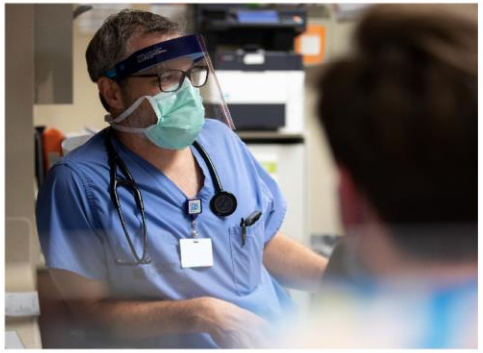

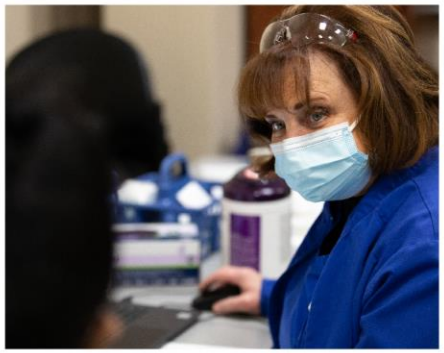

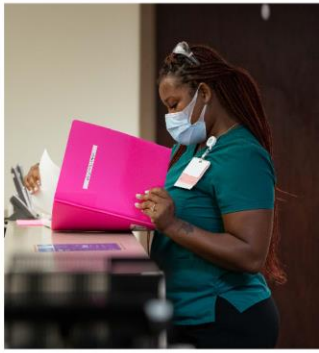

JPS Health Network
Fort Worth, Texas

Green Belt Total Joint Arthroplasty Turn Over Time Project

Lauren Wilson, BSN, RN, CNOR, LSSYB

Define Phase

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Fort Worth, Texas

Project Charter

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Fort Worth, Texas

Process Improvement Charter

Problem Statement

JPS OR Turnover Time (TOT) forHip and Knee Orthopedic Total Joint Arthroplasty (TJA) surgeries have a mean TOT time of 48 minutes from July 2022-June 2023. This impacts the numbers of cases that can be scheduled, department revenue, and patient experience scores.

Business Case

Improve patient experience. Improve overall OR effiency between cases.

Stragetic Imperative 1.4: Operate as an integrated healthcare delivery system by creating alignment across all areas of the network in order to improve patient experience, safety, clinical outcomes and resource utilization.

Improvement Scope

In-Scope: Orthopedic TJA surgeries, beginning at patient registration to wheels out of OR. Out of Scope: Pre-procedure clinic process, post surgical care

Improvement Goal Statements

Improve TJA average TOT from 48 minutes to 30 minutes by March 31, 2024.

Improvement Team

Role	Name	Organization
Leader	Lauren Wilson	PeriOp
Champion	Dr. Vincent Moretti	
Coach	Walt Kline	Performance Excellence
Process Cner	Deb Saunders	PeriOp Director
Team Merber	Brian Cotton	EVS
Team Merber	Shane Spinks	Anesthesia
Team Merber	Whitney Sanders	PreOp
Team Merber	Michael Goldstein	Scrub Tech
Team Merber	Bridgette Broyles	Circulating Nurse
Team Merber	Kim Harrington	Scrub Tech
Team Merber	Becky Daly	Circulating Nurse
Team Merber	Nick Wilkinson	Circulating Nurse

High Level SIPOC

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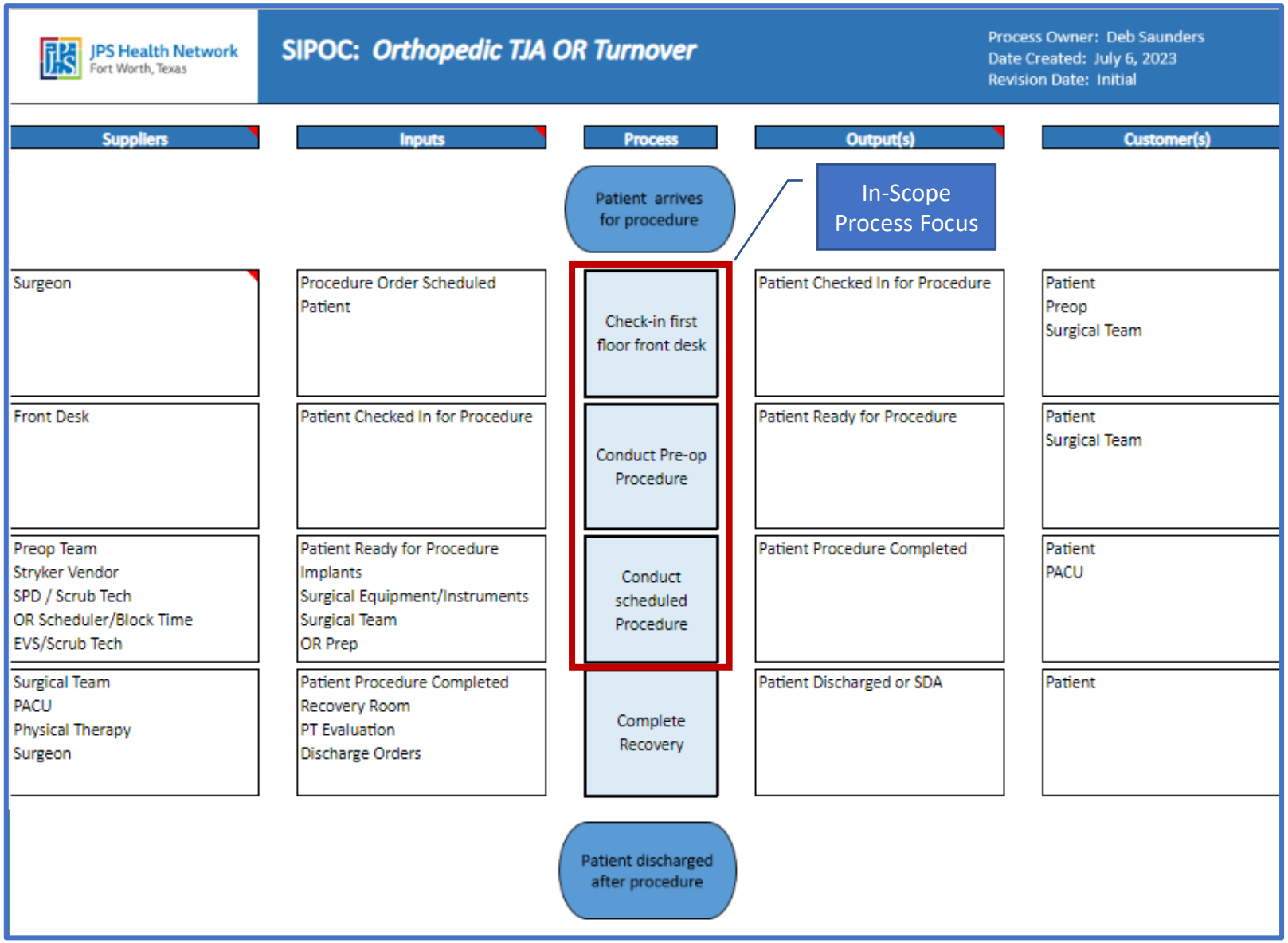

Pareto Causes for OR Delays

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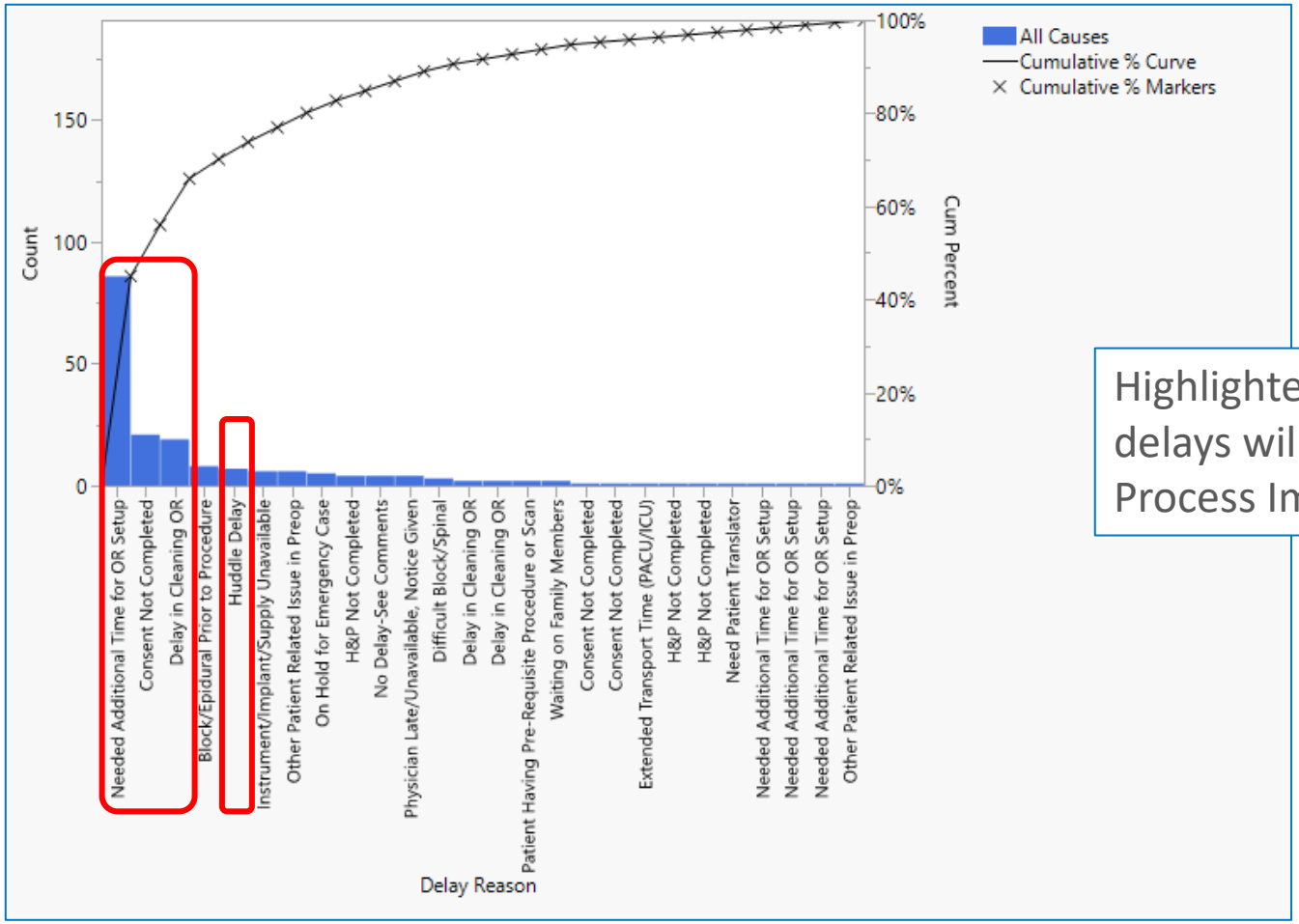

Highlighted Causes for delays will be a focus for Process Improvement

Source: IP OR Case Volume Clarity 427141 Report date: Jul 2023 – Dec 2023

Run Chart (Primary & Balancing Metrics)

