Clinical Safety & Effectiveness
Cohort # 18

Follow up and tracking of EMR virology and microbiology test results in a Pediatric university-based ambulatory teaching clinic

CENTER FOR PATIENT SAFETY & HEALTH POLICY
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SAN ANTONIO

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Background

Failure to follow up microbiology results can delay diagnosis and treatment of important infections, harm patients, and increase the risk of litigation. Current systems to track pending tests are often inadequate.

Background

Failure to Follow-Up Test Results for Ambulatory Patients: A Systematic Review

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BACKGROUND: Serious lapses in patient care result from failure to follow-up test results.

OBJECTIVE: To systematically review evidence quantifying the extent of failure to follow-up test results and the impact for ambulatory patients.

DATA SOURCES: Medline, CINAHL, Embase, Inspec and the Cochrane Database were searched for English-language literature from 1995 to 2010.

STUDY SELECTION: Studies which provided documented quantitative evidence of the number of tests not followed up for patients attending ambulatory settings including: outpatient clinics, academic medical or community health centres, or primary care practices.

DATA EXTRACTION: Four reviewers independently screened 768 articles.

RESULTS: Nineteen studies met the inclusion criteria and reported wide variation in the extent of tests not followed-up: 6.8% (79/1163) to 62% (125/202) for laboratory tests; 1.0% (4/395) to 35.7% (45/126) for radiology. The impact on patient outcomes included missed cancer diagnoses. Test management practices varied between settings with many individuals involved in the process. There were few guidelines regarding responsibility for patient notification and follow-up. Quantitative evidence of the effectiveness of electronic test management systems was limited although there was a general trend towards improved test follow-up when electronic systems were used.

LIMITATIONS: Most studies used medical record reviews; hence evidence of follow-up action relied upon documentation in the medical record. All studies were conducted in the US so care should be taken in generalising findings to other countries.

CONCLUSIONS: Failure to follow-up test results is an important safety concern which requires urgent attention. Solutions should be multifaceted and include: policies relating to responsibility, timing and process of notification; integrated information and communication technologies facilitating communication; and consideration of the multidisciplinary nature of the process and the role of the patient. It is essential that evaluations of interventions are undertaken and solutions integrated into the work and context of ambulatory care delivery.

INTRODUCTION

Failure to follow up test results is a critical safety issue which has been identified as a major problem in ambulatory settings.[1–4] The practices and processes currently used are varied and unsystematic[2,5] and physicians[6,7] and patients[8,9] acknowledge that this needs to improve. The testing process in ambulatory settings is complex and can be divided into three broad phases, pre-analytic, analytic and post-analytic (Fig. 1), each involving multiple steps and multiple personnel including clinicians, patients, office and laboratory staff.[10]

Most primary care practices are not using electronic health records,[11] and most are communicating with multiple laboratories often not electronically connected.[12] Increased volumes of tests and the time consuming nature of test follow-up places further pressures on physicians.[6,13,14] Failure to follow-up can lead to missed or delayed diagnoses which impact on patient care[13,15–17] and can also have medico-legal implications for health services and health professionals.[18–21]

Without knowledge of the size of the problem, many clinicians may underestimate its extent and therefore fail to take any action to improve the process.[22] Feedback on medical errors is essential to negate overconfidence in decision making in relation to diagnostic accuracy.[22–25] Ambulatory settings pose specific challenges for effective test management in addition to many of those present in acute care settings.[26] There have been no systematic

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Background

"I Wish I Had Seen This Test Result Earlier!"

Dissatisfaction With Test Result Management Systems in Primary Care

Eric G. Poon, MD, MPH; Tejal K. Gandhi, MD, MPH; Thomas D. Sequist, MD; Harvey J. Murff, MD, MPH; Andrew S. Karson, MD, MPH; David W. Bates, MD, MSc

Background: Failure to review and follow up on outpatient test results in a timely manner represents a patient safety and malpractice concern. Therefore, we sought to identify problems in current test result management systems and possible ways to improve these systems.

Methods: We surveyed 262 physicians working in 15 internal medicine practices affiliated with 2 large urban teaching hospitals (response rate, 64%). We asked physicians about systems they used and the amount of time they spent managing test results. We asked them to report delays in reviewing test results and their overall satisfaction with their management of test results. We also asked physicians to rate features they would find useful in a new test result management system.

