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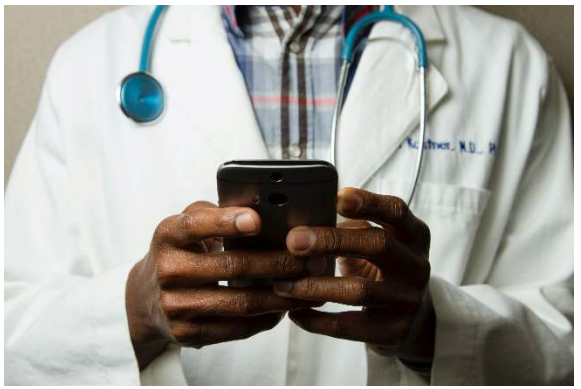
Archived Showcase Programs

UAMS
For a Better State of Health

Showcase of Medical Discoveries

Digital Health & Innovation



Thursday
January 21, 2021
10 a.m. — noon

A Research & Innovation virtual event featuring UAMS Investigators discussing their research and discoveries

Zoom event

UAMS
For a Better State of Health

Poster #1

Auscultation Device that Attaches to a Smart Device

Dr. Joseph Sanford, Dr. Kevin Sexton, Adria Abella Villafranca, Nikiya Simpson, Dr. Melody Greer, Dr. Samir Jenkis, Dr. Aaron Storey, and William Kalkbrenner

ClipBeat is an auscultation device that attaches to a smart device and allows health care professionals to listen to and record the sounds of a patient's heart, lungs and GI, providing useful data when an in-person evaluation of the patient is not possible or practical. ClipBeat is a mechanical attachment device that places a bell or diaphragm in communication with the microphone of a smart device. The smart device can receive auscultatory sounds transmitted through the bell or diaphragm. These sounds can be amplified through the smart device's speaker, and recorded or transmitted to a third party. The attachment device, bell and diaphragm can be manufactured in a surprisingly economical manner. Therefore, it can be distributed to patients who may live far from medical services and used by them to record or transmit auscultatory sounds in telehealth settings. Key benefits of the device are that it is mechanical and does not require a power source to operate, it will be extremely useful in the telehealth space, and is extremely economical to produce.

Poster #14

Virtual Reality Distraction During Awake Deep Brain Stimulation Lead Placement


Elberson, B.W.; Merchant, A.; Abdeldayem, A.; and Petersen, E.

Introduction: Deep brain stimulation (DBS) surgery is proven as an effective treatment modality for debilitating movement disorders, and putative targets are emerging for psychiatric conditions. Significant pain and stress are endured by patients undergoing this procedure, as the surgery is often performed awake without sedation to allow intra-operative testing of the lesional effect and make adjustments in lead position if necessary. We propose virtual reality (VR) as a novel intra-operative tool for managing pain and anxiety when sedation is contraindicated. Intra-operative VR has been explored for orthopedic surgeries (Chan et al, 2017) and during labor and delivery (Frey et al, 2019).

Methods: Patients undergoing bilateral lead placement were selected for this study. The VR headset was attached to the Leksell frame. For one lead placement procedure, VR was not used. For the other side, VR was used. A scoring questionnaire with values from 1 to 10 – 1 being the worst and 10 being the best – was provided to examine the anxiolytic and analgesic effect of VR. We examined the immersive effect, enjoyment, nausea and willingness to use VR again in addition to pain relief and anxiolysis.

Results: Current data appears to support a greater anxiolytic rather than pain-relieving effect of VR during awake DBS surgery. Patients report the same pain value with or without VR. Anxiety scores trend lower with the use of VR and though the same pain value is felt, patients report that they spend significantly less time thinking about that pain. All patients surveyed reported enjoyment with VR, willingness to use VR again, and are interested in DBS-specific VR content development.

Conclusions: VR appears to be a useful tool for the functional neurosurgeon during awake DBS lead implantation to provide anxiolysis and distraction from pain while avoiding sedatives that would obfuscate the intra-operative neurologic exam.

Poster #13

Feasibility of TeleLactation Service: Results from a Mixed Methods Analysis

Nalin Payakachat, Ph.D.; Hari Eswaran, Ph.D.; Sarah Rhoads, Ph.D.; Hannah McCoy, B.A., CRS; Song Ounpraseuth, Ph.D.; and Curtis Lowery, M.D.

