Diagnosing the Diagnostic Dilemma:
An analysis of diagnostic events in the inpatient setting

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Director; Patient Safety Service, CRICO Strategies
Board of Directors, SIDM

Learning Objectives
At the end of the webinar, the participant should be able to:

1. Describe claims data patterns found regarding failure to diagnose in hospitals.
2. Identify non-physician risk mitigation strategies surrounding failure to diagnose.
3. Utilize the adverse reporting system to identify organization failure to diagnose trends.
NAM (IOM) on the Diagnostic Dilemma

... Diagnostic errors persist through all settings of care and harm an unacceptable number of patients

... data on diagnostic errors are sparse

... few reliable measures exist

... errors are often found in retrospect


NAM (IOM) on the Diagnostic Dilemma

• 6 -17% of hospital adverse events
• 5% of US outpatient adults/year
• Contribute to app 10% of patient deaths
• Leading type of paid medical malpractice claims*
  • Twice as likely to have resulted in death
  • Highest proportion of total payments

IOM REPORT SEPTEMBER
2015
NAM (IOM) on the Diagnostic Dilemma

The failure to:

(a) establish an accurate and timely explanation of the patient’s health problem(s)

or

(b) communicate that explanation to the patient

Healthcare is Inherently Risky

› Ever-changing “industry” knowledge
› Ever-growing body of clinical options
› More complex technologically
› Constant variability in work demands
› Production pressure
› Variable individual competency
› Aging population with complex health issues
› Evolving workforce issues
  ◦ shortages / part time / per diem, turnover, (Pandemics!)
We Are Inherently Human

› Memory lapses from stress, fatigue and excessive workloads
› Slips / distractions from interruptions and multi-tasking
› Reliance on workarounds and lax use of protocols in response to production pressure / resource issues
› Decision making with variable availability of information and multi-disciplinary care with poor communication
› Ever shifting resources and team players
› Strong, independent personalities

Can we improve diagnostic error?

Improving Diagnosis in Healthcare; IOM; 09/2015

"Errors will likely worsen as the delivery of health care and the diagnostic process increase in complexity….

...to improve diagnosis, a significant re-envisioning of the diagnostic process and a widespread commitment to change from a variety of stakeholders will be required."
What are the key drivers of diagnostic error?

Monet? Seurat? Cezanne?
Why study medical malpractice data

What you see is not always the truth.
– PsyBoom

We study MPL to “see” what lies beneath the visible aspect of the event.

Small “N” a manageable “view” of most critical
- Smaller “N” allows for deeper analysis of each
- Emphasis on most defined/serious injuries
- CBS multiplies “like” case types (e.g. Dx)

Consistent source for case analysis and trending
- Few sources routinely capture Dx events
- “Hindsight” provides rich detail from full medical record, claims, depositions, and medical experts
- Structured Taxonomy & coding aligns “like issues” for consistent trending of common causation factors

Looks beyond the “headline”
- Explores the relationship between system and human factors in cognitive processing
- Detail level factors promote multi-specialty discussion / solution sharing across usual “silos”
Diagnostic failures are ‘veiled’

- Occur over long timespan or as a result of multiple smaller provider-process failures that are hard to “see / connect”
- Often apparent only in hindsight, but in the pace of urgent care delivery, you have moved on (e.g. Failure to Rescue)

Medical errors can happen to anyone

“Everyone makes errors everyday. No one makes an error on purpose (and) an error is not misconduct. We make errors for a reason.”
Lucian Leape, MD (author IOM)
Exploring medical error thru the lens of Medical Malpractice (MPL) Claims (Comparative Benchmarking System (CBS))

- National database of medical professional liability (MPL) claims
- Claims from >20 Captive & Commercial Insurers from across the country
- Identifies trends with a unique lens on the root causes of medical error and patient harm
- Convenes a national Community of Learning for sharing of insights and best practice solutions

Volume:
- Total Cases include: • claims & suits > 450,000* • open & closed cases
- New cases annually ~ 8–10,000
  *Represents ~30% of US Paid Claims (NPDB)

Content:
- Hospitals & Health Systems • academic & community ~ 500+
- Physicians 185,000
- Clinical, Legal & Financial Attributes

Each case includes expert review of clinical and legal files for in-depth analysis of the issues and trends driving clinical risk and financial loss

*Surgery-related cases are most prevalent; diagnosis-related cases result in higher severity injuries and are more costly.

