Workshop on Reducing Diagnostic Error in Clinical Settings

Interventions to Improve Diagnosis in Medicine
Prototyping Collaborative
SIDM and IHI
Nothing to Disclose

Diana Rusz and Virginia Hamilton Crowe have no relevant financial or nonfinancial relationship(s) within the services described, reviewed, evaluated, or compared in this presentation.
Setting the Stage

Welcome
Diana Rusz MPH
Research and Program Manager
Society to Improve Diagnosis in Medicine

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Principal, Hamilton Consulting, LLC
IHI Improvement Advisor for SIDM IHI Prototyping Collaborative

Agenda
12:30 – 2:00 PM
Welcome!
Exploring the Who Why & What
The IHI SIDM Project: Part 1  Design

Break 2:00 – 2:15 PM

2:15 – 4:00 PM
The IHI SIDM Project: Part 2  Drivers
The IHI SIDM Project: Part 3  Results
Closing
Setting Our Context

Who, Why and What?

• Who is in the room?
• Why are you here?
• What is one expectation you would like to have met before we leave today?

Exercise

Pair Up

• Introduce your selves to each other
• Have a conversation regarding why you are here and one expectation for the day that would delight you if it was met.
• Group Debrief:
  • Introduce yourselves to the larger group
  • Share a “Why” if you like
  • And the one expectation
Why Quality Improvement is Needed

• Diagnostic errors affect more than 12 million Americans each year and likely cause more harm to patients than all other medical errors combined.

• Missed diagnoses may seriously harm one-third of these patients, and even conservative estimates find 40,000-80,000 die each year from diagnostic failures in U.S. hospitals alone.

• Costs are driven up by treating sicker patients in more advanced disease states, and by the overuse of unnecessary, expensive tests.

• Improving the quality and accuracy of diagnosis will reduce costs from inappropriate testing, wrong treatments, and malpractice lawsuits. Current best estimates suggest that more than $100 billion per year is currently wasted.
The Economic and Personal Harm is Evident in Malpractice Data

- Diagnostic errors were the leading type (28.6%) of malpractice claims
- Accounted for the highest proportion of total payments (35.2%)
- Diagnostic errors more often resulted in death than other allegation groups (40.9% vs 23.9%)
- More diagnostic error claims were outpatient than inpatient, but inpatient diagnostic errors were more likely to be lethal

Executive Brief

Top 10 Patient Safety Concerns for Healthcare Organizations 2018

Diagnostic Errors

According to both studies and claims analyses, diagnostic errors are common, and they can have serious consequences. Miscommunication is a common issue, but often not the only one. “It’s a multifactorial problem,” says Gail M. Honuth, MSN, RN, CNOR, CRNFA, patient safety analyst and consultant, ECRI Institute. “Diagnostic errors are the result of cognitive, systemic, or a combination of cognitive and systemic factors.”

Diagnostic errors are also challenging to measure and learn from because they often go undetected until after the patient leaves the hospital or emergency department (ED). Healthcare organizations should capture data on diagnostic errors and near misses. Sources may include the event-reporting system, malpractice and payment claims, patient complaints, patient surveys, autopsies, and record reviews. The organization can then make changes to address gaps. Discussing the topic in multiple forums, such as grand rounds and debriefings, can support ongoing analysis and learning for clinicians.
ALL TEACH ALL LEARN
The Diagnostic Process

The Process!

What does the Diagnostic Process look like?

What gets in the way of flow and accuracy?

What gets in the way of supporting the diagnostician to do the best they are able every time?

The Exercise!

Introduce yourselves to each other at your table.

First: Draw a picture of the Diagnostic process
• High Level Flow chart
• Concept Map
• Other Tool?

Second: Identify barriers problems that could contribute to Diagnostic Error? Harm?

Third: Large Group Debrief
Improvement Tools

**Flow Chart**

Flowcharts allow you to draw a picture of the way a process actually works so that you can understand the existing process and develop ideas about how to improve it.

A **high-level flowchart**, showing six to 12 steps, gives a panoramic view of a process. These flowcharts show clearly the major blocks of activity, or the major system components, in a process. High-level flowcharts are especially useful in the early phases of a project. (Block Diagram)

http://www.ihi.org/resources/Pages/Tools/Flowchart.aspx

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**Concept map**

A concept map or conceptual diagram is a diagram that depicts suggested relationships between concepts. It is a graphical tool that instructional designers, engineers, technical writers, and others use to organize and structure knowledge.

A concept map typically represents ideas and information as boxes or circles, which it connects with labeled arrows in a downward-branching hierarchical structure. The relationship between concepts can be articulated in linking phrases such as causes, requires, or contributes to.[2]

https://en.wikipedia.org/wiki/Concept_map
The Diagnostic Process
IOM report on “Improving Diagnosis in Health Care”
- identified diagnostic error as a major, unaddressed patient safety issue
- summarized a wide range of factors relevant to considering possible interventions
- called on healthcare organization to consider what could be done to improve the diagnostic process

The project advanced a plan to break the cycle of inaction by enabling pioneering healthcare organizations to begin experimenting with interventions and evaluating their relative merits and impact.
Objective - Identify and disseminate effective tools for improving diagnostic performance and reducing harm associated with diagnostic error.

Deliverables

- Environmental scan to identify relevant, existing tools
- Classification system for tools
- Evaluation framework
- Website for dissemination
- System for collecting feedback on tool use and effectiveness
Environmental Scan Results

Environmental scan integrates findings from multiple sources:

- 2012 systematic reviews (Mark Graber, Hardeep Singh, Kathy McDonald)
- Literature search (additions since 2012)
- Survey
  - Three main open-ended questions:
    - What data/measures are being collected? (on diagnostic quality or safety)
    - Please describe the tools or interventions
    - What data has been collected? (to evaluate the effectiveness of the tool or intervention)
  - Over 1000 survey responses
- Manual additions
Concept Map of Drivers
Synthesis of Environmental Scan: Survey and Literature Review

- Work System
- Teamwork
- Patient Partnership
- Cognitive Processes

Learning System
TECHNOLOGY:
• Isabel DDx Disease Pattern Recognition Engine Platform (DREP).
• PACS: picture archiving
• and communications systems (PACS)
• PROACT Investigation Management System (RCA)
• UpToDate: EB clinical decision support program
• VisualDX – decision support

CHECKLISTS
• CARE: short mnemonic /checklist
• Child Behavior Checklist (CBCL)
• ECG interpretation checklist
• Emergency Room:
• Checklist for Diagnosis
• General Checklist: Pocket general checklist R/t diagnostic error.
• Radiology Reporting Template Checklist-Style for Cervical Spine Computed Tomography Examinations (residents)

SEGMENTS: Disease/Location Specific
• ASC (AHRQ Toolkit CUSP)
• Ankle Trauma: Ottawa ankle/knee tool
• BRAAFF Scoring System dermoscopic algorithm for diagnosing acral melanoma
• Cardiac MRI, CT and SPECT: STARD criteria in cardiac
• Cardiac: The SYNTAX Score revascularization guidelines for decision-making between CABG and PCI as part of a SYNTAX-pioneered heart team approach.
• Chronic Heart Failure (CHF) Follow Up Management: Intelligent Data Analysis
• Coronary Angiography: Endovascular Simulation
• Epidural Abscess Clinical pathway
• ER: Assessment Domestic Violence
• Depression (PHQ-9)
• Depression / Complex Chronic Care Management pathway with phone follow-up
• Mental Health: critical use of the DSM in mental health intake session

