

# Abstract Packet

## Opening Keynote

### **Eduardo Sanchez, MD, MPH, FAAFP**

Chief Medical Officer for Prevention, The American Heart Association

## Focus Session

### **Dr. Jorge Rodriguez Fernandez** , UT Medical Branch

Title: Reality of operationalizing documentation reduction

Abstract:

Operationalizing clinician documentation burden reduction involves implementing strategies and practices that will help streamline documentation efficiency and satisfaction. Strategies to consider include workflow reassessment and optimization, structured data capture, effective clinical decision support, training and education, end-user feedback and continuous improvement, and regulatory and policy updates. Operationalization of EHR documentation requires a collaborative effort amongst clinicians, healthcare organizations, vendors, and policymakers. Improving the clinician documentation experience improves satisfaction, patient care and outcomes, as well as overall efficiency both financially and in time-savings (Hoelscher et al., 2023; Lindsay & Lytle, 2022; Moy et al., 2021).

#### We Did it To Ourselves

Many areas of dissatisfaction with clinician EHR documentation can be linked to self-imposed practices. Healthcare providers often spend excess time documenting. This becomes self-imposed when documentation is reduced or the required criteria is lessened, and healthcare providers may still feel the need to document, despite recent billing changes (Rodríguez-Fernández, et al., 2022). Factors related to this type of burden (Figure 1) include:

- Avoidance of charting by exception
- Individual clinician documentation habits and perception of minimum documentation requirements
- Misuse or no use of time-saving technology such as copy forward
- Overreliance or avoidance of structured templates
- Reluctance to let go of the dated administrative needs in EHRs
- Lack of effort or time available to spend in education sessions

## Conclusions

Clinician documentation currently supports patient care, but often it is obscured by the burden of bureaucratic tasks, mostly related to reimbursement or regulatory practices imposed or self-imposed at the point of care. Highlighting the current and future trends of documentation will help to streamline the writing and reading of clinical notes, and enhance their utility for medical decision-making, patient safety while revamping the joy of medical practice.

### Ana Aleksandric, UT Arlington

Title: Analyzing the Stance of Facebook Posts on Abortion Considering State-level Health and Social Compositions

#### Abstract:

Ana Aleksandric, Henry Isaac Anderson, Anisha Dangal, Gabriela Mustata Wilson, Shirin Nilizadeh

Abortion remains one of the most controversial topics, especially after overturning Roe v. Wade ruling in the United States. Previous literature showed that the illegality of abortion could have serious consequences, as women might seek unsafe pregnancy terminations leading to increased maternal mortality rates and negative effects on their reproductive health. Therefore, the stances of the abortion-related Facebook posts were analyzed at the state level in the United States from May 4 until June 30, 2022, right after the Supreme Court's decision was disclosed. In more detail, the pre-trained Transformer architecture-based model was fine-tuned on a manually labeled training set to obtain a stance detection model suitable for the collected dataset. Afterward, we employed appropriate statistical tests to examine the relationships between public opinion regarding abortion, abortion legality, political leaning, and factors measuring the overall population's health, health knowledge, and vulnerability per state. We found that states with a higher number of opinions against abortion also have higher infant and maternal mortality rates. Furthermore, the stance of social media posts per state is mostly matching with the current abortion laws in these states. These findings indicate how public opinion, laws, and women's and infants' health are related, and interventions are required to educate and protect women, especially in vulnerable populations.

### Serenity Fanene, UT Arlington

Title: Health Intelligence Atlas: A Core Tool to Address Substance Use and Overdose Cases in Harris County, TX

#### Abstract:

## Morgan Foreman, UTHealth Houston

Title: Cultural-tailoring of a digital application for Black Pregnant Women with Hypertensive Disorders

### Abstract:

Morgan A Foreman, BS; Angela Ross DNP, Sahiti Myneni PhD, Angela Hanyes Burgess MD PhD, Amy Franklin PhD

