

2021-2026

PENN STATE CTSI

FIVE-YEAR IMPACT REPORT

**Building Translational
Scientists, Connecting with
Communities, and Improving
Health Outcomes**



PennState

Clinical and Translational
Science Institute





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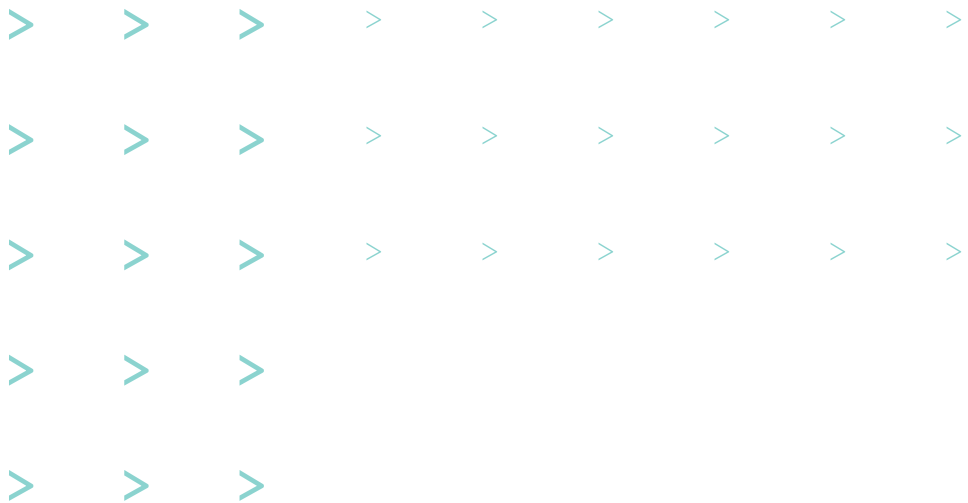
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A Message From The Director

It is with tremendous pride and deep gratitude that I share this five-year impact report for Penn State Clinical and Translational Science Institute (CTSI). Since our founding in 2011, CTSI has grown into a catalyst for innovation and collaboration across Pennsylvania—advancing translational science that improves health where it is needed most, particularly in our rural communities.

At CTSI, we believe discovery matters only when it changes lives. Over the past five years, we have strengthened the research infrastructure that supports investigators at every career stage, expanded partnerships across health systems and communities, and accelerated the movement of evidence into practice. Together, these efforts have supported more than 150 pilot projects, generated hundreds of

publications, and yielded a strong return on investment—demonstrating that strategic support of translational science delivers measurable impact.

Rural health remains at the center of our mission. Many communities across the Commonwealth face persistent challenges in access, chronic disease burden, and health outcomes. Through community-driven research, implementation science, and sustained partnerships with clinical and community organizations, we are ensuring that research is not conducted



in isolation—but in collaboration with the people and places it is meant to serve. By aligning scientists, health systems, and community leaders around shared priorities, we are translating knowledge into sustainable solutions.

Our leadership extends beyond institutional boundaries. Through statewide partnerships and national engagement, CTSI is helping shape strategies that strengthen rural health research, expand access to innovation, and position Pennsylvania as a leader in translational science. Just as importantly, we are investing in the next generation of scholars, clinicians, and research professionals who will carry this work forward.

This report reflects the dedication of our faculty, trainees, staff, health system collaborators, and community partners. Their commitment fuels our progress and reinforces what is possible when we work together with purpose.

As we look ahead, we remain energized by the opportunities before us—to deepen community partnerships, harness emerging technologies, expand implementation science, and continue accelerating discoveries into practice. The momentum is real, and the future is bright.

Together, we are not only advancing science—we are improving lives across rural Pennsylvania and beyond.

With pride and optimism,

Jennifer L. Kraschnewski, MD, MPH

Director, Penn State Clinical and Translational Science Institute

Vice Dean for Clinical Research,
Penn State College of Medicine



About Penn State Clinical and Translational Science Institute (CTSI)

Penn State Clinical and Translational Science Institute (CTSI) accelerates the movement of discovery into practice to improve health across Pennsylvania and beyond. Through strategic leadership, robust research infrastructure, and strong clinical and community partnerships, CTSI advances translational science that delivers measurable, real-world impact—particularly in rural communities.

By connecting investigators, clinicians, students, health systems, and community partners; CTSI strengthens the ecosystem needed to turn innovation into action.

Our Mission

To connect translational scientists and community partners and provide the infrastructure, training, and collaborative support necessary to move research into practice and improve health outcomes across the Commonwealth.

Our Vision

To advance translational science in partnership with communities to improve rural health and ensure discoveries benefit those who need them most.



Our Foundational Pillars



RESEARCH INFRASTRUCTURE

We provide funding, data resources, clinical research support, and implementation science expertise that enable investigators to design, conduct, and scale impactful research.



COMMUNITY CONNECTIONS

We foster meaningful partnerships with health systems, community organizations, and rural stakeholders to ensure research priorities reflect local needs and lead to sustainable solutions.



EDUCATION AND TRAINING

We prepare the next generation of translational scientists and research professionals through structured training programs, mentorship, and career development opportunities.

Why This Matters

Strong infrastructure, trusted partnerships, and workforce development are essential to accelerating innovation and reducing health disparities. By integrating these pillars, CTSI ensures that scientific advances translate into improved health for rural communities across Pennsylvania, including those in rural and underserved areas.



By the Numbers

Five Years of Measurable Impact

Over the past five years, CTSI has advanced research excellence, fostered community engagement, and positioned Penn State as a leader in rural health innovation.

RESEARCH INVESTMENT & RETURN

Larger-scale funding helps researchers transform early-stage ideas into nationally competitive programs.

150+ PILOT RESEARCH PROJECTS SUPPORTED

\$254 MILLION IN FOLLOW-ON FUNDING GENERATED

15.7:1 ON INVESTMENT FOR EVERY \$1 INVESTED **RETURN**

16 IMPLEMENTATION SCIENCE GRANTS FUNDED
(\$25.6M+)

74 GRANT PROPOSALS COMPLETED

19 CAREER DEVELOPMENT AWARDS CONFERRED

RESEARCH PRODUCTIVITY

CTSI supports scholarly publication and advances visibility and disciplinary growth through high-impact research.

490+ PUBLICATIONS CITING CTSI SUPPORT

120+ PUBLICATIONS SUPPORTED THROUGH TRINETX

KL2 SCHOLARS*

140 PUBLICATIONS

TL1 TRAINEES**

134 PUBLICATIONS

WORKFORCE & SCHOLAR DEVELOPMENT

Through structured mentoring and protected research time; CTSI prepares the next generation of interdisciplinary translational scientists.

13 KL2 SCHOLARS

8 secured federal funding

Multiple NIH, PCORI, and foundation awards

36 TL1 TRAINEES TRAINED

*KL2: Penn State CTSI Early-Stage Investigator Training Program

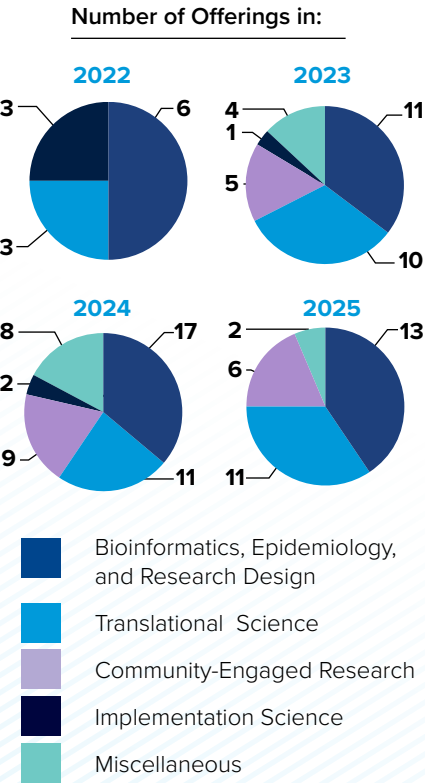
**TL1: Penn State CTSI Translational Research Training Program



WORKSHOPS AND SEMINARS

Increased educational offerings show the growing demand for translational research training.

