![Main Line Health® logo]

Reducing Turnaround Time for Routine Inpatient MRIs to Improve Length of Stay (LOS)

We implemented a **"demand signal"** in the EMR for the **ordering provider** to indicate the patient will be discharged 24 hours after receiving results. This shows a **car icon in the imaging workflow**, which helps to prioritize workload.

Learning Objectives

- Explain the impact of traditional radiology workload prioritization on length of stay.
- Use select data analysis and process improvement tools to implement an intervention to improve prioritization.
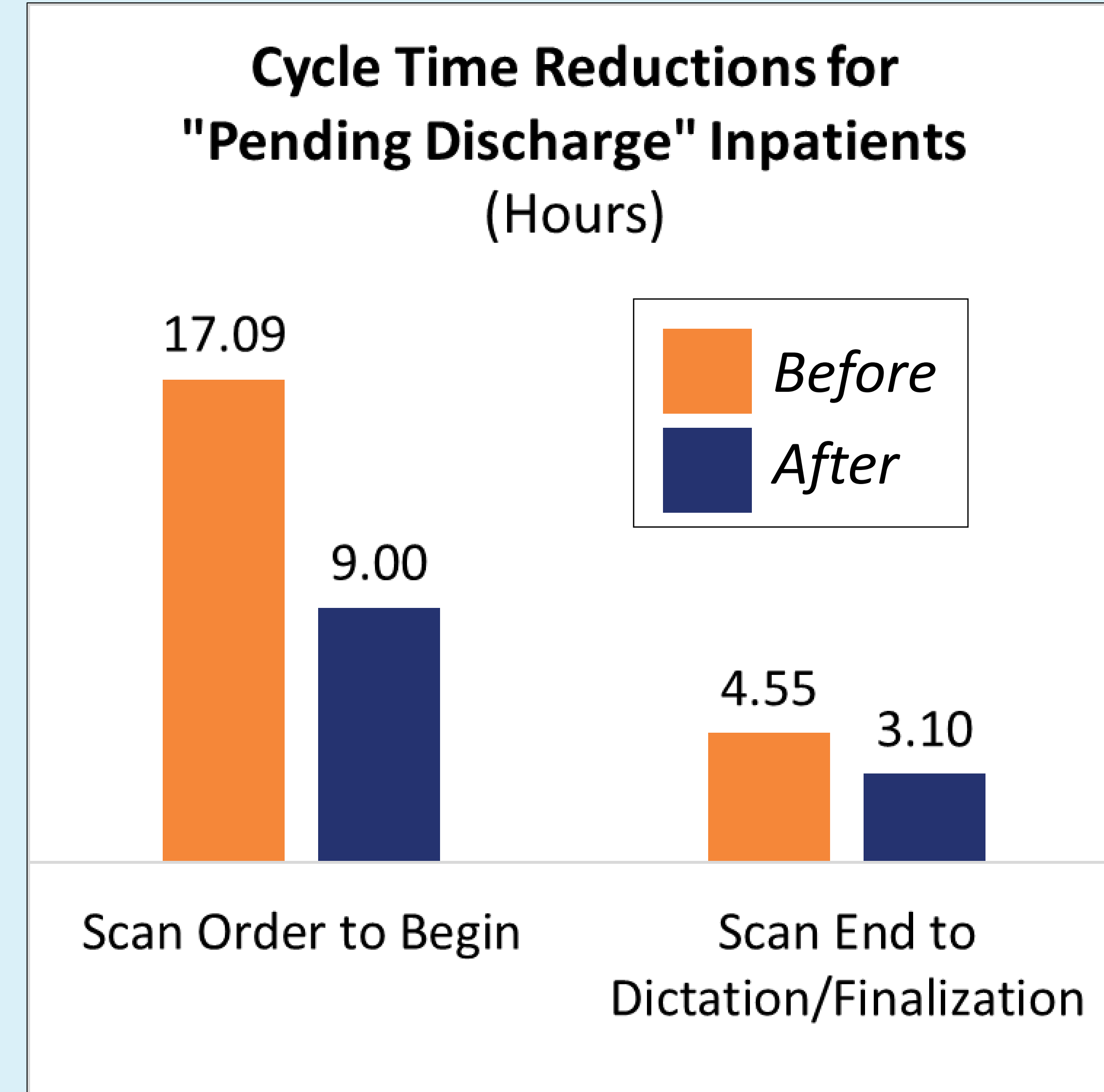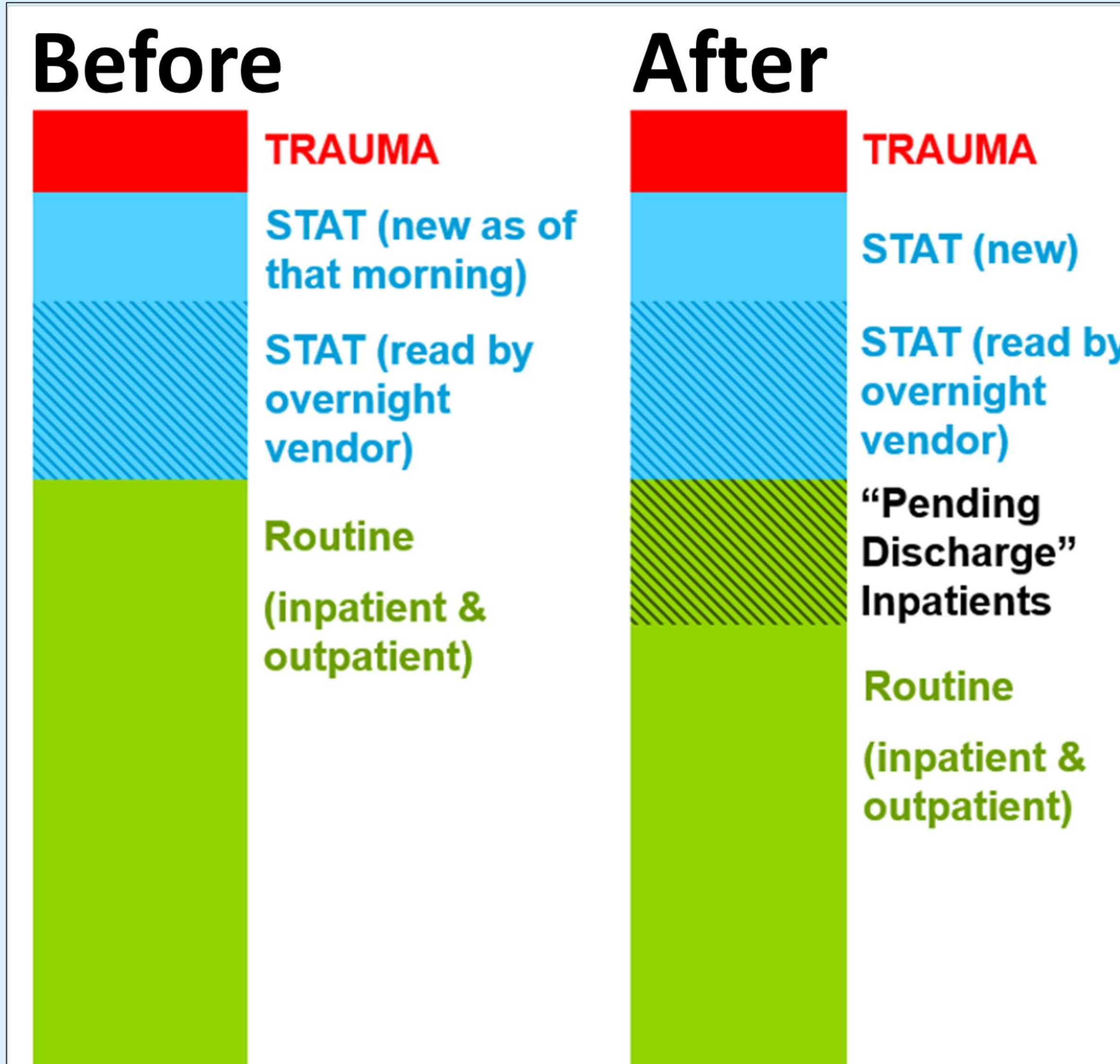
Lessons Learned