In the United States' pregnancy-related mortality ratios vary significantly by race with Black women times more likely to die than other groups (Saluja & Bryant, 2021). Additionally, Black women are more likely to face difficulties throughout their pregnancy journey due to disproportionate rates of non-pregnancy related health conditions and prior experiences of discrimination (Rosenthal & Lobel, 2011). A common concern in pregnancy with a disproportionate risk in Black women is hypertension. Although hypertensive disorders affect about 5-10% of pregnancies, Black women have higher rates of gestational hypertension along with more severe complications with preeclampsia. Preeclampsia risk is 60% higher in Black versus white women. Black women are more likely to underutilize or delay seeking prenatal care even though they are at increased risk of complications. This dissertation project seeks to understand Black women's barriers and facilitators of patient activation in care planning to develop digital educational aids for Black women at risk of Hypertensive Disorders of Pregnancy. Existing frameworks in behavior change, such as Michie and coauthor's (2011) behavior change wheel do not consider cultural differences that may have effects on increasing participation in care. 20 qualitative interviews with postpartum and pregnant Black women have been conducted to find themes of barriers and facilitators of patient activation and shared decision making in prenatal care. Themes such as Faith, Cultural Beliefs, and Experiences of Discrimination from Providers represent cultural factors previously not included in other digital health frameworks. Here the goal is to establish expanded framework that include culturally tailored digital health features as part of an informatics solution for educating Black women on their increased risk of hypertensive disorders of pregnancy.

## Dr. John Robert Bautista, UT Austin

Title: Teaching Data Analysis, Visualization, and Reporting in Public Health Informatics

### Abstract:

The Informatics Academy at the Public Health Informatics Institute lists "data analysis, visualization, and reporting" as one of the eight competencies in the Applied Public Health Informatics Competency Model. In this presentation, I will share my experience in teaching data analysis, visualization, and reporting as part of an undergraduate

public health informatics course. In the Spring 2023 semester, UT Austin's School of Information offered I320M: Public Health Informatics as part of the Undergraduate Informatics Program's Health Informatics Concentration. Opportunities to enhance students' skills in data analysis, visualization, and reporting were made through mentored individual and group projects that focuses on creating a public health dashboard. To promote principles of equity and inclusion, Microsoft Power BI Online (browser-based) was used to create dashboards since it is readily part of the Microsoft suite of applications provided to university students. For the individual project, students were tasked to create a dashboard based on an instructor-prepared 2020-2022 US COVID-19 dataset from the CDC. Students presented their dashboards after three weeks of individual mentoring. For the group project, students were asked to form groups (i.e., three per group) and were given 10 weeks of mentoring on (1) finding an open-access public health dataset, (2) data collection and cleaning, (3) descriptive data analysis, (4) dashboard design, and (5) reporting public health insights. Students presented dashboards on public health topics, such as newborn mortality, dental carries, obesity, vaping, and teen abortion. All of the groups integrated insights on social determinants of health in their dashboards. I will present some of the dashboards created by the students and I will conclude with lessons learned in teaching data analysis, visualization, and reporting in an undergraduate public health informatics course.

### Dr. David Gibbs, Texas State University

Title: Get'em While They're Young: Kick-starting the health informatics student pipeline in high schools.

Abstract:

#### Problem Statement

Despite the large and expanding opportunities for rewarding careers in health informatics, not enough students graduate from high school with aspirations in the field. Relatively few of today's health informaticists identified their profession as a career goal in high school. Hence the importance of raising awareness of health informatics careers earlier in the education cycle. Exposure to the field's knowledge and skillset should find a receptive audience among high school students, including those considering careers in other STEM disciplines such as data science.

The figure below from the Texas Education Agency summarizes the Statewide Program of Study for Health Informatics and highlights content at each level. The full TEA overview shows study beginning in high school and continuing through graduate school with opportunities to enter the workforce at all levels.

#### Method

We propose development of health informatics presentations to raise awareness and promote engagement among high school students, parents, and advisors.

Presentations could be delivered in the context of a high school career day. Our approach leverages existing groups of students interested in healthcare (HOSA) along with related professional organizations (HIMSS, AMIA, and AHIMA) already engaging with younger students at local and national levels.

#### Outcome/Call to Action

Proposed topics for health informatics presentations include a high-level discussion of health data as an important example of “big data” – one where the health informaticist works at the intersection of healthcare, technology, and business management – and an introduction to a relevant programming language (such as SQL) along with a demonstration of a data visualization tool (such as a Power BI interactive dashboard). We will walk through the outline of such a career day presentation, as an example for professional colleagues to implement in their local communities.

### Dr. Robert Turer, UT Southwestern Medical Center

Title: Trends of Real Time Patient Portal Use Among Emergency Department Patients: An SAEM Informatics Collaborative Report.