Workshops & Seminars



38 WORKSHOPS AND SEMINARS PER YEAR ON AVERAGE.

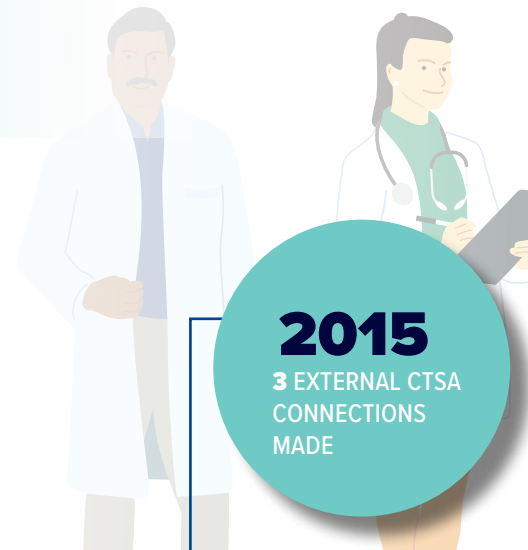
“Over the past five years, Penn State CTSI has amplified the College of Medicine’s role as a critical hub for collaboration, innovation, and community impact. By linking our faculty, staff, and learners with partners across campuses, health systems, and communities, the CTSI has advanced discoveries that improve health, particularly for rural and underserved populations, and is poised to expand its impact across Pennsylvania and beyond.”



Karen Kim, MD, MS
Dean, Penn State College of Medicine



Nearly 20
Years of
Steady
Growth



2015

3 EXTERNAL CTSI
CONNECTIONS
MADE

2011

ORIGINAL NIH
FUNDING AWARDED

2007

2008

2009

2010

2011

2012

2013

2014

2015

2016

2007

CTSI ESTABLISHED

K SCHOLAR COHORTS

COHORT 1 - 2012-2014; 5 Scholars

COHORT 2 - 2015-2017; 6

2016

JOINED APPALACHIAN
TRANSLATIONAL
RESEARCH NETWORK
(ATRN)





2020

19 EXTERNAL CTSA
CONNECTIONS
MADE

2021

PRIMARY HEALTH
NETWORK
COLLABORATION
ESTABLISHED

2021

ALLEGHENY HEALTH
NETWORK (AHN)
PARTNERSHIP
ESTABLISHED

2024

PENNSYLVANIA AREA
COMMUNITY HEALTH
CENTERS (PACHC)
COLLABORATION
ESTABLISHED

2024

CTSI AFFILIATE
PROGRAM
LAUNCHED

2026

GEISINGER
COLLABORATION
ESTABLISHED

2017

2018

2019

2020

2021

2022

2023

2024

2025

2026

Scholars

COHORT 3 - 2018-2020; 9 Scholars

COHORT 4

2022-2025; 9 Scholars

COHORT 5

2024 - Present; 5 Scholars

2019

FIRST COMMUNITY-
DRIVEN RESEARCH
DAY LAUNCHED
(HARRISBURG)

2023

iSMART
LAUNCHED

2023

JOINED CTSA
CONSORTIUM OF
RURAL STATES
(CORES)

2023

14 EXTERNAL CTSA
CONNECTIONS
MADE

Community Engagement

Advancing Rural Health

COMMUNITY ENGAGEMENT MATTERS

Improving rural health requires more than scientific discovery; it requires working in and with the communities who will put that science into practice. Therefore, community-engaged research is central to how we advance translational science. Because we are working with local leaders, within community health systems, and alongside neighborhood organizations, we know that our research reflects (and addresses) the actual needs of real people.

Rural communities encounter persistent yet specific challenges. Rural residents often face limited access to care, higher rates of chronic disease, workforce shortages, and other social and environmental barriers to health. Research that can address these disparities must be informed by their lived experience.

CTSI's community-engaged research creates opportunities for practitioners and researchers to build trust with residents, to strengthen partnerships with other community organizations, and to accelerate the translation of evidence into practice.

COMMUNITY-DRIVEN RESEARCH DAYS (CDRDS)

Community-Driven Research Days bring together researchers, healthcare providers, public health professionals, nonprofit leaders, and residents to both identify the most pressing local health priorities as well as develop research solutions together. These structured events spark sustained collaboration and are characterized by the following success factors:

- 1 Data-Informed Planning:** Public health metrics and local input identify priority health challenges.
- 2 Inclusive Stakeholder Engagement:** Healthcare, academic, governmental, and community organizations participate.
- 3 Collaborative Solution Design:** Participants develop actionable research and implementation strategies.
- 4 Sustained Follow-Up:** Pilot funding and continued partnership support translate ideas into funded projects.



PennState
Clinical and Translational
Science Institute

These outcomes reflect CTSI's broader approach to rural health:

- Listen first
- Partner locally
- Align research with community priorities
- Translate knowledge into practical, sustainable solutions





Since 2019, CTSI has hosted six CDRDs across rural Pennsylvania, bringing together more than 420 community members, healthcare providers, researchers, and Penn State faculty to identify locally defined health priorities, build authentic community-academic partnerships, and catalyze community-engaged research. These events have become the foundation of CTSI's rural engagement strategy by strengthening trust, informing CTSI priorities, and aligning research infrastructure, pilot funding, and training with community-identified needs.

Since 2023, outcomes have included:

- **8 community-academic seed and planning grants** addressing kindergarten readiness, rural mental health, food security, mobile health screening, healthy food access, and implementation of community-based interventions
- **Expanded partnerships** across healthcare, public health, academia, and local government

CDRD SPOTLIGHT

SPOTLIGHT, IMPACT, AND OUTCOMES

In May 2024, Penn State CTSI partnered with Penn State Schuylkill and regional leaders to host a Community-Driven Research Day focused on a critical intersection of rural health: food access, nutrition, and community wellness.

PENN STATE CTSI, PENN STATE SCHUYLKILL, AND PRIMARY HEALTH NETWORK HOSTS THE SCHUYLKILL COUNTY HEALTH COLLABORATIVE COMMUNITY-DRIVEN RESEARCH DAY



Building upon the work of the Schuylkill County Public Health Infrastructure Task Force, which has prioritized listening to residents and aligning regional resources to improve community well-being, partners focused

on strengthening the connection between food access and health education. Together, they developed and distributed healthy, easy-to-follow recipes using common pantry staples. These resources provided families with practical guidance on how to prepare nutritious meals while maximizing available food resources.

In distributing nutrition education, the Schuylkill County collaboration also strengthened local infrastructure. By pairing access to nutritious food with actionable health education, the partnership gave community members the knowledge and tools needed to support healthier eating habits, which will result in improved long-term health outcomes. Families across the county have reported they are able to use nutritious pantry items and apply this meaningful health education in their daily lives. This is one example of how community-engaged translational research can drive sustainable impact in rural communities.

