Session Objectives

- Discuss the background for development of a results verification and follow-up program at University of Minnesota Health and Fairview
- Describe case studies within radiology, pathology and lab
- Describe specific examples of improvement regarding result communication and tracking at University of Minnesota Health and Fairview
- Recognize opportunities to learn and improve in your own organization
Background

- Nonprofit, academic health system driven to heal, discover and educate for longer, healthier lives
- 900 Staffed Beds
- 60 Specialty Clinics
- 5 Primary Care Clinics
- 1,600 Physicians
- 6,300 Employees

Background

- Nonprofit, integrated health system providing exceptional patient care across the full spectrum of health care services.
- 22,000-plus employees
- Fairview Medical Group is an employed Medical Group:
  - 46 Clinics
  - 700 Providers
- Fairview Health Network affiliate + FMG primary care physicians comprise the Fairview Pioneer ACO
- 53 senior housing locations
- 30+ retail pharmacies
Background

University of Minnesota Health and Fairview 2014 Volume

- 6.39 million outpatient encounters
- 1.95 million clinic visits
- 71,049 patient admissions
- 76,595 surgeries
- 9,298 births
- 181,217 ED visits
- 9,969 behavioral inpatients served

Overview

WHAT IS DIAGNOSTIC ERROR?

IOM defines diagnostic error as the failure to
(a) establish an accurate and timely explanation of the patient’s health problem(s)
(b) communicate that explanation to the patient
Overview

- The Joint Commission
  - 2015 National Patient Safety Goal #2
    - Improve the effectiveness of communication among caregivers
- Minnesota Department of Health
  - Reportable event
    - Patient death or serious injury resulting from the failure to follow up or communicate radiology, pathology, or lab test results

25% of diagnostic related malpractice is related to failures in follow-up systems for critical results

Average settlement in the community is $1.5M

“...most people will experience at least one diagnostic error in their lifetime, sometimes with devastating consequences.”
Overview

Minimize risks associated with results, by ensuring results are:
- Communicated to the right clinicians
- Communicated to the patient in a timely manner
- Abnormal findings are acted upon appropriately

Maximize opportunities associated with results, by:
- Capitalizing on follow up value of diagnostic testing
- Decrease patient leakage by providing patients follow up care within the system
- Enhance the ability for our clinicians to provide coordinated, consistent, high quality care for our patients
38 year old inpatient male postop day 2 after esophageal surgery
Past medical history of achalasia, otherwise healthy
New shortness of breath with hypoxemia
Stat CT pulmonary angiogram performed at 4:26 pm

● New bilateral pulmonary emboli
Radiology- Critical Result

- Bilateral pulmonary emboli were identified
- Call made to surgery intern promptly
- Audit required to demonstrate compliance with prompt notification of critical findings is arduous, requiring manual data collection of a representative sample of patients.
- Audit data is an estimation of performance based on a subsection of the data

Radiology- Urgent Result

- 21 year old female presents to primary physician with progressive abdominal pain for 8 hours. Chills.
- WBC= 12,000
- Focal rebound tenderness in the right lower quadrant.
- CT abdomen and pelvis ordered and performed
Radiology - Urgent Result

- Acute appendicitis

Contact information for private practice referring provider is not in the system
Radiologist spends next 10-20 minutes searching system directory and Google to locate and contact referring provider
Meanwhile, stat CT scan to evaluate for acute intra-abdominal hemorrhage and stat plain film to evaluate for tension pneumothorax sit unread
70 year old male with vague upper abdominal discomfort.
Past medical history of hypertension and degenerative joint disease of the knees
Normal abdominal exam. Normal CBC, LFTs and metabolic panel
CT of the abdomen and pelvis ordered by gastroenterologist.
Patient instructed to follow-up after CT with primary care MD
CT scheduled and performed on an outpatient basis at 6:30pm.

Radiology- Incidental Finding

- Renal mass
Radiology- Incidental Finding

- Referring provider paged multiple times by radiologist with no response. Answering service at clinic will not take results.
- Radiologist faxes result to clinic and considers calling provider in AM. Trauma arrives in ER at 6:50 AM, just before end of shift and call never made.
- Patient follows-up with primary MD but primary doesn't realize CT was ordered and performed.
- Patient presents with severe back pain 1 year later found to represent renal cell carcinoma metastasis.

Small Group Discussion

- What are you doing to address this in your organization?
- What were you hoping to accomplish coming to this session?
- What did you want to learn more about?
- Take 2 - 3 minutes to discuss.
- Share as a group.
Radiology- Critical Result

- New bilateral pulmonary emboli

Radiology- Critical Result

CT REPORT

EXAM: CT angiogram chest with contrast
COMPARISON: ....
...
FINDINGS:
There is thrombus within the right main pulmonary artery. There is also extensive segmental and subsegmental pulmonary emboli throughout all lobes of both lungs....
...
IMPRESSION:
1. Extensive bilateral pulmonary emboli...

