Penn State’s Vision

“To be a leader in promoting quality of life through comprehensive approaches to enhancing personalized and population health, achieved through a commitment to and investment in relevant research, education, clinical practice and outreach.”

Enhancing Health--Strategic Plan
The Current Landscape

• Rapidly Changing Health Care Provider Systems
• Competitive Environment for Research Funding
• New Treatment Options for Cancer and other Diseases
• Impact of Big Data
• Focus on Population Health and Personalized Medicine
Where Penn State is positioned today

• Expenditures for Medical Research 4\textsuperscript{th} lowest in the Top 25.
• $229.9M for all Health Related Awards for FY 2017 (includes research, instruction, outreach and service).
• A widely distributed presence across the Commonwealth, including a Medical Center, College of Medicine and Extension Service.
• University Health Sciences Council working to integrate expertise across Penn State.
Penn State Health NIH Awards (FY16)

- NIH awards to university’s medical school
- NIH awards to university’s other schools
Penn State’s Ability to Integrate is a Strength
**Huck Institutes of the Life Sciences**

- Provides $15M in support to co-fund faculty, students and research initiatives.
- 476 faculty members representing 7 colleges and 31 departments.
- 316 grad students, postdocs and staff.
- 10 Instrumentation facilities with state-of-the-art equipment.
- 23 Research Institutes and Centers of Excellence:
  - Infectious Disease Institute: Targeting emerging infections and evolution of antibiotic resistance.
Population Research Institute

- 200+ affiliates, including 70+ research faculty, 40 teaching faculty, postdoctoral scholars, predoctoral trainees and professional staff.
- Established by Penn State and the NIH.
- Example: Studying racial/ethnic disparities in the kidney donation and transplant process.
Child Maltreatment Solutions Network

• 16 faculty and staff, 4 foundational centers, and 10 affiliates building a sustainable network of researchers and practitioners.

• 21 awarded grants totaling $19M; 9 pending grants totaling $11M; most are transdisciplinary collaborations across 5 colleges.

• $7.7M award to support a new NIH Capstone Center

• Example: Penn State’s “Child Health Study” with 1,200 children; designed to detect abusive head trauma in Pediatric ICU settings.
Penn State’s Goal is to Impact the World through Human Health. 

*How can we get there?*
Our Approach

1. Transform medical education to meet 21st century needs.
2. Promote collaborations across colleges and campuses.
3. Accelerate the process from discovery to clinical trials.
4. Promote health and wellness across the lifespan.
1. Transform medical education to meet 21st century needs.

- Personalizing Medical Education
- Global Health Experiences
- Research
Personalizing Medical Education

- Full curriculum at University Park
- New longitudinal integrated clerkships
  - York (caring for frail and elderly patients)
  - Summit Health (community health system)
  - Kaiser (care coordination/population health)
- Joint degree programs
  - MD/PhD, MD/MPH, MD/MBA
  - Coming 2018: MD/MEd
- Accelerated Programs
  - Family & Community Medicine
  - Emergency Medicine
  - Neurosurgery
  - Orthopedics
College of Medicine: Global Health
Impact of Global Health Experiences

ZAMBIA

1st year medical students participate in HIV and malaria research; in their 4th year, they care for patients at a mission hospital.

GHANA

Medical students and residents provide care at a rural hospital.

TAIWAN

Medical and graduate students research Taiwan’s healthcare system and compare it to the US system.
Two examples from 517 awards:

- Cross-campus grant on genomics (Computation, Bioinformatics and Statistics) to train scientists to analyze large data sets.
- 5-year $9.7M project studying peripheral arterial disease.
2. Promote Collaborations Across Colleges and Campuses

Active Research and Education Projects Underway in:

- Agricultural Sciences
- Arts and Architecture
- Business
- Commonwealth Campuses
- Communications
- Education
- Engineering
- Health and Human Development
- Information Sciences and Technology
- Law
- The Liberal Arts
- Medicine
- Nursing
- Science
Research Projects and Activities that Cross Programs

• Address human exposure to air toxins in buildings.

• Teaching doctor-patient communication techniques by incorporating art history and painting practice.

• Using food science to improve health.

• Applying social and behavioral neuroscience to manage autism, memory and aging, social anxiety disorder, and health disparities.


• Mine patient data to devise personalized medicine treatments.

• Develop smart drugs/drug delivery strategies.
Substance Abuse, Addiction and Prevention

- 100+ Penn State researchers and clinicians across 15+ colleges, departments and institutes.
- A 5-year $21M award funds projects by the Penn State Tobacco Center for Regulatory Science.
- $1M grant to establish medication-assisted opioid treatment program.
- Partners: National Institute of Drug Abuse, U.S. Food and Drug Administration, Caron Treatment Center, PA Department of Drug and Alcohol Programs.
Regenerative and Genetic Medicine

• Restoring organ function is now possible through recent advances in cell biology, genetics, and biomedical engineering.