Results: Overall, 83% of respondents reported at least 1 delay in reviewing test results during the previous 2 months. Despite reporting that they spent on average 74 minutes per clinical day managing test results, only 41% of physicians reported being satisfied with how they managed test results. Satisfaction was associated with fewer self-reported delays in reviewing test results. Physicians who actively tracked their test orders to completion were also more likely to be satisfied. The most highly desired features of a test result management system were tools to help physicians generate result letters to patients, prioritize their workflow, and track test orders to completion.
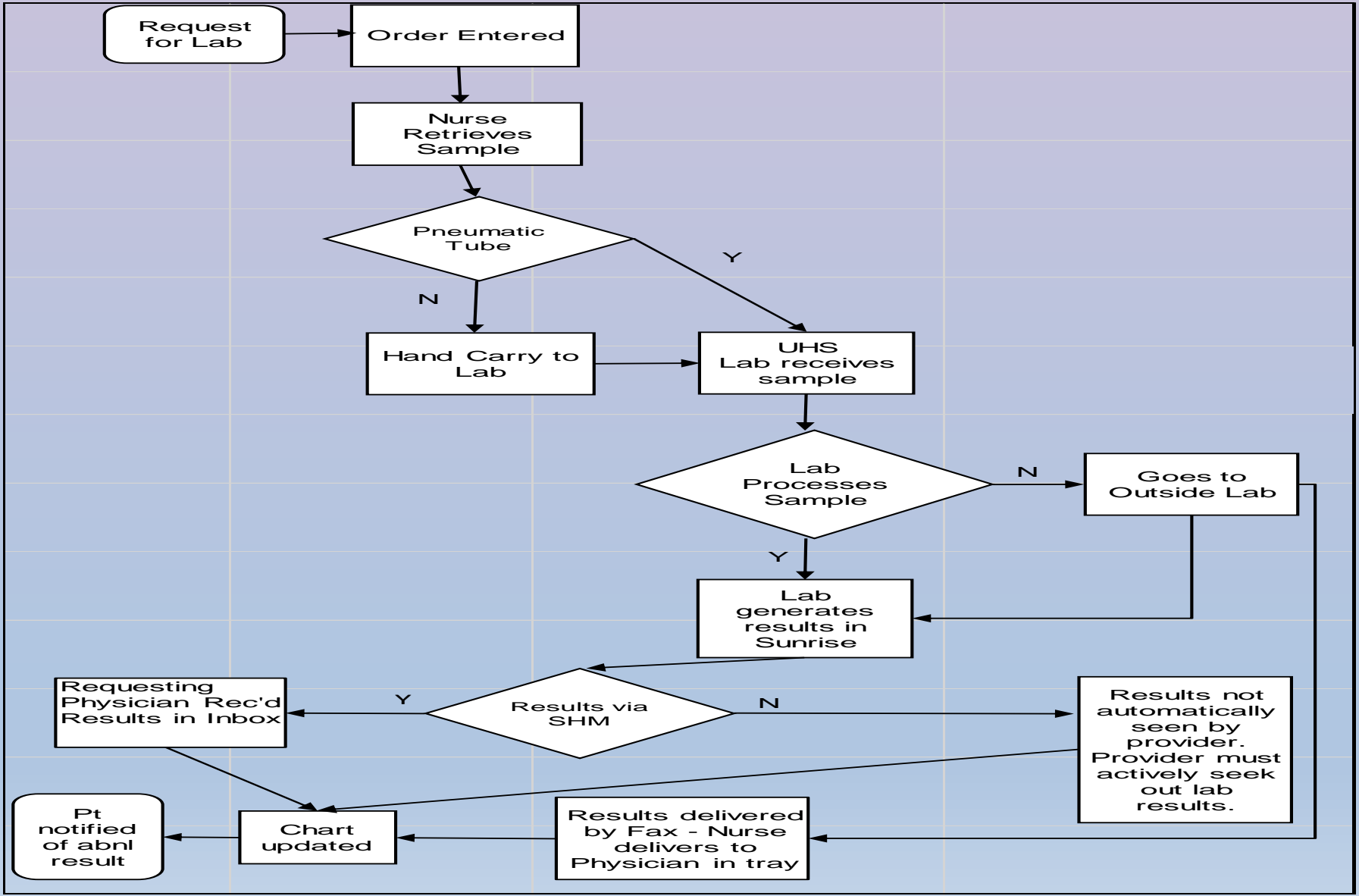
Conclusions: Delays in test result review are common, and many physicians are not satisfied with how they manage test results. Tools to improve test result management in office practices need to improve workflow efficiency and track test orders to completion.
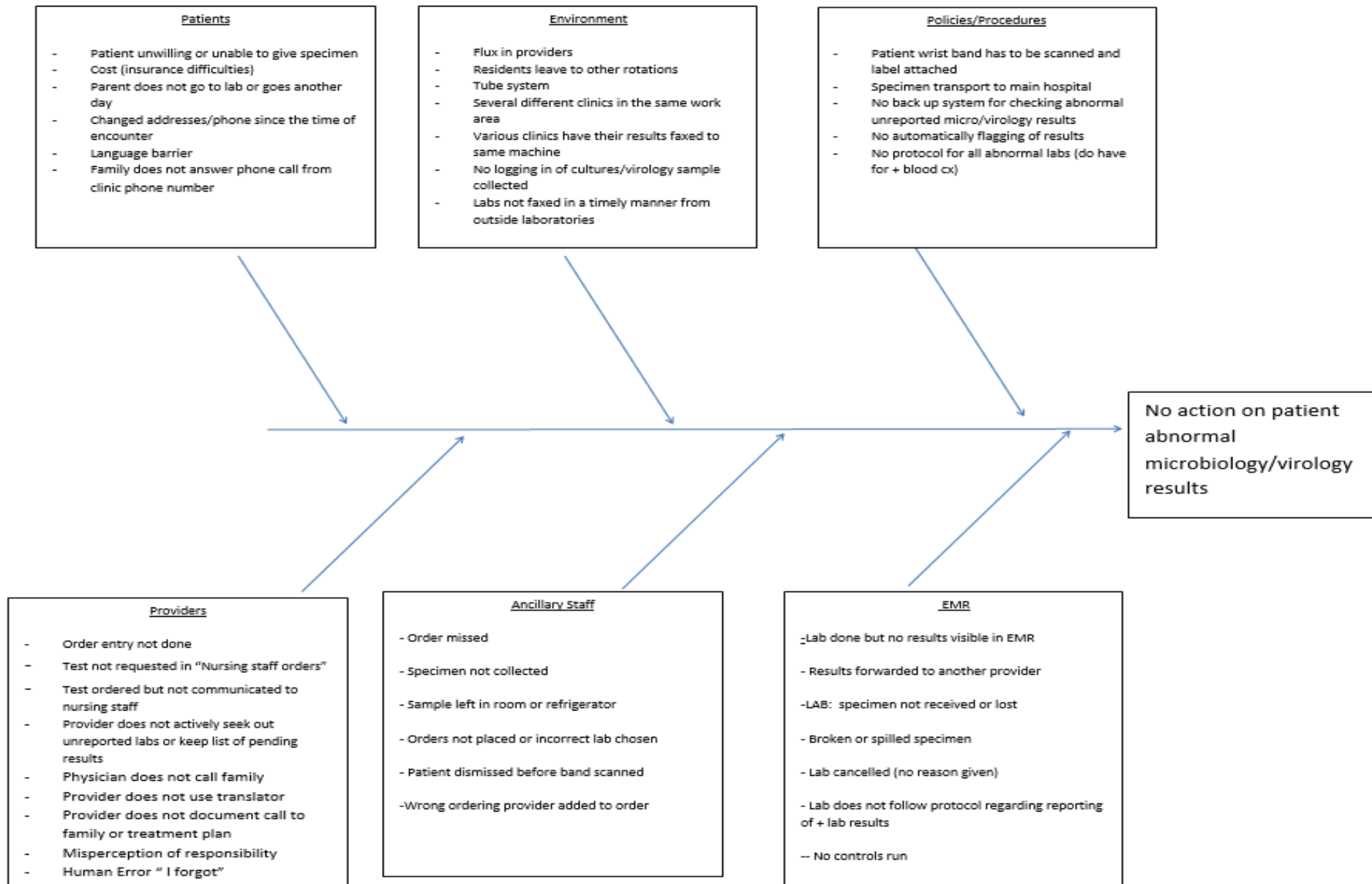
Project Milestones

