improve health outcomes and achieve health equity through access to quality services, a skilled health workforce, and innovative, high-value programs" the Health Resources and Services Administration (HRSA) has continued to exponentially increase the use of telehealth in its grant programs. Almost all HRSA awards now allow for the use of telehealth to improve care for people who are geographically isolated, or economically or medically vulnerable.

Each year since 2017, HRSA has conducted an inventory of its grant programs, looking at where and how telehealth is being used. Not surprisingly, the use of telehealth has increased over 600% in five years, with the largest increase occurring in 2020 at the start of the COVID-19 Public Health Emergency. However, an almost equal increase came in 2021 as project officers added new references to telehealth in programs that were already underway when the pandemic began.

Methods: Starting with HRSA's first telehealth project inventory in 2017, HRSA has annually asked project officers to report awards that mention telehealth (or words related to telehealth) in funding opportunity notices or applications. While mention of telehealth in awards was increasing rapidly even before the PHE, the CARES Act and other legislation substantially

increased flexibility and funding for the use of telehealth. That allowed HRSA to add new projects to expand telehealth service and delivery as well as telehealth training and technical assistance. Now that CARES Act funding is over, much of that sudden telehealth increase has been incorporated into HRSA's ongoing programs and work. OAT also conducted a review of telehealth related programs in other HHS agencies in 2022 and a high-level summary of that work will be given, pending clearance.

Results: This presentation will outline the growth of projects by Bureau and type of service or clinical telehealth use. As in past years, the Bureau reporting the most telehealth in its grants remains HRSA's Bureau of Primary Health Care, which oversees the nation's 1,400 health center grantees and 13,500 health center sites. Health centers report activity through the Uniform Data System (UDS) and this presentation will overview changes in telehealth use reported in UDS. This year OAT also increased the amount of information on the telehealth website (Telehealth.hhs.gov) which OAT created and operates for the Department of Health and Human Services. In particular, the Research and Funding Opportunities tabs have been fully populated with consolidated information valuable to the telehealth research community, as will be outlined in this presentation.

Lastly, this presentation will highlight other HRSA funded resources that may assist telehealth research including the Telehealth Research Centers, the Telehealth Centers of Excellence, the Telehealth Resource Centers (TRCs), the Rural Health Information Hub (RHIhub), the Rural Health Research Gateway, and the HRSA Data Center.

Discussion: HRSA's primary contribution to telehealth research is to support the telehealth research community. This presentation will highlight the growth and breadth of HRSA support for telehealth projects and research. As the funder of a host of telehealth training and information projects, this presentation will also seek to reference and highlight projects of interest to the research community if not otherwise presented by HRSA grantees.

Presentation Objectives: 1)To explain HRSA's role in federal support of telehealth grants and telehealth use and its increasing role in fostering telehealth research. 2)To explain the breadth of telehealth grant support by HRSA. 3)To highlight research, data and resources supported by HRSA and the Office for the Advancement of Telehealth that are relevant and useful to telehealth researchers.

EB.2 Developing a Toolkit to Apply Dissemination and Implementation Science to Telehealth Evaluation

Emily Johnson PhD, Katherine Sterba PhD MPH,
Ryan Kruis MSW LISW-CP, Elana Wells MPH, Dee Ford MD

Medical University of South Carolina

Primary Email: johnsoem@musc.edu

Background: Telehealth modalities for healthcare delivery have increased at a rapid pace across various settings, resulting in challenges for how to best disseminate these practices, define barriers to implementation outcomes, and characterize strategies for optimal delivery. Principles of implementation science can guide this systematic evaluation.

Guided by our team's experience evaluating a variety of dissemination and implementation (D&I) programs, the goal of this project was to present lessons learned in a comprehensive telehealth D&I toolkit with the goal to guide interprofessional telehealth teams to design and conduct D&I evaluations.

Methods: Using three telehealth evaluation projects in the areas of maternal mental health, school-based asthma care and diabetes remote patient monitoring we compiled lessons learned to guide evaluation of D&I processes and outcomes in telehealth programs. These evaluations were framed as dynamic processes that could be adapted to meet changing health care and organizational needs. Team experiences in refining research questions, determining study design, defining implementation outcomes, selecting

implementation science frameworks, and developing data collection tools and measures were summarized through case studies.

Results: The toolkit sections included key questions for the D&I team, telehealth specific examples, and case study exemplars to demonstrate toolkit application. Principles of using previous telehealth observations to frame the research question, engaging multiple stakeholders involved in the delivery of a telehealth service, mapping an appropriate conceptual model to guide research, and using mixed methods were emphasized. A perinatal anxiety and substance abuse disorder telehealth project outlined steps taken to identify a study question. A diabetes remote patient monitoring project demonstrated steps for determining appropriate D&I study design and selecting data collection measures. Lastly, a description of a school-based telehealth asthma evaluation highlighted strategies for defining implementation outcomes and selecting a study framework.

Discussion: D&I resources are valuable in addressing the unique characteristics and timely challenges for implementation processes and outcomes in the telehealth field. Telehealth innovations involve diverse clinic settings with varying internal and external influential factors, policy variations, and distinct patient level factors that can all individually and collectively influence implementation outcomes. The Telehealth D&I toolkit can be a key resource for interprofessional telehealth teams to improve implementation and sustainability of telehealth programs.

Acknowledgements: The development of this document was supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of the National Telehealth Center of Excellence Award (U66 RH31458). The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by HRSA, HHS or the U.S. Government.