“...strong commitment to collaboration and their ability to meaningfully engage community stakeholders.”



Dave Young,
Chief Executive
Officer, Schuylkill
Community
Action

LEARN MORE ABOUT SCHUYLKILL COUNTY'S HEALTH COLLABORATIVE COMMUNITY-DRIVEN RESEARCH DAY



Community Engagement

Amplifying Local Voices

INTEGRATING COMMUNITY INPUT INTO RESEARCH DESIGN MAKES A DIFFERENCE

Community Engagement Studios (CES) provide structured consultations that connect patients, caregivers, and community stakeholders in research development, so that studies are relevant and aligned with the needs of the populations they serve. Early community input strengthens research design and allows investigators to increase both scientific rigor and funding competitiveness. CES impacts rural-focused research by engaging community stakeholders

from the outset, creating feasible programs for rural healthcare settings that address obstacles like workforce limitations and are tailored to unique social and environmental contexts.



Since June 2021, Community Engagement Studios have:

SUPPORTED

22

RESEARCH PROJECTS

INFORMED

33

GRANT PROPOSALS

Initiated contributions to **MAJOR FEDERAL AWARDS**, including PCORI- and NIH-supported projects

SUPPORTED CAREER DEVELOPMENT (K awards) and large multi-site clinical trials

CES strengthened grant competitiveness by:

- Increasing clarity and responsiveness in grant applications
- Improving R01 and career development resubmissions
- Providing language and community-informed insights for proposals
- Documenting authentic stakeholder engagement for funders

SUCCESS SPOTLIGHT:

COMMUNITY-ENGAGED RESEARCH IN ACTION

Deepa Sekhar, MD, MSc, exemplifies the impact and potential of sustained community-engaged research supported by Penn State CTSI. Beginning as a Community-Engaged Research Core (CERC) Faculty Fellow in 2018 under the mentorship of **Jennifer Kraschnewski, MD, MPH**, Deepa quickly advanced from fellow to thought leader. Drawing on skills from her fellowship, she secured major funding from both the Patient-Centered Outcomes Research Institute (PCORI) and the Health Resources and Services Administration (HRSA) to study universal school-based depression screening in adolescents (2018–2021).

In 2021, she was awarded a PCORI Engagement Award to establish the Adolescent Health Network, which remains supported by CTSI. Her commitment to community-driven research continues, having submitted additional proposals as principal investigator to both PCORI and the NIH.

In 2023, Deepa became a Community-Engaged Research Core Co-Lead, and her leadership was central to the success of the CDRD in Northern Dauphin County. From this event, a standout initiative emerged: the Lykens Valley Children's Museum Project, which Deepa co-led. Funded by CTSI, this pilot program investigated whether museum-based experiences can improve preschool access and kindergarten readiness in rural communities. This project is a living example of how community-engaged research seeds real-world impact.



Deepa Sekhar, MD, MSc



Community Engagement

Turning Collaboration Into Impact

ADVANCING RURAL HEALTH THROUGH PARTNERSHIP

Together, CTSI's partnerships with AHN/Highmark and PHN demonstrate how coordinated academic–health system collaboration can:

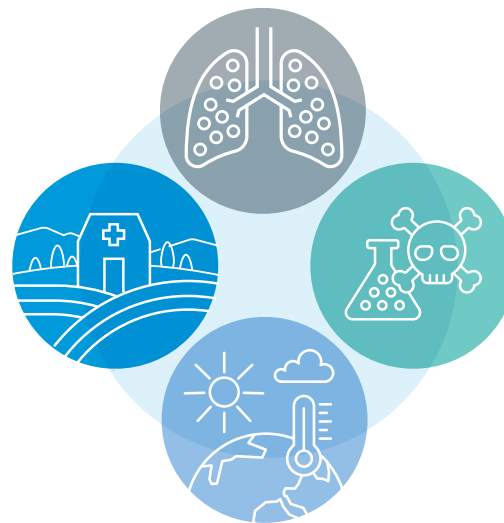
- Accelerate research translation
- Reinforce rural clinical infrastructure
- Increase access to expertise
- Address social and environmental determinants of health
- Move discoveries into sustainable practice



These partnerships exemplify CTSI's commitment to building a statewide network that transforms collaboration into measurable impact for rural communities.

ALLEGHENY HEALTH NETWORK (AHN) AND HIGHMARK HEALTH

Allegheny Health Network (AHN), a leading health and wellness system serving western Pennsylvania, and its parent organization, Highmark Health, bring extensive clinical reach and a unique payer perspective to CTSI's translational research efforts. This collaboration, initiated in 2021, bridges real-world clinical and administrative data with health system strategy to help rural and underserved communities.



After a full-day collaborative research seminar with over 100 attendees, five cross-institutional proposals were submitted. Research initiatives from these proposals explored disease-specific prediction models, generative AI applications in rural medicine, and amputation risk and social determinants of health.

By combining Highmark's analytics capabilities with CTSI's translational expertise, this partnership is accelerating data-driven solutions for rural health challenges.

“Our in-person collaborations that have already led to grant proposals, data sharing agreements, maturing projects, and manuscript submissions. This partnership, blending our expertise and data with CTSI's research acumen, has been productive and beneficial as we pursue our goals of improving health outcomes.”



Tyson Barrett, PhD
Manager Research Analytics and Enablement, Highmark Health

PRIMARY HEALTH NETWORK (PHN)

Founded in 1984, Primary Health Network (PHN) has grown into the largest Federally Qualified Health Center (FQHC) in Pennsylvania, serving patients across 40 sites in 17 counties throughout Pennsylvania and northeastern Ohio. PHN's deep presence in rural communities makes it a vital partner in community-engaged research and implementation.

PHN

40 Sites

in

17 Counties

Regional Health and Social Services Hub

CTSI partnered with PHN and the Buhl Regional Health Foundation in

2022 to assess interest in establishing a regional health and social services hub. The partnership began with a survey that engaged over 100 community organizations. Once foundational grant funding was secured, an online regional hub was launched to connect health systems and social service agencies. The online hub streamlined referral pathways and strengthened rural service coordination, which improves patient access to community resources. Improved access results in improved health.

Project ECHO at Penn State: Environmental Determinants of Health ECHO Series

In the wake of the 2023 train derailment in East Palestine, Ohio, Pennsylvania's Acting Secretary of Health made a call for a coordinated response. Penn State CTSI stepped up by partnering with Primary Health Network and Project ECHO at Penn State College of Medicine to launch a monthly learning series for rural providers. This ECHO series brought together experts in pulmonology, toxicology, atmospheric science, and rural medicine. These sessions were designed specifically to support rural clinicians managing patients whose health was impacted by environmental factors. ECHO's "all teach, all learn" model allows expanded access to expertise for providers who have limited opportunities for collaboration and continuing education.

“While caring for first responders and community members impacted by the Norfolk-Southern train derailment, I realized that there were gaps in my ability to care for patients impacted by this and other environmental events. To honor their bravery, I committed to learn as much as I could about Environmental Determinants of Health and to share this knowledge with other primary care providers who might be faced with similar challenges. Partnering with CTSI and Project ECHO has helped to fulfill that

commitment and to honor all who serve the needs of our community, especially those who are most vulnerable.”