- The effectiveness of the tool is predicated on two competing factors: (1) The ordering providers' perception that it speeds up results. (2) Limiting the use of the tool so that the workload for technologists/radiologists is manageable.
- Effective stakeholder education during rollout of the new process is critical to success.

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Main Line Health saves approx. $170,000 by streamlining imaging barriers to discharge.

Before

- TRAUMA
- STAT (new as of that morning)
- STAT (read by overnight vendor)
- Routine (inpatient & outpatient)

After

- TRAUMA
- STAT (new)
- STAT (read by overnight vendor)
- "Pending Discharge" Inpatients
- Routine (inpatient & outpatient)

Cycle Time Reductions for "Pending Discharge" Inpatients (Hours)

Legend: *Before* (orange), *After* (navy)

	Before	After
Scan Order to Begin	17.09	9.00
Scan End to Dictation/Finalization	4.55	3.10

Key Takeaway: Doctors order **routine** studies for patients who are almost ready to go home to **clear them for discharge**. Imaging professionals **do not have this information** to help prioritize their workload. These studies can elongate the time to discharge while the doctor is **waiting for results.**

Embedding this information into the **imaging workflow** helped expedite discharge and **shorten length of stay by 1 day** per patient for our target population.

How did we do this?

Define – *Problem Statement*
Studies that are required to clear patients for discharge elongate length of stay.

Measure – *How are we doing?*
The average time from when a **study is ordered to when it begins** is 17.09 hours. The average time from when a **study ends until the results are available** to the ordering provider is 4.55 hours.

Analyze – *Root Causes*
There is no way for the ordering provider to communicate that a routine order is for an inpatient who is almost ready for discharge.
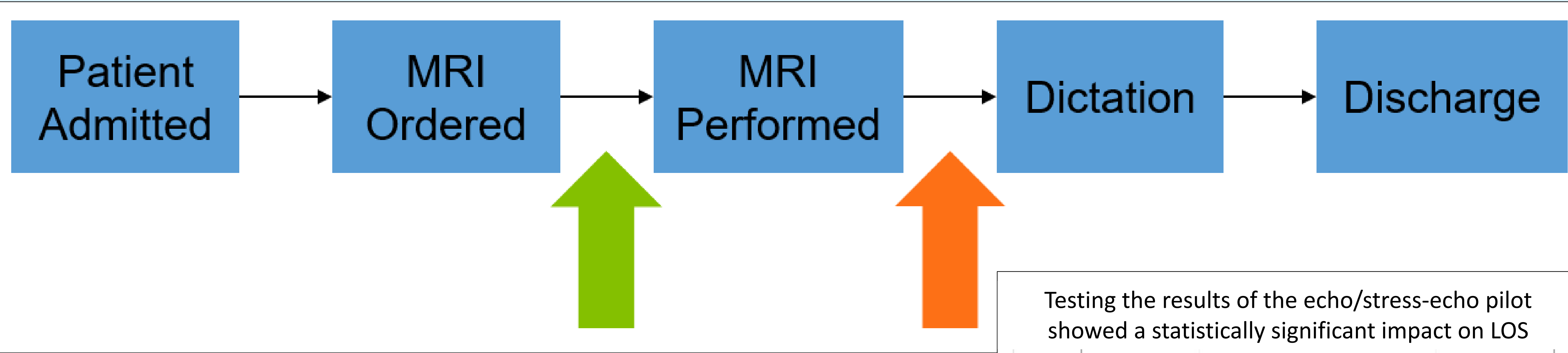Technologists have limited time to schedule inpatient scans in between heavy emergency and outpatient workloads.
Radiologists stop reading routine scans in the evening because of heavy volume with lighter staff, and it is unclear which routine scans should be prioritized over others.