There are many benefits to both the mother and child when the child is breastfed. To overcome the geographic barrier to access lactation consultant service, this pilot RCT explored the service delivered by telephone only versus virtual among new mothers aged ≥18 years, who were discharged from UAMS hospital and Baptist Health Hospital, located in Little Rock, Arkansas. The target outcomes were perceived social support, breastfeeding knowledge, and satisfaction toward the telelactation service. Lactation consultation was provided within 24-48 hours post-discharge, 1-week, and 4-week post-discharge. Consented participants completed a survey at baseline and 6 weeks post-discharge, and participated in a semi-structured exit interview.

Of N=97 enrolled participants, 43 completed the study. The majority were aged 30-39 years, of white race, married, and had some college or higher education. There was no difference in their intention to breastfeed or knowledge between the two groups. Both groups perceived high overall social support and high satisfaction toward the consultant. Telelactation service is beneficial and can be adopted into a routine service to new mothers.

Poster #2

Opioid Treatment Mobile App (OPTiMA): Feasibility, Usage, and Pilot Outcomes

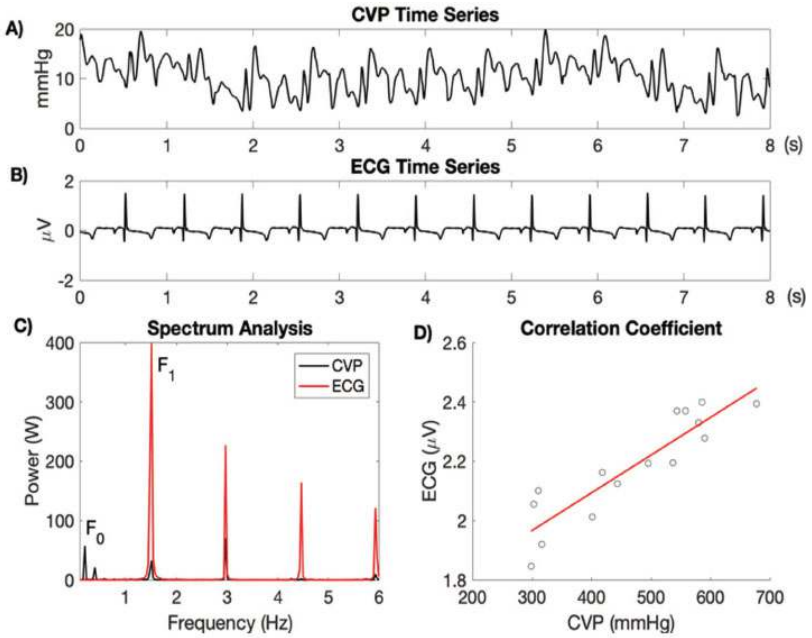
Andrew James, Ron Thompson Jr., Mary Bollinger, Michael Mancino and Clint Kilts

We developed the smartphone app OPTiMA (Opioid Treatment Mobile Application) as an adjunctive therapy to reduce opioid misuse among adults receiving medication assisted treatment (MAT) for opioid use disorder (OUD). OPTiMA offers (1) daily self-monitoring of mood and opioid craving, withdrawal, and relapse; and (2) personalized feedback to promote continued abstinence.

Sixteen participants receiving outpatient MAT at UAMS CAST enrolled in a non-randomized experimental trial evaluating OPTiMA efficacy over three months. Four participants did not use OPTiMA and were withdrawn for study noncompliance. 100% of remaining participants were abstinent from opioid misuse (determined by weekly urinalysis) throughout the 3-month study duration, compared to 79% of CAST MAT clients (n=33) who chose not to participate in the OPTiMA trial during the same period. Percent days of OPTiMA usage steadily declined during trial (from 52% to 24% across 3 months), prompting future work to explore approaches for increasing OPTiMA usage rates. Future directions include a RCT to confirm OPTiMA's efficacy, mapping neurocognitive mechanisms underlying treatment response, and providing just-in-time intervention via geographic ecological momentary assessment (GEMA).

Poster #3

Methods and Systems for Predicting the Effect of Inhaled and Infused Anesthetics



Ali Z. Al-Alawi, Kaylee R. Henry, Lauren D. Crimmins, Patrick C. Bonasso, M.D., Abul Hayat, Melvin S. Dassinger, Jeffrey M. Burford, Hanna K. Jensen, Joseph Sanford, Jingxian Wu, Kevin W. Sexton, and Morten O. Jensen

Analysis of peripheral venous pressure (PVP) waveforms is a novel method of monitoring intravascular volume. Two pediatric cohorts were studied to test the effect of anesthetic agents on the PVP waveform and cross-talk between peripheral veins and arteries: dehydration setting in a pyloromyotomy using the infused anesthetic propofol and hemorrhage setting during elective surgery for craniosynostosis with the inhaled anesthetic isoflurane.