George Garrow, MD
CEO, Primary Health Network



Implementation Science

Putting Evidence Into Practice



WHY IMPLEMENTATION SCIENCE MATTERS: TRANSLATING EVIDENCE INTO PRACTICE FOR RURAL COMMUNITIES

Scientific discovery improves health only when we can put it into practice and use those advances to help people. Implementation science bridges the gap between research findings and real-world practice. This way, evidence-based interventions reach the communities that need them most. At Penn State CTSI, implementation science is a priority when it comes to our Pennsylvania rural communities.

Over the past five years, CTSI's Implementation Science team has:

Supported **16** Funded Grants
\$25.6
 Totaling More Than **MILLION**

Provided Consultation For
74 Grant Proposals

+ **19** Career Development Awards

Expanded cross-institutional collaborations focused on rural health

Rural communities encounter workforce constraints and resource limitations. In addition, often simply reaching these locations is a challenge because of their remote locations. Therefore, the adoption of new practices that come out of emerging research is often slow or inconsistent for rural populations. Without specific, targeted implementation strategies, even the best evidence-based practices may not reach them.

CTSI's Implementation Science team improves researchers' study design and feasibility to better address rural health issues, and then provides sustained support of interventions that can change lives in rural communities.

THE COMMUNITY IMPLEMENTATION STUDIO MODEL

To address the challenges that rural communities have in accessing new healthcare practices, CTSI developed the Community Implementation Studio.

This program assists community organizations and research teams:

- Assess feasibility within rural settings
- Build and sustain community coalitions
- Adapt interventions for local context
- Develop actionable implementation plans

The Studio provides a phased, collaborative approach that includes a facilitated consultation session, a self-paced training curriculum, ongoing technical assistance, and

the development of a practical implementation roadmap for local practitioners. The Studio increases the potential for interventions to be adopted, sustained, and able to grow or adjust as necessary.

EXPANDING NATIONAL COLLABORATION

CTSI's implementation science efforts extend beyond Pennsylvania. Through partnerships supported by the Consortium of Rural States (CORES) and collaboration with peer CTSA hubs, the Community Implementation Studio model has been piloted across multiple states, strengthening shared learning and advancing rural implementation research nationally.

IMPLEMENTATION SCIENCE IMPACT

CTSI aims to strengthen the adoption of evidence-based interventions in rural settings, with both statewide and national reach.

- Community Implementation Studio launched
- Cross-state collaboration with CORES and University of New Mexico
- Pilot programs support rural community organizations
- Participation in national CTSA consortia and rural health collaboratives



Core Facilities

Powering Discovery at the Clinical Research Center



WHY THE CRC MATTERS:

Strong clinical research infrastructure is essential to advancing translational science. The Clinical Research Center (CRC) provides the clinical space and expertise needed so researchers can transform their innovative ideas into rigorous studies. Located at both University Park and Penn State College of Medicine (CRCCOM), the CRC serves as a cornerstone of Penn State CTSI's research infrastructure. The CRC's interdisciplinary, networked framework enables discoveries to move efficiently from protocol to patient impact.

COMPREHENSIVE RESEARCH SUPPORT

With the use of shared resources, the CRC reduces investigator burden, improves study quality, and promotes collaboration across Penn State's research community.

Dedicated clinical research spaces and services include:

- Nursing and medical support
- Study coordination and participant visits
- Blood sampling and specimen processing
- Exercise testing and metabolic assessments
- Bio-nutritional services, including a metabolic kitchen and participant dining room

RESEARCH VOLUME, REACH, AND EFFICIENCY (2023–2025)

\$15.8 + **MILLION**
In Grant Funding Supported

34 Investigators Engaged Across Multiple Departments and Colleges

1,500⁺ Participant Visits Across 22 Studies

232 Research Protocols Supported

400 Investigators Have Implemented Services

Nearly **2,000** Unique Study Visits at CRCCOM

50% Reduction in Total Billing Costs at CRCCOM

ADVANCING RURAL HEALTH THROUGH CLINICAL RESEARCH

The CRC supports studies addressing rural health priorities, chronic disease, preventive interventions, and implementation strategies. The CRC gives investigators access to a robust clinical research infrastructure, which accelerates the translation of scientific discovery into better patient care and outcomes for those Pennsylvanians who are often overlooked.



Data and Informatics

Using Data to Drive Innovative Breakthroughs

BUILDING THE DATA INFRASTRUCTURE FOR TRANSLATIONAL SCIENCE AND HELPING RURAL COMMUNITIES

Modern translational research depends on access to high-quality, harmonized data. In addition, rural populations are often underrepresented in large data sets. Penn State CTSI's Informatics program provides the data infrastructure, analytic expertise, and artificial intelligence (AI) that afford researchers the capability to transform complex health data into usable information, all while integrating rural patient data securely into existing national networks. Integrating electronic health records (EHR) and clinical data, CTSI helps investigators conduct rigorous, collaborative research. The use of advanced analytics positions researchers as well as practitioners to better predict disease, evaluate existing interventions, target care strategies, and identify health disparities in rural populations.

EXPANDING ACCESS TO CLINICAL DATA

Over the past decade, CTSI has steadily expanded its data ecosystem to support large-scale, multi-site research. The result is faster study startup, more robust collaborations, and increased competitiveness for external funding.

These advancements include:

- Participation in PCORnet and national data networks
- Deployment of i2b2 and transition to TriNetX
- Integration into the Observational Medical Outcomes Partnership (OMOP) Common Data Model (CDM)
- Participation in the Observational Health Data Sciences and Informatics (OHDSI) global collaborative network

Through harmonized data models and shared electronic health records, CTSI provides ways for local healthcare systems, researchers, and national

CTSA partners to effectively collaborate across disciplines and geographies. As a result, Penn State investigators effectively define patient cohorts; conduct feasibility analyses; participate in standardized, multi-institutional studies; and perform population-level and patient-level analytics.

HARNESSING ARTIFICIAL INTELLIGENCE FOR BIOMEDICAL AND HEALTH RESEARCH

AI and machine learning (ML) are transforming biomedical research. CTSI is committed to lowering barriers to AI adoption by providing expertise, infrastructure, and training so that researchers can responsibly and effectively use advanced analytics. CTSI accelerates discovery while maintaining rigorous standards of data governance and scientific validity, primarily focusing AI use on the predictive modeling of health risks and outcomes, multi-modal data integration, and causal inference from observational health data.

Because CTSI applies informatics innovation aligned with translational science priorities, data-driven discovery can lead to practical health solutions for Pennsylvanians and beyond.

