Quality Improvement: Applications for the Viral Load Cascade

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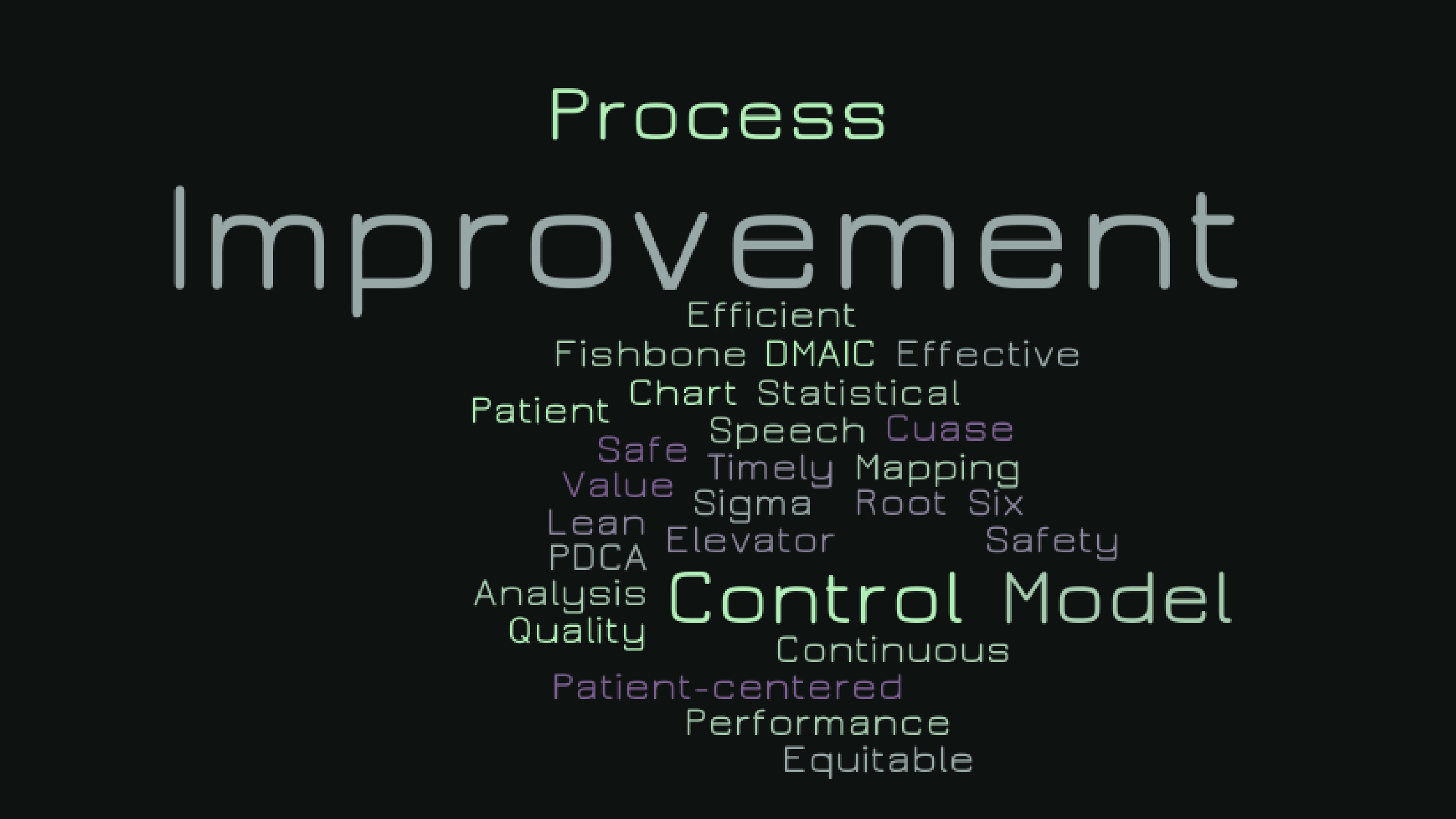

Process
Improvement
Efficient
Fishbone DMAIC Effective
Chart Statistical
Patient
Speech Cuase
Safe
Timely Mapping
Value
Sigma Root Six
Lean
Elevator
Safety
PDCA
Analysis
Control Model
Quality
Continuous
Patient-centered
Performance
Equitable

The Viral Load Cascade

Demand Creation for Testing

Specimen Collection & Processing

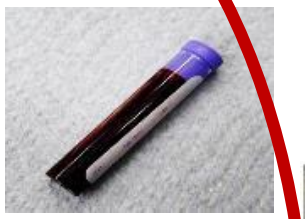
Sample Transport

Laboratory Testing

Result Reporting & Interpretation by Clinician

Patient Management

The Viral Load Cascade



LARC Mozambique, Malawi

LARC Kenya

LARC Swaziland, Tanzania

LARC Uganda

Demand Creation for Testing

Specimen Collection & Processing

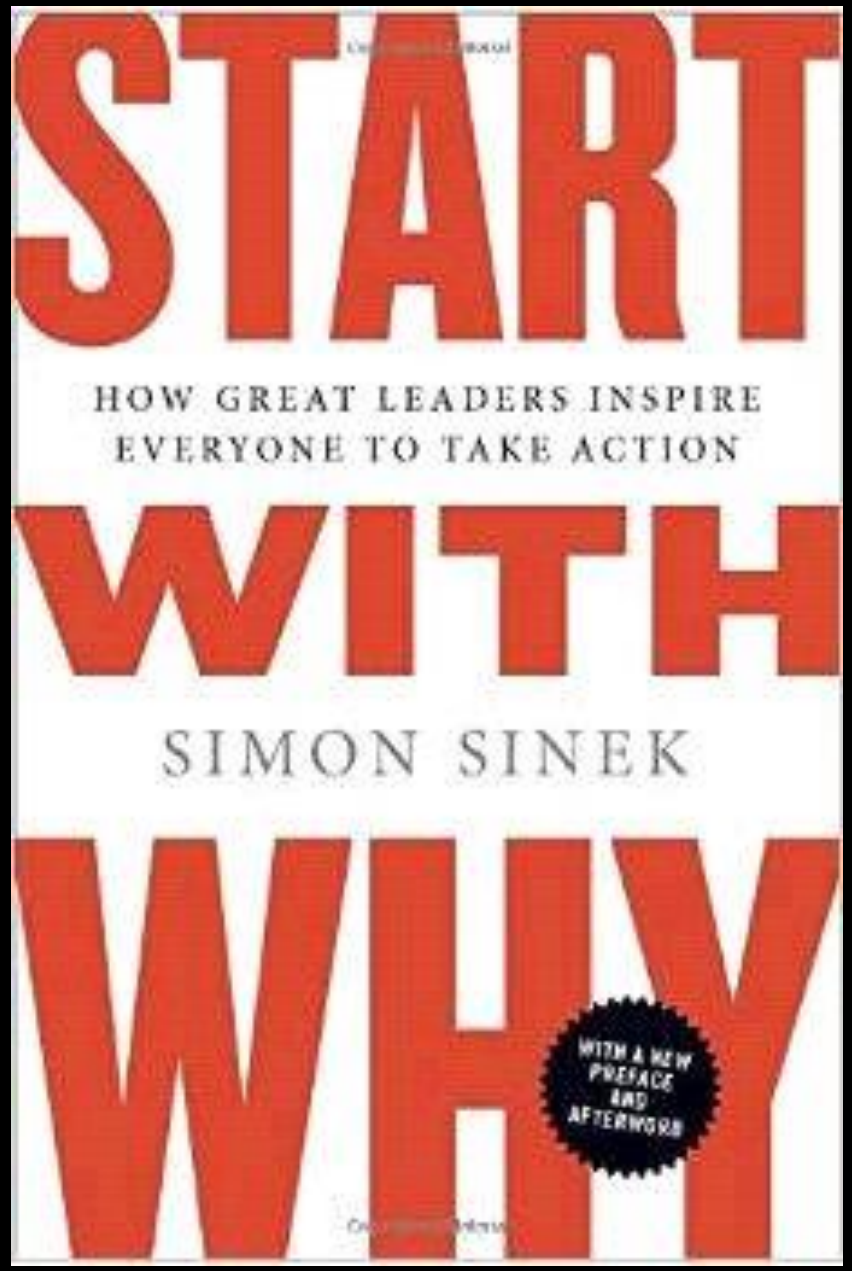
Sample Transport

Laboratory Testing

Result Reporting & Interpretation by Clinician

Patient Management

WHY?

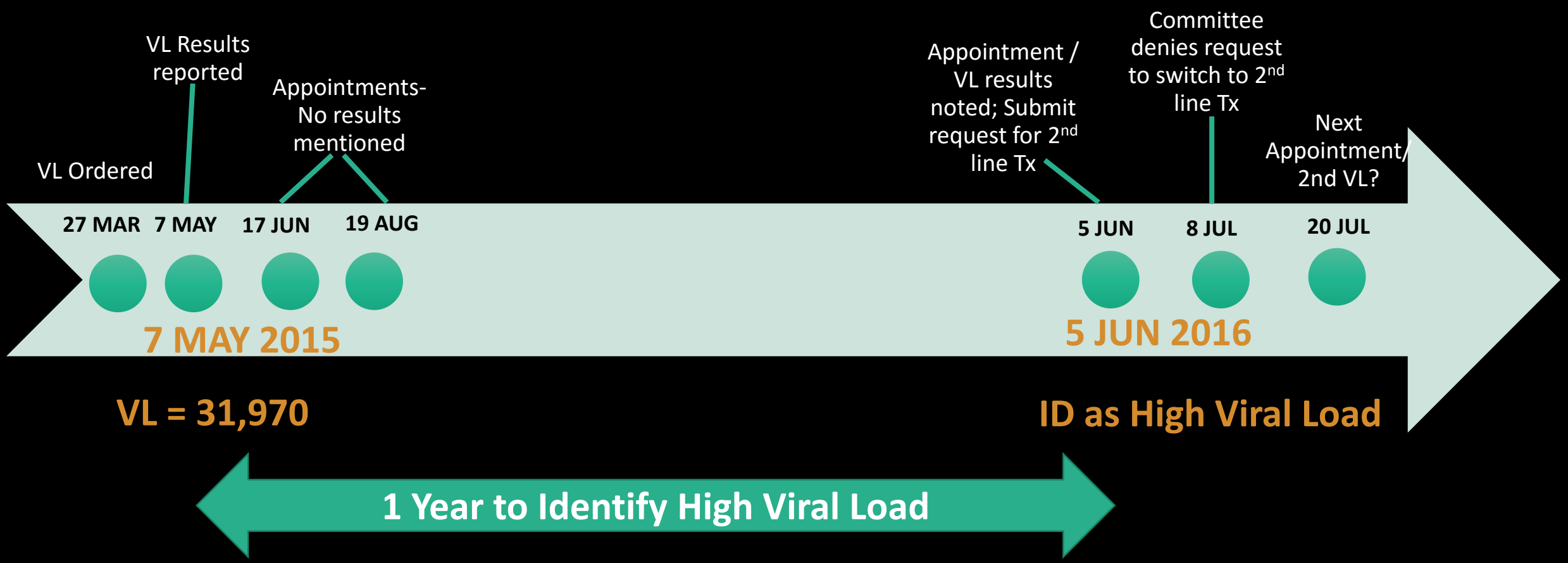

START
HOW GREAT LEADERS INSPIRE
EVERYONE TO TAKE ACTION
WITH
SIMON SINEK
WHY
WITH A NEW
PREFACE
AND
AFTERWORD

- “How wonderful it is that nobody need wait a single moment before starting to improve the world”

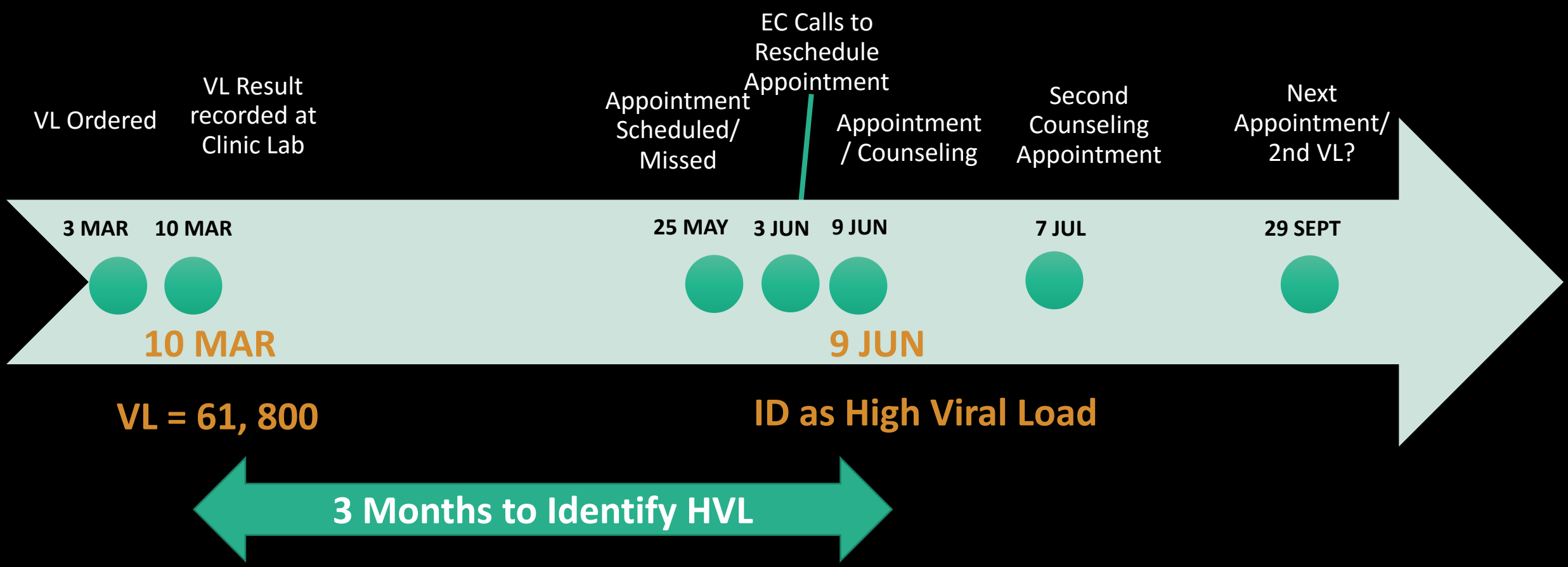
  – Anne Frank

Two Countries ~ Two Teams ~ Two Stories

Story #1: A Patient ”Falls through the Cracks”



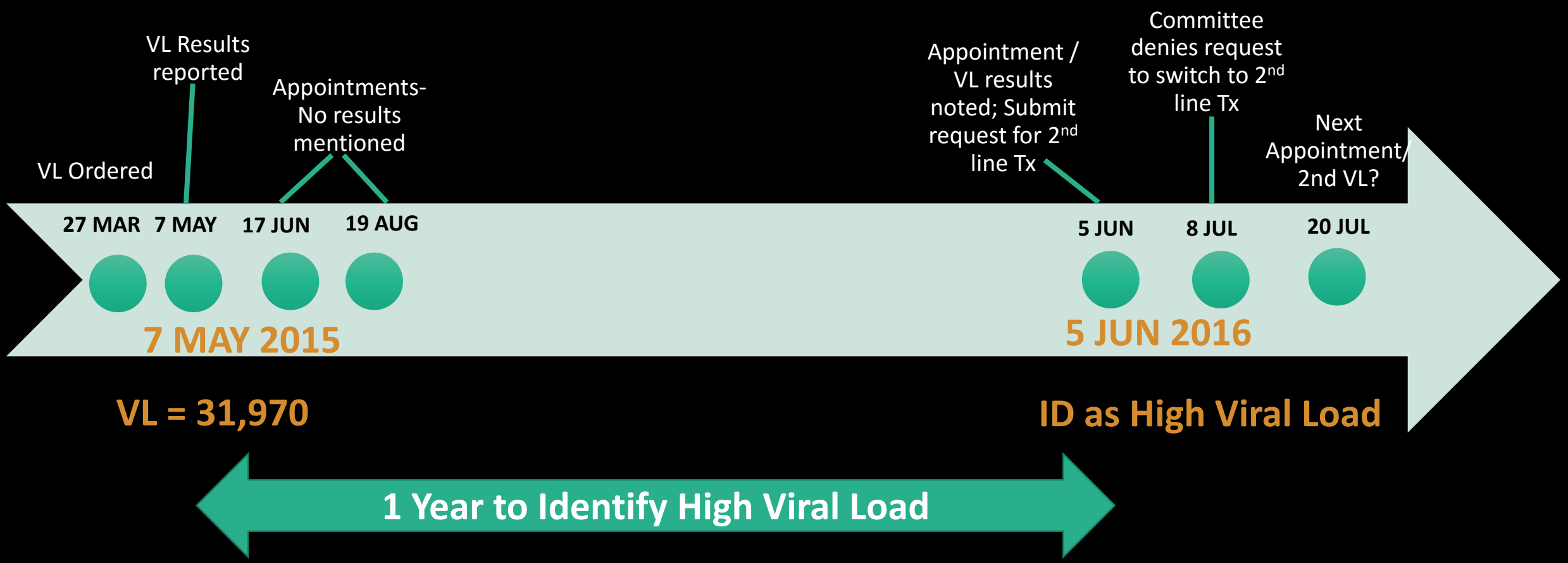
Story #2: A Patient ”Falls through the Cracks”



Let’s “Go & See”

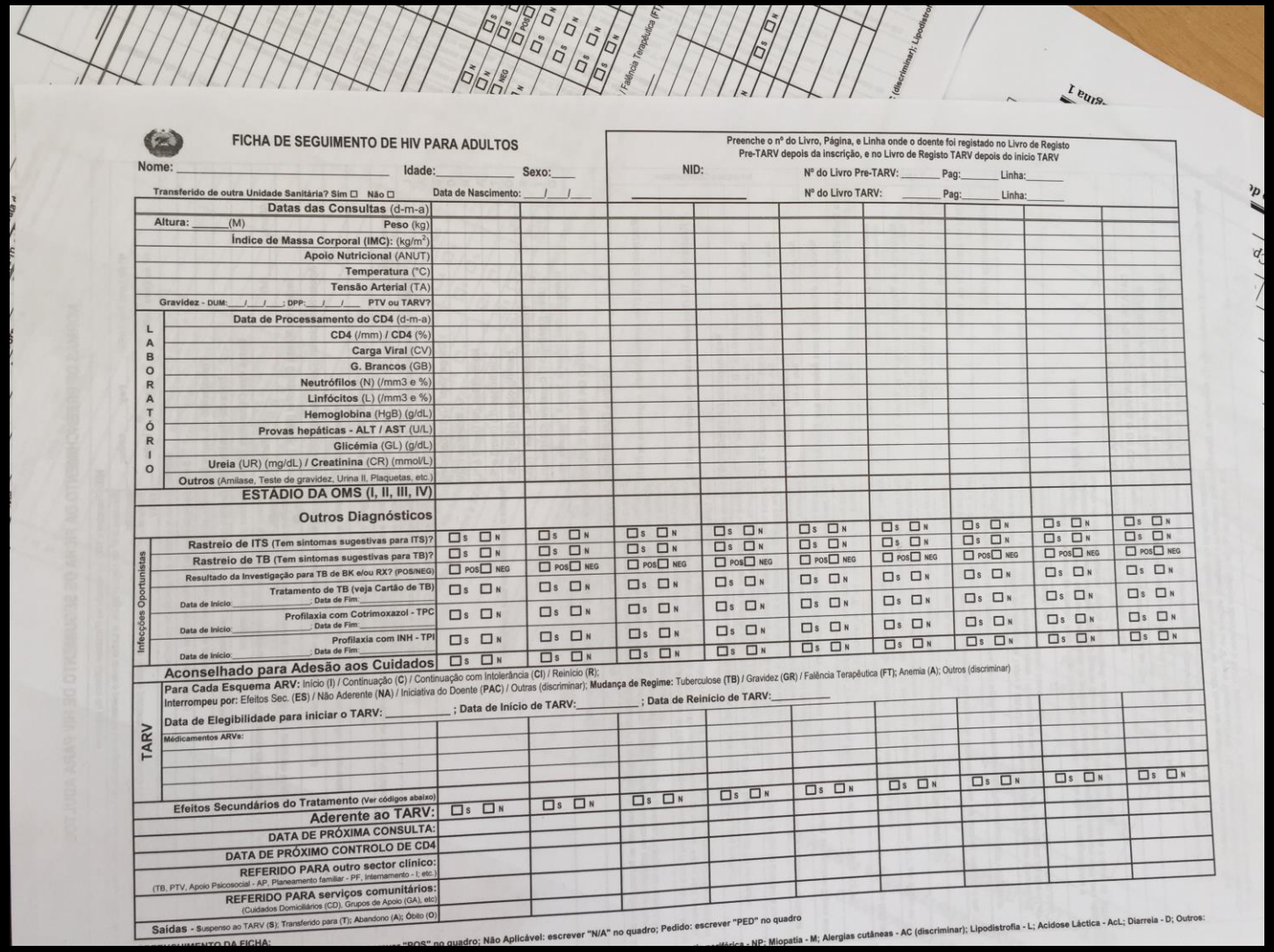
We’d like to know WHY these patients “fell through the cracks”

