Improving Prostate MRI Quality

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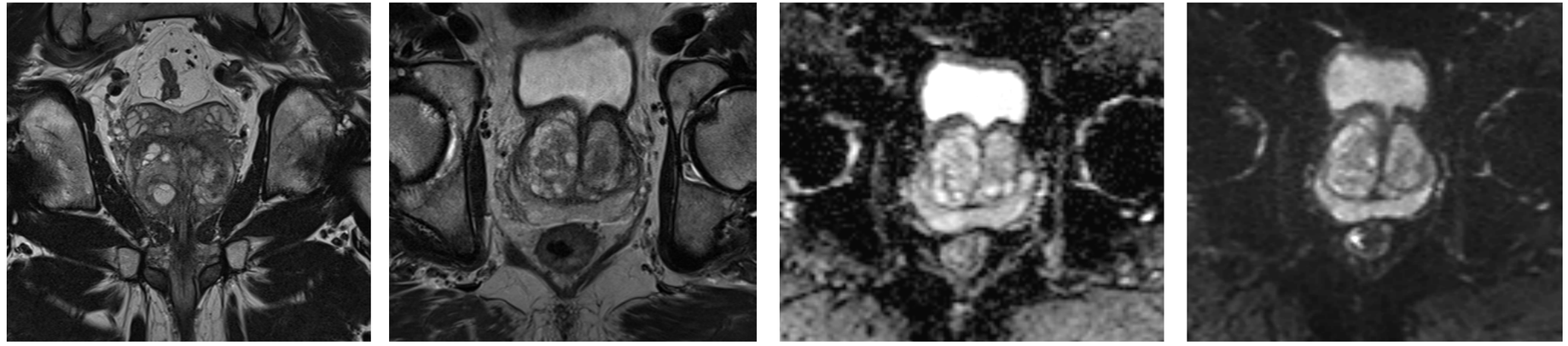