Top major allegations

MPL cases from claim made years 2013–2017
All CBS N=35,739
NAIC Severity Scale: High = death, permanent grave, permanent major, or permanent significant Medium = permanent minor, temporary major, or temporary minor Low = temporary insignificant, emotional only, or legal issue only
While a larger percentage of cases occur in the ambulatory setting, **cases occurring in the inpatient setting drive a larger proportion of total incurred dollars.**

**Average Total Incurred**

- **Inpatient**
- **Ambulatory**
- **ED**

![Chart showing average total incurred costs for inpatient, ambulatory, and ED cases.]

**Diagram illustrating cost distribution**

- **ED**: 24%
- **Inpatient**: 22%
- **Ambulatory**: 54%

6K cases $1.9B total incurred

NPL cases from claim year 2013-2017 with diagnosis major allegation (N=5,921)

*Cases will often have multiple factors identified*

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**What are the drivers of diagnosis-related cases in the inpatient setting?**
### Overview of ALL Inpatient Diagnosis Cases

**Who is involved and what kinds of cases?**

<table>
<thead>
<tr>
<th>TOP RESPONSIBLE SERVICES</th>
<th>% CASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine</td>
<td>52%</td>
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<td></td>
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<tr>
<td>Surgery</td>
<td>20%</td>
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<td></td>
<td></td>
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<tr>
<td>Radiology</td>
<td>9%</td>
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#### TOP FINAL DIAGNOSES % CASES

- MIs and cardiac events
- Complications of care
- Cerebrovascular disease
- CNS infection

#### INJURY SEVERITY - ALL

<table>
<thead>
<tr>
<th></th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIs and cardiac events</td>
<td>21%</td>
<td>76%</td>
</tr>
<tr>
<td>Complications of care</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>42%</td>
<td>24%</td>
</tr>
<tr>
<td>CNS infection</td>
<td>4%</td>
<td>10%</td>
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</table>

#### INJURY SEVERITY - Medicine

<table>
<thead>
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<tr>
<td>MIs and cardiac events</td>
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<td>10%</td>
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<td>7%</td>
</tr>
<tr>
<td>CNS infection</td>
<td>4%</td>
<td>6%</td>
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n=1,268 claims made 2013–2017 alleging a diagnostic failure and involving an inpatient.

### Details for Medicine-related Inpatient Diagnosis Cases

**Primary Diagnostic Failures drive diagnostic cases in Medical Specialties**

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</tr>
<tr>
<td>Hospitalist</td>
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</tr>
<tr>
<td>Internal Medicine</td>
<td>12%</td>
</tr>
<tr>
<td>Cardiology</td>
<td>7%</td>
</tr>
<tr>
<td>Neurology</td>
<td>4%</td>
</tr>
<tr>
<td>Family Medicine</td>
<td>4%</td>
</tr>
</tbody>
</table>

#### SECONDARY SERVICES % CASES

<table>
<thead>
<tr>
<th></th>
<th>% CASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing</td>
<td>11%</td>
</tr>
</tbody>
</table>

#### TOP FINAL DIAGNOSES % CASES

- MIs and cardiac events 27%
- Cerebrovascular disease 9%
- Complications of care 7%
- Sepsis 6%

#### INJURY SEVERITY - Medicine

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<td>7%</td>
</tr>
<tr>
<td>Sepsis</td>
<td>4%</td>
<td>6%</td>
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#### PT INITIAL DX FINAL DX