Story #1: A Patient ”Falls through the Cracks”



Trace the patient

Viral Load recorded in patient's chart, but no action taken for 2 visits



FICHA DE SEGUIMENTO DE HIV PARA ADULTOS

Nome: _____ Idade: _____ Sexo: ___

Transferido de outra Unidade Sanitária? Sim ☐ Não ☐ Data de Nascimento: ___/___/___

Preenche o nº do Livro, Página, e Linha onde o doente foi registado no Livro de Registo Pre-TARV depois da inscrição, e no Livro de Registo TARV depois do início TARV

NID: _____

Nº do Livro Pre-TARV: _____ Pag:_____ Linha:_____

Nº do Livro TARV: _____ Pag:_____ Linha:_____

Datas das Consultas (d-m-a)											
Altura: _____(M) Peso (kg)											
Índice de Massa Corporal (IMC): (kg/m²)											
Apoio Nutricional (ANUT)											
Temperatura (°C)											
Tensão Arterial (TA)											
Gravidez - DUM:___/___/___; DPP:___/___/___ PTV ou TARV?											
LABORATÓRIO: Data de Processamento do CD4 (d-m-a)											
LABORATÓRIO: CD4 (/mm) / CD4 (%)											
LABORATÓRIO: Carga Viral (CV)											
LABORATÓRIO: G. Brancos (GB)											
LABORATÓRIO: Neutrófilos (N) (/mm3 e %)											
LABORATÓRIO: Linfócitos (L) (/mm3 e %)											
LABORATÓRIO: Hemoglobina (HgB) (g/dL)											
LABORATÓRIO: Provas hepáticas - ALT / AST (U/L)											
LABORATÓRIO: Glicémia (GL) (g/dL)											
LABORATÓRIO: Ureia (UR) (mg/dL) / Creatinina (CR) (mmol/L)											
LABORATÓRIO: Outros (Amilase, Teste de gravidez, Urina II, Plaquetas, etc.)											
ESTÁDIO DA OMS (I, II, III, IV)											
Outros Diagnósticos											
Infecções Oportunistas: Rastreio de ITS (Tem sintomas sugestivas para ITS)?	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	
Infecções Oportunistas: Rastreio de TB (Tem sintomas sugestivas para TB)?	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	
Infecções Oportunistas: Resultado da Investigação para TB de BK e/ou RX? (POS/NEG)	☐POS☐NEG	☐POS☐NEG	☐POS☐NEG	☐POS☐NEG	☐POS☐NEG	☐POS☐NEG	☐POS☐NEG	☐POS☐NEG	☐POS☐NEG	☐POS☐NEG	
Infecções Oportunistas: Tratamento de TB (veja Cartão de TB) Data de Início:_____; Data de Fim:_____	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	
Infecções Oportunistas: Profilaxia com Cotrimoxazol - TPC Data de Início:_____; Data de Fim:_____	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	
Infecções Oportunistas: Profilaxia com INH - TPI Data de Início:_____; Data de Fim:_____	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	
Aconselhado para Adesão aos Cuidados	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	

TARV

Para Cada Esquema ARV: Início (I) / Continuação (C) / Continuação com Intolerância (CI) / Reinício (R); Mudança de Regime: Tuberculose (TB) / Gravidez (GR) / Falência Terapêutica (FT); Anemia (A); Outros (discriminar)

Interrompeu por: Efeitos Sec. (ES) / Não Aderente (NA) / Iniciativa do Doente (PAC) / Outras (discriminar);

Data de Elegibilidade para iniciar o TARV: _____ ; Data de Início de TARV:_____ ; Data de Reinício de TARV:_____

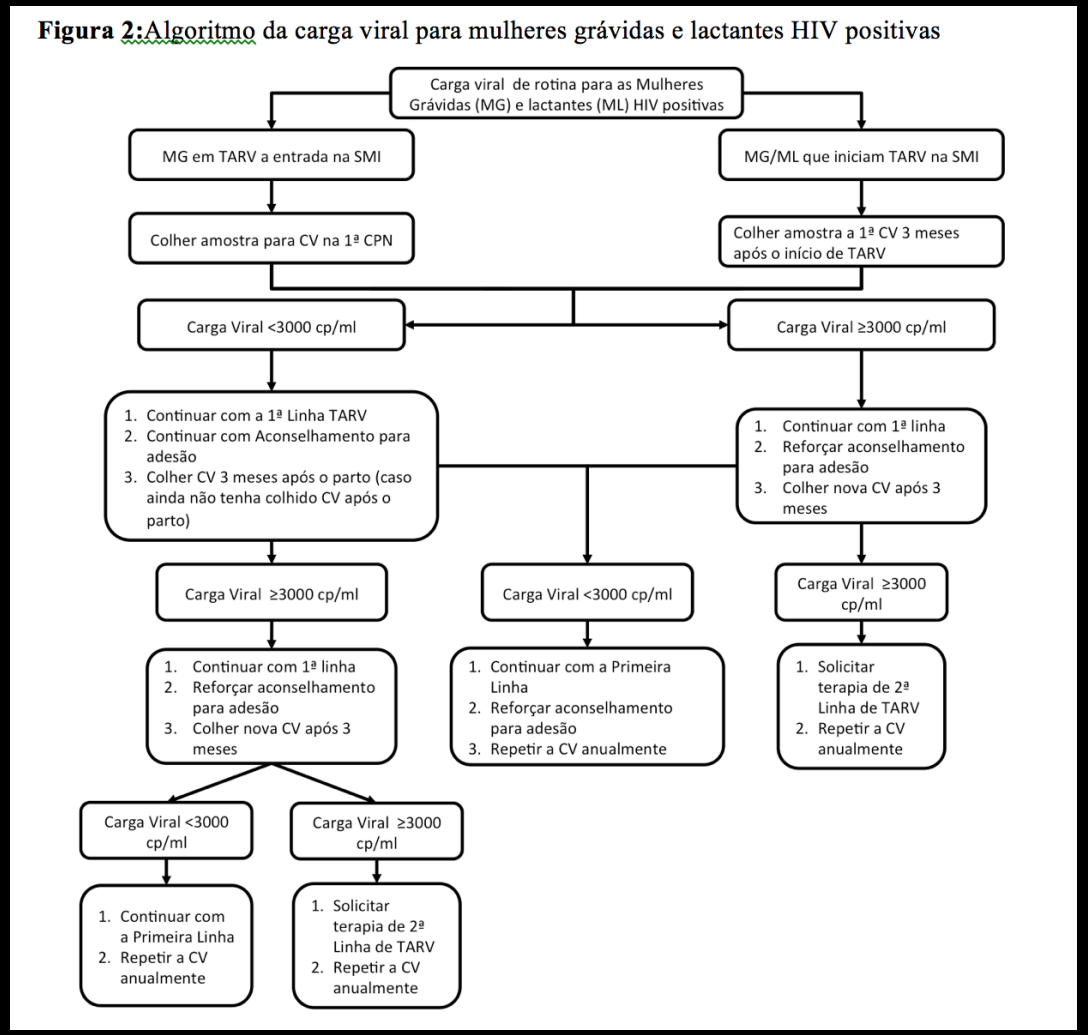
Médicamentos ARVs:										
Efeitos Secundários do Tratamento (Ver códigos abaixo)	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N	☐S ☐N
Aderente ao TARV:										
DATA DE PRÓXIMA CONSULTA:										
DATA DE PRÓXIMO CONTROLO DE CD4										
REFERIDO PARA outro sector clínico: (TB, PTV, Apoio Psicosocial - AP, Planeamento familiar - PF, Internamento - I; etc.)										
REFERIDO PARA serviços comunitários: (Cuidados Domiciliários (CD), Grupos de Apoio (GA), etc)										
Saídas - Suspenso ao TARV (S); Transferido para (T); Abandono (A); Óbito (O)										

"POS" no quadro; Não Aplicável: escrever "N/A" no quadro; Pedido: escrever "PED" no quadro

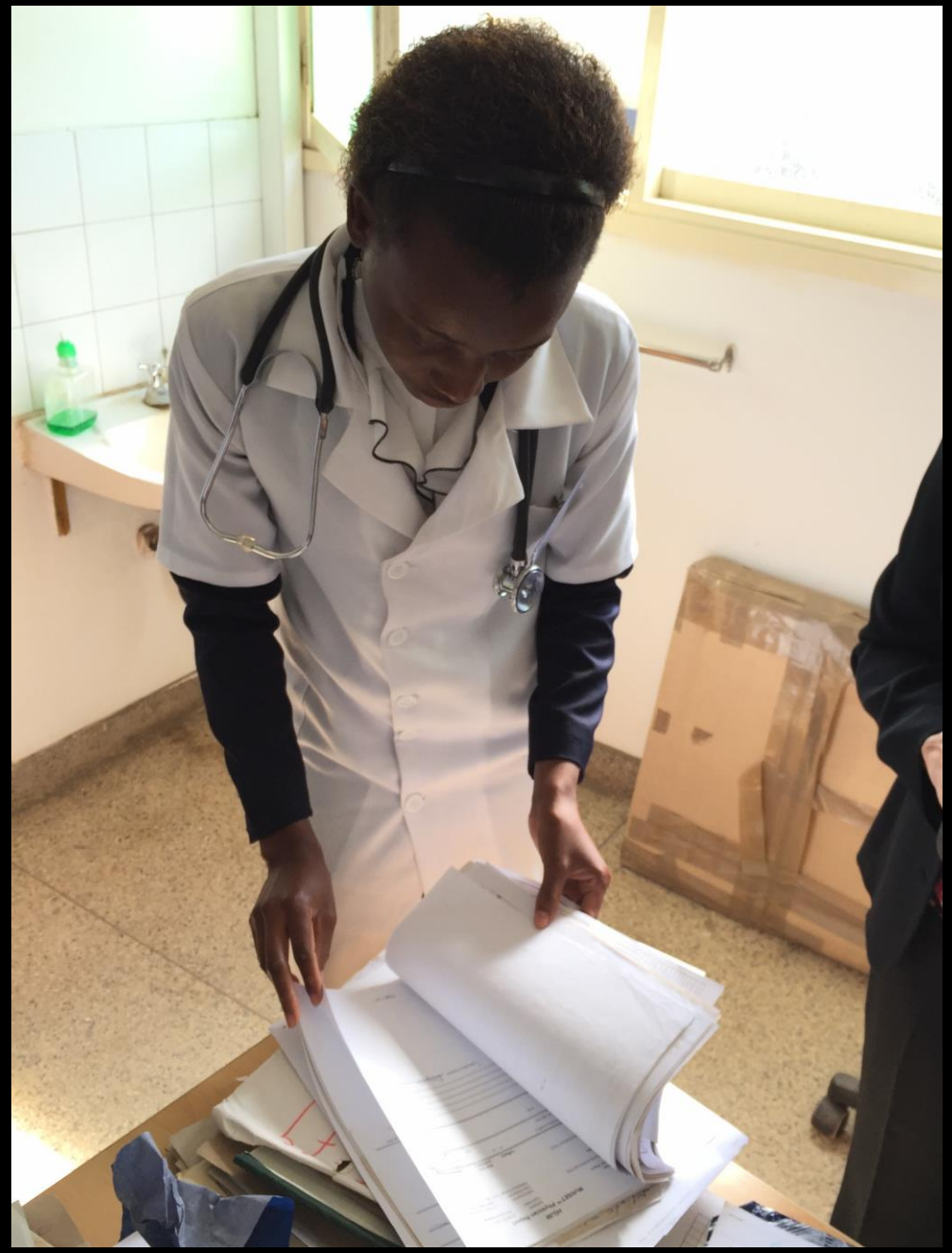
NP: Miopatia - M; Alergias cutâneas - AC (discriminar); Lipodistrofia - L; Acidose Láctica - AcL; Diarreia - D; Outros:

Algorithm sent to Clinic

- Only 1 staff received any training implementation of the algorithm
- Early draft circulated with different viral load cutoffs (3,000 vs 1,000)



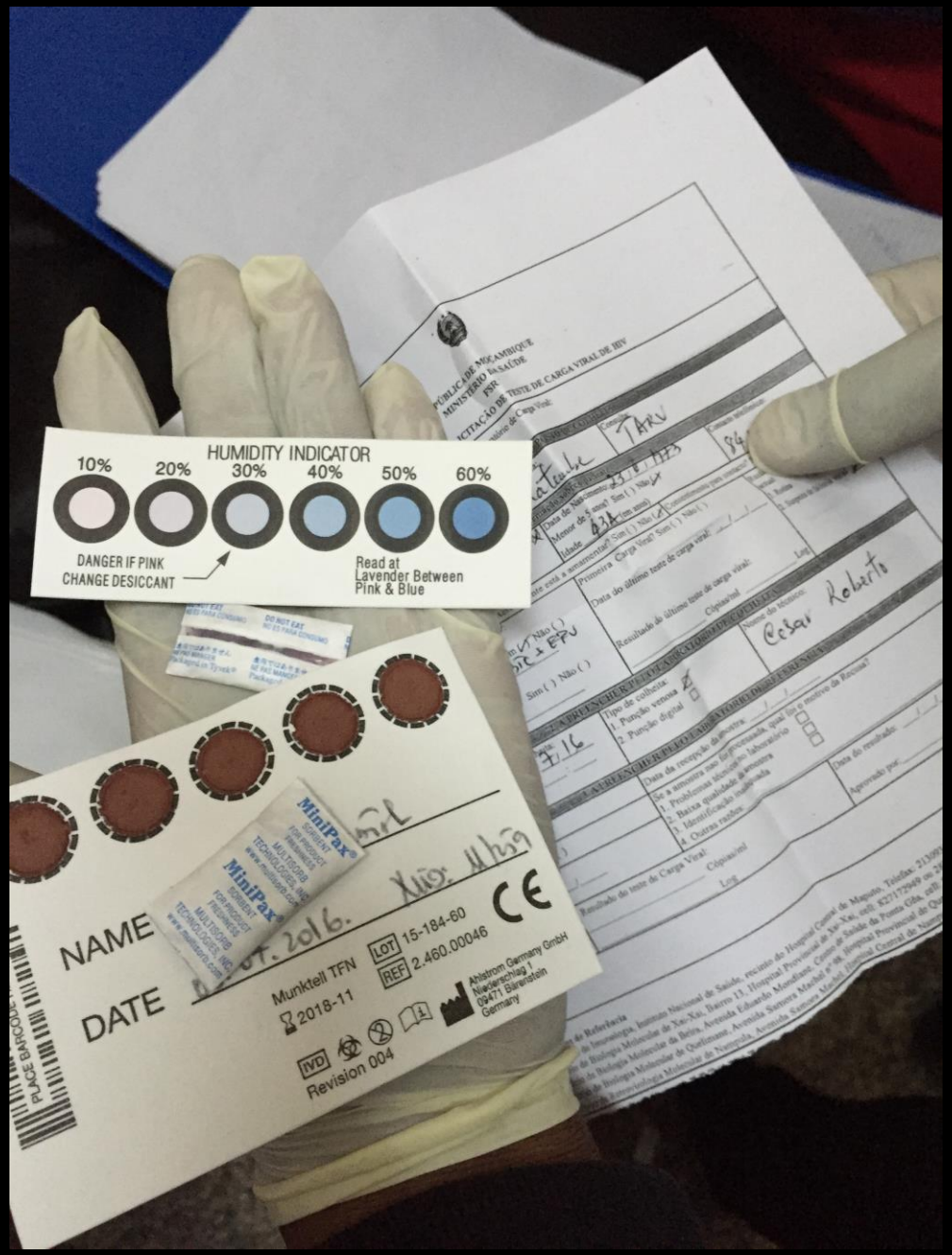
Viral Load ordered on all newly diagnosed pregnant HIV+ patients



Low viral load volume at this site

Site given a monthly quota for viral load testing; Questions as to who should be tested

< 5 viral load tests ordered per month



‘Ah Ha’ Moment

What we discovered at MCH Clinic

Training

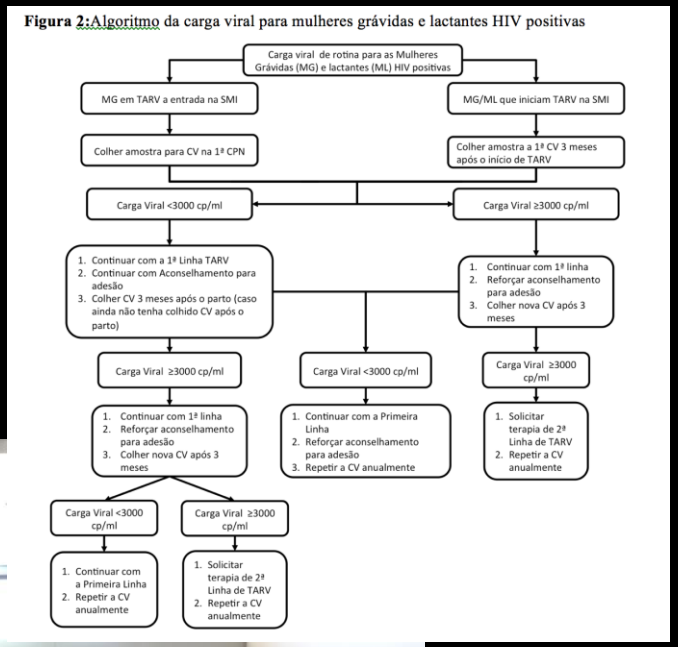
- Training to one person, but no transmittal to other staff

Algorithm

- Unclear on when VL is to be ordered
- Draft algorithm circulated
- No register to track when VL required/ordered/received

