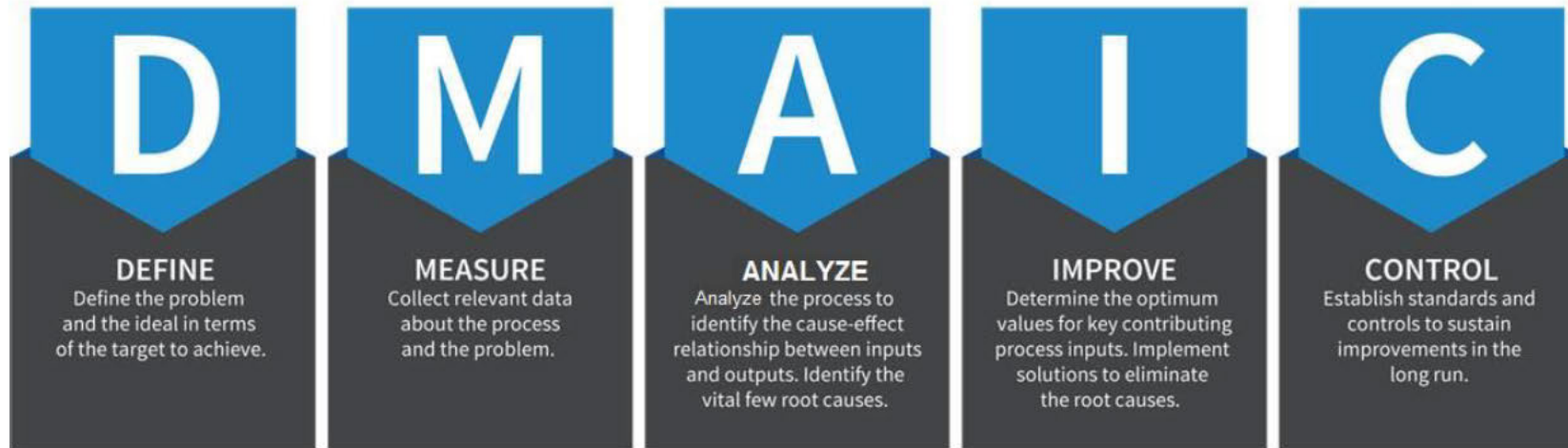




# Lean Six Sigma Methodology

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# Define Phase

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Define and scope the problem, identify the key metric and the team that will work the project, and create the project charter.

# Project Background

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- CSP-Corcoran referred nearly triple the amount more than the next closest institution of Foreign Body Ingestion (F.B.I.) patients to the community hospital for evaluation and treatment. Each send-out drives significant human and fiscal resource consumption in CDCR, and negatively impacts the institutions ability to run normal program. Absent CCHCS Clinical Care Guidelines, our providers do not have a standard of care to follow. This is an important project to highlight the critical X's that drive the high rate of referrals so our organization can develop the appropriate clinical guidelines and decision support to better serve our patient and stabilize institution operations

# Project Charter

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- Problem Statement: The number of referrals to Community Hospital Emergency Departments for Foreign Body Ingestion (F.B.I.) patients at CSP-Corcoran is too high. Inappropriate referrals drive significant human and fiscal resource consumption. Additionally, excessive patient transports, especially outside of core hours, place constraints on custody programming and create staff and public safety issues.
- Project Objective: To reduce the number of inappropriate Foreign Body Ingestion send-outs from CSP-COR to community hospitals and thereby drive down healthcare costs, labor costs, and stabilize custody programming by reducing the number of unscheduled transports.
- Primary Metric: Percentage of inappropriate referrals to the Emergency Dept which are classified as not having the required elements/tests (X-ray) for appropriate decision making

# Team Members

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- Champion: [REDACTED], Chief Executive Officer
- Process Owner: [REDACTED], Chief Nurse Executive
- Executive Sponsor: [REDACTED], MD., Regional Chief Medical Executive
- Team Members:
  - [REDACTED], CP&S
  - [REDACTED], P&S
  - [REDACTED], SRN-III
  - [REDACTED] Sr. Psychologist
  - [REDACTED], HPM-I
  - [REDACTED], AW-HC

