SUCCESSFUL HANDOFF IMPLEMENTATION

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Intermountain Healthcare
Integrating Research into the system

**HOSPITALS & CLINICS**
- **22** Hospitals (including pediatric and orthopedic)
- **2,700** Beds
- **185** Intermountain Clinics

**OUR TEAM**
- **5000** Affiliated Physicians
- **1,400** Medical Group doctors & advanced practice clinicians
- **36,000** Employees
- **3,000** Volunteers

**CLINICAL PROGRAMS**
- Behavioral Health
- Cardiovascular
- Intensive Medicine
- Oncology
- Pediatrics

**FEE FOR VALUE**
Transition from fee for service to fee for value — quality improvement, enhance patient experience, and lower cost.

**HOMER WARNER CENTER**
- **80** Current informatics projects

**ENTERPRISE DATA WAREHOUSE**
SYSTEM-WIDE data warehouse: financial, clinical, laboratory, pharmacy, and other departmental systems.

**iCentra**
Fully integrated electronic health record, practice management, and revenue cycle system.

**OFFICE OF RESEARCH**
Over **1600** Open clinical research studies
Patient Safety in the U.S.: Ongoing Problems

Institute of Medicine, 1999
• 44,000-98,000 deaths per year due to adverse events

Office of the Inspector General, 2010
• 180,000 deaths per year due to adverse events

Makary et al, BMJ, 2016
• 251,000 U.S. deaths per year due to medical error
• 3rd leading cause of death

North Carolina Pt Safety Study
• 2341 randomly selected
  o admissions from ten randomly selected hospitals
  o statewide

Landrigan et al., NEJM 2010: 363:2124-34
Causes of Adverse Events

Root Causes of Sentinel Events

- Communication
- Assessment
- Physical Environment
- Information Management
- Operative Care
- Care Planning
- Continuum of Care
- Medication Use
- Special Interventions
- Anesthesia Care

Multisite study at 9 Children’s Hospitals

Created I-PASS handoff *bundle* for change of shift

- High reliability communication methods
- Observation/Feedback/Performance improvement

Test whether implementation associated with:

- Reduced overall error and preventable adverse events (active surveillance)
- Improved verbal/written handoff communication
- Changes in resident workflow

1Starmer AJ, Acad Med. 2014 Jun; 89(6):876-84
I-PASS Mnemonic

A Standardized Structure for Communication

I - Illness Severity
   *Stable, Watcher, Unstable*

P - Patient Summary
   *Summary statement; events leading up to admission; hospital course; ongoing assessment; plan*

A - Action List
   *To do list; timeline and ownership*

S - Situation Awareness & Contingency Planning
   *Know what’s going on; plan for what might happen*

S - Synthesis by Receiver
   *Receiver summarizes what was heard; asks questions; restates key action/to do items*

Starmer AJ et al *Pediatrics* 2012
I-PASS: More Than Just A Mnemonic
Bundle Components

- I-PASS Mnemonic
- I-PASS Campaign
- Faculty Observations & Feedback
- Faculty Development
- I-PASS Printed Handoff Document
- Introductory Workshop
- TeamSTEPPS Training
- Simulation Exercises

All Handoff Bundle Components Available at www.ipasshandoffstudy.com
Primary Outcomes of I-PASS Study

**Significant** Reduction in Medical Errors and Patient Harm, No Change in Workflow or Time for Handoffs

<table>
<thead>
<tr>
<th></th>
<th>Pre (n=5516 admissions)</th>
<th>Post (n=5571 admissions)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall rate of medical errors</strong></td>
<td>24.5</td>
<td>18.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Preventable adverse events</strong></td>
<td>4.7</td>
<td>3.3</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Pre-Intervention N = 3510 hours</th>
<th>Post-Intervention N = 4618 hours</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean duration of verbal handoff per patient</td>
<td>2.4 min</td>
<td>2.5 min</td>
<td>0.55</td>
</tr>
</tbody>
</table>

Significant Reduction in Medical Errors and Patient Harm, No Change in Workflow or Time for Handoffs


