

Medical Follow-Up of Lab & Diagnostic Imaging Results in the Emergency Department

Transitioning from Paper to an Auditable Electronic Format – ED Callback & PharmaNet

AIM STATEMENT

100% of urgent/abnormal microbiology results for KGH ED patients, will be **flagged and readily accessible** to KGH ED Physicians [either on the electronic record or as a centrally located hardcopy] within 4 months of the start of this project. (October 30, 2018 – February 28, 2019)

BASELINE DATA

October 2018 Recognition of the Quality Gap and Barriers

- Paper based system, difficult to quantify.
- System relied upon vigilance and written notes
- Physicians concerned about sporadic follow up, quality and risks.
- We estimate dozens of positive microbiology labs with delayed or no follow-up.
- Flagged x-ray results (2-6 per day) were not necessarily getting picked up or receiving next day follow-up.

CHANGE IDEAS TESTED

PDSA SET 1 - Revised Paper Process:

- ✓ Daily Physician Review Process - 2 ED physicians
- ✓ Review all positive microbiology results (++) paper)
- ✓ Follow-up x-rays performed after hours/flagged by the radiologists as requiring follow-up.

RESULTS

- ✓ Major improvement in MD follow-up
- ✓ Difficult to measure paper based system
- ✓ Still relied upon unit clerk to move paper
- ✓ Burning platform for technological change

PDSA SET 2 - IMIT Iterative Interventions:

- ✓ *Significant IMIT synergies became apparent:*

ED Call back in Meditech

- ✓ Physician usability testing of Meditech functionality
- ✓ Enabled electronic follow-up (auditable process)

PharmaNet Integration

- ✓ Medication list in **NOW** visible to KGH ED Physicians

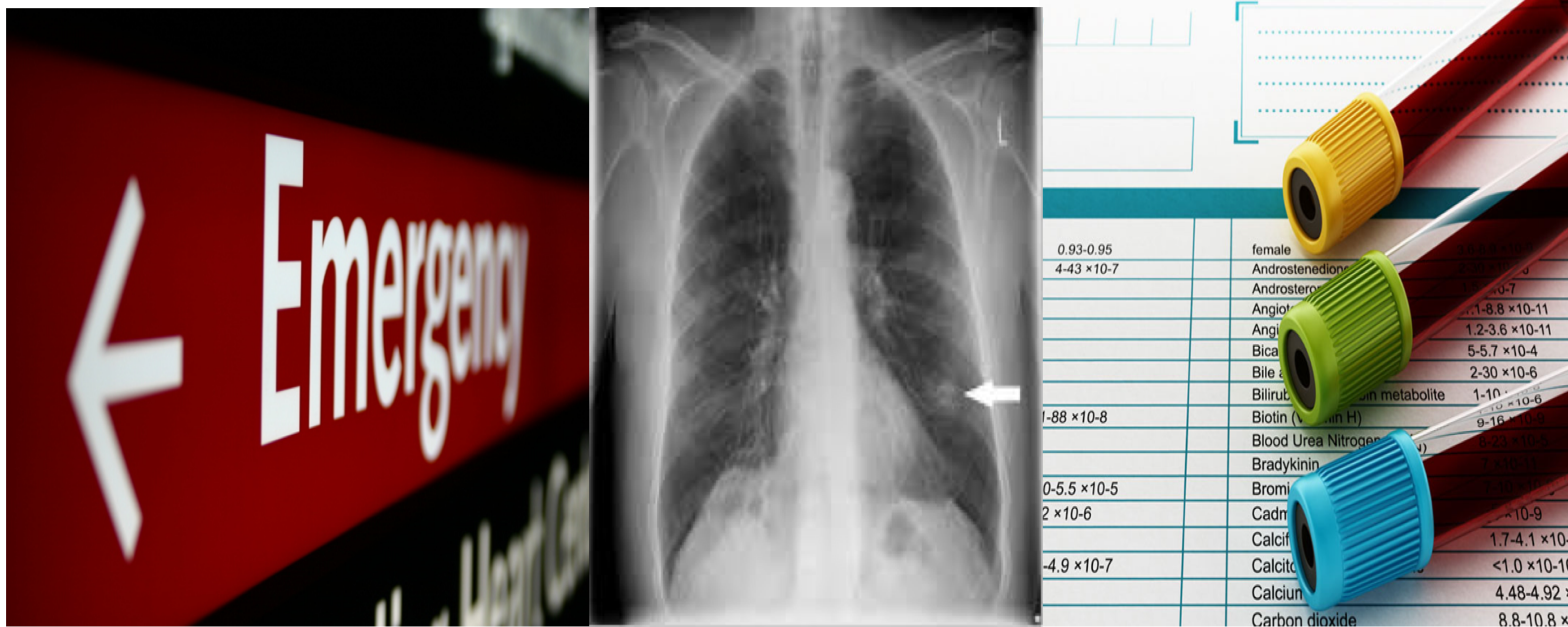
PDSA SET 3 – Incorporate Radiology Reports (Jan 2020):

- ✓ Flagged radiology results that require follow up are integrated into the call back system.
- ✓ Collaboration with respiratory department for streamlined referrals for incidental lung nodules requiring follow up.
- ✓ Subtle MSK x-ray findings are flagged by radiologists which triggers a call back, ensuring next-day follow up by an ED physician.