Improve – *test existing echo pilot & implement*

Control – *Control Plan*
Monitor % of patients who are discharged within 24-48 hours after results are available. Target >60%.
Monitor usage of demand signal for significant dips or spikes in volume.

Patient Admitted → MRI Ordered → MRI Performed → Dictation → Discharge

Testing the results of the echo/stress-echo pilot showed a statistically significant impact on LOS

Priority: Routine — Routine STAT TRAUMA
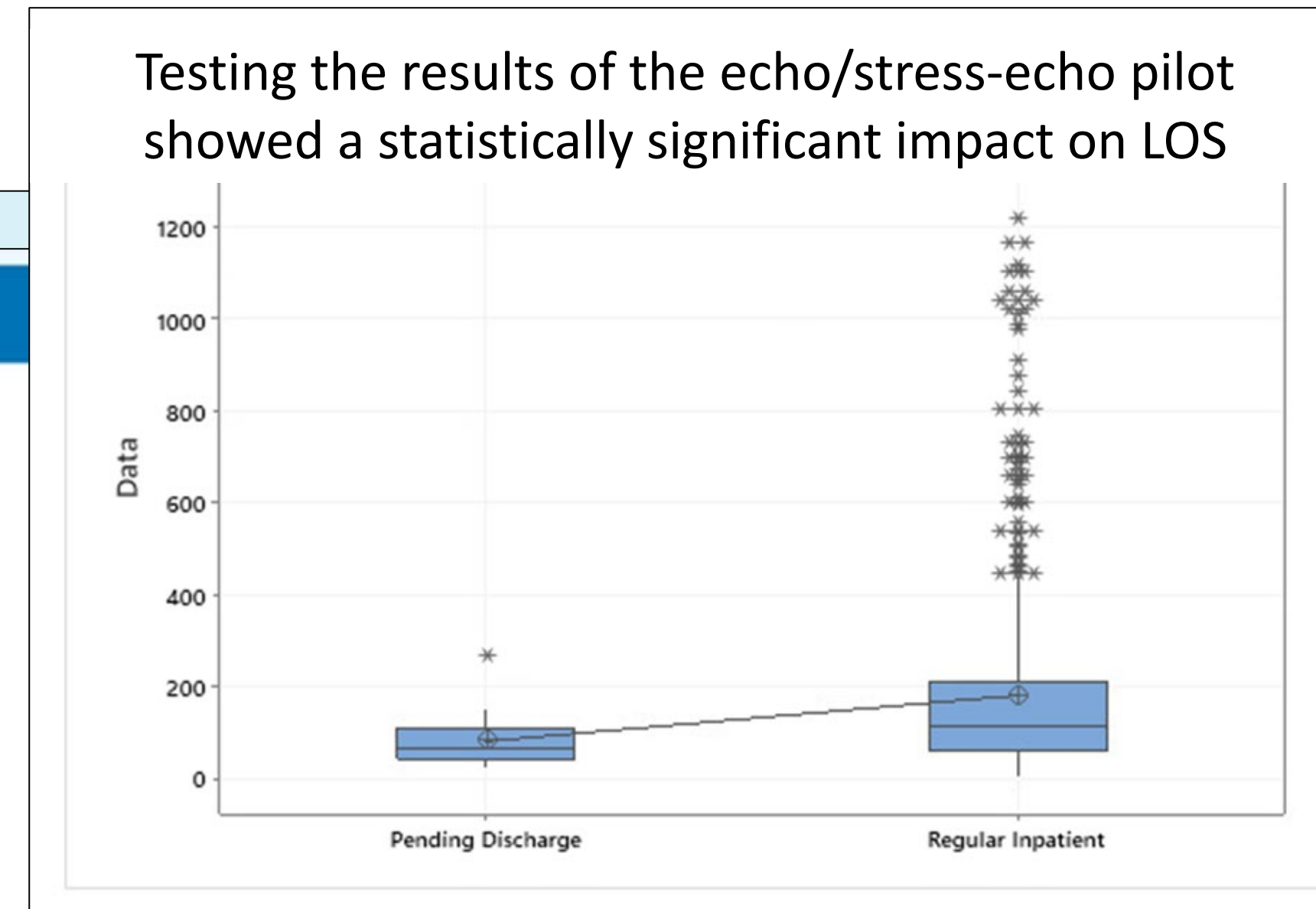Frequency: Once
At 9/15/2022 Today Tomorrow
1350
Pending discharge? Yes No