- Team Created   Jan 2016
- AIM statement created   Jan 2016
- Weekly Team Meetings   Jan 29, Feb 4, Feb 8, March 7,25; April 8
- Background Data, Brainstorm Sessions,   Jan 25 – Feb 5

  Workflow   Jan-Feb

  Fishbone Analyses   Feb 4
- Interventions Implemented

       Survey Monkey   Feb 3-6, 2016

       Spreadsheet developed for lab tracking   March 22

       Nurse huddle/teaching session   March 30

       Physician teaching   Last week of March

       Nurses start using logs   April 1
- Data Analysis   Feb 5 and May 16
- CS&E Presentation   Jun 3

Process Analysis Tool: Initial Flowchart

Process Analysis Tool: Fishbone

Patients

- Patient unwilling or unable to give specimen
- Cost (insurance difficulties)
- Parent does not go to lab or goes another day
- Changed addresses/phone since the time of encounter
- Language barrier
- Family does not answer phone call from clinic phone number

Environment

- Flux in providers
- Residents leave to other rotations
- Tube system
- Several different clinics in the same work area
- Various clinics have their results faxed to same machine
- No logging in of cultures/virology sample collected
- Labs not faxed in a timely manner from outside laboratories

Policies/Procedures

- Patient wrist band has to be scanned and label attached
- Specimen transport to main hospital
- No back up system for checking abnormal unreported micro/virology results
- No automatically flagging of results
- No protocol for all abnormal labs (do have for + blood cx)

No action on patient abnormal microbiology/virology results

Providers

- Order entry not done
- Test not requested in "Nursing staff orders"
- Test ordered but not communicated to nursing staff
- Provider does not actively seek out unreported labs or keep list of pending results
- Physician does not call family
- Provider does not use translator
- Provider does not document call to family or treatment plan
- Misperception of responsibility
- Human Error " I forgot"

Ancillary Staff

- Order missed
- Specimen not collected
- Sample left in room or refrigerator
- Orders not placed or incorrect lab chosen
- Patient dismissed before band scanned
- Wrong ordering provider added to order

EMR

- Lab done but no results visible in EMR
- Results forwarded to another provider
- LAB: specimen not received or lost
- Broken or spilled specimen
- Lab cancelled (no reason given)
- Lab does not follow protocol regarding reporting of + lab results
- No controls run

Pre-intervention Data
How do we know if there is a problem?