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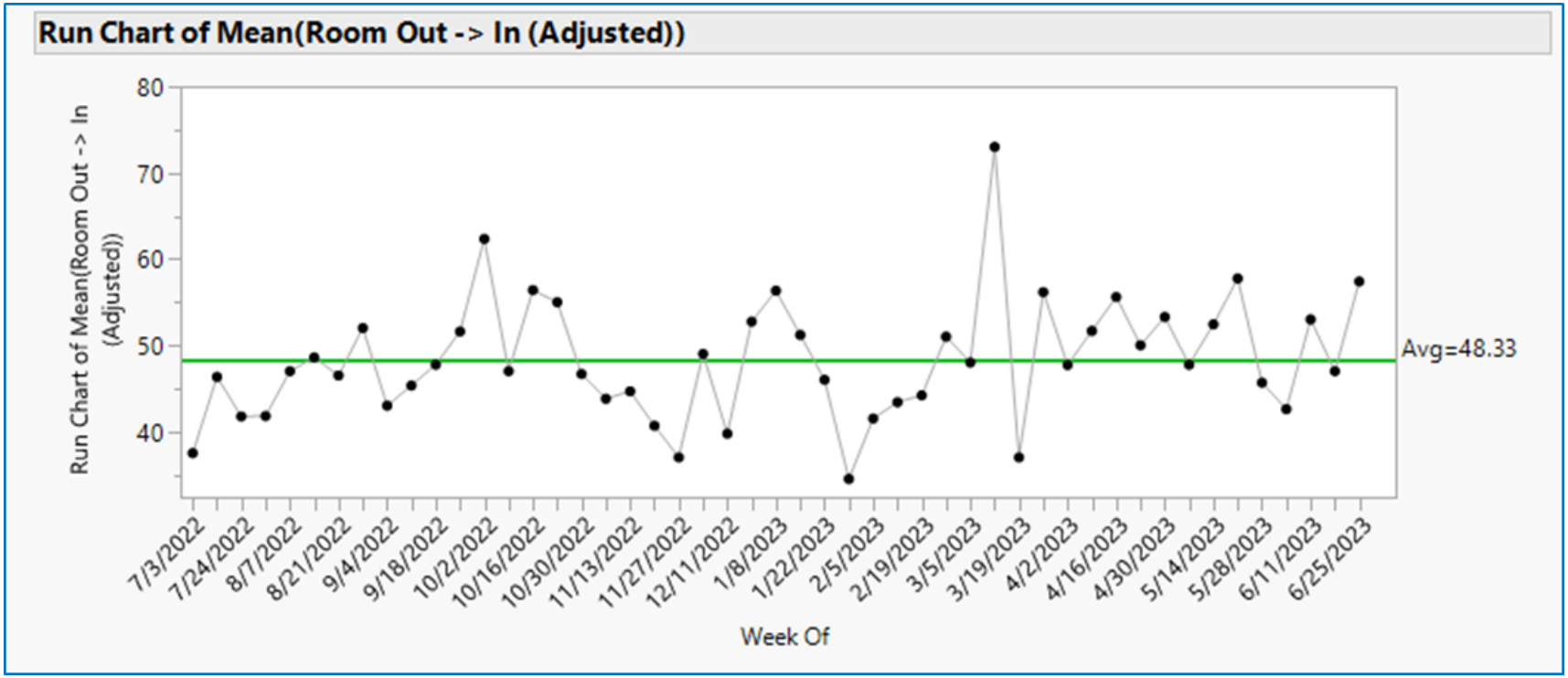

Source: EPIC Report IP OR Surgeon Turnover OR 427175F, data July 2022_June 2023 Weekly Average

Highlights & Next Steps

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- Scope of Project: Wheels Out to Wheels In (PACU is out of Scope)
- Top Delays:
    1. Needing additional time for OR Set-Up
    2. Consent not completed
    3. Delay in cleaning OR
    4. Huddle Time

Next Steps:

- Complete Current State Gemba Walks, Process Mapping and Time studies

Measure Phase

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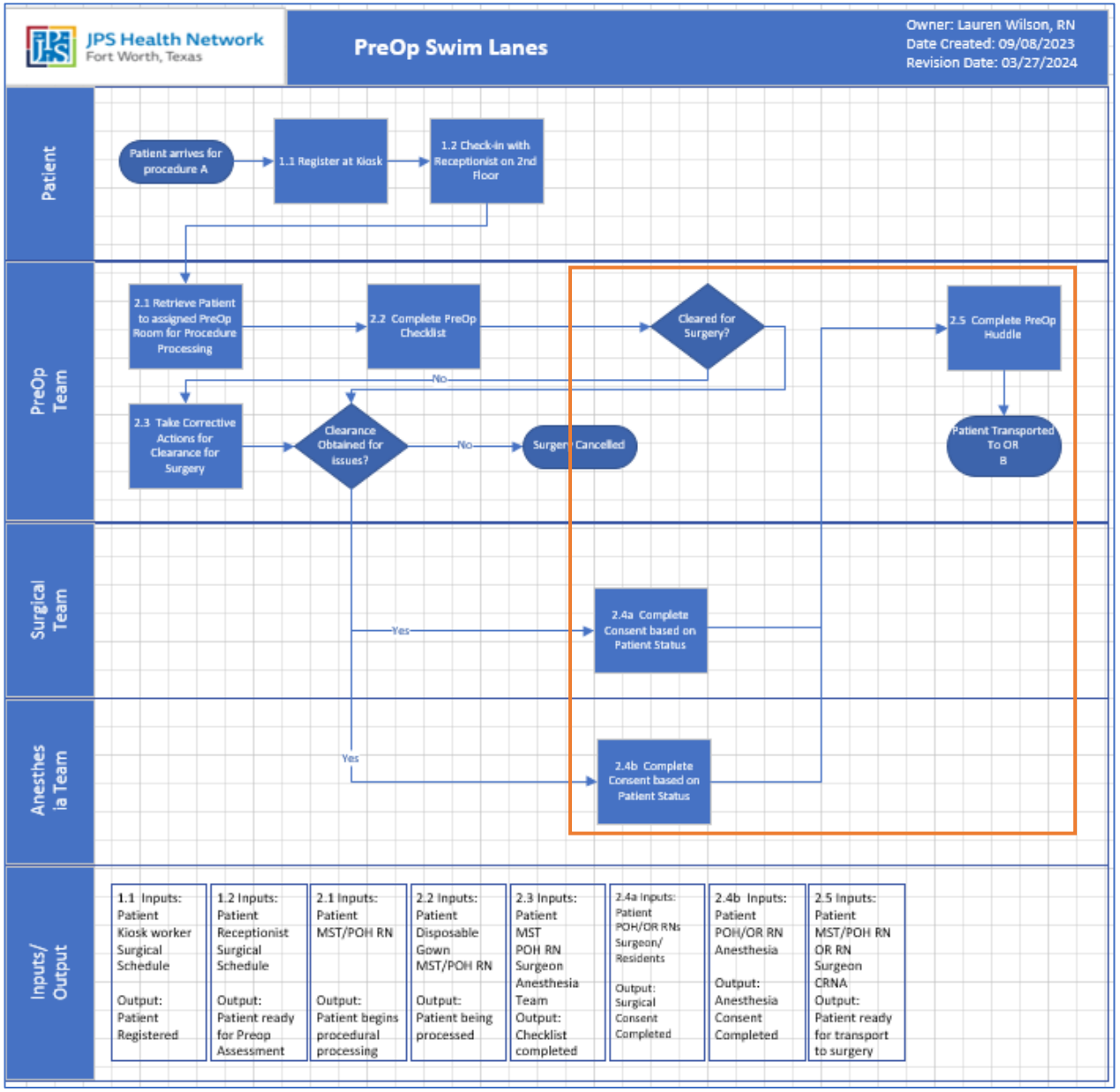
Current State PreOp Process Map

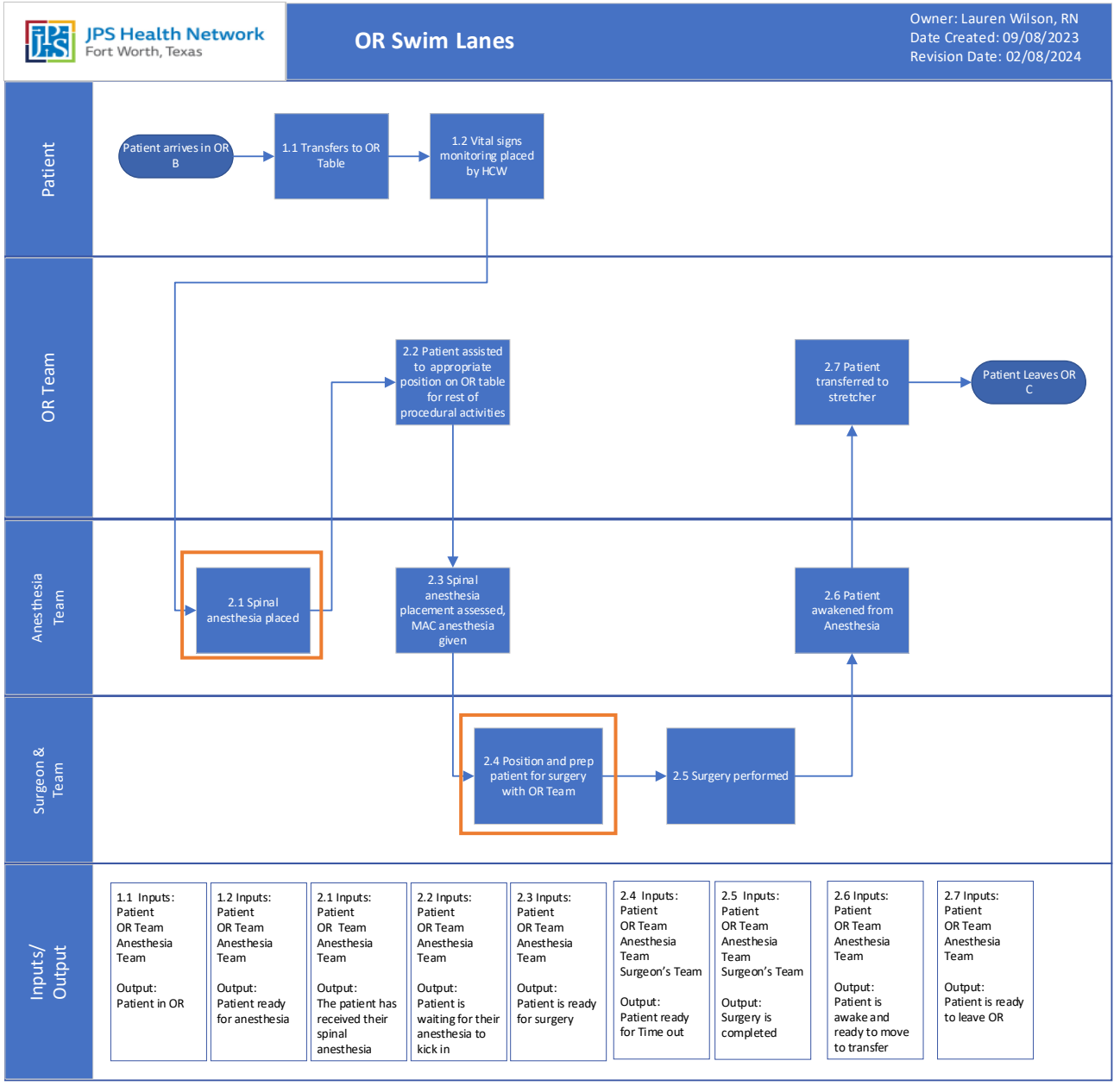
Box indicates activities that were identified as delay causes.



Current State OR Process Map

2.1 indicates a difference in practice. Dr. Moretti requests spinal anesthesia, whereas Dr. Wagner does not.

2.4 indicates a difference in practice. Dr. Moretti positions supine, whereas Dr. Wagner positions lateral.



