Patient Safety, Error Reduction, and Quality Improvement: Successes and Lessons Learned from 10 Years of Lean, Process Redesign, and Hospital-wide Staff Engagement

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HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL

A FOUNDING MEMBER OF PARTNERS HEALTHCARE

Brigham and Women's Hospital

- 763-bed teaching affiliate of Harvard Medical School
- Founding member of Partners HealthCare.
- > 4.2 MM annual patient visits
- 46,000 inpatient stays
- The largest birthing center in Massachusetts
- 47 operating rooms, 150 ambulatory sites
- > $2.6 billion in operating revenues
- 16,000 employees
- Biomedical Research Institute
  - $670 million in research funding
  - Second largest NIH funded hospital in the U.S.

BWH Department of Pathology

Clinical Laboratories	> 5.6 MM billed tests
Transfusion Service	48,300 blood products
Surgical Pathology	53,000 accessions + 24,500 consults
Cytopathology	35,000 accessions + 1,760 consults
Cytogenetics	7,800 accessions
Molecular Diagnostics	10,500 accessions
Autopsies	219 adults + 35 infants

Our Mission

The mission of Brigham and Women's Department of Pathology, as one of the world's premier Pathology Departments, is to provide the highest quality and most cost-effective care for our patients; to lead the field of Pathology discovery through innovative basic, translational and clinical research; and to provide exceptional training for the next generation of pathologists.

Ramzi Cotran, M.D.
1933-2000
Chairman of BWH Pathology
(1974-2000)

Strategic Goals

Core Laboratories

- *Process Improvement*
  - Clinical Decision Support
  - LEAN
  - Automation

Resource Redeployment

Advanced Diagnostics

- *Molecular Pathology*
  - Center For Advanced Molecular Diagnostics
  - Molecular Virology
  - Tissue Typing
- *Toxicology / LCMS*
- *Flow Cytometry*
- *Immunology*

Process Improvement Initiatives

Central Processing

Communication Handoff

Supply Standardization

Hematology Automation

Auto verification

Phleb Rounding Assignments

2008 2010 2012 2014 2016 2018

Physician Order Entry-Based Clinical Decision Support

Positive Patient Identification

Outpatient Phlebotomy Wait Times

Chemistry Automation

Displaying Order Instructions to RN

Blood Draw Process

Phlebotomy Staffing Model

2nd Gen Automation

EPIC / Sunquest

A NASCAR pit stop taken by a U.S. soldier. The U.S. Army #01 car driven by Mark Martin in the pits at Daytona for the Daytona 500. From flickr (CC-BY-SA 2.0) but claimed originally from U.S. Army http://flickr.com/photos/soldiersmediacenter/40609446

Talk Outline

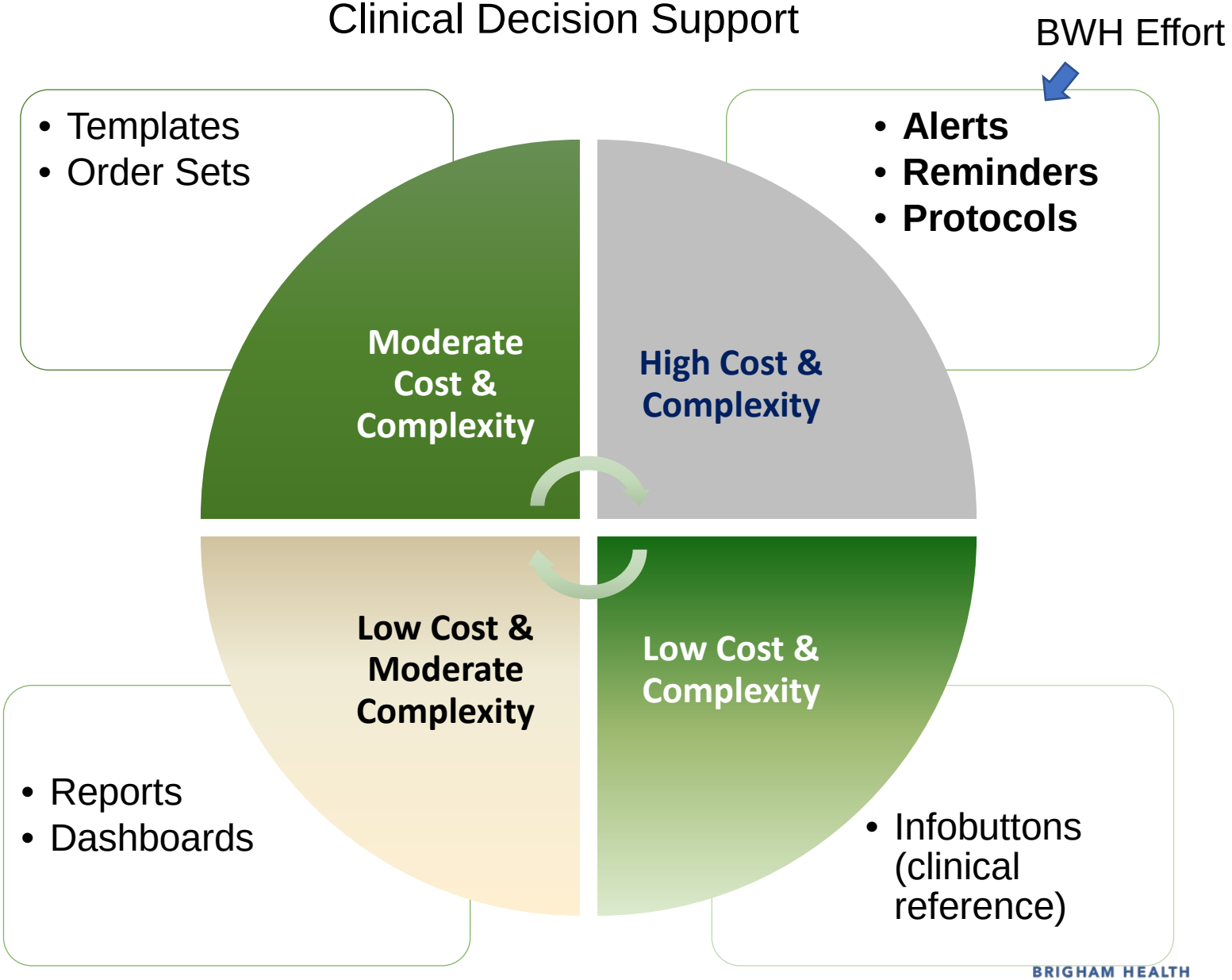
I. Optimization of test ordering
   - Physician Order Entry-Driven Clinical Decision Support
   - Computerized alert-value paging system (prototype)

II. Phlebotomy

III. Order Communication System including Positive Patient Identification

IV. Pathology-wide Safety Reporting System

I. Physician Order Entry-Driven Clinical Decision Support



Credits: Roberto A. Rocha, MD, PhD

Clinical Decision Support Initiatives

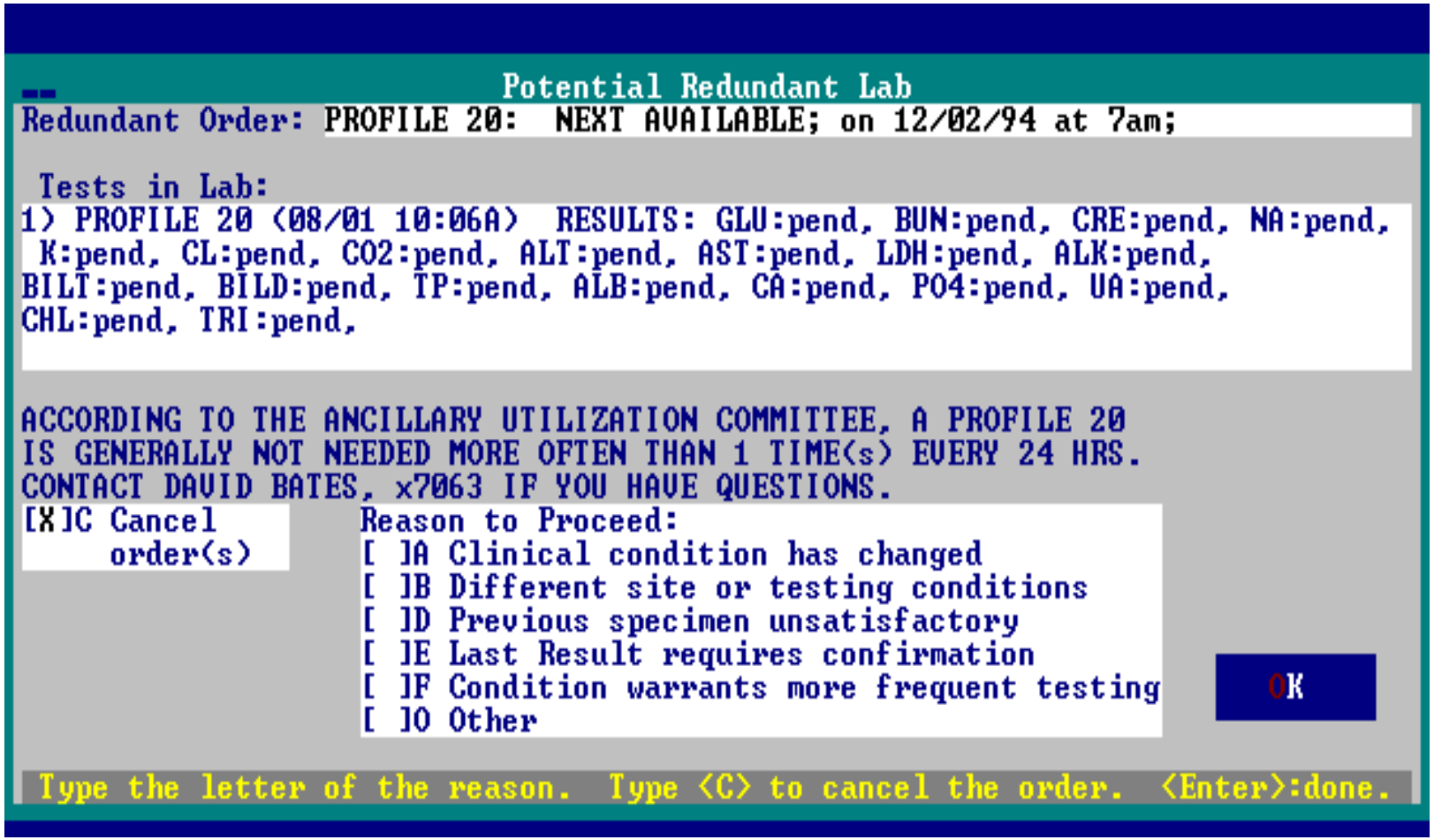
- *Optimized Lab Utilization*
  - Lab charges display
  - Reminders for redundant labs
  - Appropriateness guidelines
  - Frequency reminders
- *Improved Patient Safety*
  - Computerized alert value identification and auto-paging
    - Test result trending
    - Drug-lab interactions
  - Appropriate timing of therapeutic drug levels

Guiding Principles

- **Speed** is everything
- Anticipate needs and deliver in **real time**
- Fit into the user's **workflow**
- Little things can make a big difference – proper **defaults**
- Physicians **resist stopping** - never say never
- Provide **alternatives**
- Simple activities work best – not complex guidelines
- Avoid manual data entry - be sure you really need it
- Monitor **impact**, get feedback, and respond
- **Manage** and update content on the ongoing basis

Bates et al, JAMIA 2003

Redundant Test Reminders



Level of Acceptance of Reminders

	Intervention (n = 437)	Control (n = 502)
Accepted reminder	300 (69%)	N/A
Test performed after reminder	117 (27%)	257 (51%)

Reasons for Overrides of Redundant Tests

Reason	Frequency	Test Done	Justified
Condition warrants more frequent testing	43 (31%)	34 (79%)	21 (49%)
Clinical condition has changed	34 (25%)	20 (59%)	11 (32%)
Last result requires confirmation	18 (13%)	12 (67%)	10 (56%)
Previous specimen unsatisfactory	15 (11%)	7 (47%)	6 (40%)
Different site or testing conditions	11 (8%)	6 (55%)	5 (45%)
Other	16 (12%)	9 (56%)	3 (19%)
Total	137 (100%)	88 (64%)	56 (41%)

Potential Adverse Consequences of Canceled Tests

- Evaluated canceled tests followed by abnormal result within 3 days
- Only 8 (4%) of these tests provided new information
    - 3 UA w/ few RBCs or WBCs, previously negative
    - 3 Sputum Cx w/ new pathogen, all patients had stable CXR
    - Digoxin level dropped from 1.0 to 0.5 ng/mL
- Change of medical management in 2/8 cases
    - One patient given new Abx
    - One patient given an extra dose of digoxin

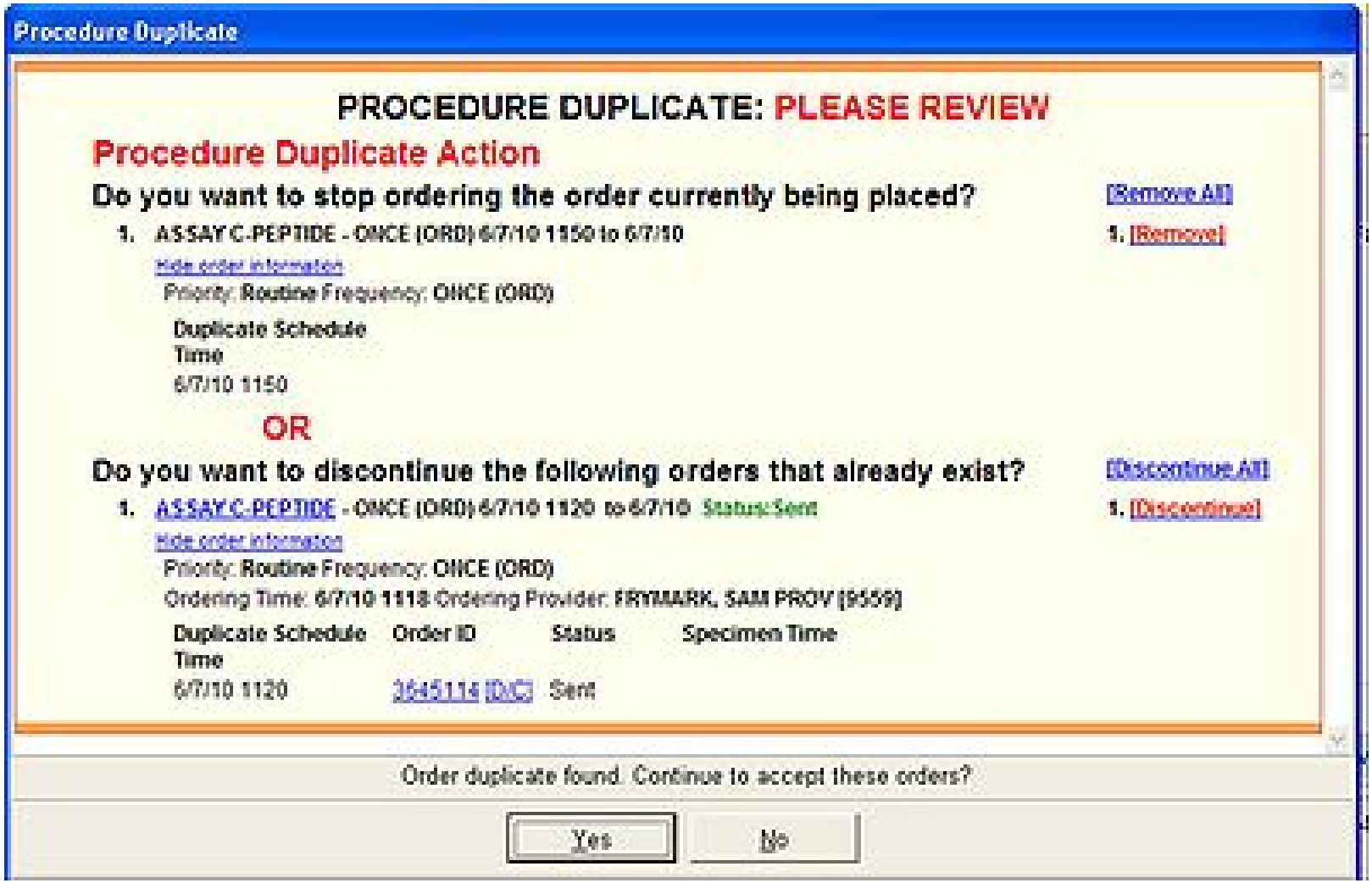
Redundant Orders In EPIC

Tests	Duration
CBC with autodiff	24 hours
Hypercoag Panel	30 days
Hemoglobin electrophoresis	30 days
Hgb A1C	30 days
Protein electrophoresis	7 days
Immunology (ANA, RF, CCP)	1 year
Vitamin D	7 days
Anemia (Ferritin, Folate, B12)	7 days
Thyroid (TSH, free T4, total T4)	7 days
*Phenobarbital	20 days