Survey Monkey Results

Respondents 27 out 42 Residents + Faculty:

% are Affirmative (Yes) Responses

1. Do you track your outpatient micro/virology lab results? 85%
2. Do you usually document abnormal micro/virology results in your patient's record? 59%
3. Do you usually notify the patient's family with all abnormal micro/virology results? 92%
4. Do you think appropriate micro/virology follow-up is a safety concern in our clinic? 100%
5. What obstacles have you encountered when attempting to track micro/virology results on your patient?

    a. I forgot to keep follow-up list or check the result. 51%

    b. I was away from the clinic or on another rotation and did not have enough time to track my outpatient labs. 74%

    c. I assumed that the labs would be reported to my attending if they were abnormal. 22%

    d. I checked the lab, but there was no result in the computer.   37%

    e. Other: 22%

Pre-intervention Data
Other Obstacles to Tracking Results

A combination of these answers. At the beginning I assumed the attending would be a back up if I forgot or let one slip. And sometimes I have gotten too busy on another rotation and forgotten to follow up.

Sometimes I'll see a normal result and be reassured, then forget to let the parent know. As opposed to an abnormal result, which would likely prompt me to more immediate action of getting the patient treated.

Lab was sent to another provider Abnormal labs flag did not pop up on my follow up list

I don't check labs that residents see and I staff. I do review inbox on regular basis but results may be in patients I did not staff.

I assumed someone from staff or lab would notify me of abnormal result

I always see the labs and report any abnormal findings to family. I do not call for normal values.

Decision Making Tools
Pareto Diagram: Survey Monkey Results

Obstacles to Tracking Micro/Virology Results
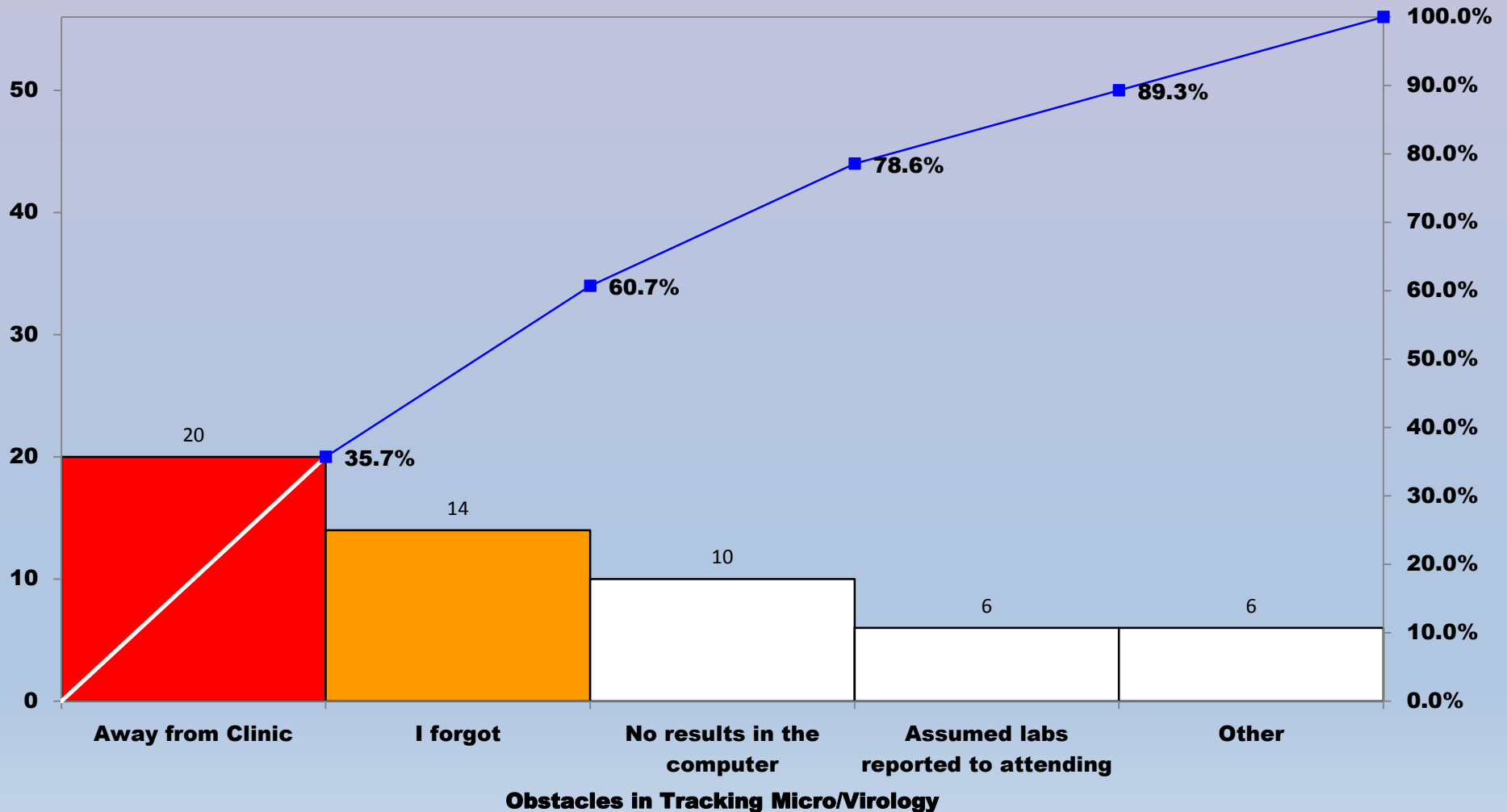
Pre-intervention Data