ACR LEARNING NETWORK

Cleveland Clinic

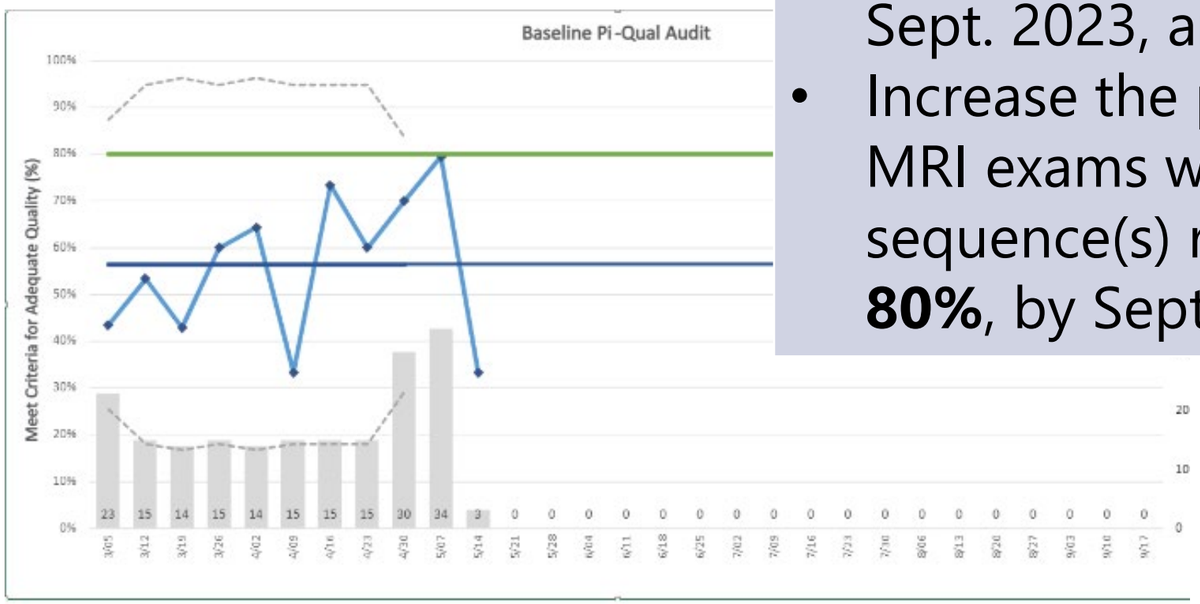
IMPOWER
IMPROVING PERFORMANCE TOGETHER

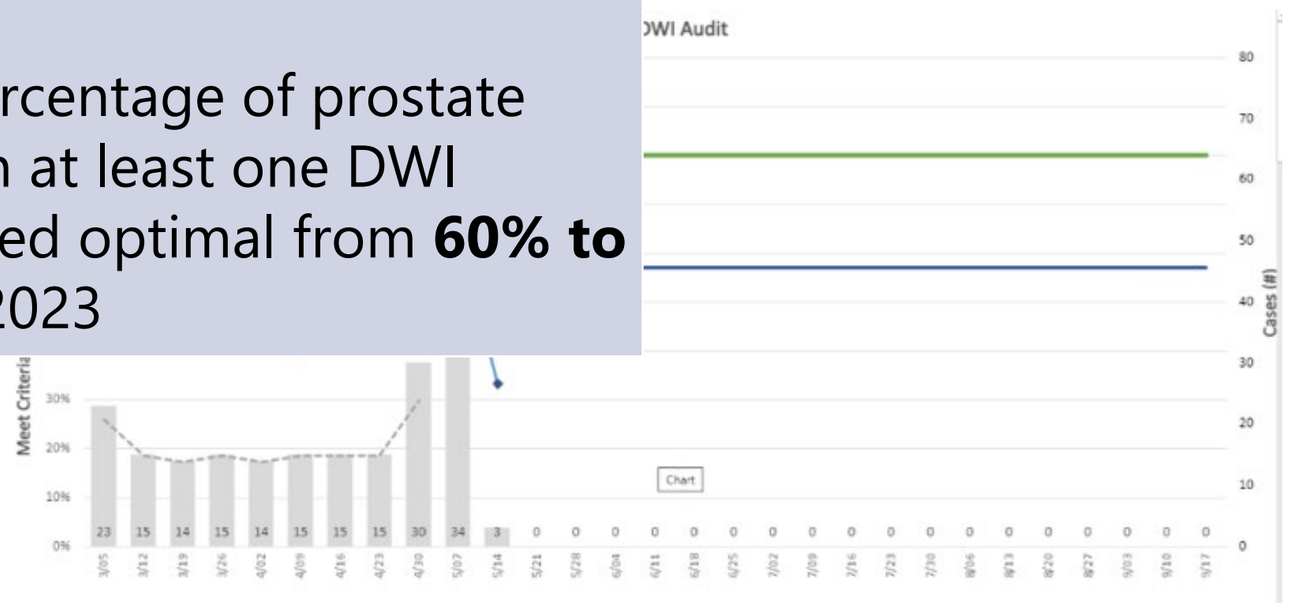
Baseline

- Baseline scores show that approximately 55% of our MRI prostate scans reach a Pi-Qual sc
- Our baseline DWI % of our MRI prostate scans are

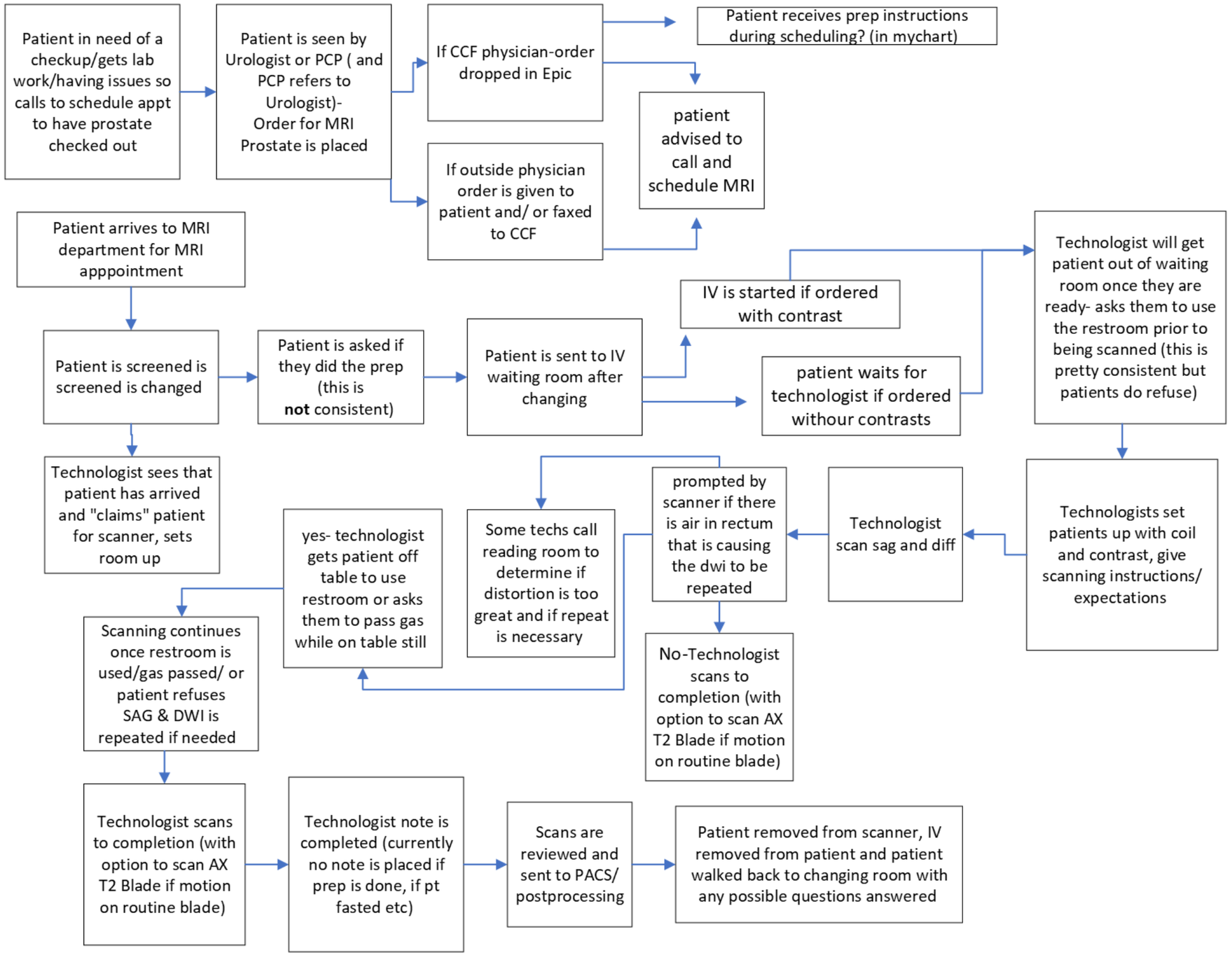
SMART Goal

- Increase the percentage of prostate MRI exams that receive a PI-QUAL score of ≥4 from of **55% to 80%**, by Sept. 2023, and
- Increase the percentage of prostate MRI exams with at least one DWI sequence(s) rated optimal from **60% to 80%**, by Sept. 2023