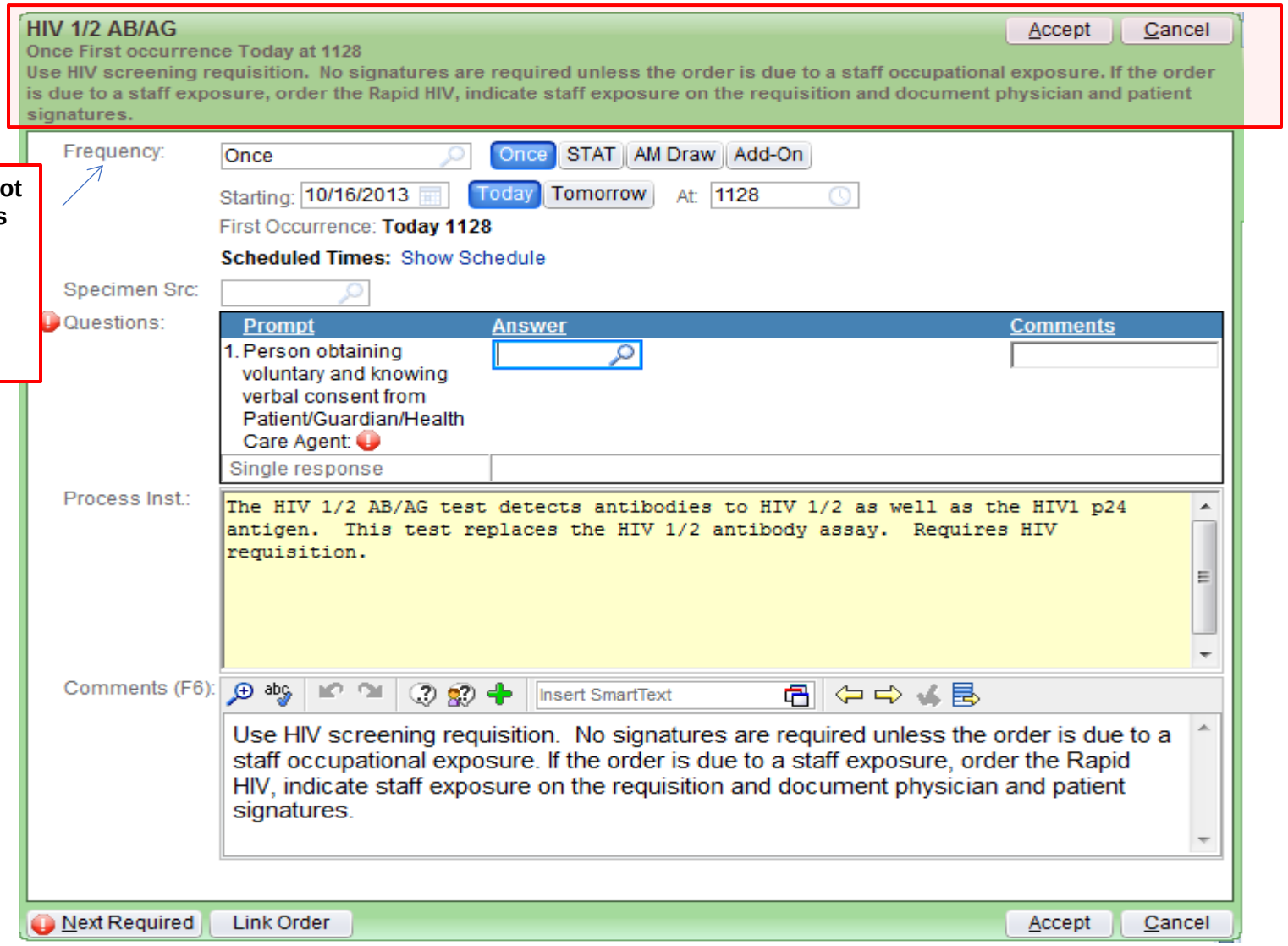
Redundant Orders In EPIC

Tests	Duration
*Antiepileptics	3 days
*C. Difficile	5 days
*Stool Culture	24 hours
O&P	24 hours
*Urine culture	24 hours
*Sputum culture	24 hours
Viral loads	24 hours
Viral and Micro serologies	7 days
Beta glucan and GM	4 days

Duplicate Reminder in EPIC

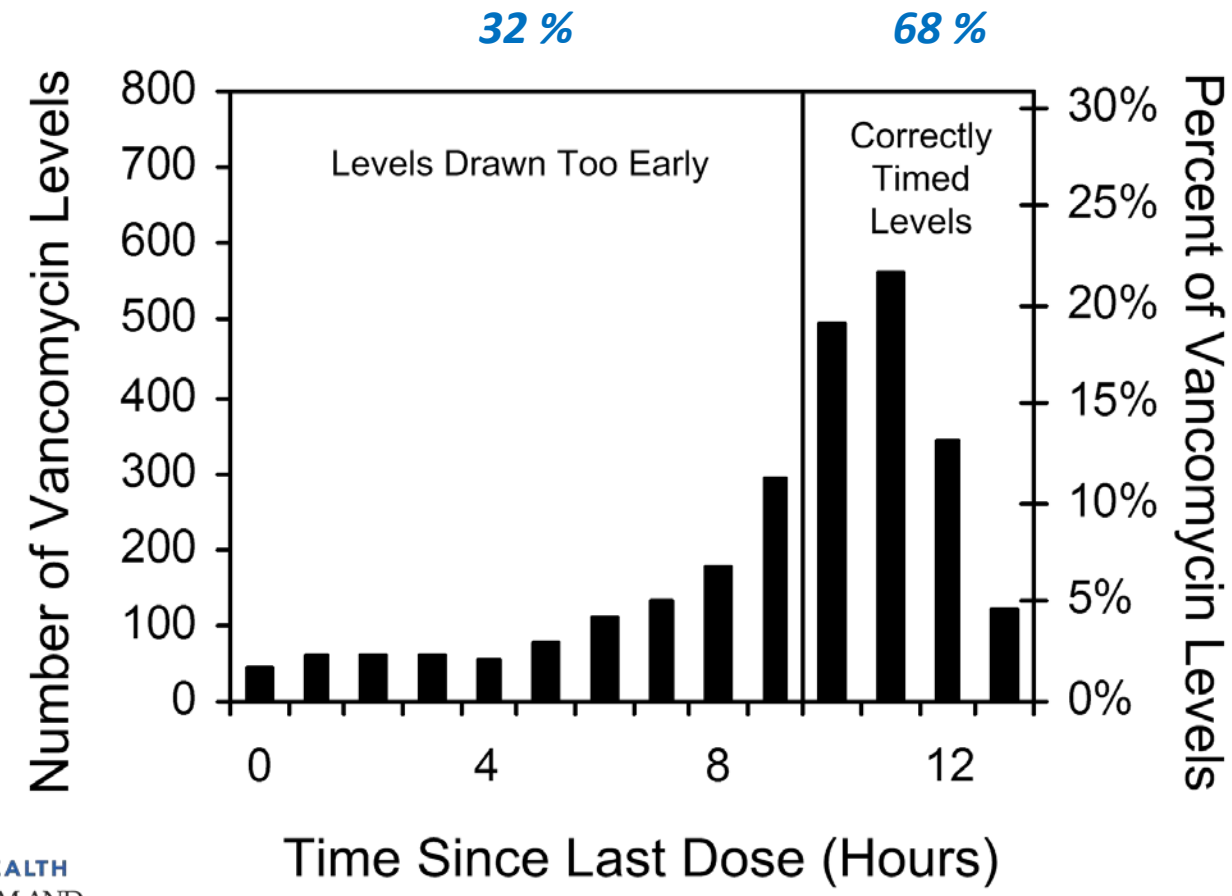


Ordering Duration Limits



"Daily" will not be allowed as frequency

Clinical Decision Support for Therapeutic Drug Monitoring



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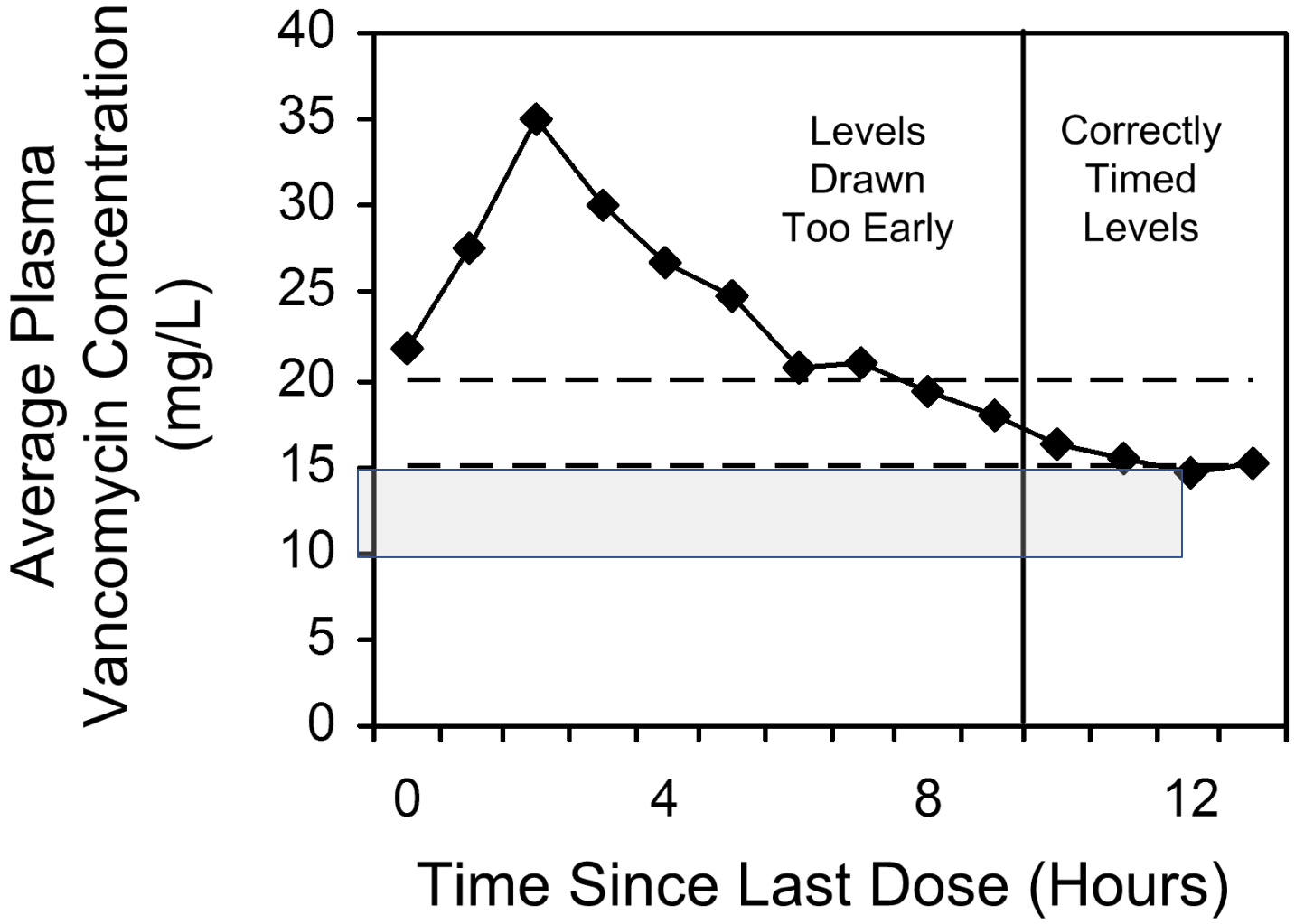
Melanson / Tanasijevic: Am J Clin Path. 2013



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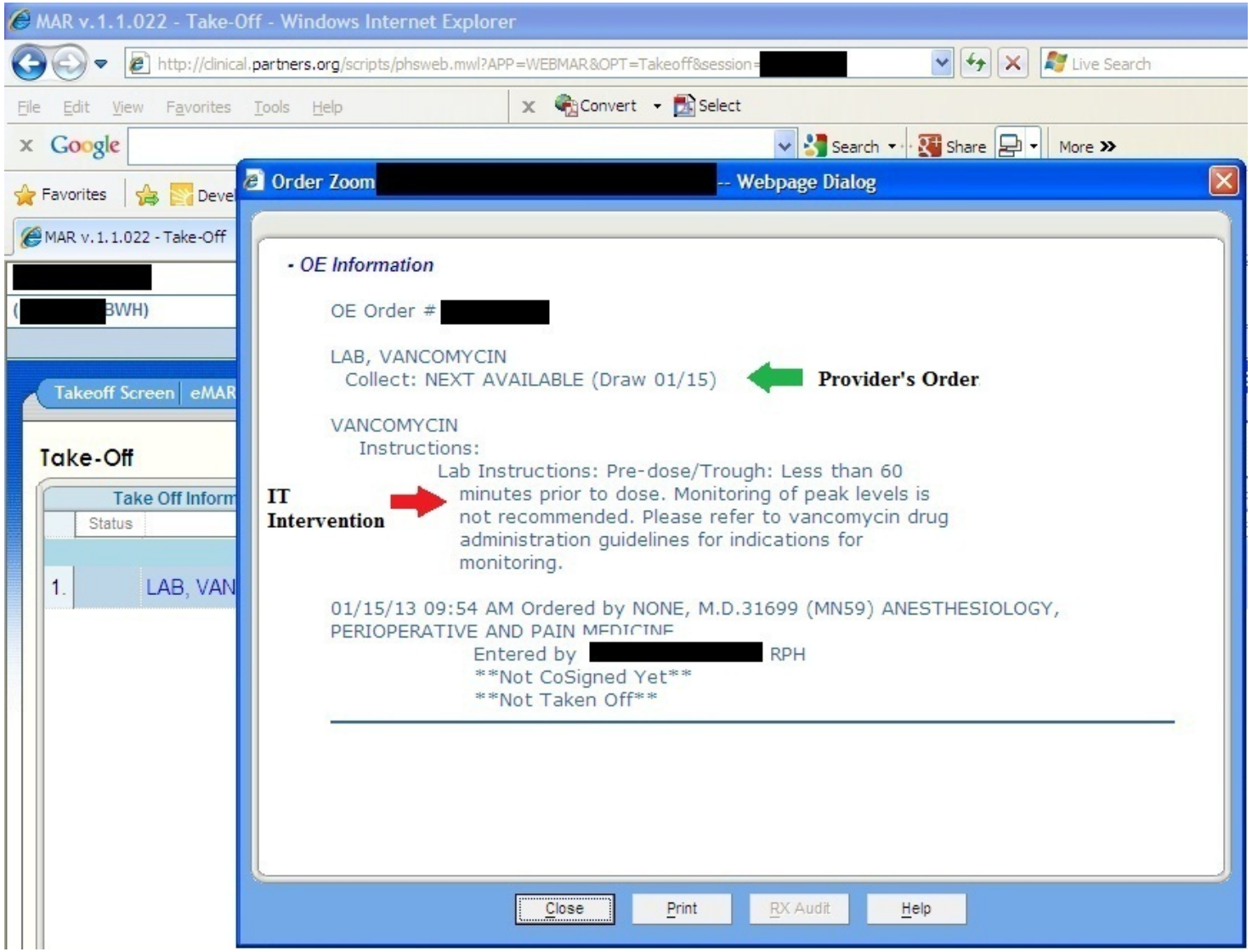

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Melanson / Tanasijevic: Am J Clin Path. 2013