Poster #12

Utilization of Telehealth in Arkansas during COVID-19

Taiwo Adesoba, Arina Eyimina, Clare Brown, Mick Tilford, and Ben Amick

Background: Since the outbreak of COVID-19, telehealth has become an alternative means for accessing health care, particularly in non-emergency cases.
Methods: We obtained data from the Arkansas Pulse Poll, a random digit-dial survey implemented in March 2020. Questions to assess adult Arkansans' preferences for telehealth were added December 13, 2020. We report on initial survey data weighted by age, race, and gender to ensure state representation.
Results: Preliminary results* show that 37% of respondents tried to schedule a telehealth appointment from March until their survey date. About 90% of those who tried to schedule an appointment actually had one, with the most common appointments being for checkup (50.1%). The characteristic most appealing to respondents was for transportation reasons (47.3%), and the reason most cited for telehealth non-use was preference for face-to-face visits (18.9%).
Conclusion: This preliminary analysis provides insight into the current state of telehealth preferences in Arkansas. More detailed findings by race, gender, and public health region will be forthcoming.

**Approximately 40 to 50 surveys are completed per day. As such, we anticipate the final sample size of this survey portion, which will stop at the end of the calendar year (i.e. 600 – 800).*

Poster #11

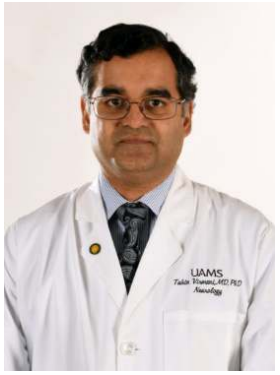
Natural Language Processing and Visualization to Digest Complex Themes Discussed in Online Caregiver Support Forums

Shoults, Catherine C.; Rutherford, Michael W.; Brown, Aliza; Hayes, Corey; Greene, Carolyn; Addicott, Merideth; Kemp, Aaron; Gan, Jennifer; Bona, Jonathan P. and Larson-Prior, Linda J.

Background: Content posted by users on social media can provide unique insights into their lives and opportunities to understand views and concerns of communities using those platforms. This study examined public social media discussions by individuals who identify as caregivers (taking care of someone without having specific formal training). We used Natural Language Processing (NLP) and machine learning tools to identify the major topics discussed in caregiver communities on Reddit.com and to provide interactive visualizations, allowing easy digestion of the topics. Methods**:** We collected publicly-accessible posts from caregiver discussion forums using the Pushshift.io API. Using the Python Natural Language Toolkit, we performed text processing and NLP tasks. Themes were extracted using Latent Dirichlet Allocation topic modeling and the word2vec neural network tool. Visualizations were generated using t-SNE dimensionality reduction and the interactive visualization library, Bokeh. Results**:** Results showed common themes throughout caregiver posts, including worries about mental health, access to care, and providing social support. Analysis of these themes is ongoing. Lay summary: Social media platforms such as Reddit give researchers a way to learn about specific populations such as caregivers. This study examined what people who identify as caregivers commonly post on the Reddit platform.

Poster #4

Utilization of a Neuroinformatics Research Platform (ARIES) to Develop Quantitative Tools for Clinical Assessment and Treatment of Parkinson's Disease Patients in Rural Arkansas



Tuhin Virmani, Lakshmi Pillai, Aliyah Glover, Aaron Kemp, Horace Spencer, Michael Rutherford, Phillip Farmer, Shorabuddin Syed, Hari Eswaran, Mitesh Lotia, Jonathan Bona, Linda Larson-Prior and Fred Prior

Parkinson's disease (PD) is a neurodegenerative disorder that leads to progressive decline in both motor and non-motor features. Direct medical costs for PD care in the US was recently estimated at $25.4 billion. PD gait and balance problems make travel cumbersome, and cognitive impairments limit driving safety, making patients reliant on others for transportation. This limits both access to care and research participation. About 75% of the UAMS Movement disorders clinics patients' reside in medically designated underserved areas.