<table>
<thead>
<tr>
<th>PT</th>
<th>INITIAL DX</th>
<th>FINAL DX</th>
</tr>
</thead>
<tbody>
<tr>
<td>52 M</td>
<td>Non-Specific Chest Pain</td>
<td>MI (d) - lack of urgency / consult - weekend</td>
</tr>
<tr>
<td>54 M</td>
<td>Pancreatitis</td>
<td>MI (d) - undocumented CP and VS changes</td>
</tr>
<tr>
<td>46 F</td>
<td>High Blood Pressure</td>
<td>Stroke (severe disability) - ETOH withdrawal</td>
</tr>
<tr>
<td>60 M</td>
<td>Non-Specific Chest Pain (no w/up)</td>
<td>PE (d) - focused on cardiac work up</td>
</tr>
</tbody>
</table>

n=662 claims made 2013–2017 alleging a diagnostic failure, involving an inpatient and with Medicine as the primary responsible service.
Causation Factors for Medicine-related Inpatient Diagnosis Cases

**TOP FACTORS % CASES**

- Clinical Judgment 85%
- Communication 43%
- Clinical Environment 19%
- Clinical Systems 19%
- Behavior-related 15%
- Documentation 15%

**Detailed Contributing Factors**

- Failure to appreciate and reconcile relevant sign/symptom/test result 40%
- Failure/delay in ordering dx test 33%
- Narrow diagnostic focus/differential 26%
- Failure/delay obtaining consult/referral 22%
- Misinterpretation of dx studies 18%

- Communication among providers 35%
- Communication with patient/family 11%
- Shift/off-hours conditions 16%
  - including: weekend/holiday 10%

n=1,268 claims made 2013–2017 alleging a diagnostic failure and involving an inpatient.

Details for Surgery-related Inpatient Diagnosis Cases:

Failure to Rescue cases drive diagnostic cases in Surgical services

**TOP RESPONSIBLE SERVICES % CASES**

- Surgery 20%
  - General Surgery 6%
  - Orthopedic 5%

**TOP FINAL DIAGNOSES % CASES**

- Complications of care 17%
- Nervous system & sense organs 6%
- Circulatory system 5%

**INJURY SEVERITY - Surgery**

- High 78%
- Medium 28%
- Low 39% deaths

**Final Diagnoses**

- Hemorrhage
- Sepsis
- Cardiac (events)
- Respiratory (events)

n=98 claims made 2013–2017 alleging a diagnostic failure, involving an inpatient, with Surgery as the primary responsible service, and failure to appreciate and reconcile relevant sign/symptom/test result.
Causation Factors for Surgery-related Inpatient Cases: Failure to Rescue

<table>
<thead>
<tr>
<th>TOP FACTORS</th>
<th>% CASES*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Judgment</td>
<td>94%</td>
</tr>
<tr>
<td>Technical Skill</td>
<td>54%</td>
</tr>
<tr>
<td>Communication</td>
<td>41%</td>
</tr>
<tr>
<td>Third-party Involved</td>
<td>27%</td>
</tr>
<tr>
<td>Documentation</td>
<td>24%</td>
</tr>
<tr>
<td>Clinical Environment</td>
<td>22%</td>
</tr>
</tbody>
</table>

Detailed Contributing Factors

- Failure to appreciate and reconcile relevant sign/symptom/test result: 50%
- Failure/delay in ordering dx test: 33%
- Sel/mgmt surg/invasive procedure: 29%
- Narrow diagnostic focus/differential: 26%
- Known complication: 37%
- Poor technique: 8%
- Communication among providers: 30%
- Communication with patient/family: 13%

n=659 claims made 2013–2017 with a diagnosis-related secondary allegation; 594 involving inpatients; 65 involving ED patients.

Medicine has >% of Primary Dx failure, while Surgery drives “failure to rescue”

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<tr>
<td>Neurology</td>
<td>4%</td>
</tr>
<tr>
<td>Family Medicine</td>
<td>4%</td>
</tr>
<tr>
<td>Surgery</td>
<td>20%</td>
</tr>
<tr>
<td>General Surgery</td>
<td>6%</td>
</tr>
<tr>
<td>Orthopedic</td>
<td>5%</td>
</tr>
<tr>
<td>Radiology</td>
<td>9%</td>
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Failure to Rescue: Surgery: additional services:
- 12% medicine
- Including general medicine, hospitalists, intensivists, gastroenterology
- 8% nursing
- 6% radiology

Failure to Rescue: Medicine: additional services:
- 6% other medicine specialties
- Including infectious disease, gastroenterology, hospitalists, cardiology
- 4% nursing
- 2% radiology
Overview of Emergency Department Diagnosis Cases

Who is involved and what kinds of cases?