Ib. Computerized Communication of Alert Laboratory Values

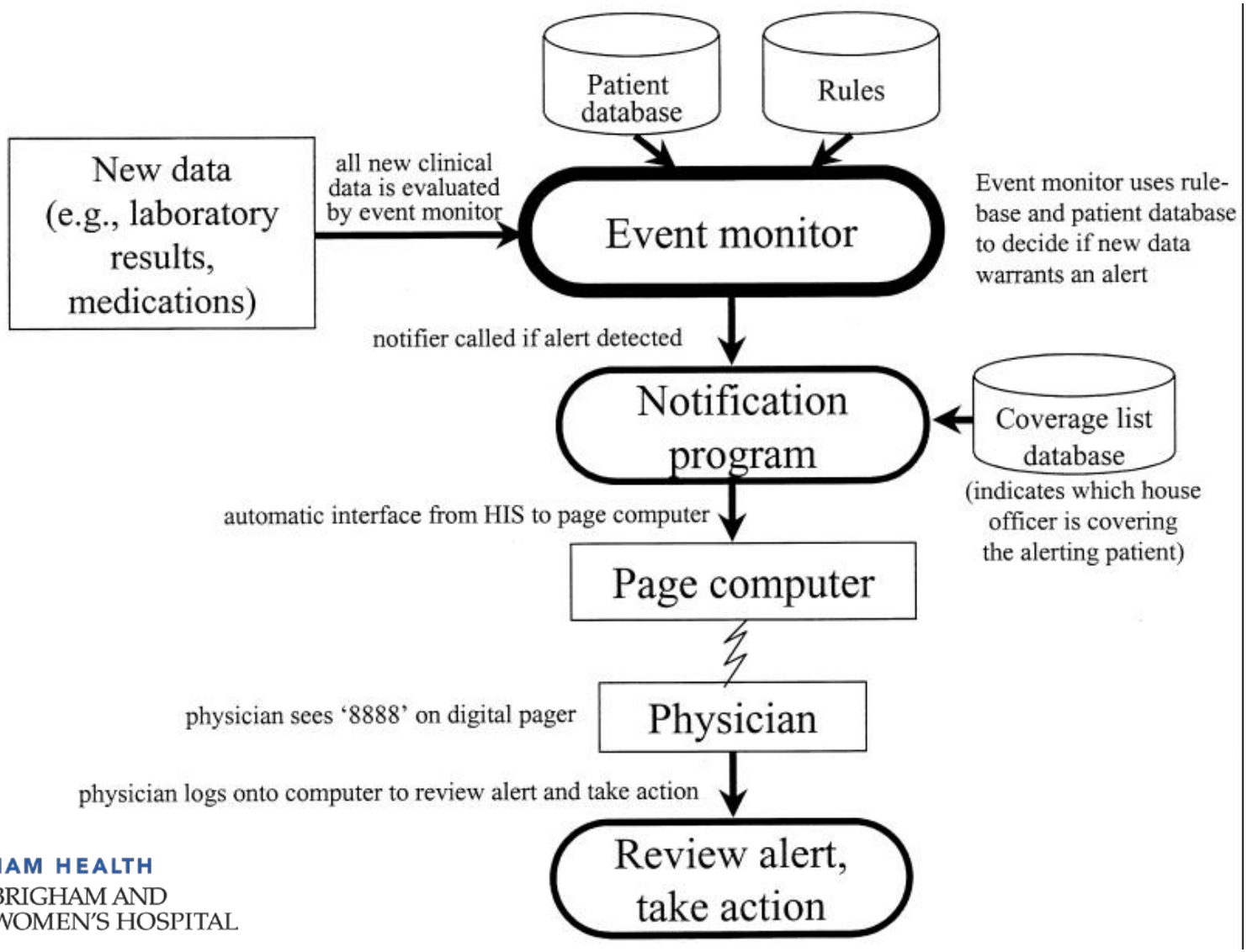
Table 1

Frequency Distribution of Alerts

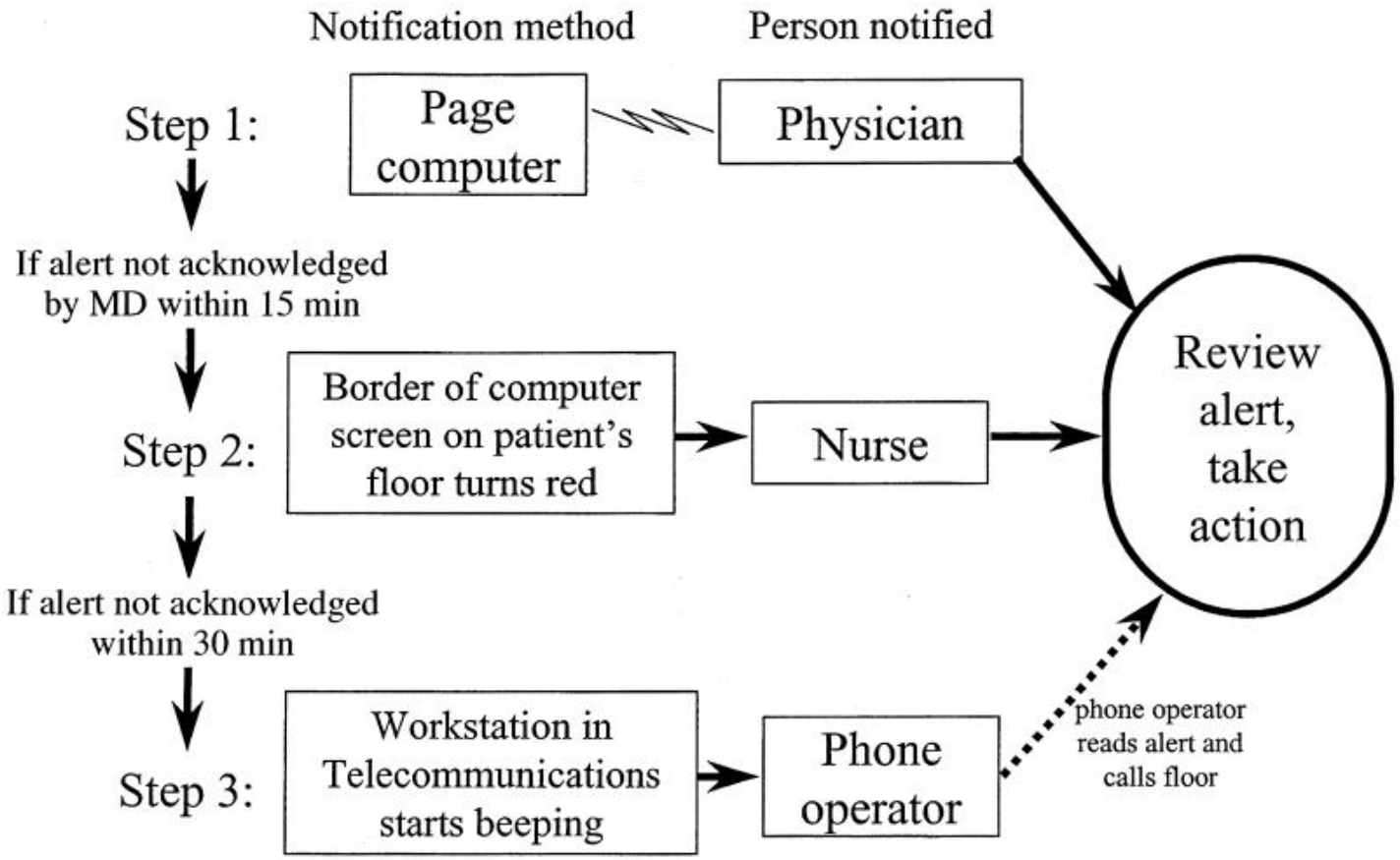
Rule	Alerting Criterion	No.* (%)
1	Hematocrit has fallen 10% or more since last result and is now less than 26%‡	38 (19.8)
2	Serum glucose is greater than or equal to 400 mg/dL	34 (17.7)
3	Hematocrit has fallen 6% or more since previous result, and has fallen faster than 0.4% per hour since last result, and is now less than 26% and the patient is not on the cardiac surgery service‡	32 (16.7)
4	Serum potassium is greater than or equal to 6.0 mEq/L	32 (16.7)
5	Serum potassium has fallen 1.0 mEq/L or more over the last 24 hours and is now less than 3.2 mEq/L‡	29 (15.1)
6	Serum potassium less than 3.3 mEq/L and patient has an active order for digoxin‡	15 (7.8)

Kuperman G et al., J Am Med Inform Assoc. 1999

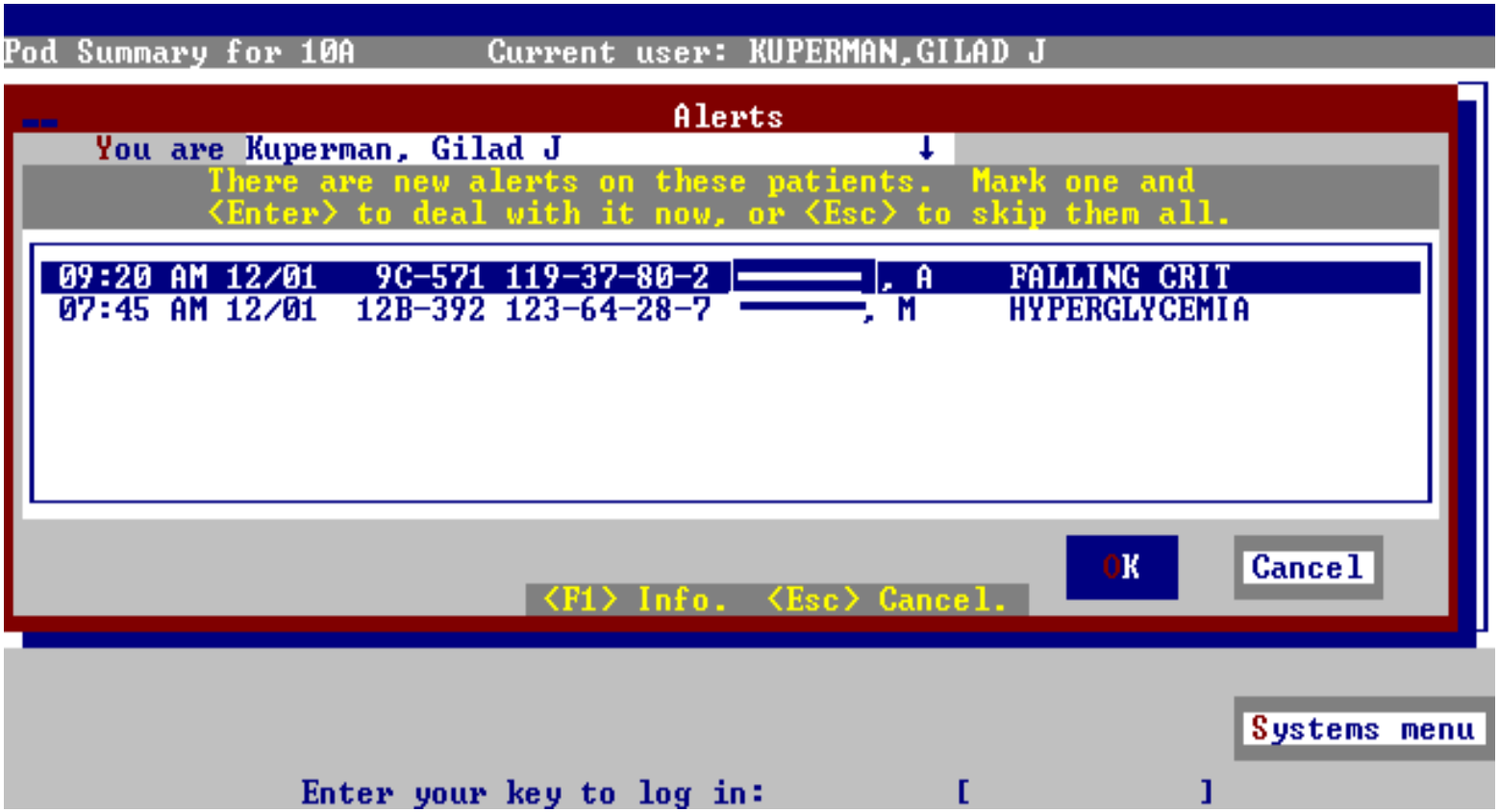
Design of the Alerting System



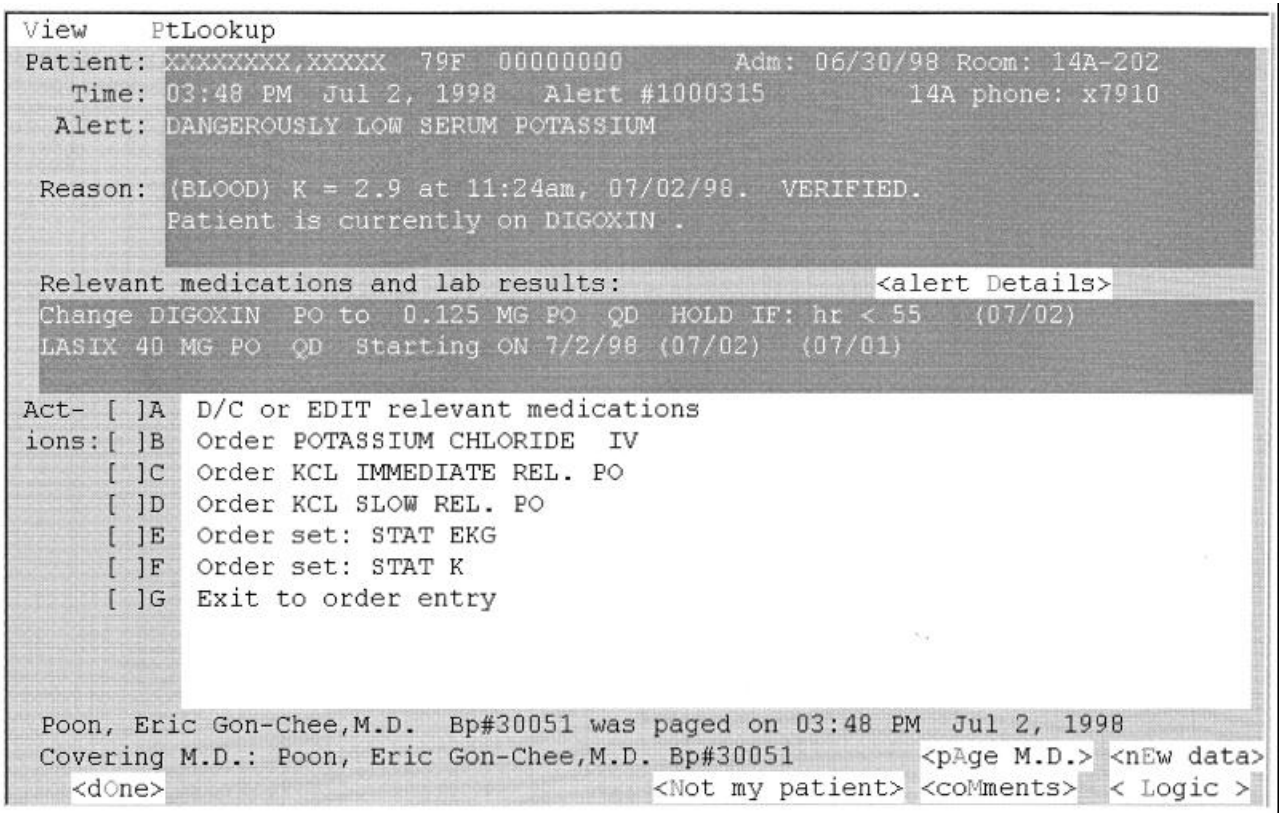
Fail-Safe Notification Sequence



"Alerts" Screen: Emphasizing an Abnormality



Clinical Action Sub-Screen



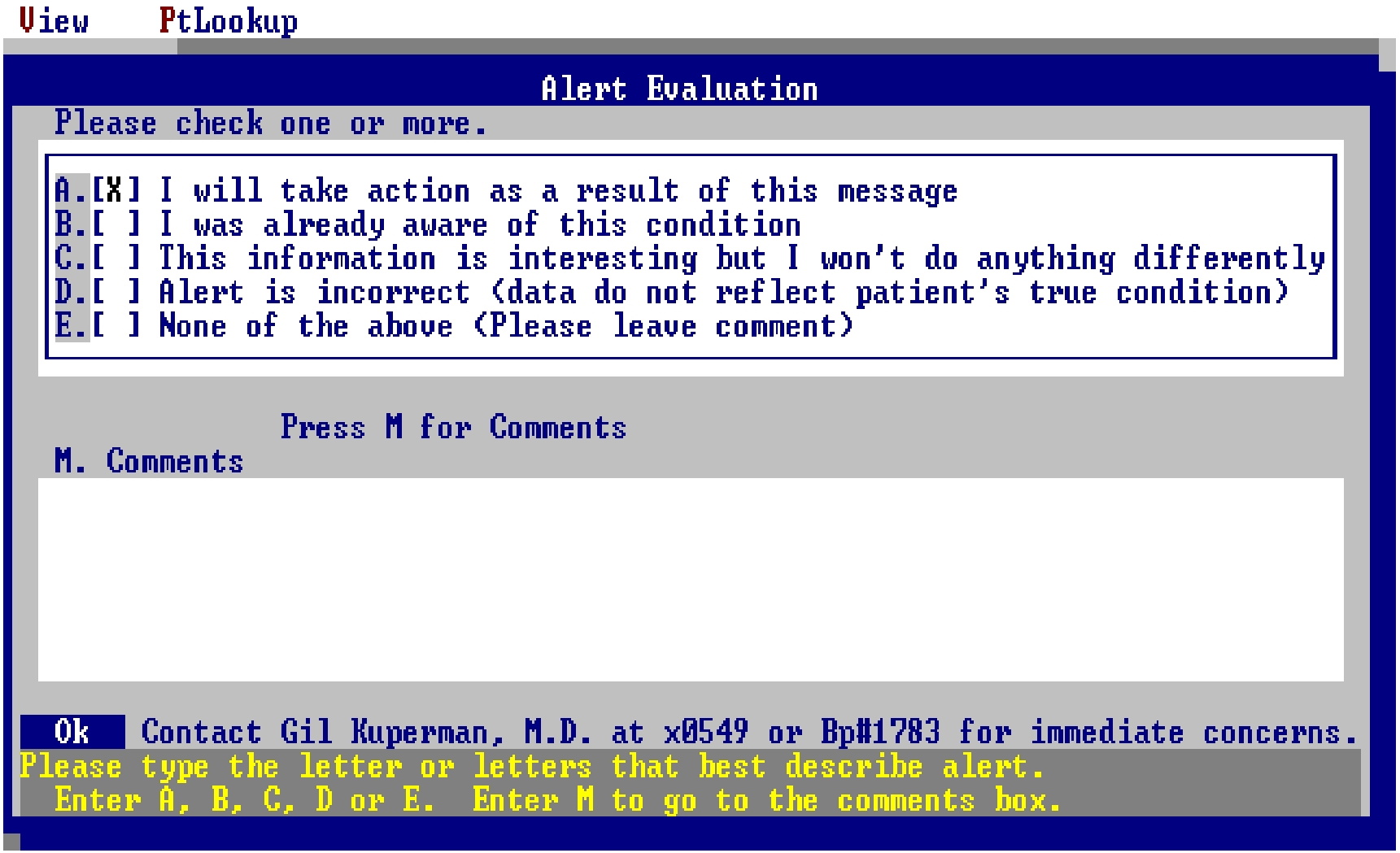

View PtLookup
Alert Evaluation
Please check one or more.
A.[X] I will take action as a result of this message
B.[ ] I was already aware of this condition
C.[ ] This information is interesting but I won't do anything differently
D.[ ] Alert is incorrect (data do not reflect patient's true condition)
E.[ ] None of the above (Please leave comment)
Press M for Comments
M. Comments
Ok Contact Gil Kuperman, M.D. at x0549 or Bp#1783 for immediate concerns.
Please type the letter or letters that best describe alert.
Enter A, B, C, D or E. Enter M to go to the comments box.

Table 2

Criteria Used by Reviewers to Determine the Time Appropriate Treatment Was Ordered

Alert Type	Examples of Appropriate Treatment
Low or falling sodium	Isotonic or hypertonic solution intravenously, fluid restriction, demeclocycline
High sodium	Isotonic or hypotonic solution intravenously
Low or falling potassium, or low potassium with patient on digoxin	Potassium replacement (intravenous or oral)
High potassium	Discontinue potassium 50% dextrose with insulin
	Furosemide
	Bumetanide
	Discontinue spironolactone or triamterene
	Kayexalate (sodium polystyrene sulfonate)
	Sodium bicarbonate

Impact of Auto-Alerting System

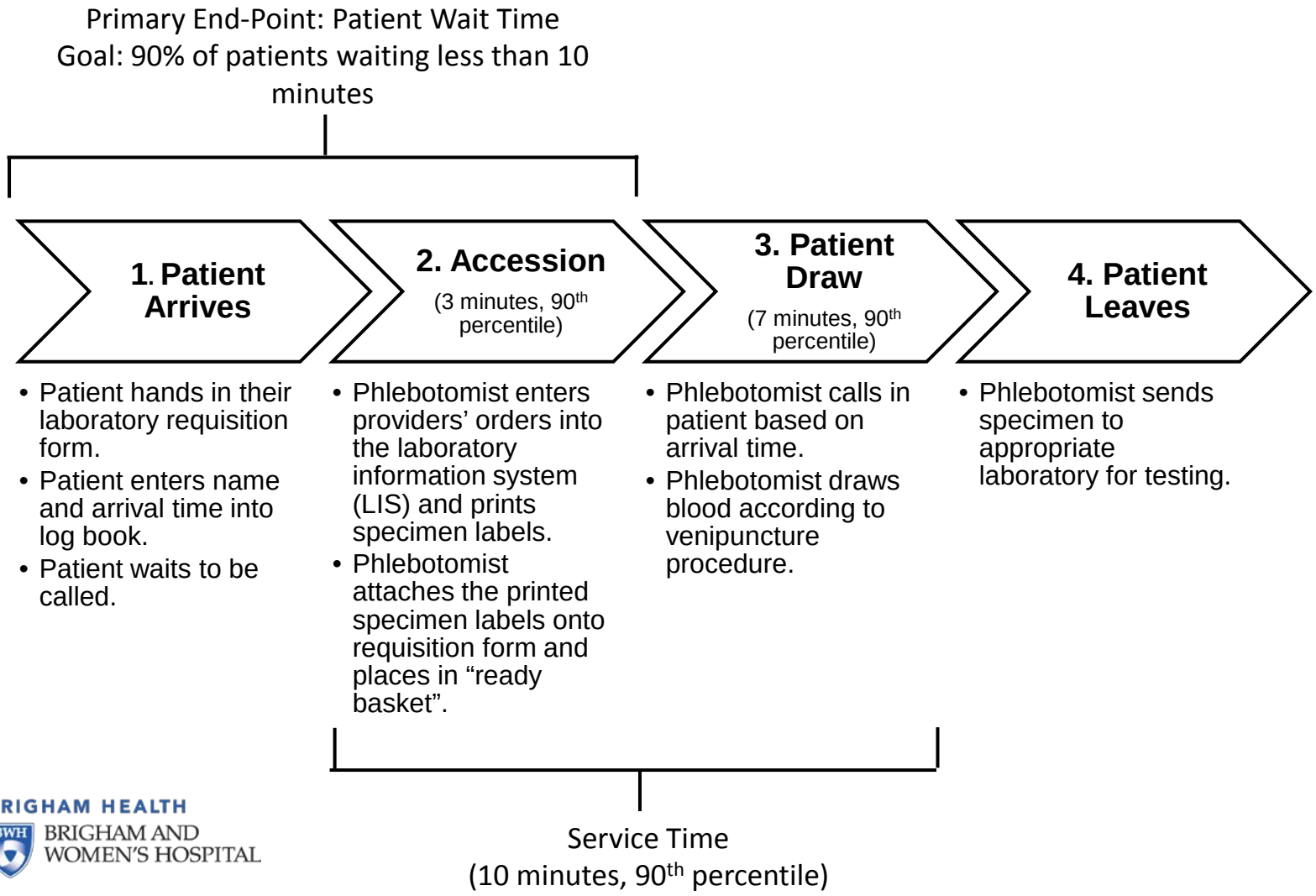
	Intervention (N = 94)	Control (N = 97)	P-value
Time Until Rx Ordered (hrs)			
Median	1 .0	1.6	0.003
Mean	4 .1	4.6	0.003
Time Until Condition resolved			
Median	8.4	8.9	0.11
Mean	14.4	20.2	0.11