BACKGROUND

Medical care by Emergency Physicians can be asynchronous, such that the physician who orders investigations may not be the same physician who is on duty to interpret the results. The implications of microbiology and diagnostic imaging (DI) results falling through these predictable gaps is serious. ED Physicians are at risk due to high degrees of ambiguity, partial information availability and asynchronous coverage. The follow up system was haphazard and paper based.



ED CALL BACK (Meditech)

Follow-Up within the EMR (Electronic Medical Record)

Physician Uptake:

- ✓ Peer to Peer (Supported by IMIT)
- ✓ Video tutorial for colleagues – Feb 14 Dr Reid
- ✓ In person tutorial for KGH ED Doctors – Feb 20 Dr Reid
- ✓ Feedback on usability / uptake data

Call List Type	KGH ED Call List
*Status	ED Micro Result Follow Up
Action	Completed
Priority	No Call Needed/On Antibiotic
Scheduled Date/Time	High
*Actual Date/Time	25/04/19 22:48
Rescheduled Date/Time	26/04/19 13:16

Subject/Summary of Call
Auto-generated call for the following results: - Organisms present: Trichomonas Antigen Rapid
25 Apr 2019 22:48 PDT: The following MIC procedure has triggered this followup call. Please see EMR for result details: - Organisms present: Trichomonas Antigen Rapid
25 Apr 2019 23:41 PDT: Edited results have been received. Please see EMR for result details: - Organisms present: Trichomonas Antigen Rapid
26 Apr 2019 13:16 PDT: Call Status - Completed
26 Apr 2019 13:16 PDT: Call Action - No Call Needed/On Antibiotic. Being cared for by gyne and appropriate antibiotics already started

DATA AFTER 2 MONTHS

KGH ED physician response to abnormal results are now in the auditable electronic patient record.

KGH ED PHYSICIAN FOLLOW UP PERFORMANCE:

91 % - Closed within one day of opening.
5.6 % - Calls reopened for editing
71% (25/35) – Physicians with access have followed-up on calls
62% (410/666) – Of ED Call back activity was in the KGH ED Streaming area

MEASURES :

Balancing: Physician work time (reduced), Unit Clerk Workload (reduced)

Process: Improved reliability of new ED Call back process

Outcome: Improved degree/timing of microbiology follow-up

FUTURE - Potentially use ED Callback to:

- ✓ Enable pulmonary DI follow-up
- ✓ Cellulitis (return to ED for antibiotics) follow-up
- ✓ SPREAD to other Interior Health Emergency Departments using physician peer to peer “SuperUser” (+ IMIT support). Nine (9) other IH ED sites currently have *Meditech EDM module*

KGH ED PHYSICIANS FEEDBACK

Clinical Utility of Meditech ED Callback & PharmaNet Tools

“I have been doing the microbiology list (call-back) daily. Electronic version is far superior, ...a day ahead of the paper version.”

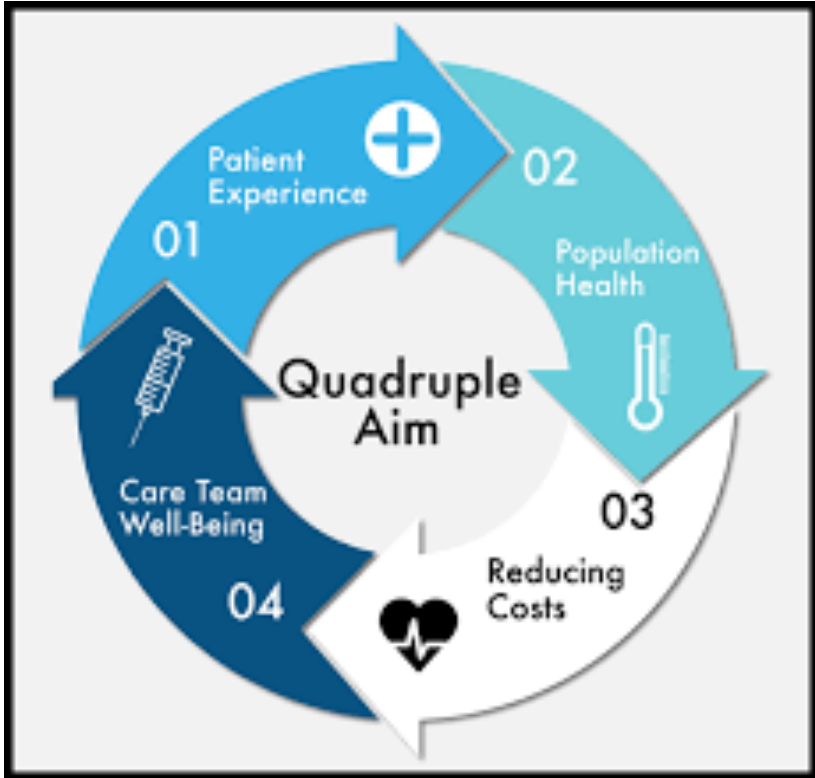
“...this is a huge leap forward in this realm that has been missing here for all too long. Is the radiology reports clipboard next?”