# Measure Phase

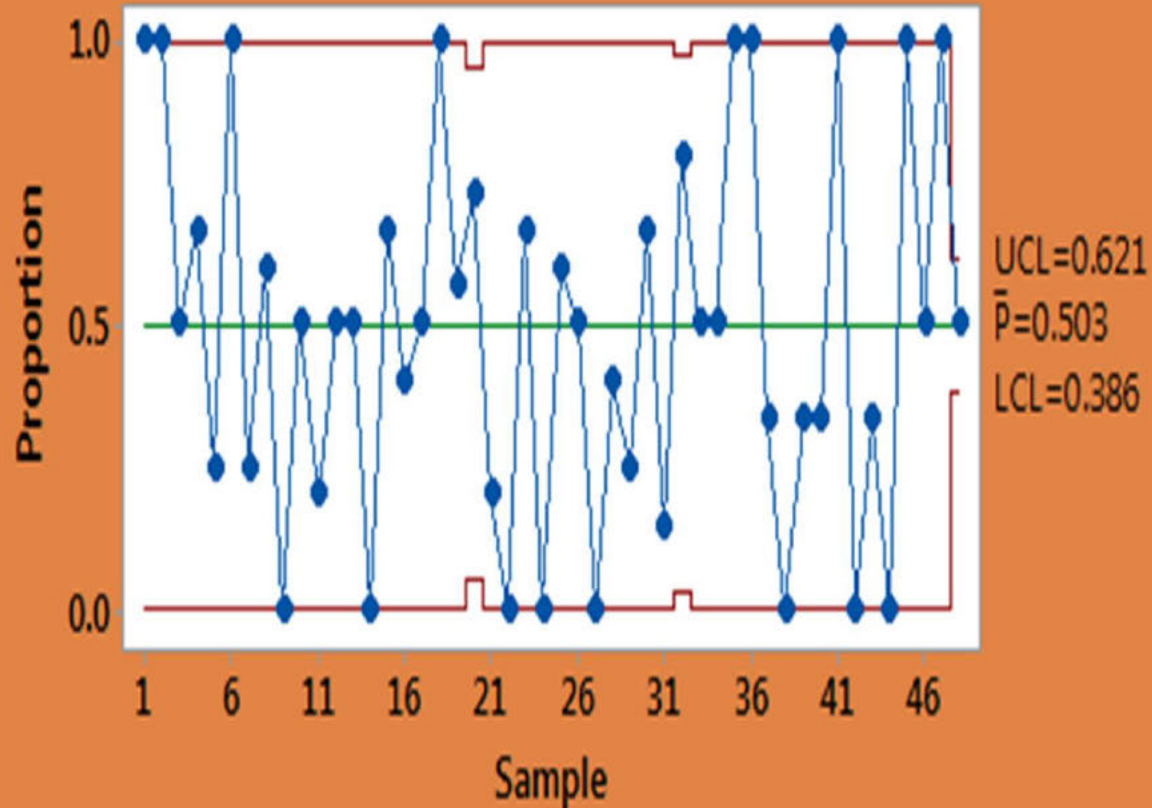
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Gather the process inputs, set up and validate the measurement system, and determine the baseline for the primary metric.