Project aims are: 1) Develop telehealth digital data collection methods for evaluation of multi-modal function in PD and, 2) Develop biomedical informatics tools for collation, storage and exploration of data. 50 PD participants will perform telemedicine visits at home or at an Area Health Education Centers (AHEC) in-person. Digital assessments will objectively quantify motor and non-motor features of PD. Bioinformatics tools will be developed to collate and store collected data utilizing the Arkansas Research Image Enterprise System (ARIES). Semantic ontologies will be developed to facilitate future data mining.

Poster #5

A Pilot Study Evaluating the Use of Mobile Health Technology in Older Adults with Heart Failure: Foundation for a Clinical Trial

Lefler. L.L.; Rhoads, S.; and Harris, M.

Background: Remote patient monitoring (mHealth) shows promise in improving HF management. However, limited information exists regarding perceptions of older adults with HF about mHealth use.
Objective: This pilot study compared perspectives of older HF adults who were randomized to mHealth or home equipment or standard care.
Methods: We used mixed-methods with pre/and post surveys and qualitative interviews, following participants for 12 weeks.
Results: 28 HF patients were enrolled. At baseline, 50% rated their health fair or poor and 36% and 25% were very often/always frustrated and discouraged by their health; 46% did not monitor weights; 29% did not monitor blood pressures; and 68% did not monitor their symptoms. Post intervention, 100% of the equipment groups were monitoring daily. Narrative data revealed: (1) traditional communication delayed access to care; (2) mhealth monitoring was useful, and users felt secure someone was "watching over" them; (3) equipment groups felt more confident.
Conclusions: mHealth has the potential to improve patient-centered outcomes in older adults with HF. This work led to large clinical trial funding which has just started recruiting at UAMS.

Poster #10

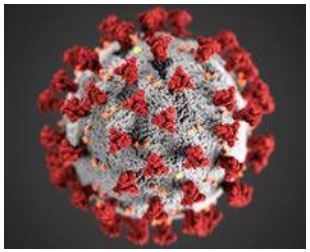
Potential health care cost saving of the UAMS Nurse Call Center for Obstetric Services

Nalin Payakachat, Ph.D.; Yi-Shan Sung, Ph.D.; Naleen Raj Bhandari, Ph.D.; Wanda Whitehurst; Susan Fogelman; Hari Eswaran, Ph.D.; Tina Benton, R.N.; and Curtis Lowery, M.D.

Background: The UAMS High Risk Pregnancy Nurse Call Center (NCC) for obstetric services was established in 2005 to allow experienced registered nurses access to an on-call maternal-fetal-medicine physician staff on 24/7 triage services. Despite benefits that are provided by the NCC, the potential economic outcome has not been evaluated. The objective of this study was to estimate projected NCC cost savings to the health care system associated with the NCC obstetric triage services. Methods: We conducted a retrospective study using the NCC call data from 2016 and 2017 to estimate an average annual number of ED visits avoided. Average cost of an ED visit was calculated using Arkansas Medicaid data. We excluded ED visits that resulted in an inpatient hospitalization or under observation status. ED health care costs related to prenatal and postpartum were identified. Average cost per ED visit from Medicaid's perspective was then calculated. The potential 2-year cost saving was estimated by multiplying the number of ED visits avoided with an average ED visit cost. Results: The potential 2-year cost saving for unnecessary ED visits avoided was estimated at $157,920. The projected cost savings only on ED visits avoided since the NCC was incepted was substantial if these patients' bills were paid by Medicaid. Discussion: Our study showed that the NCC potentially saved Arkansas Medicaid almost a million in the past 14 years for unnecessary pregnancy-related ED visits. This potential NCC cost saving information for obstetric services is crucial to supporting the value of this type of service and helping policymakers better understand the value of the service to the health care delivery system.

Poster #9

Implementation of an Interprofessional 1-800-COVID-19 Hotline Call Center Training Simulation



Kevin Sexton, M.D.; Kathryn K. Neill, Pharm.D., FNAP; Kristen Sterba, Ph.D.; Jared Gowen (4th yr. M.D./M.P.H. student); Layla Simmons, M.Ed, RDCS, RDMS; Megan Lane, M.H.A., RT(R)(CT), RDMS, RVT; and Joseph A Sanford, M.D.

Background: On March 13th, 2020, an academic health center suspended onsite classes due to the first confirmed case of COVID-19 in the state. Faculty across five colleges (Nursing, Medicine, Public Health, Pharmacy and Health Professions) and the graduate school rapidly implemented alternative methods of instruction to complete coursework for the spring semester.