Robert W. Turer MD<sup>1</sup>, Samuel A. McDonald MD<sup>1</sup>, Sayon Dutta MD<sup>2</sup>, Richard A. Taylor MD<sup>3</sup>, Christian C. Rose MD<sup>4</sup>, Adam Frisch MD<sup>5</sup>, Kristian Feterik MD<sup>5</sup>, Craig Norquist MD<sup>6</sup>, Carrie K. Baker DO<sup>7</sup>, Jeffrey A. Nielson MD<sup>7</sup>, David Cha MD<sup>7</sup>, Brian Kwan MD<sup>8</sup>, Christian Dameff MD<sup>8</sup>, James P. Killeen MD<sup>8</sup>, Richard Medlin MD<sup>9</sup>, Caryn Boyd BS<sup>9</sup>, Michael K. Hall MD<sup>10</sup>, Robert C. Doerning MD<sup>10</sup>, S. Trent Rosenbloom MD<sup>11</sup>, Casey Distaso MD<sup>11</sup>, Bryan D. Steitz PhD

#### Abstract:

##### Introduction

Since the 21st Century Cures Act provision on information blocking went into effect, most test results and clinical notes are immediately released via patient portals.<sup>1,2</sup> We previously showed at a single site that emergency department (ED) patients are increasingly viewing test results in real time during their visit.<sup>3</sup> We present a multi-site study evaluating trends in real-time patient portal use by ED patients.

##### Methods

We report data from 8 academic and 23 community emergency departments. We extracted weekly proportions of adult ED patients who logged into the patient portal, viewed test results, and viewed notes in real time between April 5, 2021 and April 4, 2022. The primary outcome of interest was the correlation (Kendall’s tau) between time (weeks) and real time portal logins during ED visits. Secondary outcomes were the correlation between time and test result review and note review during ED visits.

## Results

The study population included 1,104,866 ED encounters across all sites. Among this cohort, 581,472 (52.6%) patients were registered for MyChart on arrival, 148,717 (13.5%) logged in during their ED stay, 129,418 (11.7%) viewed test results during their ED stay, and 10,742 reviewed notes (1.9%). Correlations between time and portal activities were: logins 0.76 (CI 0.65 – 0.84), test result review 0.82 (CI 0.71 – 0.89), notes review 0.65 (CI 0.50 – 0.78), suggesting increasing trends.

## Discussion

This study evaluated temporal trends of real-time patient portal use among patients at 31 academic and community EDs across the United States. We observed increasing rates of portal logins, test result review, and note review since implementation of the 21<sup>st</sup> Century Cures Act information blocking provision. Given these results and the sparse literature surrounding portal use in the ED, there are likely opportunities for portals to enhance care during ED visits.

## Poster Session

### Hannah Affleck, UT Arlington

Title: Examining perspectives of mHealth intervention methods in racially minoritized women

#### Abstract:

Affleck, H.A., Moza, J., Brown, K. K., Wilson, G., Liao, Y.

**Background:** Racially minoritized women, primarily non-Hispanic Black (NH Black) and Hispanic women, living in the United States are reported to have the lowest levels of physical activity. Emerging mHealth research supports that utilizing wearable sensors to promote active lifestyles can help reduce the risk of chronic health conditions and improve maternal health outcomes. The purpose of this study is to examine the association between Hispanic and NH Black women's current activity levels, and their perceptions/usage of wearable sensors with participant's socio-demographic factors.

**Methods:** A total of 883 Hispanic and NH Black women currently living in the United States, ages 18-49, completed a cross-sectional web-based survey. Surveys were completed in English (NH Black only) (n=502) in February 2021. Additionally, surveys were completed in Spanish (n=95) and English (n=420) for Hispanic participants from Oct-Dec 2022.

**Results:** Our population consisted of 43.82% NH Black women, and 56.17% Hispanic women living in the U.S., with an average age of 29.84 years. Survey results indicated that 39.5% NH Black women and 52.2% Hispanic women own a wearable device (e.g., Fitbit, Apple Watch, Garmin). For device usage, 42% indicated they used wearables to track activity levels, 26.6% utilized them to tell time, 28.8% utilized them to receive

notifications from their phone, and 8.7% used wearables just for fun. Hispanic women (85.9%) and Black women (81.13%) reported they need to be more physically active. Black women (42.3%) and Hispanic women (33.5%) also reported they had never used a health-related app before.

Conclusions: While about 47% of our target population owned a wearable device and 99% of our population owned a smartphone, the majority of participants indicated they were not physically active nor used a health-related app. Utilizing wearable sensors to promote active lifestyle can help reduce the risk of chronic health conditions and improve maternal health outcomes.

### Dr. Estefanie Garduno-Rapp, UT Southwestern

Title: Building and Deploying a Cloud Environment for Hosting Custom Application Development Services within an Academic Tertiary Center

Estefanie Garduno-Rapp, MD; John Hanna, MD; Jonathan Reeder, MD

#### Abstract:

Significance: The 21st Century Cures Act (Cures Act) is designed to help accelerate medical product development and bring new innovations and advances to patients who need them faster and more efficiently. [1] Patients can now access their health information including radiology or pathology reports in near real-time. However, a few tools exist to allow patients to interpret these findings<sup>2-4</sup>.