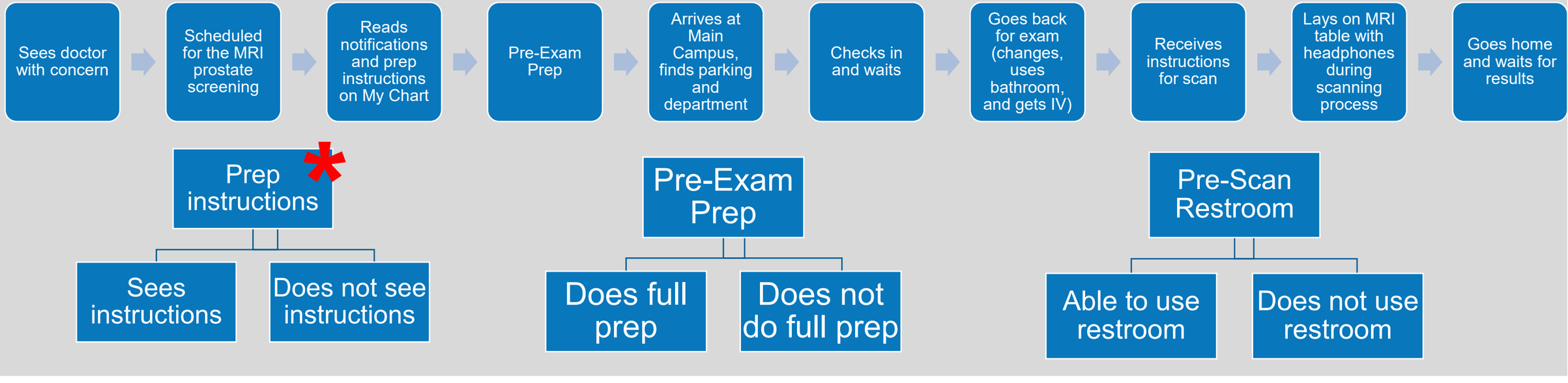
Analysis: Mapping the Process



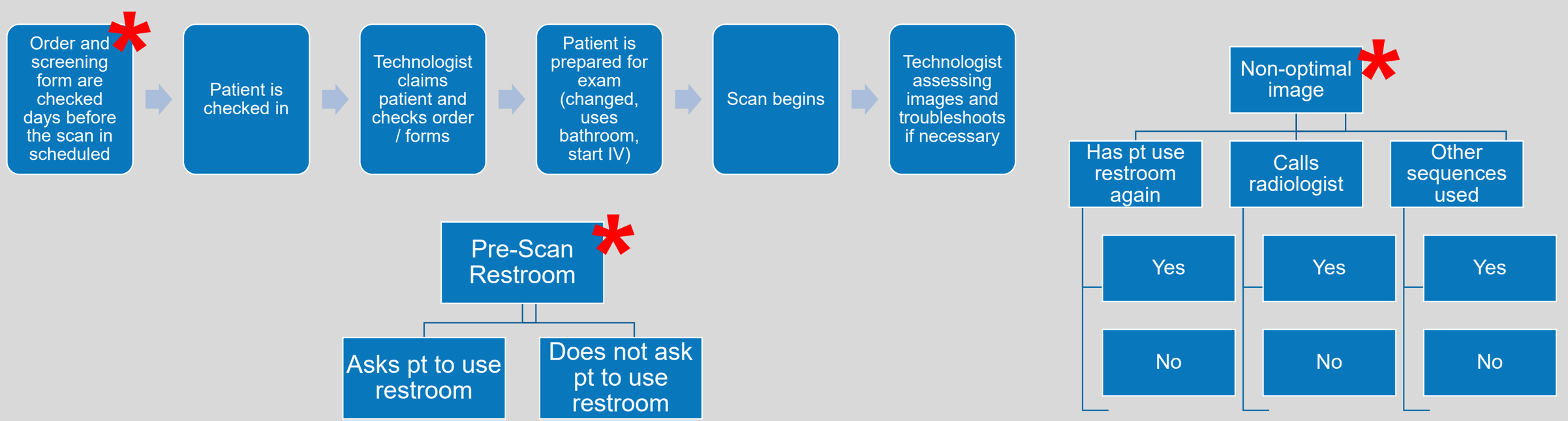
Analysis: Post-Gemba Process Maps

*** Denotes points of variability and lack of standardization**

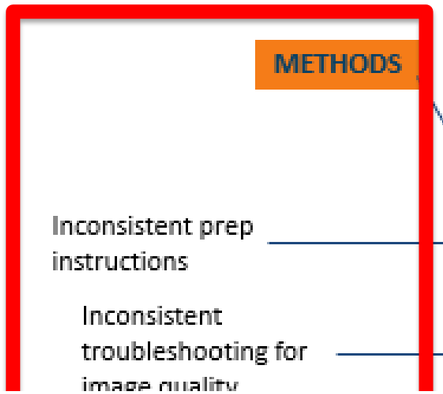
Patient Process Map

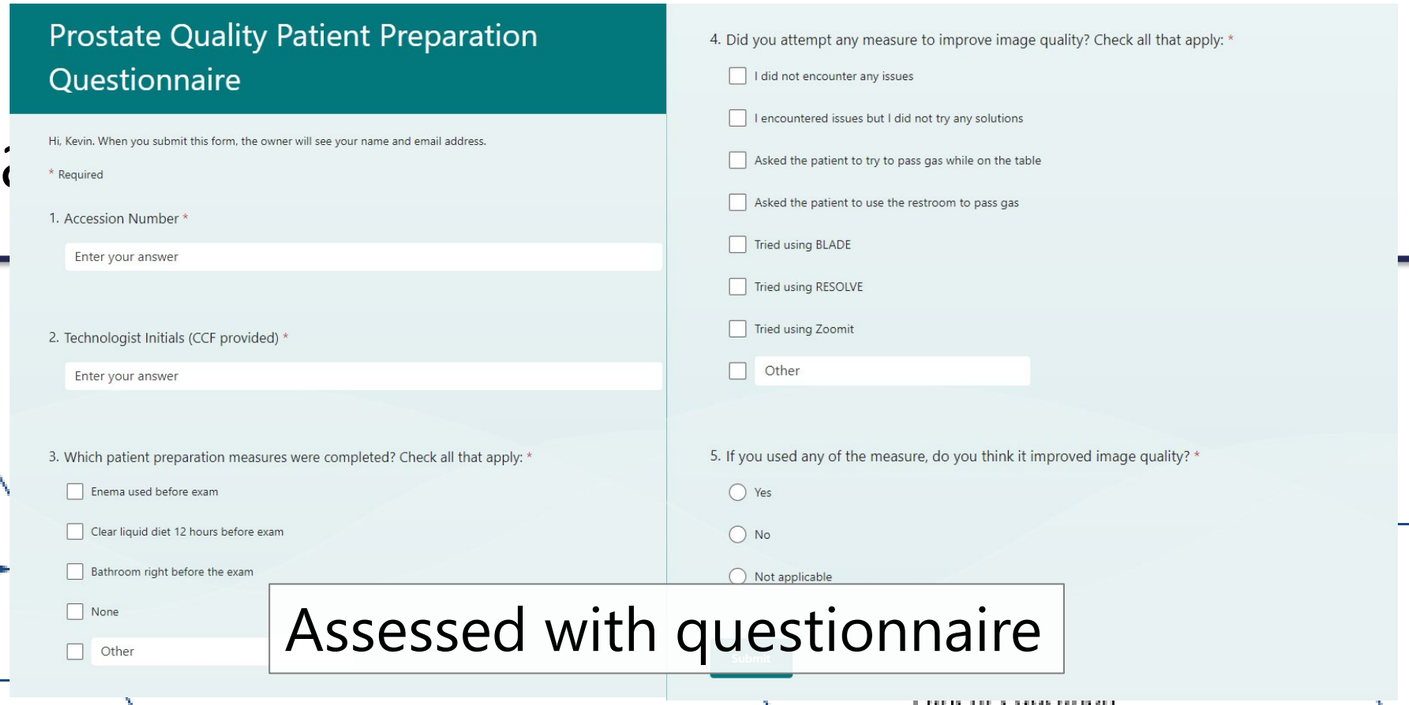


Tech Process Map

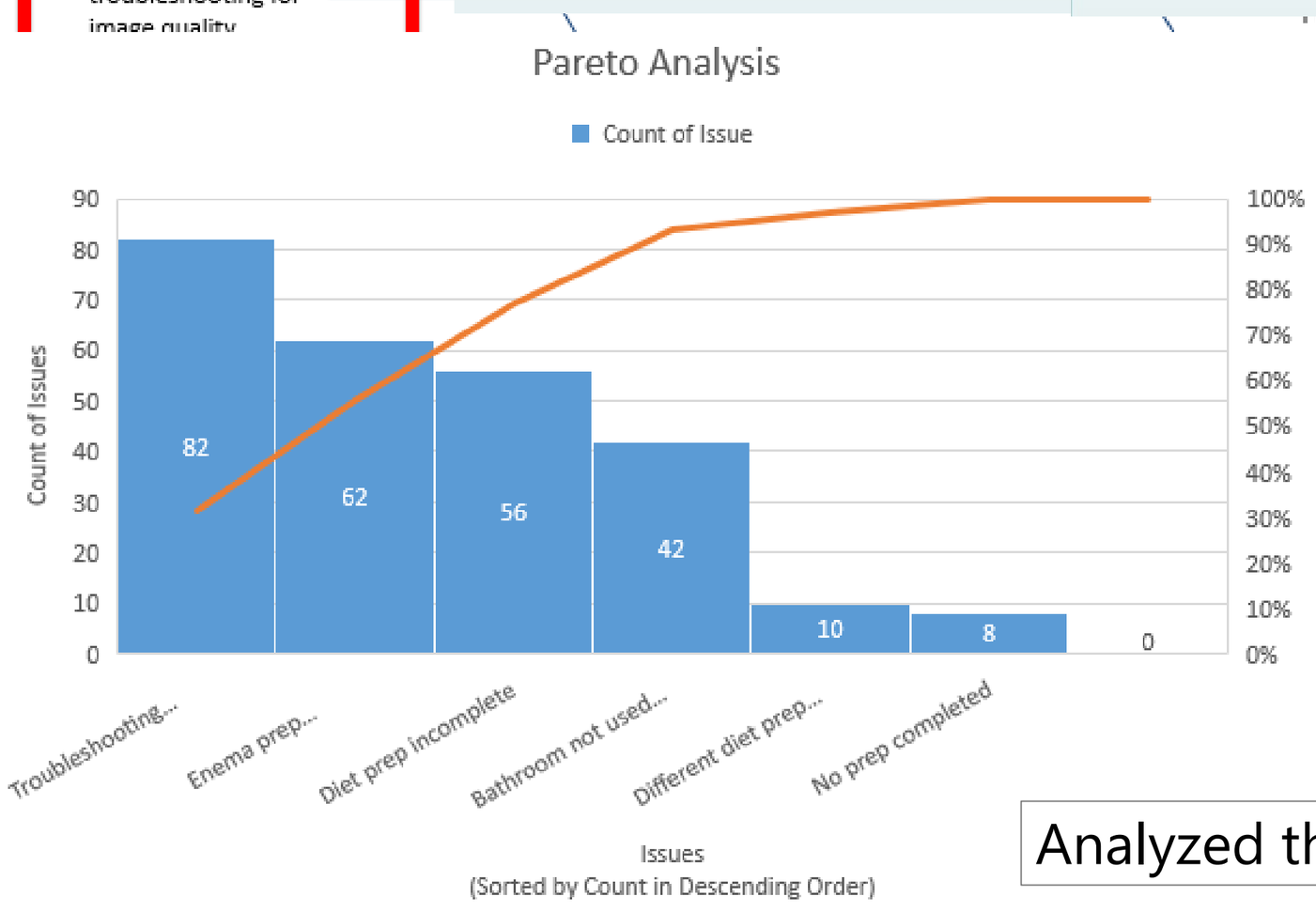