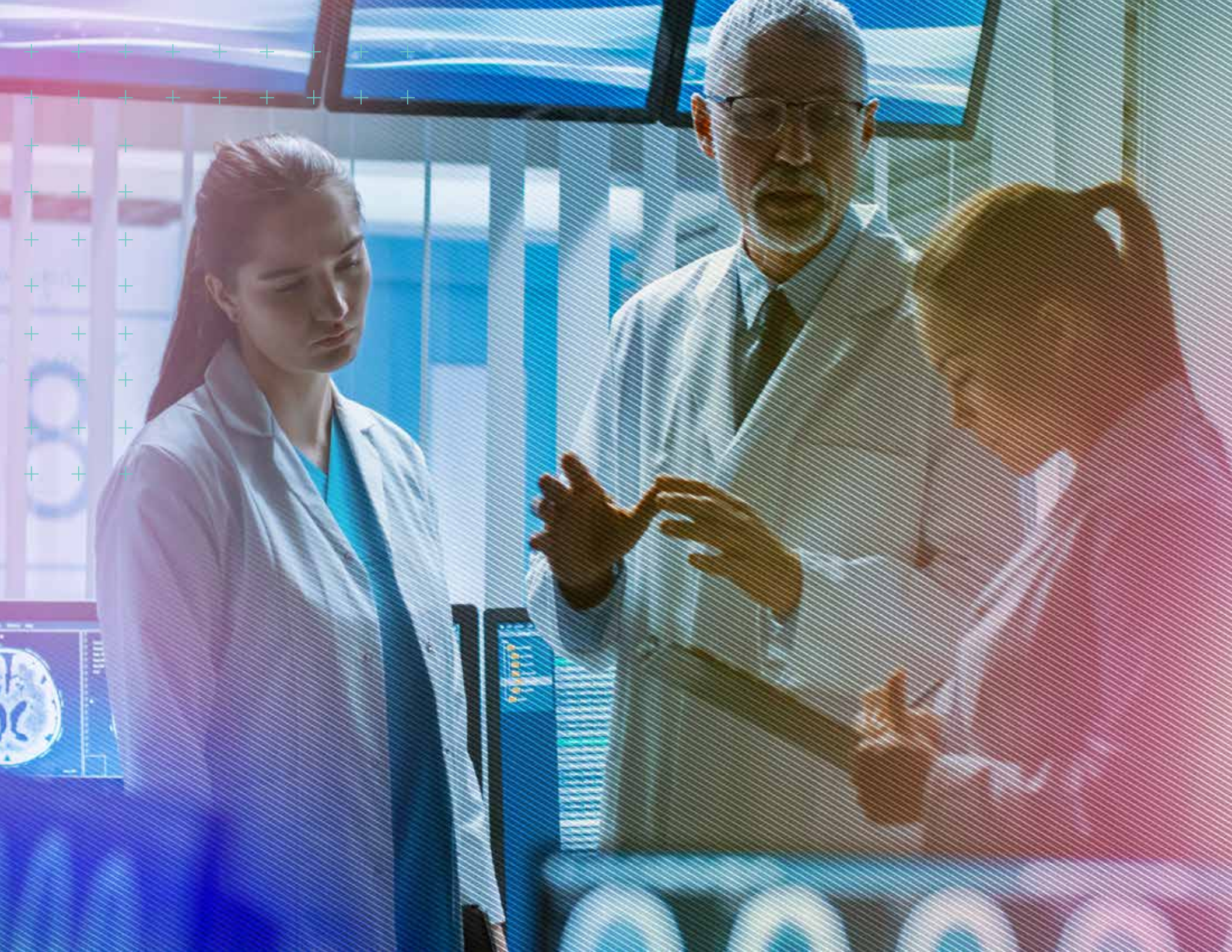
EXPANDING ACCESS TO CLINICAL DATA

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Data and Informatics

Following the Timeline of Achievements



2014 – RETIRED 2020: **INFORMATICS FOR INTEGRATING BIOLOGY AND THE BEDSIDE (I2B2)**

A database of deidentified genomic and clinical data for studying electronic medical records. Promoted accessibility (no IRB necessary). Showcased the potential for multi-site studies with CTSA partners who used a similar database infrastructure.

2015 **JOINED PCORNET (PATIENT-CENTERED OUTCOMES RESEARCH NETWORK)/ PATH NETWORK**

Connects 15 universities and health systems for her research, creating access to a larger and more diverse population than any single site. The “PaTH to Health” data conformed to the PCORnet common data model (CDM) and, to date, has been harmonized with data from over 70 PCORnet clinical sites, helping researchers work across multiple institutions and study patient-centered health outcomes.

2018 **FOUNDING OF DIGITAL COLLABORATORY FOR PRECISION HEALTH RESEARCH (DCPHR)**

The combined effort of CTSI Informatics and The Center for Artificial Intelligence Foundations in Scientific Applications. In collaboration with the Institute for Computational and Data Sciences, the Social Science Research Institute, and the Health Spoke of the National Science Foundation’s Northeast Big Data Hub, prepares Penn State’s Health electronic health records (EHR) for data-intensive research. Lowered barrier to integration of EHR with other data.

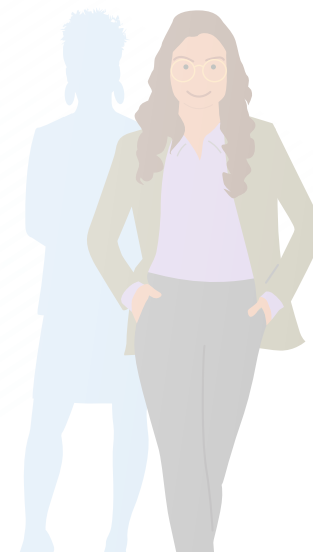
2018 **TRINETX** Cloud-based platform with access to EHR data and deidentified data from 95 different healthcare organizations. Researchers define study cohorts of interest and establish protocol feasibility by querying millions of patient records based on medications, diagnoses, demographics, lab results, genomics, mortality, oncology, procedures, and longitudinal patient history.

2021 **OMOP COMMON DATA MODEL (CDM)**

Transformed all EHR data to abide by the Observational Medical Outcomes Partnership (OMOP) CDM. Developed by the NIH-funded Observational Health Data Sciences and Informatics (OHDSI) consortium and used by thousands of collaborating institutions around the world. Researchers participate in standardized analyses with other OMOP sites to develop exposure and outcome phenotypes, estimate population-level effects, and perform patient-level predictions.

2022 **OHDSI INTEGRATION**

Penn State joined the OHDSI network as a data partner. Researchers participate in and lead OHDSI multisite network studies with a defined study protocol.



With support from the Digital Collaboratory for Precision Health Research (DCPHR), CTSI researchers have participated in several OHDSI network research studies and have piloted reusable data analytics workflows using large data sets and high-performance computing.

2022 JOINED EVOLVE TO NEXT-GEN ACCRUAL TO CLINICAL TRIALS (ENACT)

Allows researchers access to a repository of data from CTSA hubs that can facilitate EHR studies using records from over 142 million patients. A tool for clinical investigators to estimate clinical trial cohorts and gauge feasibility of a clinical protocol.

2026 AND BEYOND: TRANSITION TO BIOMEDICAL DATA SCIENCES AND AI (BDAI) MODULE

Strive for greater achievement with three defined goals: 1: Offer advanced ML methods and tools; 2: Develop and deploy multiple self-service tools, robust, validated, AI-powered data analytic workflows, and new data science and AI methods when needed to support researchers' unique needs in data and research partnerships; 3: Offer data sciences and AI education to clinical researchers with a broad range of backgrounds, interests, and needs.

2026 AND BEYOND:
TRANSITION
TO EPIC

Share a common EHR with both Geisinger and AHN, facilitating system-wide access to harmonized data. Investigators will employ the full-range of BDAI resources and services, fostering a collaborative research ecosystem.

2026 AND BEYOND:
GREATER OHDSI
INVOLVEMENT

Leverage Digital Collaboratory for Precision Health Research (DCPHR) to support multi-site studies with a rural health focus and leverage the products of the OHDSI Natural Language Processing working

group to extract and use information from unstructured clinical notes that are not currently included in DCPHR.

2026 AND BEYOND: CONTINUED COLLABORATION WITH AHN/ HIGHMARK AND GEISINGER

Leverage the unique resources of the AHN/Highmark partnership. Utilize the large claims administrative database of the integrated health system with 15 years of claim information for 14 million members. Use Geisinger OHDSI-OMOP and PCORnet CDMs to create opportunities for EHR-based research collaborations.