No More Time
Dissemination and Adaptation of I-PASS

Nurses and Medical Students
Specialties beyond Pediatrics
• Internal Medicine, Surgery, OB/GYN
• Implemented > 50 institutions
• Examples: MGH, CHOP, Johns Hopkins, Mayo, UCSF, Stanford

Patient and Family I-PASS Study
• Structured communication
• Shared mental model on rounds, MDs, Nurses, Patients/Families
• 38% reduction in harmful errors

Administration and other hospital operations
I-PASS Mentored Implementation (32 Hospitals): Effects on Communication and Patient Safety

% adherence to all 5 elements I-PASS mnemonic

Provider-reported adverse event rate
### Patient and Family Centered I-PASS Study

#### Adverse Event Rates Pre- and Post- Intervention

<table>
<thead>
<tr>
<th>Type of Adverse Event (Number/1000 patient-days)</th>
<th>Pre</th>
<th>Post</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Types</td>
<td>33.7</td>
<td>18.3</td>
<td>.002</td>
</tr>
<tr>
<td>Preventable (Harmful Errors)</td>
<td>20.7</td>
<td>12.9</td>
<td>.01</td>
</tr>
<tr>
<td>Non preventable</td>
<td>12.4</td>
<td>5.0</td>
<td>.003</td>
</tr>
</tbody>
</table>

38% Reduction
Harvard Business School / Medical School Health Acceleration Challenge

Question: How do we continue to spread?

Selected as finalist
• Healthcare business community input
• Identified CEO / Business Team

Formed I-PASS Institute
• Patient Safety Improvement Company
• Comprehensive Hospital-Wide Handoff Solutions
Full-Scale Adoption Challenges:

- Requires change in workflow and adaptation to culture
- "Scale" required to train thousands of providers
- Sustaining change requires re-enforcement and feedback
- Needs integration and alignment with hospital systems (e.g. EHR)
- Requires experience and mentoring
The I-PASS Patient Handoff System

As Dr. Amy Starmer of Boston Children’s Hospital dialed into the regularly scheduled conference call of the I-PASS Executive Council—of which she was one of six members—she realized that this small group had to address an increasingly large range of issues. Of the other five members of the Executive Council, two—Drs. Christopher Landrigan and Theodore Sectish—were pediatricians and colleagues of Starmer’s at Boston Children’s; the other three, Drs. Nancy Spector, Raj Srivastava, and Daniel West, were pediatricians at St. Christopher’s Hospital for Children in Philadelphia, Pennsylvania; Primary Children’s Hospital of Intermountain Healthcare in Salt Lake City, Utah; and the Benioff Children’s Hospital at the University of California at San Francisco (UCSF), respectively.
I-PASS Study Group wins Eisenberg Award for National Innovation in Patient Safety

The I-PASS Study Group was awarded the 2017 John M. Eisenberg Award for Innovation in Patient Safety and Quality at the National Level. The award is presented annually by the National Quality Forum and the Joint Commission.
Original Conceptual Model

Context
- Noise
- Interruptions
- Time
- Who's in the room
- Rushed
- Level of focus

Individual Factors
- Ownership
- Developmental expertise

Relational Factors
- Transfer of responsibility
- Interpersonal skills
- Etc.
- Pick up nonverbal cues
- Read back/feedback:
- dyad: two or more people
- Team steps

Facts
- Concord's patient summary accuracy
- Adherence to nonverbal
- Efficiency
- Signal to noise

Quality of signout: Shared mental model

Outcomes
I-PASS Study Leadership:
I-PASS Study PI: Christopher P. Landrigan MD, MPH clandrigan@partners.org
I-PASS Project Leader: Amy J. Starmer MD, MPH starmer@ohsu.edu

I-PASS Coordinating Council:

I-PASS Education Executive Committee:
Co-chairs: Nancy D. Spector MD, Amy J. Starmer MD, MPH

