Building Effective Partnerships:
HESI Annual Meeting

Center for Clinical and Translational Research

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Acknowledgement

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CTSA Clinical & Translational ® Science Awards
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Objectives

- Understand the **objectives** and **impetus** for the Clinical and Translational Science Award (**CTSA**) **program**

- Have a better understanding for the **metrics** involved in **evaluating** the **CTSA program**

- Learn about the **science of teams**

- Understand the **impact** of **team training/building**

NIH Roadmap 2002

- New pathways to discovery

- Research teams of the future

- Re-engineering the clinical research enterprise
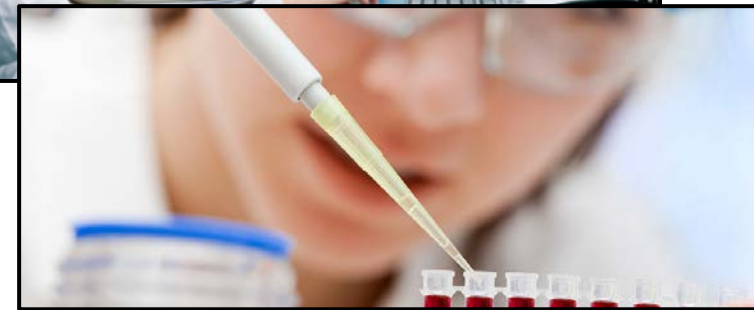
CTSA Program 2006

- Implementing discoveries demands evolution of science.

- New prevention strategies and treatments must be brought into practice more rapidly.

- Lower barriers between disciplines, and encourage, innovative approaches to solve complex problems.

- Break silos, barriers, and conventions.

CTSA Goals

- **Create** academic **homes** for CT research.

- **Provide** investigators and research teams with **research cores**, **tools** and a local **environment** that encourages and facilitates the conduct of CT research, including with **community** and **industry partners**.

- **Train** the scientific **workforce** needed for the translational sciences.

Research Gap
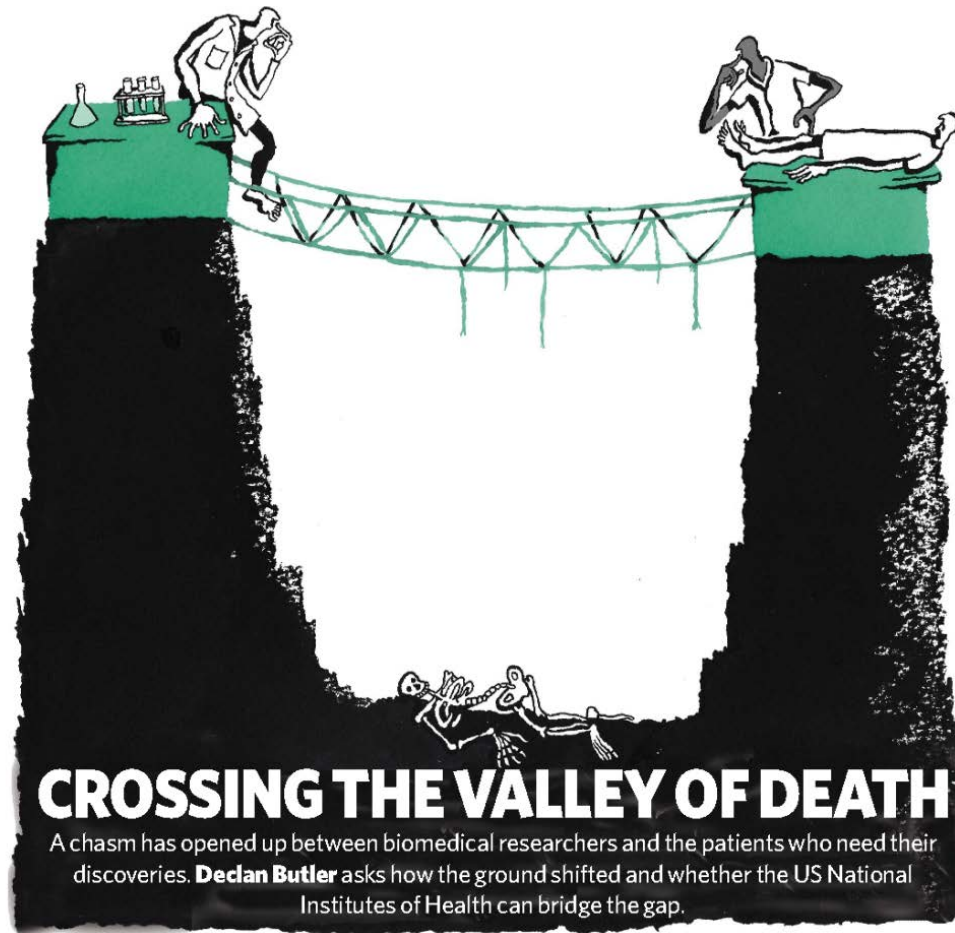
*Butler, D. (2008)