Objective: To design an application that enhances patient understanding of diagnostic descriptions by translating medical reports into lay terms. As well as, building and hosting an environment for custom application development services in our academic center.

Methods: We developed a web-based application in java that utilizes open AI to translate medical reports to layman terms. Posteriorly, we deployed our application within Microsoft Azure by building a static web app resource. Subsequently, through Visual Studio Code which was connected to our GitHub account. We downloaded an extension specifically designed to work with Azure to build and deploy static apps. By doing so, we were able to set up an authentication function that only allows access within our hospital network.

Results: The application can successfully translate medical jargon into layman terms and the deployment in azure enabled us to implement real-time changes whenever we pushed modifications in GitHub.

Conclusions: The project was a proof of concept to demonstrate the possibilities of leveraging our organization's cloud services for development and hosting purposes. This demonstration serves as an illustration of the broader potential we have for building and hosting applications that can drive development towards a more patient-focused healthcare system within our hospital. By doing so, we facilitated a playground for medical professionals to develop meaningful tools that can bridge the gap between patients understanding and diagnostic information.

### Dr. Melody Greer, University of Arkansas for Medical Sciences

Title: Social and Behavioral Data Quality

#### Abstract:

There is a strong belief that social and behavioral determinants of health (SBDOH) data can provide a more holistic view of the patient's life and produce risk assessments that accurately tailor care to the individual. However, SBDOH data elements in electronic health records (EHR) often have poor data quality. To address this issue, we have developed the first two of a four-stage automated data quality analysis instrument and tested it on a limited set of social and behavioral data elements. The instrument tests data at four transformational phases: collection, append, mapping, and imputation on data quality metrics of accuracy, completeness, coverage, and uniqueness. We have completed the collection and append phases. The collection phase resulted in over fifty-five thousand individual participants collected from the University of Arkansas for Medical Sciences' EHR. In the append phase, social and behavioral data was appended to participant data. Data quality measures were applied during each step as appropriate. Accuracy was measured using concordance of appended data elements with UAMS elements where they were available. This method of measuring accuracy does not prove accuracy since factual accuracy would require physical checking, which is impracticable but is a surrogate that provides evidence. Completeness was measured with a non-null data element count. The number of participants with data to append supplied the coverage measure, and the number of duplicate participants provided uniqueness. There are two overall and two specific data quality measures. Duplicates can occur during data collection, so we counted each unique individual totaling 55,422 during DQ Stage 1. Coverage was the second overall measure totaling 54,068 during DQ Stage 2. Completeness measures were taken in DQ stages 1 and 2 and showed improvement in all elements. Accuracy could only be measured at stage 2 because at least two stages of data are required for concordance.

### Rakshita Kota, UT Austin

Title: Promoting the Field of Health Informatics Through the Health Informatics Organization



Abstract:

Rakshita Kota, Maahe Kazmi, Xavier Hernandez, Alefia Aziz Ali, Krish Devnani, Dhivya Venkatraghavan, and John Robert Bautista

The Health Informatics Organization (HIO) is a community of students and faculty interested in promoting the field of health informatics within and beyond UT Austin. HIO was approved as a student-run organization at UT Austin in December 2022 and is led by a diverse group of undergraduate students: Rakshita Kota (Founder and President), Maahe Kazmi (Vice President), Xavier Hernandez (Social Media Director), Alefia Aziz Ali (Finance Director), Krish Devnani (Public Relations Director), and Dhivya Venkatraghavan (Event Organizing Director). HIO organizes activities that allow its members to gain more insights in the field of health informatics and network with industry and academic leaders. In Spring 2023 semester, HIO has conducted the following activities:

- Hot cocoa and cookies meet and greet (kick off event)
- Guest talk by Dr. Elizabeth Schulfwolf, Chief Medical Officer of Dell Seton Medical Center to discuss the importance of health informatics to ensure smooth operations of the hospital, issues plaguing the field, and her vision for the future of health informatics
- Profit share at Gong Cha to fundraise for club expenses
- Guest talk by Jorge Garza, Clinical Informatics Specialist at Dell Seton Medical Center to discuss the day-to-day operations of a health informaticist, what kind of projects are typical for a health informaticist, and how to get into the field

Future events in Fall 2023 semester include:

- Guest speaker event with Justin Irving, Public Health Informatics lead at MITRE
- Joint blood donating event with Texas Blood Brigade
- Guest speaker event with Dr. Ying Ding, AI and Health researcher at UT iSchool
- Promoting health informatics as a career option among local high school students

Overall, HIO's activities can persuade high school and university students to choose health informatics as a field of study which can mitigate the shortage of health informatics professionals in the US.