P

Knowledge Asset	Type	Epic Capability	Content Gap
KnowledgeLink - Infobutton manager: ~650 rules	Reference: local	P	TBD
Partners Handbook - POC web portal	Reference: local	×	TBD
Knowledge Management Portal	Reference: local	×	TBD
Clinical Reminders - disease management and preventive care: ~340 rules; outpatient	Rule: local	✓	TBD
Drug-Pregnancy Alerts: ~687 rules; outpatient	Rule: custom	✓	TBD
Drug-Laboratory Alerts: ~440 rules; outpatient	Rule: custom	✓	TBD
Drug-Disease Alerts: ~509 rules; outpatient	Rule: custom	✓	TBD
Drug-Utilization Alerts: ~12 rules; outpatient	Rule: local	✓	TBD
Health Monitoring: ~70 rules; outpatient	Rule: local	✓	TBD
Critical Laboratory Alerts: ~70 rules + 175 (new); results review	Rule: local	✓	TBD
Problem List Dictionary: ~4,000 concepts from SNOMED CT with ICD mappings; in/outpatient	Dictionary: custom	✓	TBD
Problem List Classification Subsets: ~501 problem classes using SNOMED/ICD/CPT; in/outpatient	Dictionary: local	✓	TBD
Immunization Schedule Reminders: ~370 rules; outpatient	Rule: local	✓	TBD
Maple - Problem-list reminders: ~70 rules; outpatient	Rule: local	P	TBD
Documentation Flowsheets: ~5 templates + 400 concepts; outpatient	Template: local	✓	TBD
Master Drug Dictionary (MDD): ~8,600 customized medication concepts; 3,500+ non-commercially available medications; in/outpatient	Dictionary: local	✓	TBD
MMIDL - Medication Concept Mappings: 15,700 mappings to First Databank and RxNorm	Dictionary: local	**P**	TBD
Outpatient neonatal dosing dictionary: 60 orderable medication concepts; outpatient	Dictionary: local	✓	TBD
Drug-Drug Interaction Knowledge Base (DDI): ~10,000 rules; in/outpatient	Rule: local	✓	TBD
Duplicate Therapy Alerts: 23 duplicate therapy categories; in/outpatient	Rule: custom	✓	TBD
Nephros - Drug Dosing in Renal Insufficiency: 400 dosing rules; in/outpatient	Rule: local	**P**	TBD

Roberto A. Rocha, MD, PhD

IIa. Outpatient Phlebotomy



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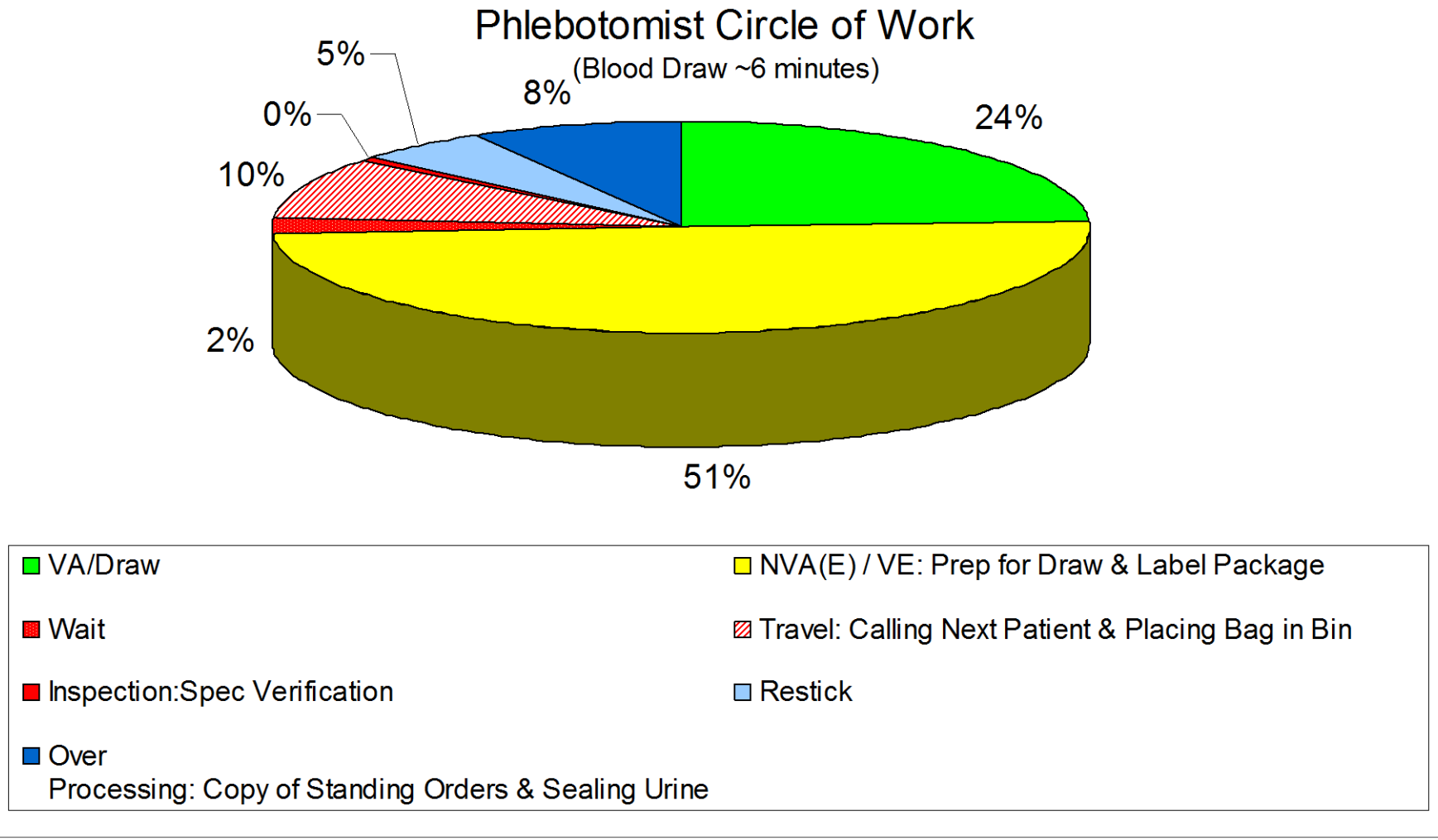
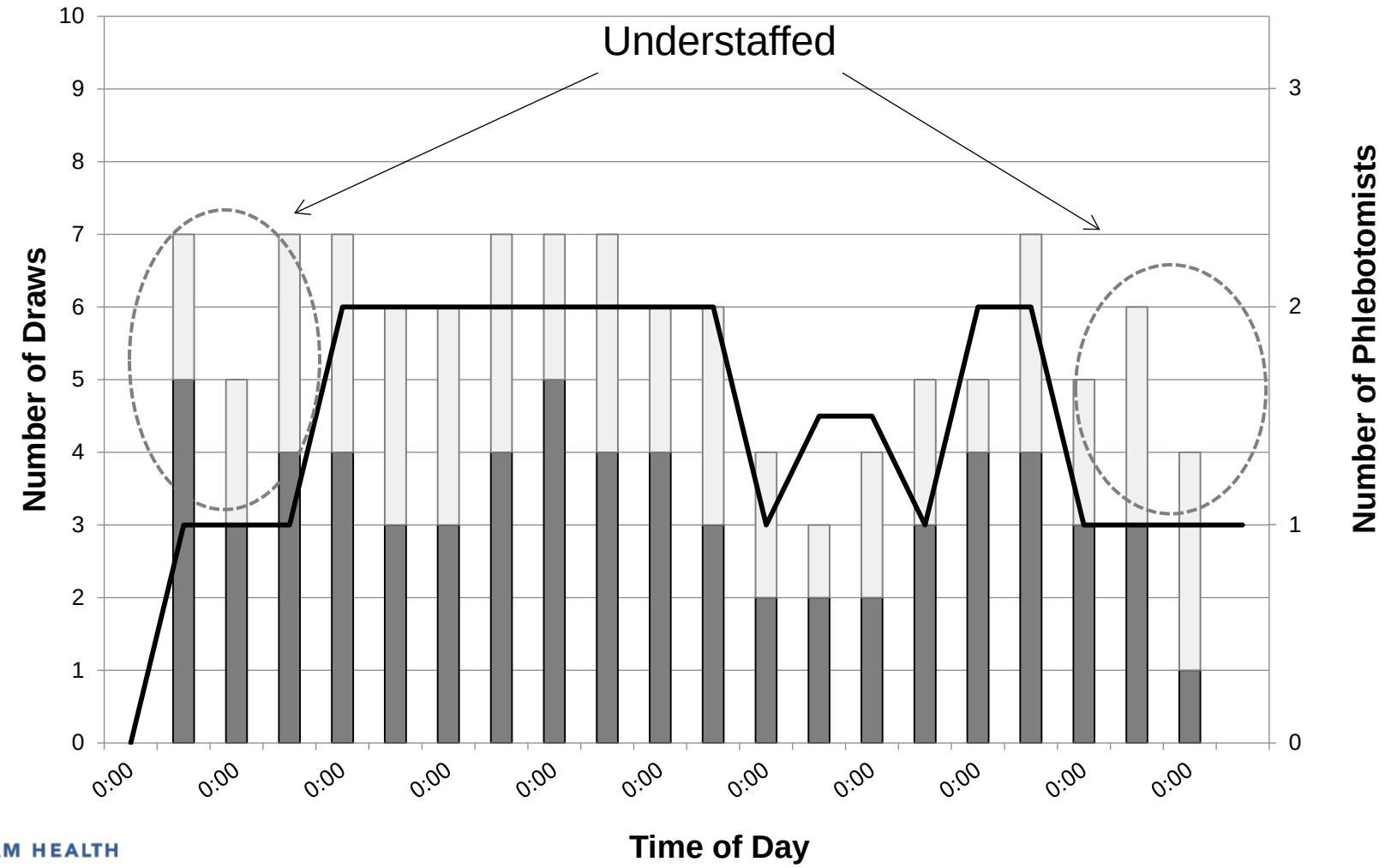

Phlebotomist Circle of Work
(Blood Draw ~6 minutes)
5%
8%
0%
24%
10%
2%
51%
VA/Draw
NVA(E) / VE: Prep for Draw & Label Package
Wait
Travel: Calling Next Patient & Placing Bag in Bin
Inspection:Spec Verification
Restick
Over Processing: Copy of Standing Orders & Sealing Urine

Improvement Opportunities

- *Patient Wait Time*
  - Decrease
    - Optimize / reorder steps of the patients visit
    - Improve patient's identification upon arrival
  - Manage Expectations
    - Clearly identify patient's order in line
    - Explicit instructions for patients arriving prior to the 8 AM opening
- *Increase Available Phlebotomy Draw Time*
  - Eliminate duplicative work
    - Before sending specimens via pneumatic tube
    - Duplicate labeling
  - Optimize staffing levels according to volume

Optimization of Staffing



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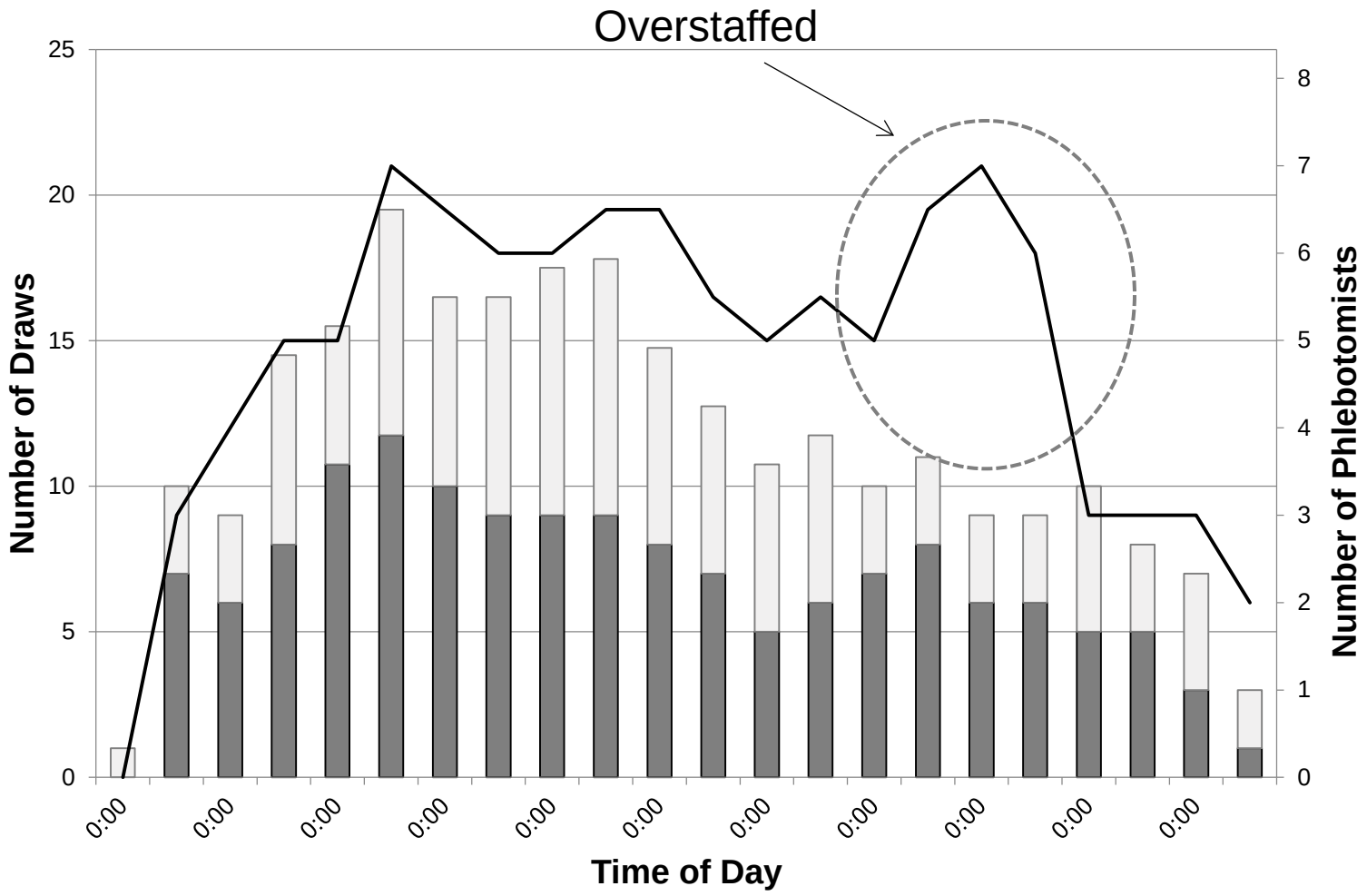
Optimization of Staffing



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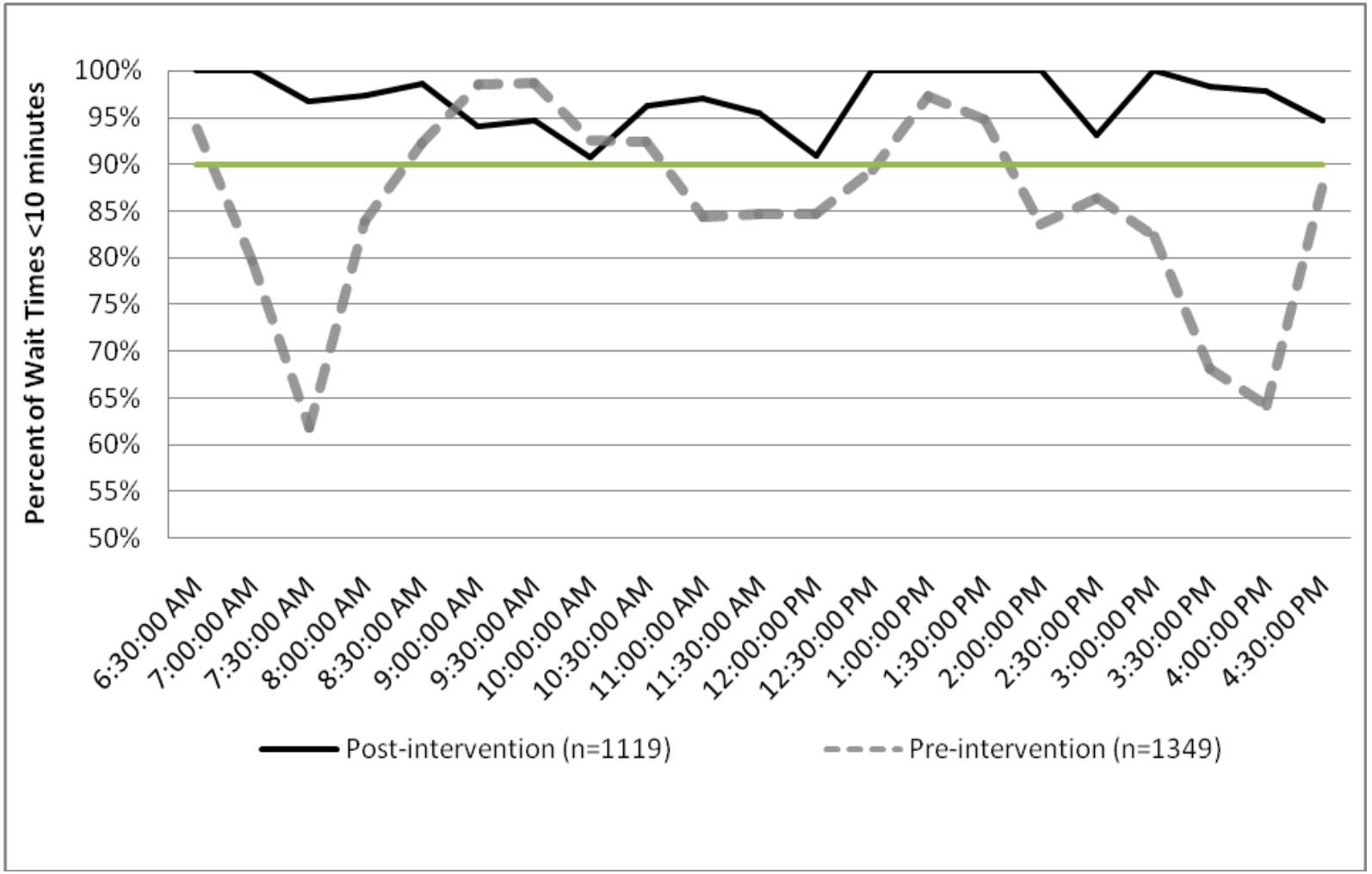
Wait Times (Pre- and Post)