• 20 PSU faculty working in stem cell biology, in vivo cell conversion, and CRISPR gene editing.
**Prevention, Treatment and Cures for Cancer**

- **Penn State Cancer Institute** is the centerpiece of our interdisciplinary efforts to fight cancer; catalyzing collaborations among cancer researchers across Penn State’s colleges and campuses.

- 2,000+ patients actively participating in more than 200 clinical trials.

- Application underway to become an NCI-designated cancer center.

- Named among the “100 Hospitals and Health Systems with Great Oncology Programs” by Becker’s Hospital Review.
3. Accelerate the process from discovery to clinical trials.

- Innovation and Entrepreneurship
- Clinical and Translational Science Institute
- Technology
Center for Medical Innovation

Launched in 2017 to generate economic and social value for Penn State discoveries

- 47 new medical technologies added to intellectual property database
  - Medical devices
  - Therapeutics
  - Diagnostics
  - Others (IT, apps, medical food)
- 10 patents
- 2 start-up companies
- 3 license agreements
Medical student launches genetics research startup.

- Olivier Noel was named to *Forbes* “30 under 30” list in the science industry for his start-up company that facilitates genetics.
- In MD/PhD Medical Scientist Training Program
Clinical and Translational Science Institute

• Central infrastructure to catalyze to help build teams, and translate new research findings into tangible health benefits.
• Awarded a 4-year $20M grant from the NIH to accelerate scientific discoveries into public health improvements

Example: fighting cancer:
• Five years ago researchers developed a compound derived from fish oil that cured leukemia in mice. It’s now in clinical studies with leukemia patients.
Enhancing Access through TeleHealth

- Tele-Stroke (LionNet)
  - 16 hospitals
  - 88% patients remain in community
- Tele-Derm
  - New acne program
- Tele-ALS
  - 67 virtual visits / 43 patients
- Tele-Psych
  - Virtual visits with 16 patients in ED
- e-ICU
  - 56 beds and expanding
  - Chambersburg Hospital (August 2017)
  - Waynesboro Hospital (October 2017)

Dr. Zachary Simmons, in a telemedicine consultation with ALS patient
4. Promote Health and Wellness Across the Lifespan

• A Community Health System
• College of Nursing
• Research and Education Across Colleges
Patient Care: The Health Care Provider Landscape

- From Independents to Groups.
- Penn State Health is transitioning to a community health system.
College of Nursing

• Pre-licensure programs are preparing over 1,100 students for nursing careers.
• Second Degree option provides a 16-month pathway to nursing for 120+ students holding a bachelor’s degree in another field.
• 84 licensed nurses engaged in primary care and acute care programs for nurse practitioners.
• Hershey Medical Center received the highest national honor for nursing excellence.
Nursing research

• Enhancing care of the victims of sexual assault and sex trafficking.
• Supporting family caregivers providing care across complex trajectories of multiple chronic conditions.
• Preventing the inappropriate use of medications in older adults.
• Developing an ultra-brief screening tool to identify patients experiencing delirium.
• Re-designing the delivery of interdisciplinary palliative care to provide timely interventions.
• Promoting organizational change in complex care delivery systems to improve outcomes.
Health and Human Development

• **Center for Individualized Health Research and Intervention**: leverage new technologies (wearable sensors), methods, and data sources (mobile phone apps) to establish, promote and sustain healthy behaviors.

• **Health disparities and vulnerable populations**: preventing cancer recurrence; understanding the long-term health consequences of child maltreatment; enhancing healthy aging; and food/water security and the health implications.
The Clearinghouse for Military Family Readiness

- Translational research to promote the health and well-being of military personnel and their families, such as: **Air Force Zero Suicide Systems Approach**. It’s closing the gaps in care systems to decrease suicides.
Summary: Impacting the world through human health

Stepping forward as the higher education leader in:

**Research:** Generating knowledge and technology that will drive new advances in population health.

**Education:** Preparing a workforce that is both highly trained and highly adaptable.

**Service:** Partnering with health care professionals to address urgent problems and to promote wellness.
Requirements

• Engaging partners across the University and beyond to expand biomedical and health sciences at Penn State.
• Enhance collaboration among College of Medicine, UP Colleges and Commonwealth Campuses.
• Nurture new strategic priorities centered on health.
• Partnering with lead donors in *A Greater Penn State for 21st Century Excellence*. 
Discussion Questions?