- Chart (EMR) review for the month of January 2016. Tracked all labs ordered for Microbiology or Virology labs: ***Were results available? Were positives addressed?***

- Approximately 600 charts were reviewed.

Lab Results Noted in Chart
Pre-Intervention
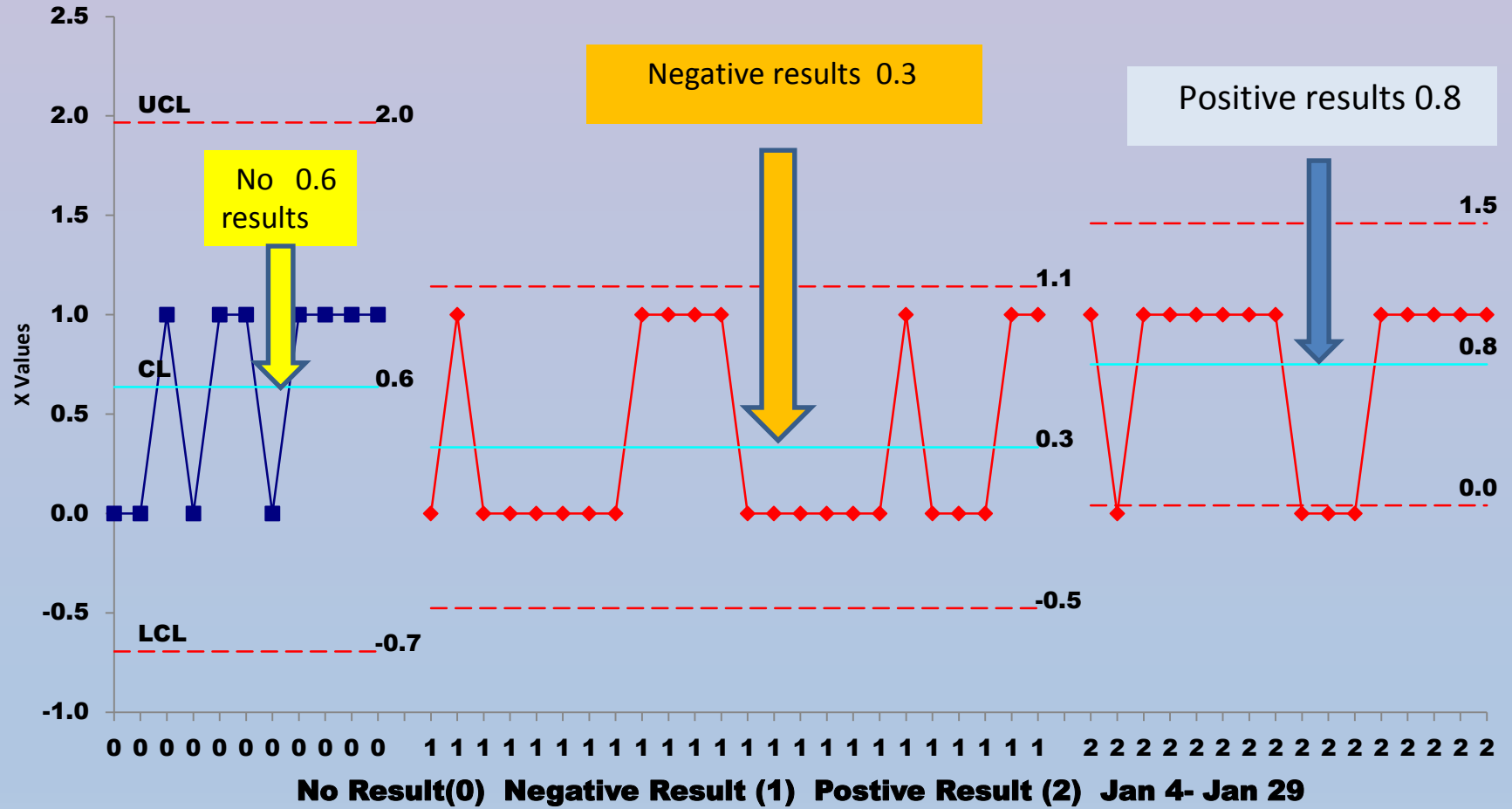
PLAN: Intervention

- Nursing Staff will take a patient label for every qualifying sample and place it in notebook with new tracking sheet

- Nurse assigned to phone messages will follow up labs ordered daily until a response to all positive results is entered in EMR by a physician.