SEGMENTS: Disease/Location Specific
• Neuroangiography simulation using a silicone model angiography suite
• Paediaytric Radiography unsupervised unit: Pictorial posters & crash course on radiographic errors
• Pneumonia: (procalcitonin)
• Primary Care: LINNEAUS Computerized diagnostic decision support systems
• Primary Care: AHRQ Research Team - Improving Your Office Testing Process: A Toolkit for Rapid-Cycle Patient Safety and Quality Improvement
• Radiology : Random review: ACR Appropriateness Criteria Program
• Respiratory physiotherapy: Lung UltraSound
• Sepsis: MD Pocket Sepsis Diagnosis Card
• Sickle Cell: every patient has list of dg and sero tests
• Solid Nodules - Fleischner Society Guidelines
• Trauma: Simulation to Improve Diagnostic Skills
Concept Map of Drivers and Changes

Cognitive Processes
- Technology*
- Checklists*
- Second Opinions
- Cognitive Support Methods
- Reflection (Take 2: Think Do)
- Multi-diagnosis process
- Education and Training Cognitive Errors and Human Factors

Teamwork
- Multidisciplinary team Care Meetings
- Work in Diagnostic Teams
- Communication
- Coordination
- Team Based Debate on Diagnosis (i.e. Red Team Blue Team)
- RCA Fishbone Diagram
- Education /training

Patient Partnership
- Engagement in Diagnostic process
- Resources i.e. SIDM Patient Toolkit
- Questions are the Answer
- Education and Training

Work System
- Segmentation*
- Handoffs (i.e, IPASS)
- Checklists*
- Linkages
- Communication
- Flow
- Pathways
- Test Tracking System/Processes (electronic or not)
- Education and Training

Learning System
- Awareness of Diagnostic Errors
- Education/Training Methods: Simulation, Grand Rounds
- Upstream, Current EB Guidelines Processes
- Measurement: i.e Diagnostic Error Measures
- Trigger Tool for Diagnostic Harm: SureNet program
- Systematic Reviews: i.e DEER Taxonomy Chart Audit Tool
- Teaching Data Bases
- Routine and Timely Feedback on Diagnosis
- Specific Training: i.e. TeamSTEPPS (AHRQ)
- Improvement Methods and Tools i.e Journey Mapping
- Rapid Cycle Improvement Methodology
- Collaborative Improvement Initiatives
Aim
Improve Diagnosis to Reduce Harm

Primary Drivers

- Care Team
  - Team Structure
  - Team Leadership
  - Team Communication and Behavior
  - Patient, Families and Caregivers as Team Member

- Diagnostic Environment & the Diagnostic Process
  - Organizational Structure
  - Clinical Operations
  - Access to Care

- Patient, Family and Caregiver
  - Patient, Families and Caregivers as Team Member
  - Patient Engagement and Empowerment

- Diagnostic Cognitive Performance
  - Clinical Decision Support
  - Reflective Self-Practice
  - Diagnostic Environment

- Learning System & Environment
  - Culture of Psychological Safety and Transparency
  - Quality Improvement Structure and Process
  - Education and Training Structure and Process
Definitions

Care Team
- Multidisciplinary team usually organized under the leadership of a physician
- Each member has specific responsibilities
- Whole team contributes to the care of the patient

Diagnostic Environment and the Diagnostic Process
- Structure, process and environment that contains and supports the diagnostic process
- How the work of your organization is accomplished
- Coordinates the internal work processes and the external resources necessary for you to develop, produce, and deliver your products to your customers and to succeed in your marketplace

Patient, Family and Caregiver
- Actions taken by the patient and family to enhance partnership with the diagnostic team

Diagnostic Cognitive performance
- The result of performance of some composite cognitive activity

Learning System and Environment
- Structure and processes of creating, retaining and transferring knowledge within an organization to support organizational learning
- Organization improves over time as it gains experience
- From experience, it is able to create knowledge
A change package is a concise and practical document that includes ideas and inspiration for teams seeking to apply QI methods to increasing the effectiveness and efficiency of their care processes and outcomes. Change packages focus on a specific condition, care process, or health system feature and generally include background material; a summary of evidence or best practices; and specific tools, strategies, and examples that can be applied to improvement work.

(National Pediatric Cardiology Quality Improvement Collaborative)
### Change Package: Care Team

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<th>KEY CHANGE IDEAS OR DESCRIPTIONS</th>
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| **Team Structure** | • Work in Diagnostic Teams as defined in IOM Report on Improving Diagnosis in Health Care  
• Identify structure of diagnostic team  
• Identify roles of diagnostic team members, including team leader  
• Improve methods for mutual support of the team e.g. ground rules, role clarification, common aim |
| **Team Leadership** | • Foster inter-professional collaboration  
• Organize and Lead Multidisciplinary Team Care Meetings and Rounding  
• Include explicit questions in Multidisciplinary Team Rounding regarding increased information gathering (influences differential) and recognition of typical clinical course  
• Improve processes to support team based debate on Diagnosis e.g. Red Team Blue Team  
• Support an environment of psychological safety and joy/meaning in work  
• Develop processes to support transparency and accountability  
• Provide evidence based training for Team Members e.g. TeamSTEPPS |
| **Team Communication & Behavior** | • Utilize and standardize communication techniques for critical information e.g. SBAR, to question diagnostic accuracy, differential diagnosis, or uncertainty throughout the care process  
• Enhance information exchange for transitions (Handoff) utilizing standardized tools e.g. I Pass the Baton  
• Improve methods to share concerns e.g. CUS  
• Utilize effective team meeting structure and process to support communication and coordination |
| **Patient, Families & Caregivers as Team Member** | • Advocate for the patient  
• Provide learning opportunities for patients, families and caregivers to learn about the Diagnostic Process e.g. Diagnostic Toolkit, Diagnostic Uncertainty Questions  
• Develop communication tool for patients and families identifying risk of diagnostic error e.g. a diagnostic charter or consent for clinical care  
• Adjust time and structure of patient discussion based on diagnostic certainty  
• Create safe environments that support feedback and concerns from patients, family or caregivers  
• Provide easy access to information to patients, family or caregivers e.g. clinical notes and testing results  
• Engage patients and family in diagnostic process improvement (e.g. shared decision making, feedback on symptom changes and second opinions)  
• Coach Patients, families on process to share symptoms e.g. SBAR  
• Develop process for patients to request a second consult when there’s diagnostic uncertainty  
• Clarify health literacy and language preference |

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SOCIETY TO IMPROVE DIAGNOSIS IN MEDICINE
### Change Package: Diagnostic Environment and the Diagnostic Process