# Baseline Capability/Performance

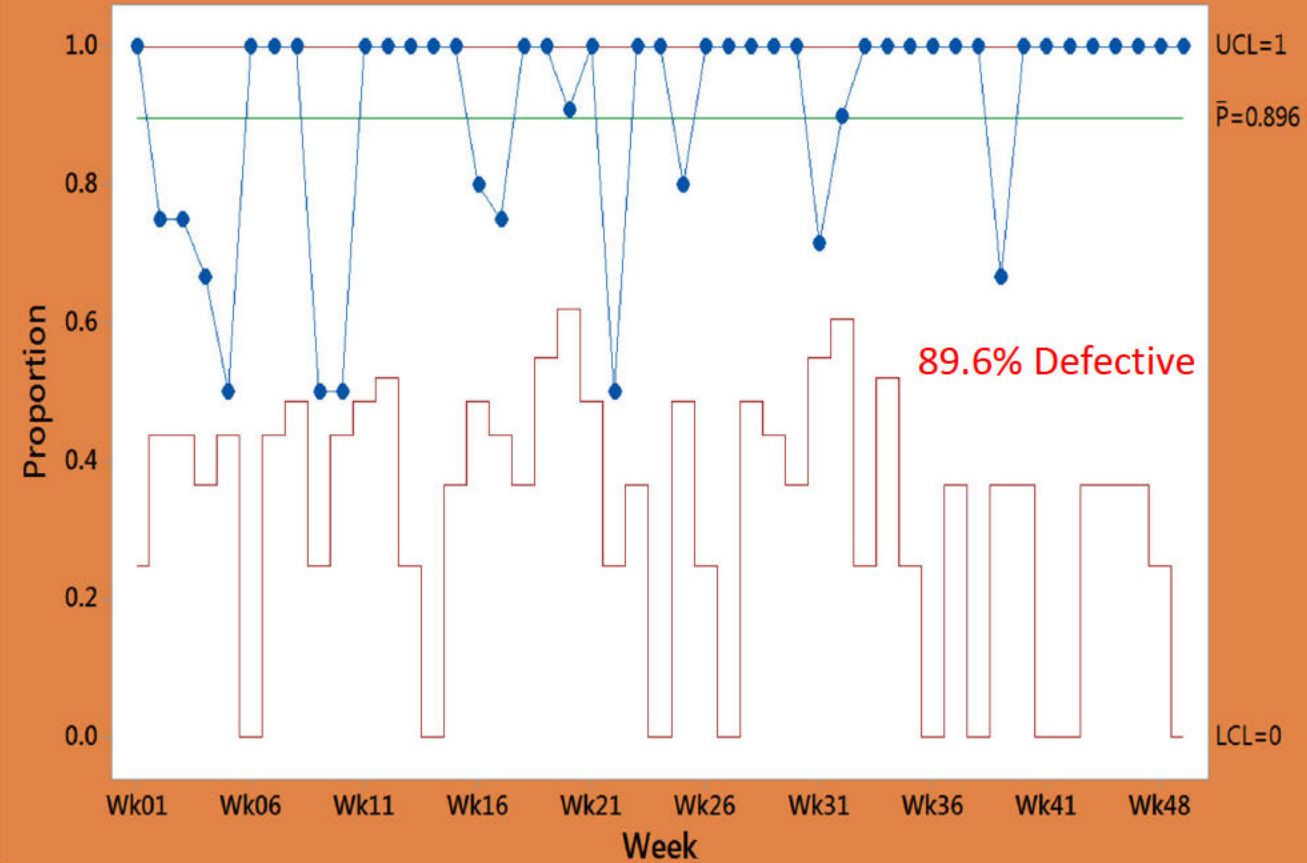
## Conservative Treatment @ Hospital

### P Chart



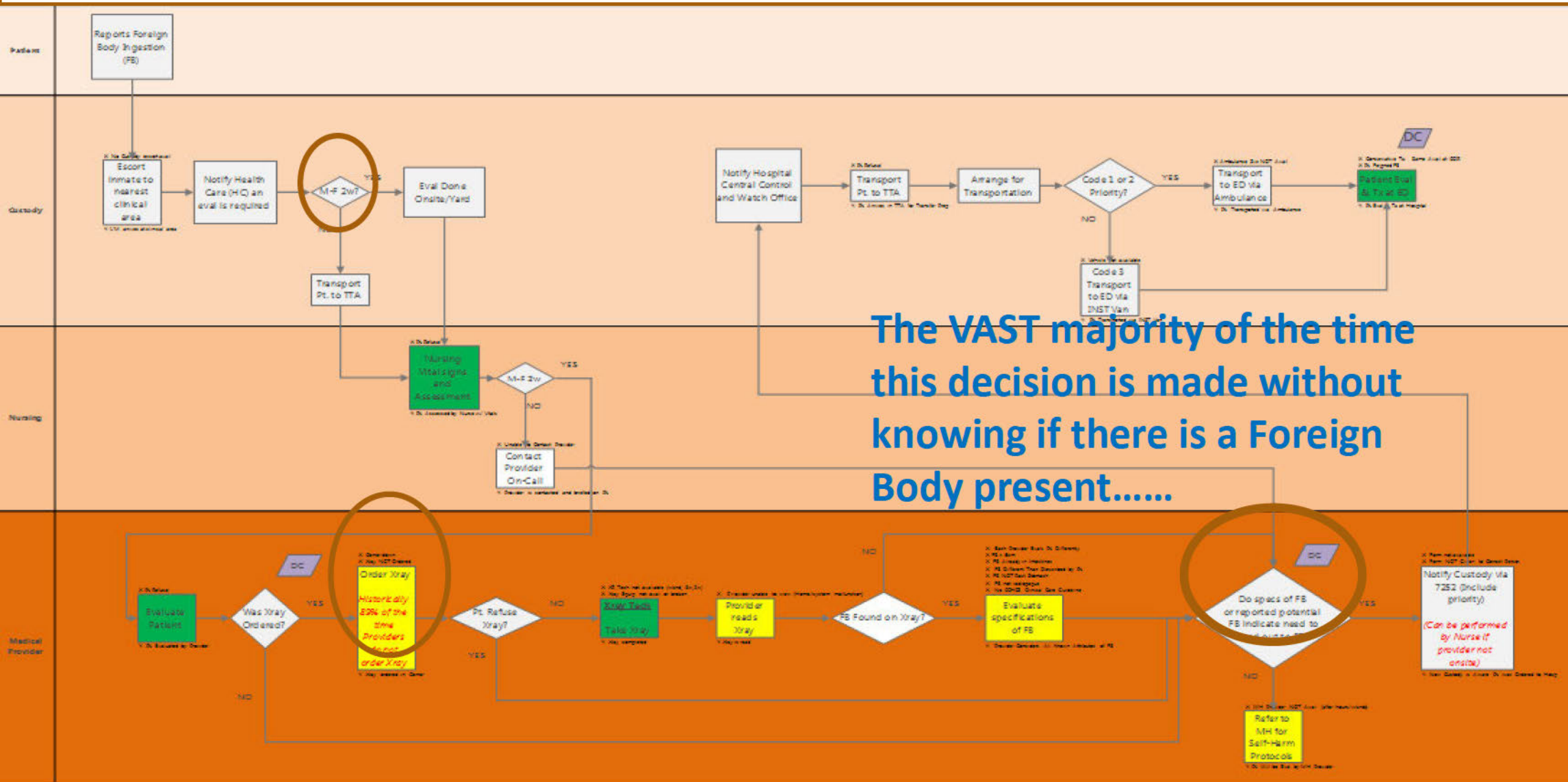
## No X-ray Taken

### Proportion of Sendouts That Did Not Receive Xrays



Two Separate Measurement Systems Analysis Performed

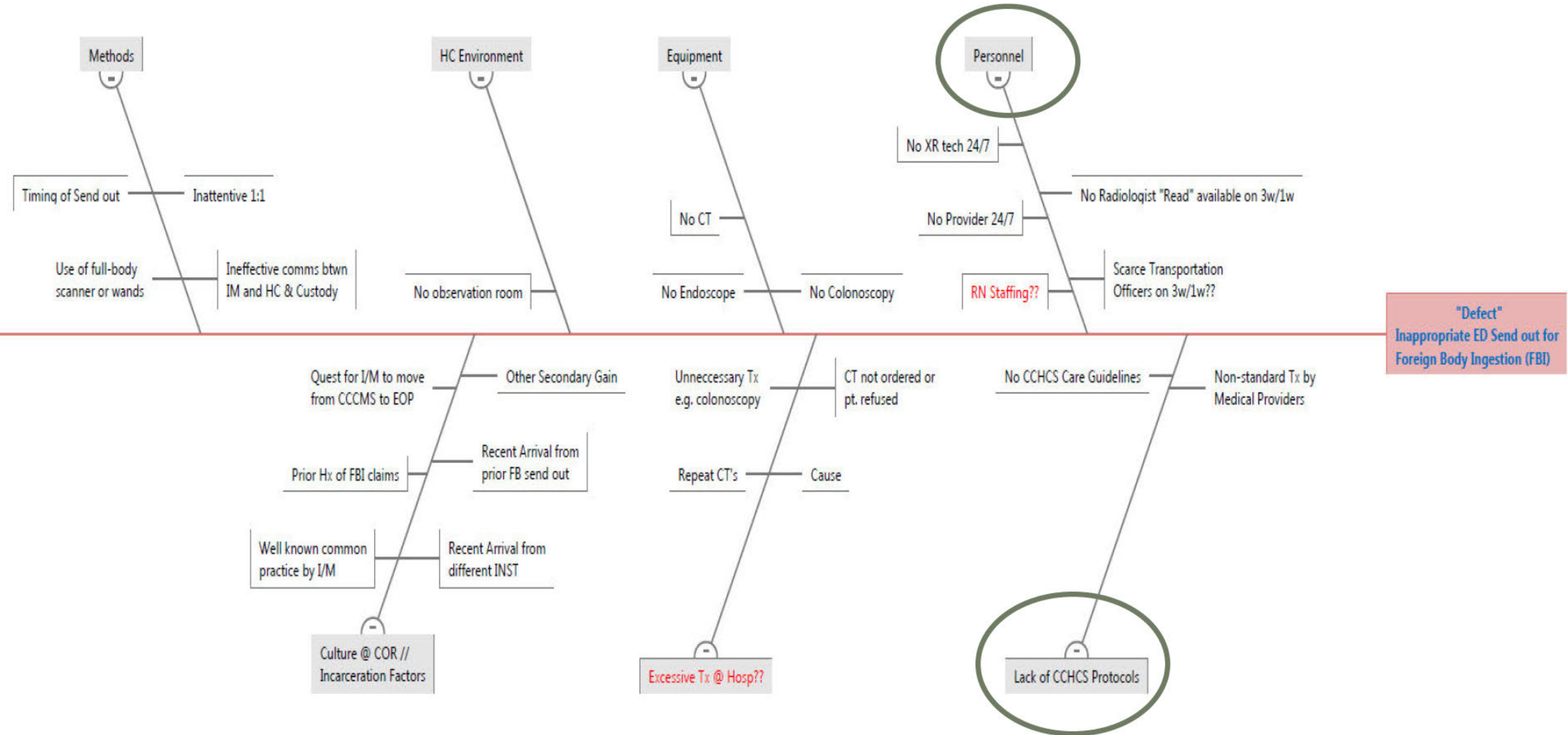
# Initial Detailed Process Map



The VAST majority of the time this decision is made without knowing if there is a Foreign Body present.....

- What Matters
1. Time of Day
  2. Decision to Order X-ray
  3. Review of FB specs and decision to send to Hosp or Not?

# Brainstorming Using Fishbone



# Measurement System Analysis

TRIAL #1- [REDACTED]

For the following sample of inmates below, please indicate:

1) IF X-Ray was available at time of TTA presentation

(Based on CSP-COR X-Ray Hours)

2) IF X-Ray was done .

CSP-COR X-Ray Hours:

MWF- 0730-1800

TTH- 0730-1530

NAME	CDC	DATE	DAY OF WEEK	XR AVAIL?	XR DONE?
XXX	XXX	[REDACTED]	Thu	n	n
XXX	XXX	[REDACTED]	Tue	y	y
XXX	XXX	[REDACTED]	Wed	y	y
XXX	XXX	[REDACTED]	Fri	y	n
XXX	XXX	[REDACTED]	Wed	y	y
XXX	XXX	[REDACTED]	Tue	n	n
XXX	XXX	[REDACTED]	Wed	y	y
XXX	XXX	[REDACTED]	Fri	y	y