- HIV results (now required for 16 y/o) will be handled separately but in the same log note book because these are often drawn on different days.

- A new algorithm (flowchart) will be followed in case results are not available.

Process Analysis Tool: Intervention Flowchart
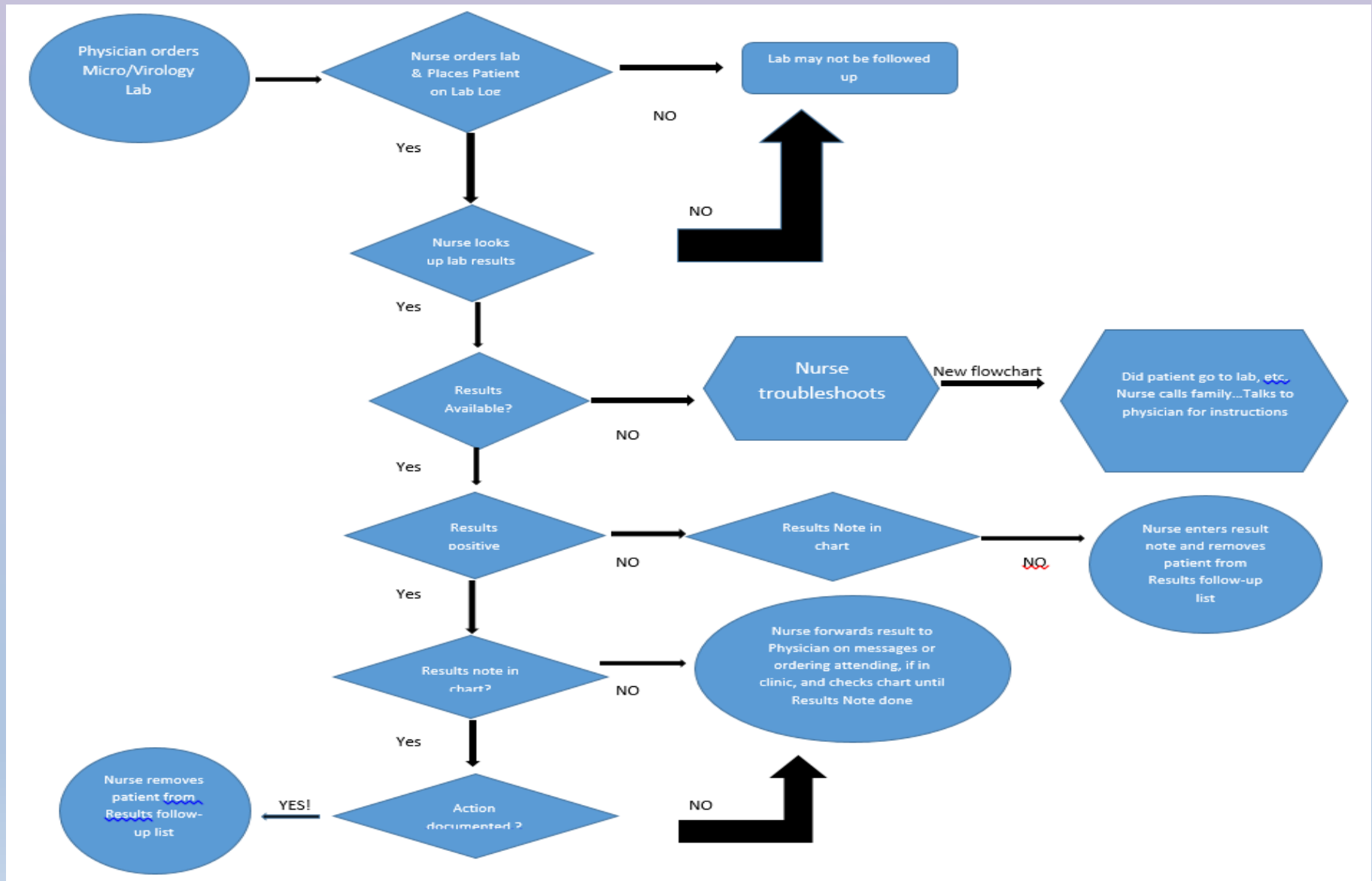
DO: Implementing the Change

March 30, 2016 Nurses huddled about new plan

April 1, 2016, for all microbiology or virology lab specimens, nursing staff took a patient label for every qualifying sample and placed it in notebook with new tracking sheet (log).

April 4,2016, the nurse in charge of phone messages used the notebook to look up patients who had qualifying labs done, checked on results, and looked for a Results note in chart.

DO: Implementing the Change
Nursing Log

Microbiology and Virology Lab F/U

Date	MRN	Patient Name	Specimen Ordered (Strep cx, Urine cx, GC, Chlamydia, HIV, etc)	Results	Action Taken If Abnormal (SHM to M.D., Family Notified, Etc.)

Do: Results Note

Do: Results Note

CHECK: Results/Impact

- Clinical chart review started on May 1st.