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| Organization Structure |  | • Use data mining and surveillance tools for early identification and mitigation of diagnostic error.  
• Develop an Early Warning System process to support clinical deterioration, e.g. PEWS MEWS, SEPSIS.  
• Place someone in charge of monitoring and improving diagnostic quality in the organization.
• Create system formal and informal second opinions in timely way e.g. diagnostic neighborhoods; fresh eyes; re-reviewing cases; Improve resiliency; Review the problem list.
• Explore electronic or telemedicine curbside/consultant documentation and infrastructure.
• Engage Leadership in creating a culture that supports diagnostic safety.
• Consider Unit based Multidisciplinary Leadership Teams. |
| Clinical Operations |  | • Reduce practice variation e.g. standardize key Handoff processes.
• Enhance linkages and support system communication.
• Consider forcing functions to help manage results e.g. alerts for out of range results, incomplete testing or delayed or canceled high risk referrals.
• Use checklists to support complex diagnostic processes.
• Clearly define escalation path for deteriorating clinical conditions.
• Optimizing who does what (working at the top of one’s license).
• Make diagnosis easier (time to think; fewer distractions;)
• Improving access to expertise e.g. KP’s electronic curbside consults.
• Improve reliability and timeliness of lab and radiology testing focusing on pre- and post-analytic problem areas; Make Key processes within Lab results, Radiology results and Specialty referral highly reliable.
• Use trigger tools to identify opportunities to improve care and prevent harm.
• Improve follow-up (lab\radiology\clinical process management systems); Closing the loop; Design process for connecting and reporting test results that return after discharge e.g. D/C summary contains list of pending test results.
• Optimizing how staff are aligned and work to improve diagnosis e.g. care tracks; pre-planned work flows; how to minimize patient trips, “Swarming” — the whole team meets the patient at the onset of care. |
| Access to Care |  | • Develop Patient portals and processes.
• Improve ER follow-up process.
• Care coordination to improve access or flow. Use patient navigators.
• Better clarity on who is the care team, how to reach them.
• Explore or Optimize Telemedicine. |
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| Patient, Family and Caregivers as Team Member | | • Report adverse events, errors, unsafe conditions (both in real-time and after the fact) to the Care Team  
• Inquire about diagnostic certainty, e.g. What else could this be?  
• Communicate new or changing symptoms  
• Explore options to request a second consult when there’s diagnostic uncertainty or for confirmation  
• Clarify language preference  
• Explore methods for communication with the Care Team and request preferred e.g. email, text, portal, mail  
• Clarify process for further diagnostic questions, especially as Care Team expands.  
• Request a translator or advocate when a language or jargon gets in the way of understanding diagnosis  
• Follow up on any results or referrals  
• Encourage provider to think broadly by asking questions e.g. What else could this be?  
• Code Help– Families and Caregivers report changes not noticeable to care team |
| Patient Engagement and Empowerment | | • Maximize use of patient access portals to your EHR  
• Maintain and update your own medical record.  
• Give feedback regarding diagnostic error or uncertainty to provider  
• Engage in shared decision making regarding goals related to diagnosis and care  
• Commit to and engage in action plan related to diagnosis and treatment i.e. accurate preparation for diagnostic testing, medication adherence  
• Utilize tools to access and engage with your health data e.g. Open Notes, Shared Notes  
• Commit to finding the right doctor, the right partnership  
• Be informed and advocate for yourself  
• Develop a care map of past diagnosis and treatments to bring to the appointments and enter into record.  
• Be actively involved in your healthcare  
• Have another person present to listen and advocate with you  
• Request and utilize tools to enhance knowledge and skill e.g. SIDM Patient Tool Kit |
## Change Package: Cognitive Performance

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| **Clinical Decision Support** | | • Use Reminders to support cognitive error e.g. Checklists  
• Use Constraints to support cognitive methods and inhibit faulty synthesis e.g. multi diagnosis process  
• Develop Affordances that support continued, reasonable alternatives after initial diagnosis is reached  
• Explore Forcing Function of Include Not Yet Diagnosed as a convention in EHR to enhance communication and convey uncertainty of diagnosis to care providers  
• Develop forcing functions to support desired behavior e.g. documentation of Clinical Thinking in EHR such as differential diagnosis  
• Utilize and Optimize current technology  
• Automate Screening Checklists |
| **Reflective Self-Practice** | | • Develop and test Critical Thinking Reflection and Metacognitive processes e.g. Take 2: Think Do, Crystal Ball (assume diagnosis is incorrect) or complete differential diagnosis  
• Determine and test Cognitive Debiasing strategies  
• Learn and test Cognitive Forcing Functions strategies |
| **Diagnostic Environment** | | • Develop processes to routinely obtain second opinions  
• Use specific tools for specific population segments or location e.g. Ottawa Ankle /Knee Tool  
• Build processes to support routine and effective feedback on diagnosis accuracy  
• Build time into the diagnostic process  
• Reduce interruptions and distractions during diagnostic process  
• Provide education and training on Clinical Reasoning guided by emerging evidence  
• Design processes to address human factors |
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| Learning System and Environment | Culture of Psychological Safety and Transparency | Create structure/processes to question practices, surface discrepancies, report problems or propose new ideas  
- Enhance structure and processes for care providers to have confidence that they will receive respect and consideration from others e.g. explore applicability of Just Culture to Diagnostic medicine  
- Support development of processes for open discussion of tough issues which nurtures contrasting points of view  
- Build process and methods to discuss error with Patient, Family, Caregivers e.g. AHRQ Candor |
| Quality Improvement Structure and Process | | Utilize improvement tools to support improved understanding of the system and experience of the patient e.g. Journey mapping, RCA Fishbone Diagram, FMEA (Failure Modes and Effects Analysis)  
- Develop reliable and routine timely feedback processes on Diagnosis to ED, Patient & Caregivers, Providers and Diagnostic Team e.g. Murmers  
- Create system processes to learn from incorrect diagnosis events  
- Develop useful measures for the Diagnostic Process and Outcome, e.g. Diagnostic Error Index  
- Explore development of proactive Trigger Tools for Diagnostic Error e.g. average LOS or clinical course for specific diagnosis with forcing function for analysis or development of new diagnosis if not following typical course  
- Develop systematic review processes e.g. DEER Taxonomy Chart Audit Tool, Case Review based on specific criteria, IHI Global Trigger Tool for Harm  
- Engage in Collaborative Improvement Initiatives and other and other networks for learning  
- Develop Patient and Family Advisory Councils  
- Use segmentation as means of creating specific targeted processes e.g. tests not performed in house, Adults, Pediatrics, ED, ICU, determination of diagnosis in complex situations  
- Consider Unit Based Multidisciplinary Leadership Teams  
- Include a patient or family member on all Improvement Teams  
- Leveraging consumer oriented surveys to focus on diagnostic satisfaction e.g. “Were your diagnostic needs met?” |
| Education and Training Structure and Process | | Increase awareness of Diagnostic Harm and Errors  
- Improve education methods and content for Diagnostic Medicine e.g. Simulation, Grand Rounds, Case based feedback, Teaching Databases, Clinical Reasoning Skills, Teaming, Arguing with Civility |

SOCIETY to IMPROVE DIAGNOSIS in MEDICINE
IHI-led 1.5-day meeting included 1-2 representatives from each participating organization as well as SIDM, IHI, GBMF, and members of the expert advisory team.

The goal of the 1.5-day meeting was to use the report of the evidence, the collection of tools, and the deliberations occurring at the meeting to identify measurable interventions.

During this meeting, SIDM/IHI paired the selected pilot sites with an appropriate intervention.
Deliverables

Driven by the Driver Diagram, each site:

• Identified an intervention
• Developed measures
• Rolled out multiple PDSA cycles
• Collected and reported data
Sites and interventions

• **MedStar Health**
  ▪ Improving utilization of the VTE advisor to help physicians stratify patients’ risk of VTE

• **University of Michigan**
  ▪ Mitigating diagnostic errors by gaining insight into the cognitive aspect of the diagnostic process

• **Nationwide Children’s Hospital**
  ▪ Improving cognitive performance as it relates to the differential diagnosis

• **Tufts Medical Center**
  ▪ Increasing compliance with specific follow-up tests

• **Northwell Health**
  ▪ Improving patient engagement in transitions of care

• **University of California San Francisco**
  ▪ Reducing diagnostic errors by developing automated trigger tools and a mechanism for provider feedback
# Sample Measures