Analysis: Ca

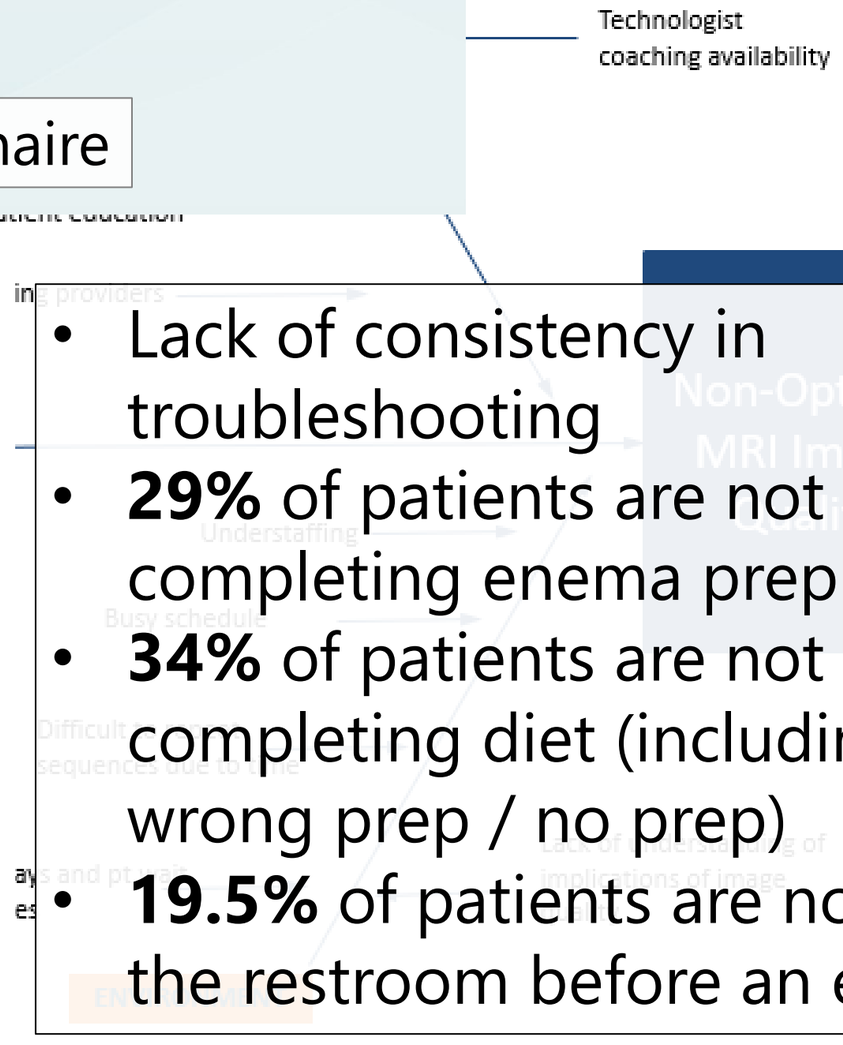




Assessed with questionnaire



Analyzed the data



- Lack of consistency in troubleshooting
- **29%** of patients are not completing enema prep
- **34%** of patients are not completing diet (including wrong prep / no prep)
- **19.5%** of patients are not using the restroom before an exam

ACR LEARNING NETWORK

Root Causes and Key Drivers

Root Causes

- Bowel gas and motion artifacts
- No / incorrect enema or diet prep
- Inconsistent troubleshooting process
- Lack of standards on image quality
- Scanner protocol variability

Key Drivers

- Standardized troubleshooting process
- Consistent and timely, and effective prep instructions
- Standardized protocols across scanners
- Have an ongoing QC process