Patient Engagement information

- No materials to encourage patient viral load demand or questions



Observations:
Successful Implementation of a New Clinical Algorithm

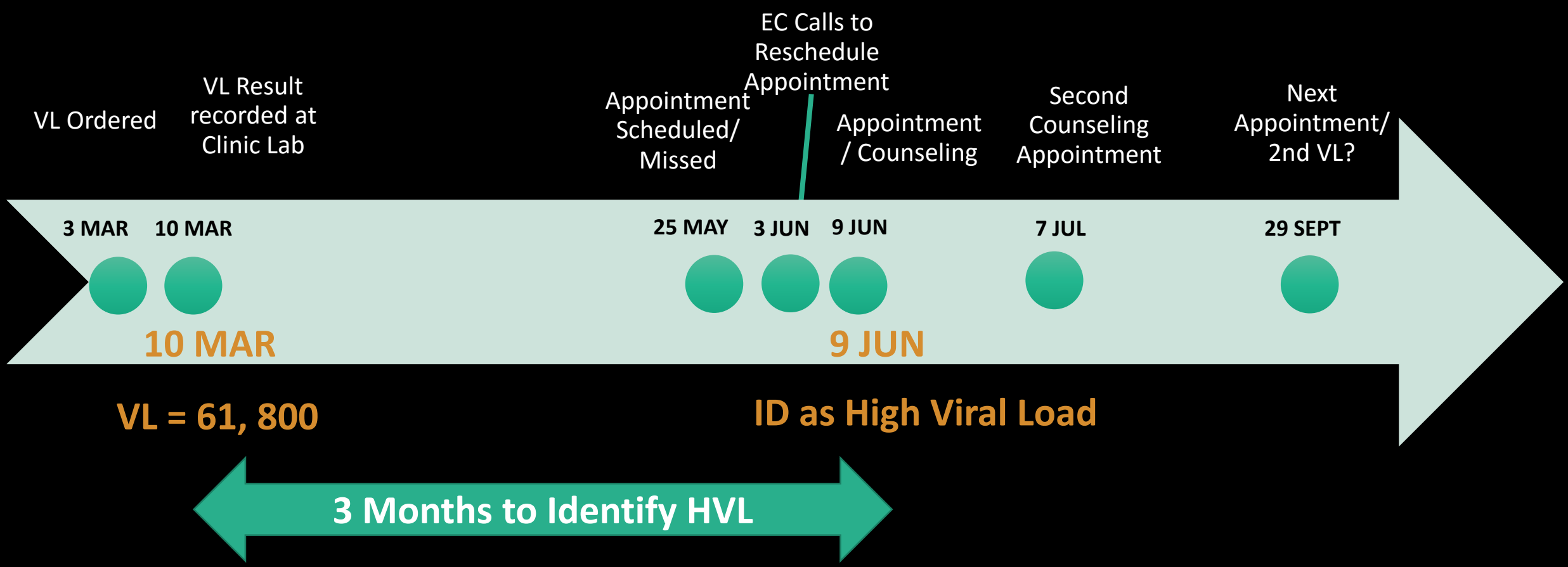
What does not work

- Sending out the Algorithm / Multiple versions
- Training Alone
- Training one person in a clinic without the “how to” or tools for training his/her colleagues
- No logs /tools / forms to support the work

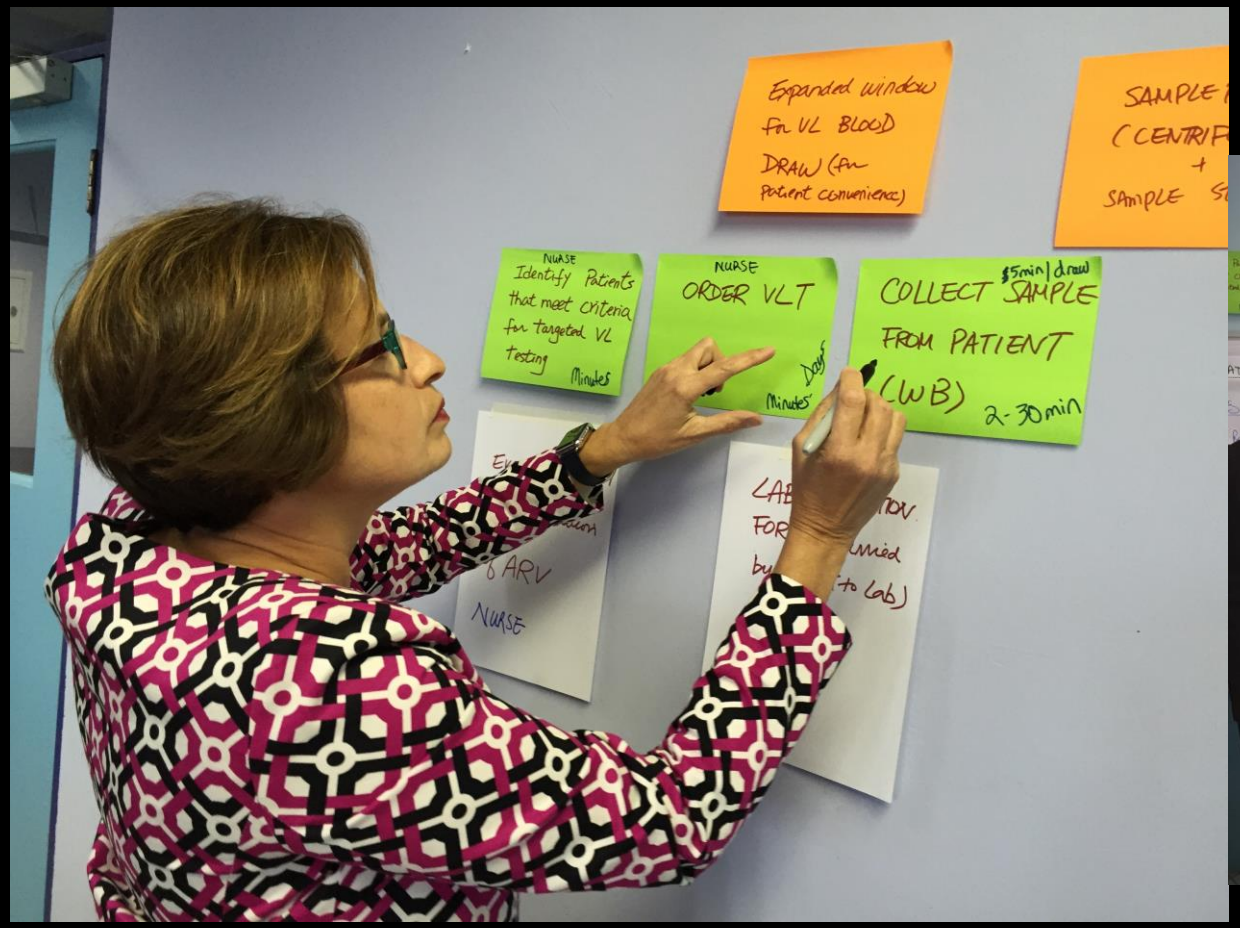
Recommendations for success

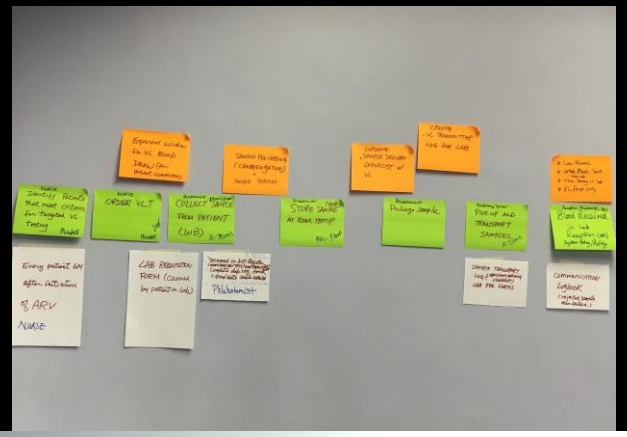
- Clinical competence must be developed
  - Use of actual cases
  - Mentoring/Coaching
  - Demonstrating competency
- Process mapping / Go & See is very beneficial when implementing a new process
- Change management is required, so all understand:
  - ”The Why”
  - How each person will be affected by this change

Story #2: A Patient ”Falls through the Cracks”



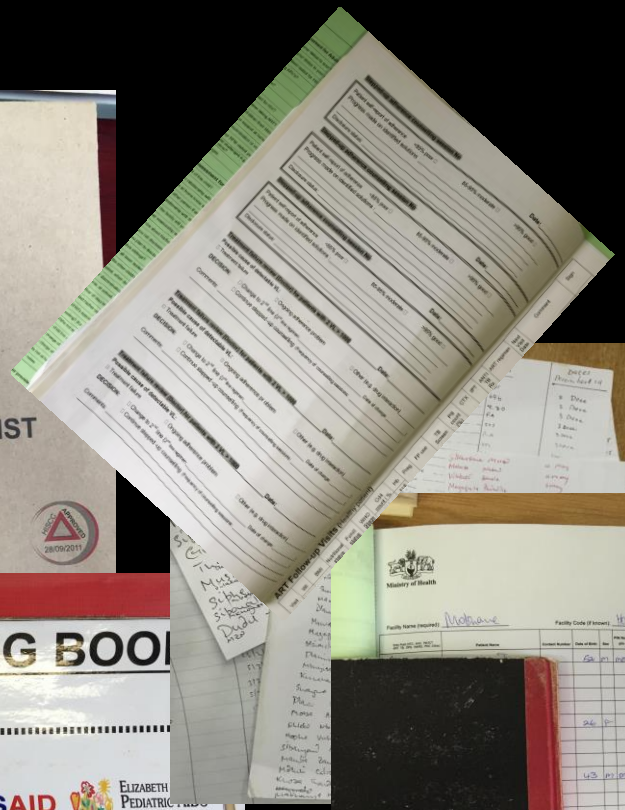
Process Mapping in Classroom

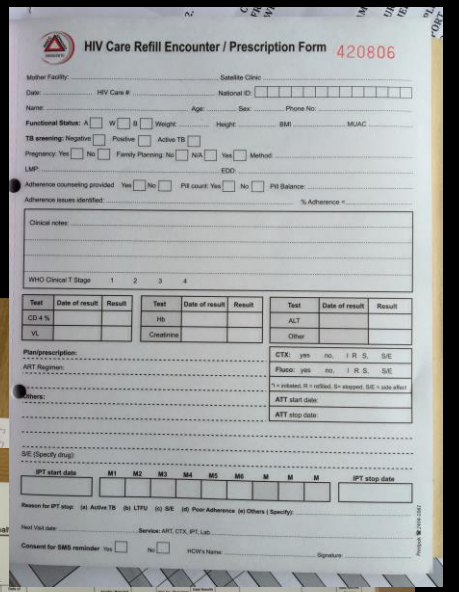


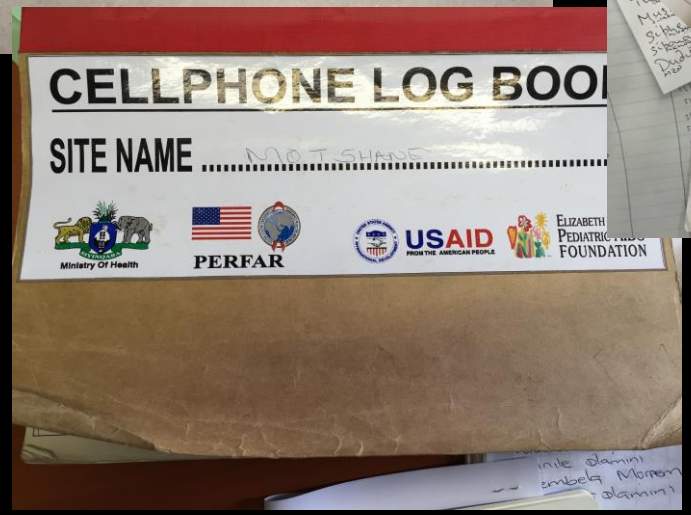


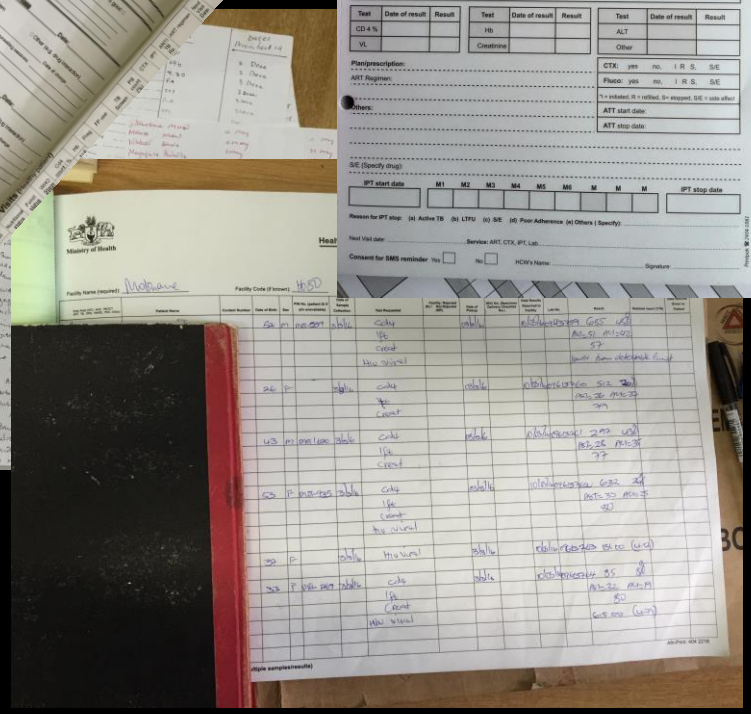
Go & See - Trace/Validate Process at Site

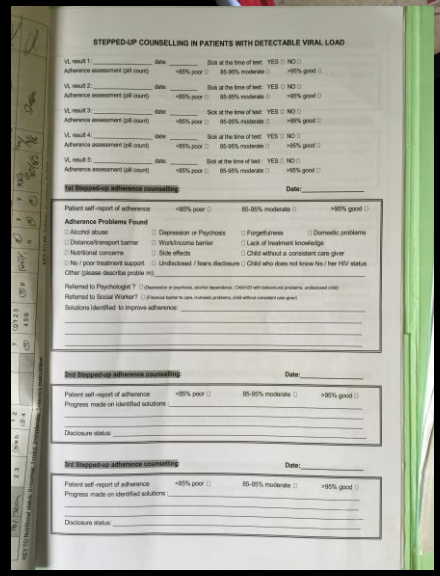
What did we find at Moshane Clinic?
Logs, Registers, and more Logs



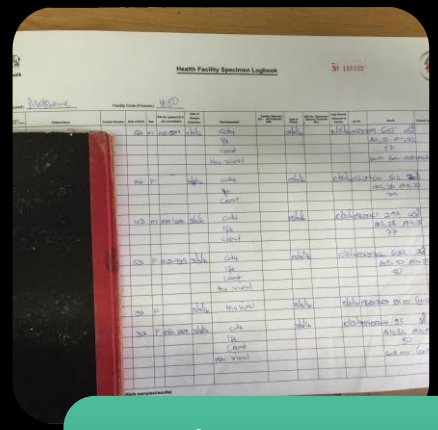








Process: Reported Current State



Results to Phlebotomist

- Record in Lab Specimen Log

Results to ART Nurse

- Review

Results to Expert Client

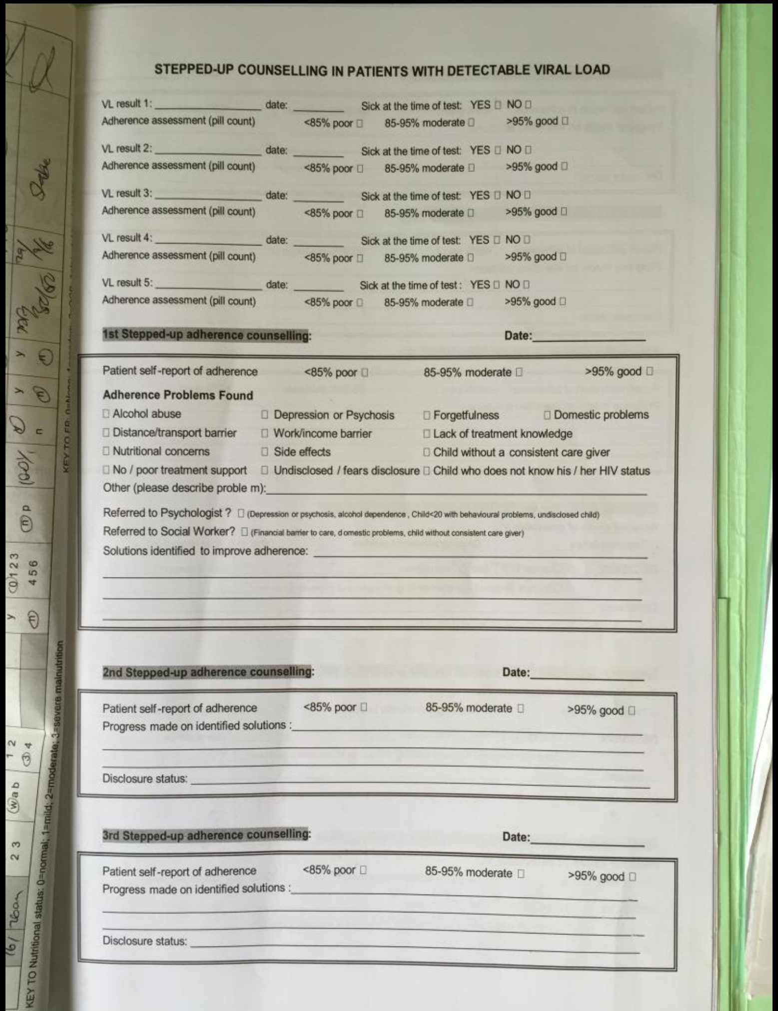
- Call to make appointment

Expert Client Checks Appt. Register

- F/U Appointment

Where are the printed laboratory results?