T0-T4, Bench to Bedside

*Khoury, 2007

CTSA Sites

● = CTSA-funded institutions
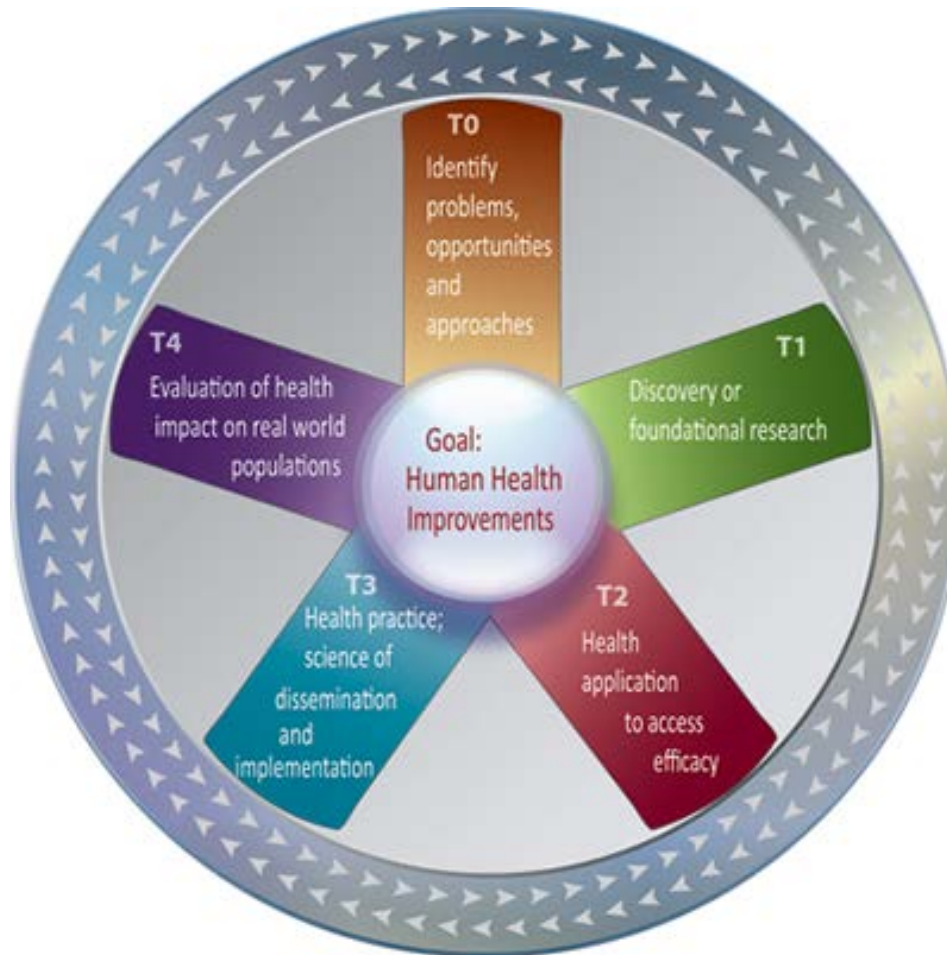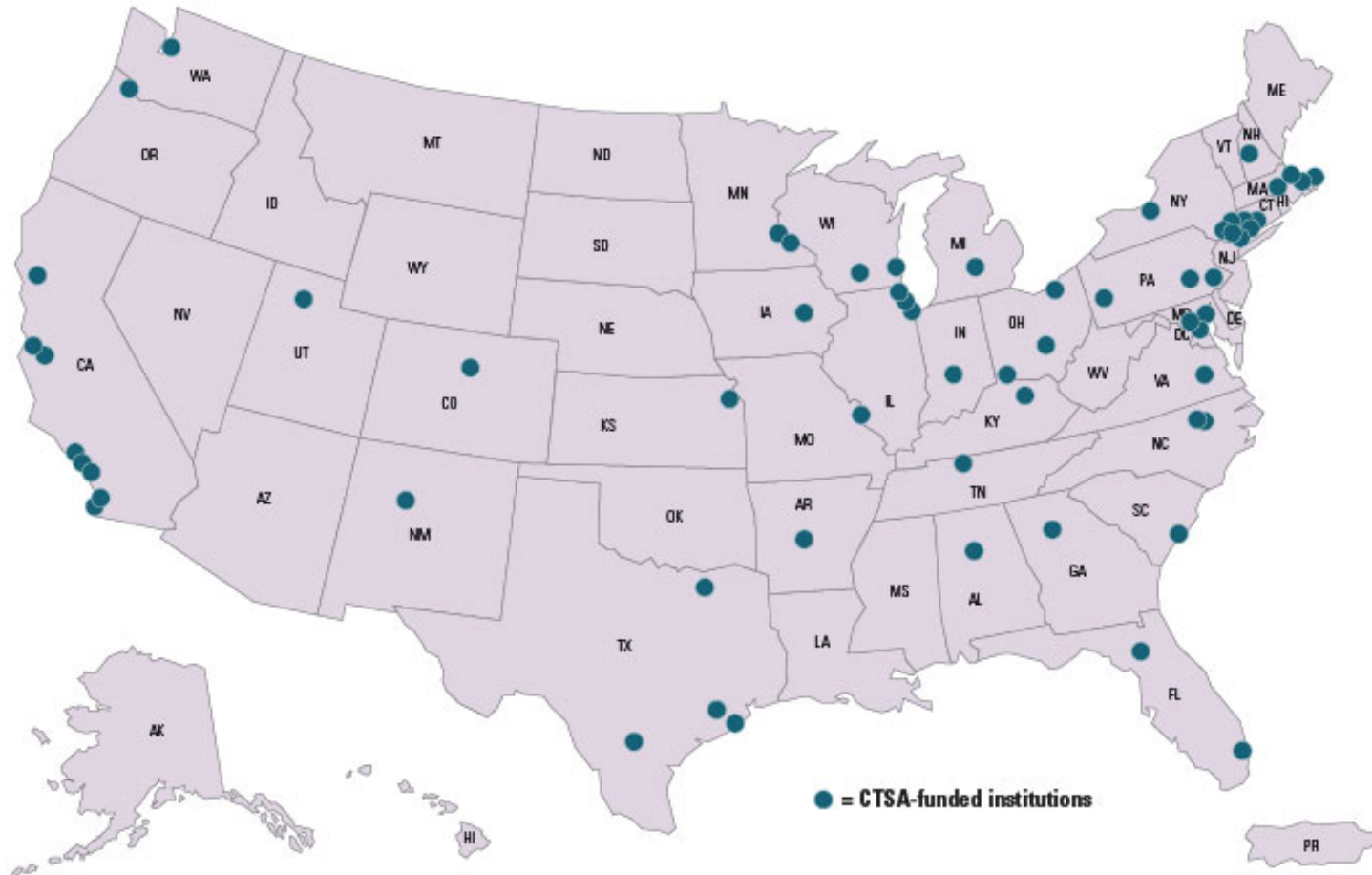
Evaluating the CTSA

- **Time**—IRB submissions, accrual, NOGA, publication
- **Number**—technology transfer products, users, services used, publications
- **ROI**—pilot programs
- **Collaborations**—grants, publications

Evaluating the CTSA

- Influence
- Culture change
- Career trajectory
- Career development
- Institutional collaboration
- CTSA impact

CTSA Current Goals

- Workforce development

- Collaboration and Engagement

- Integration

- Processes and Methods

CTSA Program Leaders

- Chris Austin, MD
  - NCATS, Director

- Petra Kauffman, MD
  - Clinical Innovation, Director

- CTSA Website
  - http://www.ncats.nih.gov/research/cts/ctsa/ctsa.html

The need

- Collaborative innovation is…
  - Dynamic
  - Complex
  - Must be executed by a team
- How can we improve collaborations to create innovation?
  - Understand the context
  - Understand the processes of collaboration
  - Understand the science