### Sun Won Min, UT Southwestern

Title: Combatting "deaths from a thousand clicks" one workflow at a time

Abstract:

With electronic health record (EHR) advancement, clinicians have an additional role of data entry clerk. EHR functions aimed at improving patient safety and charting accuracy are consistently released. However, these features can increase the number of clicks by

clinicians and/or added cognitive burden. Studies have demonstrated that click count is positively correlated to provider dissatisfaction, and can lead to limited face-to-face patient contact, emotional distress, and burnout<sup>4,5</sup>. Vendor-provided EHR usage dashboards are often utilized to gauge proficiency; however, the true workflow pain points perceived by clinicians may be different. The UT Southwestern EHR team inquired the Family Medicine (FM), Physical Medicine & Rehabilitation (PMR), and Obstetrics/Gynecology (OB/GYN) Departments about their biggest pain point. Diabetes foot examination documentation, Botox injection documentation, and lab order placements were the biggest pain points identified, respectively. To clarify each pain point, proficiency data were pulled from vendor proficiency dashboard (Epic© Signal) and tools usage was pulled from Epic Clarity using SQL. Click counts were calculated through workflow walkthrough and user estimation

In the case of FM, discrete, shared documentation features (between nurses and doctors) were implemented to simplify diabetic foot exam documentation. Order entries were redesigned to minimize the number of required clicks in the case of OB/GYN. For instance, default choices were changed according to differential diagnosis. From 52 days to over 6 months of implementation, 14 620, 1 300, and 38 035 clicks in the FM, PMR, and OB/GYN departments were saved, respectively. Each department provided subjective notice of satisfaction with the intervention. We also observed improved engagement and increases in optimization requests from various departments. These suggest that accurate pain point identification improves user satisfaction and demonstrates system-wide need. Building on this enthusiasm, we intend to expand optimization efforts.

### Jhoceline Moza, UT Arlington

Title: A geolocation analysis of Hispanic women who participated in an online survey study about digital health

Moza, J., Wilson, G., Brown, K. K., Liao, Y.

Abstract:

**INTRODUCTION:** Among racial minority women in the U.S., Hispanic women are among the lowest to report physical inactivity. Social determinants of health are conditions in the environment where a person is born, lives, and works including access to medical care and digital technology. An emerging body of research has shown that wearable technology and mobile health interventions are crucial for increasing physical activity. This study examines geolocations in Hispanic women, and creates interventions to help improve the digital divide gap.

**METHODS:** 496 Hispanic women of childbearing age (18-49) currently living in the US completed a cross-sectional web-based survey in October-December 2022. Surveys were completed in English (n=401) and Spanish (n=95). Data and locations were obtained from QuestionPro and downloaded to Excel. English and Spanish surveys

were divided to separate Excel sheets. Locations were then uploaded to a university-approved website, BatchGeo. The coordinates were downloaded from BatchGeo and converted to Google Maps. Incomplete coordinates were found on BingMaps, HERE Maps or MapQuest. Addresses were inputted to Excel and uploaded to PolicyMap. Gini index and index of medical underservice were downloaded at the census and county level from both English and Spanish speaking groups.

RESULTS: Survey respondents were 94.6% U.S.-born, the average age of 27.5 years, 76.8% single, 75.2% nulliparous, 54.0% without a bachelor's degree, and 36.5% had an annual household income  $\leq$  35,000. Respondents with low socioeconomic status (SES) were more likely to live in medically underserved areas. Additionally, there are more respondents living in large cities such as Miami. Respondents with low SES were more likely to live in southern states such as Texas or Alabama.

Figure 1. Inequality household income in Hispanic English and Spanish speaking women of childbearing age.

Figure 2: Index of medical underservice (IMU) score in Hispanic English and Spanish-speaking women of childbearing age.

CONCLUSION: More research is needed to understand income inequality in Hispanic women. Creating interventions using mobile health and wearable technology can help improve the health status and the digital divide gap in medically underserved areas with a lower socioeconomic position.