Process Behavior Chart

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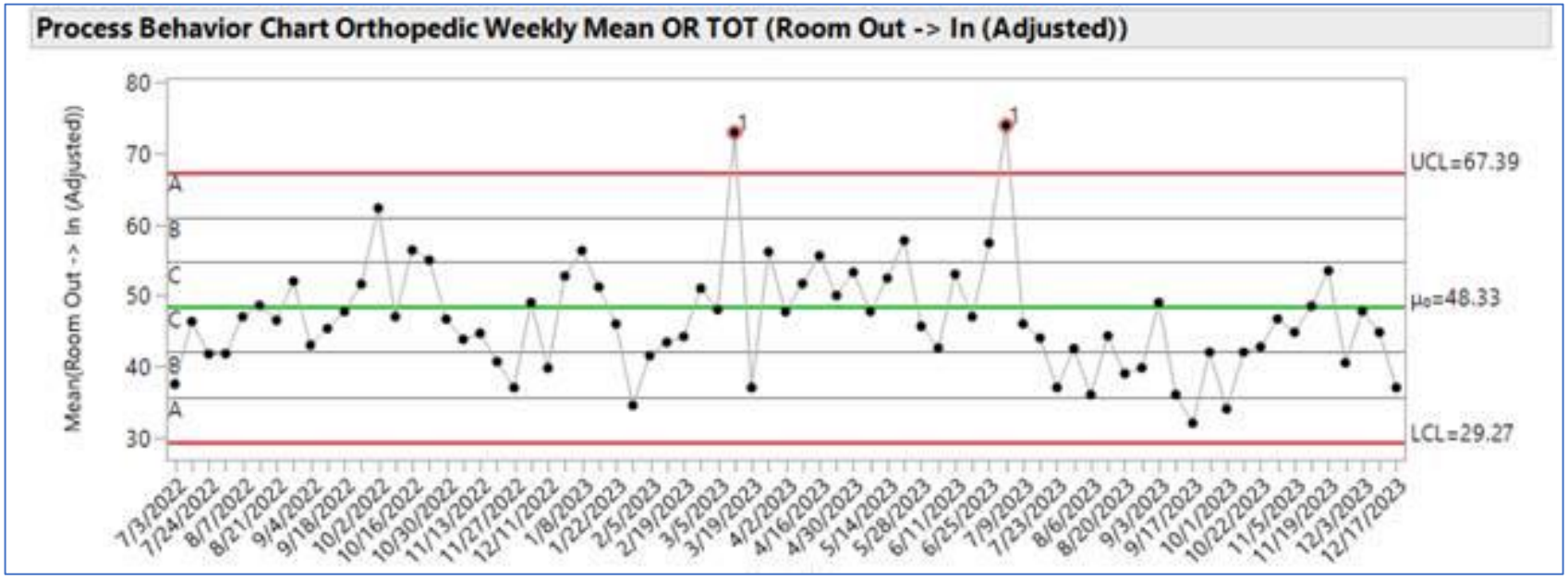

Source: EPIC Report Turnover Data July 2022_December 2023 Weekly Average

Current capability of 30 minutes goal: Zero Sigma

Spaghetti Map

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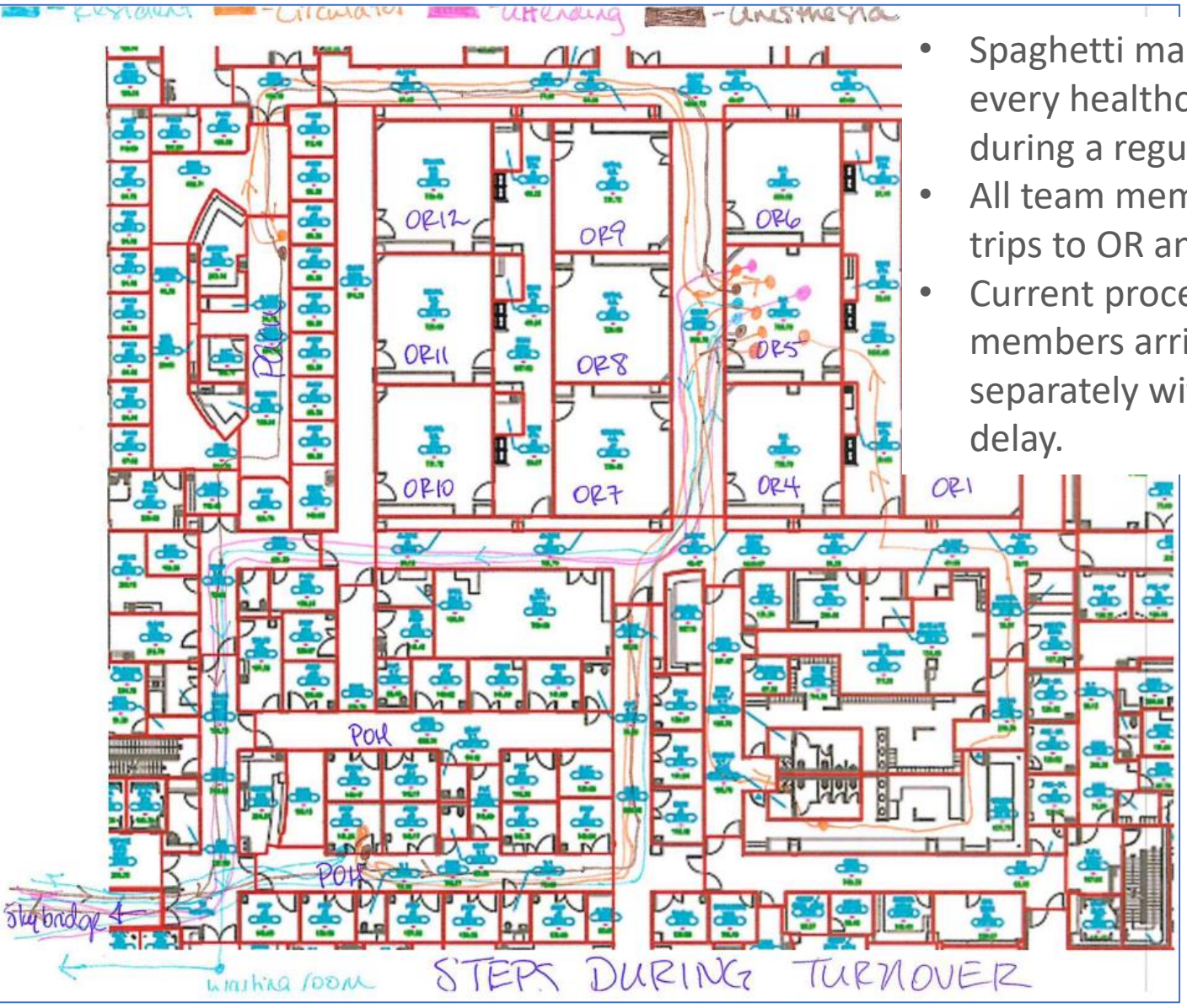

- Spaghetti map showing the steps every healthcare worker takes during a regular turnover.
- All team members make multiple trips to OR and PreOp holding.
- Current process includes team members arriving to huddle separately with potential cause for delay.

Analyze Phase

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Activity of Patient Study

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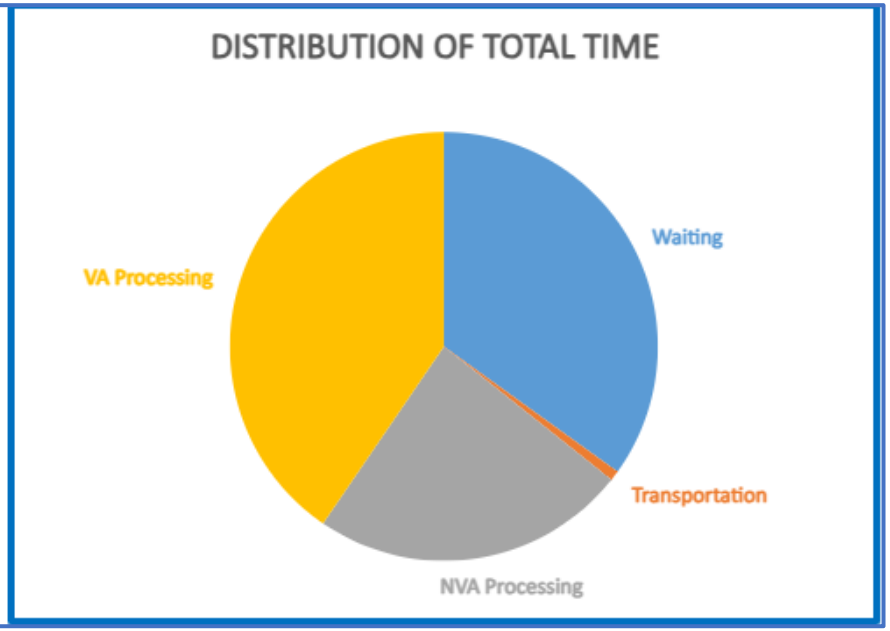
Fort Worth, Texas

Activity of the Product Summary		
	TIME	PERCENT
Waiting	139	35%
Transportation	3	1%
NVA Processing	95	24%
VA Processing	161	40%
Total Time	398	100%



Results from GEMBA walks conducted 8/8/23 and 10/10/23

- Waiting: Patient waiting for next steps or procedure
- Value added (VA): Processing activities contributing to transforming the patient (delivering service)
- Non-Value Added (NVA): Processing activities that consume resources but don't contribute delivering service to the patient

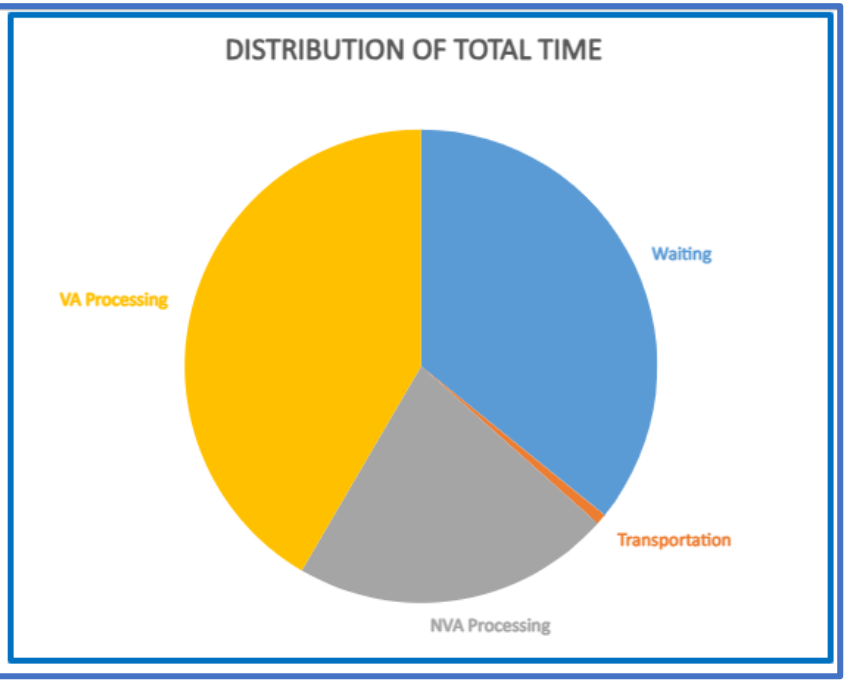
Examples:

- VA Processing: Examples are PreOp Assessment and Procedure
- NVA Processing: Examples are activity prior to patient prep/positioning or closing to surgical stop time

Activity of Patient Study

JPS Health Network
Fort Worth, Texas

Activity of the Patient Summary		
	TIME	PERCENT
Waiting	100	36%
Transportation	2	1%
NVA Processing	61	22%
VA Processing	116	42%
Total Time	279	100%



Results from Epic Event Times May-June 2023:

Using the event times recorded within the patient record, we were able to pull additional data that validated the Gemba Walk study. Both AoP studies have very similar time/percentage ratios.