- 1052 charts audited from April 1-April 29 including Continuity and Acute Care Pediatric resident clinics

- 82 patients had qualifying (micro/virology specimens) ordered

- New chart was produced using data collected during the intervention period and post-intervention
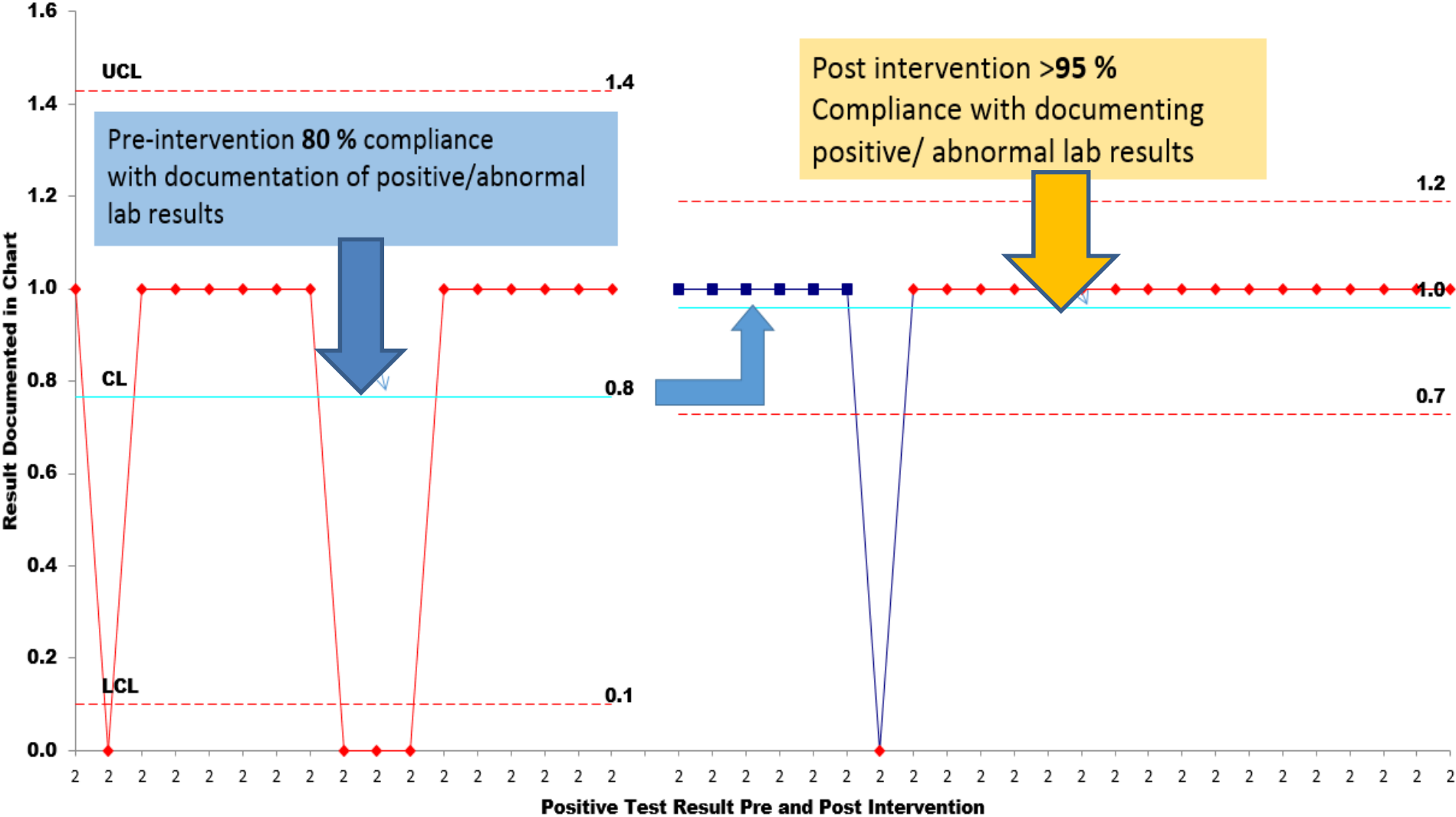
CHECK: Results/Impact