Pilot Programs

Advancing Innovation Through Translational Research



CATALYZING DISCOVERY THROUGH STRATEGIC INVESTMENT

Penn State CTSI Pilot Programs are an engine for innovation, providing early-stage funding that lets investigators test novel ideas, generate preliminary data, and earn external grant funding. With investment in projects that have high potential for success, the CTSI Pilot Program accelerates translational research to improve health outcomes across Pennsylvania.

Over the past five years, the Pilot Program has:

Supported
150+
Pilot Research Projects

Produced
34
Peer-Reviewed Publications

Generated
\$254
MILLION
In Follow-On Funding

Achieved A
15.7:1
Return On Investment

Every dollar invested through the Pilot Program results in more funding, which demonstrates the program's effectiveness in transforming promising ideas into nationally competitive research.

DRIVING RURAL HEALTH INNOVATION

Interdisciplinary collaboration and community partnership allow these Pilot Programs to scaffold scientifically rigorous, locally relevant research. Pilot funding supports projects that address:

- Access to care in rural communities
- Telehealth and technology-enabled care delivery
- Chronic disease prevention and management
- Maternal and child health
- Social and environmental determinants of health

PILOT PROGRAM SPOTLIGHT:

EXPANDING ACCESS TO CARE THROUGH TELEHEALTH INNOVATION



Sheridan Miyamoto, PhD, RN, FAAN
Associate Professor of Nursing

With CTSI pilot support, Sheridan expanded the SAFE-T System, a telehealth model designed to improve access to forensic nursing expertise in rural and underserved communities.

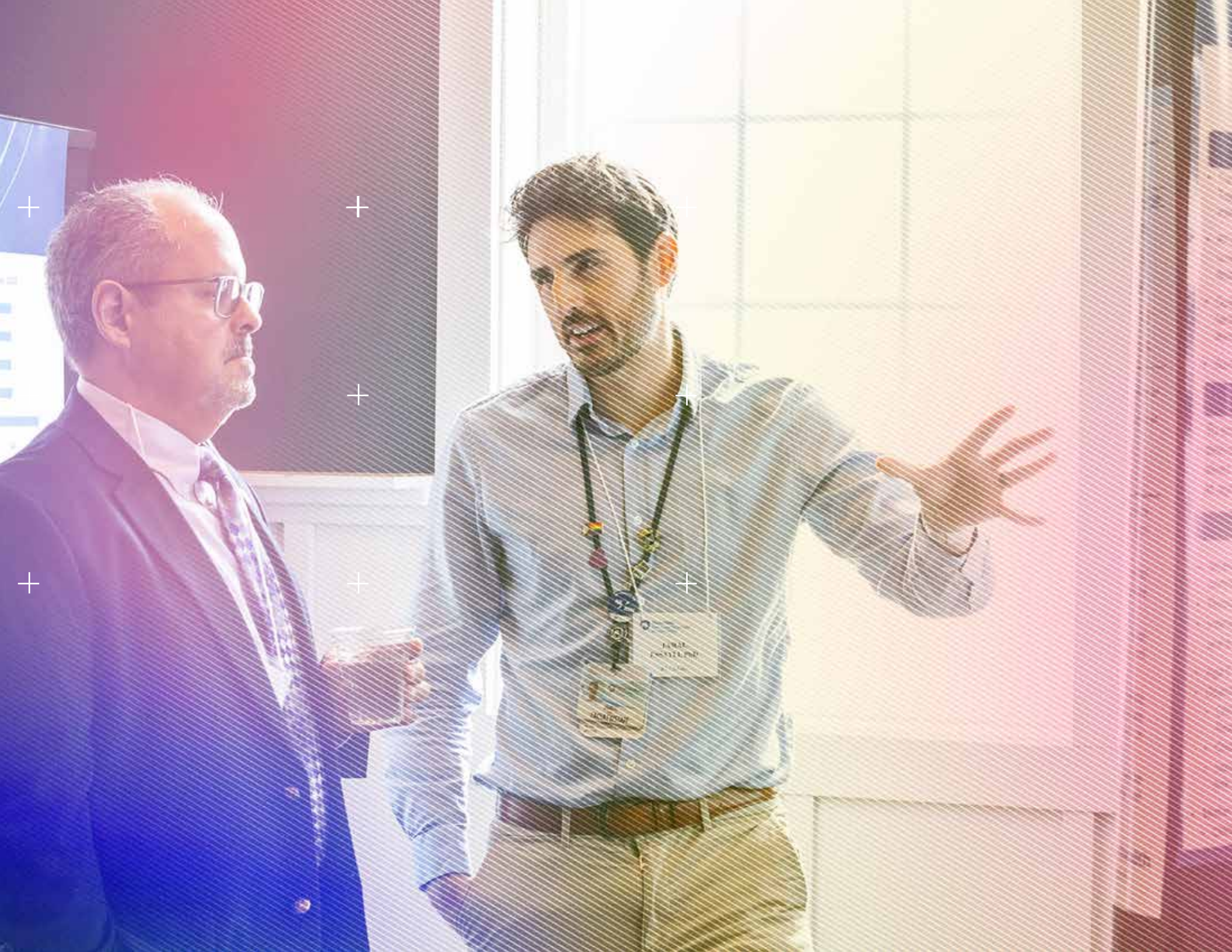
Originally developed to support adult survivors of sexual assault, Sheridan adapted the model to address pediatric care needs in communities lacking specialized services.

The initiative:

- Strengthened rural workforce capacity
- Improved access to expert clinical consultation
- Contributed to state-level policy advancement
- Secured \$500,000 in additional funding from the Pennsylvania Commission on Crime and Delinquency

The SAFE-T model has since influenced national conversations on telehealth-enabled forensic care and continues to expand access to critical services in rural Pennsylvania.

This pilot shows that early-stage funding is often the difference between an innovative idea and the follow-through for a practical, scalable solution. Strategic investment in investigators and ideas means that CTSI research does not stall at concept. Instead, research like Sheridan's is able to advance into practice, policy, and measurable outcomes that improve people's lives.



Support, Mentorship, and Research Training

Developing the Next Generation of Translational Leaders

KL2 AND TL1 CULTIVATING LEADERS

A strong translational research enterprise depends on well-trained investigators prepared to move discovery into practice. Through its KL2 and TL1 programs, Penn State CTSI provides structured, interdisciplinary training that equips scholars with the skills to become independent translational scientists. These future leaders address complex health challenges that affect rural and underserved communities.

KL2 PROGRAM: EARLY-STAGE INVESTIGATOR CAREER DEVELOPMENT

The KL2 Early-Stage Investigator Training Program supports junior faculty scholars as they transition to research independence. KL2 Scholars receive up to 75% protected research time, research funding and tuition support, structured mentorship, and interdisciplinary coursework and career development programming.

As of 2025, 13 KL2 Scholars were supported, KL2 Scholars published 140 peer-reviewed articles (including 41 first-author publications), and 8 scholars secured federal funding, including NIH and PCORI awards.

KL2 Scholars have advanced research in areas such as maternal and child health, chronic disease prevention, implementation science, and rural healthcare delivery.