Root Cause Analysis

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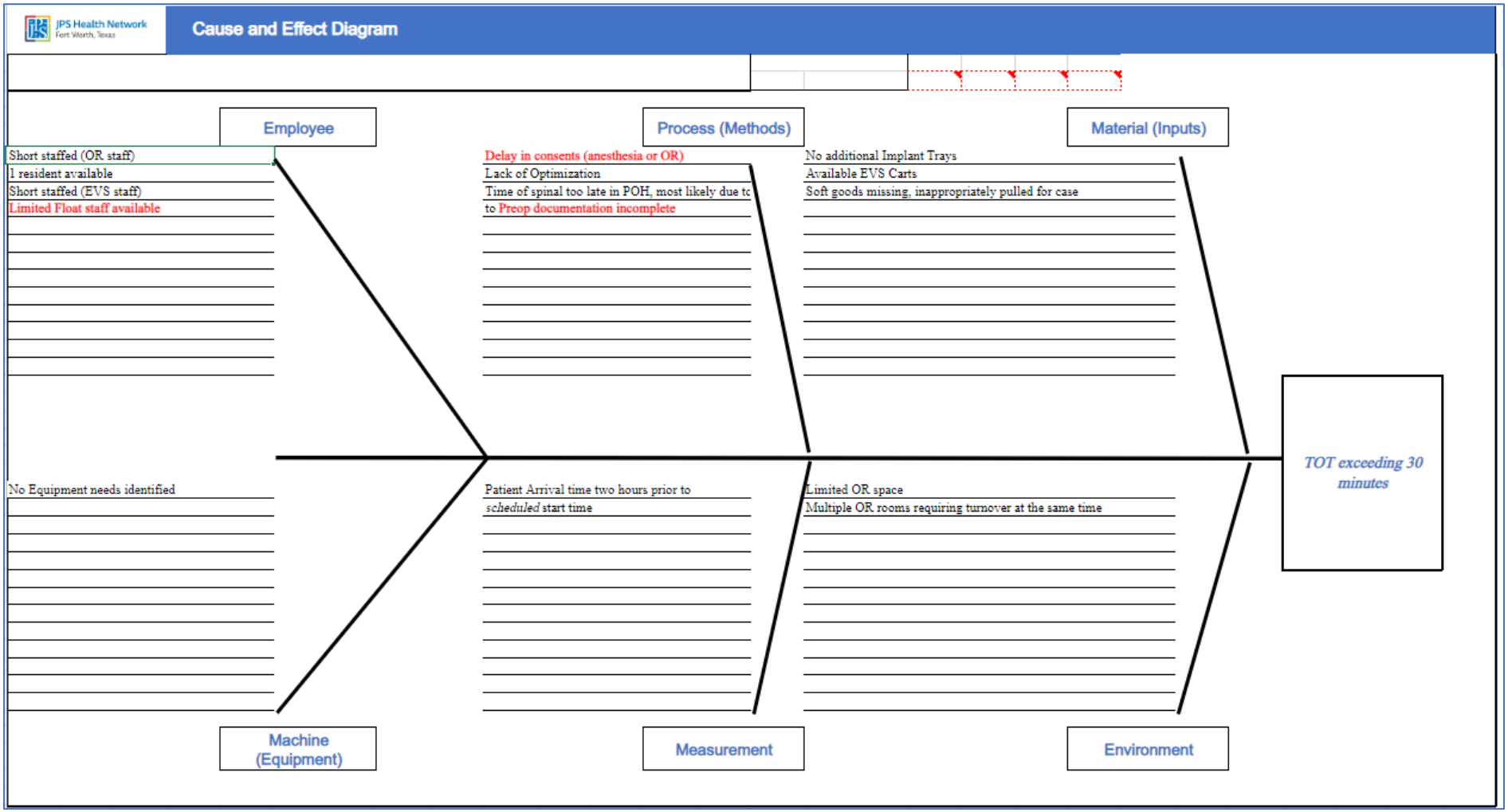

The red items correlate with top delay reasons

GEMBA/Activity Study Observations

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- Observed Opportunities for Improvement (OFIs):
  - Enter consent at clinic visit prior to surgery
  - Reduce overall wait time by changing patient arrival time from 2 hrs to 90 mins prior to scheduled surgery
  - When float staff allows, designate a pair of employees as the Turnover Team to help prep the room and assist EVS with turnover. Team will also help open supplies for next case.
  - Collaborate with vendor and Sterile Processing Department to keep one additional set of instrument trays available at facility

Improve Phase

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Pilot Testing/Improvement

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- Implement Huddle Standard from PACU-PreOp
- Dedicated Float for Turn Over
- Consent Entered in Clinic (needs continual monitoring)
- "Ready to Roll" Definition
- Nightshift helping open for first case
- Stopwatch to view turnover time in room

Green indicates ideas implemented during Pilot.

Initial Control Plan

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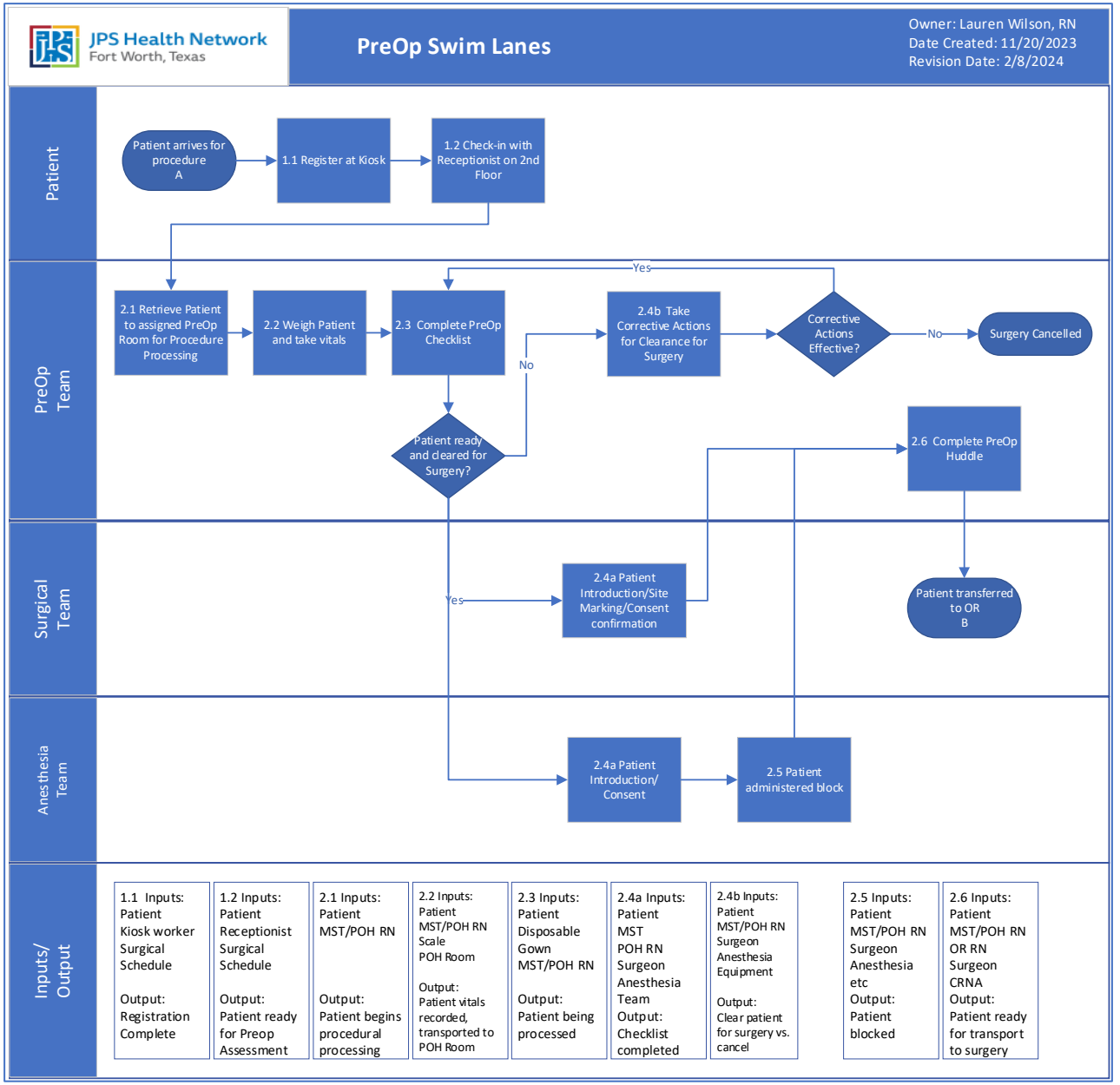
- Process Maps of PreOp, OR
- Turnover Event Flow
- Float Checklist/Work Instructions
- Process Behavior Chart

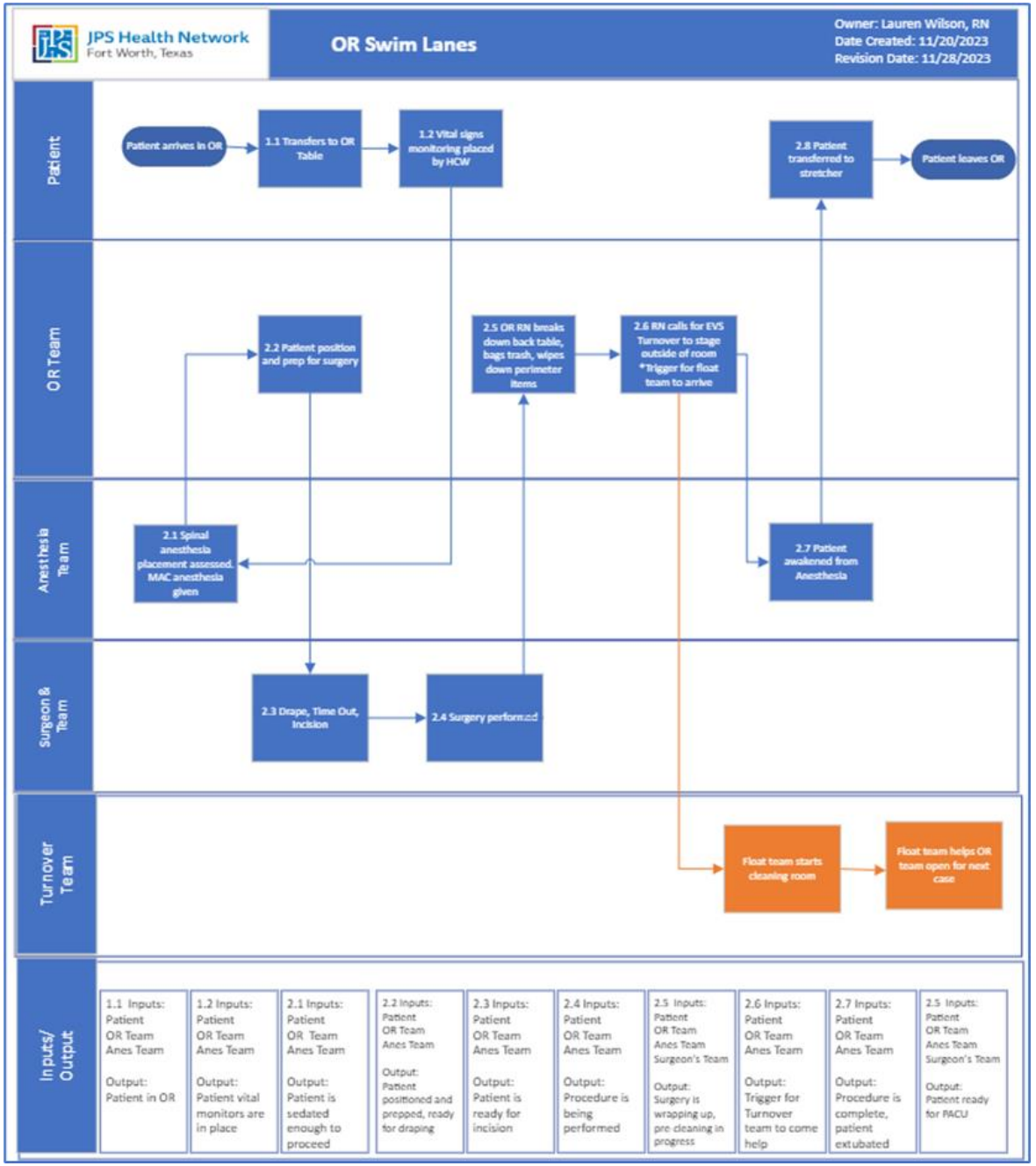
Future State PreOp Process Map

- Additional details included about PreOp processes and tasks.
- One change to the current process includes administering spinal in PreOp holding.

