The History and our Future
Creating healthcare solutions through collaborative research education and outreach
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Strategic Plan / Background

2008
• 12/3/08 - Strategic Plan for the Health Sciences at PSU

2009
• 4/19/09 - 2009 Invited Workshop
• 9/20/09 - The Center for Integrated Healthcare Delivery Systems endorsed by the UHSC and formally established
• 12/09 – Planning Grant Awarded by NSF

2010
• 3/29/10 - CIHDS Workshop
• 06/23/10 – Industry planning meeting
• 9/25/10 - Five-year proposal to NSF to be developed
CIHDS

• PSU CENTER
  – Research
  – Education
  – Operations

“Sterile incubator for Industry and academic collaboration”
CIHDS 2010 Invited Workshop

Monday, March 29, 2010
7-8am Breakfast; 8-5 Program; 5-7 Reception/Poster Session
Penn State Nittany Lion Inn

Existing Applied Research Projects Showcased

Leading Professionals Discuss New Opportunities

Research themes explored and prioritized in roundtable sessions:

• Performance
• Transformation
• Systems & Technology

CIHDS Faculty, Scholars, and Affiliates Collaborate in Interdisciplinary Teams

Innovation in Healthcare Delivery
Current Research Initiatives

- Optimizing Patient Flow
- Identification of Medical Errors
- Patient Adherence to Therapies and Treatments
- Improving Healthcare Management
- Financial Incentives for Increasing Quality
- Active Aging and Aging in Place
- Chronic Care Intervention Strategies
- Health Information Technologies: Security & Privacy
- Design and Development of Medical Devices
The NSF Industry/University Collaborative Research Center (IUCRC) Model

*Industry Strengths*: Commercializing and implementing scientific research

*Partnership Benefit*: Access to pool of groundbreaking ideas

*University Strengths*: Fresh approaches; nurturing next generation of leaders

*Partnership Benefit*: Access to industrial insights on research directions

*IUCRC Model Aim*: Support the merger of these unique strengths on research that can have a productivity impact for the Nation

NSF IUCRC on Healthcare

Center for Health Organization Transformation

Full Award: Aug. 2008
Dr. Larry Gamm, PI

Full Award: Aug. 2008
Dr. Eva Lee, PI

Planning Grant: Dec. 2009
CIHDS
Center Memberships/Industrial Advisory Board (IAB)

Current Partners

| Siemens | Lockheed Martin |

Potential Partners

| Highmark | Johnson & Johnson | Microsoft | Verizon |

$400,000/yr in industry commitments will be supplemented by $80,000/yr in NSF funding. A minimum of 3 industry partners is required.
Impact the Healthcare Delivery System through CIHDS

Benefits of Industry Participation

• Accomplishes research at a fraction of the cost of having in-house researchers
• Access to researchers, knowledge, and training to evaluate intervention design and implementation or product development and testing
• Participate in research studies using organization’s own data to answer crucial questions which may otherwise not be done
• Exclusive setting for information sharing and networking with other innovative healthcare systems across the United States
• Supports CIHDS scholarly activity  
  – Provide a field-site for CIHDS scholars projects  
  – Undergraduate senior capstone team
• Provides an excellent recruiting tool for building the future of the healthcare organization
Sample of CIHDS Projects

Designing the Emergency Department of the Future
Students: Lisha Duan, Youyang Gao, Andrew Georgeson, Cameron Hand supported by faculty advisors Dr. Harriet Black Nembhard, Dr Chris DeFlitch

Exploring How Electronic Medical Record (EMR) Systems Support Non-Clinical Users
Students: Alison Murphy, Nathan McNeese, supported by faculty advisors; Madhu Reddy and Chris DeFlitch

Transitions of Care for Hospitalized Patients
Students Hyojung (Emily) KangPraewpran Prayadsab, supported by faculty advisors Harriet Black Nembhard, Chris DeFlitch and Coleen Rafferty

Service Product Platform and Incentive Modeling for Complex Health Care Systems
Students Tao Yao, with faculty advisors Robert Weaver (AgEcon) and Chris DeFlitch

Optimizing ED Patient Flow with Support of Healthcare Info. Technology
Faculty advisors Chris DeFlitch, MD; Deb Medeiros, PhD; Janetta DeOnna, RN, PhD for students Allison Lancos; and Kathryn Wilt, RN, MSN
Sample of CIHDS Projects

_Urgicare Operation During Phase I Transition: A Simulation Study_
Students Allison Lancos, Allen Gaudelli, with faculty advisors Deb Medeiros, PhD, IE; and Chris DeFlitch, MD, Medicine

_Information Visualization for Patient Management of Hypertension_
Students Siddartha Prakasam, with faculty advisors Harriet Black Nembhard, PhD, IE; Chris DeFlitch, MD, Medicine; and Madhu Reddy, PhD, IST