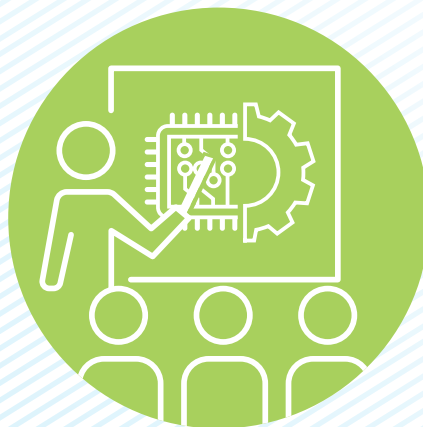
Sarah K. Horvath, MD, MSHP, FACOG

Scholar Spotlight: Sarah Horvath, MD, MSHP, FACOG
an Associate Professor and Vice

Chair of Research in Obstetrics and Gynecology, leveraged KL2 support to advance research at the intersection of reproductive health, patient engagement, and policy. Incorporating community-informed feedback, she secured a successful R01 grant focused on RhD sensitization in early pregnancy (scored in the 1st percentile). Her work exemplifies how KL2 support accelerates scientific rigor, community responsiveness, and national research leadership.

“Our scholars’ achievements reflect their own dedication and the dedication of their mentors, collaborators, and departments who have supported them along the way. The persistence, dedication, and commitment of our KL2 scholars are a constant source of inspiration. Their achievements underscore the importance of investing and supporting early-career investigators.”

Lauren Van Scoy, MD
Director of CTSI's KL2 Program.



TL1 PROGRAM: CULTIVATING CROSS-DISCIPLINARY TALENT

The TL1 Translational Research Training Program supports graduate and medical students pursuing interdisciplinary clinical and translational research. Trainees develop individualized training plans while gaining exposure to biostatistics, epidemiology, informatics, clinical research design, and scientific communication.



David (DJ) Schnabel Jr., MSN, RN, CCRN

Trainee Spotlight: David John (DJ) Schnabel, a dual-title PhD candidate in Nursing and Translational Science, exemplifies the TL1 program's cross-disciplinary impact. Building

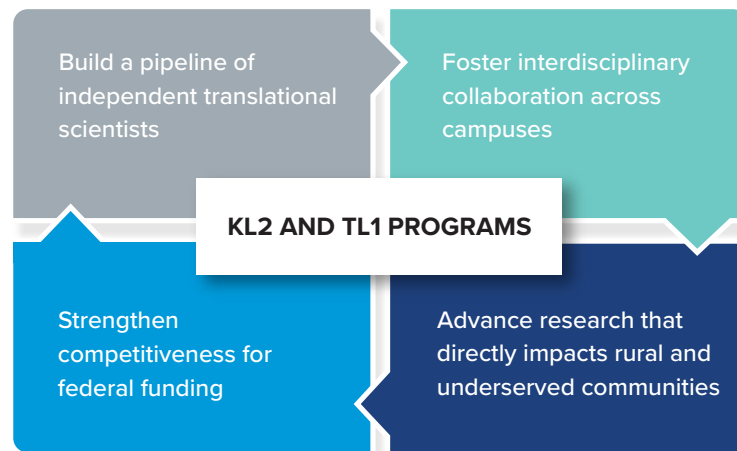
on a decade of clinical experience, he integrates nursing science with AI and biomedical data applications to improve bedside care. During his TL1 training, he presented at national research congresses, published first-author manuscripts, and advanced research combining clinical insight with translational data science. His trajectory reflects the program's goal to prepare scholars for tackling complex health challenges with innovative, interdisciplinary approaches.

Five-Year Impact (2020–2025):

- **36 TL1 Trainees: 14 at Hershey; 22 at University Park**
- **Representation across multiple colleges and campuses**
- **Trainees spanning PhD (21), dual-title PhD (11), MD/PhD (3), and MD (1) programs**
- **Strong first-author publication record**

TL1 trainees represent eight different colleges/departments across two campuses:

- College of Medicine
- Engineering
- Nursing
- Health and Human Development
- Huck Institutes of the Life Sciences
- Liberal Arts
- Agricultural Sciences



“Our curriculum is deliberately designed to be well-rounded, combining rigorous scientific training with targeted opportunities to strengthen leadership, collaboration, and communication. The protected research time the program provides helps ensure that our scholars are equipped to transition confidently from mentored investigators to independent researchers.”



Marie Boltz, PhD, GNP-BC, FGSA, FAAN

Associate Dean of Research and Innovation in the Ross and Carol Nese College of Nursing, Co-lead, KL2 program

STRENGTHENING THE FUTURE OF RURAL HEALTH RESEARCH

Together, the KL2 and TL1 programs:

- Build a pipeline of independent translational scientists
- Foster interdisciplinary collaboration across campuses
- Strengthen competitiveness for federal funding
- Advance research that directly impacts rural and underserved communities

CTSI is supporting the next generation of investigators so they can find and deliver solutions to help patients across Pennsylvania; CTSI is developing leaders who will shape the future of biomedical innovation and rural health equity.

Support, Mentorship, and Research Training

Sustaining Efficient, Effective Research with iSMART

Strong research outcomes depend on strong research teams. The iSMART program strengthens translational science at Penn State by supporting research staff and providing professional development. Research staff are essential to protocol execution, regulatory compliance, participant engagement, and data quality. Yet structured professional development and infrastructure support for research teams are often limited. iSMART closes this gap with reinforced research operations, reduced administrative burden on investigators, and improved staff retention.

ADVANCING RURAL HEALTH THROUGH WORKFORCE EXCELLENCE

Efficient, well-supported research teams are essential to delivering high-quality studies in rural settings, where logistical challenges and resource constraints can be amplified. iSMART supports rural-focused research initiatives that are well-coordinated, efficient, compliant, and sustainable.

ACCELERATED STAFF ASSISTANCE PROGRAM (ASAP)

ASAP provides short-term or partial-effort staffing support for funded investigators during critical project phases, including the study start-up, during staff transitions, for medical or family leave coverage, and when there are specialized expertise needs. ASAP ensures continuity, reduces delays, and protects research timelines even when there are challenges with staffing.

ASAP has successfully supported 12 active and completed projects, distributed \$31,067 in funding, and has been key in projects supported by NIH, PCORI, and PA Department of Health awards.

“*The ASAP program was incredibly helpful during a time of various staff changes that left us scrambling for a Spanish-speaking research assistant. The ASAP staff member has become key to making sure our project can meet its aims with regards to our Spanish interviews. He quickly got up to speed on qualitative interviewing processes, to help lighten the load on our team. Thank you!***”**

Senior Research Project Manager



"NOW WHAT?" PROFESSIONAL DEVELOPMENT SERIES

This monthly virtual series provides practical, actionable guidance for research teams at all experience levels. These sessions build confidence, improve research quality, and foster cross-campus collaboration. Topics address real-world operational challenges, including:

92% Report Increased Knowledge

77% Improved Job Effectiveness

92% Feel Connected To A Research Learning Community

85% Report Information Is Directly Applicable To Their Role

- IRB submission processes
- Data use agreements
- Research compliance
- Study implementation strategies

“Engaging, but so much more. Informative, inclusive, thought-provoking, encouraging, [and] generalizable.”

Participant



RESEARCH CHAMPIONS INITIATIVE

The Research Champions program empowers experienced research professionals to serve as peer mentors and subject matter experts across the institution.

Research Champions:

- Develop shared tools and resources
- Serve as “go-to” advisors within their domains
- Collaborate with centralized research offices
- Promote best practices in project management and study operations

Areas of expertise include:

- Project management and SOP development
- Staff tracking and longitudinal study coordination
- Retrospective chart review and EMR-based research
- Qualitative methods
- Quality improvement research

RESEARCH RESOURCE REPOSITORY

The iSMART Resource Repository serves as a centralized, curated hub for research tools, templates, and operational guidance. Regularly reviewed and updated, it provides a “one-stop” access point that increases efficiency and consistency across research teams.