Methods: Concurrent to suspension of onsite classes, the health center instituted a 1-800 COVID-19 Hotline to support the public health emergency. The hotline provided rapid access to a health screening algorithm via a telehealth platform to assist the statewide community in understanding when and where they should access the health care system to seek testing/care for COVID-19 symptoms. To support IPE delivery via alternative methods of instruction, previously scheduled onsite simulations were converted to an online platform and a new simulation was developed to address COVID-19 disease information, screening algorithm and decision tree tools, and telemedicine care.

Results: Three trainings were completed via ZoomTM with 95 interprofessional students. Evaluation metrics include pre/post Interprofessional Collaborative Competencies Attainment Survey (ICCAS), evaluation of learning objectives via Likert scale, and identification of themes from qualitative response items.

Discussion An interprofessional simulation training activity via an online platform supported student learning for COVID-19 disease information, screening algorithm and decision tree tools, and telemedicine delivery.

Poster #6

Shifting to Virtual Research in a Childhood Obesity Trial

iAmHealthy

Jeannette Lee and Jessica Snowden (on behalf of ECHO ISPCTN)

In the setting of the COVID-19 pandemic, many face-to-face research activities halted around the country. The ECHO IDeA States Pediatric Network is currently performing a trial evaluating recruitment for rural clinical trials and treatment for childhood obesity using a virtual healthy lifestyles intervention. During the COVID-19 pandemic, the study team and UAMS-based Data Coordinating and Operations Center quickly shifted other study activities, including informed consent and biometric measurements, to be fully virtual as well. Shipping concerns, participant internet access, and variability of consent platforms all introduced challenges for the study team that were ultimately surmounted with creativity and flexibility. This presentation outlines key lessons learned during this transition, highlighting the importance of using digital tools to reach rural research participants.

Poster #7

Evaluation of a Telemedicine Program Managing High-Risk Pregnant Women with Pre-Existing Diabetes

Hari Eswaran, Ph.D.; Yi-Shan Sung, Ph.D.; Donglan Zhang, Ph.D.;
and Curtis Lowery, M.D.

Background The High Risk Pregnancy Program (formerly known as ANGELS: Antenatal & Neonatal Guidelines, Education and Learning System), a telemedicine program initiated by UAMS and the Arkansas Dept. of Human Services, has transformed the landscape of obstetrical/neonatal care delivery in Arkansas. The study aimed to evaluate the effects of the telemedicine program on health outcomes, utilization of health services, and medical expenditures of pregnant women with pre-existing diabetes and their newborns.

Methods The study sample was selected from the Arkansas Medicaid claims data and was linked with infant birth and death certificates obtained from the Arkansas Department of Health and UAMS telemedicine records from January 2013 through December 2016.

Results A total of 1609 pregnant women with pre-existing diabetes and their newborns were selected, and 172 (10.69%) of them received UAMS telemedicine care.

Discussion The UAMS ANGELS telemedicine program is associated with improved utilization of prenatal care and reduced inpatient admissions among high-risk pregnant women with pre-existing diabetes. Telemedicine services did not differ from usual in-person services in outcomes, including severe maternal morbidity, infant mortality, and overall medical expenditures for maternal care.

Poster #8

Telestroke Quality Assessment Surveys; Our Plan for System-wide Assessment

Aliza Brown, Ph.D.

Background: The UAMS Institute for Digital Health & Innovation (IDHI) – Stroke Program, with 54 telestroke spoke sites, services the most rural areas. Since the telestroke programs started in 2008, we have seen dramatic improvements in stroke care and significant reductions in stroke mortality.

Methods: Four QA surveys (consults, nurse facilitators, ED physicians and tele-neurologists) were used to determine system-wide improvements. Those patient/consults (or their family/caregivers) who received tele-based consults received a one-time survey. Nurse facilitators and their emergency department (ED) physicians were emailed monthly satisfaction surveys for education, audio/visual and the telestroke program. Quarterly surveys sent to the tele-neurologists were designed to measure their level of satisfaction with the program and interaction with spoke care teams.

Results: Each survey took into consideration the audio/visual aspect and interactions with nurses, ED physicians and the tele-neurologists. Patient/consult surveys took into consideration their informed decision making and their perceived ability to receive care at local hospitals. For the care teams (nurses and ED physicians) questions of education/training were incorporated. For the teleneurologists, questions on interaction with the care teams were included.

Discussion: These surveys may have edits incorporated over time or delivery date changes for improvement in response numbers and quality of results. Surveys recently sent to the nurse facilitators were well received and offered education improvement suggestions.