I-PASS Study Group:
Members of the I-PASS Study Group include individuals from the institutions listed below as follows: Boston Children’s Hospital/Harvard Medical School (primary site): April D. Allen, MPA, MA (currently at Heller School for Social Policy and Management, Brandeis University), Angela M. Feraco, MD, Christopher P. Landrigan, MD, MPH, Elizabeth L. Noble, BA, Theodore C. Sectish, MD, Lisa L. Tse, BA; Brigham and Women’s Hospital (data coordinating center): Anuj K. Dalal, MD, Carol A. Keohane, BSN, RN, Stuart Lipsitz, PhD, Jeffrey M. Rothschild, MD, MPH, Matt F. Wien, BS, Catherine S. Yoon, MS, Katherine R. Zigmont, BSN, RN; Cincinnati Children’s Hospital Medical Center/University of Cincinnati College of Medicine: Javier Gonzalez del Rey, MD, MEd, Jennifer K. O’Toole, MD, MEd, Lauren G. Solan, MD; Doernbecher Children’s Hospital/Oregon Health and Science University: Megan E. Aylor, MD, Amy J. Starmer, MD, MPH, Windy Stevenson, MD, Tamara Wagner, MD; Hospital for Sick Children/University of Toronto: Zia Bismilla, MD, Maitreya Coffey, MD, Sanjay Maham, MD, MSc; Lucile Packard Children’s Hospital/Stanford University: Rebecca L. Blankenburg, MD, MPH, Lauren A. Destino, MD, Jennifer L. Everhart, MD, Madelyn Kahana, MD, Shilpa J. Patel, MD; Lucile Packard Children’s Hospital/Oregon Health and Science University: Megan E. Aylor, MD, Amy J. Starmer, MD, MPH, Windy Stevenson, MD, Tamara Wagner, MD; Hospital for Sick Children/University of Toronto: Zia Bismilla, MD, Maitreya Coffey, MD, Sanjay Maham, MD, MSc; Lucile Packard Children’s Hospital/Stanford University: Rebecca L. Blankenburg, MD, MPH, Lauren A. Destino, MD, Jennifer L. Everhart, MD, Madelyn Kahana, MD, Shilpa J. Patel, MD (currently at Kapi’olani Children’s Hospital/University of Hawai‘i School of Medicine); National Capital Consortium: Jennifer H. Hepps, MD, Joseph O. Lopreiato, MD, MPH, Clifton E. Yu, MD; Primary Children’s Medical Center/University of Utah: James F. Bale, Jr., MD, Jaime Blank Spackman, MSHS, CCRP, Rajendu Srivastava, MD, MPH, Adam Stevenson, MD, St. Louis Children’s Hospital/Washington University: Kevin Barton, MD, Kathleen Berchelmann, MD, F. Sessions Cole, MD, Christine Hrach, MD, Kyle S. Schultz, MD, Michael P. Turmelle, MD, Andrew J. White, MD, St. Christopher’s Hospital for Children/Drexel University: Sharon Calaman, MD, Bronwyn D. Carlson, MD, Robert S. McGregor, MD; currently at Akron Children’s Hospital/Northeast Ohio Medical University, Vahideh Niforoshan, MD, Nancy D. Spector, MD; and Benioff Children’s Hospital/University of California San Francisco School of Medicine: Glenn Rosenbluth, MD, Daniel C. West, MD, Dorene Balmer, PhD, RD, Carol L. Carraccio, MD, MA, Laura Degnon, CAE, and David McDonald, and Alan Schwartz PhD serve the I-PASS Study Group as part of the IPSE. Karen M. Wilson, MD, MPH serves the I-PASS Study Group as part of the advisory board from the PRIS Executive Council. John Webster served the I-PASS Study Group and Education Executive Committee as a representative from TeamSTEPPSTM

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Lessons Learned

• Institution leadership for standardized training, local implementation
• Workplace based assessment (assessments help drive the quality)
• Campaign for culture change
• Mechanisms of sustainment
• Barriers (logistics of training and tracking, having sufficient institutional buy-in)
• Business model for hospital leadership to consider, beyond academic medicine approach
Thank you - Questions