Translational Research Across Penn State

Building a Statewide Ecosystem

Penn State CTSI is committed to promoting translational science across campuses, disciplines, and communities. Through the Affiliates Program, faculty development initiatives, and competitive fellowship programs, CTSI services now extend across the University, which means more collaboration, expanding opportunities, and embedded translational research expertise throughout the Commonwealth. This expanding network reflects CTSI's role as a unifying force across Penn State's research enterprise.



THE CTSI AFFILIATES PROGRAM

The Affiliates Program is a network of faculty, research staff, and postdoctoral scholars engaged in translational research across Penn State. The program fosters interdisciplinary partnerships and increases access to CTSI infrastructure and consultation services.

The program provides:

- Direct access to CTSI services and expertise
- Cross-campus collaboration opportunities
- Support for community-engaged research
- Manuscript and grant development guidance
- Institutional recognition within the translational research network

With investigators connected across all campuses, CTSI removes geographic barriers to translational research resources.

As of July 2026, 104 CTSI affiliates represented 14 Penn state campuses and came from a broad range of disciplines and colleges.

FELLOWSHIPS: DEVELOPING CROSS-CAMPUS RESEARCH LEADERS

CTSI fellowships develop investigators who lead community-engaged and implementation science research across Pennsylvania.

Implementation Science Fellowship

The Implementation Science Fellowship trains Penn State researchers to apply implementation science methods within their research programs, with a strong emphasis on rural health impact. The fellowship ensures that effective, evidence-based interventions are adopted in diverse clinical and community settings.

This one-year program provides:

- Foundational training in implementation theory and methodology
- Mentored research support
- Integration into a cross-campus implementation science network

Recent fellows have:

- Submitted NIH grant applications
- Published peer-reviewed manuscripts
- Advanced rural-focused implementation studies

Community-Engaged Research Core (CERC) Fellowship

The CERC Fellowship is a year-long mentored training program designed to strengthen investigators' skills in community-engaged research. Fellows conduct pilot studies or advance community partnerships, with a focus on collaboration across Pennsylvania communities.

The program:

- Supports faculty across Penn State campuses
- Builds durable academic–community partnerships
- Prepares fellows to pursue external funding
- Aligns with Community-Driven Research Day initiatives

CERC fellows are uniquely positioned to translate community-identified priorities into competitive research proposals and sustainable health interventions.

PROVOST ENDORSEMENT PROGRAM

Through collaboration with the Office of the Executive Vice President and Provost, CTSI faculty lead professional development offerings within the Provost Endorsement framework.

The program supports faculty development in:

- 1 Teaching and outreach
- 2 Research, scholarship, and creative accomplishment
- 3 Leadership and service

“For the first time, Penn State has a strategic plan with clear outcome measures to advance community engagement and drive meaningful public health impact, building on the strengths of our R1 university. CTSI’s role in developing this plan has helped extend Penn State’s reach through your infrastructure, expertise, community engagement, implementation science, and collaborations across Pennsylvania’s largest clinical network. I look forward to the transformational work ahead with CTSI and your rural clinical network of partner organizations to improve the health of rural Pennsylvania and create healthier communities through advances in clinical and translational science.”



Andrew Read, PhD
Senior Vice President
for Research, Penn
State University

In its inaugural year, CTSI-led offerings produced 13 graduates.

Future expansions include:

- Team science training initiatives
- AI and Big Data applications in translational research
- Expanded cross-campus curriculum development

A Distributed Model of Impact Together, the Affiliates Program, Fellowship programs, and faculty development initiatives demonstrate that CTSI’s services are not centralized. Connecting rural-facing campuses to research infrastructure expands Penn

State’s ability to address rural health challenges state wide. Interdisciplinary collaboration and community engagement mean a higher implementation at the local level.

Health challenges are not confined to one geography, and innovation should not be either. With affiliates and fellows across 14 campuses, CTSI is building a unified translational research ecosystem that leverages the full strength of Penn State University. This cross-campus approach distributes expertise and expands infrastructure to reach communities across Pennsylvania.



National Leadership in Translational Science

Expanding Impact beyond Pennsylvania

While grounded in service to Pennsylvania's rural communities, Penn State CTSI plays an active and visible role in advancing translational science nationwide. Through participation in national consortia, research networks, and leadership groups, CTSI brings innovation, collaboration, and best practices back to the Commonwealth.



These connections broaden opportunity for Penn State investigators and amplify the importance of rural health research on a national stage.

CONSORTIUM OF RURAL STATES (CORES)

In 2023, Penn State CTSI joined the Consortium of Rural States (CORES), a collaborative network of institutions dedicated to advancing clinical and translational research in rural communities.

Through CORES, CTSI faculty and staff share best practices in rural community engagement, develop cross-institutional pilot projects, and mentor early-stage investigators. Penn State has supported collaborative pilot projects with CORES partners, resulting in peer-reviewed publications, national conference presentations, and continued external funding.

NATIONAL RESEARCH NETWORKS & LEADERSHIP ROLES

CTSI faculty and staff contribute to national organizations that shape the future of clinical and translational science.

Appalachian Translational Research Network (ATRN)

Penn State leaders serve in executive roles within ATRN, fostering interinstitutional partnerships to improve health outcomes across Appalachia, one of the nation's most medically underserved regions.



Association for Clinical and Translational Science (ACTS)

CTSI faculty participate in ACTS Special Interest Groups (SIGs) focused on:

- Community-engaged research
- Clinical research workforce development
- Evaluation and impact measurement

These roles influence national standards, tools, and frameworks that support translational research across CTSA hubs.

Big Ten and Multi-Institution Collaborations

Through engagement with peer research institutions, CTSI shares lessons learned in team science, implementation strategies, and data

harmonization. These collaborations give our investigators experience in and insight into large-scale research challenges.

ADVANCING SHARED INFRASTRUCTURE AND BEST PRACTICES: NATIONAL REACH, LOCAL IMPACT

CTSI leaders contribute to national efforts that align evaluation metrics across CTSA hubs, build and improve research workforce training models, refine operational collaboration between institutions, and promote data sharing.

Since 2023, 45 Penn Staters have presented at ACTS and ATRN meetings, sharing research findings and elevating the visibility of rural health innovation emerging from Pennsylvania.

These national connections increase competitiveness for federal funding, expand multi-site research opportunities, accelerate dissemination of findings, and bring leading-edge practices back to Penn State.

SINCE 2023

45

PENN STATERS
PRESENTED AT

ACTS &
ATRN

MEETINGS

Health challenges in rural communities are complex and shared across states. This national engagement means Penn State CTSI can bring to rural

Pennsylvania the benefits of national, cutting-edge science. Outward-facing leadership is what CTSI's mission is all about: accelerating translational science to improve both local and national health.



LEADERSHIP TEAM AT TIME OF PUBLICATION:

Orfeu Buxton, PhD, Associate Director

William Calo, PhD, JD, MPH, Associate Director

Erica Francis, MS, Administrative Director

Jennifer Kraschnewski, MD, MPH, Institute Director

Raffy R. Luquis, PhD, Associate Director

Lauren J. Van Scoy, MD, Associate Director



PennState
Clinical and Translational
Science Institute

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