

**POPULATION:** Collecting KL2 application records at Penn State CTSI from 2017 to 2023, comprising both accepted and not accepted candidate profiles, this study used a generalized logistic mixed model with binomial distribution to understand the factors predictive of KL2 trainee acceptance, (n=47). The following factors were modeled as potentially predictive of scholars' acceptance: Institution-specific Processes—Campus; Terminal Degree Type; College of Residency, Applicant Demographics and Portfolio—*Minoritized* or Protected Groups; Mean Application Score; Rurality Focus; Gender, and Outcomes—Post-Program h-index. **RESULTS/ANTICIPATED RESULTS:** Only Campus and Degree were significant factors predictive of trainee acceptance ( $r < .0001$ ), with a particular campus and the MD degree-designation both exerting selection pressures on acceptance rates. Applicant demographics were not significant historical factors in selection despite the most recent trainee cohort comprised of all women. Similarly, while our CTSA focuses on rural inequality and accessibility, a research proposal focused on rurality was not a significant factor for acceptance. Notably, NIH-scaled application scores and post-program h-indices were not significant for accepted and non-accepted applicants. **DISCUSSION/SIGNIFICANCE:** The absence of applicant-focused selectional pressure is striking—Penn State CTSI does not significantly select for gender, URM, or URP status. Administration is now empowered to intentionally engage, recruit, and retain from our other affiliated campuses and colleges.

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### **Radiation Therapy and Irreversible Electroporation (RTIRE) for Intermediate Risk Prostate Cancer**

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**OBJECTIVES/GOALS:** Prostate cancer treatment is associated with significant genitourinary side effects. There is a critical need for treatment with decreased morbidity. We report the development of a novel treatment paradigm combining irreversible electroporation and lower dose radiation to provide prostate cancer patients with a less morbid treatment. **METHODS/STUDY POPULATION:** Intermediate risk prostate cancer patients will undergo focal irreversible electroporation followed by low dose, whole gland radiation therapy. The primary endpoint is freedom from clinically significant cancer on biopsy at 12-month follow up. Secondary endpoints include safety profile, oncologic efficacy, effectiveness of RT and need for secondary treatment. This trial (NCT05345444) and currently actively recruiting patients after initial feasibility trial. Sample size is calculated to detect an increase in the proportion of patients who are cancer free at 1-year, from 0.80 to 0.95. An exact binomial test with a 10% one-sided significance level will have 94.3% power to detect the difference between the null and alternative hypothesis when the sample size is 42. **RESULTS/ANTICIPATED RESULTS:** This is a clinical trial in progress. **DISCUSSION/SIGNIFICANCE:** Combined irreversible electroporation (IRE) and

a lower dose radiotherapy (RTIRE) may provide prostate cancer patients a treatment with minimal side effects.

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### **An Evaluation of Altmetric Attention using Network Science and Natural Language Processing**

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**OBJECTIVES/GOALS:** Our project aims to assess the composition or characteristics of research papers that score high on alternative metrics. These alternative metrics including the number of newspaper mentions, social media mentions, and the attention score as catalogued on Altmetric, a tool used to document community attention for a given research paper. **METHODS/STUDY POPULATION:** Our study intends to 1) Utilize topic modeling to identify prevalent themes on Altmetric, and 2) Apply network analysis to elucidate the interconnectedness among universities, funding sources, journals, and publishers associated with high-attention papers. 3) Examine how these patterns vary when attention metrics shift, such as social media mentions, newspaper mentions, or the Altmetric score. We'll first perform this analysis on all types of papers and then limit the networks to Biomedical and Clinical Sciences, and Public and Allied Health Sciences to help inform what health topics garner attention. **RESULTS/ANTICIPATED RESULTS:** Our initial Altmetric topic models revealed sustained attention for COVID-19 and vaccination-related publications well beyond the pandemic (specifically, papers from January 2023). Health topics like cancer, dementia, and obesity also garnered high attention. Additionally, political papers (elections, democracy), climate change, and battery research had notable attention values. Further analysis needs to be done to explain why these topics gain attention and the type of attention they garner. We will construct networks to see the relationship between attention and entities like universities, funding sources, journals, and publishers. This will identify whether certain clusters of these entities produce papers with high attention or if attention is distributed evenly among them. **DISCUSSION/SIGNIFICANCE:** To gauge the broader impact of scholarly research alternative metrics beyond citations are needed. Altmetric is used widely by CTSA's to measure the community interest in research. Understanding the types of research that gain traction on Altmetric can help researchers understand how to garner interest from the community.

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### **Association of Asthma Specialty Care and Adverse Outcomes for Children Enrolled in the Arkansas Medicaid Program**

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**OBJECTIVES/GOALS:** Specialty care for asthmatic children should prevent adverse asthma outcomes. This study of children receiving care in the Arkansas Medicaid program used a comparative effectiveness research design to test whether allergy specialty care was associated with reduced adverse asthma outcomes. **METHODS/STUDY POPULATION:** Using the Arkansas All Payer Claims Database we studied Medicaid-enrolled children with asthma using a propensity