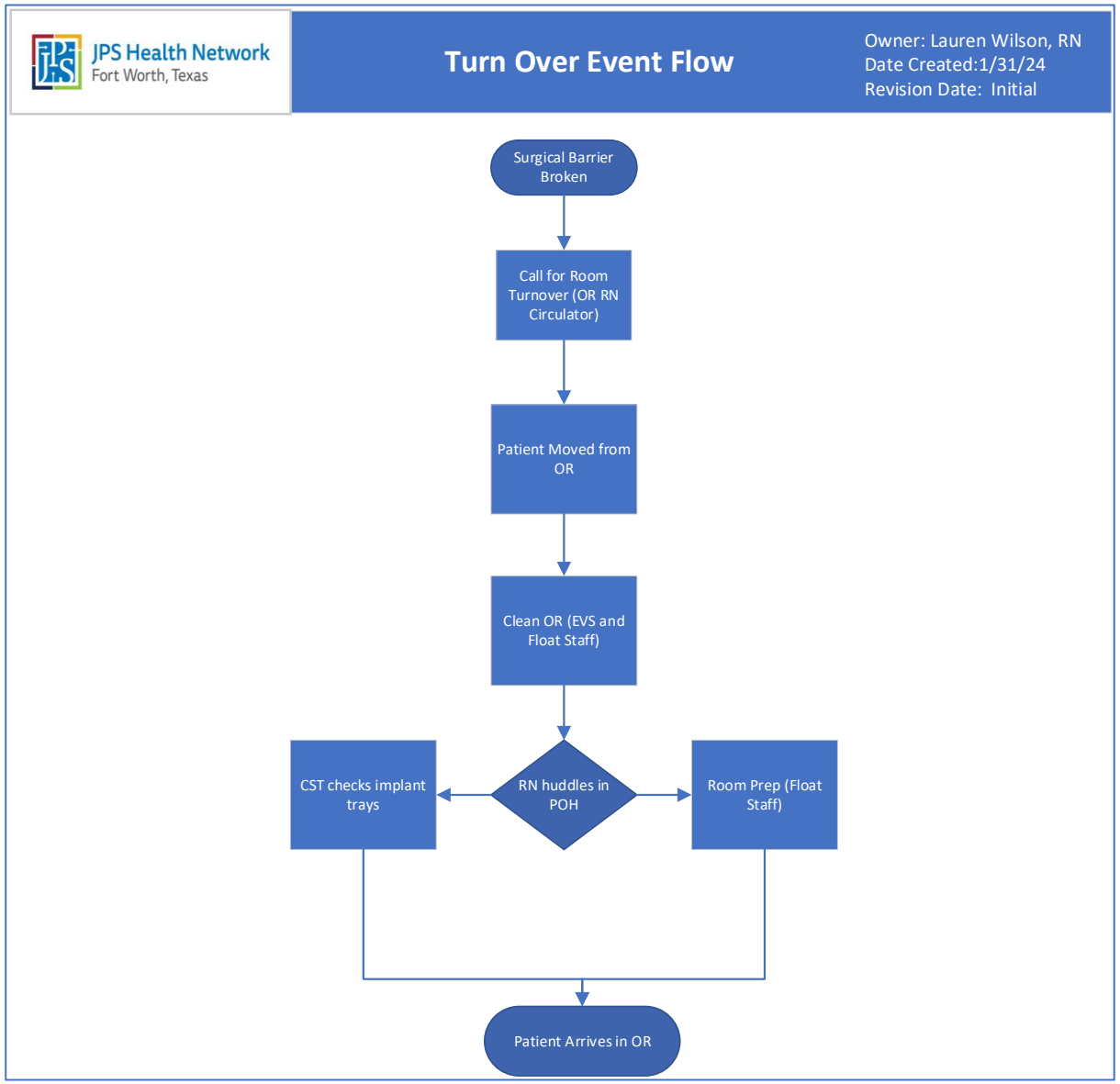


Future State OR Process Map

- Orange items indicate process change.
- Float staff involved in turn over process and set up for next case.
- Checklist created for Orthopedic OR coverage.



Future State OR Turn Over



Designated Total Joint Float Checklist

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FLOAT DUTIES

START OF SHIFT:

- ☐ Arrive and clock in at assigned shift
- ☐ Grab float phone and receive assignment from TL
- ☐ Write float phone number in each assignment room
- ☐ Revisit rooms with large complex cases or immediate issues
- ☐ Help assigned team prepare for their case, including but not limited to:
  - Opening & checking trays
  - Pulling/de-junking supplies
  - Pulling/de-junking equipment and positioners
  - RNs: Pulling meds
- ☐ Check remaining rooms for their progress and needs

POSITIONING/PREP/DRAPING AS NEEDED:

- ☐ Assist with moving the patient
- ☐ Assist with patient positioning
- ☐ Assist with helping prep patient (holding extremity)
- ☐ Assist with gowning surgeons
- ☐ Plug in cords while nurse prepares to time out

DURING CASE:

- ☐ Check the next case cart for accuracy, communicate with team as needed about requested supplies
- ☐ Pull any needed supplies
- ☐ Stage case cart and equipment outside of room if equipment/bed will change
- ☐ Call RN ascom to check on RN & CST hourly. Goal to reduce room traffic.

CLOSING:

- ☐ Break down table, if possible, if multiple tables or many instrument sets no longer needed.
- ☐ Pick up and tie full trash bags (keep in the room)
- ☐ Assist with any rapid turnover of instruments and tagging of any instruments that may need to be repaired/replaced or sharpened
- ☐ Help break down remainder of the instruments and spray
- ☐ Bring stretcher into the room
- ☐ Call overheard for EVS to stage outside OR
- ☐ Bag linen/trash
- ☐ Transfer patient
- ☐ Call for EVS if not staged outside OR
- ☐ Unlock bed so that EVS can mop under it
- ☐ Clean OR & communicate with EVS about what still needs to be cleaned

OPENING:

- ☐ During this time the room nurse should be dropping off patient, checking consents for next patient and continuing to pre op to huddle for the next patient.
- ☐ Vendor trays should be opened and checked first. Should there be any hole or contamination contact Vendor immediately for replacement. All Vendor trays should be placed on the smaller table
- ☐ Once Vendor trays are successfully opened please notify room nurse that they are free to roll with next patient

LAST CASE OF THE DAY:

- ☐ Check Rooms for dejunk and help return equipment to proper locations

Improvement Process Behavior Chart and Capability

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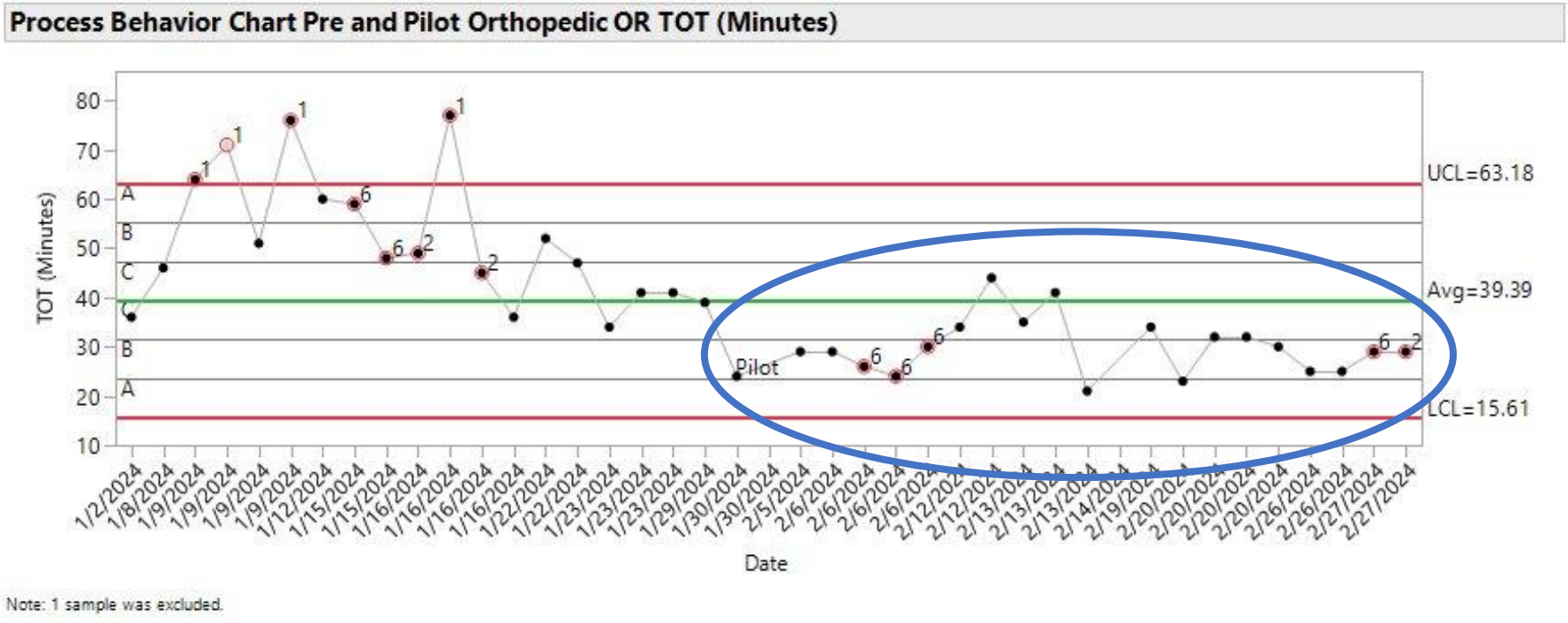
- Data for January was used as the baseline to compare against the Pilot in February
- From the day of the Pilot start the TOT shifted below the Mean with signals of non-random variation indicated
- The final day 2/27 indicates a shift in the process with nine data points below the Mean



Spaghetti Map

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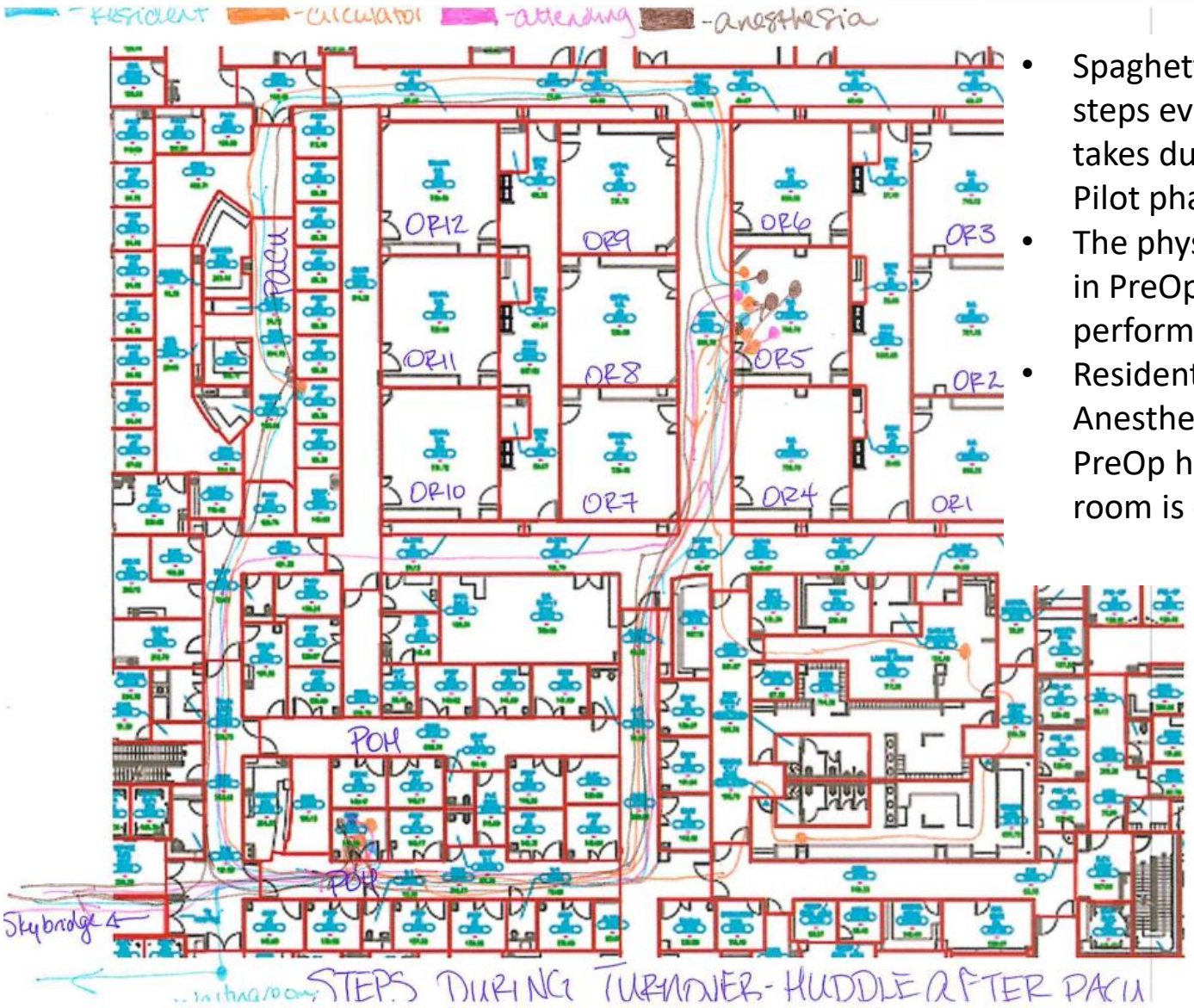

- Spaghetti map showing the steps every healthcare worker takes during a turnover during Pilot phase.
- The physician prepares patient in PreOp holding so block can be performed
- Resident travels with RN and Anesthesia to PACU and to PreOp holding to huddle while room is cleaned.