Contingency approach (Reeves et al., 2011)

Networking

Coordination

Collaboration
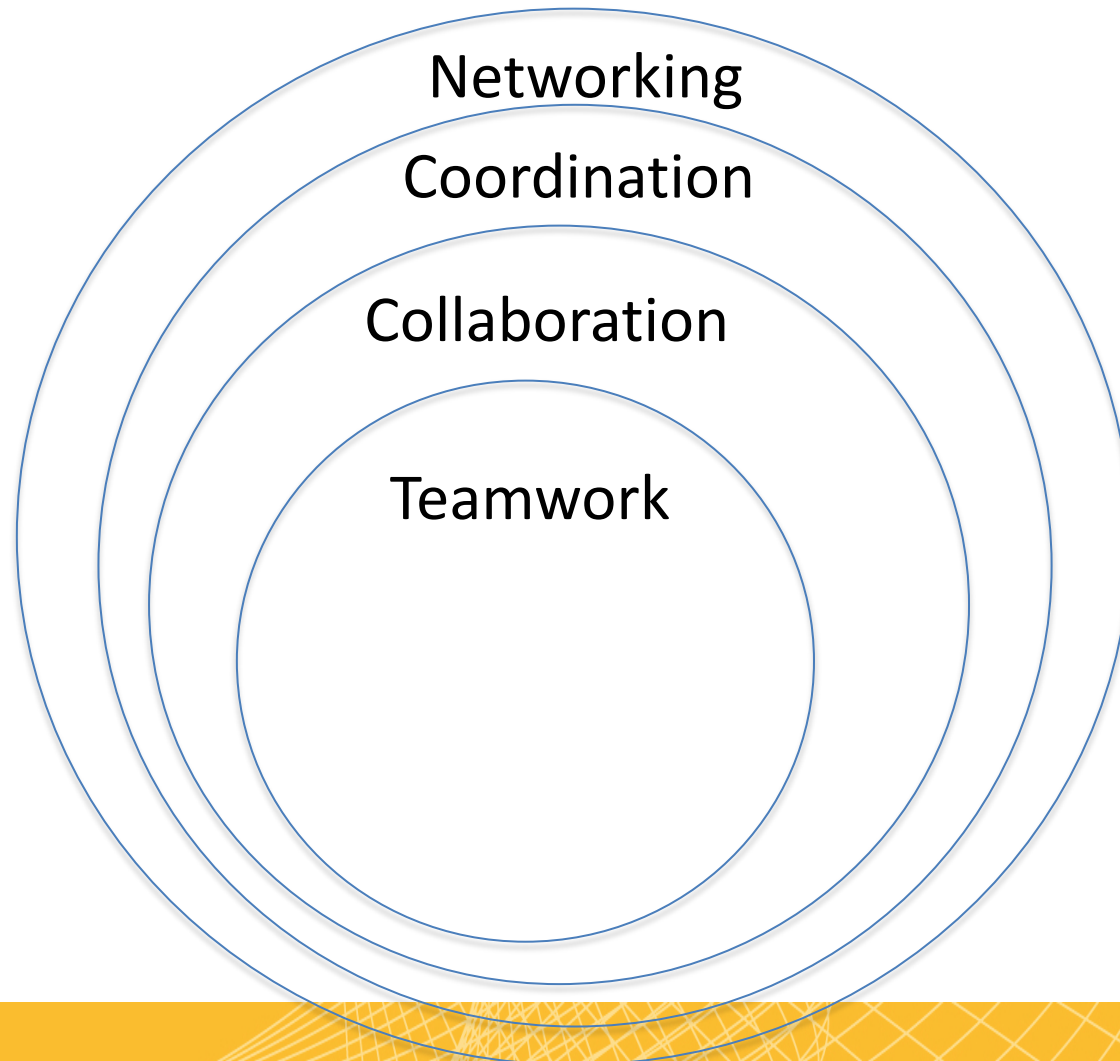
Teamwork

Teamwork and Collaboration

- Enactment of team-level **attitudes**, **behaviors**, and **cognitions** that impact how well teams perform their tasks (Salas, Cooke, & Rosen, 2008)