Example intervention

BEFORE YOUR EXAM
1. If you were given an implanted medical device identification card, please bring it with you to your appointment.
2. Do not eat for 12 hours prior to your exam, unless instructed otherwise. You may drink clear liquids. Do not drink beverages that contain caffeine or carbonation, such as coffee, tea, or colas.
3. If you have diabetes, contact the health care provider taking care of your diabetes or your primary care provider to ask how to manage your blood sugar.
4. If you have diabetes and wear an insulin pump, you will be required to remove it for your exam.
5. Give yourself a Fleet enema to cleanse your bowel 4 hours prior to your exam. Follow the directions on the package labeling and never exceed the recommended dose. If your exam is before 10 AM, you may give yourself the Fleet enema the evening before your exam.
6. Please make child and/or dependent care arrangements. Patients 17 years old and u
do not have parental/guardian permission documented in their electronic medical record
exam:
1. Written consent/permission from the parent/guardian
2. Phone number of parent/guardian to verify or gather information at time of visit

ARRIVAL INSTRUCTIONS:
1. Arrive 30 minutes before the start of your exam.
2.If you are signed up for MyChart, there is a safety screening form can be filled out pric
surgical history. FIlling this out prior to your visit is recommended as it will minimize any
form upon arrival.
3. If you use reading glasses, bring them with you to your appointment.
4. Bring with you any assistive devices you use to help you move around (cane, walker,
5. Wear comfortable clothing that is easily removed. You will be required to remove your
6. For your safety, assistance will be provided if you need help changing.

Patient instructions (BEFORE)

Blobs of text
Generic instructions

Patient instructions (AFTER)

Hello,

I am reaching out from the MRI team to remind you that the MRI appointment you are scheduled for requires some prep. See below for specific details. If you have any questions please call 216-444-8215.

ENEMA:
You will need to use a Fleet saline enema to cleanse your bowel **4 hours prior to your exam**.
If your exam is before 10 AM, you may give yourself the Fleet enema the evening before your exam.

Follow the directions on the package labeling and never exceed the recommended dose. Consult your pharmacist with specific questions.

You will be asked to use the restroom once again in the MRI department to help expel any additional gas or stool in your rectum.

DIET:
Do not eat for 12 hours prior to your exam, unless instructed otherwise.
You may drink clear liquids prior to MRI
- water
- juices (no pulp)
- broth

Do **NOT** drink beverages that contain caffeine or carbonation (at least 12 hours).
- **NO** coffee
- **NO** tea
- **NO** colas/sparkling beverages

Due to the importance of the prep, if prep is not completed fully or accurately there is a chance that the MRI appointment will need to be rescheduled. This is at the discretion of the supervising radiologist.