### Responsible Services % Cases

<table>
<thead>
<tr>
<th>Services</th>
<th>% Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency</td>
<td>72%</td>
</tr>
<tr>
<td>Radiology</td>
<td>16%</td>
</tr>
<tr>
<td>Medicine</td>
<td>5%</td>
</tr>
<tr>
<td>Surgery</td>
<td>4%</td>
</tr>
</tbody>
</table>

### Top Final Diagnoses % Cases

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>% Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIs and cardiac events</td>
<td>17%</td>
</tr>
<tr>
<td>CVAs</td>
<td>14%</td>
</tr>
<tr>
<td>Fractures</td>
<td>9%</td>
</tr>
<tr>
<td>GI</td>
<td>7%</td>
</tr>
</tbody>
</table>

### Injury Severity

- **High**: 57%
- **Medium**: 39%
- **Low**: 4%
- **Deaths**: 54%

### Top Secondary Services

<table>
<thead>
<tr>
<th>Services</th>
<th>% Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency</td>
<td>72%</td>
</tr>
<tr>
<td>Radiology</td>
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<td>5%</td>
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<td>Surgery</td>
<td>4%</td>
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</tbody>
</table>

### Top Secondary Services When EM is Primary % Cases

<table>
<thead>
<tr>
<th>Services</th>
<th>% Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing</td>
<td>9%</td>
</tr>
<tr>
<td>Radiology</td>
<td>8%</td>
</tr>
<tr>
<td>Medicine Subspecialties</td>
<td>8%</td>
</tr>
<tr>
<td>General Medicine</td>
<td>7%</td>
</tr>
</tbody>
</table>

### Patient Age

- 0-9: 5%
- 10-19: 10%
- 20-29: 15%
- 30-39: 20%
- 40-49: 25%
- 50-59: 15%
- 60-69: 10%
- 70-79: 5%
- 80-89: 1%
- 90+: 1%

### Key Drivers of Dx Failure

- **Medical**
  - Failure to appreciate and reconcile relevant sign/symptom/test result: 40%
  - Failure/delay in ordering dx test: 33%
  - Narrow diagnostic focus/differential: 26%
  - Failure/delay obtaining consult/referral: 22%
  - Communication among providers: 35%
  - Communication with patient/family: 11%

- **Surgical**
  - Failure to appreciate and reconcile relevant sign/symptom/test result: 50%
  - Failure/delay in ordering dx test: 33%
  - Sel/mgmt surg/invasive procedure: 29%
  - Narrow diagnostic focus/differential: 26%
  - Communication among providers: 30%
  - Communication with patient/family: 13%

### Summary

- **Recognition** of s/s of decline
- **Communication** of need & urgency
- **Coordination** of response

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n=1,453 claims made 2013–2017 alleging a diagnostic failure and involving a patient in the emergency department.
The average 500-bed hospital loses $4M/yr as the result of communication inefficiencies.

80% of serious medical errors involve miscommunication between caregivers during patient transfers.

41% of cases with a provider-provider communication event resulted in a high-severity injury.

Key provider-provider solutions must address:
- Lack of communication re: patient clinical status
- Lack of clarity (need for ) / follow-up in tests, consults
- Lack of role clarity (among providers – who “owns” it)
- Hierarchical and team barriers
- Failure to document and read record
19% of cases with a **provider-patient/family** communication event resulted in a high-severity injury

**Key provider-patient solutions must address:**
- Poor rapport or unsympathetic responses to patient concerns
- Inadequate informed consent
- Inadequate education (e.g., medication management, discharge teaching)

Where can we focus efforts to reduce the risk of diagnosis error in the inpatient setting?

**Key drivers of primary diagnostic errors include:**
- Failure to **appreciate and / or reconcile** relevant signs and symptoms
- **Communication** and **Teamwork** Failures

**Solutions need to focus on**
- Building strong **diagnostic teams / teamwork**
- Developing a **FOUNDATION** of a consistent **culture of safety** with a thirst for error detection, identification and management
“Patient Safety is the process of understanding error and creating processes and systems at the point of care delivery that protect both patients and providers from harm...”