XXX	XXX	[REDACTED]	Mon	y	n

## Total Gauge Assessment

Assessment Agreement:  
Xray Avail

All Appraisers vs Standard

# Inspected # Matched Percent  
95% CI

30 29 96.67 (82.78, 99.92)

# Matched: All appraisers' assessments agree with the known standard.

3.3%

Measurement  
Uncertainty

Total Measurement Uncertainty for Primary Metric	Evaluation	Action
<10% of spec	good	No action required
10-20% of spec	marginally acceptable	Improve procedures, training, etc. while measurements continue to be made
>20% of spec	unacceptable	New procedures, training, etc. are needed - measurements are unreliable

# Analyze Phase

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Analyze data to determine the critical inputs affecting the primary metric.

# Failure Modes and Effects Analysis (FMEA) Findings

Step #	Process Map - Activity	Key Process Input	Potential Failure Mode	Potential Failure Effects	SEV	Potential Causes	OCC	Current Controls	DET	RPN
1	Process.Map.High.Level.FB.Sendout - Medical Provider Evaluates Patient	Xray not ordered by Provider	No Xray done	Unable to eval specs of FB	9	<p>NO CCHCS Guidelines</p> <p>Non-Core Hours = No Xray Tech or Provider Avail</p> <p>No Observation Rooms Identified</p> <p>Even When Xray is Available, Providers are NOT ordering Xrays</p>				900
2	Process.Map.High.Level.FB.Sendout - Medical Provider Evaluates Patient	Imaging/ procedure equipment	Inability to utilize advanced imaging	Unable to eval specs or presence of FB	10					900
3	Process.Map.High.Level.FB.Sendout - Community Hospital ED Treats Patient	Hosp only provides same Tx CSP-COR can provide	TX not provided at CSP-COR	increased pt. tx and cost	9					900
4	Process.Map.High.Level.FB.Sendout - Provider Sends Patient to Community Hospital	FB Present but not immediate danger	Pt. does NOT receive care available at COR	unnecessary pt. tx and cost	9					900
5	Process.Map.High.Level.FB.Sendout - Medical Provider Evaluates Patient	Xray not ordered by Provider	No Xray done	Unable to eval specs of FB	9					720
6	Process.Map.High.Level.FB.Sendout - Medical Provider Evaluates Patient	Xray not ordered by Provider	No Xray done	Unable to eval specs of FB	9					720
7	Process.Map.High.Level.FB.Sendout - Medical Provider Evaluates Patient	Xray not ordered by Provider	No Xray done	Unable to eval specs of FB	9					720

What does contract say?