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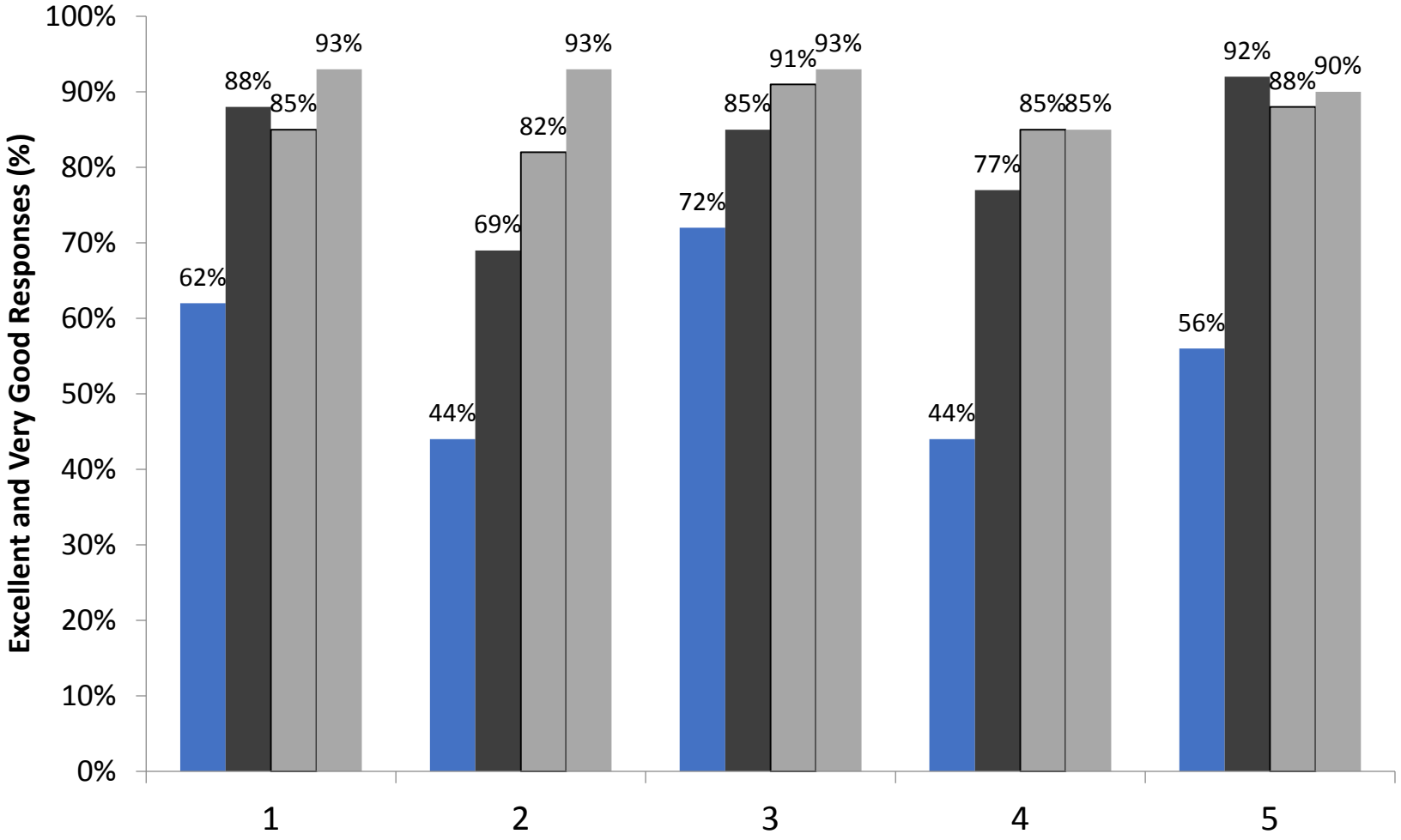
Patient Satisfaction



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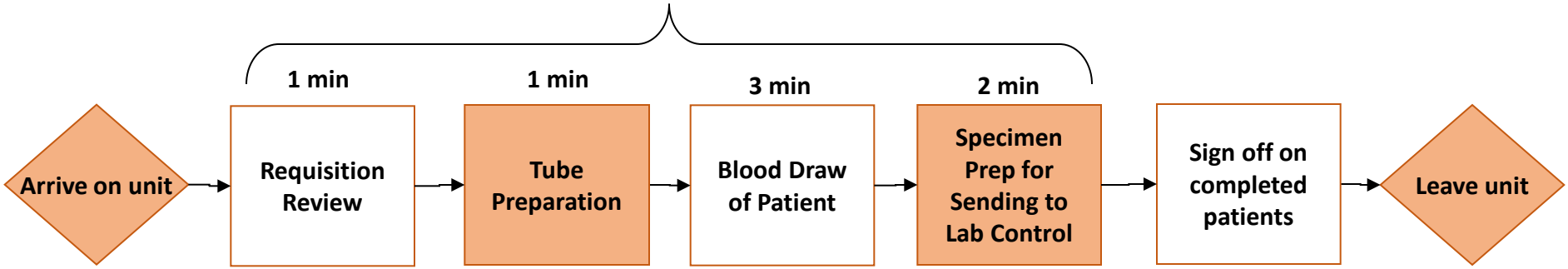
IIb. Inpatient Phlebotomy

- *Centralized phlebotomy services*
  - 375,000 venipunctures per year
  - 50% of inpatient draws (non-central line draws)
- Until 2015, order entry *without electronic order communication* with LIS
  - Paper requisitions
  - Specimens relabeled in the lab
  - Stand-alone Positive Patient Identification System (Lattice)

Variation in Blood Draw Process



Requisition Review

1. **Pull requisition**
2. **Highlight tests ordered**
3. **Initials and write ID#**
4. Fold and place in specimen bag

Tube Preparation

1. **Select tubes for draw**
2. Obtain gauze & alcohol pads
3. **Select patient name on Lattice**
4. Put on gloves

Blood Draw of Patient

1. Enter patient room
2. Introduce him/herself to patient
3. **Ask for patient name and DOB**
4. **Scan patient bracelet**
5. **Ask for arm preference**
6. Draw blood
7. Dispose of needles
8. **Step away from patient (may exit room)**

Specimen Prep for Sending to Lab Control

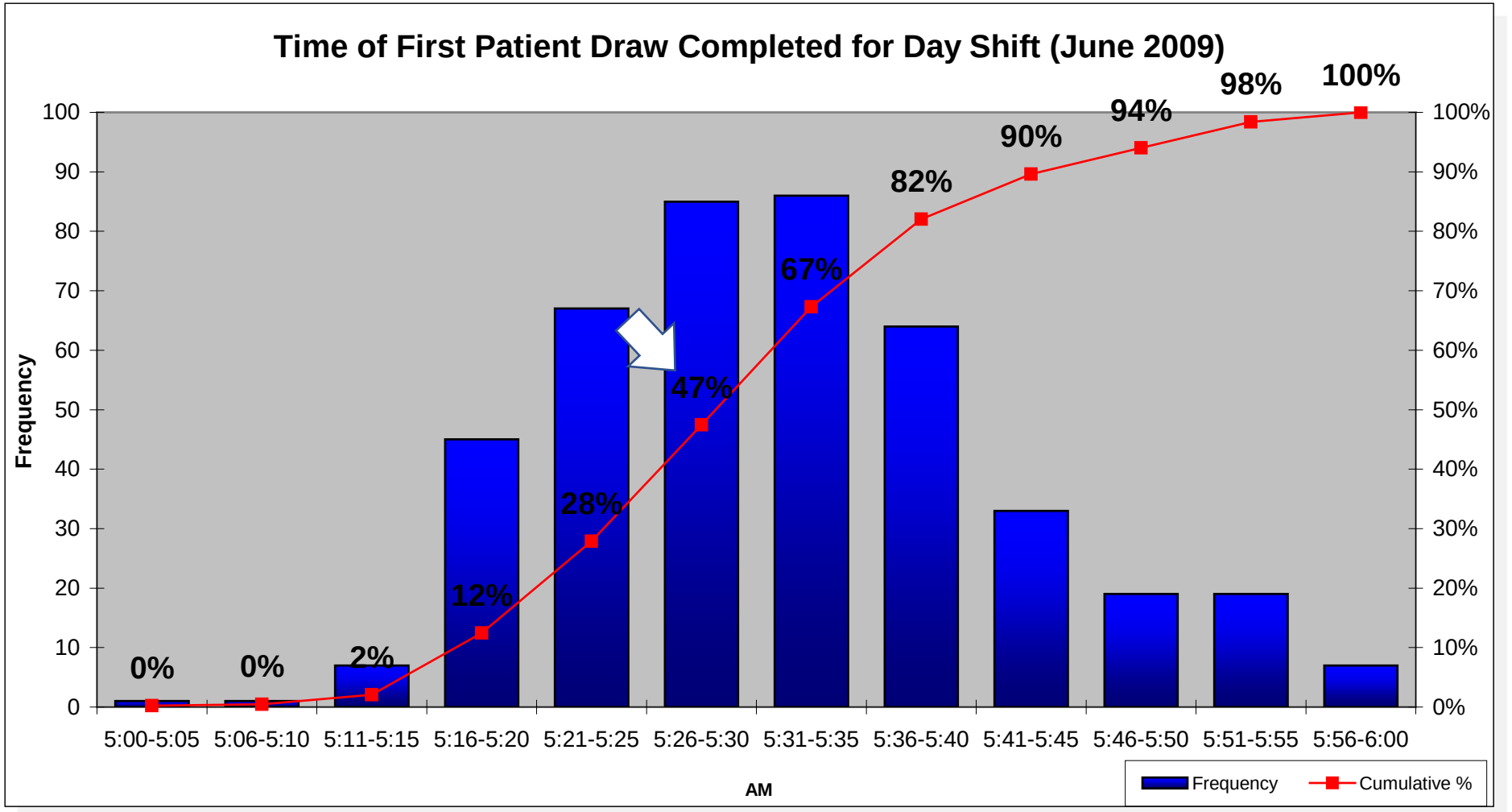
1. Select tests on Lattice
2. Scan own ID
3. **Print labels**
4. **Label tubes**
5. **Verify labels match MRN**
6. **Place tubes in bag and seal**
7. Dispose of gloves

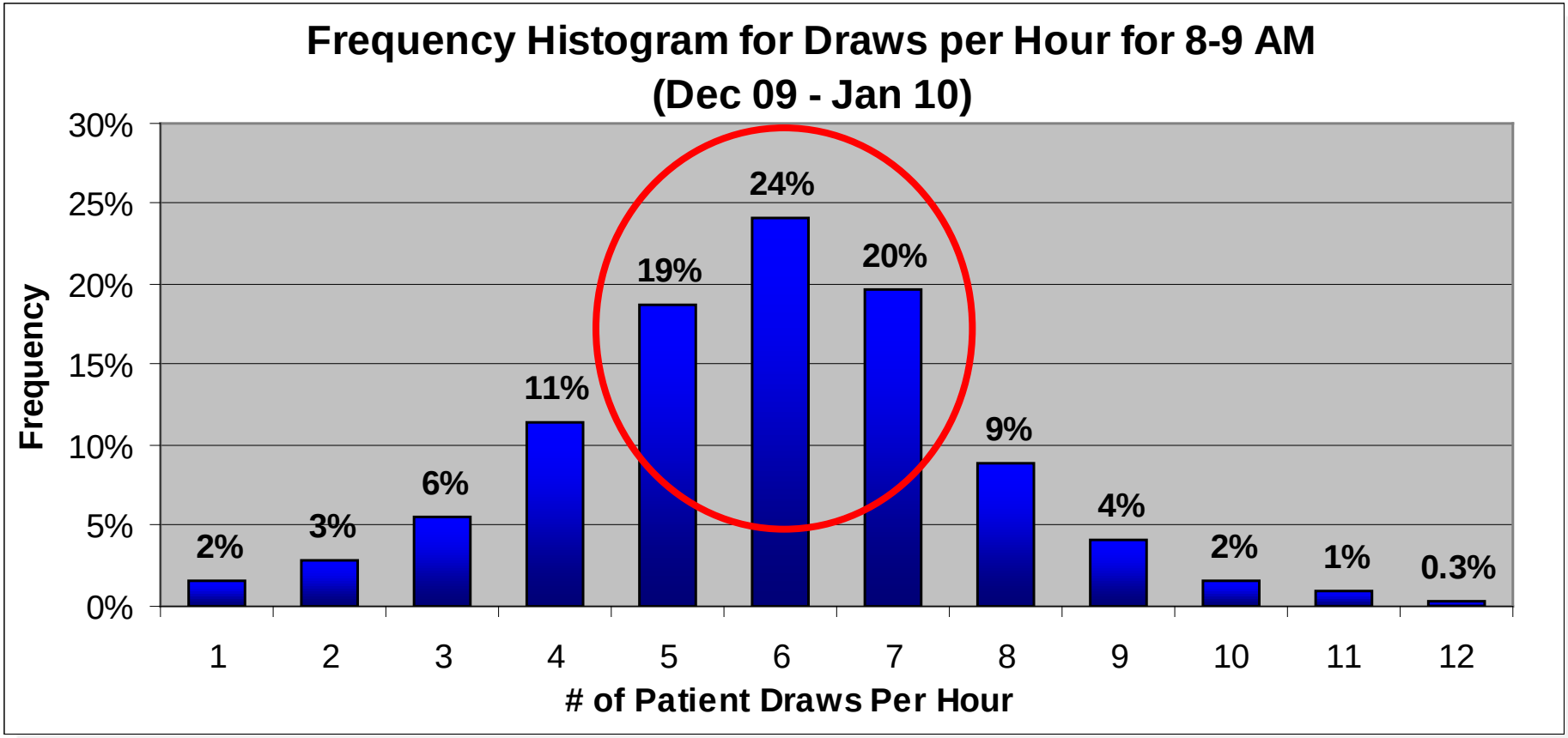
Sign off on completed patients

1. **Write time on pod sheet**
2. **Highlight completed pts**
3. Return pod sheet to UC desk

*** Steps in blue indicate observed variation (what, where, when) in process**

Average is 7 minutes per patient, but can vary greatly (2-15 min)

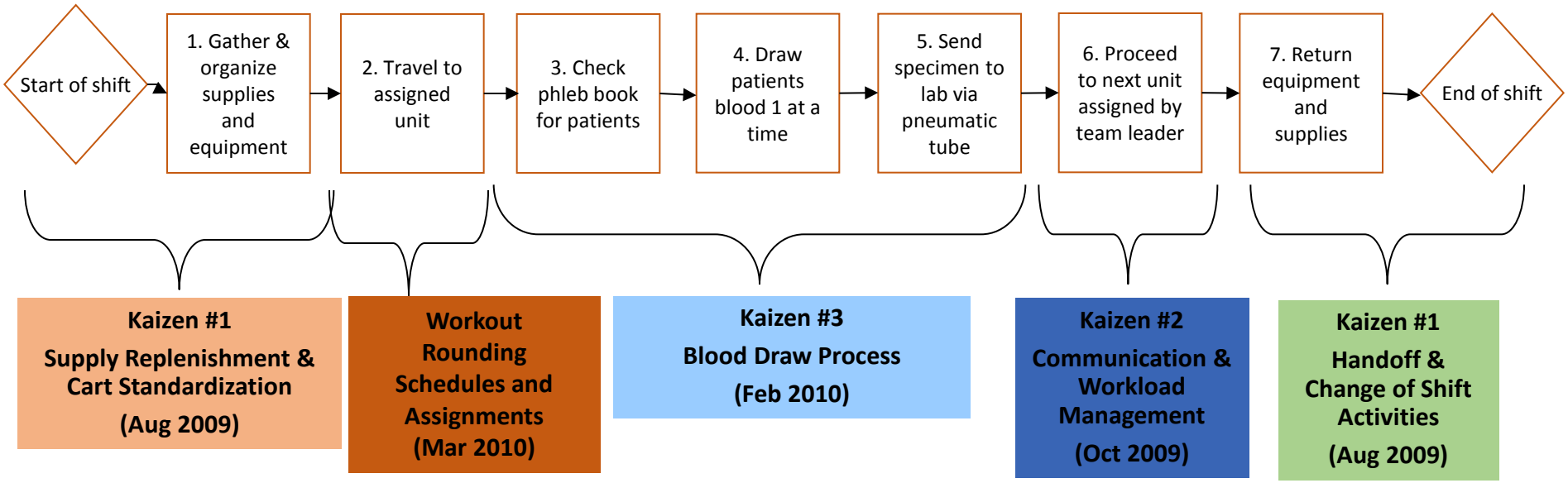

Time of First Patient Draw Completed for Day Shift (June 2009)
Frequency
AM
0%
0%
2%
12%
28%
47%
67%
82%
90%
94%
98%
100%
5:00-5:05
5:06-5:10
5:11-5:15
5:16-5:20
5:21-5:25
5:26-5:30
5:31-5:35
5:36-5:40
5:41-5:45
5:46-5:50
5:51-5:55
5:56-6:00
Frequency
Cumulative %


Frequency Histogram for Draws per Hour for 8-9 AM
(Dec 09 - Jan 10)
Frequency
30%
25%
20%
15%
10%
5%
0%
2%
3%
6%
11%
19%
24%
20%
9%
4%
2%
1%
0.3%
1
2
3
4
5
6
7
8
9
10
11
12
# of Patient Draws Per Hour

Process Improvement Goals

- 80% of phlebotomists have first patient drawn within 30 minutes after start of shift
- 90% of phlebotomists complete 8 AM rounds by 9:30 AM
- 5-7 patient draws per hour during 8 AM rounds
- Less than 4 collection errors per thousand draws each month (mislabeled, unlabeled, wrong specimen, and no specimen)