"Ready to Roll" Definition

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- "Ready to Roll" is the key phrase used to signal the circulating nurse to leave OR, head to PreOp, and bring patient back to OR.
- "Ready to Roll" is defined as after turnover has occurred, sterile field is open and ready to receive vendor trays. All vendor trays are checked first. Once checked and sterilization is confirmed, "Ready to Roll" will be initiated by scrub tech.

Activity of Patient Pilot Study

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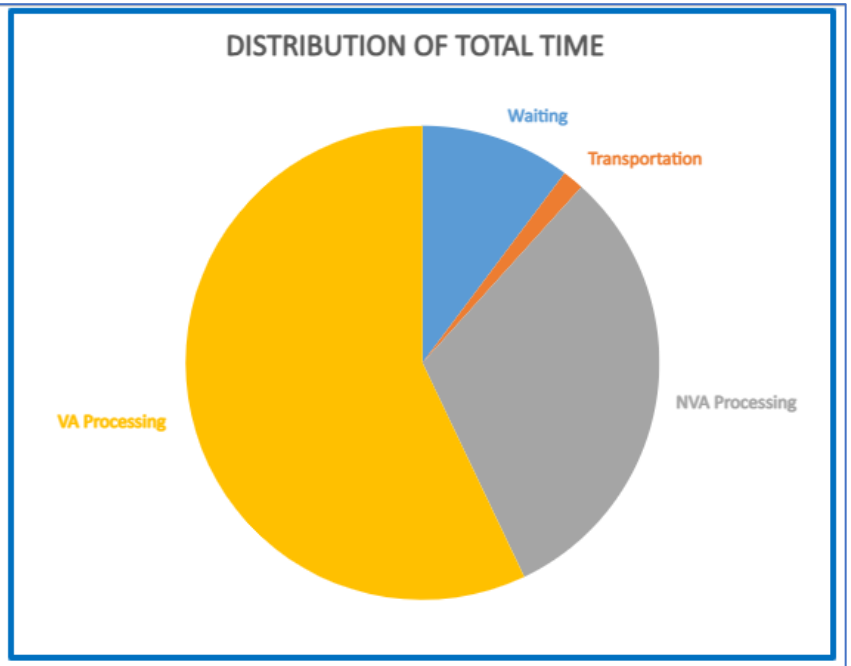
Activity of the Patient Summary		
	TIME	PERCENT
Waiting	21	10%
Transportation	3	1%
NVA Processing	64	31%
VA Processing	117	57%
Total Time	205	100%



Results from Epic Event Times February 1st-February 29th
Compared to AOP Epic Event Times May-June 2023:

- Waiting decreased from 100 to 21 minutes or 36% to 10% of Total Time
- Transportation and NVA Processing remained about the same
- VA Processing increased from 42% to 57%
- The patients total Perioperative Visit Time decreased from 279 minutes to 205 minutes

Before and Pilot Phase Distributions and Summary Statistics

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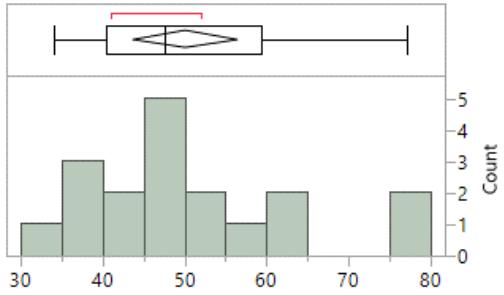
Distributions Phase=Before (January 2024 Cases)

TOT (Minutes)

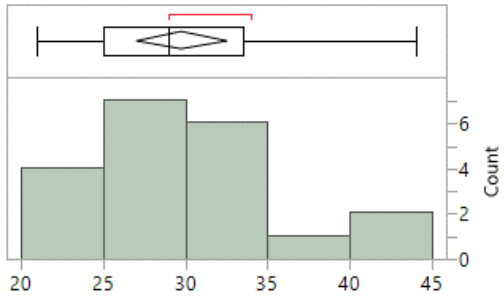


Quantiles		
100.0%	maximum	77
99.5%		77
97.5%		77
90.0%		76.1
75.0%	quartile	59.25
50.0%	median	47.5
25.0%	quartile	40.5
10.0%		35.8
2.5%		34
0.5%		34
0.0%	minimum	34

Summary Statistics	
Mean	50.055556
Std Dev	12.771624
Std Err Mean	3.0103006
Upper 95% Mean	56.406735
Lower 95% Mean	43.704376
N	18
N Missing	0

Distributions Phase=Pilot (February 2024 Cases)

TOT (Minutes)



Quantiles		
100.0%	maximum	44
99.5%		44
97.5%		44
90.0%		40.4
75.0%	quartile	33.5
50.0%	median	29
25.0%	quartile	25
10.0%		23.1
2.5%		21
0.5%		21
0.0%	minimum	21

Summary Statistics	
Mean	29.8
Std Dev	5.8633563
Std Err Mean	1.3110863
Upper 95% Mean	32.544135
Lower 95% Mean	27.055865
N	20
N Missing	2

Before Phase indicates:

- Mean of 50 minutes TOT
- Standard deviation of 13 minutes

NOTE: The Mean Confidence Intervals have no overlap indicating a difference

Pilot Phase indicates:

- Mean of 30 minutes TOT
- Standard deviation was 6 minutes

Improvement Hypothesis Testing

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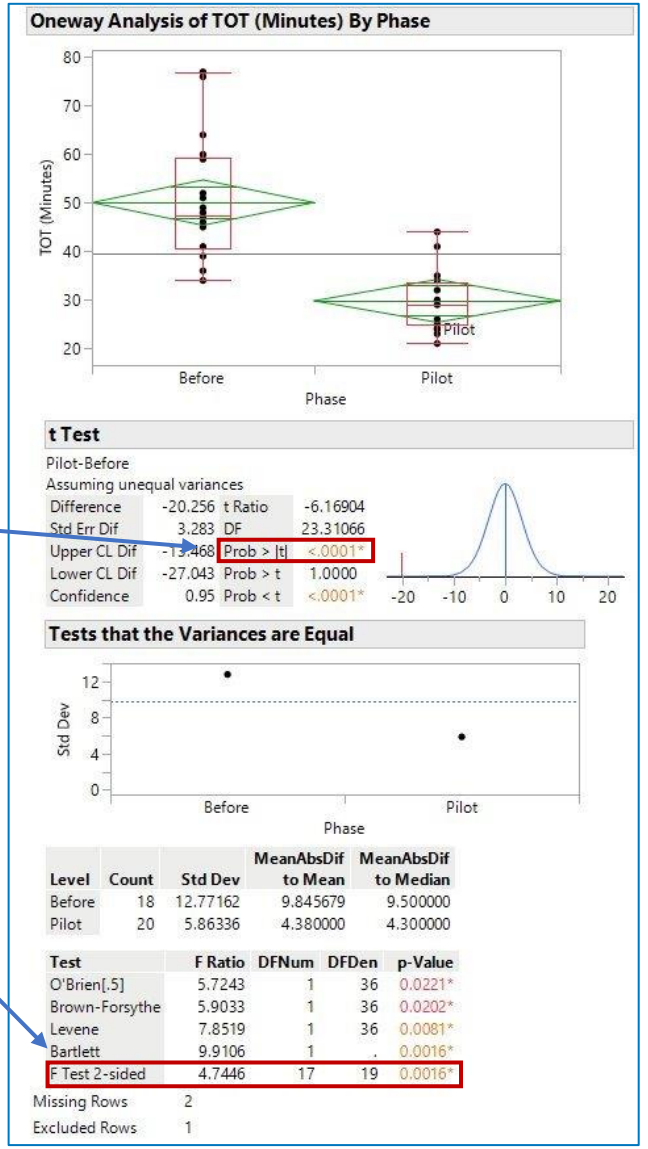
- The hypothesis test for the mean and the variance indicates that there is a difference between the Pilot and Before phase
  - Mean: t Test
  - Variance: F Test



Improvement Hypothesis Testing

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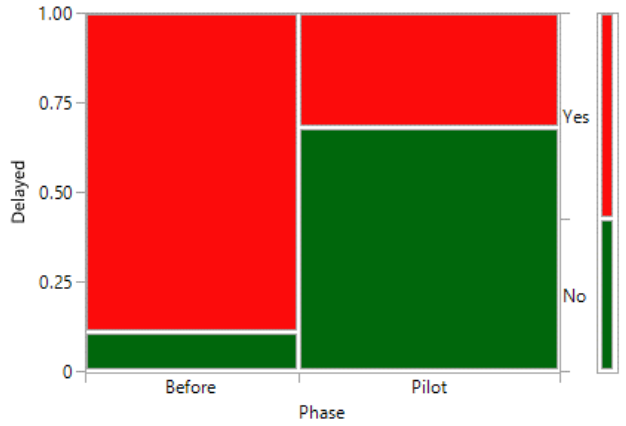
- One of the efforts of the Pilot was to reduce causes for delays and the hypothesis test shows a difference in proportions
- A Two-Proportion Test was conducted

Contingency Analysis of Delayed By Phase

Mosaic Plot



Contingency Table

		Delayed		
	Count Expected Cell Chi^2	No	Yes	Total
Phase	Before	2 7.65 4.1729	16 10.35 3.0843	18
	Pilot	15 9.35 3.4142	7 12.65 2.5235	22
	Total	17	23	40

Tests

N	DF	-LogLike	RSquare (U)
40	1	7.2343967	0.2652

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	14.469	0.0001*
Pearson	13.195	0.0003*

Fisher's Exact Test	Prob	Alternative Hypothesis
Left	0.0003*	Prob(Delayed=Yes) is greater for Phase=Before than Pilot
Right	1.0000	Prob(Delayed=Yes) is greater for Phase=Pilot than Before
2-Tail	0.0004*	Prob(Delayed=Yes) is different across Phase

Attending Physician Event Flow

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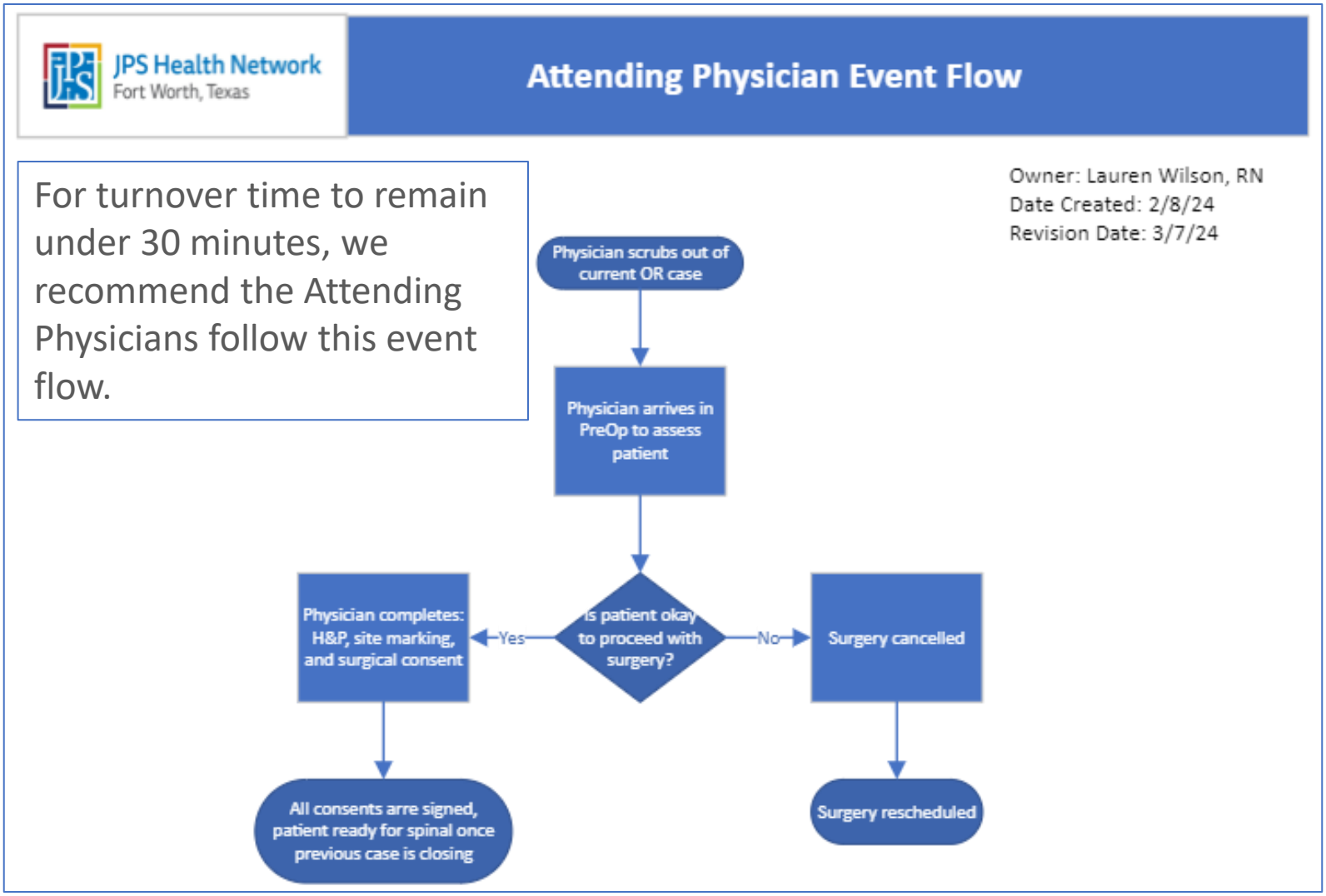