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<th>SIDM Measurement Strategy</th>
<th>Nationwide Children’s Hospital, Columbus, OH</th>
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<tr>
<th>Name &amp; Type</th>
<th>Numerator (N)</th>
<th>Denominator (D)</th>
<th>Collection Process</th>
<th>Goal</th>
<th>Due</th>
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<tbody>
<tr>
<td><strong>Percent Documented Differential Diagnosis (H&amp;P)</strong></td>
<td>N: from the denominator, the number of H&amp;Ps with documented differential diagnosis</td>
<td>D: total number of H&amp;Ps of patients admitted to general pediatrics with unspecified abdominal pain in the past month</td>
<td>On the last day of the calendar month, identify your population (denominator). From this denominator, count the number of patients with H&amp;Ps with documented differential diagnosis (numerator). Insert numerator and denominator into the Extranet each month. The Extranet will convert the numerator and denominator into a percentage.</td>
<td>Increase proportion of H&amp;Ps with documented differential diagnosis by 25% from baseline</td>
<td>Monthly (By the 15th of every month, data for the previous month should be posted)</td>
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<td><strong>7-Day Readmission Rate for Patients with Unspecified Abdominal Pain</strong></td>
<td>N: from the denominator, total number of patients readmitted to general pediatrics within 7-days</td>
<td>D: total number of patients admitted to general pediatrics with unspecified abdominal pain diagnosis in the past month</td>
<td>On the last day of the calendar month, identify your population (denominator). From this denominator, count total number of patients readmitted to general pediatrics within 7-days (numerator). Insert numerator and denominator into the Extranet each month. The Extranet will convert the numerator and denominator into a percentage.</td>
<td>Reduction from baseline median by 20%</td>
<td>Monthly (By the 15th of every month, data for the previous month should be posted)</td>
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<td><strong>30-Day Readmission Rate for Patients with Unspecified Abdominal Pain</strong></td>
<td>N: from the denominator, total number of patients readmitted to general pediatrics within 30-days</td>
<td>D: total number of patients admitted to general pediatrics with unspecified abdominal pain diagnosis in the past month</td>
<td>On the last day of the calendar month, identify your population (denominator). From this denominator, count total number of patients readmitted to general pediatrics within 30-days (numerator). Insert numerator and denominator into the Extranet each month. The Extranet will convert the numerator and denominator into a percentage.</td>
<td>Reduction from baseline median by 20%</td>
<td>Monthly (By the 15th of every month, data for the previous month should be posted)</td>
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<td><strong>Percent of Duplicate Imaging Studies</strong></td>
<td>N: from the denominator, total number of patients who received duplicate imaging studies</td>
<td>D: total number of patients admitted to general pediatrics with unspecified abdominal pain diagnosis in the past month</td>
<td>On the last day of the calendar month, identify the population (denominator). From the denominator, count total number of patients who had received duplicate imaging studies (e.g. abdominal ultrasounds, x-rays, CT scans, etc), which will serve as the numerator. Insert numerator and denominator into the Extranet each month. The Extranet will convert the numerator and denominator into a percentage.</td>
<td>Obtain baseline data; some patients may require repeat imaging studies to monitor the evolution of the underlying pathology. Conversely, data may reveal duplicate imaging studies may be unnecessary in some instances.</td>
<td>Monthly (By the 15th of every month, data for the previous month should be posted)</td>
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<td>Aim</td>
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<td>Secondary Drivers</td>
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**SIDM/IHI DRIVER DIAGRAM AND CHANGE PACKAGE**

- **Team Structure** (MedStar)
- Team Leadership
- **Team Communication and Behavior** (Nationwide, Northwell)
- **Patient, Families & Caregivers as Team Member** (Northwell, MedStar)
- **Organizational Structure** (UCSF)
- **Clinical Operations** (Tufts, UCSF, U of M, Nationwide, MedStar)
- Access to Care
- Patient, Families and Caregivers as Team Member
- **Patient Engagement and Empowerment** (Tufts)
- **Clinical Decision Support** (Nationwide, U of M)
- Reflective Self-Practice
- **Diagnostic Environment** (Nationwide, UCSF)
- **Culture of Psychological Safety and Transparency** (UCSF)
- **Quality Improvement Structure and Process** (MedStar, Nationwide, Tufts, UCSF, U of M)
- **Education and Training Structure and Process** (U of M)

(11/01/2017)
Choosing Approaches and Improvement Methods to Support Change

No one has solved the issue/little evidence on theories that work with high success, are scalable, or replicable. Other areas may have some ideas of change that have worked but not in this field. Approaches: idealized design, prototyping, N of 1, co-design.

We know what to do. Process meets needs appropriately, but is not reliable. Approaches: BTS, reliability design process, work on sub population, use DD, Concept Map, MFI, etc.

Some evidence available. Some research/successful ideas. Process is not effectively or efficiently meeting customer and/or organizations needs. Approach: develop Charter and problem statement, understand theory of change (DD, Concept map), learning community, LAN, Tool kits, MFI, Co-design, sub-population etc.

Adapted from W.E. Deming.
BTS- Beyond Traditional Education

Figure 1. Sketch of the Breakthrough Series Model by Paul Batalden, MD (1994)
IHI Breakthrough Series (6 to 13 months time frame)

Select Topic (develop mission)

Expert Meeting

Planning Group

Participants (10-100 teams)

Prework

Develop Framework & Changes

Supports

Email

Visits

Phone

Assessments

Monthly Team Reports

Congress, Guides, Publications etc.
Model for Improvement* (MFI)

How many have used the Model for Improvement (MFI) in your improvement work?
AIM Worksheet

The (name of your team/group) ________________

intends to accomplish (This is a general over arching statement describing what you intend to accomplish during the time you work on this process. It might also include the initial change areas to be tested i.e. eliminating waste, cross training.) ___________________________________________________________
_______________________________________________________________________
_______________________________________________________________________
_______________________________________________________________________

by (time frame, i.e., month/year in which you intend to accomplish improvement)______________________

for (what group are you doing this for – who is the customer)____________________________________

because (the rational and reasons to work on this improvement project)
_______________________________________________________________________
_______________________________________________________________________
_______________________________________________________________________

Our goals include: (These are the numeric goals you hope to achieve i.e. 75 % reduction in errors or 50% decrease in turnaround time. They can also be structure goals such as 85% staff trained in QI tools.)
•
•
•

Our measures: (The specific measures that show if your goals are met. i.e. rate of errors per week using sampling method or weekly average turn- around time etc.)
•
•
•
<table>
<thead>
<tr>
<th>Name &amp; Type</th>
<th>Numerator (N) Denominator (D) Count</th>
<th>Collection Process</th>
<th>Goal</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Measure Type (Outcome Process Structure Balance)</td>
<td>N: D: C:</td>
<td>Process by which data will be routinely collected</td>
<td>Percent reduction or Numeric Goal</td>
<td>Monthly (By the 15th of every month, data for the previous month should be posted)</td>
</tr>
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<td>Monthly (By the 15th of every month, data for the previous month should be posted)</td>
</tr>
</tbody>
</table>
Change

Improvement usually requires change.....

however not all change is an Improvement!
Learning with the PDSA cycle

Who remembers their very first PDSA Cycle? Or a very memorable PDSA cycle?
The Sequence for Improvement

1. **Developing a change**
2. **Theory and Prediction**
3. **Testing under a variety of conditions**
4. **Implementing a change**
5. **Testing a change**
6. **Make part of routine operations**
7. **Sustaining improvements and spreading changes to other locations**

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BREAK
## SIDM/IHI DRIVER DIAGRAM AND CHANGE PACKAGE

### Improve Diagnosis to Reduce Harm

**Aim**

**Primary Drivers**
- Team Structure (MedStar)
- Team Leadership
- **Team Communication and Behavior** (Nationwide, Northwell)
- Patient, Families & Caregivers as Team Member (Northwell, MedStar)