# Critical X's

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1. NO Clinical Care Guidelines to assist providers with evidence-based clinical decision support
2. No X-ray taken even when available (89% defect rate)
3. No current area set aside for patient observation s/p F.B. Ingestion
4. Non-Core Hours: No provider or X-ray Tech onsite.
5. No CT, Endo/Colonoscopy at COR

# Key Findings 1: No CCHCS Clinical Care Guidelines

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- Medical Providers do not have a standard of care or clinical decision support to assist them with treating F.B.I. patients.
  - Without clear guidelines, providers will continue to provide highly-variable treatment which includes high send-outs

# Key Findings 2: No Medical Observation Beds Available

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- Providers did not have observation beds available which limited their treatment options. With limited options, providers always deferred to sending the patient to the hospital.

# Key Findings 3: No Xray Taken

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- Providers did not order an X-ray 89% of the time before sending a patient to the hospital for evaluation and treatment. It's important to know the location of the foreign body because it's one of the factors that determines the need to send a patient to the hospital.

# Key Findings Not Related to Critical X's Taken

1. CSP-COR does send out significantly different (more) number of patients to the ED than the rest of the INST's.
2. CSP-COR does send out significantly different (more) F.B.I. patients than the other INST's
3. There is not a significant relationship between total MH population and total number of send-outs for F.B
4. There is a significance for patients that have > 10 yr Sentence
5. There is a significance for Housing Unit and Race?
6. There is a significant difference between the Types of Tx at the Hospital (Conservative)
7. After review of hundreds of emergency department SOAP notes, there seems to be a indication that at least in-part some of this is drug-seeking behavior
8. Potentially unnecessary procedures performed at community hospitals

# Improve Phase

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Identify and implement fixes for the problem, and analyze new data to validate the improvement.

# Improvements

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- 1. Clinical Care Guideline: COR providers are authoring a first draft of a clinical care guideline. The guideline will encompass all improvements implemented.
- 2. Medical Observation Beds: CEO & Warden authored a joint-memo to create observation beds.
- 3. Ordering X-ray: CP&S gave direction to providers to always order an X-ray when the technician is available.
- 4. X-ray Technician Availability: CEO is studying efficacy of increasing time X-ray tech is available.

# Control Phase

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Implement controls to assure that the improvement remains permanent, and create a control plan with a sustaining and continuous improvement strategy.