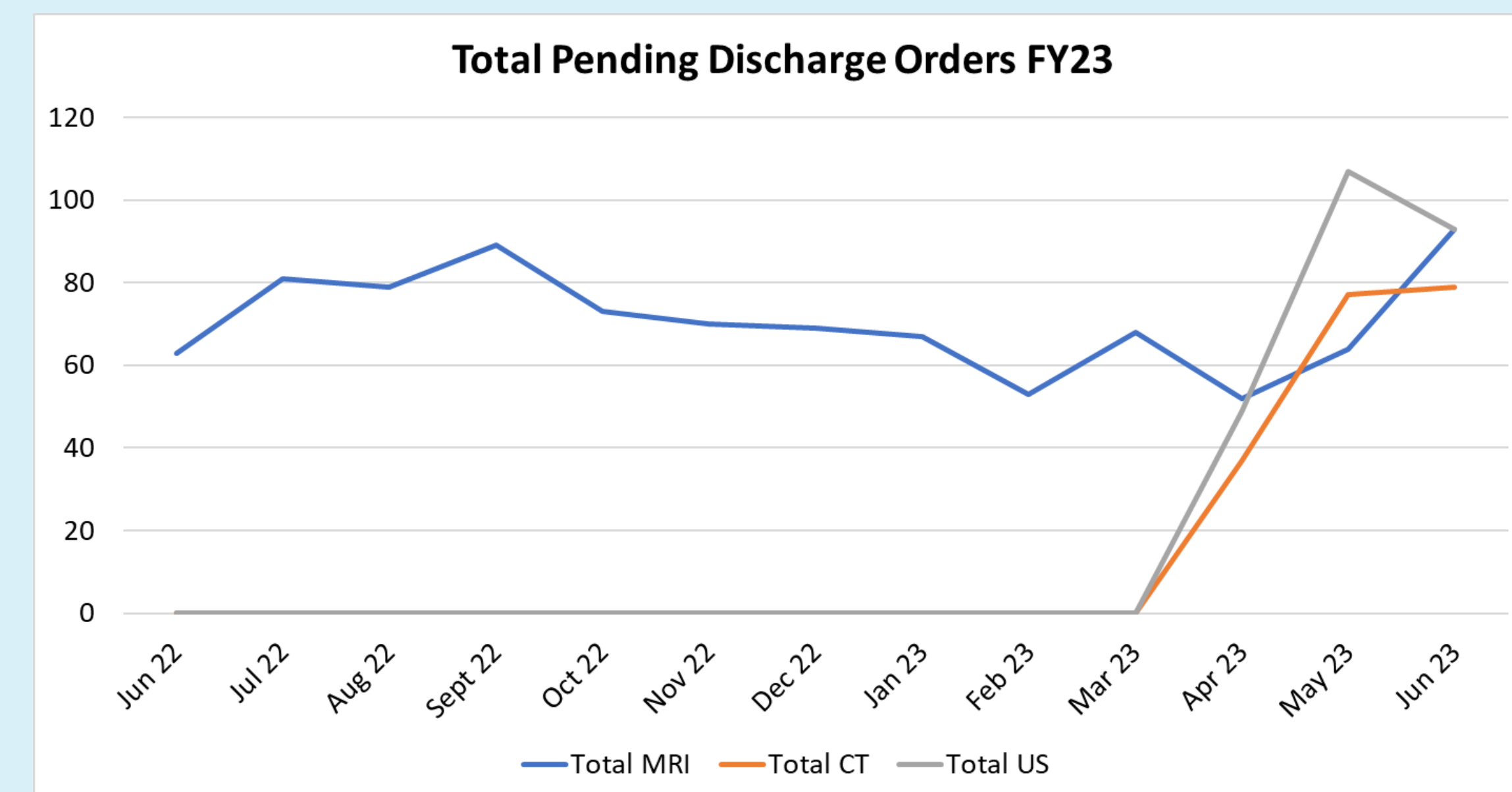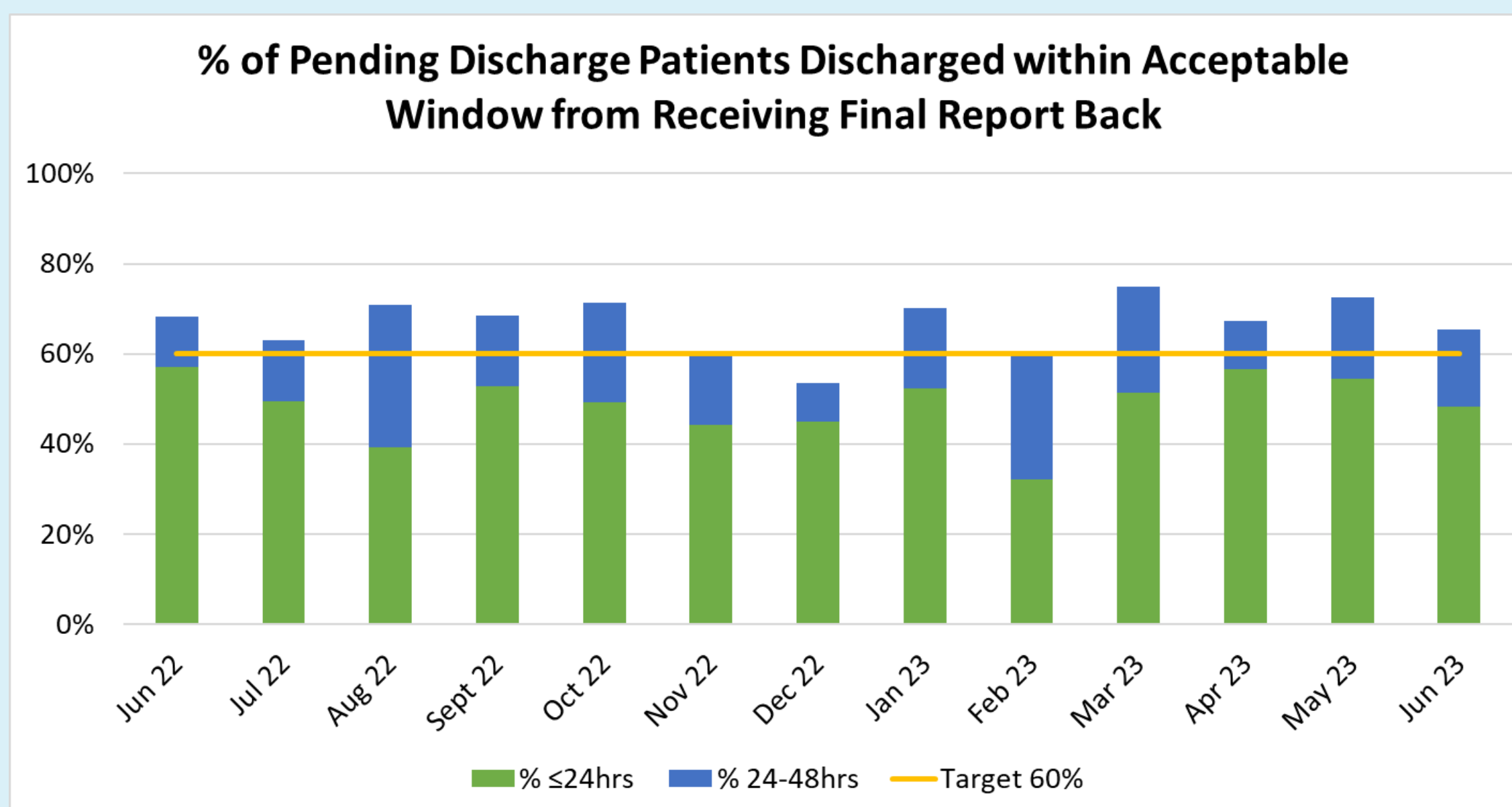By selecting yes to the question above, you are indicating that the patient will be discharged within 24hr of having this study performed.
OK
Does the Patient have a pacemaker, implant, shunt or implantable device? Yes No
Is the Patient claustrophobic? Yes No