Finding was identified on 11/6/2015 4:45 PM.

Dr. Jones was contacted by Dr. Kuehn-Hajder at 11/6/2015 4:55 PM and verbalized understanding of the critical finding.
Critical Result Workflow: “Pulmonary embolus” case

- Images reviewed by radiologist - Critical Result identified
- Radiologist personally discusses report with referring provider within 1 hour of discovery
- Radiologist formulates report containing “Alert 1” Powernormal documenting discussion
- Powernormal fields interface with EMR
- Result is “flagged” in the EMR
- Audit is generated

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Radiology- Urgent Result

- Acute appendicitis
CT REPORT

EXAM: CT abdomen and pelvis with contrast

COMPARISON: ....

FINDINGS:
There is diffuse inflammation of the right lower quadrant of the abdomen. The appendix is markedly dilated measuring 11 mm at its origin from the cecum, and coursing inferomedially, dilated to 2.0 cm. There is thickening of the lateral conal fascia, as well as inflammatory infiltration and wall thickening of the distal ileum.

....

IMPRESSION:
Acute appendicitis with possible rupture considering extent of inflammation.

Urgent Result: Appendicitis
Notification by Call Center

Radiology- Urgent Result Workflow

"Appendicitis Case"

Images reviewed by radiologist - Urgent Result identified

Radiologist formulates report containing “Alert 2 (a or b)” Powernormal

Radiologist discusses report with referring provider within 8 hours of discovery OR

Call Center picks up case from EMR worklist and calls referring provider with result. Documented in EMR.

Powernormal fields interface with EMR and audit is generated

Result is “flagged” in the EMR
Radiology- Incidental Finding

- Renal mass

CT REPORT

EXAM: CT abdomen and pelvis with contrast
COMPARISON: ....

FINDINGS:
There is a somewhat ill-defined heterogeneous mass in the superior pole of the right kidney which measures 3.3 x 2.4 x 2.6cm. This mass enhances heterogeneously at 2 minutes, and remains enhanced, albeit more diffusely at 9 minutes...

IMPRESSION:
1. Enhancing mass in the right kidney which is worrisome for renal cell carcinoma.

[Incidental Result: Kidney mass]
Radiology - Incidental Finding

Incidental Result Workflow “Renal Mass Case”

Images reviewed by radiologist - Incidental Result identified

Radiologist formulates report containing “Alert 3” Powernormal

Call Center picks up case from EMR worklist and calls referring provider with result. Documented in EMR.

Powernormal fields interface with EMR and audit is generated

Radiology

- Standard critical, urgent and incidental flagged workflows.
- Centralized “safety net” to ensure results are communicated to patients and providers.
- Lung Nodule protocol and process for the unified safety net team/Call Center to initiate and schedule follow up.
- Market primary care services to patients without a PCP.
- Lung screening program and centralized follow-up.
Radiology

• Average urgent result communication time to ordering provider is < 24 hours
• Average incidental result communication time to ordering provider is 28 hours
• 50% conversion rate on outstanding radiology orders

Pathology- “Send-Out”

• 9 year old female, status-post brain tumor resection
• Specimen sent out for BRAF testing
• Results were scanned into Epic and not routed to treating provider
• Patient started monthly chemotherapy based on the pathology diagnosis that did not incorporate the send out result
• Result discovered during chart review nearly 10 months after initial surgical procedure (treatment plan modified)
Pathology- Reflex Ordering

- 67 year old patient male had outpatient lung biopsy
- Pathologist confirms cancer diagnosis and verbally discusses case with oncologist
- Oncologist requests molecular testing
- Patient informed of result but must wait for treatment options until further testing is performed
- Pathologist places order in Co-Path, results routed to pathologist not oncologist
- Result discovered by care coordinator during chart review
- Delay in treatment of nearly 30 days

Pathology- New or Recurrent Cancer

- 53 year old male with lung biopsy of previously resected tumor
- Pathologist confirms recurrent malignancy
- Lab staff give verbal results to care coordinator
- Care coordinator takes down the result on a piece of paper, forgets to give result to oncologist
- After 2 weeks, patient does not receive any results and places a call to the oncologist office
- Oncologist discusses result with the patient nearly one month after discovery of the cancer returning
Small Group Discussion

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Pathology- “Send-Out”

“Send-Out” Workflow: “Brain tumor Case”

Pathologist opens addendum and fills out online requisition form.

Pathology office enters order in EMR and sends specimen to reference lab.

Reference lab communicates the result to the pathology office.

Pathology office scans paperwork to the order.

Audit is generated.