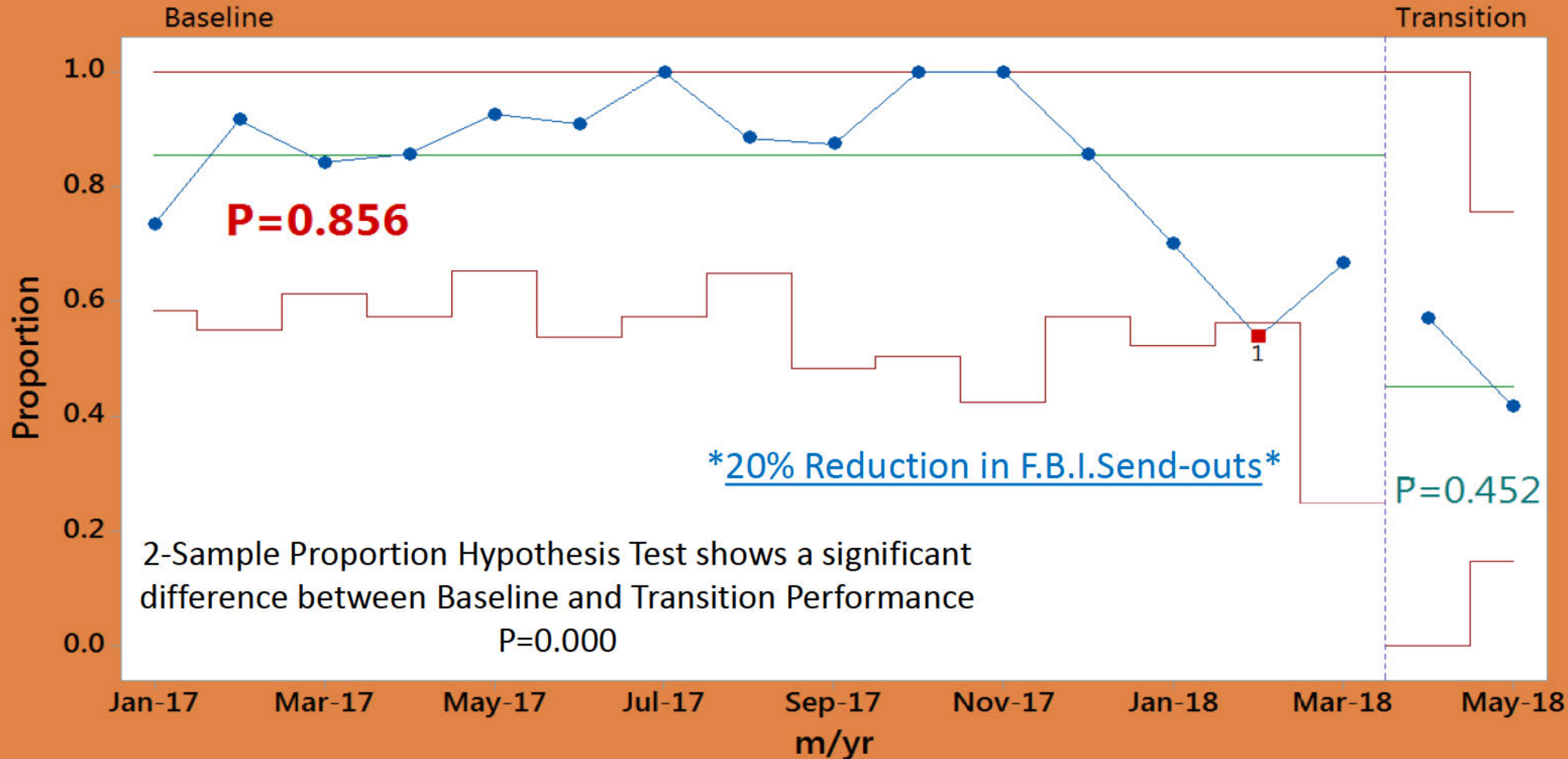
# Updated Process Map

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- The process map did not need to be adjusted. Decision points within the process were clarified, but the activity steps did not need revision.

# Updated Capability/Performance Analysis

P Chart: No X-ray Taken by Phase



40%  
Improvement

# Control Plan: Controlling the Critical X's

Process step	Item to be controlled	Control method	Control description	Person responsible
Decisions: Was X-ray Ordered	Ordering an X-ray every time the pt. presents to TTA w/F.B.I.	CCHCS clinical care guidelines	CP&S gave clear direction to medical provider staff to ensure they take an X-ray when an F.B.I. pt. presents in TTA. Ultimately, this direction will be memorialized in the CCHCS clinical care guidelines	CP&S/CME
Decision: Do Specs of FB indicate need to send to ED?	Decision to send pt. to ED	CCHCS clinical care guidelines	CSP Cor medical staff will take first cut on a draft clinical care guideline for Foreign Body Ingestion patients. This guideline will provide direction and options for providers to consider when treating an F.B.I. pt.	██████████ CP&S CME ██████████
Decision: Do Specs of FB indicate need to send to ED?	Use of medical observation beds	CEO/Warden Memo & CCHCS clinical care guidelines	CEO/Warden, in conjunction with the stakeholder group have outlined a plan to utilize four beds in the OHU area for "medical observation" beds. This will give the medical provider an option of NOT sending patients that can either wait till the next day when Xray is available, or simply an area to observe a patient that is sub-acute and can be appropriately monitored at COR	CEO
X-ray Tech: Takes X-ray	X-ray Tech availability on 3w & 1w	Under review	The idea of increasing the availability of an X-ray technician to take X-rays on 3w is being evaluated by the CEO. Greater availability of X-ray will help providers make more informed decisions on appropriateness of referring pt. to ED	CEO

## General Information:

**Project Title:** Appropriately Reducing Send-outs for Foreign Body Ingestions at CSP-Corcoran  
**Agency/Department:** CCHCS  
**Division/District/Office:** Region-III  
**Champion/Process Owner:** [REDACTED], Chief Executive Officer  
**Green Belt:** [REDACTED], RHE, Region-III  
**Executive Sponsor:** [REDACTED] Regional CME, Region-III  
**Date:** June 26, 2018

## Problem Statement:

The number of referrals to Community Hospital Emergency Departments for Foreign Body Ingestion (F.B.I.) patients at CSP-Corcoran is too high. Inappropriate referrals drive significant human and fiscal resource consumption. Additionally, excessive patient transports, especially outside of core hours, place constraints on custody programming and create staff and public safety issues.