“Creating safety systems... at the delivery level is the ultimate target.” (IOM 2002)

But we have been doing this for years - Why haven’t our efforts been successful?

Culture. (you have to WANT it)
Are you culturally focused on being organizations that are committed to patient safety?
You understand the tasks, but do you always live the mindset.

Data. (you have to IDENTIFY it)
Have you truly identified the actual root causes of our vulnerabilities?
If not, are we targeting our solutions to the wrong problems?

Business Case. (you have to SUPPORT it)
Have we made the right investment in the best solutions to prevent our most devastating outcomes?
Do your players know they are on the diagnostic team?

It takes a village... or a diagnostic team!

The puzzle of perspective
Everyone has a CRITICAL role on the diagnostic team. Here are some key contributors:

- **Support Staff:** Unit Clerks, Transport, Housekeeping, Additional Contributors to Diagnostic Excellence
- **Education & Orientation Staff**
- **Quality, Risk and Patient Safety Staff**
- **Leadership**
- **Bedside Clinicians:** e.g., Physicians, RN, LPN, NP, PA, NAs, Pt. Care Technicians
- **Ancillary Staff:** PT, OT, ST, Respiratory Therapy, Phlebotomist
- **Consultant Staff:** Pathology, Radiology, Pharmacy, Social Workers, Discharge Planners

Do you have the right environment and data for your team to be successful?

**Risk Management and Culture of Safety**

(RAP: Risk Assessment for RM/PS)

...promotes and enables learning from near misses and safety events by ensuring psychological safety and addressing barriers to transparent communication.
Building a culture of safety with a *thirst* for learning:

- Is there active evidence of a transparent and non-punitive approach to reporting and learning from errors and near misses at each entity? Are reporters recognized and responded to?
- Are there concerns about discussing or reporting errors or near misses? If so what are the barriers to speaking up?
- Are there clear processes in each department for recognizing and distinguishing system errors from unsafe, (blameworthy) actions?
- Is the ‘mindset’ of patient safety evident at all levels of the organization, including the board?
  - Do staff and providers recognize the importance of reporting risk-related information? Do they get feedback on follow-up? Do they SEE the data?
  - Is there recognition / reward of those who raise issues, participate in solutions, develop skills as local “champions” of patient safety

You have the foundation... now what?

Let's Pause for a Case Study
Case Example

Mismanaged / misdiagnosed sepsis of post-op surgical patient
• Managed by 2nd year Resident with no supervision (attending had left the hospital)
• Nursing staff advocated for attending support but this was dismissed by the Resident (x2)
• Resident did make minimal adjustments in care over a period of time but still did not contact attending
• Nursing staff did a “curbside” consult with a peer MD who confirmed her concern but no action taken until:
• Nurse escalated to supervisor – attending was called as pt. crashed
• Serious harm to pt. by the delay

Focus 1: Failure to appreciate and/or reconcile relevant understanding clinical futile cycles / failure to rescue scenarios

Clinical futile cycles
Traditional hierarchical referral model of care

Adapted from Brist, BMJ 2007
There is no good time to raise the ALARM

Deteriorating patients are inconvenient interruptions to standard workflow

Good communication is flat (no hierarchy) and while not always pleasant – is necessary

Experience requires the humility and flexibility to reevaluate one’s self

The patient journey is fraught with transitions – comprehensive report-out is critical to continuity of care

Intuition is an invaluable asset: hard to develop... harder to defend

Forewarned is forearmed: Debriefs, data and case review are critical to improvement strategies

Role clarity is advantageous

Role silos are detrimental to communication

There is no good time to raise the alarm

Deteriorating patients are inconvenient interruptions to standard workflow

Good communication is flat and not always pleasant

The patient journey is fraught with transitions – the least anticipated can be most dangerous

Intuition is a invaluable asset that is hard to develop... harder to defend

Role silos are advantageous in certain context/detrimental in others

• Build an environment that supports and encourages early escalation of care: Rapid Response Teams

• Make anticipating and planning for deterioration a standard workflow – Clinical Case Review

• Create a culture that values all voices equally – support with Escalation Policies

• Identify procedural transitions and structured Communication Tools

• Develop an environment that values hard and soft patient data - Clinical Case Review

• Build a culture of role clarity - dismantle silos

Emotional Narratives Accelerate Behavior Change

- Experiments involving stories and behavior change confirm an intuition we’ve learned around campfires in the past – namely, that traditional narrative structure promotes empathy in listeners, and empathy drives positive behavior change.
- Put more simply, emotional appeal is what inspires the listener to take action.