“Transformative” “PharmaNet is essential” “Very useful” “Helpful”

“Far superior! Significantly improves response times, patient safety, and documentation.”

“I really appreciate the ability to chart the call backs for my own medico-legal sake. Especially for the people that are very difficult to reach.”

“Can not place high enough value on this as the previous system was such that many of us didn't even bother doing the follow-ups.”



RESULTS : HIGHER QUALITY / LOWER COST / EASIER

KGH EMERGENCY DEPARTMENT Survey data from 11 Physicians May 15/2019	A: PAPER Chase (4000 reports/yr)	B: ELECTRONIC (4000 reports/yr)	Benefits (A-B)
Physician follow up time / cost per patient	15 Minutes /Pt \$ 147,600 / yr MD Follow Up	8 Minutes/ Pt \$ 78,720 / yr MD Follow up	EFFICIENCY 7 Minutes / pt follow up \$ 68,880 Physician time saved / yr \$ 4,928 Unit Clerk time saved / yr Total saved / yr = \$ 73,808 yr
Unit clerk time saved	\$ 4,928/ yr Unit Clerk time (30 min/day)		
Effectiveness / Reliability / Completion	53 % Estimated	91 % within 24 hrs (n=986)	EFFECTIVENESS : 71 % improved
System Usability / Utility	POOR	72 % Usability	USABILITY : 72 %
Wasted Physician Time (duplication/ GP follow up)	14 hrs/ wk estimated ~ \$ 109,200/yr	Less waste	WASTE REDUCTION \$ 109,200 Physician time saved/yr
Reduced KGH ED Workload	20 % of reports were for admitted pts No way to know if follow-up occurred elsewhere	No need for KGH ED Physician follow up Hospitalists are on it	Less workload

RETURN ON INVESTMENT = 3.73 x

BENEFITS: \$183,008/yr. = Efficiency (\$68,880 + \$4928) + Reduced waste (\$109,200)
COST OF IMPROVEMENT (One time cost) \$38,695 = KGH ED PQI Project/Support
ECONOMIC IMPACT = \$144,313 in 2018/9 = Benefit-Cost = **\$183,008/yr.** – Cost \$38,695
RETURN ON INVESTMENT = 3.73 x = (Benefit-Cost)/Costs = **(\$183,008 – \$38,695)/\$38,695**

SPREAD ROI Estimated: To IH Emergency Departments with Meditech EDM Module Access (9)

- ESTIMATED COST TO SPREAD** = ~ \$ 13,000 (total includes physician “SuperUser” time)
- ESTIMATED BENEFITS/COST SAVINGS FROM SPREAD = \$724,409/yr.**
- ECONOMIC IMPACT OF SPREAD** = Benefit-Cost = **\$711,409/yr.**
- ESTIMATED 5-YEAR IMPACT = > \$ 3.5 Million**

TEAM INVOLVED

Dr. James Reid – Dept. Head Emergency Medicine KGH

Project Participants:

- Dr. Amanda Wilmer - Medical Microbiology
- Hope Byrne, PPL, KGH Lab
- Joyce Hebert, PCC, KGH ED
- Trevor Zacharius
- Dr. Mike Partrick (radiologist)
- Dr. Julio Dommineli
- Todd Kinnee, Daniel Atkinson, Diane Jones, Kelsey Garner (IMIT Physician Systems / Lab Systems)
- Wrae Hill, PQI Consultant

LEARNING OUTCOMES

- Take the necessary time to thoroughly understand current workflow, keeping an eye on failure points and opportunities
- Gather a team of experts to look for solutions together from a Clinical, IMIT and Human Factors Usability lens. (Test / Test / Test)
- Develop the physician’s “SuperUser” skills in mentoring colleagues to adapt/adopt the new system. Physician provides meaningful feedback by using short videos and data on team performance
- Had fun creating a new way of working with IMIT & Physicians