Improvement Process Behavior Chart and Capability

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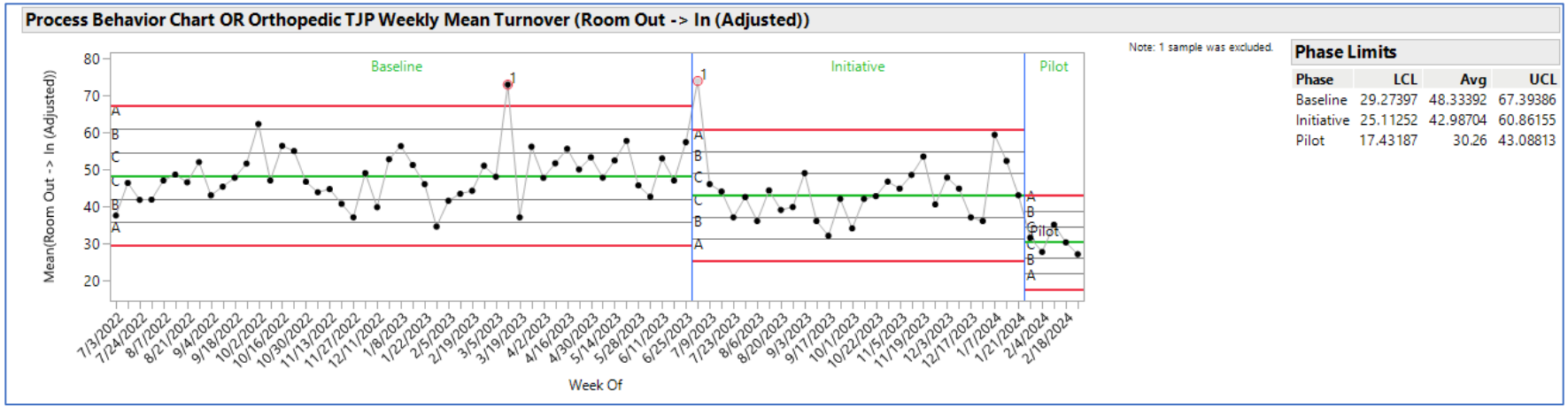
Fort Worth, Texas



- The Baseline and at the start of the Initiative the Mean was above 40 minutes with a 0.0 Sigma Level
- The Pilot reduced the TOT to an average of 30 minutes with a Sigma Level of 1.49

Calculating Sigma Level for Continuous Data

Note: Normally Distributed Data required!

Enter the calculated average, X-bar	30.05
Enter the calculated standard deviation, s	5.6
Enter the Upper Spec Limit, leave blank if none	30
Enter the Lower Spec Limit, leave blank if none	
This is your Sigma Level	**1.49**
This is the Z value for your Upper Spec Limit	-0.01
This is how much is out of spec	50.36%
This is the Z value for your Lower Spec Limit	N/A
This is how much is out of spec	0.00%
Your Percentage Yield is then	49.64%
Your DPM will be	**503,562**

Control Phase

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Final Control Plan

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- OR Float Generic Checklist
- Designated Total Joint Float Surgeon check-off
- Float Turnover Event Flow
- Process Behavior Chart
- Final Hypothesis Test for Sustainability

OR Float Generic Checklist

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FLOAT DUTIES

START OF SHIFT:

- ☐ Arrive and clock in at assigned shift
- ☐ Grab float phone and receive assignment from TL
- ☐ Write float phone number in each assignment room
- ☐ Revisit rooms with large complex cases or immediate issues
- ☐ Help assigned team prepare for their case, including but not limited to:
  - Opening & checking trays
  - Pulling/de-junking supplies
  - Pulling/de-junking equipment and positioners
  - RNs: Pulling meds
- ☐ Check remaining rooms for their progress and needs

POSITIONING/PREP/DRAPING AS NEEDED:

- ☐ Assist with moving the patient
- ☐ Assist with patient positioning
- ☐ Assist with helping prep patient (holding extremity)
- ☐ Assist with gowning surgeons
- ☐ Plug in cords while nurse prepares to time out

DURING CASE:

- ☐ Check the next case cart for accuracy, communicate with team as needed about requested supplies
- ☐ Pull any needed supplies
- ☐ Stage case cart and equipment outside of room if equipment/bed will change
- ☐ Call RN ascom to check on RN & CST hourly. Goal to reduce room traffic.

CLOSING:

- ☐ Break down table, if possible, if multiple tables or many instrument sets no longer needed.
- ☐ Pick up and tie full trash bags (keep in the room)
- ☐ Assist with any rapid turnover of instruments and tagging of any instruments that may need to be repaired/replaced or sharpened
- ☐ Help break down remainder of the instruments and spray
- ☐ Bring stretcher into the room
- ☐ Call overheard for EVS to stage outside OR
- ☐ Bag linen/trash
- ☐ Transfer patient
- ☐ Call for EVS if not staged outside OR
- ☐ Unlock bed so that EVS can mop under it
- ☐ Clean OR & communicate with EVS about what still needs to be cleaned

OPENING:

- ☐ During this time the room nurse should be dropping off the patient, checking consents for next patient and immediately going to pre op from PACU for the next patient's huddle
- ☐ Cases with Vendor trays:
  - Open and check vendor trays first. Should there be any hole or contamination contact Vendor immediately for replacement. All vendor trays should be placed on the smaller table.
  - Once Vendor trays are successfully opened please notify room nurse that they are free to roll with next patient
- ☐ Cases without Vendor Trays:
  - Assist team with opening supplies for next procedure

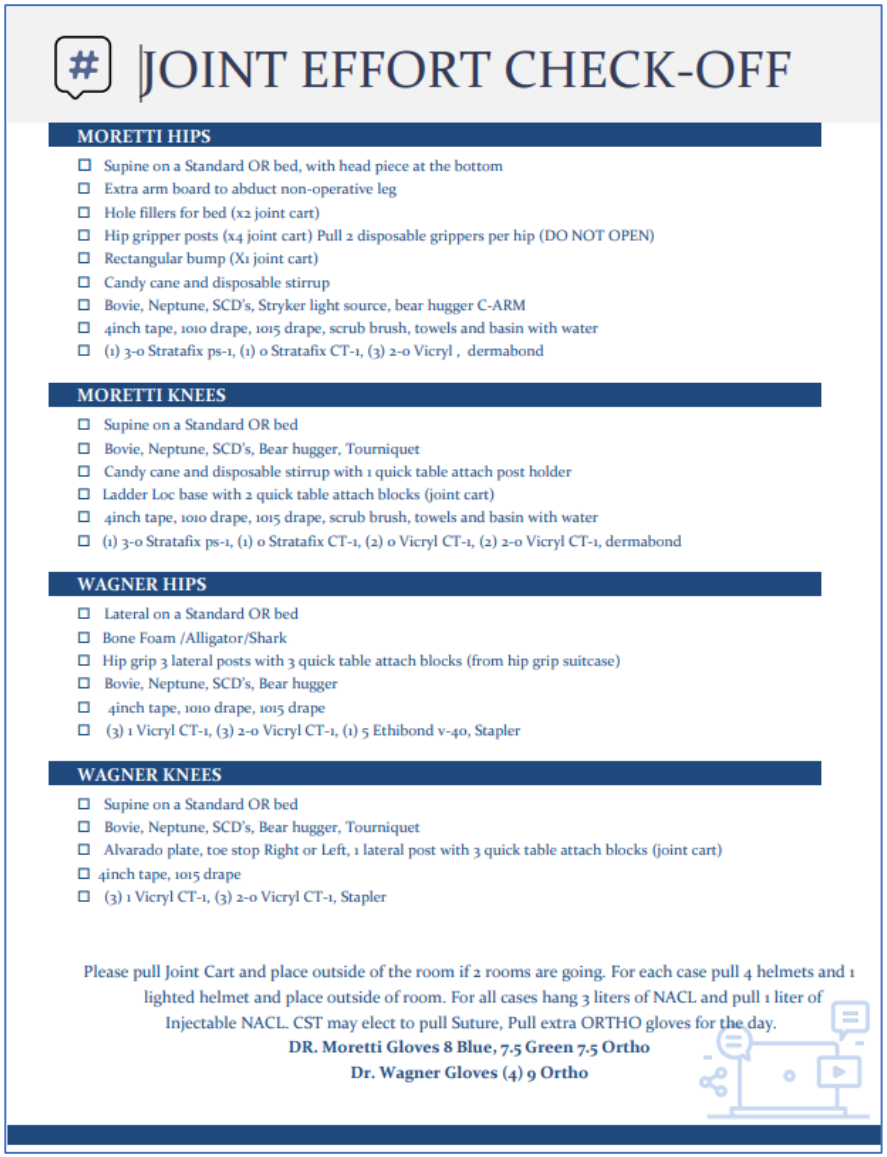
LAST CASE OF THE DAY:

- ☐ Check rooms for dejunk and help return equipment to proper locations

- This has been implemented by management and team leaders moving forward across all OR.
- This checklist is in addition to the Dedicated Joint float checklist.