score greedy nearest neighbor one-to-one matching algorithm. We matched children with (treatment) and without (comparison) an allergy specialist visit in 2018. The propensity score model included 26 covariates (demographic, clinical, and social determinants of health). Multivariable adjusted logistic regression was used to estimate adverse asthma events (AAE: emergency department visit or inpatient hospitalization with a primary or secondary diagnosis of asthma in 2019). RESULTS/ANTICIPATED RESULTS: We identified 3,031 children with an allergy specialist visit in 2018, and successfully propensity-score matched 2,910 of the treatment group with a non-allergy specialist visit comparison group. The rate of AAEs in 2019 was 9.5% for individuals with an allergy specialist visit versus 10.1% among those without a specialist visit ( $p=0.450$ ). The adjusted regression analysis showed 20.3% lower rates of AAEs (aOR: 0.797; 95% Confidence Interval: 0.650, 0.977;  $p=0.029$ ) in 2019 for children with an allergy specialist visit in 2018 compared to those that did not. DISCUSSION/SIGNIFICANCE: Utilizing allergy specialist care was associated with better asthma outcomes in our statewide study of Arkansas Medicaid-enrolled children with asthma. Asthma quality metrics based on guideline-based recommendations for allergy specialist care should be considered in population health management programs.

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### Scaffolding Learning through Digital Play: Translating Theory to Practice

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OBJECTIVES/GOALS: Scaffolding aids learning by gradually removing assistance to encourage independence (Bickhard, 2013; Gross, 2015). Mightier is a commercially available biofeedback game that fosters emotion regulation (ER) skill practice through play. This study aims to evaluate the ability of Mightier to scaffold the learning of ER and reduce irritability. METHODS/STUDY POPULATION: Data were collected via online caregiver report. Inclusion criteria were age of child ( $\leq 18$  years) and study enrollment prior to the child engaging with Mightier. Children wear a heart rate (HR) monitor while playing games in the Mightier app library. As their HR increases, play becomes more difficult. Children can pause the game to use a scaffolded ER activity or regulate independently to return the game to normal difficulty levels. Caregivers were instructed to use the game ad libitum. Participants included caregivers of 195 children (Age = 7.84 years old; range = 4-18 years old; 24.28% female; 74.57% male); the sample was predominantly White (56%). Caregivers completed the Affective Reactivity Index, a measure of their child's irritability, before and after playing Mightier for 8-12 weeks. RESULTS/ANTICIPATED RESULTS: A first Wilcoxon Signed Rank Test revealed a significant reduction in the ratio of scaffolded cooldowns (using a guided activity to regulate) to total cooldowns on the first play day (Md = .50) versus the last play day (Md = .22),  $z = -6.51$ ,  $p < .001$ . A second test revealed a statistically significant increase in the ratio of independent cooldowns (regulating on their own) to total cooldowns on the first play day (Md = .50) versus the last day of play (Md = .80),  $z = 6.34$ ,  $p < .001$ . Given the significant, inverse relationships between scaffolded and independent ER on the first play day versus the last play day, further analyses will examine potential mediation and moderation effects of game engagement (play minutes, total cooldowns, scaffolded cooldowns, and independent cooldowns) on changes in irritability.

DISCUSSION/SIGNIFICANCE: ER is vital for healthy development and protects against mental health challenges (LeBlanc et al., 2017). Across domains, scaffolded practice promotes learning (Vygotsky, 1978). Results reveal that scaffolded practice leads to independent ER during play. Future research should explore whether this pathway leads to independent ER outside of play.

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### Temporal Trends in Young Adult Cannabis and Tobacco Use in Relationship to Cannabis Policy

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OBJECTIVES/GOALS: Cannabis laws may impact cannabis and tobacco use, given high prevalence of co-use of these products among young adults (YAs). The objective of this study was to examine trends in YA any cannabis, blunt, cigarette, and cigar use from 2002-2018 in states that passed adult and medical use (AMU) or medical use only (MUO) cannabis laws during that time (N=16). METHODS/STUDY POPULATION: Using data from the National Survey on Drug Use and Health, we conducted a segmented regression analysis to calculate absolute percent change (APC) in past 30-day cannabis and tobacco use between time points. The National Cancer Institute's Joinpoint software was used to also estimate points of inflection (Joinpoints) when the slope of a trend significantly ( $p < 0.05$ ) changes. Separate models were estimated for each state, with time as the independent variable measured in years. Up to three Joinpoints per model were allowed. The model with optimal Joinpoints was determined using a model selection criterion via a permutation test. Joinpoints and APCs were compared with key legalization dates to describe patterns within and across states with varying cannabis policies. RESULTS/ANTICIPATED RESULTS: Generally, the 16 states showed a steady decline in YA cigarette smoking over time, a slight decline in cigar smoking, and increases in cannabis and blunt use. AMU states had lower average 2018 prevalence of cigarette smoking than MUO states (18.3% vs. 21.5%) and higher cannabis use (32.3% vs. 21.3%). Cannabis use consistently increased following opening of MUO retail outlets. Generally, there appears to be a slight delay in cannabis use increases following AMU laws, and in some states temporary declines. For example, Washington experienced an initial decrease (-20.3%) following AMU passage (2012) then increase (+16.3%) after retail dispensaries opened in 2014. In AMU states, blunt use has surpassed cigar smoking, while in MUO states, the prevalence of blunt and cigar use is similar. DISCUSSION/SIGNIFICANCE: Introduction of cannabis laws are correlated with increases in YA cannabis and blunt use, with higher cannabis use in AMU states. Trends may also correlate other state political, economic, or social factors. Joinpoint regression can assess changes in a policy's target behavior with no a priori assumptions regarding timing of policy effects.

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### Roles and Expectations for Evaluators within a Learning Health System

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OBJECTIVES/GOALS: Our objective is to explore the evolving role of evaluators within Learning Health Systems (LHSs) and the