### Jorge Zamora, Methodist Healthcare

Title: Healthcare-Associated Infections (CAUTI and CLABSI) Prevention Using QR Code for Bundle Audits

Abstract:

## Panel Session

Panelist 1: Monica Coley, DHI, MPH, Health Informaticist and Sr. Business Development Manager for Amazon Web Services

Topic 1: The Health Disparities Dilemma with Artificial Intelligence and Machine Learning

Panelist 2: Kirk Roberts, PhD, Associate Professor, The University of Texas Health Sciences Center at Houston, D. Bradley McWilliams School of Biomedical Informatics

Topic 2: Organizational Bias and Federated Learning for Machine Learning Models

Panelist 3: Xiaoqian Jiang, PhD, Associate Vice President of Medical AI and Christopher Sarofim Family Professor, The University of Texas Health Sciences Center at Houston, D. Bradley McWilliams School of Biomedical Informatics

Topic 3: Technology Solutions for Mitigating Algorithmic Unfairness and New Challenges

Panelist 4: Michael Conward, PhD, Chief Technology Officer and Founder, MyLUA Health

Topic 4: Advancing Health Equity: Real World Application of AI/ML for Maternal Care

## Lightning Talks

### Shannon Shiffer, UT Southwestern

Title: Worth the Weight: Improving Insight into Surgical Weight Loss

Abstract:

Perceived as extreme but effective treatment for obesity, bariatric surgery procedures drastically alter patients' lives. The complications and undesirable side effects such as dumping syndrome and vomiting must be carefully avoided to achieve successful weight loss for patients. While previous research resulted in novel measures to monitor weight trends, practical and regular usage of post-operative weight loss tracking tools has yet to be fully studied. A provider-facing tracker that monitors weight and comorbidity trends can assist in the detection and prevention of regaining weight. We evaluated the efficacy of such a tracker through needs assessment, user interface mockup, and data analysis. Our data show that weight loss trends diversify over time, thus indicating that an early detection tracker can act as an effective prevention tool for providers to monitor their patients.

### Dr. Sundeepa Bhattacharyya, Arkansas State University

Title: Addressing Colorectal Cancer Prevalence And Screening Disparities in Arkansas: A Computational Framework Towards Targeted Personalized Interventions.

Bhattacharyya S, Greer ML, Aguilar DR, Berryhill J, Adkins A, Laryea JA

Abstract:

High prevalence of colorectal cancer (CRC) is a major public health issue in Arkansas (AR). We have analyzed BRFSS, Claims and AR Cancer Registry data to estimate incidence rates, screening rates and associated risk factors in Arkansas from 2013 to 2020. Spatiotemporal modeling highlighted specific clusters and hotspots, particularly in the eastern delta region of the state. Significant disparities were associated with race, age, gender and location in incidence rates and screening rates. Age-adjusted mortality

rates were higher in males, particularly among the blacks. Social Determinants of Health (SDOH) factors like education level, household income, area deprivation index were correlated with higher CRC incidences, advanced stage and lower screening rates. Of particular concern was the fact that those below 50 have 81% higher odds of late-stage diagnosis compared to those 50-75 (OR 1.81, (1.45-2.27)). However, our interest lies in examining whether disparities exist in factors beyond what may be attributable to differences in socioeconomic status, such as modifiable health and behavioral risk factors. So far only neighborhood level measures of SDOH factors have been considered for CRC predictive models. Towards our two-pronged objective of 1) identifying modifiable behavioral risk factors and 2) initiating targeted, personalized interventions, we are creating a computational framework of individualized social and behavioral determinants of health (SBDOH) resource that will be contextualized with a neighborhood component, will be current, on-demand, semantically mapped, interoperable, adaptable and equipped with a deep-learning model based missing value and bias mitigation component. Preliminary data will be presented on this individualized SBDOH framework. In partnership with community stakeholders, we plan to use this framework to target individuals at risk for CRC incidence in the counties within the catchment area of the University of Arkansas for Medical Sciences, for health literacy campaigns.

## Jorge Zamora, Methodist Healthcare

Title: Health Data Literacy Advancement

### Abstract:

Health data literacy plays a crucial role in enhancing patient care and improving outcomes within the healthcare system. As the volume and complexity of health data continue to increase, healthcare professionals and the healthcare system must seize opportunities to enhance their data literacy skills and effectively leverage health informatics and analytics. This abstract explores the importance of health data literacy and identifies opportunities to leverage this knowledge to provide better patient care and achieve positive outcomes.

Currently, healthcare professionals face challenges in harnessing the full potential of health data due to limited data literacy skills. Many lack the sufficient knowledge and expertise to navigate complex datasets, interpret statistical analyses, and effectively communicate health insights. The rapidly evolving landscape of health technology and data standards creates difficulties in staying updated with the latest practices. As a result, there is a risk of missed opportunities for evidence-based decision-making and suboptimal patient care.