Thanks,
Rachel Harris (RT)(R)(MR), MRI Imaging Education Specialist

Clear, concise
Specific
Bolded

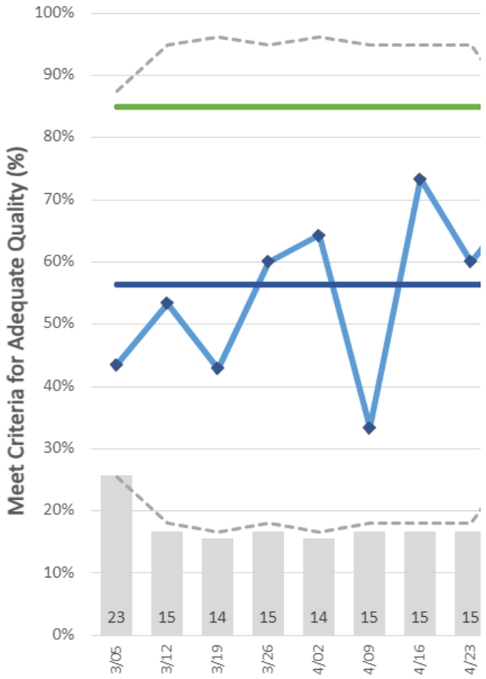
Have an ongoing QC process

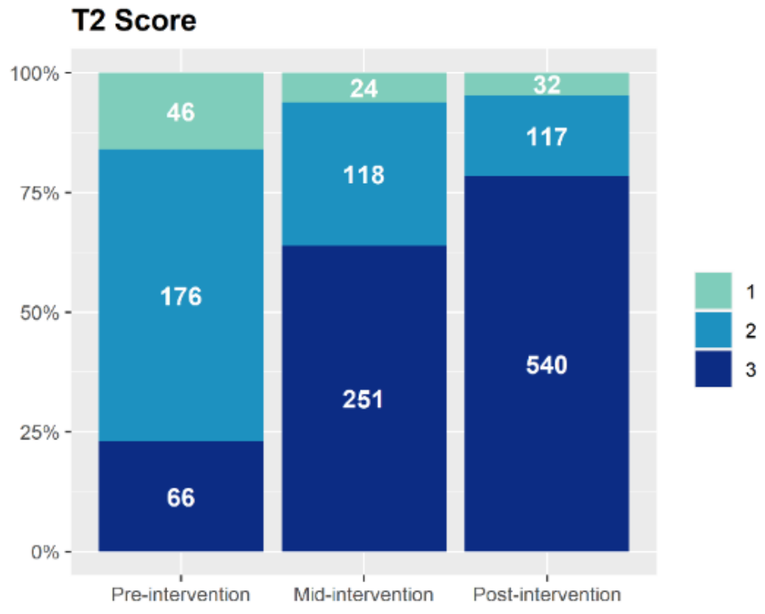
Developing consensus on image quality

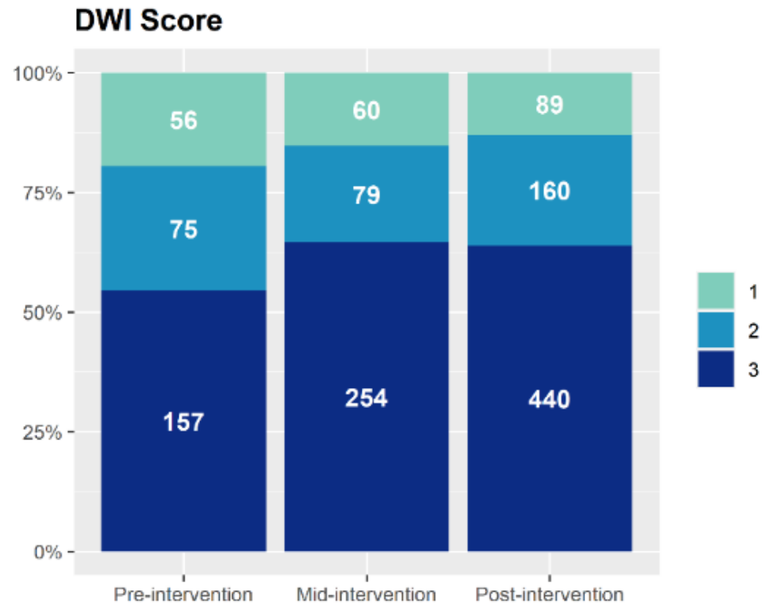
Maintain technologist skill

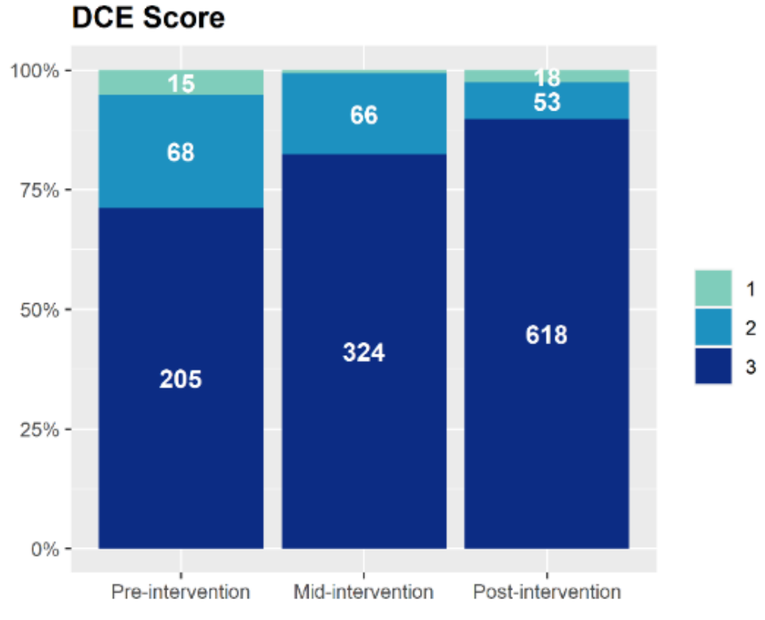
Results

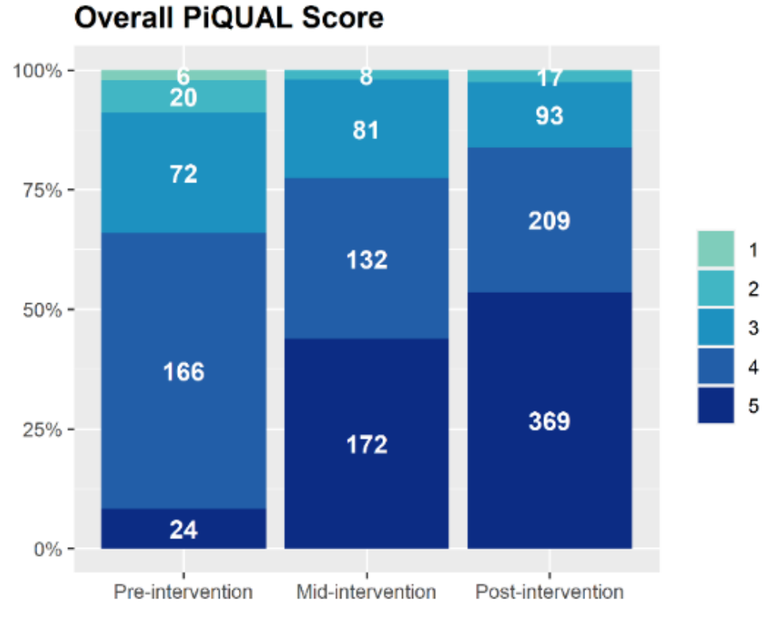
Distribution of image quality scores pre-, mid-, and post-intervention.