**Secondary Drivers**
- Organizational Structure (UCSF)
- **Clinical Operations** (Tufts, UCSF, U of M, Nationwide, MedStar)
- Access to Care

### Care Team

- Patient, Families and Caregivers as Team Member
- Patient Engagement and Empowerment (Tufts)

### Diagnostic Environment & Diagnostic Process

- Clinical Decision Support (Nationwide, U of M)
- Reflective Self-Practice
- **Diagnostic Environment** (Nationwide, UCSF)

### Patient, Family and Caregiver

- Patient, Families and Caregivers as Team Member
- **Patient Engagement and Empowerment** (Tufts)

### Diagnostic Cognitive Performance

- Culture of Psychological Safety and Transparency (UCSF)
- Quality Improvement Structure and Process (MedStar, Nationwide, Tufts, UCSF, U of M)
- Education and Training Structure and Process (U of M)

### Learning System & Environment

- **Culture of Psychological Safety and Transparency** (UCSF)
- Quality Improvement Structure and Process (MedStar, Nationwide, Tufts, UCSF, U of M)
- Education and Training Structure and Process (U of M)

(11/01/2017)
**Scope:**
UM sought to field test a highly-limited scope intervention in the form of a scripted, structured patient problem representation statement template to increase the influence of System 2 (slow thinking) over System 1 (fast thinking) and thus potentially reduce diagnostic mishaps.

**Results:**
In the post-intervention chart review after the MDM template was available to providers for implementation, 99% of participant provider documentation contained a patient problem representation statement within the MDM. Each critical portion presence also improved.

<table>
<thead>
<tr>
<th>What is being included in the patient problem representation statement?</th>
<th>Pre-Intervention (n=154)</th>
<th>Post-intervention (n=147)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient demographics</td>
<td>81.2% (n=125)</td>
<td>92.5% (n=136)</td>
</tr>
<tr>
<td>Presenting complaint</td>
<td>90.3% (n=139)</td>
<td>97.3% (n=143)</td>
</tr>
<tr>
<td>Relevant history</td>
<td>25.3% (n=39)</td>
<td>63.3% (n=93)</td>
</tr>
<tr>
<td>Key relevant findings</td>
<td>88.3% (n=136)</td>
<td>98% (n=144)</td>
</tr>
<tr>
<td>Key interventions/test results</td>
<td>61.7% (n=95)</td>
<td>74.8% (n=110)</td>
</tr>
</tbody>
</table>
Challenges

• The biggest challenges faced with implementation of this initiative were provider acceptance and sustainability. Transitioning from one way of documenting to another required behavior change as many felt that the intervention was inconsistent with the way they currently document or in many instances, unnecessary especially if it was not a diagnostic dilemma.

• Another major issue was the variability of processes to document the MDM portion among providers – some used verbal dictation to transcription services for their documentation while others either rely on either electronic, highly customized templates, or Dragon dictation software, or conventional typing.

• Many providers felt that adjusting the documentation for MDM in the emergency department notes was not helpful for their “in the moment” diagnostic decision making while caring for patients, as many complete this cognitive task prior to documentation initiation.
Scope:
To carry out enhanced patient communication using a scripted “Teach-Back“ intervention in 507 trials during a five-month period of time. Providers were asked to explain a given diagnosis to a patient and have the patient repeat back what they understood about their diagnosis/diagnoses at the end of the encounter.

Results:
• 85% of the inpatient adult and 54% of the pediatric families were successfully able to demonstrate an understanding of their diagnoses.
• Providers involved in the project unanimously reported improved satisfaction with the patient-physician relationship that took place during the intervention, especially in the Emergency Department and Ambulatory settings. The need to perform Teach-Back and judge the adequacy of the patient’s response yielded an effective forcing strategy for a “diagnostic time-out“.
Challenges

• “Time stress”, either due to physician time pressure or pressure to be discharged by the patient

• Difficulty generalizing the Teach Back script developed to fit all patients, particularly due to varying levels of medical/health care literacy

• Locating the resources necessary (i.e. staff) to develop and administer the Teach-Back intervention presented challenges in some of the clinical settings involved (e.g. Ambulatory, Inpatient Pediatrics)

• Maintaining providers’ enthusiasm over the five-month span of this initiative
Scope:
During this prototyping collaborative, the team introduced a framework for diagnostic deliberation, the “diagnostic time-out” in efforts to circumvent cognitive biases that may interfere with medical decision-making. The diagnostic time-out asks the medical team to pause and structures the discussion with two questions: 1) What are the two to three most likely diagnoses for this patient? and 2) What is at least one life-threatening/more severe diagnosis that we must consider for this patient?

Results:
At baseline, residents and attending physicians documented a differential diagnosis in 52% of initial H&Ps. Through the applied intervention and increased situational awareness, differential diagnosis documentation is gradually improving towards a goal of 65%, representing an aim of a 25% increase.
Challenges

• Education to both resident and attending physicians regarding the diagnostic time-out intervention was difficult to provide consistently due to frequent transitions within the physician teams.

• Feedback on physician documentation habits lagged; had originally planned to evaluate imaging studies and correlate to possible misdiagnoses, but were limited in time and resources given the need for exhaustive chart reviews.

• Maintaining a sustained level of interest and participation of the physicians in utilizing the diagnostic timeout on daily rounds, as well as the documentation of high quality differentials, especially in times of high patient volumes.
Scope:
The members of the hospital medicine program developed a triggered 2-provider diagnostic error review in parallel with a provider-level diagnostic error feedback mechanism. Cases were identified utilizing four triggers-- seven-day all-cause hospital readmissions, autopsy, inpatient mortality, and self-report. These cases were reviewed by two hospital medicine physicians using the SaferDX tool to determine if a diagnostic error had occurred and the impact of said error.

Results:
From January-June 2018, there were 4458 discharges from the hospital medicine service with 201 (4.5%) seven-day readmissions; 196 readmissions underwent review. Seventeen (8.7%) were found to contain diagnostic errors representing a breadth of unique diagnoses. Sixteen had a moderate impact on patients including short-term morbidity, increased length of stay, or invasive procedure. The most common categories of root cause included Laboratory/Radiology Tests and Assessment; the most common subcategories were failure/delay in ordering needed test(s), erroneous clinician interpretation of test, and failure/delay to recognize/weigh urgency.
Challenges

• In spite of an advanced patient safety culture at UCSF with a robust anonymous incident reporting system and a Division-level Case Review Committee (that allows for direct provider referral via verbal/email contact), there was a palpable and unique resistance to referring cases of diagnostic inaccuracy that may have been “committed” by another provider in the Division. There was a perception that diagnostic error was more readily attributed to an individual provider as opposed to the system that facilitates diagnosis

• Among other clinical and non-clinical responsibilities, the team of six hospitalists had very limited in bandwidth to complete project deadlines

• Though uncertainty was relatively simple to measure using the adapted scale, the process of identifying patients and obtaining real-time diagnostic uncertainty was rather time intensive
Tufts Medical Center

Scope:
The Outpatient Radiology Results Notification Engine ("Results Engine") is designed to send notifications related to outpatient orders/results to Tufts MC Physicians who place these orders. The workflow starts when a Radiology order is placed for a patient and an appointment is scheduled. If the appointment date is less than five days from the date the appointment was scheduled, or if the order is for an inpatient admission, then the Results Engine will not track that order because it is assumed to be at low risk of missed follow up. Otherwise, the Results Engine sets a timer to expire 14 days from the time/date of the outpatient test appointment.