## Primary Metric:

Percentage of inappropriate referrals to the Emergency Dept which are classified as not having the required elements/tests (X-ray) for appropriate decision making

## Goal:

Appropriately reduce the number of Foreign Body Ingestion sendouts from CSP-COR. Drive down healthcare cost, labor cost, and stabilize custody programming by reducing the number of unscheduled transports.

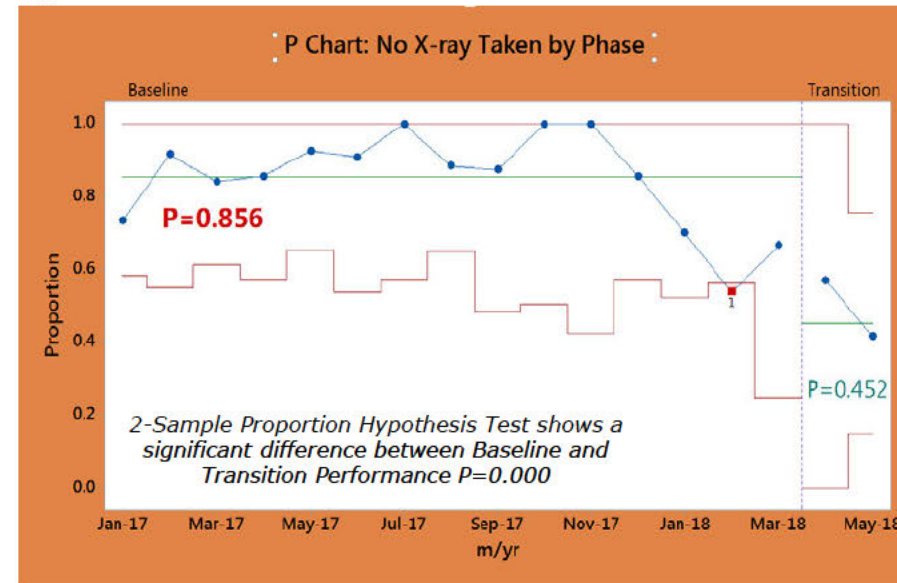
## Root Causes (Critical X's):

- **CRITICAL X #1:** NO CCHCS Clinical Care Guidelines exist to assist providers with evidence-based clinical decision support.
- **CRITICAL X #2:** No current area set aside for pt. observation s/p F.B.I.
- **CRITICAL X #3:** X-ray not ordered before sending F.B.I. pt. to ED
- **CRITICAL X #4:** No X-ray Technician onsite during non-core hours

## Solution Implementation Tracking:

item	status
<b>NO Clinical Care Guidelines (CCG):</b> Dr. McCabe is organizing stakeholder mtg to develop first draft of care guidelines.	In progress
<b>Observation Area:</b> Memo drafted by CEO stating 4 beds in OHU will be used for observation.	In progress
<b>No X-ray Ordered:</b> Informally, COR providers have been instructed to order Xray. Concept will be included in CCG's	Partially implemented
<b>Non-Core Hours:</b> Issue being studied by CEO	In progress

## Updated Control Chart:



**Baseline Average:** 89.9% Defective  
**Current Average:** April/May 2018 data = 45.2% Defective

# Conservative Project Impacts

## Soft Savings

Name of task that was removed	hours of work eliminated per each item processed	no. of items processed each year	average hourly fully-burdened labor cost for PY	annual labor savings
Reduction in Transports to the ED	17.00	163	124.54	\$345,100

## Hard Savings

name of cost item incurred by defects	no. of defects eliminated per year	cost per defect	annual savings
ED Visit	30	1882	\$56,460

\$401,560

# Project Impacts

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- Too early to judge all impacts
  - Early Successes:
    - ❖ 20% reduction in Send-Outs during Transition Phase, anticipate that improvement to rise
    - ❖ 40% improvement of Providers ordering X-ray to assist in decision making to send patient to hospital
    - ❖ \*New\* Availability of medical observation beds.

# Project Summary and Lessons Learned

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- CSP-Corcoran is on the way to improving upon the substantial gains they've made early in the transition phase of the project. Medical providers now recognize and embrace the need for standards of care and clinical decision support. They also realize the support of not only their CEO and CP&S, but also the support they have from the RHE, RCME, and the Statewide CME to address the high number of Foreign Body Ingestion patients being sent to the hospital. As each critical X is addressed, the momentum will continue to build to ensure success and sustainability are realities.

# Green Belt Contact Information

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- [REDACTED]
- Regional Healthcare Executive, Region-III
- [REDACTED]
- [REDACTED]

# Appendix

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- Include additional information to support/describe this project to an outside reviewer who may be interested in replicating this project at their facility