Summary of Kaizen Events

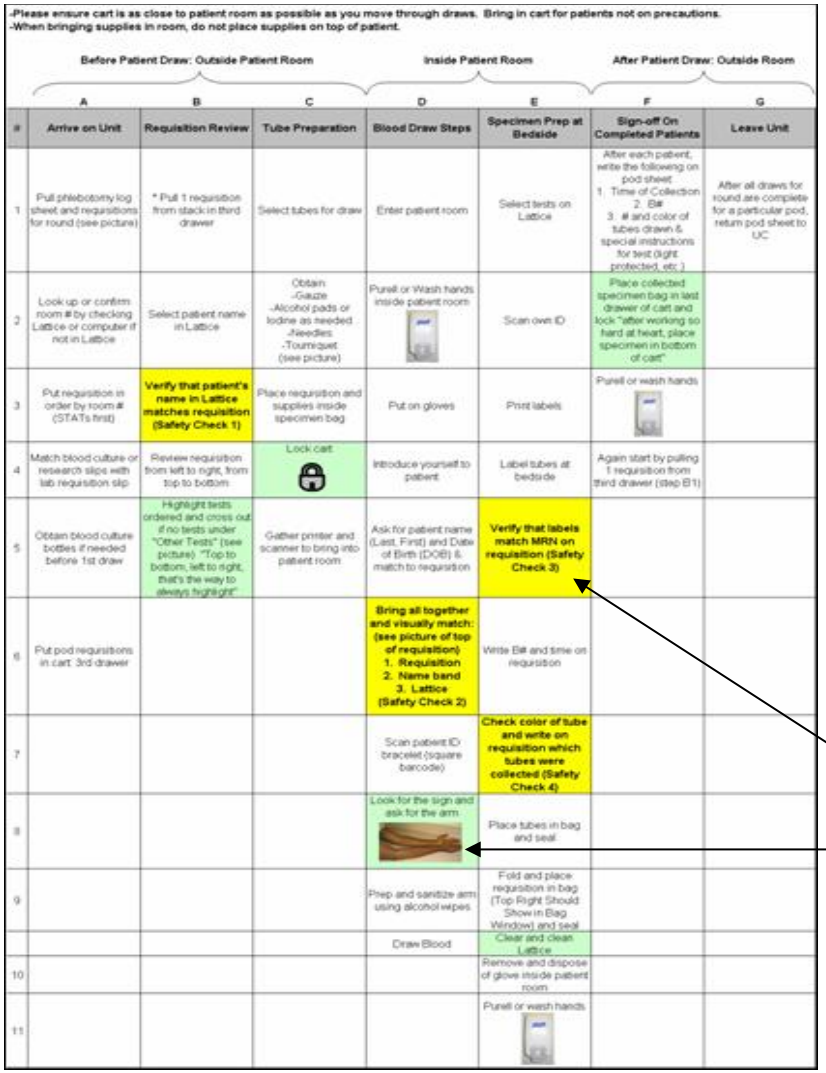


Le et al. J Clin Pathol 2014

Supply Standardization and Communication

- Communication Strategy within Shift
  - Communication Board
  - Team Leader priorities
  - Missed draw communication and handoff
  - Draws for patients who are not in room
- Use of Direct Connect phones to more easily contact phlebotomists
- Optimize rounding schedules in collaboration with nursing

New Blood Draw Process

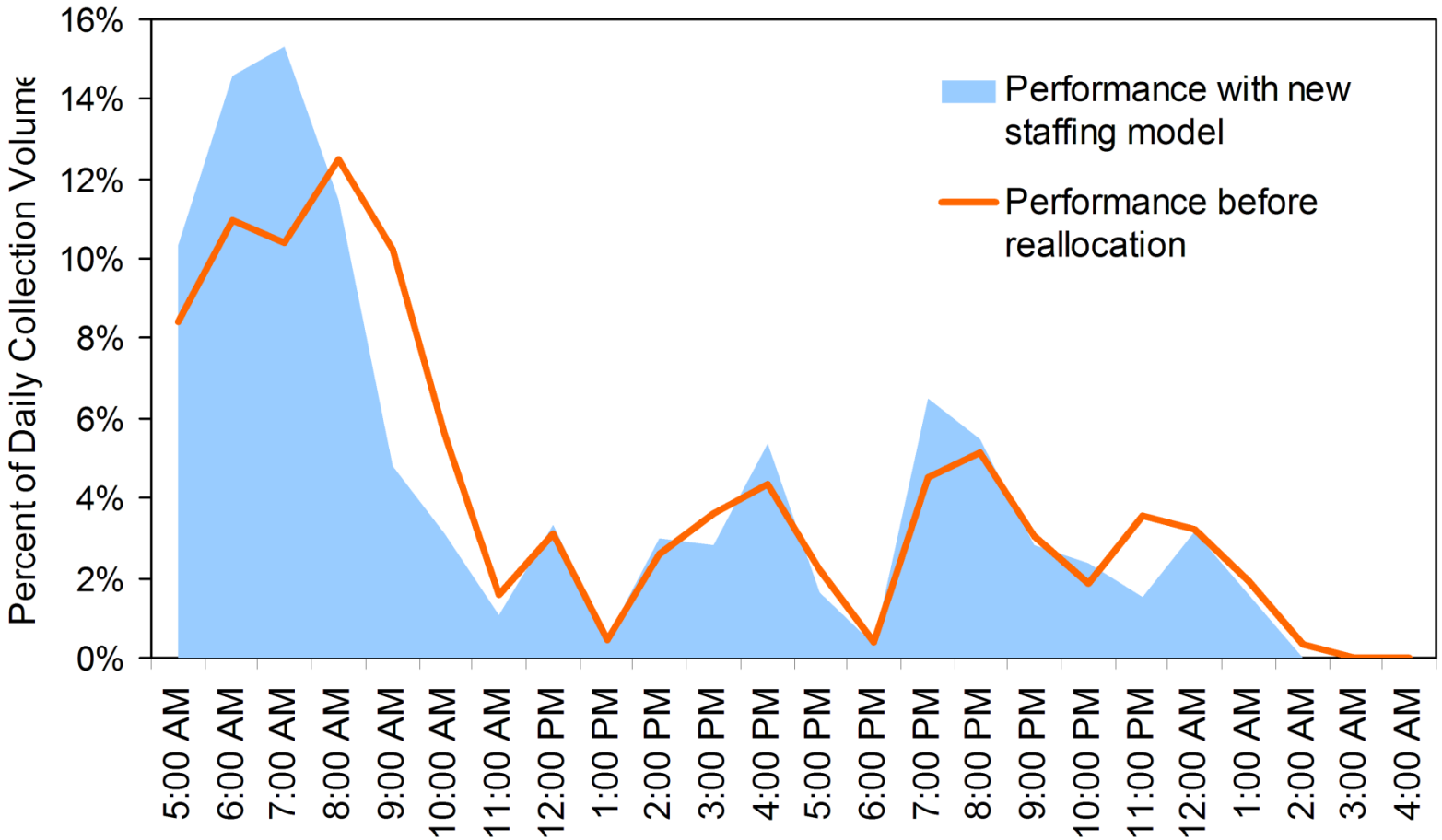


-Please ensure cart is as close to patient room as possible as you move through draws. Bring in cart for patients not on precautions.
-When bringing supplies in room, do not place supplies on top of patient.

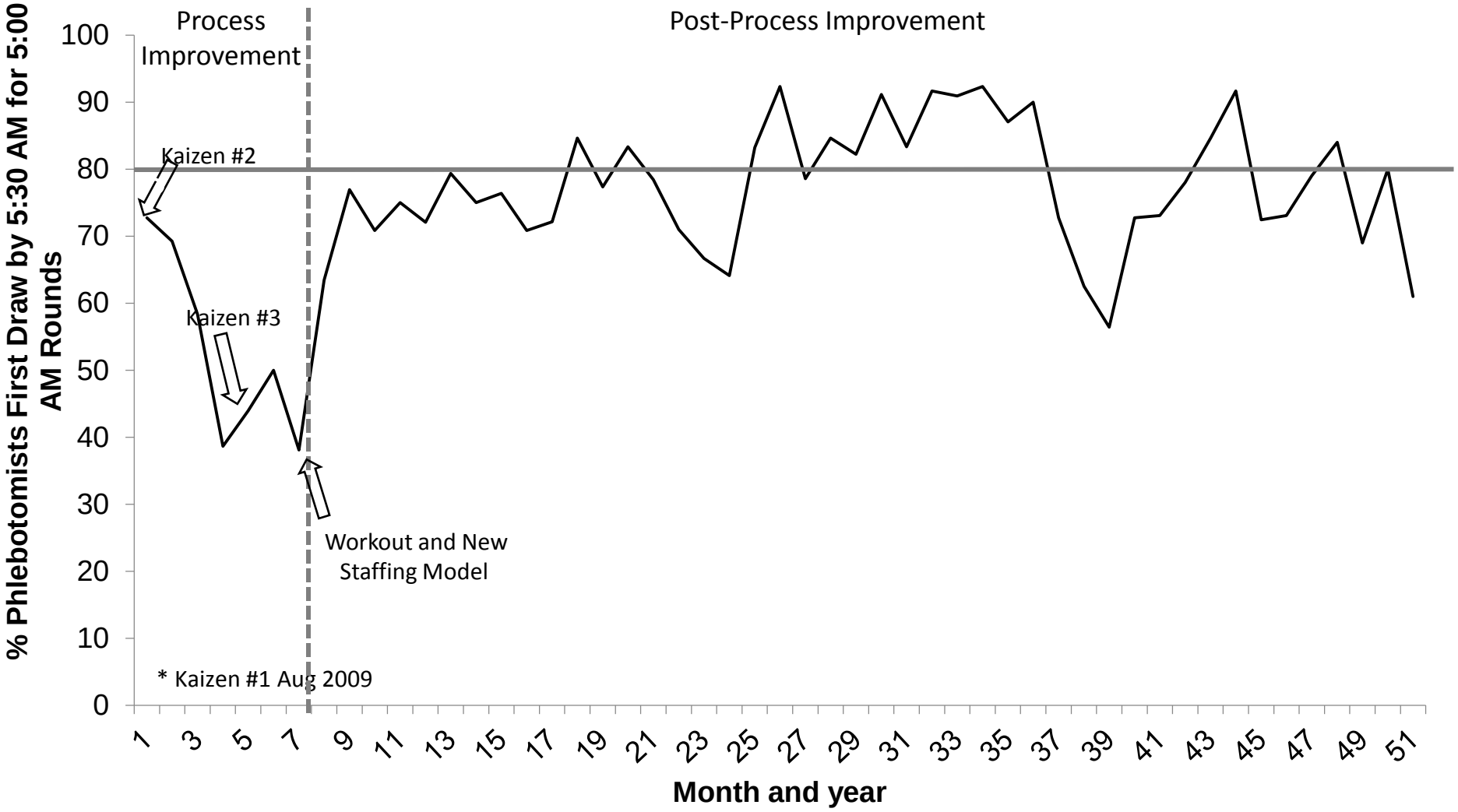
	Before Patient Draw: Outside Patient Room			Inside Patient Room		After Patient Draw: Outside Room	
	A	B	C	D	E	F	G
#	Arrive on Unit	Requisition Review	Tube Preparation	Blood Draw Steps	Specimen Prep at Bedside	Sign-off On Completed Patients	Leave Unit
1	Pull phlebotomy log sheet and requisitions for round (see picture)	* Pull 1 requisition from stack in third drawer	Select tubes for draw	Enter patient room	Select tests on Lattice	After each patient, write the following on pod sheet: 1. Time of Collection 2. Bit 3. # and color of tubes drawn & special instructions for test (light protected, etc.)	After all draws for round are complete for a particular pod, return pod sheet to UC
2	Look up or confirm room # by checking Lattice or computer if not in Lattice	Select patient name in Lattice	Obtain: -Gauze -Alcohol pads or Iodine as needed -Needles -Tourniquet (see picture)	Purell or Wash hands inside patient room	Scan own ID	Place collected specimen bag in last drawer of cart and lock "after working so hard at heart, place specimen in bottom of cart"	
3	Put requisition in order by room # (STATs first)	**Verify that patient's name in Lattice matches requisition (Safety Check 1)**	Place requisition and supplies inside specimen bag	Put on gloves	Print labels	Purell or wash hands	
4	Match blood culture or research slips with lab requisition slip	Review requisition from left to right, from top to bottom	Lock cart	Introduce yourself to patient	Label tubes at bedside	Again start by pulling 1 requisition from third drawer (step B1)	
5	Obtain blood culture bottles if needed before 1st draw	Highlight tests ordered and cross out if no tests under "Other Tests" (see picture) "Top to bottom, left to right, that's the way to always highlight"	Gather printer and scanner to bring into patient room	Ask for patient name (Last, First) and Date of Birth (DOB) & match to requisition	**Verify that labels match MRN on requisition (Safety Check 3)**		
6	Put pod requisitions in cart 3rd drawer			**Bring all together and visually match: (see picture of top of requisition) 1. Requisition 2. Name band 3. Lattice (Safety Check 2)**	Write Bit and time on requisition		
7				Scan patient ID bracelet (square barcode)	**Check color of tube and write on requisition which tubes were collected (Safety Check 4)**		
8				Look for the sign and ask for the arm	Place tubes in bag and seal		
9				Prep and sanitize arm using alcohol wipes	Fold and place requisition in bag (Top Right Should Show in Bag Window) and seal		
				Draw Blood	Clear and clean Lattice		
10					Remove and dispose of glove inside patient room		
11					Purell or wash hands		

- Eliminated unnecessary steps
  - Initialing the requisition
  - Highlighting phlebotomy log sheet
- Set rules for the use of cart and the order for patient draws
  - Cart to be placed in or near the patient room and locked
  - Order draws based on room #
- Rearranged steps and set proper order and location
  - Labeling tubes at the bedside
- Highlighted 4 key safety checks
- Developed memory aids for frequently missed steps
  - Use of pictures and catch phrases

Earlier Collection Times



% Phlebotomist First Draw by 5:30 AM for 5:00 AM Rounds



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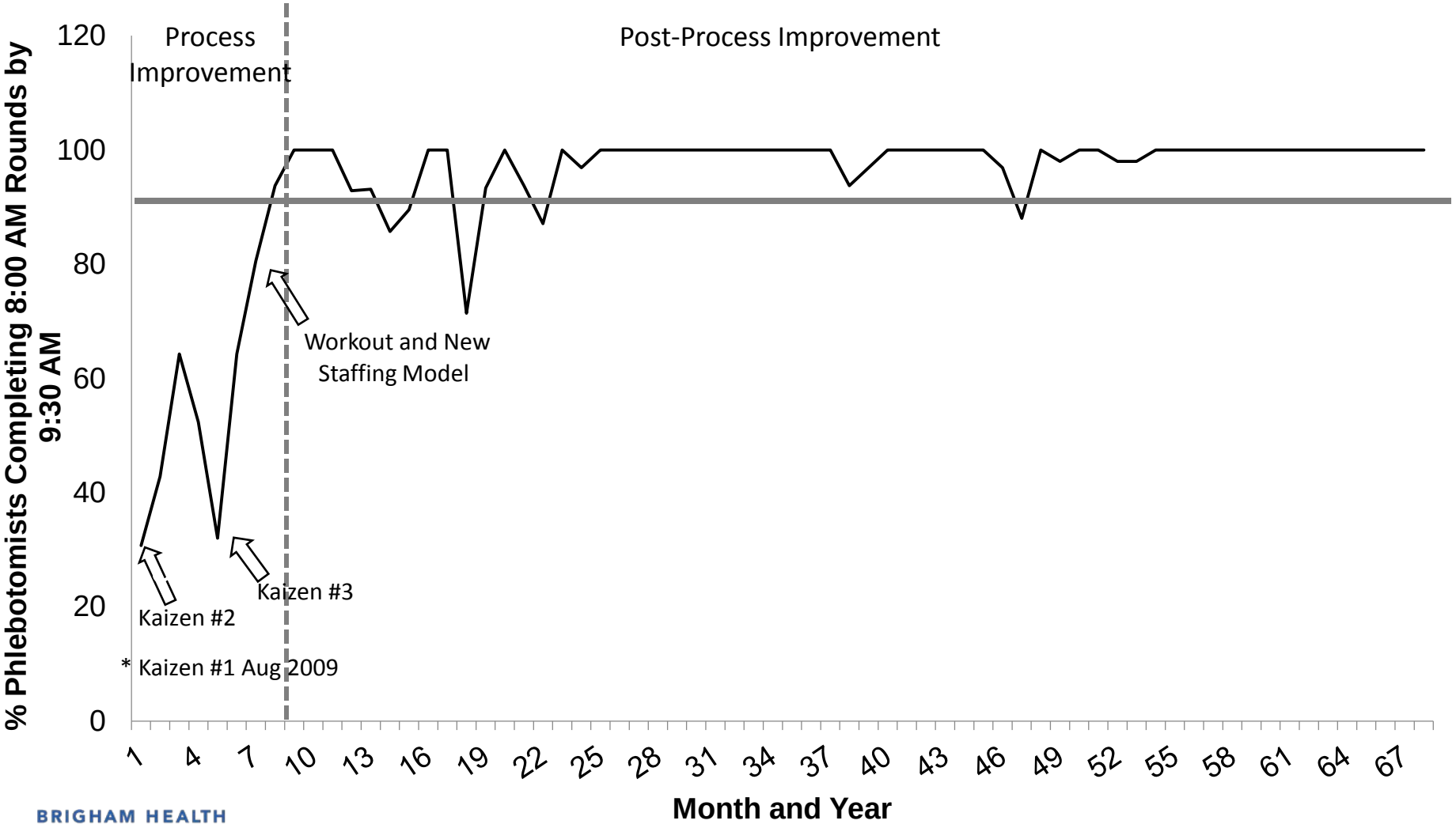
Le RD et al. J Clin Pathol. 2014