Results:
• Implemented the Results Engine in Adult Primary Care and Pulmonary Clinic in each of three PDSA cycles.
• Improved adoption of the Results Engine by incorporating improvements from frontline physicians at Tufts MC.
• Physicians who participated in the first two PDSA cycles reported cases in which the notifications had helped them ensure appropriate follow-up for their patients.
• Participating physicians had a higher number of completed tests compared to their own baseline performance and compared to their non-participating peers.
Challenges

• Surveying physicians about the value of completed tests notifications was challenging, given their busy schedules

• Physicians in Adult Primary Care reported that their ambulatory EMR (Logician) provided them with completed order notifications and the Results Engine email notifications cluttered their email inboxes. In contrast, Pulmonary Clinic physicians generally appreciated completed test notifications, as it offered a more convenient format than their EMR (eCW). A unified EMR would simplify implementation, but the Results Engine tool functioned across multiple platforms.

• Hand collection of performance data became onerous and infeasible after PDSA-1, as the volume of data increased substantially

• A small number of tests without an ordering MD were associated with outside MDs and were excluded from the project

• Different physicians had different preferences for participating in the project and embracing the new notifications
**Scope:**
This project sought to improve utilization of the VTE tool by providing education on clinical decision support tools, requirement of VTE risk stratification as a core measure performance metric, ACCP recommendations for optimal VTE prophylaxis and session on correct completion of VTE advisor tool.

**Results:**

- **MedStar Washington Hospital Center**
  Surveying providers and regularly reviewing the Advisor tool at monthly VTE Committee meetings greatly increased understanding of barriers to its use. The team was surprised to learn that the VTE advisor has many nuances to aid in completion of accurate risk assessment, such as icons and color coding, which were not activated and could enhance utilization. Studying individual instances of inaccurate assessment identified three groups for potential intervention: nocturnists (who demonstrate highest usage of the Advisor tool due to the predominance of evening and overnight admissions), residents (whose demonstrated least familiarity with the tool and its use), and specialists (who demonstrate lowest use of the Advisor tool due to standard protocols for post-operative VTE prophylaxis).

- **MedStar Southern Maryland Hospital Center**
  Focusing on improving VTE risk assessment through small tests of change revealed that assessments were not routinely performed. The team saw this as an opportunity to implement a standard workflow that was easily adopted by the entire care team. Further, although direct patient engagement in tests of change was not achieved, a survey of existing resources led to the discovery of a patient education channel that included VTE prophylaxis. This is now used more extensively by staff caring for post-operative patients. For best patient impact, VTE risk assessment was incorporated into interdisciplinary daily bedside patient rounds.
Challenges

• Although patient and family advisory councils for quality and safety (PFACQS) exist at each location, it was challenging to engage providers to directly involve patients in tests of change.

• Specialty-specific protocols for VTE prophylaxis circumvent the need for provider-based VTE risk assessment at the time of admission, which creates a mismatch between actual and perceived risk for developing VTE and is a barrier to use of the tool.

• Although both teams collected a large amount of data, they did not feel that it accurately represented their work or moved providers to permanently adopt use of the Advisor tool.

• Because the VTE Risk Advisor is designed at the time of EHR implementation, there is limited ability to make changes to support clinical decision making, making workarounds through provider education a necessity.
1. What quality improvement initiative is your organization working on? What do you think you need to work on?

2. Which of the drivers in the Driver Diagram are most relevant to your institution?
Improve Diagnosis to Reduce Harm

**Aim**
- **Primary Drivers**
  - Care Team
    - Team Structure
    - Team Leadership
    - Team Communication and Behavior
    - Patient, Families and Caregivers as Team Member
  - Diagnostic Environment & the Diagnostic Process
    - Organizational Structure
    - Clinical Operations
    - Access to Care
  - Patient, Family and Caregiver
    - Patient, Families and Caregivers as Team Member
    - Patient Engagement and Empowerment
  - Diagnostic Cognitive Performance
    - Clinical Decision Support
    - Reflective Self-Practice
    - Diagnostic Environment
  - Learning System & Environment
    - Culture of Psychological Safety and Transparency
    - Quality Improvement Structure and Process
    - Education and Training Structure and Process

(11/01/2017)
Learnings

• Structuring of cognitive processes
• Change package utilization
• PDSA cycle value
• Physician feedback
Challenges

- Global measure
- Cross pollination
- Inadequate time
- Cultural norms
- Effective patient and family engagement
- Research versus improvement paradigm
- Sustainability
1. Reports from various hospitals on their QI initiatives in the diagnostic quality and safety field
2. Group work on three main questions:
   - What are the barriers to making diagnostic quality and safety a top priority?
   - What are the barriers to identifying promising practices?
   - What are the barriers to scaling and accelerating the use of practices and lessons learned?

Interest in future collaborations on:
   - Establishing a burning platform: demonstrating there is a diagnostic error problem
   - Improving diagnostic psychological safety
   - Lung cancer diagnosis OR other "screenable" cancers
   - Implementation of clinical decision support tools
   - Testing/ referral completion from multiple settings (My Chart, txt msg, EMR)
   - Emergency medicine condition specific diagnostic improvement (AMI, stroke, undifferentiated abdominal pain, PE)
Driver Change Package Exercise!
DEFINITION OF A DRIVER DIAGRAM:

A Driver Diagram is a tool to help form and display a current workable theory of change towards improvement. The Primary and Secondary Drivers attempt to include current knowledge and understanding of the processes that are necessary and sufficient to achieve the intended desired Outcomes. They [usually] include three elements: structures that comprise the system, processes that represent the work of the system and operating norms that demonstrate the explicit and tacit culture of the system.” (Bennet and Provost 2015 What's your Theory? Quality Progress.com). This Driver Diagram was created based on an environment scan of current work, literature and multiple rounds of feedback. It is a living document and changes as we learn.
**Driver Definitions**

**Key Leverage Points:** “The Primary and Secondary Drivers ...identify the elements in the system that are necessary and sufficient to achieve the intended Outcomes. They [usually] include three elements: structures that comprise the system, processes that represent the work of the system and operating norms that demonstrate the explicit and tacit culture of the system.” (Bennet and Provost 2015 What's your Theory? Quality Progress.com)

- The **Care Team Driver** may be defined as a multidisciplinary team usually organized under the leadership of a physician; each member of the team has specific responsibilities and the whole team contributes to the care of the patient. The Diagnostic Care Team is described in the IOM Report on *Improving Diagnosis in Health Care* as the Diagnostician, the Healthcare Professionals who support the diagnostic process and the patient and family members. The Key Change Ideas or Descriptions associated with the Care Team Drivers are actionable changes known to or have potential to improve the system, processes or operating norms and that can be tested by *the care team*.

- The **Diagnostic Environment and Diagnostic Process** may be described as all of the steps involved in attempting to provide a patient an explanation of their health problem, and the environment is which this takes place. For the purposes of this project, the focus is within the local environment more than the many external factors that could impact diagnosis. The Key Change Ideas or Descriptions associated with the Diagnostic Environment and Diagnostic Process Drivers are actionable changes known to or have potential to improve the system, processes or operating norms and that can be tested by *caregivers, management and leadership*.

- The **Patient, Family and Caregiver** may be defined as actions taken by the patient and family to be a member of the diagnostic team, engage with the healthcare system and support their empowerment within the system of care. The Key Change Ideas or Descriptions associated with the Patient, Family and Caregiver Drivers are actionable changes known to or have potential to improve the system, processes or operating norms that can be tested by *patients, family and caregivers*.