NOT in the patient's chart



STEPPED-UP COUNSELLING IN PATIENTS WITH DETECTABLE VIRAL LOAD

VL result 1: ______________ date: ________ Sick at the time of test: YES ☐ NO ☐
Adherence assessment (pill count) <85% poor ☐ 85-95% moderate ☐ >95% good ☐

VL result 2: ______________ date: ________ Sick at the time of test: YES ☐ NO ☐
Adherence assessment (pill count) <85% poor ☐ 85-95% moderate ☐ >95% good ☐

VL result 3: ______________ date: ________ Sick at the time of test: YES ☐ NO ☐
Adherence assessment (pill count) <85% poor ☐ 85-95% moderate ☐ >95% good ☐

VL result 4: ______________ date: ________ Sick at the time of test: YES ☐ NO ☐
Adherence assessment (pill count) <85% poor ☐ 85-95% moderate ☐ >95% good ☐

VL result 5: ______________ date: ________ Sick at the time of test: YES ☐ NO ☐
Adherence assessment (pill count) <85% poor ☐ 85-95% moderate ☐ >95% good ☐

1st Stepped-up adherence counselling: Date: ____________

Patient self-report of adherence <85% poor ☐ 85-95% moderate ☐ >95% good ☐

Adherence Problems Found

☐ Alcohol abuse ☐ Depression or Psychosis ☐ Forgetfulness ☐ Domestic problems
☐ Distance/transport barrier ☐ Work/income barrier ☐ Lack of treatment knowledge
☐ Nutritional concerns ☐ Side effects ☐ Child without a consistent care giver
☐ No / poor treatment support ☐ Undisclosed / fears disclosure ☐ Child who does not know his / her HIV status
Other (please describe proble m): ____________

Referred to Psychologist ? ☐ (Depression or psychosis, alcohol dependence , Child<20 with behavioural problems, undisclosed child)
Referred to Social Worker? ☐ (Financial barrier to care, domestic problems, child without consistent care giver)
Solutions identified to improve adherence: ____________

2nd Stepped-up adherence counselling: Date: ____________

Patient self-report of adherence <85% poor ☐ 85-95% moderate ☐ >95% good ☐
Progress made on identified solutions : ____________

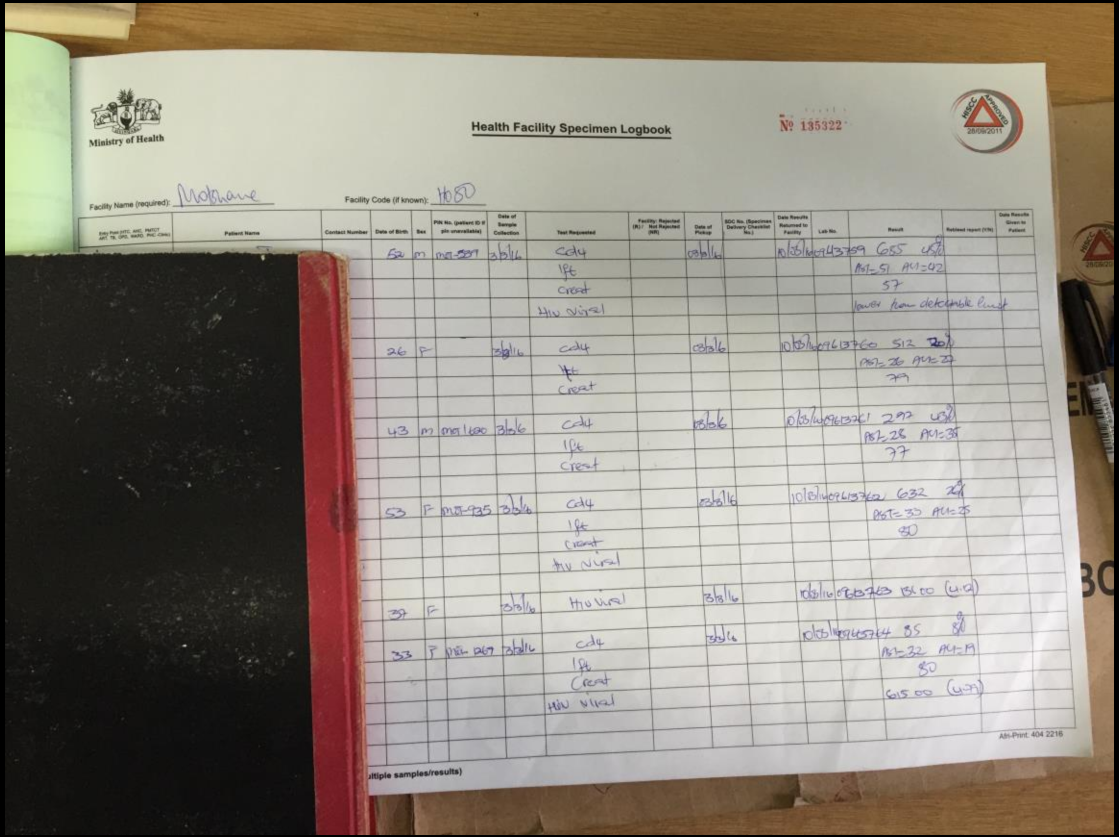
Disclosure status: ____________

3rd Stepped-up adherence counselling: Date: ____________

Patient self-report of adherence <85% poor ☐ 85-95% moderate ☐ >95% good ☐
Progress made on identified solutions : ____________

Disclosure status: ____________

YES, results recorded in the lab register

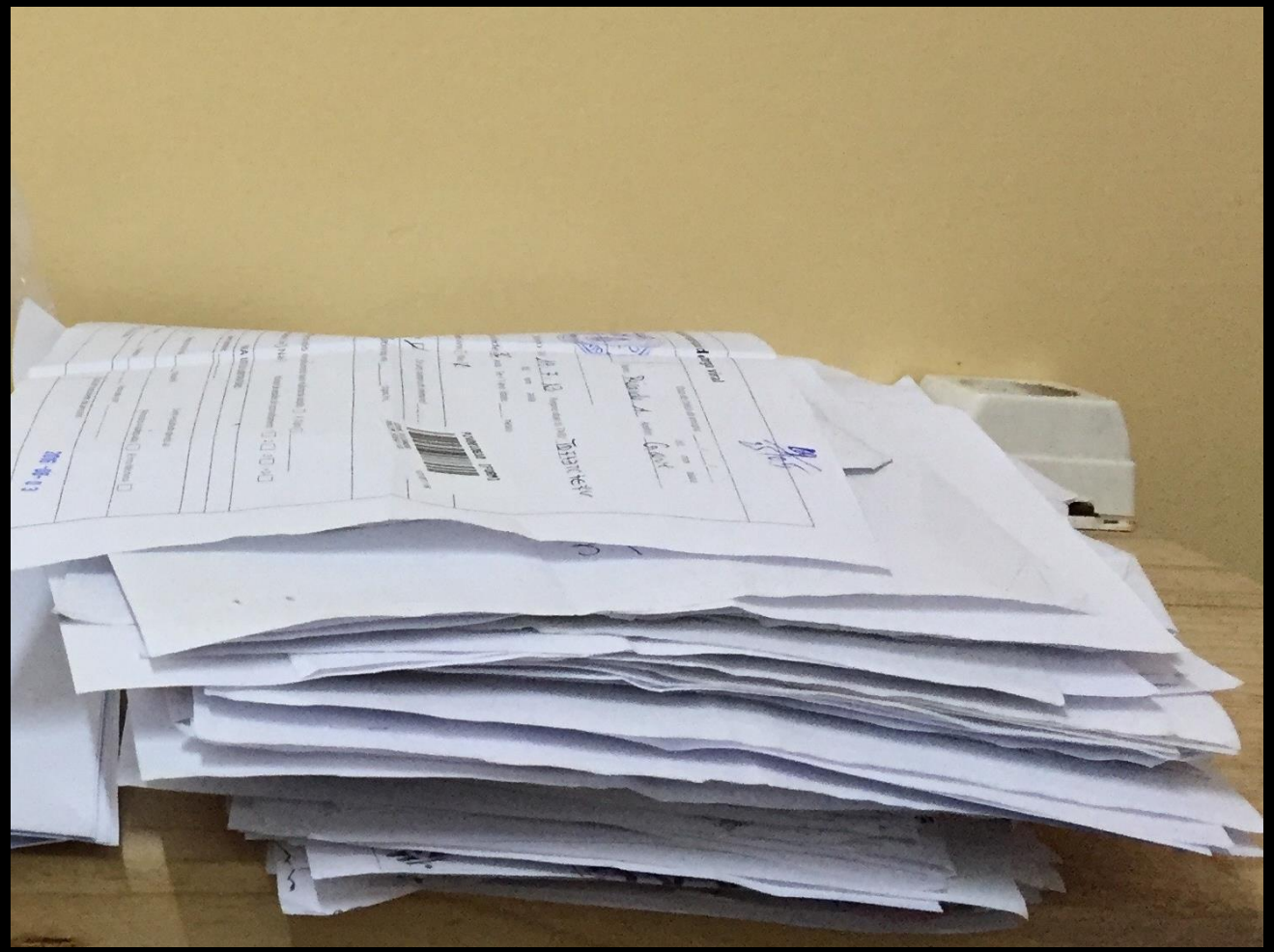


Go & See - Trace/Validate Process at Site

Where are the printed laboratory results?

Tracing the path of the results

Unfiled, on the expert client's desk (last 3 months)



Phlebotomist

Patients stopping in to the phlebotomist station to ask for laboratory results

The ‘Ah Ha’ Moment

Process Step	What Happens?	Who is responsible?	Duration	Forms/logs	Opportunity for Improvement
14. Receive results and enter in NST logbook; sort result printouts into high vs low VL piles		Phlebotomist	0.5 hour	NST logbook; test result reports	Direct communication of high VL results to clinic and patients (SMS); make high VL results visible (e.g., highlight)
15. Deliver results to ART nurse		Phlebotomist	0.5 day		In-box on wall to receive high VL reports
16. Review results and deliver to Expert Client for follow-up action		ART nurse	0.5 day		Have one dedicated nurse to manage care of all patients with high VL results; in-box on wall to receive high VL reports
17. Call patients with high VL results and schedule appointment for clinic visit	To coincide doctor's visit	Nurse/expert client	1-4 days	Call log and appointment book	How to identify all high VL patients
18. Monitor call log, appointment book, and chronic patient files		Expert client			Create a diary to ensure all follow-ups are done

Filing VL Results
- Missing process step
- Missing in EC job description

QI Tools for Success

Process Mapping

Process Mapping

Process Mapping

There is no substitute for ”Go & See”

Keep Tracing the Patient / Results

DMAIC Framework

A Quality Improvement Approach

Quality Improvement (QI) Approach

DMAIC Framework: To Improve Any Process

Nature of the problem?
Goals / Aims
Timeline
Scope

Magnitude of the problem? Select metric to show improvement

What are the most important causes of the problem?

What change will we make to address the causes of the problem?

How can we sustain & spread the improvements?
Communicate success

DMAIC FRAMEWORK:

To Improve Any Existing Process

Define → Measure → Analyze → Improve → Control

The QI team selected the DMAIC approach to address this critical patient safety issue.

MAYO CLINIC

Implementing a System for Inferior Vena Cava Filter Retrieval: A Process to Improve Patient Safety

Charles Stoneburner MD, Barbara C McKinney MD MPH, Weiping Wang MD, David Sella MD, Ricardo Paz-Fumagalli MD, Gregory Frey MD, Lyn Starke RN, Destinee Gregory, J Mark McKinney MD
Mayo Clinic, Jacksonville, FL

Description/Context

Inferior Vena Cava (IVC) filters have recently been targeted by the FDA as a patient safety issue if filters are left in place long after the risk of pulmonary embolism has subsided.

- FDA-issued Warnings—Providers encouraged to closely follow-up and retrieve IVC filters when clinically indicated.
- Inferior Vena Cava (IVC) Filter Complications—Patients with prolonged implantation and/or lost to follow-up potentially experience complications:
  - Filter limb penetration
  - IVC occlusion
  - Embolization
  - Filter migration
  - Filter fragmentation
- Benchmarked Retrieval Rates—Rates extrapolated from the literature recommend a 40–80% retrieval rate, depending on patient population.

It is in this context that the Interventional Radiology leadership at Mayo Clinic Florida convened a multidisciplinary quality improvement (QI) team with the goal of:

- Improving IVC filter follow-up and ensuring appropriate clinical management / retrieval in patients with retrievable IVC filters.

Aim/Metrics

PRIMARY AIM / METRIC:

Patient IVC Filter Follow-up:

To ↑ IVC Filter follow-up rates from 45% to 100% by June 30, 2015.

ADDITIONAL AIMS / MULTIPLE METRICS:

Counterbalance Measure:
To avoid ↓ provider satisfaction rates with IVC filter care delivery after new protocols implemented (Baseline 40% satisfaction; 53% knowledgeable)

Filter Retrieval:
To ↑ IVC Filter Retrieval Rates from 15% to 40%

Identification of Contact Provider:
To ↑ identification of contact provider to 100%

Actions Taken

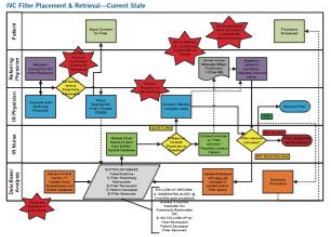
DMAIC FRAMEWORK:
To Improve Any Existing Process
Define → Measure → Analyze → Improve → Control
The QI team selected the DMAIC approach to address this critical patient safety issue.

Define

- The QI team was assembled:
  - To assess the current state
  - Envision the future state
  - Create an actionable plan to bridge the quality gap
- Literature Review
- Stakeholder Input & Engagement
  - Vascular Workgroup
  - Interventional Radiology Operating Committee (IROC)

Measure

- Process Map—Current State with Opportunities



- Baseline Data collection

METRICS	BASELINE DATA
IVC Filter Follow-up Rate	45%
Provider Satisfaction	40%
Provider Knowledge	53%
IVC Filter Retrieval Rates	15%
Identification of Contact Provider	45%

- Select actionable metrics and create aim statements

Analyze

The Fishbone diagram was used to analyze the causes for IVC Filters not being followed-up or retrieved.

Improve

Design and implement a new database follow-up system

- Develop / Publish Protocols / Guidelines for IVC Filter Placement, Follow-Up and Retrieval
- Update the Electronic Medical Record (EMR) IVC Filter Procedure Order
  - Protocols / Guidelines
  - Option to select a permanent filter
- PDSAs to establish a new standardized workflow process, including provider and patient communication
- Provider Education: Mayo Clinic Florida Medical Grand Rounds

Control

- Metrics followed at IROC committee on an ongoing basis

Results

METRICS	OUTCOMES
IVC Filter Follow-up Rate	Increased to 100%
Provider Satisfaction	Increased to 100%
Provider Knowledge	Increased to 86%
IVC Filter Retrieval Rates	Increased to 40%
Identification of Contact Provider	Increased to 100%

Lessons Learned

- The multidisciplinary team was instrumental in selecting and implementing changes to improve the safety for patients with IVC Filters at MCF
- Patient Engagement / Self-Advocacy:
  - Ordering physician and Interventional Radiologist should discuss the importance of IVC filter removal with the patient prior to implantation
- Interventional Radiology (IR) Service:
  - IR consults available for patients with additional questions or concerns
  - IR should serve as the main lead in following-up IVC filters
- Retrieval Orders:
  - IVC filter removal orders best placed at the time of insertion
- Patient Selection / Protocol Modification:
  - Certain patients, such as those undergoing surgery who require very short term interruption of anticoagulation, are candidates for removal much sooner than 90 days
  - Opportunity to proactively identify of a population of critically or terminally ill patients in whom permanent filters may safely be placed

Multidisciplinary Team Members

Charles Stoneburner MD
Barbara C McKinney MD MPH
Weiping Wang MD
David Sella MD
Ricardo Paz-Fumagalli MD
Gregory Frey MD
Lyn Starke RN
Destinee Gregory
J Mark McKinney MD
Margaret Johnson MD
Charlie Burger MD
Tammy Bunik RN
Catina Lewis RN
Adam Rubin RT(R)

Project Checklist

Session 1 Deliverables DEFINE / MEASURE

- ❑ Identify Stakeholders
- ❑ Map the Process (Current State)
- ❑ Identify / Prioritize Opportunities
- ❑ Action Plan
- ❑ Project Outline
- ❑ Baseline Metrics / Data Collection Plan
- ❑ VOC Information
- ❑ Elevator Speech
- ❑ Communication Plan
- ❑ 1 Rapid Test of Change (PDSA)
- ❑ Presentation

Session 2 Deliverables ANALYZE / IMPROVE

- ❑ Root Cause Analysis
  - ❑ Fishbone Diagram, 5 Whys, or Pareto Chart
- ❑ Update Aim Statement, if necessary
- ❑ 1 Rapid Test of Change (PDSA)
- ❑ 1 5S Exercise
- ❑ 1 Visual Management Application
- ❑ Create Future State Map (if ready)
- ❑ Presentation

Session 3 Deliverables CONTROL

- ❑ Update Aim Statement, if necessary
- ❑ Modify Solution(s) where necessary by additional Rapid Test of Change (PDSA)
- ❑ Create Control Plan
- ❑ Transfer to Operational Owner
- ❑ Presentation

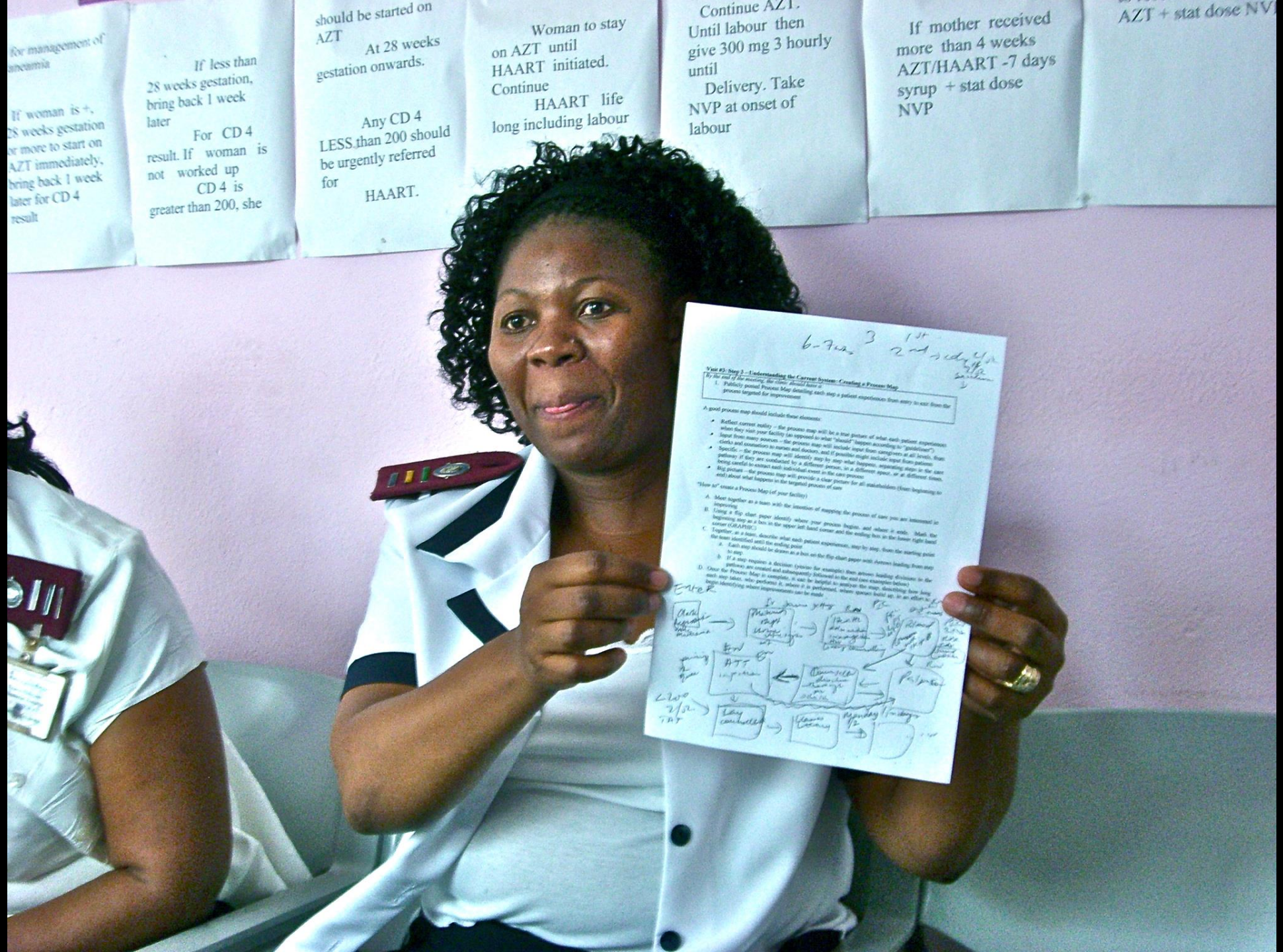
Session 1 Deliverables
DEFINE / MEASURE

- Identify Stakeholders
- Map the Process
- Identify /Prioritize Opportunities
- Action Plan
- Project Outline – 3 Questions & Aim Statement

- Baseline Metrics / Data Collection Plan
- VOC Information
- Elevator Speech
- Communication Plan
- 1 Rapid Test of Change (PDSA)
- Presentation

Process Mapping


PARKING LOT
Improvement Tools
1
Lebina Mathaba
LESOTHO


for management of
anaemia
If woman is +,
28 weeks gestation
or more to start on
AZT immediately,
bring back 1 week
later for CD 4
result
If less than
28 weeks gestation,
bring back 1 week
later
For CD 4
result. If woman is
not worked up
CD 4 is
greater than 200, she
should be started on
AZT
At 28 weeks
gestation onwards.
Any CD 4
LESS than 200 should
be urgently referred
for
HAART.
Woman to stay
on AZT until
HAART initiated.
Continue
HAART life
long including labour
Continue AZT.
Until labour then
give 300 mg 3 hourly
until
Delivery. Take
NVP at onset of
labour
If mother received
more than 4 weeks
AZT/HAART -7 days
syrup + stat dose
NVP
AZT + stat dose NV
Visit #3--Step 3 -- Understanding the Current System: Creating a Process Map
By the end of this meeting, the clinic should have a:
1. Publicly posted Process Map detailing each step a patient experiences from entry to exit from the process targeted for improvement
A good process map should include these elements:
Reflect current reality -- the process map will be a true picture of what each patient experiences when they visit your facility (as opposed to what "should" happen according to "guidelines")
Input from many sources -- the process map will include input from caregivers at all levels, from clerks and counselors to nurses and doctors, and if possible might include input from patients
Specific -- the process map will identify, step by step what happens, separating steps in the care pathway if they are conducted by a different person, in a different space...or at different times. Being careful to extract each individual event in the care process
Big picture -- the process map will provide a clear picture for all stakeholders (from beginning to end) about what happens in the targeted process of care
"How to" create a Process Map (of your facility)
A. Meet together as a team with the intention of mapping the process of care you are interested in improving
B. Using a flip chart paper identify where your process begins, and where it ends. Mark the beginning step as a box in the upper left hand corner and the ending box in the lower right hand corner (DIAGRAM)
C. Together, as a team, describe what each patient experiences, step by step, from the starting point to exit.
a. Each step should be drawn as a box on the flip chart paper with Arrows leading from step to step
b. If a step requires a decision (yes/no for example) then arrows leading divisions to the pathway are created and subsequently followed to the end (see examples below)
D. Once the Process Map is complete, it can be helpful to analyze the map, identifying how long each step takes, who performs it, where it is performed, where queues build up, in an effort to begin identifying where improvements can be made

*"The first step in any organization is to draw a flow diagram (process map) to show how each component depends on others. Then everyone may understand what their job is. If people do not **see** the process, they cannot **improve** it."*

W Edwards Deming
(1900-1993)

"Draw a flowchart (process map) for whatever you are doing. Until you do, you do not fully understand what you are doing. You just have a job.”