% Phlebotomists Completing 8:00 AM Rounds by 9:30 AM



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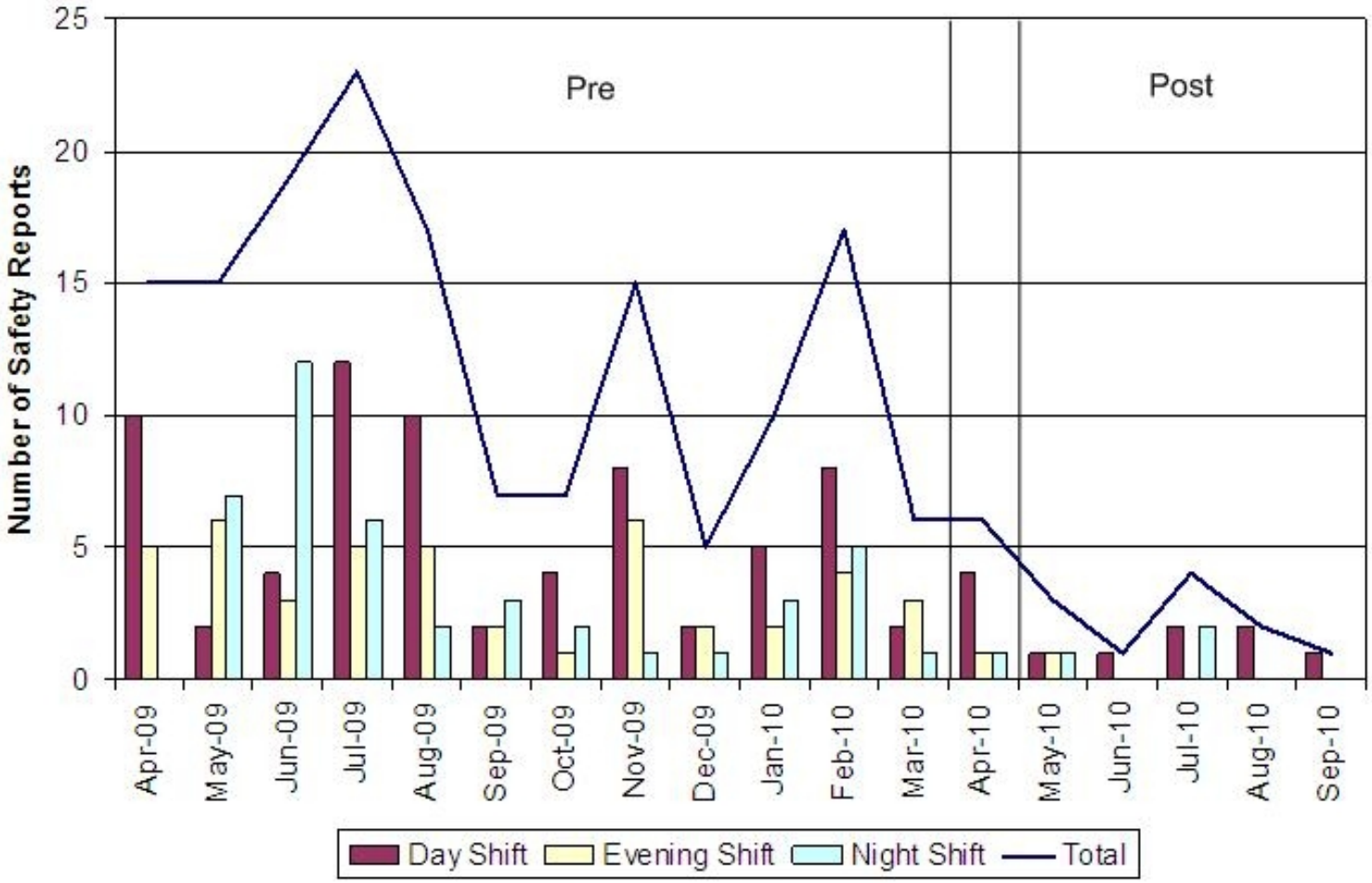
Le RD et al. J Clin Pathol. 2014

Decreased Number of Safety Reports

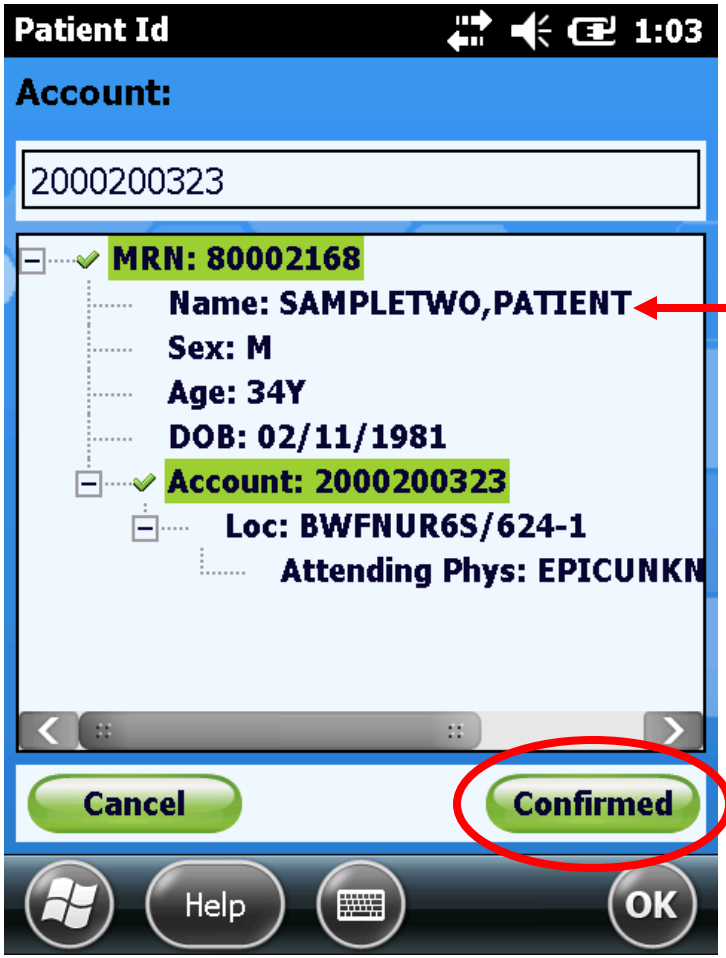


III. Order Communication System

- Sunquest LIS (Nov 2014)
- Epic HIS (May 2015)
- Order communication between Epic and Sunquest
  - Limit the number of paper requisitions
  - Reduce specimen re-labeling
- Fully integrated Positive Patient Identification (PPID) system (Sunquest Collection Manager)
  - Sunquest labels generated at the bedside
  - Collection and processing instructions shown
  - Use of Collection Manager by nursing, ED, outpatient phlebotomy and procedural areas

Sunquest Collection Manager

Use scroll bar and +/- icons to navigate screen



Verify that correct patient is displayed

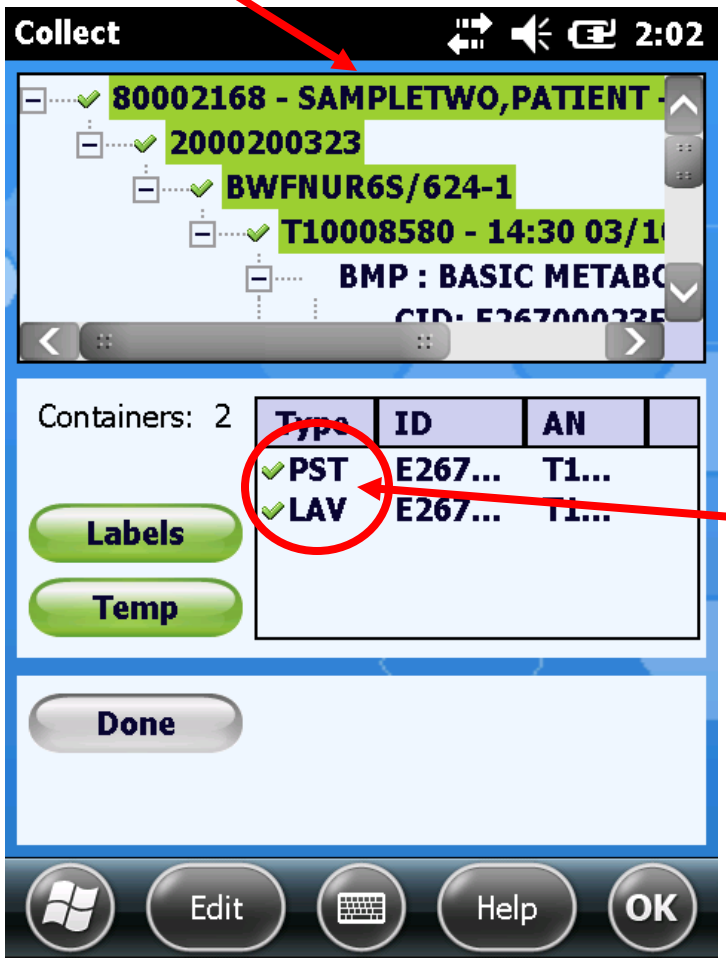
Tap Confirmed button to continue

Courtesy Stacy Melanson MD PhD

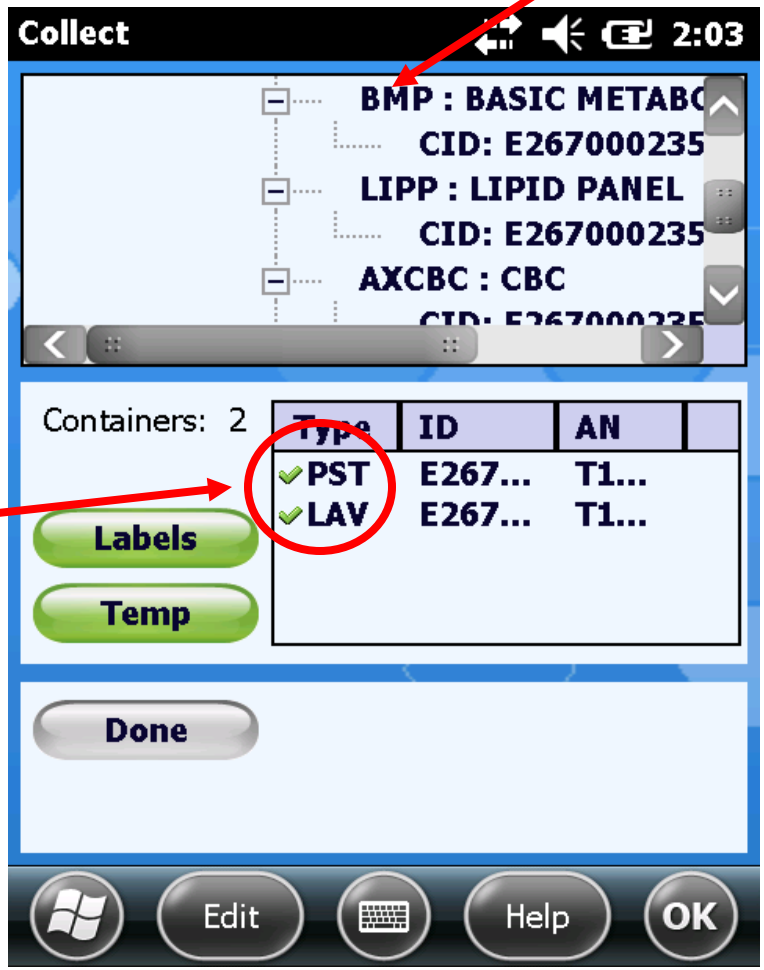
Collection Screen

Patient information

Ordered tests



Tube types Listed in correct Order of draw

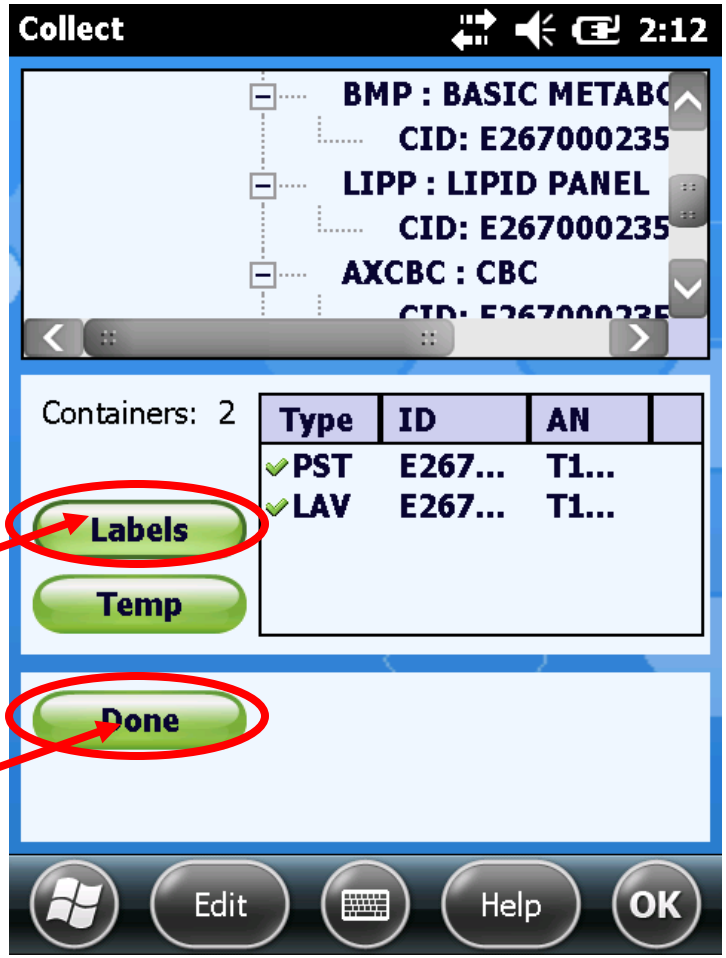


Courtesy Stacy Melanson MD PhD

Print Labels – Label Specimens

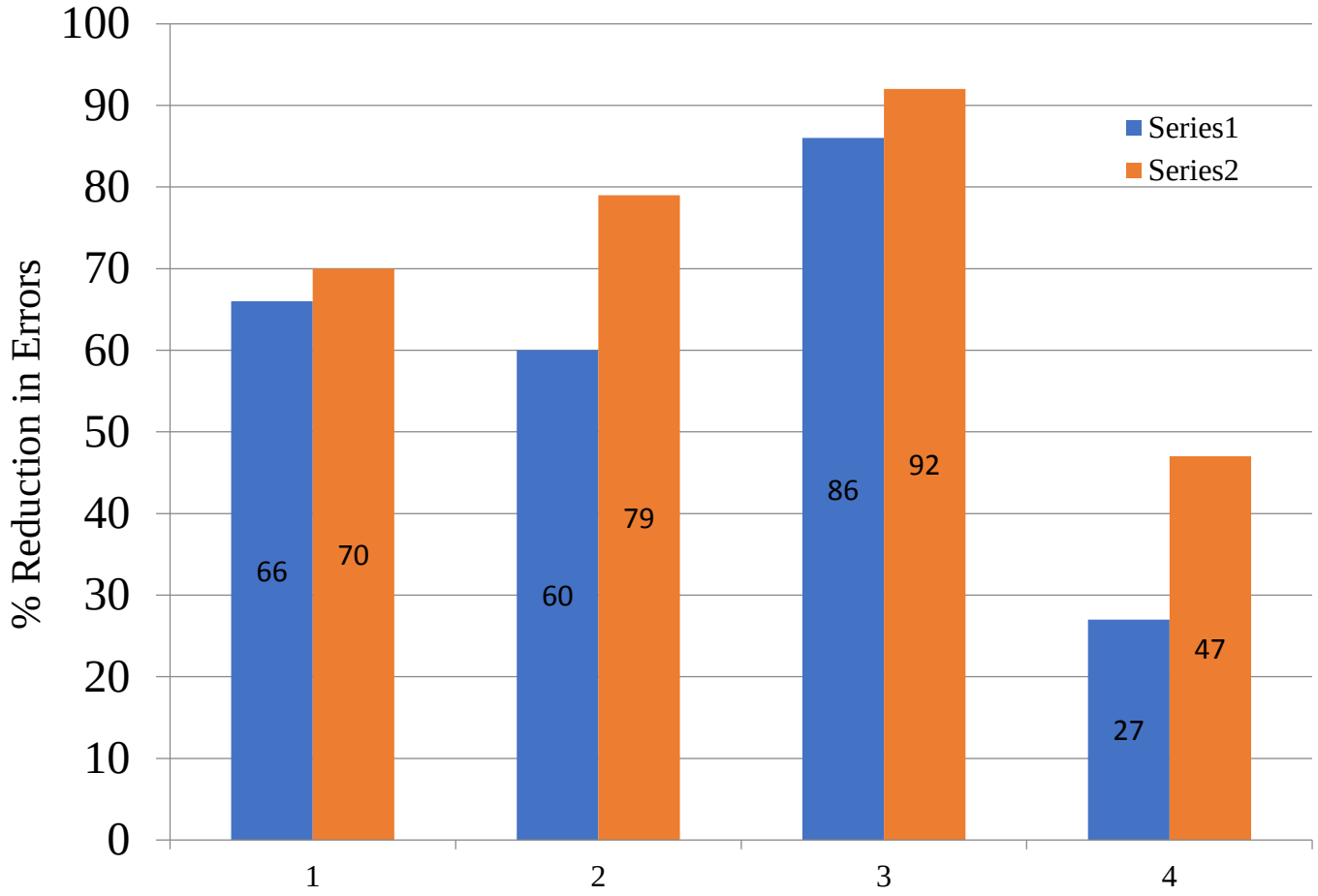
You must click on **Labels** first and Label all specimens

When specimens Are labeled – click **Done**



Courtesy Stacy Melanson MD PhD

Reduction of Pre-analytical Errors Pre- vs. Post-Epic in Inpatient Nursing and ED



IV. Safety Event Reporting System

Types of Safety Events:

- Pre-analytical
  - Incorrect selection of tests by the ordering clinician
  - Specimen collection
    - Patient misidentification
    - Wrong number, type of specimen
    - Mislabeled / unlabeled specimen tubes
  - Transportation / lost specimens
  - Log-in errors
  - Processing and routing errors
    - Specimen sent to the wrong lab
    - Delays in sending out to reference laboratories
- Intra-analytical
  - Technical (QC, instrument failure)
  - Suboptimal quality or quantity of specimen
  - Specimen mix ups before or during analysis
  - Product recalls (reagent, instrument)
- Post-analytical
  - Incorrect interpretation or results
  - Result entry errors
  - Delayed reporting or results
  - Reporting of wrong results

Delays caused by HIS/LIS or Instrument downtime

Categories of Severity

- *"No harm"*
  - Low potential for patient harm
  - Identified before reporting of results to the ordering clinicians
- *"Non-lab event"*
  - Pre-analytical errors caused by clinical / nursing staff
    - Test incorrectly ordered by the provider
    - Mis-timing of specimen collection
    - Incorrect understanding about scheduled phlebotomy rounds
- *"Near harm / near miss"*
  - Potential to cause harm or injury
  - Identified before major harm occurred
- *"Harm"*
  - Direct patient impact resulting in serious injury or death

Medical Directors Review

Event List : Require Action Job Aid # 01-17

All Departments: AP, CAMD, CP, Cytology, BB	Enter Safety Report √ = Yes	Event Requires Medical Director Review (refer to Workflow #02-17)
Lost Specimen (includes specimens sent for testing intended for multiple locations eg. Micro and AP)	√	All events
Receipt of Mislabeled or Unlabeled Specimen (includes specimen/req mismatch, NO D/T/I)	√	□ For AP, CAMD, Cytology only mislabeled and unlabeled specimens which impact clinical care or have the potential to impact clinical care. □ For CP, BB only mislabeled or unlabeled specimens on which tests results were reported.
Specimen Mislabeled in laboratory (excludes pathology mislabeled slides and blocks)	√*	□ For AP, CAMD, Cytology only events which impact clinical care or have the potential to impact clinical care. *Note: Mislabeled slides and blocks are tracked in PowerPath only, entry of a safety report is not required. □ For CP, BB all events
System testing/Process failure which impacted tissue quality, test results or diagnosis (eg. instrument problem that impacted a number of tests/test results,diagnosis)	√	All events
Finalized report with misidentified (incorrect) patient	√	All events
Finalized report with incorrect test results or major diagnostic error	√	All events
Delay Reporting Results	√	□ For AP, CAMD, Cytology, BB only delay reporting results which impact clinical care. □ For CP only delay reporting results for category 3 and 4 safety reports.
Failure to report Critical Value or Result	√	All events
Injury to patient or donor Adverse patient or donor outcome	√	All events
Safety report classified by reporter as 3 or 4	NA	All events
Blood Bank only	**Enter Safety Report √ = Yes**	**Event Requires Medical Director Review (refer to Workflow #02-17)**
Incorrect blood product issued	√	□ Requires Medical Director review when patient care is impacted
Wrong blood in tube (blood sample does not match historical ABO type)	√	□ Requires Medical Director review when patient care is impacted
Product Wastage	√	NA
Product transfused without transfusion order or consent	√	NA
Emergency release without patient name or MRN	√	NA
Products issued/transfused not meeting patient special requirements (eg. irradiated, washed, etc)	√	NA
Delay receiving ordered blood products	√	□ Requires Medical Director review when patient care is impacted