- The **Cognitive Performance** Driver refers to the process of clinical reasoning: How the diagnostician integrates his\her own knowledge and the information derived from the patient, family and the medical record to arrive at appropriate diagnostic considerations. Cognitive performance also includes meta-cognitive aspects of diagnosis, including calibration, an appropriate sense of uncertainty and the need (or lack of need) for urgency, understanding how affect and emotions influence the diagnostic process, and being able to incorporate feedback to improve performance. The Key Change Ideas or Descriptions associated with the Cognitive Performance Drivers are actionable changes known to or have potential to improve the system, processes or operating norms that can be tested by *Diagnosticians*.

- The **Learning System** Driver maybe described as the structure and processes of creating, retaining, and transferring knowledge within an organization to support organizational learning. An organization improves over time as it gains experience. From this experience, it is able to create knowledge. The Key Change Ideas or Descriptions associated with the Learning System Drivers are actionable changes known to or have potential to improve the system, processes or operating norms that can be tested by *those who work within or manage the system*.
SIDM/IHI DRIVER DIAGRAM AND CHANGE PACKAGE

Aim

Improve Diagnosis to Reduce Harm

Primary Drivers

Care Team
- Team Structure
- Team Leadership
- Team Communication and Behavior
- Patient, Families and Caregivers as Team Member

Diagnostic Environment & the Diagnostic Process
- Organizational Structure
- Clinical Operations
- Access to Care

Patient, Family and Caregiver
- Patient, Families and Caregivers as Team Member
- Patient Engagement and Empowerment

Diagnostic Cognitive Performance
- Clinical Decision Support
- Reflective Self-Practice
- Diagnostic Environment

Learning System & Environment
- Culture of Psychological Safety and Transparency
- Quality Improvement Structure and Process
- Education and Training Structure and Process

Secondary Drivers

(11/01/2017)
DEFINITION OF A CHANGE PACKAGE:

A change package is a concise and practical document that includes ideas and inspiration for teams seeking to apply QI methods to increasing the effectiveness and efficiency of their care processes and outcomes. Change packages focus on a specific condition, care process, or health system feature and generally include background material; a summary of evidence or best practices; and specific tools, strategies, and examples that can be applied to improvement work.

(National Pediatric Cardiology Quality Improvement Collaborative)
<table>
<thead>
<tr>
<th>PRIMARY DRIVER</th>
<th>SECONDARY DRIVERS</th>
<th>KEY CHANGE IDEAS OR DESCRIPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Team Structure</strong></td>
<td>• Work in Diagnostic Teams as defined in IOM Report on Improving Diagnosis in Health Care</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Identify structure of diagnostic team</td>
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<td></td>
<td></td>
<td>• Identify members of the diagnostic team e.g. individual service line members, being cognizant of care transitions and fluid nature of team</td>
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<tr>
<td></td>
<td></td>
<td>• Identify roles of diagnostic team members, including team leader</td>
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<tr>
<td></td>
<td></td>
<td>• Improve methods for mutual support of the team e.g. ground rules, role clarification, common aim</td>
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<td></td>
<td><strong>Team Leadership</strong></td>
<td>• Foster inter-professional collaboration</td>
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<td></td>
<td></td>
<td>• Organize and Lead Multidisciplinary Team Care Meetings and Rounding</td>
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<tr>
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<td>• Include explicit questions in Multidisciplinary Team Rounding regarding increased information gathering (influences differential) and recognition of typical clinical course</td>
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<td></td>
<td>• Improve processes to support team based debate on Diagnosis e.g. Red Team Blue Team</td>
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<tr>
<td></td>
<td></td>
<td>• Support an environment of psychological safety and joy/meaning in work</td>
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<tr>
<td></td>
<td></td>
<td>• Develop processes to support transparency and accountability</td>
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<tr>
<td></td>
<td></td>
<td>• Provide evidence based training for Team Members e.g. TeamSTEPPS</td>
</tr>
<tr>
<td></td>
<td><strong>Team Communication &amp; Behavior</strong></td>
<td>• Utilize and standardize communication techniques for critical information e.g. SBAR, to question diagnostic accuracy, differential diagnosis, or uncertainty throughout the care process</td>
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<tr>
<td></td>
<td></td>
<td>• Enhance information exchange for transitions (Handoff) utilizing standardized tools e.g. I Pass the Baton</td>
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<tr>
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<td>• Improve methods to share concerns e.g. CUS</td>
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<tr>
<td></td>
<td></td>
<td>• Utilize effective team meeting structure and process to support communication and coordination</td>
</tr>
<tr>
<td></td>
<td><strong>Patient, Families &amp; Caregivers as Team Member</strong></td>
<td>• Advocate for the patient</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Provide learning opportunities for patients, families and care givers to learn about the Diagnostic Process e.g. Diagnostic Toolkit, Diagnostic Uncertainty Questions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Develop communication tool for patients and families identifying risk of diagnostic error e.g. a diagnostic charter or consent for clinical care</td>
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<td>• Adjust time and structure of patient discussion based on diagnostic certainty</td>
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<td></td>
<td>• Create safe environments that support feedback and concerns from patients, family or caregivers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Provide easy access to information to patients, family or caregivers e.g. clinical notes and testing results</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Engage patients and family in diagnostic process improvement (e.g. shared decision making, feedback on symptom changes and second opinions)</td>
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<td></td>
<td></td>
<td>• Coach Patients, families on process to share symptoms e.g. SBAR</td>
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<td></td>
<td>• Develop process for patients to request a second consult when there’s diagnostic uncertainty</td>
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<td>• Clarify health literacy and language preference</td>
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<tr>
<td></td>
<td></td>
<td>• Clarify members of the diagnostic team and their role e.g. facesheet for providers or “baseball cards”</td>
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<tr>
<td></td>
<td></td>
<td>• Ask patients their preferred method for communication e.g. phone, email, mail</td>
</tr>
</tbody>
</table>
|                |                   | • Identifying Context of Patient and Family e.g. Transportation needs, family/caregiver support network, health literacy, insurance status, SES.
<table>
<thead>
<tr>
<th>PRIMARY DRIVER</th>
<th>SECONDARY DRIVER</th>
<th>KEY CHANGE IDEAS OR DESCRIPTIONS</th>
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</thead>
</table>
| Diagnostic Environment and the Diagnostic Process | Organization Structure | • Develop evidence based Policies and associated procedures to support reliable care, clarify roles and responsibilities  
• Explore automated Clinical Decision Support for the Diagnostic Process  
• Test automated programs for immediate communication and feedback on readmissions e.g. Murmurs  
• Standardize and implement Diagnostic Algorithms; Automate Checklists and Algorithms  
• Use data mining and surveillance tools for early identification and mitigation of diagnostic error  
• Develop an Early Warning System process to support clinical deterioration, e.g. PEWS MEWS, SEPSIS  
• Place someone in charge of monitoring and improving diagnostic quality in the organization  
• Create system formal and informal second opinions in timely way e.g. diagnostic neighborhoods; fresh eyes; re-reviewing cases; Improve resiliency; Review the problem list  
• Explore electronic or telemedicine curbside/consultant documentation and infrastructure  
• Engage Leadership in creating a culture that supports diagnostic safety.  
• Consider Unit based Multidisciplinary Leadership Teams |
|               | Clinical Operations | • Reduce practice variation e.g. standardize key Handoff processes  
• Enhance linkages and support system communication  
• Consider forcing functions to help manage results e.g. alerts for out of range results, incomplete testing or delayed or canceled high risk referrals  
• Use checklists to support complex diagnostic processes  
• Clearly define escalation path for deteriorating clinical conditions  
• Optimizing who does what (working at the top of one’s license)  
• Make diagnosis easier (time to think; fewer distractions; )  
• Improving access to expertise e.g. KP’s electronic curbside consults  
• Improve reliability and timeliness of lab and radiology testing focusing on pre- and post-analytic problem areas; Make Key processes within Lab results, Radiology results and Specialty referral highly reliable  
• Use trigger tools to identify opportunities to improve care and prevent harm  
• Improve follow-up (lab\radiology\clinical process management systems); Closing the loop; Design process for connecting and reporting test results that return after discharge e.g. D/C summary contains list of pending test results  
• Optimizing how staff are aligned and work to improve diagnosis e.g. care tracks; pre-planned work flows; how to minimize patient trips, “Swarming” – the whole team meets the patient at the onset of care |
|               | Access to Care | • Develop Patient portals and processes  
• Improve ER follow-up process  
• Care coordination to improve access or flow. Use patient navigators  
• Better clarity on who is the care team, how to reach them  
• Explore or Optimize Telemedicine  
• Devices to improve communication with the patient (whiteboard; iPad)  
• Picking up diagnostic issues wherever they arise |
<table>
<thead>
<tr>
<th>PRIMARY DRIVER</th>
<th>SECONDARY DRIVER</th>
<th>KEY CHANGE IDEAS OR DESCRIPTIONS</th>
</tr>
</thead>
</table>
| Patient, Family and Caregivers as Team Member | • Provide accurate and complete information to your provider  
• Know your medication purpose, doses and side effects  
• Present symptoms completely and clearly using a frame of symptomology e.g. SBAR, advanced checklist for preparing description of symptoms  
• Report adverse events, errors, unsafe conditions (both in real-time and after the fact) to the Care Team  
• Inquire about diagnostic certainty, e.g. What else could this be?  
• Communicate new or changing symptoms  
• Explore options to request a second consult when there’s diagnostic uncertainty or for confirmation  
• Clarify language preference  
• Explore methods for communication with the Care Team and request preferred e.g. email, text, portal, mail  
• Clarify process for further diagnostic questions, especially as Care Team expands.  
• Request a translator or advocate when a language or jargon gets in the way of understanding diagnosis  
• Follow up on any results or referrals  
• Encourage provider to think broadly by asking questions e.g. What else could this be?  
• Code Help– Families and Caregivers report changes not noticeable to care team |
| Patient, Family Engagement and Empowerment | • Maximize use of patient access portals to your EHR  
• Maintain and update your own medical record.  
• Give feedback regarding diagnostic error or uncertainty to provider  
• Engage in shared decision making regarding goals related to diagnosis and care  
• Commit to and engage in action plan related to diagnosis and treatment i.e. accurate preparation for diagnostic testing, medication adherence  
• Utilize tools to access and engage with your health data e.g. Open Notes, Shared Notes  
• Commit to finding the right doctor, the right partnership  
• Be informed and advocate for yourself  
• Develop a care map of past diagnosis and treatments to bring to the appointments and enter into record.  
• Be actively involved in your healthcare  
• Have another person present to listen and advocate with you  
• Request and utilize tools to enhance knowledge and skill e.g. SIDM Patient Tool Kit  
• Volunteer to be a patient representatives on an improvement effort  
• Volunteer to be on a Patient and Family Advisory Counsel |
## Cognitive Performance