W Edwards Deming (1900-1993)

Prioritization of Opportunities

Taking the Process Map to the next step in Improvement

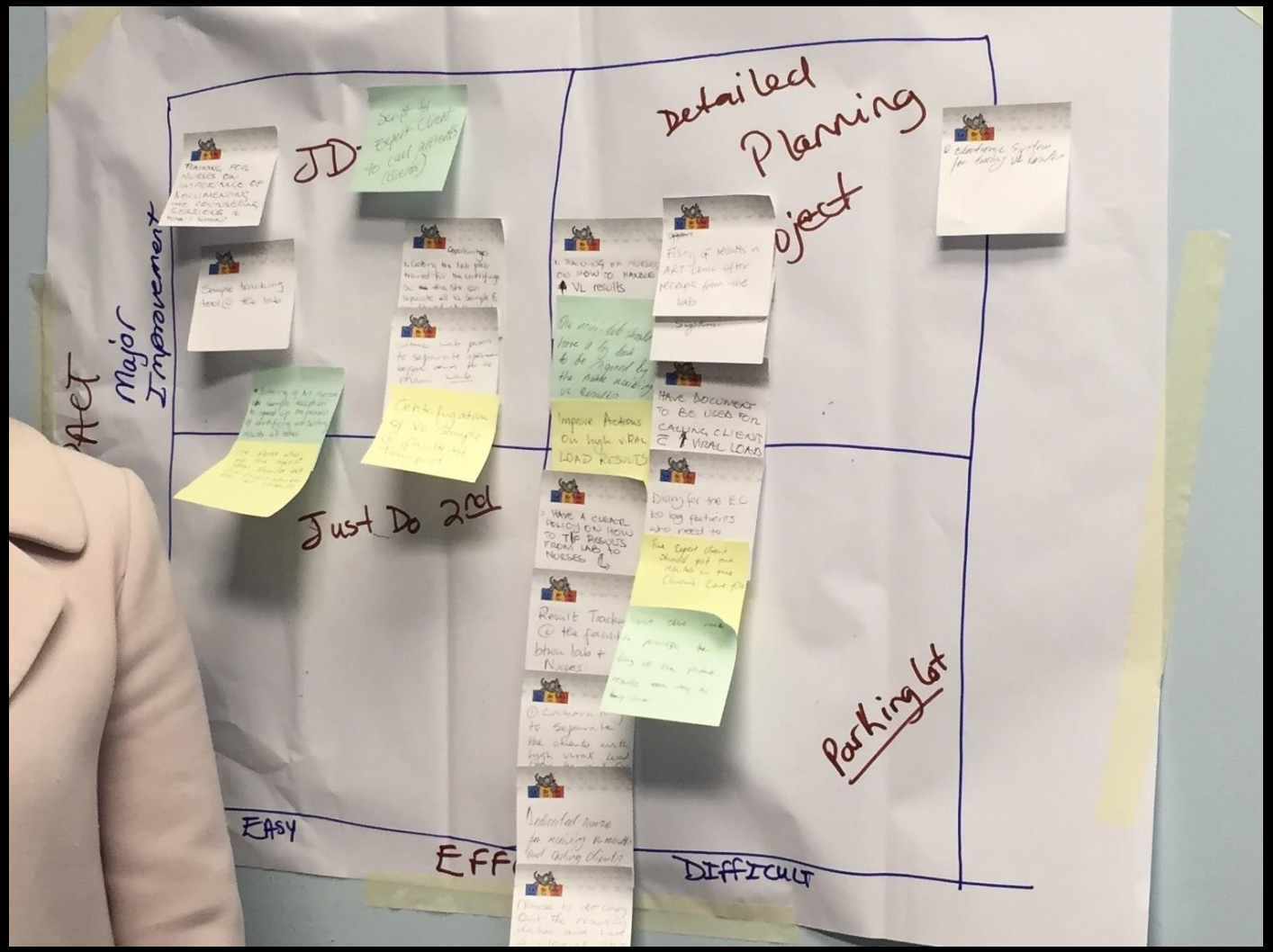
After the site visits, multiple opportunities for improvement were generated

Team comments:

“Eye-opening”

“Going and seeing showed us so many opportunities for improvement”

“We had several ‘ah-ha’ moments”



IMPACT / EFFORT GRID A Tool for Prioritizing Opportunities

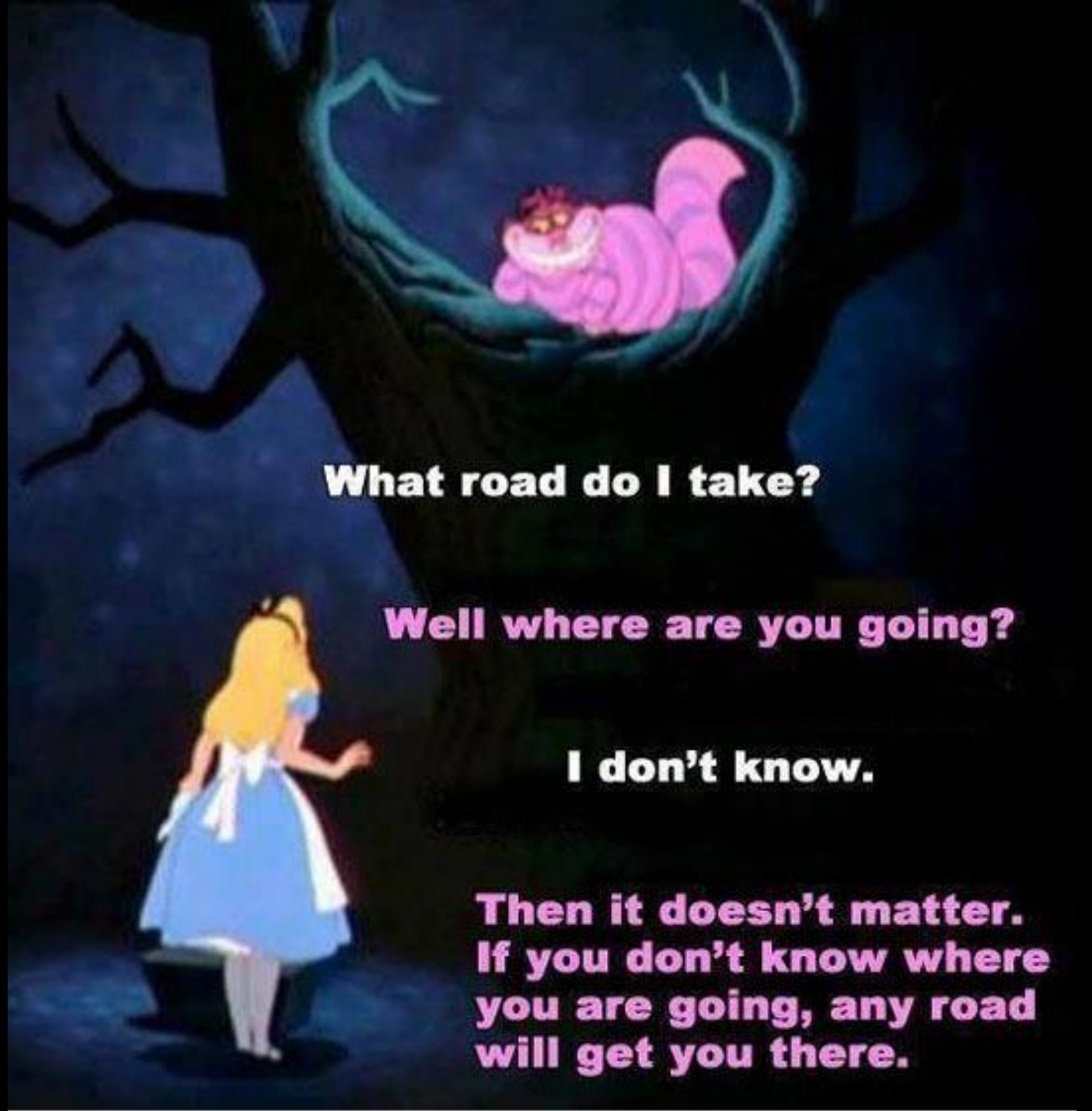
Action Plan

Action Item	By whom?	By When?
1. Create Hand-off Tracking Sheet	Sehlephi (ICAP)	July 12
2. Supply high VL in-boxes for ART clinic	Dan (CDC)	July 12
3. Produce site-level high VL result report by month	Sindisiwe (NRL)	July 13
4. Collect baseline data	Hloniphile (Site)	July 15
5. Revise LARC proposal	Dan (CDC)	July 15
6. Analyze baseline results	Sindisiwe (NRL)	July 29
7. Create PowerPoint for Tanzania meeting	Dan (CDC)	July 29
8. Send sample rejection criteria to clinic	Siphiwe (NRL)	July 31
9. Share VL training curriculum	Katy (CDC)	July 31
10. Contact CNO for national algorithm training on site	Sindisiwe (NRL)	August 31
11. Clarify job description for Expert Client - Include timely filing of viral load test results to patient charts	CNO MOH	November 1

Aim Statement

Why?

Why do we need a aim statement?

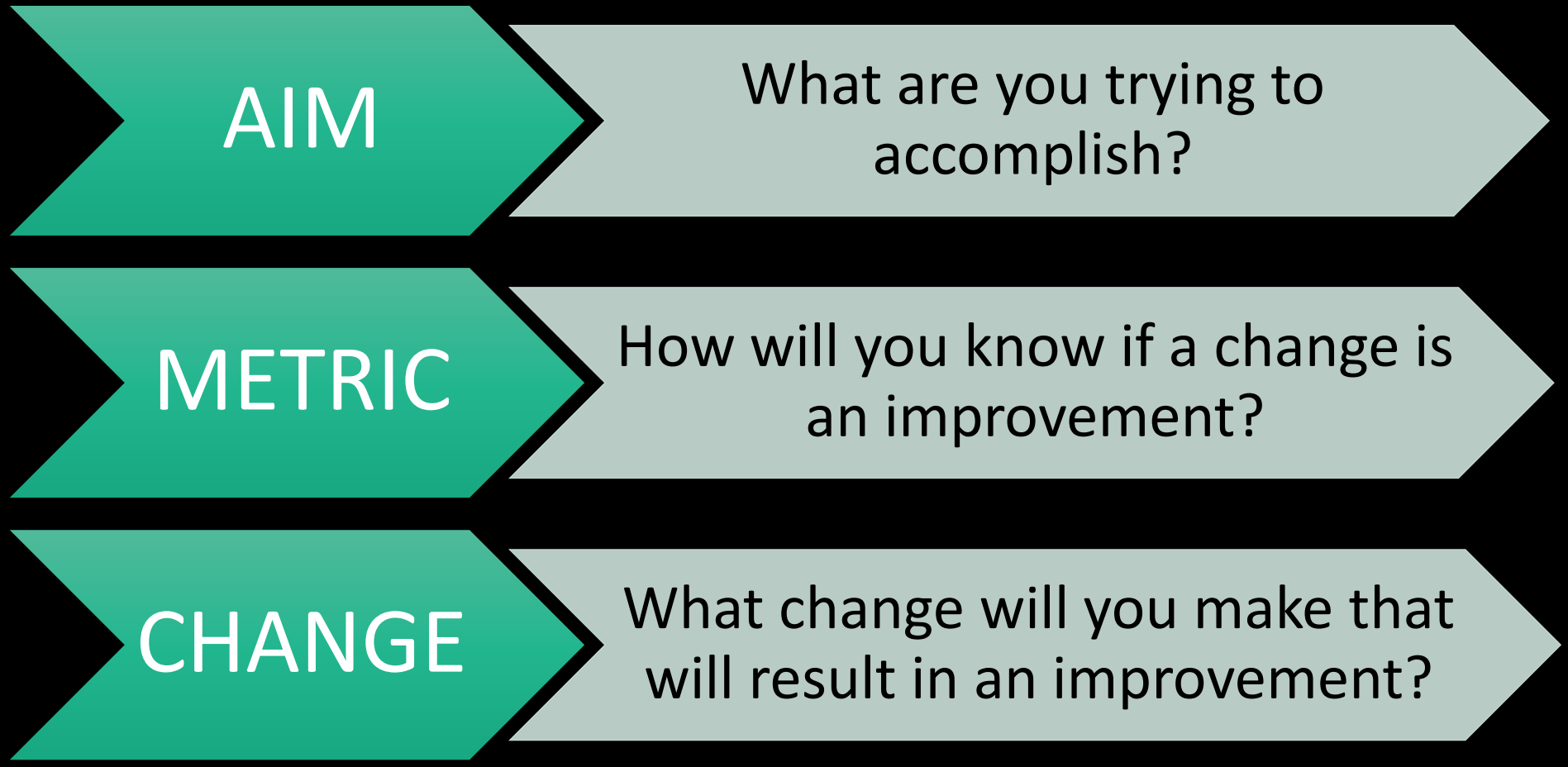


Aim Statement

Improve (increase, decrease) _____ (metric) from _____ to ____ by _____ (date).

Do What, by When?

Ask 3 Questions – The Model for Improvement



The Model for Improvement

What are we trying to accomplish?	How will we know if a change is an improvement?	What change will we make that will result in an improvement?
Overarching Goal Improve the care & management for patients with high HIV viral load, specifically addressing the result reporting/clinician interpretation step of the viral load cascade	**AIM Statement** **Increase the percentage of high viral load patients with documented appointment and timely clinical follow-up** ➢ from _____ to 50% by 22 July 2016 (Short term aim = Follow-up appointment scheduled) ➢ from 50% to 80% by 31 October 2016 (Long term aim = Counseling and second viral load recorded) **Metric:** $\frac{\text{\# of patients who meet follow-up criteria}}{\text{\# patients with high viral load}}$	**NEW LOG / NEW PROCESS** **Track Handoffs and Clinical Actions related to High VL Test Results**  **Appropriate Clinical Care for Patients**

MAYO CLINIC

Practice Redesign of the Pre-operative Evaluation (POE) Clinic: A Quality Improvement Initiative

Matthew Lundy, MBA, MHA, Barbara Chase McKinney, MD, MPH*,
Virginia Reynolds, RN, Frank Ray, MBA, Joan M. Irizarry-Alvarado, MD
Mayo Clinic, Jacksonville, FL

Description

The vast majority of surgical patients (90%) at Mayo Clinic Florida (MCF) are medically optimized and cleared for surgery through the Pre-Operative Evaluation Clinic (POE). The MCF surgical practice prioritized increasing surgical volumes and decreasing the length of the surgical itinerary for patients. These priorities impacted POE by increasing demand for POE services, especially same day/next day (SD/ND) POE requests.

A multidisciplinary team of stakeholders met over 5 months and used the DMAIC process to address the issues. The team utilized multiple quality improvement tools—**Process Mapping, PDSA Cycles, Voice of the Customer, Pareto Chart for triage defects, Brainstorming, Stochastic Discrete-Event Simulation (SDES), Stochastic Linear Programming (SLP), Exploratory Data Analysis (EDA), Data Envelopment Analysis (DEA), Control Charts, and the Impact Effort Grid.**

As baseline data was collected, three significant gaps were identified that impacted the quality of care delivered and the timely throughput of patients in POE.

Patient Safety
- Persistent mismatch (45% of patients had to be manually reassigned) between the patient acuity and the assigned provider—ARNPs, Internal Medicine Physicians and Anesthesiologists

Patient Access/Efficiency of Throughput
- 35% of cases were SD/ND surgical patient requests
- Lengthy triage process fraught with errors
- POE became a bottleneck, limiting access to the surgical practice

Staff Dissatisfaction and Burnout
- Persistent daily patient-to-provider mismatches → Rework to reassign patients to the appropriate providers' calendars the day of/before the appointment
- Surgical requests for rapid turnaround time (SD/ND appointments)
- Limited time to safely assess patients and order additional testing when necessary

Aim/Metrics

PRIMARY AIM/METRIC:
Improve efficiency/access:
To ↑ patient through-put/volumes in the POE Clinic by 10% without increasing staffing or provider time by June 30, 2014.

ADDITIONAL AIMS/MULTIPLE METRICS required to monitor entire practice redesign:
Improve Efficiency/Access:
To ↑ operating margins by 10%
To ↓ the nurse triage time by 20%
Improve Safety:
To ↓ the number of high-acuity patients seen by ARNP's from 7% to 5.4%
To ↓ the patient reschedule rate from 45% to 30%
Improve Staff Satisfaction:
To ↑ staff satisfaction scores by 20%

Changes

- Develop and Implement the **Acuity Gauge/Standardized Care Sets with Standardized Laboratory Orders** to ensure patients are scheduled with the correct provider based on their acuity: (Acuity Gauge went through several iterations (PDSAs) & was tested in 2 departments prior to clinic-wide implementation)

Low = No Checks High = 1 or more checks	POE Acuity Gauge Check List
Cardiovascular Disease	Does the patient have any history of cardiovascular disease (MI, Atrial fibrillation, CHF, CABG, valve surgery, stent, CRT, pacemaker, defibrillator, cardioversion)?
Neurological Disease	Has patient had recent stroke/TIA (<12 months)
Blood Pressure	Is the patient on more than 3 blood pressure medications and/or any 1 antiarrhythmic (Propafenone, Flecainide, Amiodarone, Dronedarone, Dofetilide)?
Anticoagulation	Is the patient chronically on blood thinners (Warfarin, Plavix, Pradaxa, Eliquis, Brilinta, Xarelto)?
Pulmonary Disease	Is the patient on more than 3 inhalers and/or continuous oxygen, or have history of pulmonary hypertension?
Dialysis	Is the patient on dialysis?
Diabetes	Is patient on more than 3 diabetes medications (oral and/or injectable) or recent A1c (less than 3 months ago) was greater than 8%?
Transplant	Is patient a transplant patient or being worked up for transplant?
Clotting	Does the patient have history of hemophilia or any other clotting factor deficiency?