- Collaboration is an **evolving process** whereby **two or more social entities** actively and reciprocally **engage** in **joint activities aimed** at achieving at least one **shared goal** (Bedwell, Wildman, DiazGranados, Salazar, Kramar, & Salas, 2012)
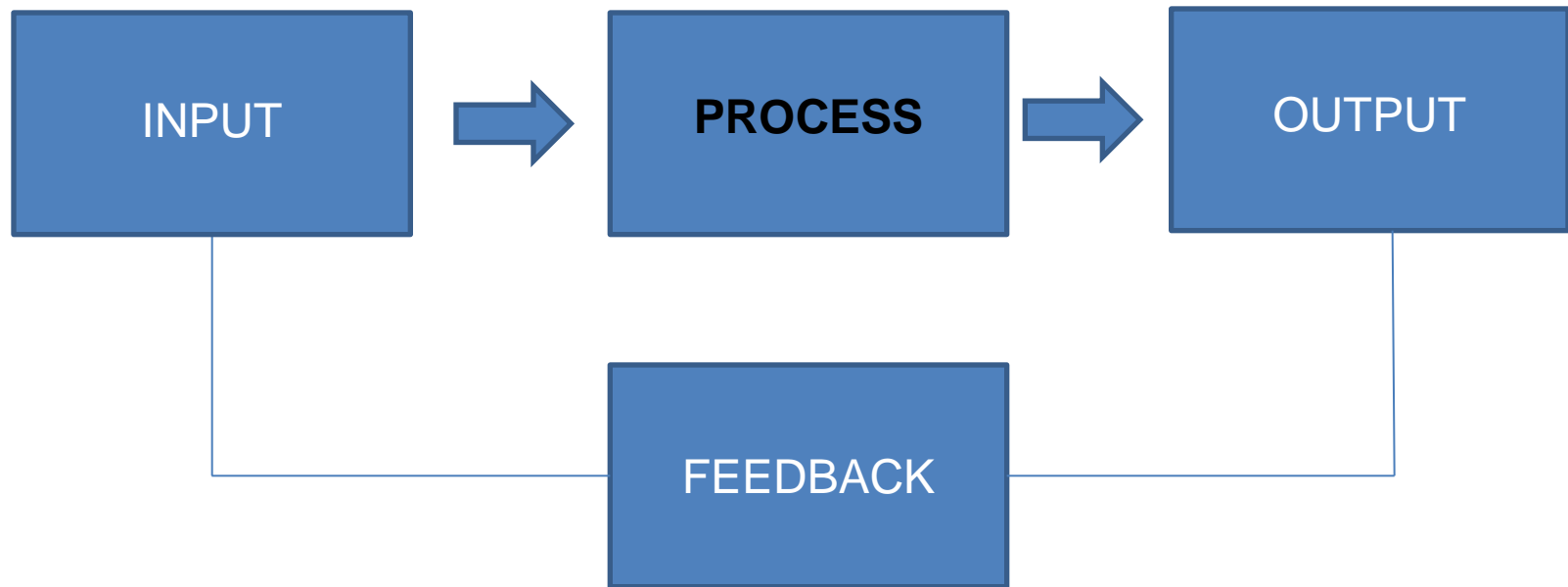
Team Performance

Affect

Motivational Components

- **Psychological safety**
- **Collective Efficacy**
- Collective Orientation
- Cohesion
- Goal Orientation
- Culture

Behaviors

Behavioral Strategies

- **Supporting Behavior/ Backup Behavior**
- **Information exchange**
- **Debriefing/Reflection**
- **Leadership**
- Team Self Correction
- **Mutual Performance Monitoring**
- **Adaptation**

Cognition

Knowledge Components

- **Mental Models**
  - Technology/equipment
  - Job/Task
  - **Team Interaction**
  - Strategic: Shared vision
- Transactive Memory
- Collaborative Problem Solving
- Meta-Cognition
- Knowledge of Stress

Motivation for the Meta-Analyses (MA)

- Update to the literature
- Understand team training methods
  - Differences between team building and team training
- Examine moderators
- Better understand impact of team training on team performance