To address these challenges, potential solutions exist to increase health data literacy. First, incorporating health data literacy training into the education and professional

development can foster a better understanding of data analysis techniques and interpretation. Furthermore, healthcare systems can invest in technological infrastructure that facilitates data integration, visualization, and analysis. User-friendly interfaces and tools can enable healthcare professionals to extract meaningful insights from vast amounts of data efficiently. Lastly, partnering with experts in health informatics and analytics can foster interdisciplinary knowledge exchange and enhance health data literacy across the board. In conclusion, health data literacy is of paramount importance for modern healthcare. By addressing the challenges through education, collaboration with health informatics and analytics, and leveraging technology, healthcare professionals can make more informed decisions, develop personalized treatment plans, and identify trends that drive positive patient outcomes. Ultimately, this can lead to enhanced patient satisfaction, reduced healthcare costs, and improved overall population health.

## Elizabeth Gonzalez, UT Southwestern

Title: Reducing Nursing Documentation and Empowering Patients Through the Use of Patient Entered Questionnaires

Elizabeth L. Gonzalez, M.S., Christoph U. Lehmann MD<sup>1,2</sup>, Ferdinand Velasco MD<sup>3</sup>, Christina Lin BS<sup>4</sup>, Tiffany N. Vo BS<sup>4</sup>, DuWayne L. Willet MD<sup>1,4,5</sup>, Michael Mayo MSN<sup>5</sup>, Matthew J. Sherman MD<sup>5</sup>, Carl Piel Jr. DO<sup>5</sup>, Samuel A. McDonald<sup>1,4,5</sup> MD, Robert W. Turer MD<sup>1,4</sup>

Abstract:

### Introduction

Older patients with frailty are at high risk for functional decline, hospitalization, and mortality after emergency department (ED) visits. The Identification of Seniors at Risk (ISAR) tool, typically completed by ED nurses, aims to predict these adverse outcomes and facilitate referral for geriatric or social work services. Patient-completed screening might improve patient engagement and reduce nursing workload. Concordance between patient-entered and nurse entered ISAR scores has not previously been evaluated. We pursued a quality improvement (QI) project to design, test, deploy, and evaluate a patient-entered version of the ISAR.

### Methods

This is a single site QI project in an academic ED in North Texas. A workflow analysis suggested that a patient-entered questionnaire using the Epic electronic health record (EHR) through the patient portal was a cost effective way to deliver the ISAR tool to patients. The primary study outcome was action concordance between patient- and nurse- entered scores (i.e. did both scores lead to the same recommendation). We also evaluated total score and question-specific concordance.

### Results

Within the pilot period from March 7 to June 7, 2023, 158 (3.8%) of patients completed the questionnaire out of 4203 eligible patients. Out of the 158, 84(53.2%) could be compared with nurse entered responses. Action concordance was found in 55 (65%). In 23 cases (27.3%) the patient score and nurse score differed indicating a missed opportunity for referral interventions.

#### Conclusions

We observed discordance between patient and nurse-entered ISAR scores, representing missed opportunities for frailty intervention referral. Better notification strategies are needed to increase response rates before this strategy could meaningfully reduce nursing task burden.

#### Dr. Prerna Dua, UT Southwestern

Title: A Machine Learning Approach for Prediction of Cancer Outcomes with Determined Smoking Status

#### Abstract:

**Background:** Tobacco induced cancer is amongst the most common cause of death as well as the most preventable cause. It has been investigated that disparity also plays a critical factor in tobacco consumption with people from marginalized population, living in rural areas and/or poverty and low educational status with a higher prevalence rate, thereby making the factors of Social Determinants of Health (SDOH) prominent. This work presents a comprehensive study focused on predicting the occurrence of cancer with consumption of tobacco as an underlying factor.

**Materials and Method:** Data is acquired from the National Health Interview Survey of 2021 (NHIS) with 29,482 records and 622 attributes having a wide range of variables related to existing health conditions, socio-demographical status, mental health, and financial conditions. Various machine learning methods are employed, including feature selection, dimensionality reduction, and classification algorithms involving ensemble based techniques, to build predictive models. Sensitivity, specificity, accuracy, and area under receiver operating characteristic (ROC) curve are used to determine the performance of the models.

**Results:** The results highlight the established factors of social determinants of health, tobacco use and cancer as being. The average accuracy of predication on our models is 87% with age, education, economic status, mental health and life satisfaction as the most important predictors in all models.