- **Update/Automate Calendar Appointment Slots**—SD/ND holds distributed throughout day, focusing on matching times to need for highest demand (Forecasting)
- **Staffing Changes**—stacking staffing at the first of the week and tapering towards the end of the week, to match surgical demand
- **Streamline Triage Process**—Improve the accuracy & efficiency of the nursing triage process by developing an M-page & optimizing the PowerNote

Multidiscplinary Team Members

Brantlee Broome-Stone, RN
Claudia Crawford, MD
Aletta Fry, MA
Debra Jolly, RN
Joan M. Irizarry-Alvarado, MD
Donna Kalkines, RN
Catina Lewis, RN
Matthew Lundy, MBA, MHA
Barbara McKinney, MD, MPH*
Nancy Pitruzzello, ARNP
Frank Ray, MBA
Virginia Reynolds, RN
Michael Vizzini, MHA
Katey Wert, PA

*mentor for Matthew Lundy

Results

Metrics	Actual Outcomes
Patient Volumes	**Increased 23%**
Percentage of High Acuity Patients on the ARNPs' Calendars	**Decreased to 3%** *(Decreased by 50%)*
Reschedule Rate	**Decreased to 27%** *(Decreased by 40%)*
Operating Margins	**Increased by 14%**
Triage Time	**Decreased by 30%** *(approximately 11 minutes/patient)*
Utilization Rate	**Modulated staffing and demand ratios** *(See graph)*
Staff Satisfaction	**Scores improved by 24%** *(Statistically significant improvement in relation to the triage process, teamwork, the scheduling process, and provider assignment)*

Primary Aim/Metric

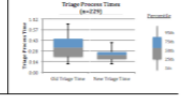
The primary aim was exceeded with a 23% increase in patient volumes without increasing staffing or provider time.

Additional Aims/Metrics

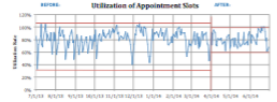
- ↓ the number of high acuity patients on ARNP's calendars from 7% to 3% (↓ > 50%)
- Reschedule rate ↓ 40%

- Operating Margins ↑ 14%

- Triage Time ↓ 30%



- Modulated Utilization Rates — ↓ Variation 44.5%



- ↑ Staff Satisfaction 24%

Lessons Learned

Best Practices:
- Multidisciplinary Team of stakeholders, committed and engaged
- Use of data collection tools to guide decision making
- Acuity Gauge for triaging and scheduling patients to the right provider
- Standardized Laboratory orders and Care sets for all patients
- Creation and execution of the project Education and Communication plan
- Standardized Triage PowerNote—focusing on essential elements
- Use of Simulation Center for Brainstorming & thinking "outside the box"
- Forecasting model for template & staffing changes
- POE Dashboard/Key Performance Indicators for ongoing monitoring & sustainability after the "project" is over

What could have been improved?
- Narrowing the scope of the project to meet project timeline
- Improved communication for the development of new orders and "Go-Live" dates

Aim/Metrics

PRIMARY AIM/METRIC:
Improve efficiency/access:
To ↑ patient through-put/volumes in the POE Clinic by 10% without increasing staffing or provider time by June 30, 2014.

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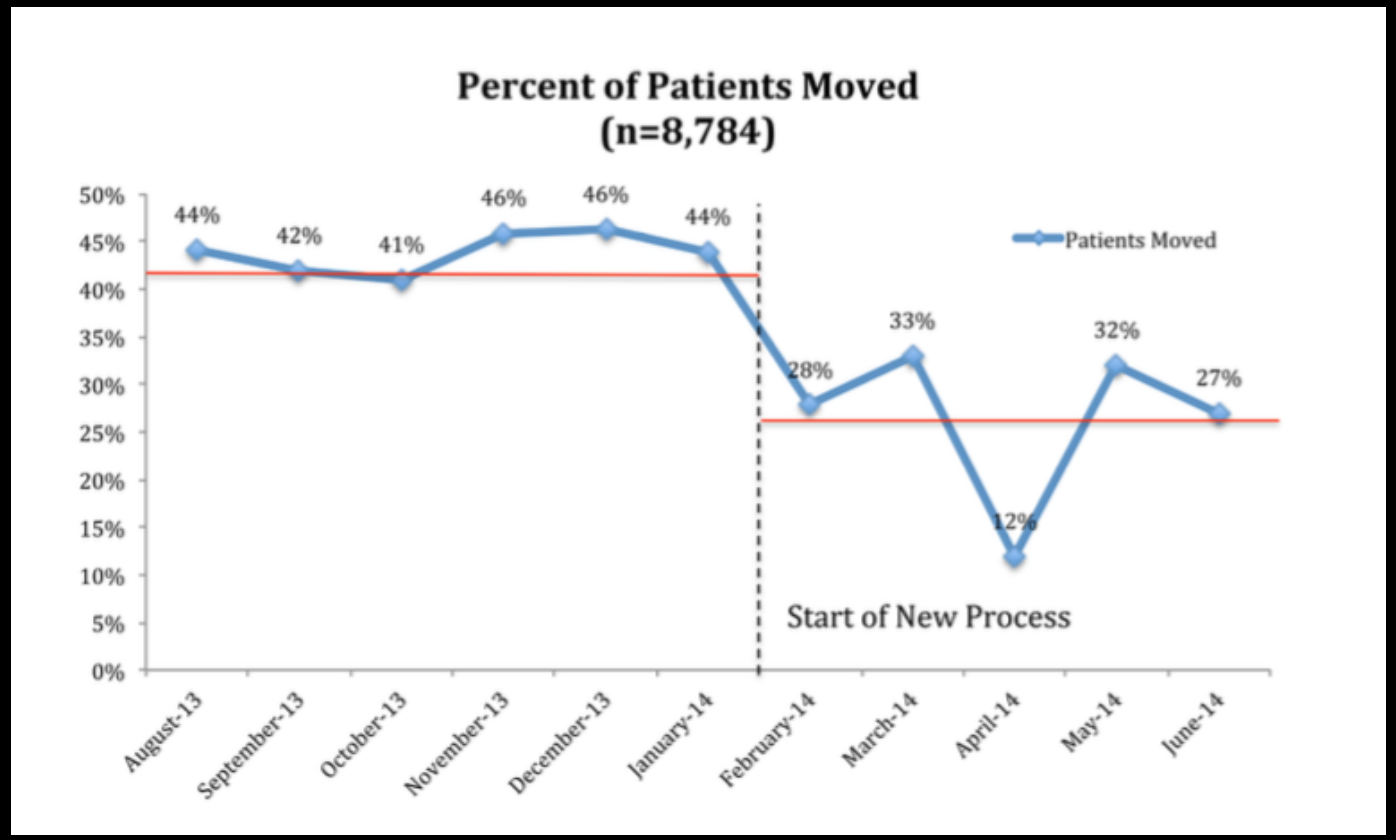
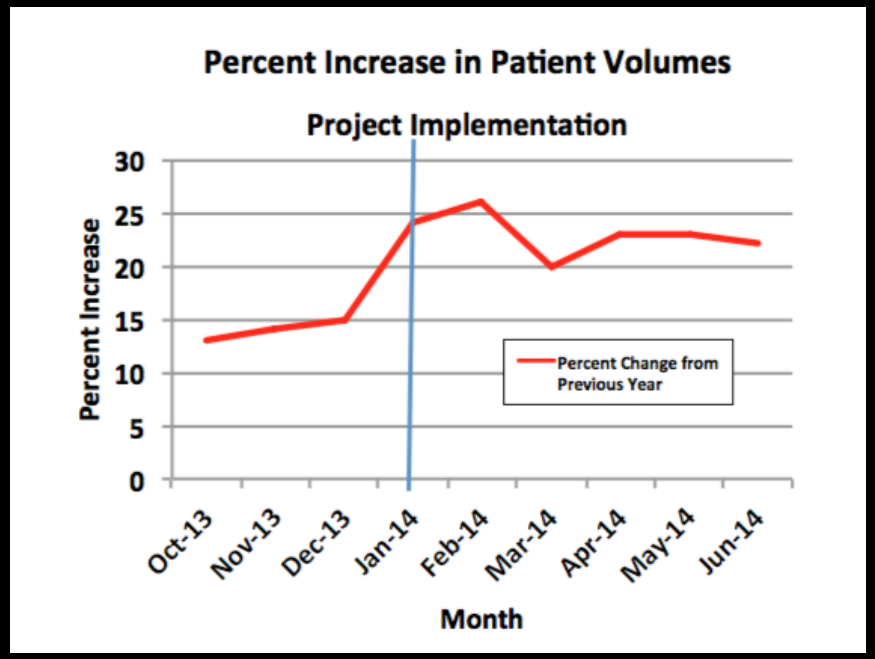
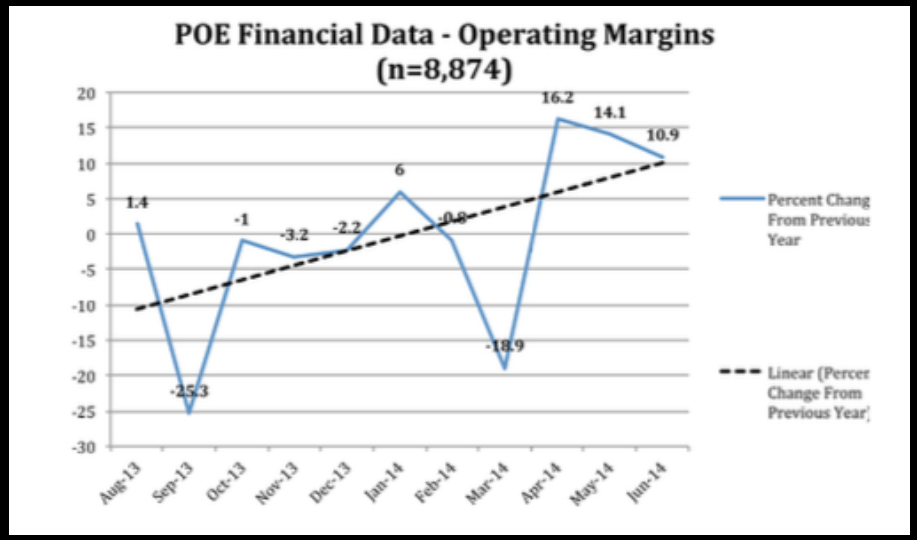
To ↑ staff satisfaction scores by 20%

Metrics


Percent of Patients Moved
(n=8,784)
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
44%
42%
41%
46%
46%
44%
28%
33%
12%
32%
27%
Patients Moved
Start of New Process
August-13
September-13
October-13
November-13
December-13
January-14
February-14
March-14
April-14
May-14
June-14


Percent Increase in Patient Volumes
Project Implementation
Percent Increase
30
25
20
15
10
5
0
Percent Change from Previous Year
Oct-13
Nov-13
Dec-13
Jan-14
Feb-14
Mar-14
Apr-14
May-14
Jun-14
Month


POE Financial Data - Operating Margins
(n=8,874)
20
15
10
5
0
-5
-10
-15
-20
-25
-30
1.4
-25.3
-1
-3.2
-2.2
6
-0.8
-18.9
16.2
14.1
10.9
Percent Chang From Previous Year
Linear (Percer Change From Previous Year)
Aug-13
Sep-13
Oct-13
Nov-13
Dec-13
Jan-14
Feb-14
Mar-14
Apr-14
May-14
Jun-14

DMAIC

Project Outline

Project Outline

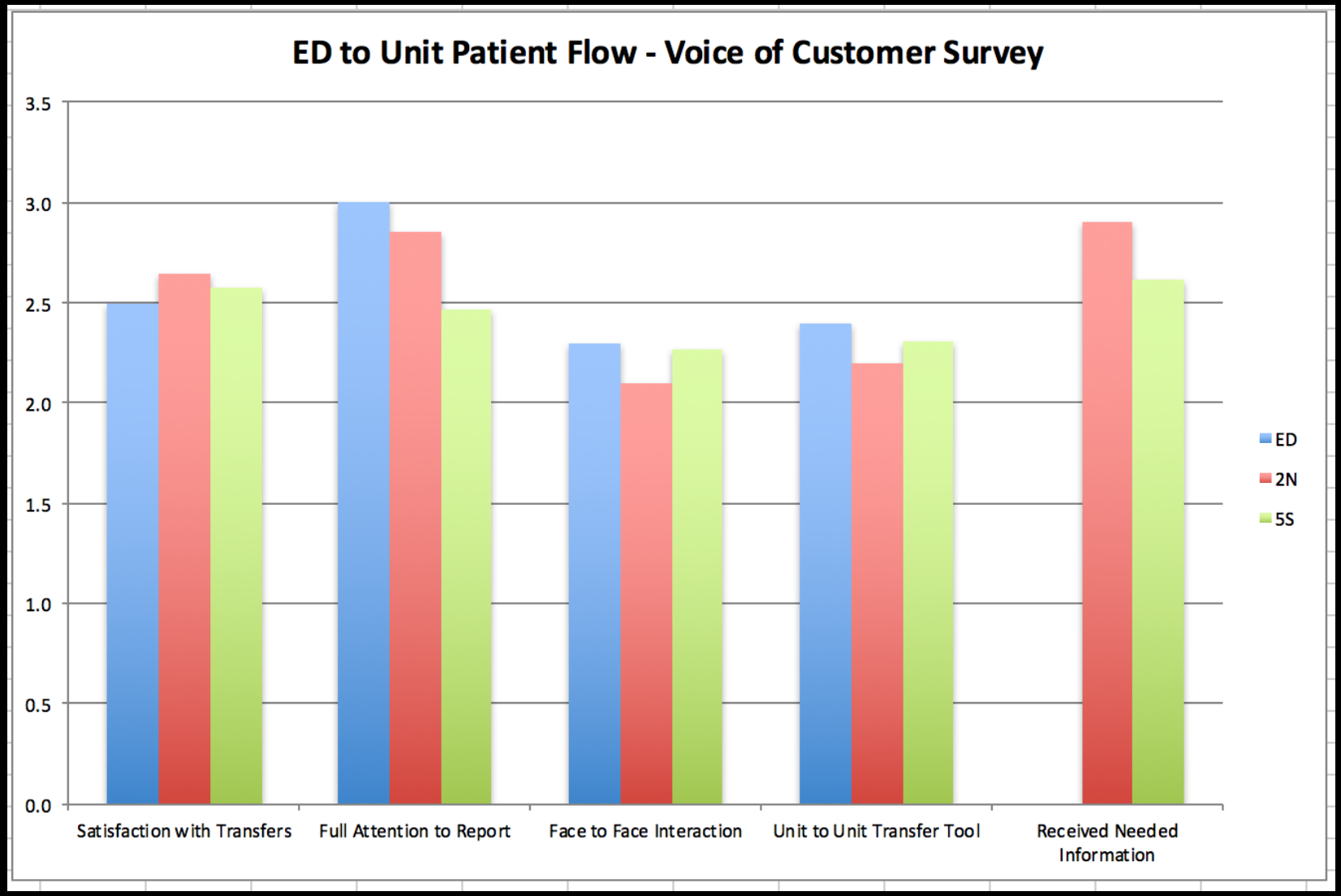
THE THREE QUESTIONS	DEVELOP	YOUR ANSWERS
What are you trying to accomplish?	AIM	
How will you know if a change is an improvement?	METRIC	
What change will you make that will result in an improvement?	CHANGE	

DMAIC

PHASE	KEY COMPONENTS	PROJECT DETAILS
Define	Gap: Aim with Timeline:	
Measure	Baseline Measure: Data Source: Sample Size:	
Analyze	Contributing Factors:	
Improve	Intervention: Re-measure (Graphical Display):	
Control	Project Owner: Control Plan: Communication: Lessons Learned:	

Accomplishments:

Voice of Customer Survey



Elevator Speech

Elevator Speech

This project is about

_____

As a result of these efforts,

_____

It's important because we are concerned about:

- _____
- _____

Success will be measured by showing improvement in:

- _____
- _____

What we need from you –

_____

Elevator Speech

This project is about:
Increasing the demand for HIV viral load testing at Bagamoyo Health Facility
As a result of these efforts,
All pregnant and breastfeeding women, meeting the country criteria, will have their VL ordered

It's important because we are concerned about:

- **Reduction in vertical transmission from mother to child**
- **Early detection of treatment failure**

Success will be measured by showing improvement in:
Percentage of viral load tests ordered for all algorithm-eligible pregnant and breastfeeding women

What we need from you: (Variable answers depending on audience)

Small Test of Change = PDSA

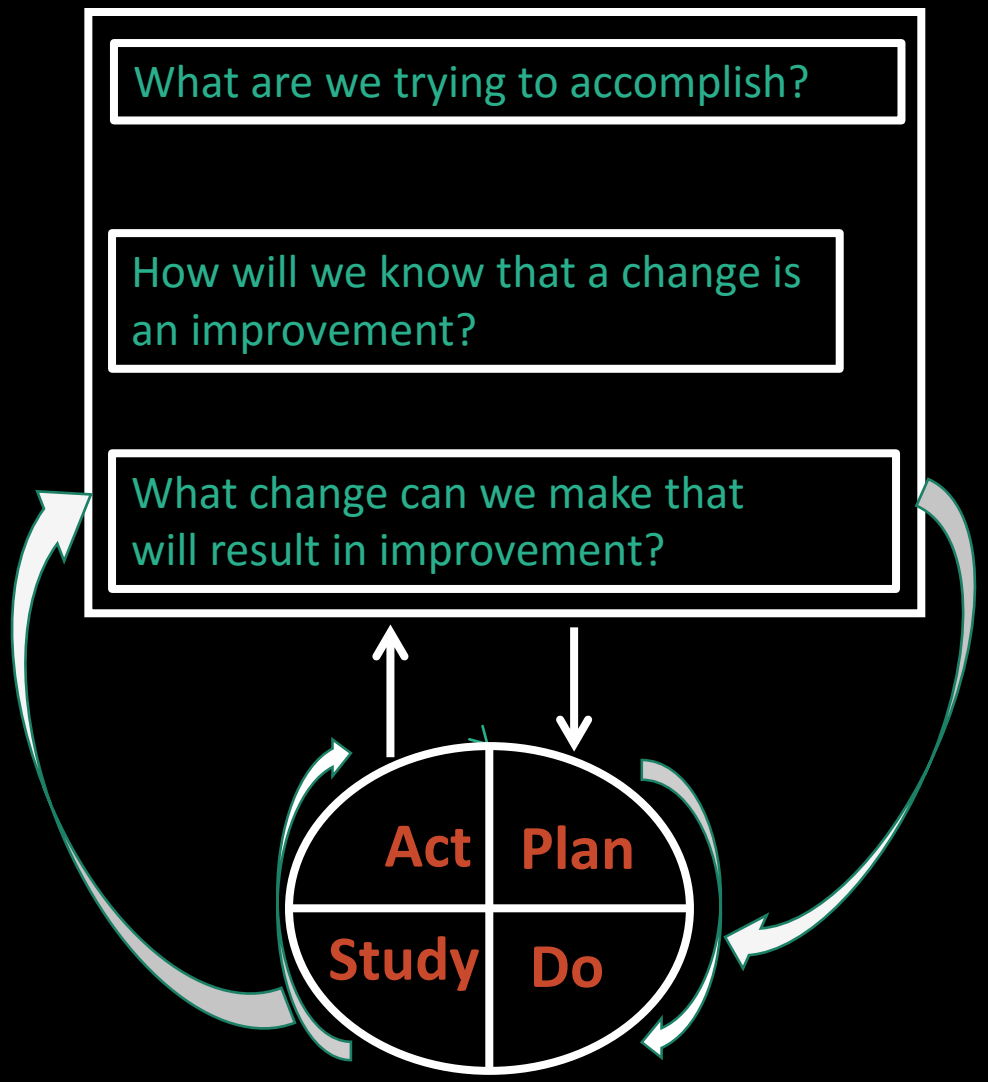
The Model for Improvement (IHI)