Forewarned is forearmed:
Debriefs, data and case review are critical to improvement strategies.

After a presentation, 63% of attendees remember stories. Only 5% remember statistics.

Source: Dan and Chip Heath
Case Example

Mismanaged / misdiagnosed sepsis of post-op surgical patient

- Managed by 2nd year Resident with no supervision (attending had left the hospital).
- Nursing staff advocated for attending support but this was dismissed by the Resident.
- Resident did make minimal adjustments in care over a period of time but still did not communicate with the attending.
- Nursing staff did a “curbside” consult with a physician who confirmed her concern but no action was taken until:
- Nurse escalated to supervisor – attending was called as pt. crashed
- Serious harm to pt. by the delay

Data driven Case Study: Diagnostic failure—Communication

Growing concern re: host of “failure to rescue” cases in the post-op / surgical setting

Treated the concern as an opportunity to further explore issues

Dove Deeper:
- Were the complications avoidable?
- Was there a specific trend / pattern / root cause that could be identified?
- Was there an opportunity to intervene / improve outcomes?

Was there an identifiable root cause? … YES

What drove these cases?
Is there an improvement opportunity
How do we respond?

Action Plan: need to sustain the consistent training
### Department of Surgery

**Expected communication practices for patients admitted to surgical services**

1. For all critical changes in a patient's condition, the attending will be notified promptly (generally within 1 hour following evaluation). These include:

- Admission to the hospital
- Transfer to the ICU
- Unplanned intubation or ventilatory support
- Cardiac arrest
- Hemodynamic instability (including arrhythmias)
- Code
- Development of significant neurological changes (suspected CVVH, seizure/new onset paralysis)
- Development of major wound complications (dehiscence, eversion)
- Medication or treatment errors requiring clinical intervention (invasive procedure(s), increased monitoring, new medications except Narcan)
- First blood transfusion without prior attending knowledge or instruction (before or after operation)
- Development of any clinical problem requiring an invasive procedure or operation for treatment

*(continued on back)*

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2. The following will be discussed with and approved by the attending before they occur:

- Discharge from the hospital or from the Emergency Department
- Transfer out of ICU

3. The attending should also be contacted if:

- Any trainee feels that a situation is more complicated than he or she can manage
- Nursing or physician staff, or the patient request that the attending surgeon be contacted
Findings after implementation of Resident-to-Attending (expanded to Nsg to Attending) Communication Cards

- **Marked reductions** in failure of residents to contact the attending for an inpatient critical event (33% → 2%)

- **Gaps in frequency** of daily attending notification regarding patient condition **virtually eliminated** (15% → 1%)

- In critical events where attendings were reached, attending contact led to change in management in 33% of cases

- Residents reported attendings were easy to reach, receptive to contact, and willing to provide adequate coverage if covering for primary surgeon

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**Can we improve diagnostic error?**

*Improving Diagnosis in Healthcare; IOM; 09/2015*

“Errors will likely worsen as the delivery of health care and the diagnostic process increase in complexity....

...to improve diagnosis, a significant **re-envisioning of the diagnostic process** and a widespread **commitment to change** from a variety of stakeholders will be required.”
Solving the Diagnostic Dilemma in the Inpatient Setting

• Key drivers of primary diagnostic errors include:
  – Failure to appreciate and/or reconcile relevant signs and symptoms
  – Communication and Teamwork Failures

• Solutions need to focus on
  – Building strong diagnostic teams / teamwork
  – Developing a consistent culture of safety with a thirst for learning about error identification and management

Re-envisioning the diagnostic process

Do you recognize your role on the diagnostic team?
What do you see? Are you sure?

What you see is not always the truth.
– PsyBoom

Malpractice Risks in the Diagnostic Process

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