**Conclusions:** Ensemble based techniques can be used to classify large amounts data from the with good accuracy. Our study adds to the growing body of evidence on the harmful effects of tobacco consumption and tobacco related stigma among low income populations. Policies for control and intervention should be implemented equitably to

remove tobacco related disparities.

Tanvi Ingle, UT Southwestern

Title: Epic's Early Detection of Sepsis Model to Broadly Predict Patient Mortality

Abstract:

Tanvi Ingle, BS; Samuel McDonald, MD, MS; Mujeeb Basit, MD, MS; Mark Courtney, MD; Betty Yang, MD, MS, Robert Turer, MD, MSE, MSACI

The Early Detection of Sepsis (EDS) model in the EPIC (Epic Systems Corp., Verona, WI) electronic health record leverages real-time, clinical and demographic data to predict the onset of sepsis. This penalized logistic regression model produces EDS scores which are employed nationally and may also predict mortality in patients with other life-threatening conditions.

We fit a binary logistic regression model to explore the association between the EDS scores in the emergency department (ED) and inpatient mortality, adjusting for age, sex, ESI, race/ethnicity, and language. This study evaluated all encounters at an academic ED in North Texas from October 2021 to December 2022. Data were extracted from Epic's Clarity reporting database. Patients with Emergency Severity Index (ESI) 4 and 5 were excluded because there were no deaths in these categories. We modeled continuous variables with restricted cubic splines and evaluated our model with the likelihood ratio Chi-square test and Harrell's C-index. We evaluated individual features with Wald scores

Of the 23,832 encounters, the median age was 61 years (IQR 44-72), and 52.5% were women. Regardless of the ultimate diagnosis of sepsis, the overall model was significant with a C-index of 0.734. Increasing EDS scores were associated with higher odds of mortality (OR 2.5, 95% CI [1.8 - 3.4],  $P < 0.0001$ ). When compared to ESI 3, the likelihood of mortality for those with ESI 1 was 15 (95% CI [9.5 - 23.7]) and 2.6 (95% CI [1.9 - 3.5]) for those with ESI 2. Increasing age was also associated with increased odds of mortality (OR 1.3, 95% CI [1 - 1.8]).

We observed an association between the EDS scores and inpatient mortality among all ED patients, suggesting predictive value beyond sepsis. Future work should evaluate combining the EDS score, ESI, and age to better identify patients at risk for decompensation and death.

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Title: Progress on Evidence-based Recruiting for AI and ML Talent

Abstract:



### Problem Statement:

The rising demand for healthcare professionals proficient in artificial intelligence (AI) and machine learning (ML) skills poses a challenge in recruiting and retaining such individuals. These skills are vital for optimizing electronic health records (EHRs) and enhancing patient care delivery. Therefore, there is a need for tools that can assess the specific characteristics associated with AI and ML skills to address this problem effectively.

### Method:

This study aims to identify the characteristics linked to AI and ML skills in healthcare professionals and apply them to an assessment platform to enhance recruitment and retention efforts. The research methodology involves qualitative and mixed methods analysis. A comprehensive questionnaire, consisting of 10 scenario-based questions, has been developed to evaluate niche knowledge and skills across four subdomains. The product will be tested with a sample of 75 students to measure two key constructs: perceived usefulness and perceived ease of use.

### Results/Conclusions:

The completion of the AI/ML questionnaire, containing 10 scenario-based questions to assess niche knowledge and skills within four subdomains, marks a significant milestone in this study. By employing qualitative and mixed methods analysis, this research seeks to identify the characteristics associated with AI and ML skills in healthcare professionals.

To evaluate the product's effectiveness, a sample of 75 students will participate in testing. The evaluation will focus on two key constructs: perceived usefulness and perceived ease of use. These measures will provide insights into the product's potential impact on recruitment and retention efforts for healthcare professionals with AI and ML skills.

The anticipated results and conclusions of this study have the potential to address the challenges of misaligned professionals, improve employee retention, and increase revenue within the healthcare sector. By incorporating student feedback on the perceived usefulness and ease of use, the assessment platform can be refined and optimized for broader implementation.

This research holds significance given the projected growth of the healthcare informatics field and the increasing demand for specialists with AI and ML expertise. As federally mandated incentives for improved quality care outcomes continue to grow, the development of effective recruitment and retention strategies becomes critical for the success of the healthcare industry.

## Closing Keynote

**Maria E. Fernández, PhD**, Lorne Bain Distinguished Professor in Public Health and Medicine, Director, Center for Health Promotion and Prevention Research, UTHealth Houston School of Public Health

*Title: Implementation science and Health Informatics: Partnership for promoting equity*