Training Content

- Team Building (Klein, DiazGranados, Salas, et al., 2009)
  - Goal setting
  - Interpersonal relations
  - Role clarification
  - Problem solving

Training Content

- Team training (Salas, DiazGranados, Klein, et al., 2008)
  - Taskwork
  - Teamwork
  - Mixed

Outcomes examined

- Affective

- Behavioral

- Cognitive

- Performance

Moderators tested

- Team size
  - Small ($n = 2$)
  - Medium ($2 < n < 5$)
  - Large ($n \geq 5$)

- Team member stability
  - Intact vs. adhoc teams

Team Building MA Hypotheses

- Hypotheses
  - Team building interventions will result in enhanced team outcomes.
  - Team building will be most effective for improving affective outcomes.
  - The role clarification component of team building will be most effective for improving team functioning.
  - Large teams will show greater benefits from team building than small- or medium- sized teams.

Team Training MA Hypotheses

- Hypotheses
  - Team training is positively related to overall team outcomes.
  - Team training that includes a combination of teamwork and taskwork content will be more effective than interventions that target either phenomenon in isolation.
  - Team training will be more effective for intact teams than for ad hoc teams.
  - Team training will be more beneficial for small and large teams than for medium sized teams.

Methodology

- Meta-analytical techniques
  - Schmidt & Le (2005)
- Random effects model
  - True effect sizes to vary
- Literature search
  - Team building—130 articles identified, after coding 20 articles included
  - Team training– 500+ articles after initial review 168 articles identified for coding

Methodology

- Raters coded for:
  - Team type
  - Team membership stability
  - Number of teams
  - Average team size
  - Training content
  - Effect size(s)
- Rater reliability was tested
- Effect sizes were weighted by sample size

Methodology

- Team building
  - 60 correlations from 20 primary studies
  - 1,562 teams

- Team training
  - 93 correlations from 45 primary studies
  - 1,660 teams

Team Building MA Results

- Team building does improve team outcomes
  - Omnibus test: ρ = .31
  - Affective and process outcomes (ρ = .44)
- Team building components improve outcomes
  - Role clarification: ρ = .35
  - Interpersonal relations: ρ = .26
  - Problem solving: ρ = .24
  - Goal-setting: ρ = .37
- Team size does matter
  - Large teams: ρ = .66 compared to ρ = .26

Team Training MA Results

- Team training does improve team outcomes
  - Omnibus test: ρ = .34
  - Cognitive and process outcomes (ρ = .42 and 44)
- Team training content improves team outcomes
  - Teamwork training: ρ = .38
  - Taskwork training: ρ = .35
  - Mixed training: ρ = .40
- Team stability
  - Intact teams (ρ = .54) and adhoc teams (ρ = .38)
- Team size
  - Large teams: ρ = .50 compared to ρ = .39 and ρ = .34

Implications

- Team training can explain 12-19% of the variance of a team's performance

- Not all teams will benefit from the same intervention

- Consider the outcomes needed

- Specify the type of training needed and the focus

Intervention at VCU

- Integrative capacity
  - Capability that is sustained through an interactive system linking social, psychological, and cognitive team processes to provide a team with the resources needed to succeed in interdisciplinary scientific activities.

- Transdisciplinary intellectual orientation
  - Enduring values, beliefs, conceptual skills and behaviors that support collaboration in interdisciplinary research activities.

Intervention at VCU

- The importance of integrative capacity varies, depending upon the degree of knowledge integration needed to reach a science team's objectives.
  - Cross-functional, cross-disciplinary, and multi-disciplinary teams = low integrative capacity
  - Interdisciplinary teams = integrative capacity is critical

Intervention at VCU

- Individual and team-based instructional strategies
- How to build leadership capacity
- Mitigate inter-disciplinary divides
- Build social identity
- Measure the teams integrative capacity index

Intervention at VCU

- Boundary spanning leadership training
  - Effectively make connections between one another's ideas, methods and approaches
- Communication structuring strategies
  - Fostering the sharing of broad and deep knowledge from individual members of the group
  - Empowering leadership style

Conclusion

- There is a science of teams

- Consider the context

- Evaluate the attitudes, behaviors and cognitions

- Not one intervention is the answer

- Evaluate the outcomes of the team

Thank you for your time!

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