Discharge? Infection Prior Priority
High Priority Orders — STAT / STAT
Schedule Orders — Routine / Routine / Routine / Routine / Routine

% of Pending Discharge Patients Discharged within Acceptable Window from Receiving Final Report Back
(Jun 22 – Jun 23)
% ≤24hrs, % 24-48hrs, Target 60%

Total Pending Discharge Orders FY23
(Jun 22 – Jun 23)
Total MRI, Total CT, Total US

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Where do we go from here?

Expansion
- The pilot on neurology inpatients showed proof of concept.
- Radiology leadership sponsored expansion of the demand signal to other modalities.

Considerations
- The perception-workload paradox
  - ✓ The tool will only make a meaningful impact on LOS if enough ordering providers *believe* it speeds up results.
  - ✓ Abuse/overuse of the demand signal will create a workload burden that is too broad for the technologists/radiologists to effectively prioritize, which will reduce the impact on LOS.
- Good candidates are studies which have higher proportion of patients discharged within 24-48 hours after study results are available (finalization).
- Include "related" studies to avoid "cherry picking."

Imaging Procedures on Patients Who Were Discharged <=48 Hours After Finalization
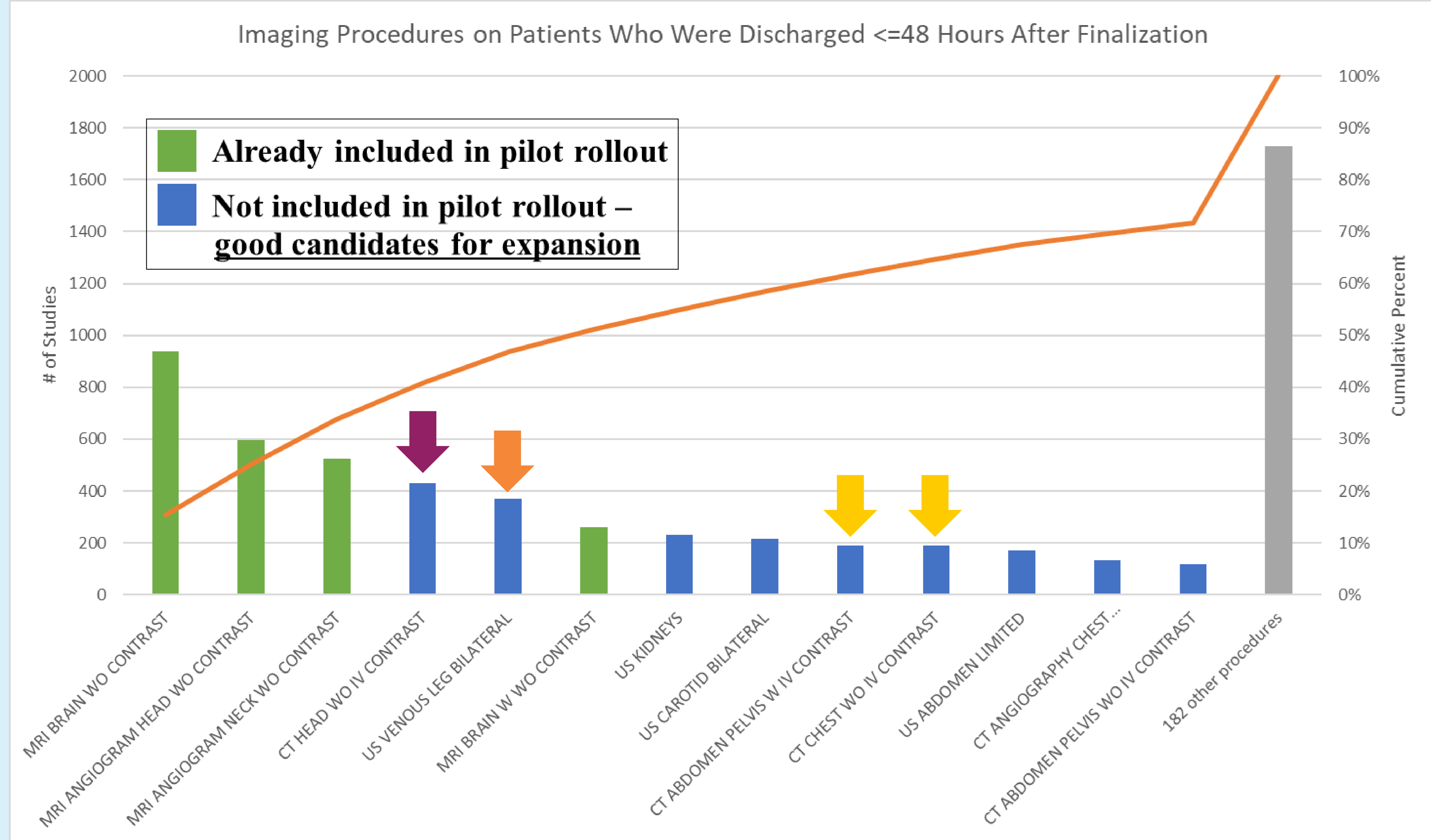
CT HEAD WO IV CONTRAST	431
CT ABDOMEN PELVIS W IV CONTRAST	190
CT CHEST WO IV CONTRAST	189
CT ANGIOGRAPHY CHEST PULMONARY EMBOLISM W IV CONTRAST	133
CT ABDOMEN PELVIS WO IV CONTRAST	119
CT CHEST W IV CONTRAST	62
CT CHEST/ABDOMEN/PELVIS W IV CONTRAST	42
CT CHEST ABDOMEN AND PELVIS WO IV CONTRAST	17
CT ABDOMEN PELVIS W WO IV CONTRAST	14
CT ABDOMEN WO IV CONTRAST	4
CT CHEST W WO IV CONTRAST	4
CT HEAD W WO IV CONTRAST	4
CT ABDOMEN W IV CONTRAST	3
CT HEAD W IV CONTRAST	3
CT ABDOMEN W WO IV CONTRAST	1
CT CHEST/ABDOMEN/PELVIS W WO IV CONTRAST	1

US VENOUS LEG BILATERAL	369
US KIDNEYS	232
US CAROTID BILATERAL	215
US ABDOMEN LIMITED	171
US KIDNEYS / BLADDER	81
US VENOUS ARM RIGHT	56
US VENOUS LEG LEFT	48
US VENOUS LEG RIGHT	45
US VENOUS ARM LEFT	43
US ABDOMEN COMPLETE	38
US LIVER	22
US VENOUS ARM BILATERAL	8