Designated Total Joint Float Surgeon check-off

JPS Health Network
Fort Worth, Texas



JOINT EFFORT CHECK-OFF

MORETTI HIPS

- ☐ Supine on a Standard OR bed, with head piece at the bottom
- ☐ Extra arm board to abduct non-operative leg
- ☐ Hole fillers for bed (x2 joint cart)
- ☐ Hip gripper posts (x4 joint cart) Pull 2 disposable grippers per hip (DO NOT OPEN)
- ☐ Rectangular bump (X1 joint cart)
- ☐ Candy cane and disposable stirrup
- ☐ Bovie, Neptune, SCD's, Stryker light source, bear hugger C-ARM
- ☐ 4inch tape, 1010 drape, 1015 drape, scrub brush, towels and basin with water
- ☐ (1) 3-0 Stratafix ps-1, (1) 0 Stratafix CT-1, (3) 2-0 Vicryl , dermabond

MORETTI KNEES

- ☐ Supine on a Standard OR bed
- ☐ Bovie, Neptune, SCD's, Bear hugger, Tourniquet
- ☐ Candy cane and disposable stirrup with 1 quick table attach post holder
- ☐ Ladder Loc base with 2 quick table attach blocks (joint cart)
- ☐ 4inch tape, 1010 drape, 1015 drape, scrub brush, towels and basin with water
- ☐ (1) 3-0 Stratafix ps-1, (1) 0 Stratafix CT-1, (2) 0 Vicryl CT-1, (2) 2-0 Vicryl CT-1, dermabond

WAGNER HIPS

- ☐ Lateral on a Standard OR bed
- ☐ Bone Foam /Alligator/Shark
- ☐ Hip grip 3 lateral posts with 3 quick table attach blocks (from hip grip suitcase)
- ☐ Bovie, Neptune, SCD's, Bear hugger
- ☐ 4inch tape, 1010 drape, 1015 drape
- ☐ (3) 1 Vicryl CT-1, (3) 2-0 Vicryl CT-1, (1) 5 Ethibond v-40, Stapler

WAGNER KNEES

- ☐ Supine on a Standard OR bed
- ☐ Bovie, Neptune, SCD's, Bear hugger, Tourniquet
- ☐ Alvarado plate, toe stop Right or Left, 1 lateral post with 3 quick table attach blocks (joint cart)
- ☐ 4inch tape, 1015 drape
- ☐ (3) 1 Vicryl CT-1, (3) 2-0 Vicryl CT-1, Stapler

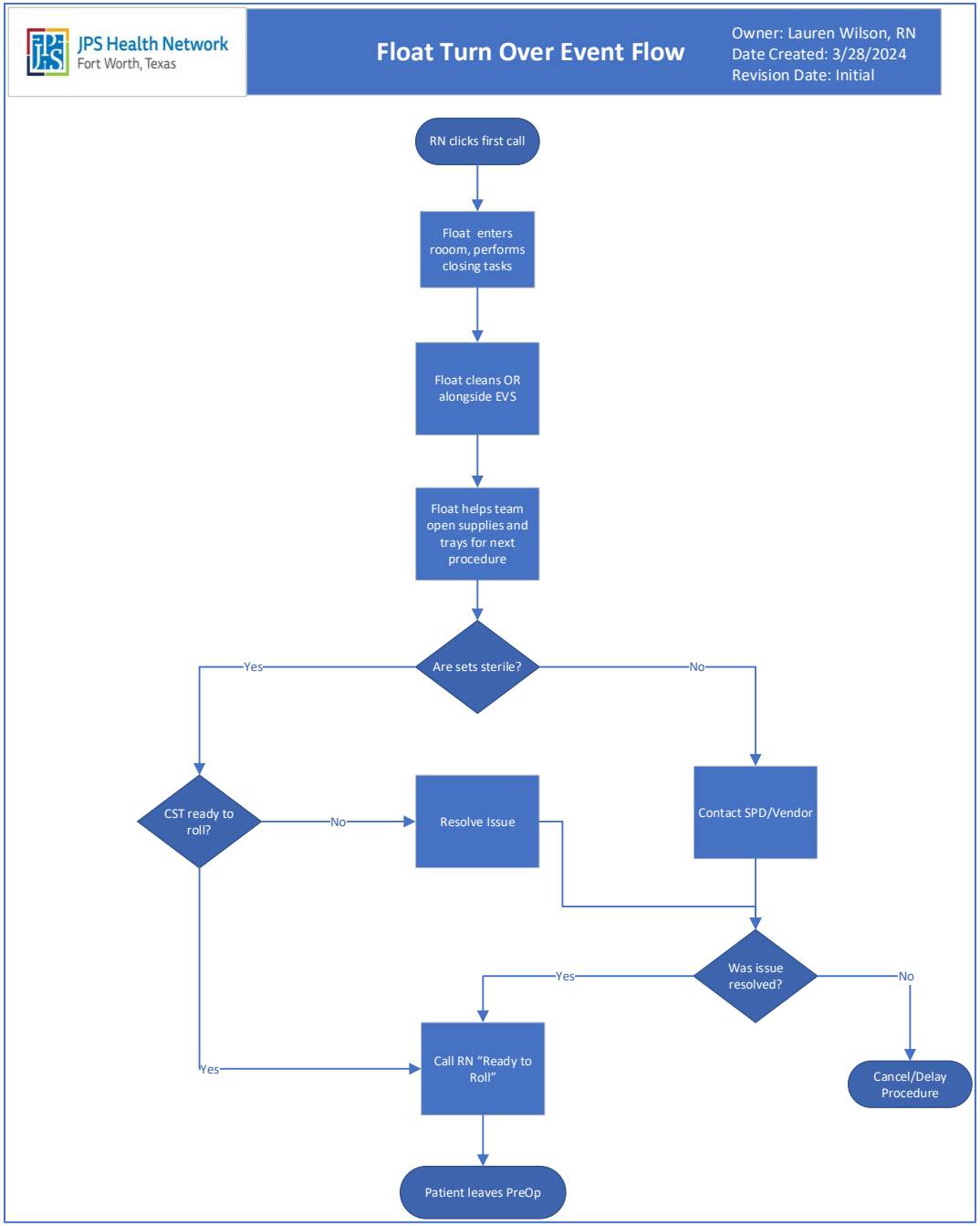
Please pull Joint Cart and place outside of the room if 2 rooms are going. For each case pull 4 helmets and 1 lighted helmet and place outside of room. For all cases hang 3 liters of NACL and pull 1 liter of Injectable NACL. CST may elect to pull Suture, Pull extra ORTHO gloves for the day.

DR. Moretti Gloves 8 Blue, 7.5 Green 7.5 Ortho

Dr. Wagner Gloves (4) 9 Ortho

- Training Tool Checklist for Dedicated Total Joint Float.

Float Turnover Event Flow



Process Behavior Chart

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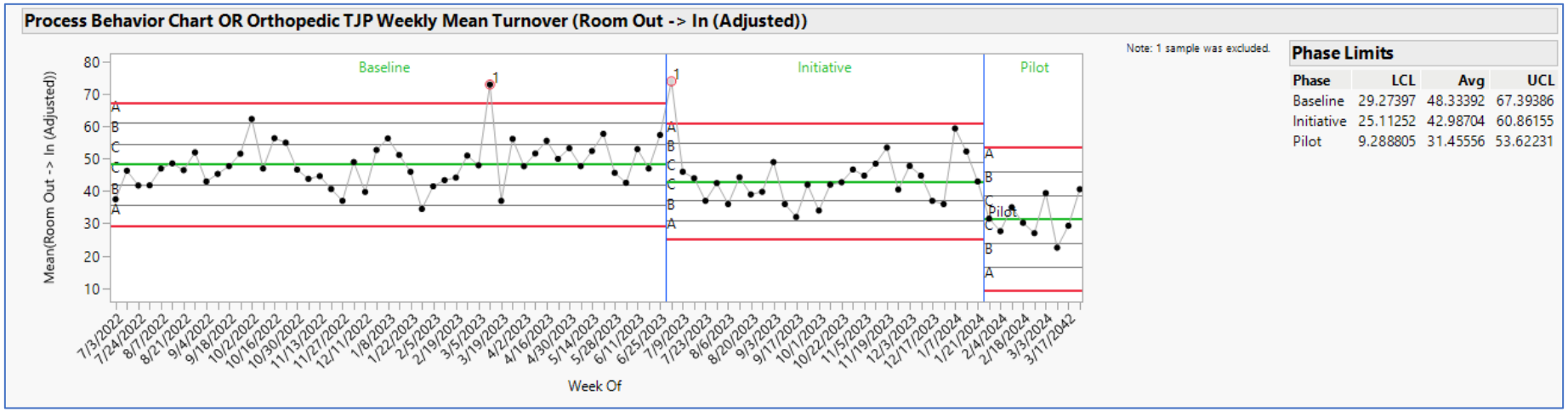

- Pilot period was extended into March 2024 to show sustainability.
- Will continue to monitor in the upcoming months.

Final Hypothesis Test for Sustainability

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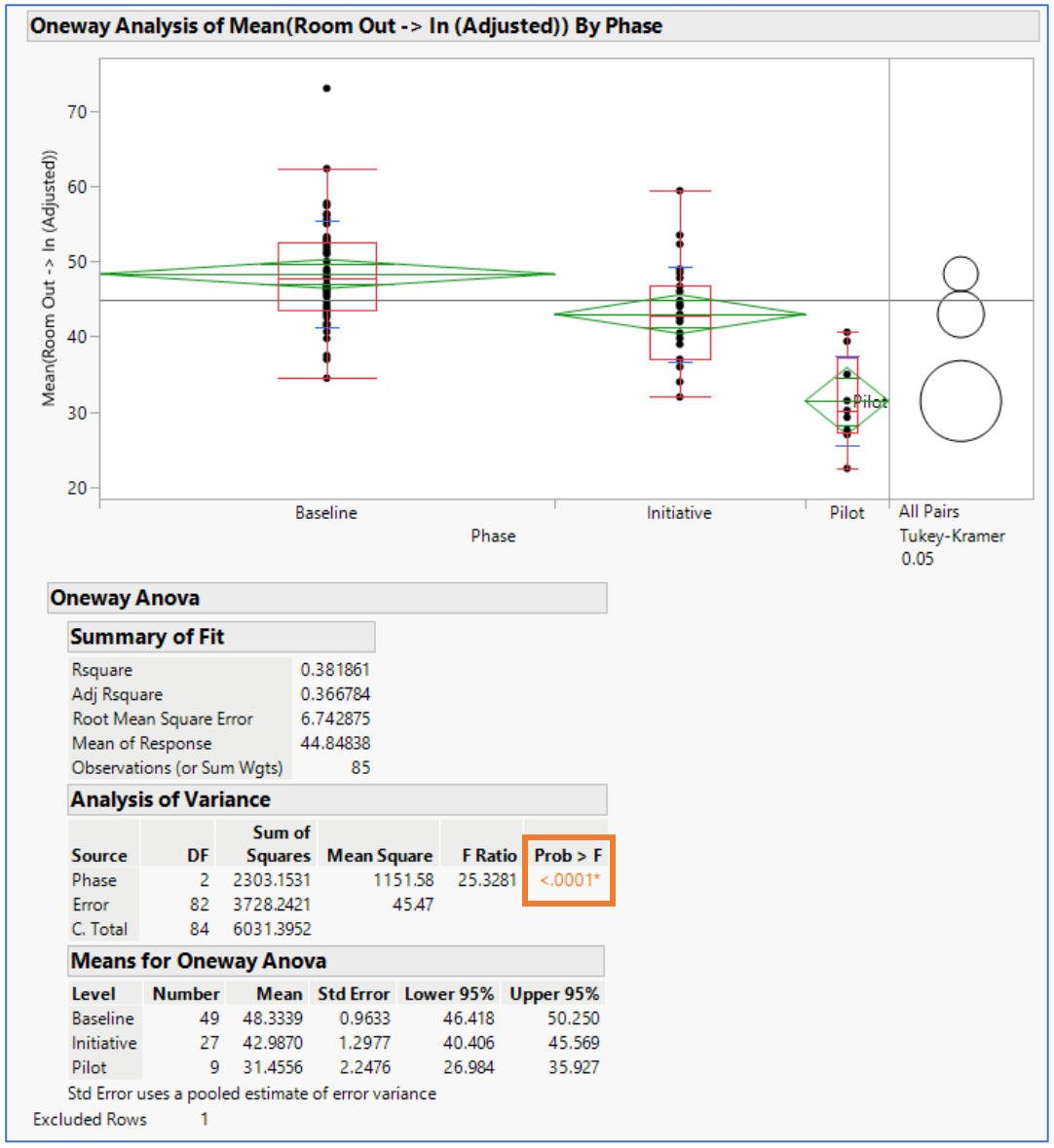

- Hypothesis shows that there is a difference between the three phases.
- ANOVA test was performed.
- Tukey comparison shows that all three phases are statistically different.

Lessons Learned

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List All The Successes Your Team Experienced	What Went Well For Your Team In Terms of Group Dynamics?
• We achieved our goal • Developed universal actions to help reduce *all* turnovers • Improved teamwork amongst key stakeholders	• All group members were motivated to participate in the project
What Didn't Go Well For Your Team In Terms of Group Dynamics?	**What Were Some Barriers to Change Your Team Experienced?**
• Difficult to hold meetings due to different schedules/shifts	• Changing the Nurses' process for huddling • Working with EVS to stage outside of the OR • Staffing might not always allow for multiple floats during turnover
What Were Some Best Practices In Implementation That Your Team Established?	**What Activities / Tools Did Your Team Find The Most Beneficial?**
• "Ready to Roll" • Huddle directly after PACU drop off • Generic float checklist	• Dedicated total joint float