Lab Results Noted in Chart
Post Intervention
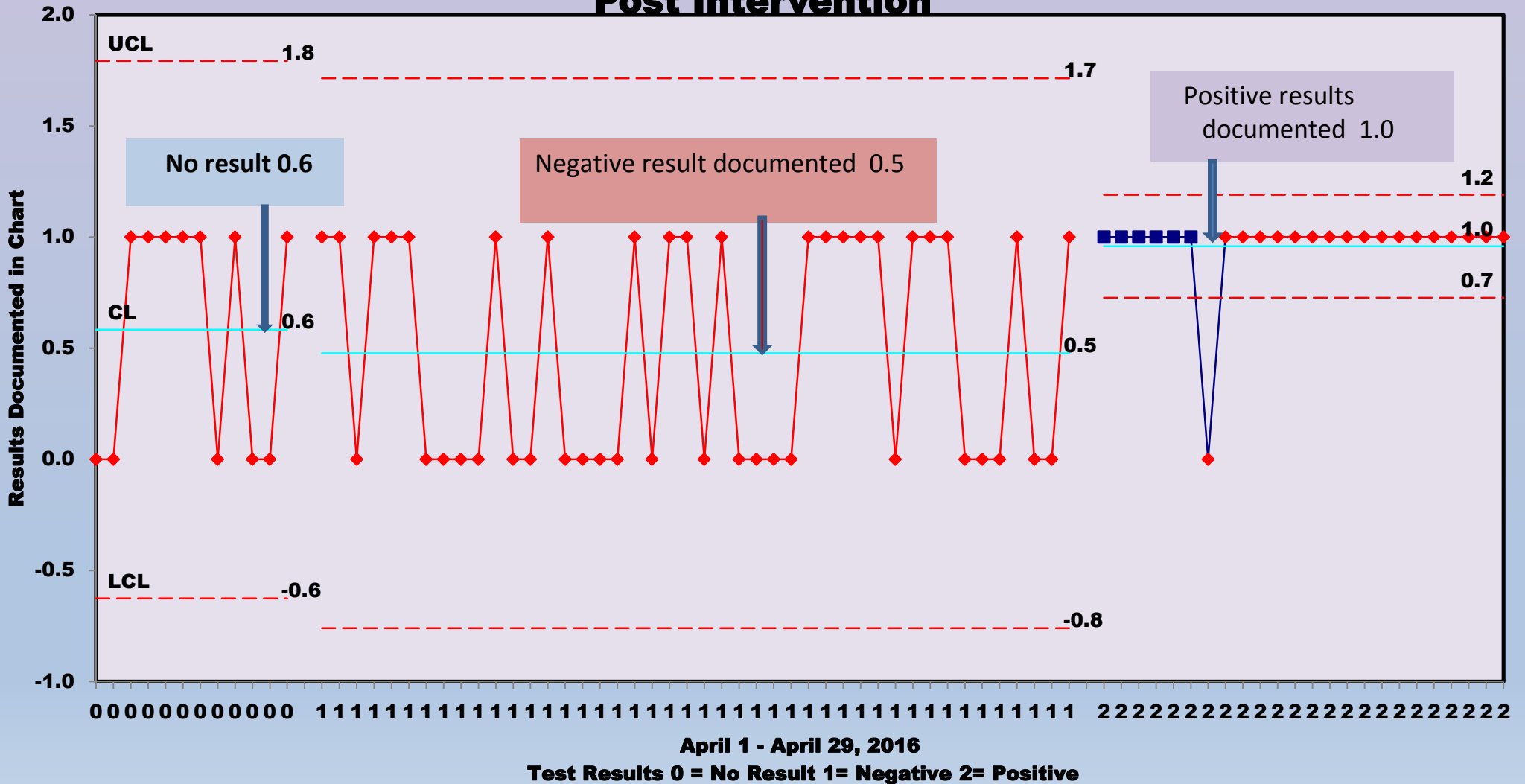
CHECK: Results/Impact

Positive Lab Result Noted in Chart
Pre and Post Intervention

Pre-intervention **80 %** compliance with documentation of positive/abnormal lab results

Post intervention >**95 %** Compliance with documenting positive/ abnormal lab results

UCL 1.4

CL 0.8

LCL 0.1

1.2

1.0

0.7

Result Documented in Chart

Positive Test Result Pre and Post Intervention

CHECK: Results/Impact

- Out of the 24 positive results, 23 had documentation in EMR.

- A nurse found 4 out of the 24 positive results before provider documented receiving information and forwarded results to physician in charge of messages for the day.

- Only one had a positive result which was not addressed on EMR (+ influenza on Respiratory Viral Panel), but it would not have changed management.

ACT: Sustaining the Results

- Continue to use the logs until an electronic system can be developed for tracking these types of results.

- Education of nursing and clinical staff
  - Nursing: once a year
  - Continuity residents: once a year (especially at the start of intern year)
  - Ambulatory Care residents: monthly reminder on the first day of the block orientation.

Return on Investment

- An appreciation of the problem and an attainment of buy-in from providers and nursing staff to document lab follow-up.

- Establishment of a nursing log and follow-up process that improved the response to abnormal labs overall and decreased the physician response time to abnormal findings.

- Nursing intervention led to improved physician efficiency and less errors in a clinic with almost 40 providers.

- Most importantly, there is a decreased chance for mortality in the case of a positive blood culture or morbidity for those with a strep or urine infection.

Conclusion/What's Next

1. We met our aim in that we increased documentation of microbiology or virology lab results in EMR from 80% to 95%.

2. We revised the process of tracking of abnormal labs that begins with ordering of lab to documentation of identified areas of concern, focusing on what we could do ourselves as first line agents who come in contact with patients rather than the hospital system processes.

3. We plan to involve UHS in establishing an electronic list that nurses and residents can use to track specific labs.

4. We plan to emphasize these lab tracking policies in the Acute Care Clinic "Expectations" and incorporate them into the training guidelines for charting in Continuity Clinics.

Thank you!