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Follow-up to External Reported Events
Guide for Technical Directors and Pathology Managers
Workflow #02-17

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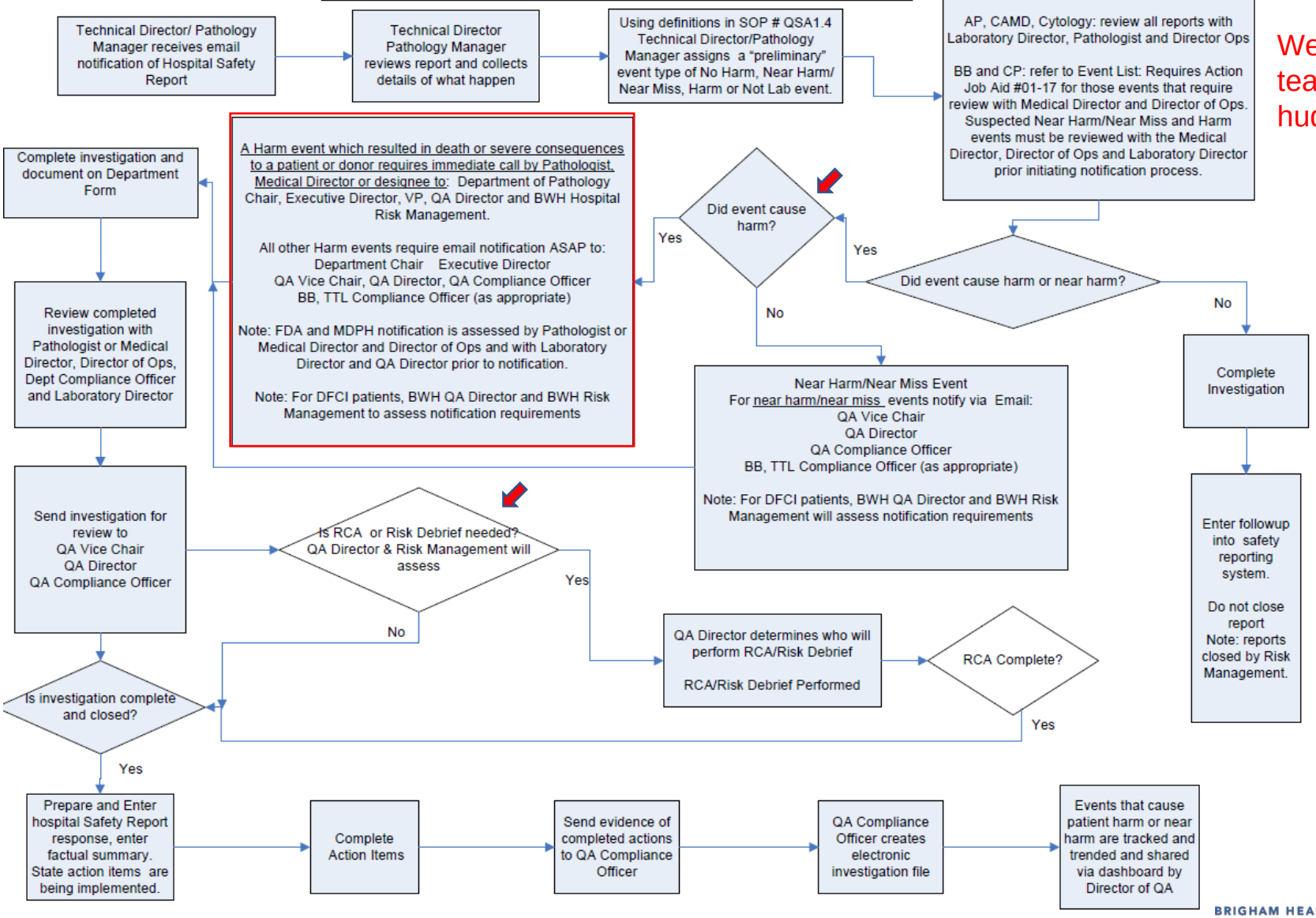

Weekly team huddles

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Entry and Follow-up to Internal Reported Events Guide for Department of Pathology Staff Workflow #01-17

Events Which Require Safety Report Entry

Receipt of:
Unlabeled Specimen
Mislabeled Specimen

BB
LCO
AP*
CAMD*
Cytology
*Note: applies to clinical wet specimens and tissue, consults are not included

Enter Event into Hospital Safety Reporting System Refer to SOP QSA #1.4

No Further Action Required

***Receipt of Mislabeled or Unlabeled Specimen**
***Lost Specimen**
***Specimen mislabeled in laboratory**
***Delay Reporting Results**
***Failure to report Critical Value or Result**
***Finalized report w/ misidentified (incorrect) patient, incorrect test result, or major diagnostic error**
***System testing/process failure that impacted/may have impacted tissue quality, patient reported test results, administered blood products, diagnosis**
***Injury to patient or donor; adverse patient or donor outcome**

Refer to Job Aid #01-17 and SOP QSA#1.4

BB
CP
AP
CAMD
Cytology

Enter Event into Hospital Safety Reporting System Refer to SOP QSA #1.4

Did the event cause Near Harm, Near Miss or Harm?

Yes

Initiate same process used for Follow-up to External Reported Events Workflow #01-17 and SOP QSA #1.4

No

Complete Investigation

Enter followup into safety reporting system.

Do not close report
Note: reports closed by Risk Management.

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Staff Training

‘Healthstream’ training modules
In-person (1.5 hr, case scenarios)

Trainees:

Pathologists
Directors of Operations
Technical Directors
Managers
Compliance Officers
Compliance Sr. Techs
Supervisors

Content:

1. Roles and Responsibilities
2. Event notification and discovery
3. When and How to enter a report
4. Event Types
   - No Harm
   - Near Harm/Near Miss and Harm
   - Not Lab Event
6. Investigation
7. Leadership notification
8. QA Review
9. How to enter follow-up in Hospital Safety Reporting System
10. Quiz

Courtesy of Denise M. Fountain MS, MT(ASCP)SBB CQA(ASQ)
Director of Quality Assurance and Regulatory Compliance

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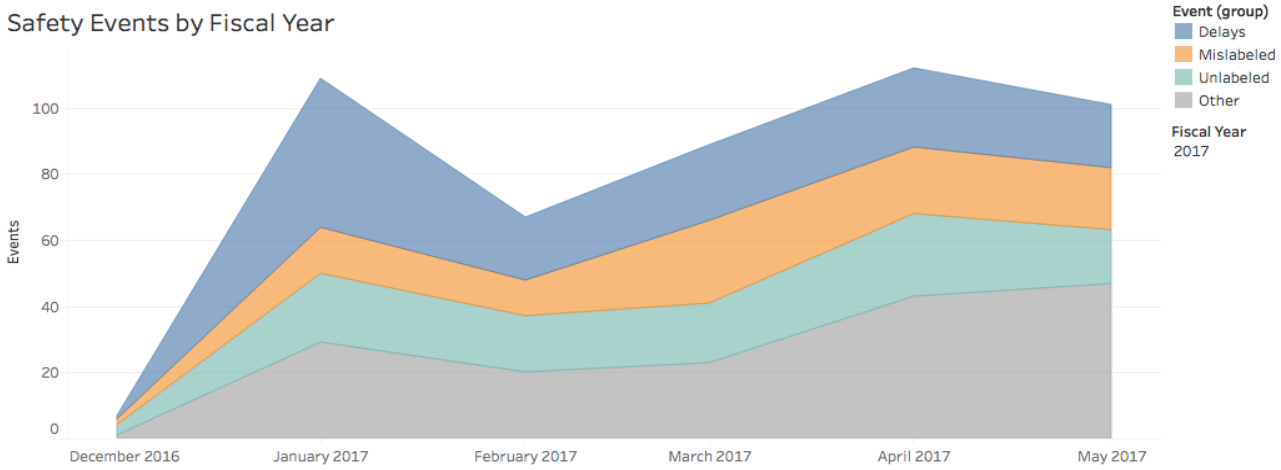
Training Scenarios

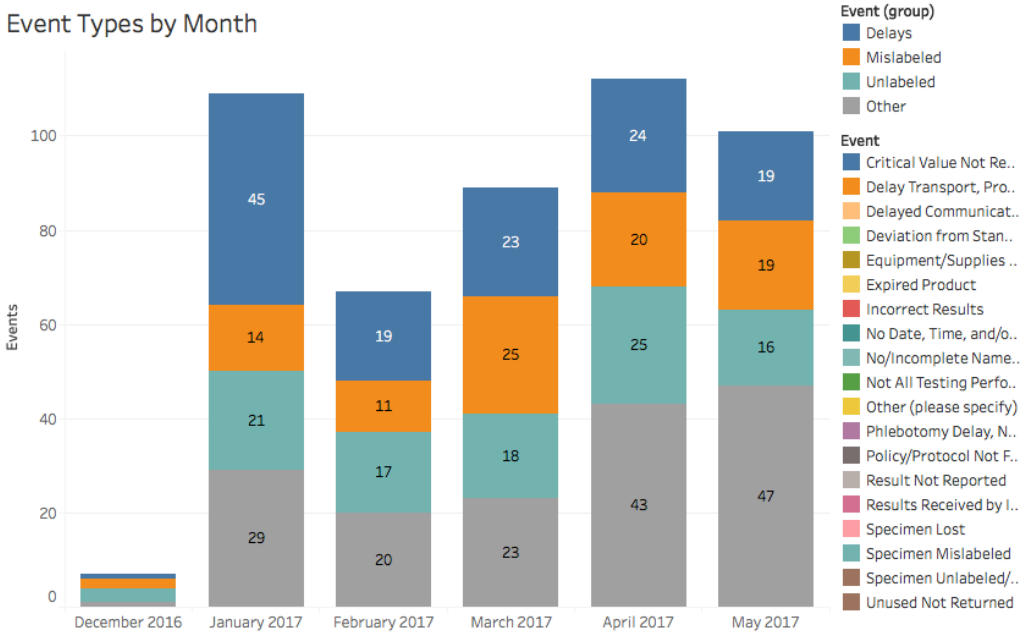
	Event Description	Event Type
1	Unit collect - 4 blood specimen tubes collected and placed in one specimen bag. Upon receipt in Lab Control only the gray top tube was labeled with a Sunquest label, all other tubes were unlabeled.	
2	The molecular chimerism report for patient A was manually filed in Epic into patient B's record.	
3	Two microcontainers received at same time on Twin A and Twin B. Upon receipt in Lab Control Twin B microcontainer tube was relabeled with Twin A label. Samples given to Chemistry for testing and since both labeled with Twin A identifiers pooled together for testing. Results reported on Twin A.	
4	Urine HCG was resulted as positive in Sunquest/Epic. Serum HCG ordered and resulted as negative. Provider called to request verification of urine HCG. Investigation showed that urine HCG had been resulted and recorded on the urine HCG testing form as negative but transcribed in Sunquest as positive.	
5	Department of Pathology received consult slide material on 6/21/17 and subsequently lost the patient slides between the point of department receipt and transport to the MRB laboratory for consultation.	

Safety Event Trending

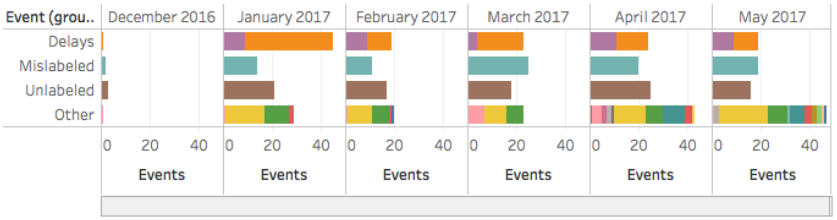


Event (group)	Total	December 2016	January 2017	February 2017	March 2017	April 2017	May 2017
Delays	131	1	45	19	23	24	19
Mislabeled	91	2	14	11	25	20	19
Unlabeled	100	3	21	17	18	25	16
Other	163	1	29	20	23	43	47

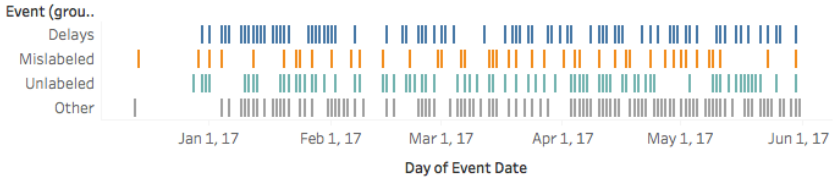
Event Types by Month



Event Types by Month Subtypes



Event Types by Day with Tooltip



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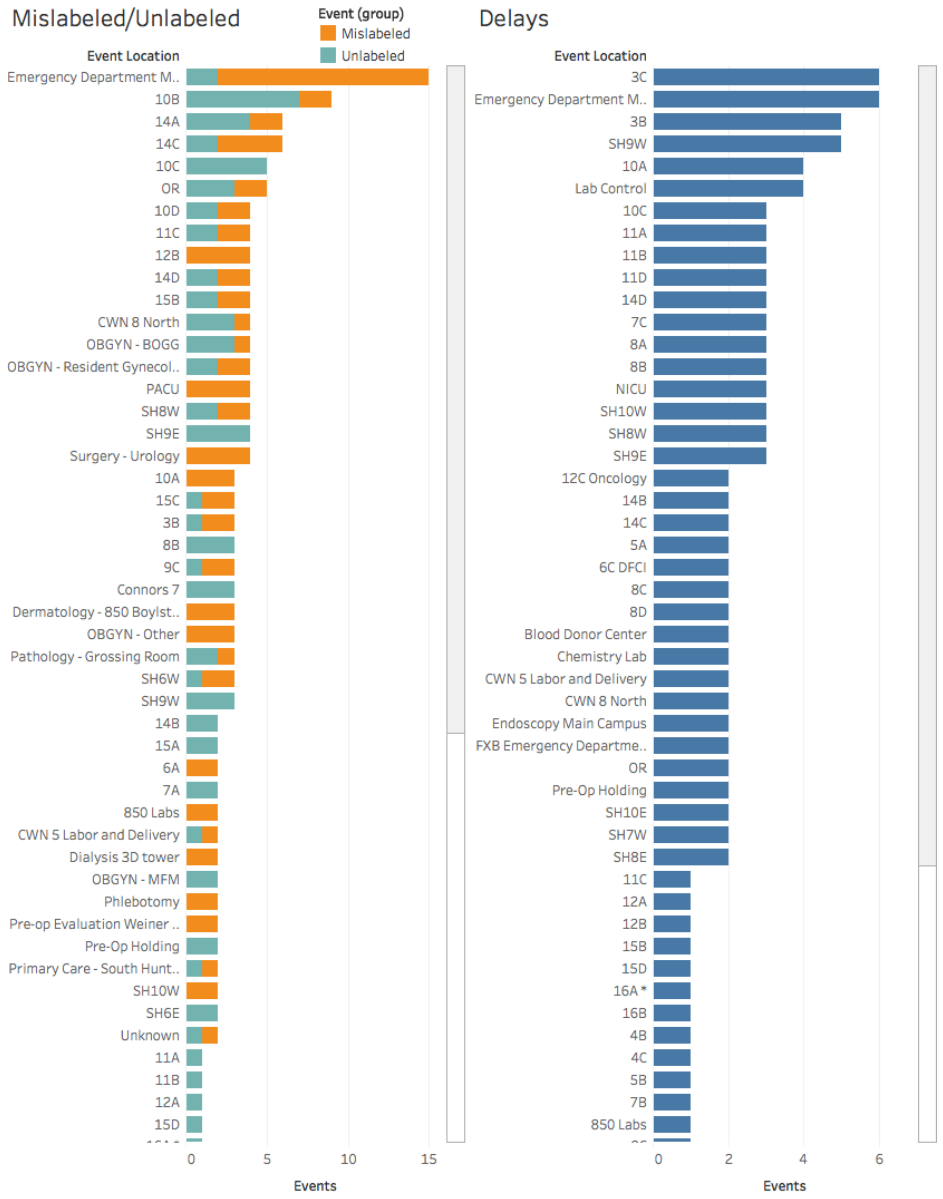
Developed by Ryan J. Schmidt, MD, PhD



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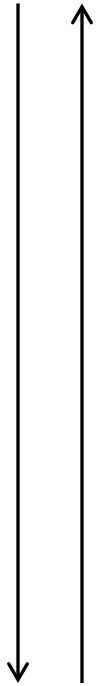
Developed by Ryan J. Schmidt, MD, PhD

Process Improvement
Key Factors for Success

- Project definition
  - Sharply defined problem(s)
  - Realistic goals (ambitious but achievable)
  - Clear articulation of boundaries
- Process improvement events
  - Direct engagement of front-line staff
  - Detailed value stream map
  - Simple, well-defined interventions
  - Real-time testing
  - Real-life environment
  - Rapid iteration
- Post-intervention period
  - Dashboards for key metrics
  - Application to related processes and activities
  - Culture of continuous process improvement



Communication

Strategic Goals

Core Laboratories

- Clinical Decision Support
- LEAN
- Lab Automation

Resource Redeployment

Advanced Diagnostics

- Molecular Pathology
- Center For Advanced Molecular Diagnostics
- Molecular Virology
- Tissue Typing
- LCMS
- Flow Cytometry

Research Assistants

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Rachel Le
Alex Mijailovic
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Quality Team

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Athena Petrides
Cathleen Quade
Fred Schoen
Ed Cibas
Jason Hornick
Rick Kaufman

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HARVARD MEDICAL SCHOOL TEACHING HOSPITAL

A FOUNDING MEMBER OF PARTNERS HEALTHCARE

A NASCAR pit stop taken by a U.S. soldier. The U.S. Army #01 car driven by Mark Martin in the pits at Daytona for the Daytona 500. From flickr (CC-BY-SA 2.0) but claimed originally from U.S. Army http://flickr.com/photos/soldiersmediacenter/40609446