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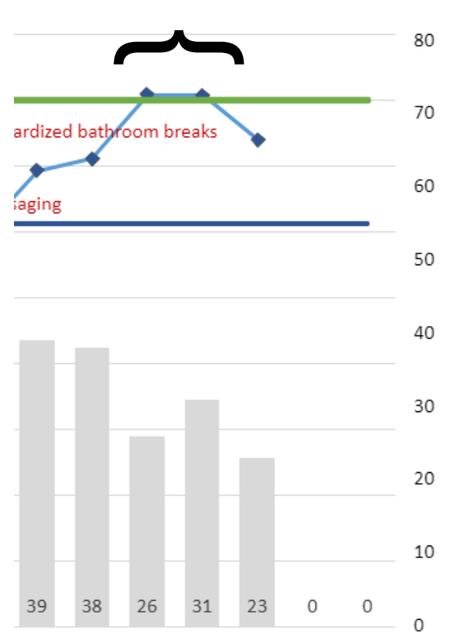
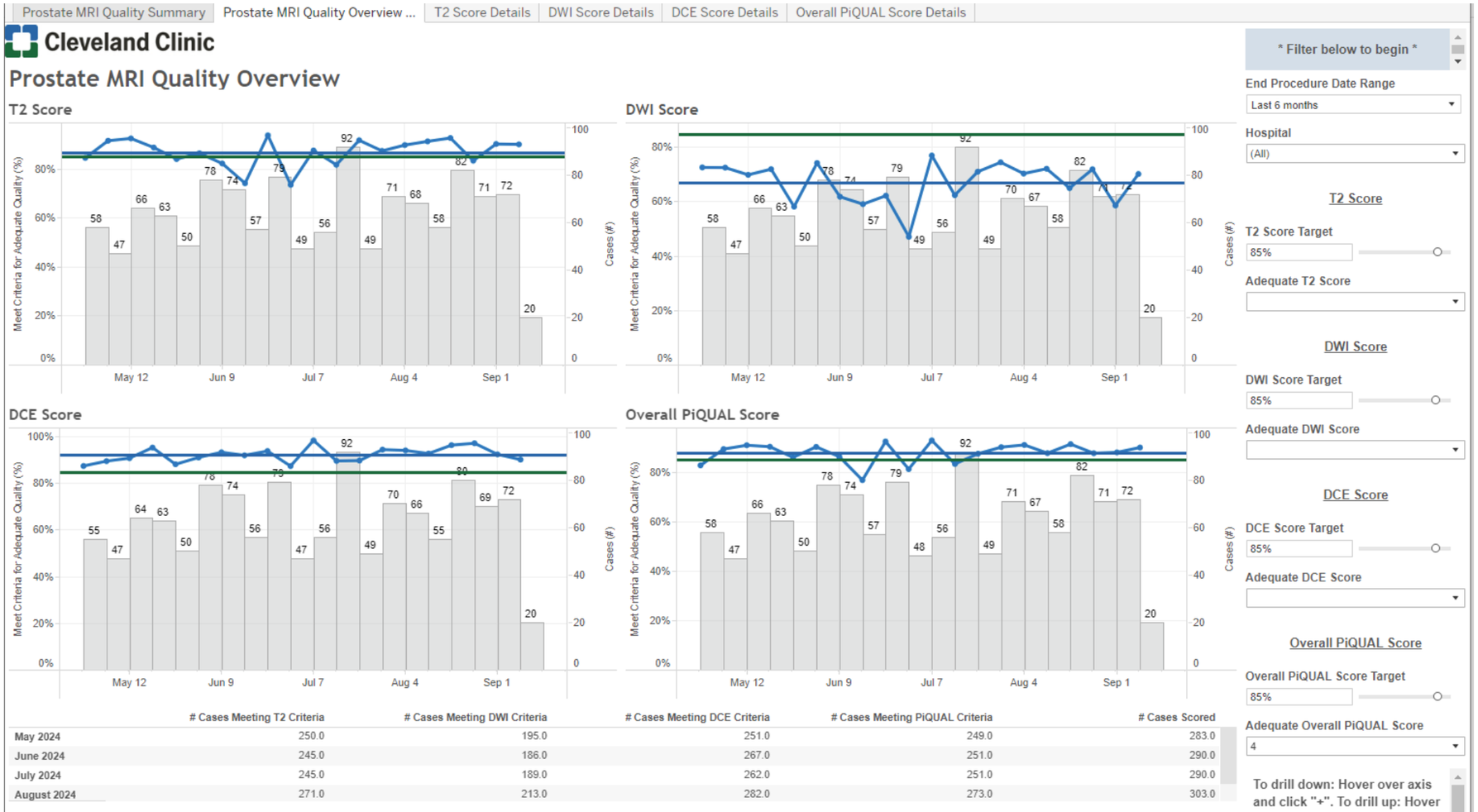


Discussion

- Most important interventions to improve image quality, particularly on the diffusion weighted images, related to removing rectal gas.
- Main challenge was the effort required to score each exam. Key to develop methodologies to automate steps in the process, where possible.
- Critical to understand when and how patients are receiving information to better understand how to reach them.
- Discussing the importance of prep compliance with patients and referring clinicians improved the effectiveness of the intervention.
- Creating a shared mental model on image quality is paramount in helping technologists understand what makes a quality image.

Discussion

- The project has also facilitated a sustainable quality control process through the development of tools to automate quality reporting.
- To date, over 3000 prostate MRIs have been scored using the PI-QUAL scoring system with results available in a real-time dashboard.



Conclusion and Next Steps

- Quality improvement is a process that requires concerted effort.
- Using a team-based approach, our organization was able to achieve sustainable performance improvement.
- We will continue to monitor image quality and adjust protocols and workflows where necessary.
- Given the initial intervention was at our main hospital, these efforts can be scaled and reproduced at other hospitals and imaging centers in our enterprise.
- Continue to build tools and techniques to reduce effort needed to capture important quality data.