Pathologist receives inbasket result message in the EMR.
Pathology - Reflex Ordering

Reflex Ordering Workflow  “Cancer Treatment Delay Case”

- Pathologist evaluates criteria for reflex testing and identifies block
- Pathologist enters relevant stain process panel in the sign out report
- Pathology office reviews panel on daily reflex report
- AND
- Histotech cuts tissue and routes it to molecular lab
- Places order in the EMR
- Molecular lab processes the specimen for testing
- Surgeon receives inbasket result message in the EMR

Pathology - New or Recurrent Cancer

New or Recurrent Cancer Result Workflow  “Recurring Malignancy Case”

- Specimen analyzed by pathologist
- New or recurrent cancer identified
- Pathologist formulates report containing “Alert” in Voicebrook
- Call Center picks up case from EMR worklist and calls referring provider with result. Documented in EMR.
- Voicebrook fields interface with EMR and audit is generated
Pathology

- Standardize send out processes to optimize resulting and tracking of outstanding tests.
  - Reporting to support order tracking for send out reports.
- Reflex testing per protocol to eliminate inefficiencies and to prevent delays in treatment
- Extend and modify the radiology “flagging” workflow to pathology groups to create a safety net for abnormal pathology results.
  - Initial focus on adenocarcinoma follow up

Lab- Pap

Management of Pap smear results has evolved

- **1995**: 20 y/o female with repeated ASCUS findings would likely have been subject to colposcopy
- **2000**: 20 y/o with ASCUS findings may have had reflex HPV testing; if negative would not have had any procedure
- **2010**: 20 y/o would not have had a pap smear.
- **2020**: Pap may be replaced as preferred screening method by HPV testing
**Lab- Emergency Department**

- 25 year old patient female with chief complaint of abdominal pain
- Urine specimen sent to lab
- Urine analysis suggests a urinary tract infection
- Patient prescribed broad spectrum antibiotics and discharged from emergency department with pending urine culture results
- Patient’s urine culture results indicate the need to change antibiotics, patient not informed of the results
- Patient returned to the emergency department 3 days later with flank pain, fever and chills
- Patient diagnosed with pyelonephritis

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**Lab- Result Routing**

- 41 year old patient female had outpatient breast biopsy performed by interventional radiologist
- Patient was told she would receive result within 5-7 days
- Care coordinator noticed the patient sent an electronic message after 5 days inquiring about the status of the result
- Care coordinator replied to the electronic message indicating the result was not back yet
- Patient called the clinic three days later, care coordinator indicated the result was not back yet
- Patient calls the clinic back in 5 days, care coordinator indicates they do not yet see the result in the physician’s inbasket
- Care coordinator discovers result in chart review tab, result was routed to interventional radiologist
- Care coordinator calls patient back to schedule appointment to discuss results
- Delay in communication of result
Small Group Discussion

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Lab- Pap

IOM: Accurate interpretation of results

- Moving a large medical practice to evolving protocols is a challenge. Go live with centralized protocol was in 2005.

- Pap results routing to a pool staffed with trained RN’s allows Fairview to be agile in accurately handling pap results through agreed upon protocols.
**Lab- Pap**

**IOM: Communicate the explanation to the patient**

- Communication to the patient should reflect clarity about results and their implications. Scripting was helpful.
- The emotional overlay of receiving abnormal results must be well managed.
- RN’s who understand the pap protocol and are trained in communication skills has dramatically improved patient experience.

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**Lab- Pap**

**IOM: Establish a **timely** explanation of the patient’s health problem(s)**

- Turnaround time: communicated to patient in less than 7 days. Volume: approximately 650 results/month.
- Timely reminders for overdue follow up to abnormal results are assured.
Lab- Emergency Department

- Reduce the liability associated with high-risk patient population
- Appropriate follow-up within the organization’s health care network
- Primary care follow-up for those without an established provider

Lab- Result Routing

- 107 Result Routing Schemes
- 1041 departments (out of 1998) are using the system (default) scheme
- 14 different hospital schemes
- 12 different affiliate clinic schemes
- Inconsistent hospital, ED, Hospital Outpatient Department (HOD), and outpatient scheme design

Our goal was to reduce overall routing schemes by 77%!
Lab- Result Routing

- Leadership commitment to standardization
- Guiding principles
- System level “Meta Scheme”
- Consistent schemes incorporating guiding principles, based on “Meta Scheme” with location specific deviation only where necessary
  - I.E. Location specific result pools
- Attention to workflows where “authorizing provider” isn’t necessarily correct responsible provider (e.g., pathology specimen collection)

Lab

- PAP follow up
- Centralized management of emergency department post discharge abnormal labs
  - Primary care provider scheduling offered for all ED patients without a PCP and an abnormal lab
- Optimized result routing schemes in all inpatient, hospital outpatient, emergency departments and clinics
  - Single approach defined system wide in result routing guiding principles
- Developing a standardized report for inbasket result message tracking
Questions?

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Resources


The Joint Commission National Patient Safety Goals
http://www.jointcommission.org/assets/1/6/2015_NPSG_HAP.pdf

Minnesota Department of Health
http://www.health.state.mn.us/patientsafety/ae/adverse27events.html