### Change Package: Cognitive Performance

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<th>PRIMARY DRIVER</th>
<th>SECONDARY DRIVER</th>
<th>KEY CHANGE IDEAS OR DESCRIPTIONS</th>
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| Cognitive      | Clinical Decision Support | - Use Reminders to support cognitive error e.g. Checklists  
|                |                   | - Use Constraints to support cognitive methods and inhibit faulty synthesis e.g. multi diagnosis process  
|                |                   | - Develop Affordances that support continued, reasonable alternatives after initial diagnosis is reached  
|                |                   | - Explore Forcing Function of Include Not Yet Diagnosed as a convention in EHR to enhance communication and convey uncertainty of diagnosis to care providers  
|                |                   | - Develop forcing functions to support desired behavior e.g. documentation of Clinical Thinking in EHR such as differential diagnosis  
|                |                   | - Utilize and Optimize current technology  
|                |                   | - Automate Screening Checklists |
|                | Reflective Self-Practice | - Develop and test Critical Thinking Reflection and Metacognitive processes e.g. Take 2: Think Do, Crystal Ball (assume diagnosis is incorrect) or complete differential diagnosis  
|                |                   | - Determine and test Cognitive Debiasing strategies  
|                |                   | - Learn and test Cognitive Forcing Functions strategies |
|                | Diagnostic Environment | - Develop processes to routinely obtain second opinions  
|                |                   | - Use specific tools for specific population segments or location e.g. Ottawa Ankle/Knee Tool  
|                |                   | - Build processes to support routine and effective feedback on diagnosis accuracy  
|                |                   | - Build time into the diagnostic process  
|                |                   | - Reduce interruptions and distractions during diagnostic process  
|                |                   | - Provide education and training on Clinical Reasoning guided by emerging evidence  
<p>|                |                   | - Design processes to address human factors |</p>
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|                | Culture of Psychological Safety and Transparency | • Explore structures to support patient contribution to records e.g. Open Notes, Shared Notes, MyChart  
• Create structure /processes to question practices, surface discrepancies, report problems or propose new ideas  
• Enhance structure and processes for care providers to have confidence that they will receive respect and consideration from others e.g. explore applicability of Just Culture to Diagnostic medicine  
• Support development of processes for open discussion of tough issues which nurtures contrasting points of view  
• Build process and methods to discuss error with Patient, Family, Caregivers e.g. AHRQ Candor  
• Support transparency of measurement related to Diagnostic Processes |
|                | Quality Improvement Structure and Process | • Utilize improvement tools to support improved understanding of the system and experience of the patient e.g. Journey mapping, RCA Fishbone Diagram, FMEA (Failure Modes and Effects Analysis)  
• Develop reliable and routine timely feedback processes on Diagnosis to ED, Patient & Caregivers, Providers and Diagnostic Team e.g. Murmers  
• Create system processes to learn from incorrect diagnosis events  
• Develop useful measures for the Diagnostic Process and Outcome, e.g. Diagnostic Error Index  
• Explore development of proactive Trigger Tools for Diagnostic Error e.g. average LOS or clinical course for specific diagnosis with forcing function for analysis or development of new diagnosis if not following typical course  
• Develop systematic review processes e.g. DEER Taxonomy Chart Audit Tool, Case Review based on specific criteria, IHI Global Trigger Tool for Harm  
• Engage in Collaborative Improvement Initiatives and other and other networks for learning  
• Develop Patient and Family Advisory Councils  
• Use segmentation as means of creating specific targeted processes e.g. tests not performed in house, Adults, Pediatrics, ED, ICU, determination of diagnosis in complex situations  
• Consider Unit Based Multidisciplinary Leadership Teams  
• Include a patient or family member on all Improvement Teams  
• Leveraging consumer oriented surveys to focus on diagnostic satisfaction e.g. “Were your diagnostic needs met?” |
|                | Education and Training Structure and Process | • Increase awareness of Diagnostic Harm and Errors  
• Improve education methods and content for Diagnostic Medicine e.g. Simulation, Grand Rounds, Case based feedback, Teaching Databases, Clinical Reasoning Skills, Teaming, Arguing with Civility, Hypothesis Driven Physical Examine  
• Include Diagnostic Harm in Morbidity and Mortality reviews  
• Enhance Leadership development by using effective education and training methods |
Closing ..... 

What is Next?
ONE  WORD