_Investigating Barriers to Using Electronic Medical Records in Collaborative Work_
Students Arvind Karunakaran*, IST; Young Hee Nam*, HPA with faculty advisors Madhu Reddy, PhD, IST; Chris DeFlitch, MD, Medicine; and Harriet Black Nembhard,

_Optimizing Patient Flow in the Emergency Department_
Faculty advisors Chris DeFlitch, MD; Deb Medeiros, PhD; Janetta DeOnna, RN, PhD for students Allison Lancos; and Kathryn Wilt, RN, MSN

_Using Lean to Decrease Door to Doctor Time_
Students Jeffrey Penoyer, Health Administration. Elizabeth Olson Industrial Engineering Jessica Havener Health Administration with faculty advisor Chris DeFlitch
CIHDS & CHOT interplay

PSU
Center for Integrated Healthcare Delivery Systems
“Sterile incubator for Industry and academic collaboration”

NSF
Center for Healthcare Organizational Transformation

“Sterile incubator for Industry and academic collaboration”
>80 CIHDS scholars

Osama Alotaik, PhD Candidate
Industrial Engineering
2015-16 CIHDS Scholar

Nathaniel Bastian, PhD expected Summer 2016
Industrial Engineering

Linlin Ma, PhD Candidate
Industrial Engineering
2015-16 CIHDS Scholar

Abhinav Singh MS expected Spring 2016
Industrial Engineering
2014-15, 2015-16 CIHDS Scholar

Eric Swanson, PhD Candidate
Industrial Engineering
2015-16 CIHDS Scholar

• Many Colleges
• Many degrees
• Many Backgrounds
• Job Opportunities

• Nathaniel Bastian, PhD, Co-author
• Alison Murphy, PhD. IST Faculty
• Ashley Britton
PennState Health
Center for Integrated Healthcare Delivery Systems

College of Engineering
D. Wormley, Dean
P. Griffin, IE
H. B. Nembhard, IE
D. Medeiros, IE

Hershey - College of Medicine
H. Paz, Dean
C. DeFlitch

Information Science & Technology
D. Hall, Dean
M. Reddy

Health and Human Development
A. C. Crouter, Dean
D. Shea, HPA
D. Brannon, HPA

Office of the VP for Research
H. Foley, VP & Dean
P. Schiffer, AVP & Dir.

Office of Economic and Workforce Development
T. Franklin, Dir
J. DeOnna

Leadership Support
Center Faculty
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NSF CHOT expansion & Phase 2

ATM | TEXAS A&M UNIVERSITY

W UNIVERSITY OF WASHINGTON

UNIVERSITY OF LOUISVILLE

UAB THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

PennState

Georgia Institute of Technology

FAU FLORIDA ATLANTIC UNIVERSITY

University of Nottingham
Penn State CHOT 2016-17

• Rebranded – CHOT
  – Consolidated branding for consistency
  – Combined collaborations

• Maintain focus on education and research

• Continued I/UCRC concepts and model
Penn State CHOT Partners
PSU and NSF CHOT interplay
Penn State CHOT Leadership

**Conrad Tucker**, PhD
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**Chris DeFlitch**, MD, FACEP, FAAEM
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- Co-PI, NSF CHOT grant, phase 1/2
- VP & CMIO, Penn State Health
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Penn State CHOT Faculty Liaisons

– **Russell Barton, PhD**
  • Senior Associate Dean, Professor of Supply Chain and Information Systems and Industrial Engineering, PhD

– **Kevin Black, MD**
  • Professor and C. McCollister Evarts Chairman, Department of Orthopaedics and Rehabilitation

– **Mary Frecker, PhD**
  • Professor of Mechanical Engineering and Bioengineering, University Park Campus
  • Director of the Learning Factory

– **Lee Giles, PhD**
  • David Reese Professor of Information Sciences and Technology, Graduate School
  • Professor of Computer Science and Engineering

– **José Pinto Duarte, PhD**
  • Stuckeman Chair in Design Innovation and director of the Stuckeman Center for Design Computing (SCDC)
Penn State CHOT

• CHOT Research Faculty Advisors
  – Eun Kyoung Choe, PhD
  – Yuan-Han (rick) Huang, PhD
  – Greg Lewis, PhD
  – Yunfeng Shi, PhD
  – Andrea Yevdhak Sillner, RN, PhD

• CHOT Faculty and Affiliate Members
  – Larry Baronner, Dep Dir PA of Rural Health
  – Nathan Bastian, PhD
  – Maria Hamilton, Dir, HSSA, Penn State Health
  – Jen Kraschnewski, MD,
  – Soundar Kumara, PhD
PSU CHOT

Research in transformational strategies for healthcare
Education of the next generation of healthcare delivery innovation