Aim

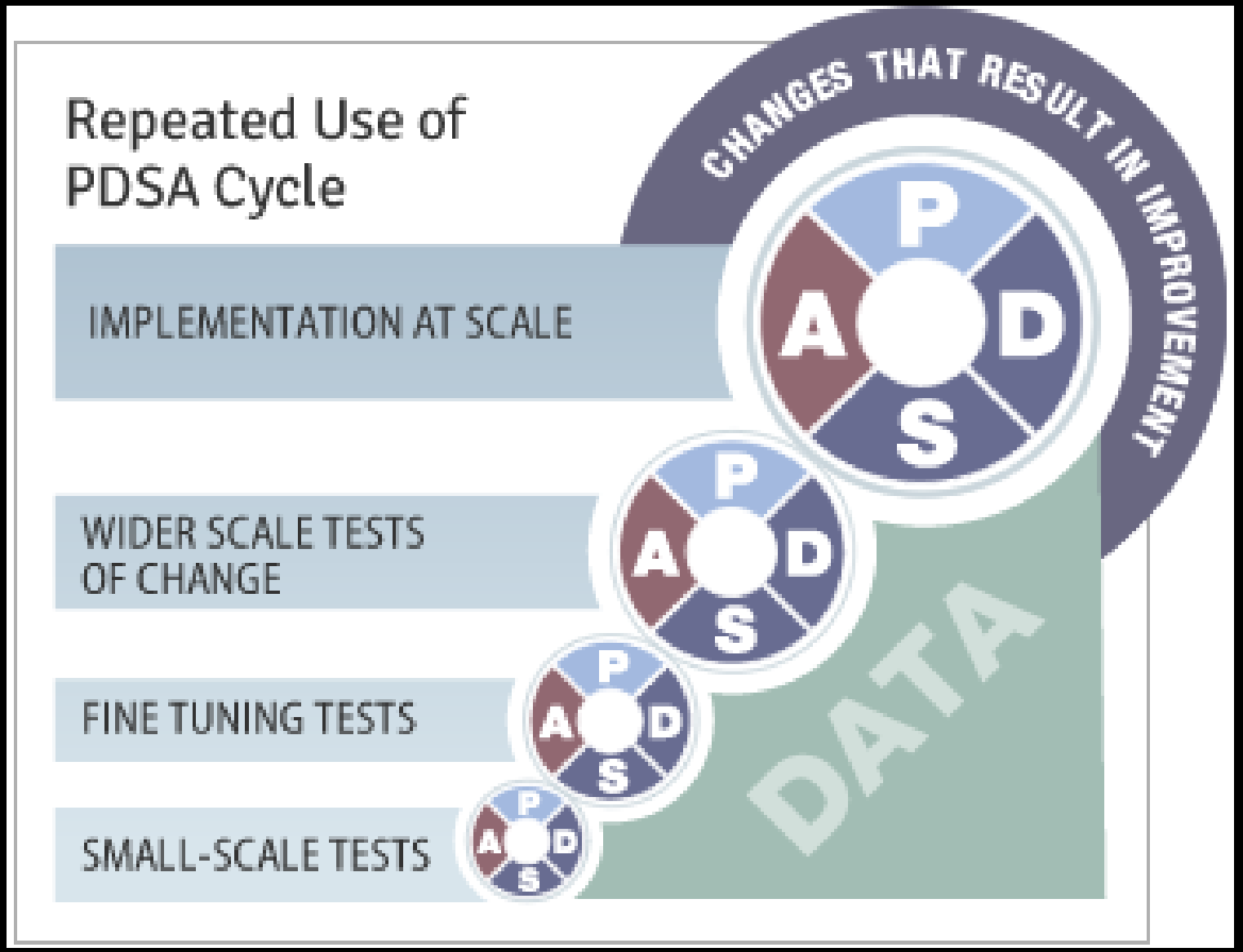
Measure

Change

Small tests of change



PDSA – Not one and done!



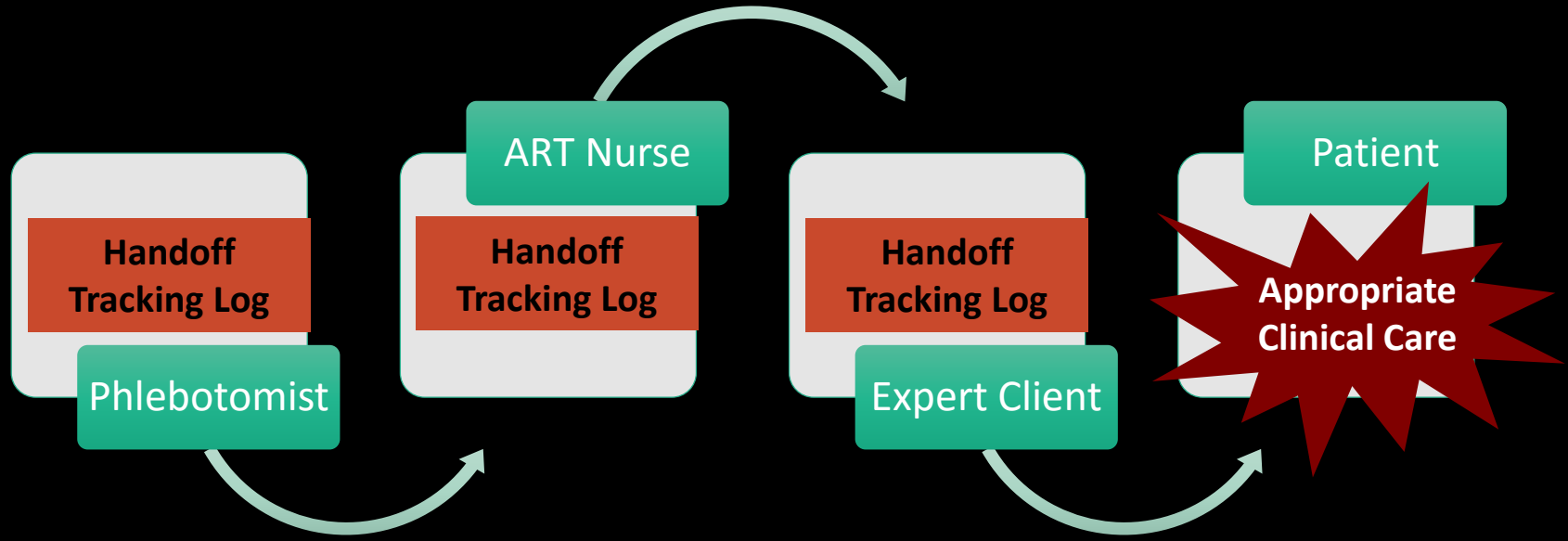
NEW LOG

Daily High HIV Viral Load Tracking Log									
Patient IDs- Name and ART #	Date Results Ret.	Date Results Rec. by Nurse	Date Req. Action Taken by Nurse	Date Pt Results Rec. by EC	Date / Type Action Taken by EC	Date Result Filed by EC	Date Rev. by Nurse	Dates – F/U Appt with Enhanced Counsel-ing	Date 2nd VL Results Rec.

The Change/Intervention

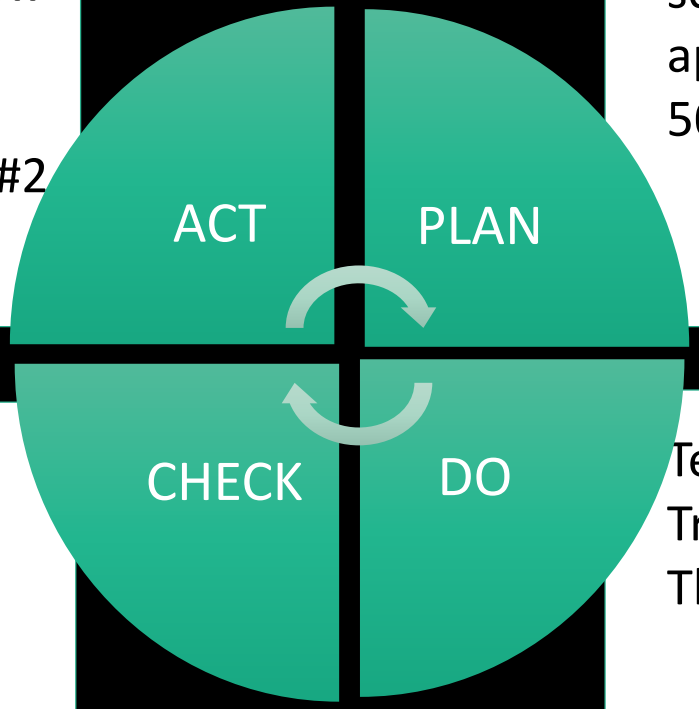
What we will DO to make an improvement

NEW PROCESS



PDSA - Small Test of Chance (July)

- Worked well ➞ Standardize
- Did not work ➞ Create new test of change (PDCA)
- Worked partially ➞ "Tweak" and begin PDCA #2



⬆ % of high VL patients scheduled for F/U appointment from ___ to 50%

Analyze Data (by 29 July)

- Met goal?
- Why/Why not?

Test new Daily High VL Tracking Log on Tuesdays & Thursdays 12-22 July

“There’s always room for improvement, you know – it’s the biggest room in the house.”

– Louise Heath Leber

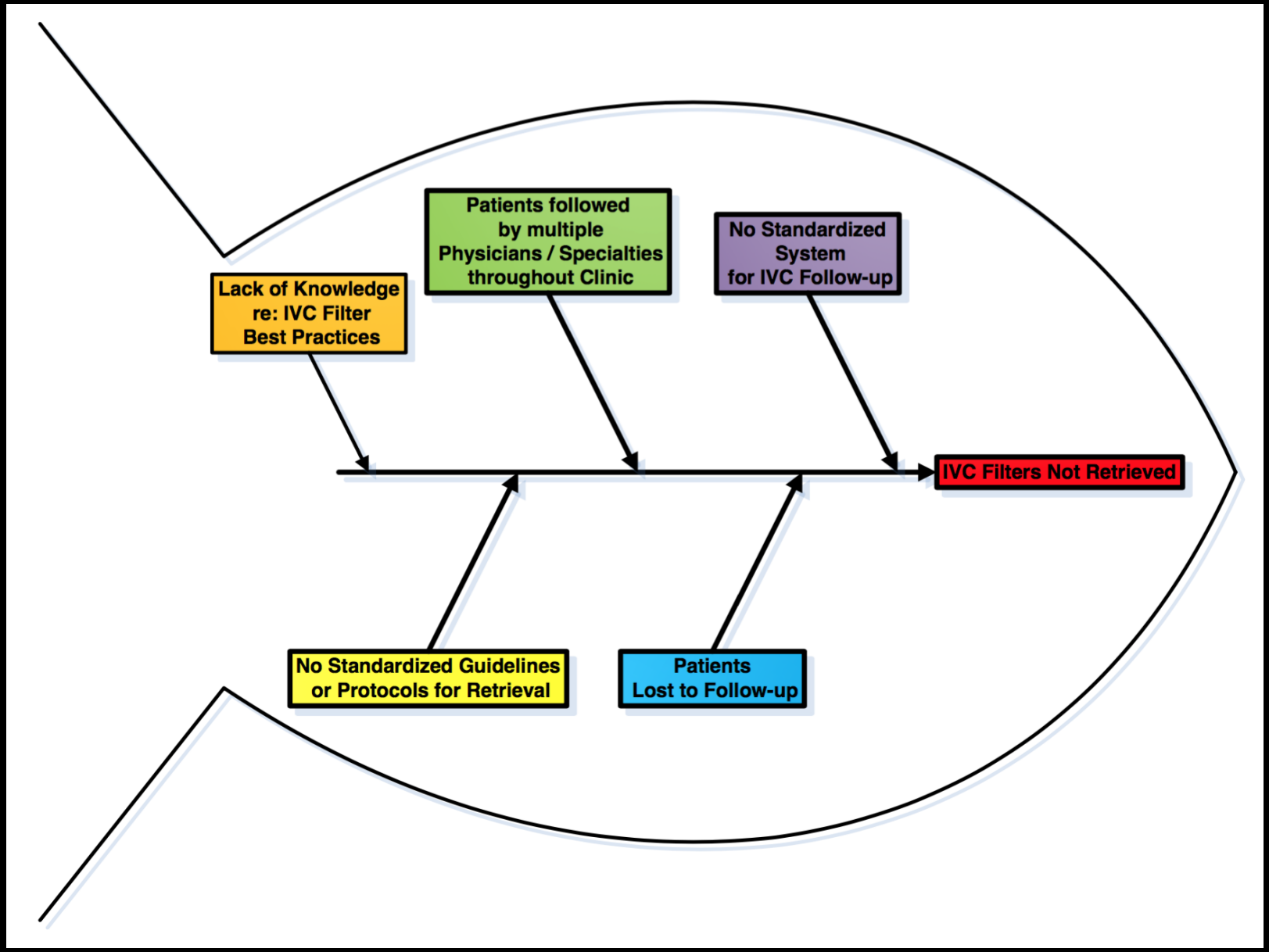
Session 2 Deliverables
ANALYZE / IMPROVE

- Root Cause Analysis
  - Fishbone Diagram
  - 5 Whys
  - Pareto Chart
- Update Aim Statement, if necessary
- 1 Rapid Test of Change (PDSA)
- 1 5S exercise
- 1 Visual Management Application
- Create Future State Map (if ready)
- Presentation

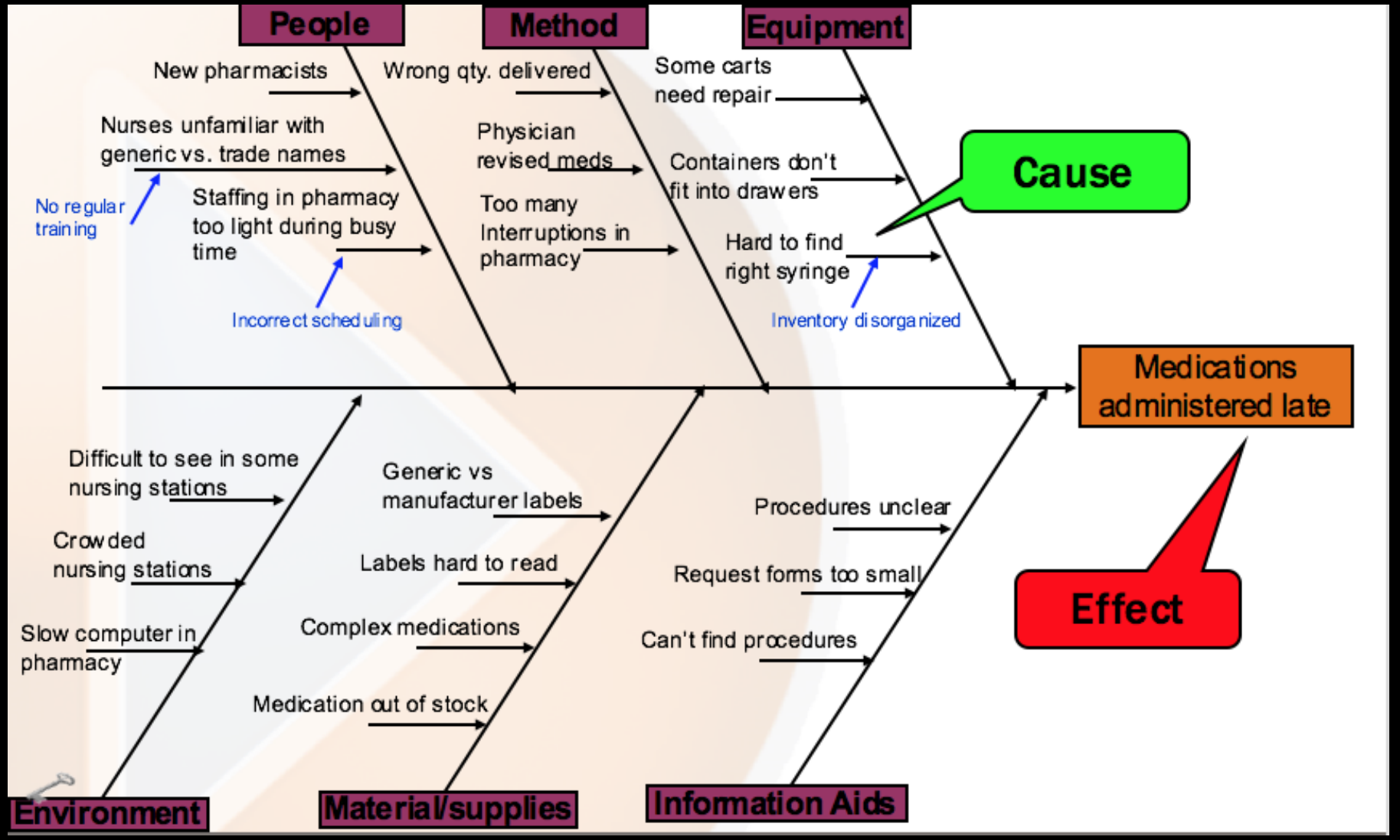
Root Cause Analysis

Root Cause Analysis

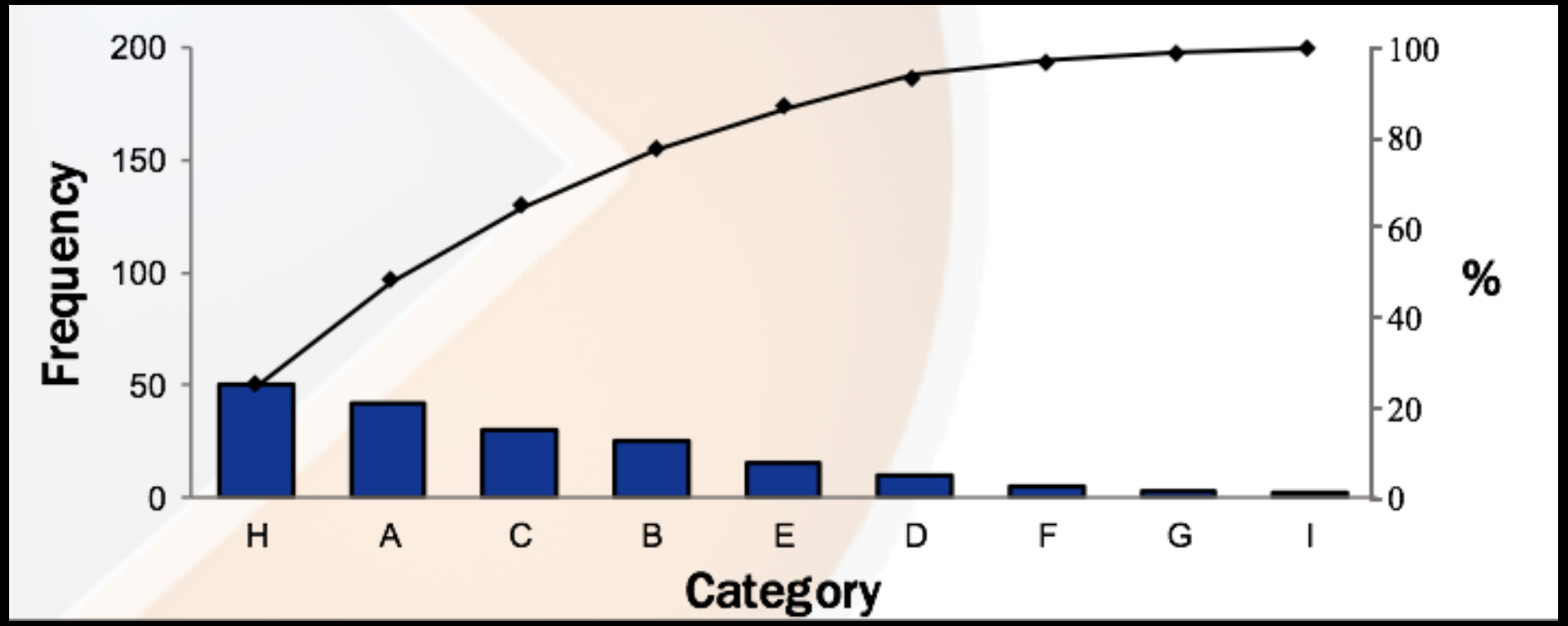
Fishbone Diagram



Fishbone Diagram



Pareto Chart



Spread Sheet – Defects / Ranked

Title:

Order Defects

Data:

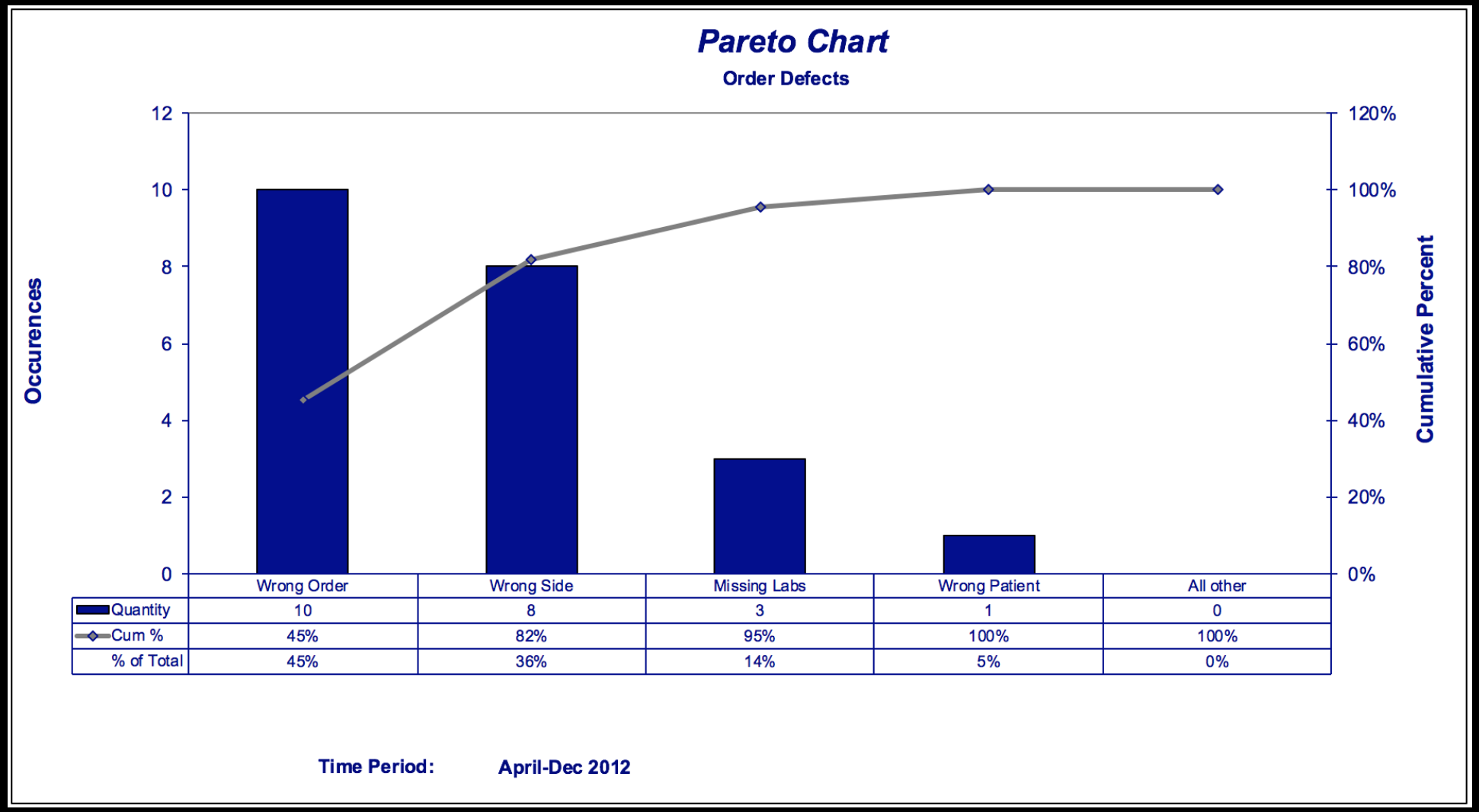
Category	Quantity
Wrong Order	10
Wrong Side	8
Missing Labs	3
Wrong Patient	1
All other	

Time Period: April-Dec 2012

Order Defects - ranked

Category	Quantity	% of Total	Cum %
Wrong Order	10	45%	45%
Wrong Side	8	36%	82%
Missing Labs	3	14%	95%
Wrong Patient	1	5%	100%
#N/A			
#N/A			
#N/A			
#N/A			
#N/A			
#N/A			
#N/A			
#N/A			
#N/A			
#N/A			
#N/A			
#N/A			
#N/A			
#N/A			
#N/A			
All other	0	0%	100%

Example: Ultrasound Order Defects (Errors)



5S Exercise

If you are here…

But you want to be here…

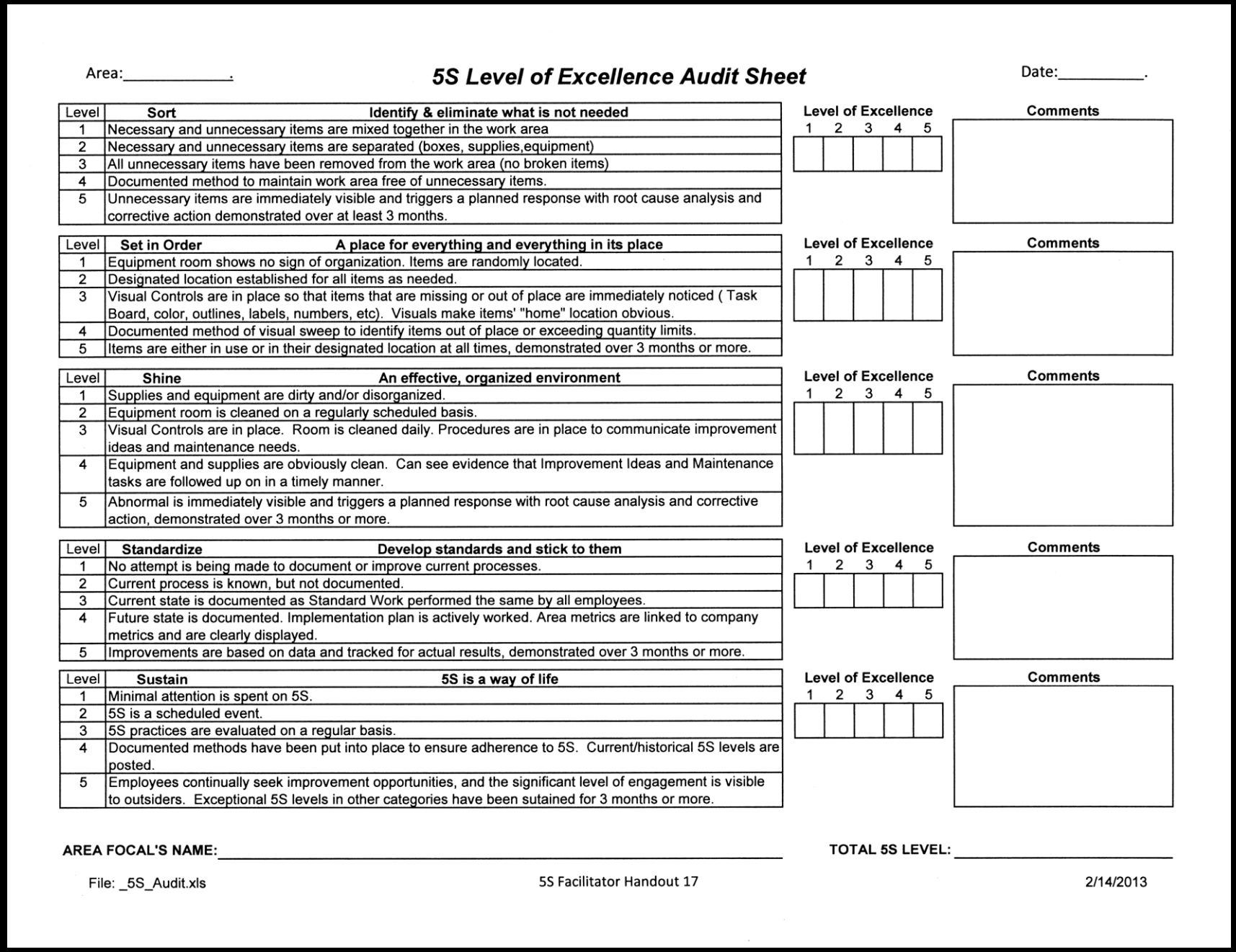
5S is the tool for you!

Before

After

Measure
Measure
Measure

5S Audit Sheet



Area:_____.

5S Level of Excellence Audit Sheet

Date:_____.

Level	Sort	Identify & eliminate what is not needed
1	Necessary and unnecessary items are mixed together in the work area	
2	Necessary and unnecessary items are separated (boxes, supplies,equipment)	
3	All unnecessary items have been removed from the work area (no broken items)	
4	Documented method to maintain work area free of unnecessary items.	
5	Unnecessary items are immediately visible and triggers a planned response with root cause analysis and corrective action demonstrated over at least 3 months.	

Level of Excellence: 1 2 3 4 5 | Comments

Level	Set in Order	A place for everything and everything in its place
1	Equipment room shows no sign of organization. Items are randomly located.	
2	Designated location established for all items as needed.	
3	Visual Controls are in place so that items that are missing or out of place are immediately noticed (Task Board, color, outlines, labels, numbers, etc). Visuals make items' "home" location obvious.	
4	Documented method of visual sweep to identify items out of place or exceeding quantity limits.	
5	Items are either in use or in their designated location at all times, demonstrated over 3 months or more.	

Level of Excellence: 1 2 3 4 5 | Comments

Level	Shine	An effective, organized environment
1	Supplies and equipment are dirty and/or disorganized.	
2	Equipment room is cleaned on a regularly scheduled basis.	
3	Visual Controls are in place. Room is cleaned daily. Procedures are in place to communicate improvement ideas and maintenance needs.	
4	Equipment and supplies are obviously clean. Can see evidence that Improvement Ideas and Maintenance tasks are followed up on in a timely manner.	
5	Abnormal is immediately visible and triggers a planned response with root cause analysis and corrective action, demonstrated over 3 months or more.	

Level of Excellence: 1 2 3 4 5 | Comments

Level	Standardize	Develop standards and stick to them
1	No attempt is being made to document or improve current processes.	
2	Current process is known, but not documented.	
3	Current state is documented as Standard Work performed the same by all employees.	
4	Future state is documented. Implementation plan is actively worked. Area metrics are linked to company metrics and are clearly displayed.	
5	Improvements are based on data and tracked for actual results, demonstrated over 3 months or more.	

Level of Excellence: 1 2 3 4 5 | Comments

Level	Sustain	5S is a way of life
1	Minimal attention is spent on 5S.	
2	5S is a scheduled event.	
3	5S practices are evaluated on a regular basis.	
4	Documented methods have been put into place to ensure adherence to 5S. Current/historical 5S levels are posted.	
5	Employees continually seek improvement opportunities, and the significant level of engagement is visible to outsiders. Exceptional 5S levels in other categories have been sutained for 3 months or more.	

Level of Excellence: 1 2 3 4 5 | Comments

AREA FOCAL'S NAME:_____

TOTAL 5S LEVEL:_____

File: _5S_Audit.xls

5S Facilitator Handout 17

2/14/2013

Visual Management

Making quality/safety/efficiency visible & therefore, easy to do!

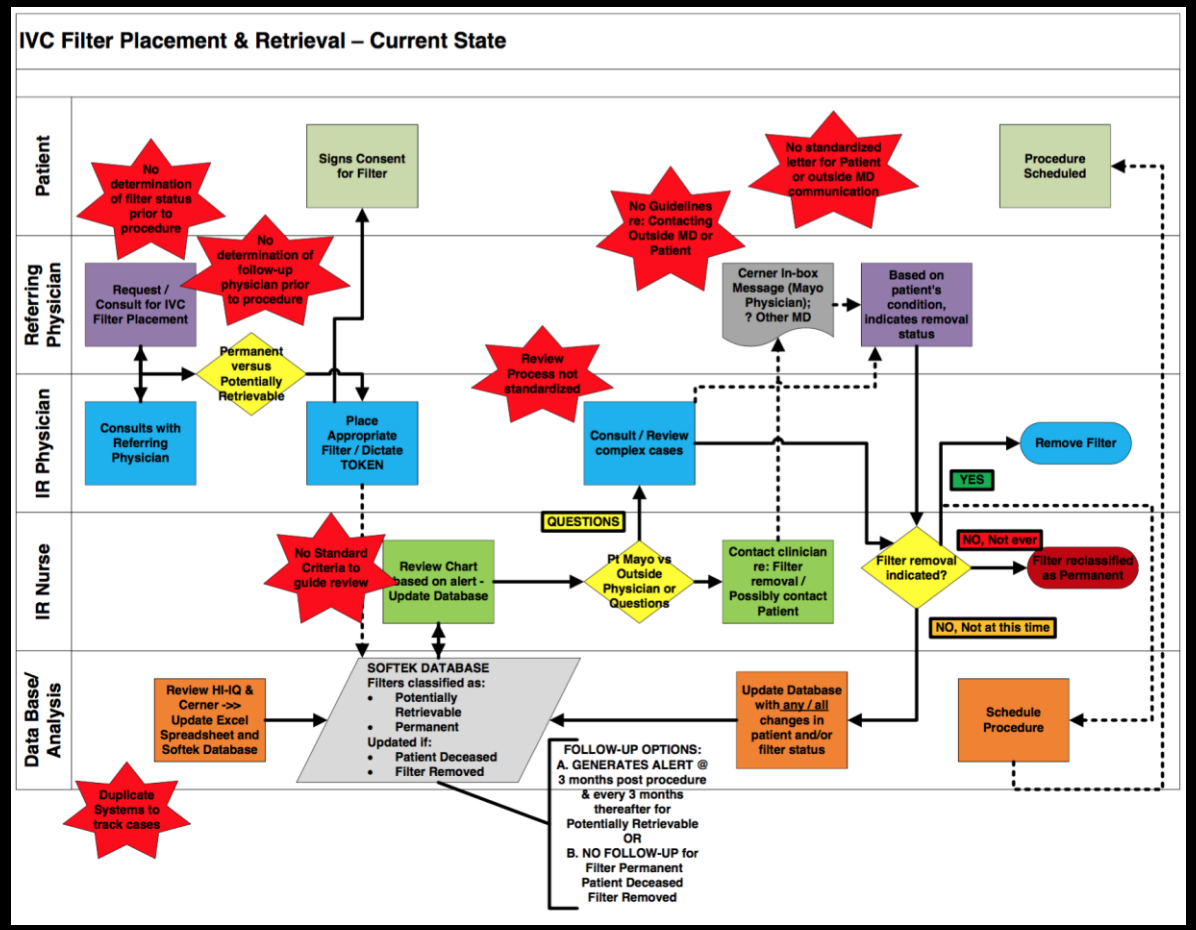

747-4
A340-2/3
A340-6
767-4
777-2ER/2LR
777-3ER


DELTA
SKYTEAM
171
ETOPS

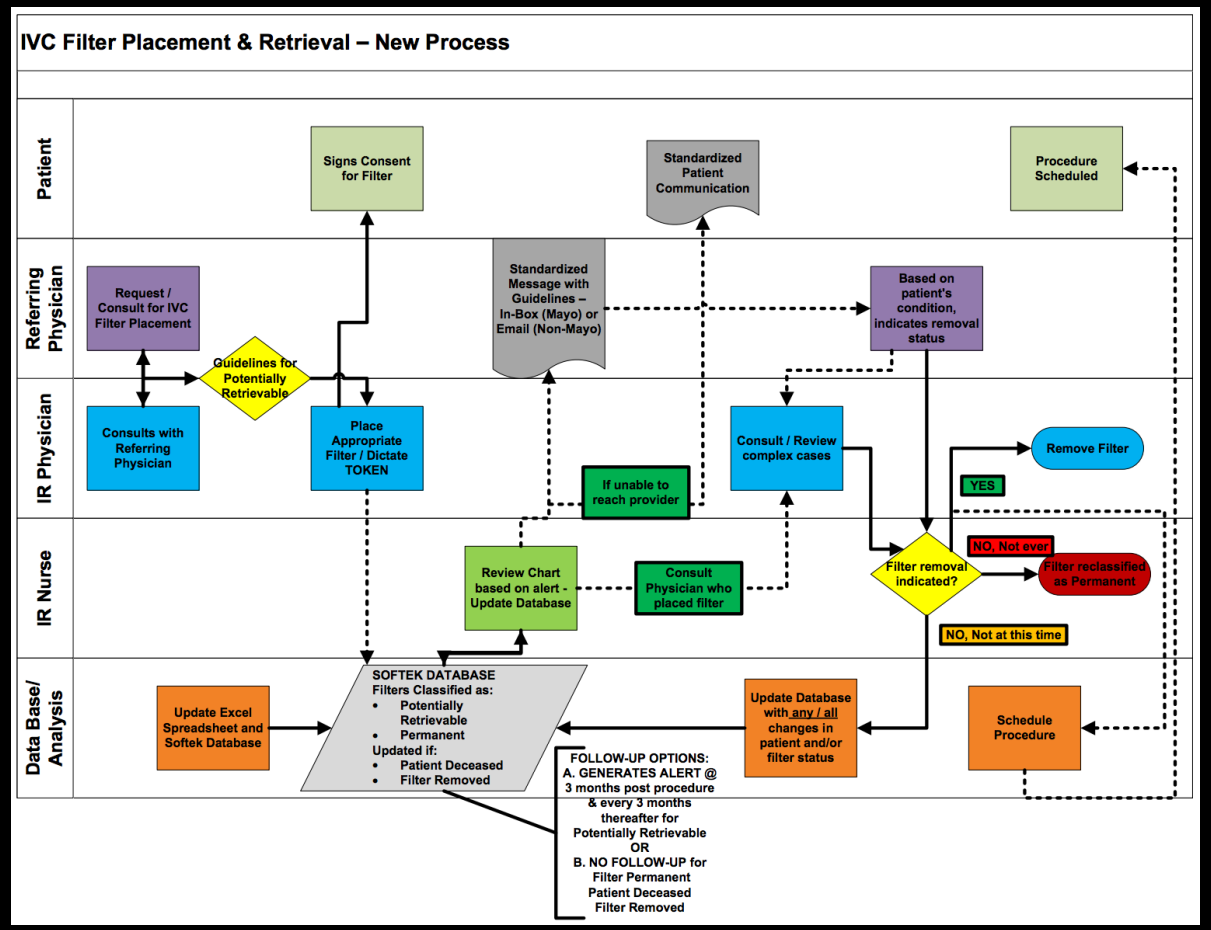
Process Map – Future State

Process Maps

Current State



Future State



Session 3 Deliverables
CONTROL

- Update Aim Statement, if necessary
- Modify Solution(s) where necessary by additional Rapid Tests of Change (PDSA)
- Create Control Plan
- Transfer to Operational Owner
- Communicate Results / Spread Best Practices / Final Presentation

Lessons Learned

QI Tools / Essential Elements for Success

QI Tools for Success

- Process Mapping
  - A crucial tool for seeing, understanding, and improving the process
  - ”Go & See”
- Impact Effort Grid
  - Tool for prioritizing multiple opportunities/suggestions for improvement
- Aim Statement/Metric
- Action Plan
- PDSA
  - Scientific method for improvement
- Elevator Speech
  - Focuses the team on “the why” of the project
  - Communication to stakeholders
- Fishbone / Pareto Chart
  - Root Cause Analysis
- 5S / Visual Management

Essential Elements of Success

1. Leadership
   - Culture
   - Leveraging Accreditation & Regulatory Requirements
2. QI Expertise / Interest / Mentorship
3. Setting an Aim/Goal
4. Action Plan
5. Data/Informatics Facilitator
6. Team Engagement
   - Engaging the cross-cadre team in “seeing” the process leads to engagement of all the team members in improving the process

Thank You