Improving Compliance of Barcode Medication Administration of Contrast in CT on Mayo 3

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DEFINE

TEAM MEMBERS

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BACKGROUND

The Radiology CT team on Mayo 3 identified that they were not in compliance with Mayo Clinic's Barcode Medication Administration (BCMA) Policy, which requires staff to scan medications prior to administering them to a patient. It was also noted that aspects of Mayo Clinic's Medication Administration Policy and Medication Preparation Policy were not being followed appropriately.

GAP IN QUALITY

The CT team on Mayo 3 was utilizing a laminated sheet containing barcodes for various iodinated contrast medias and saline (seen in Figure 1). These were scanned during medication administration, as opposed to scanning the contrast bottle or saline vial used for each individual patient.

It was also noted during the Define phase that contrast was being prepared and loaded into the injectors for upcoming patients at inappropriate times in the process, such as when the previous patient was still in the exam room.

AIM STATEMENT

Improve compliance rate for barcode medication administration of contrast from 9% to 80%, by June 1st, 2022, without negatively impacting exam durations.

INSTITUTIONAL SIGNIFICANCE

Barcode scanning of medications is the final check of the five rights of medication administration: right patient, right medication, right dose, right route, right time.

Utilizing this technology allows frontline staff an opportunity to catch medication errors before they reach the patient, resulting in enhanced patient safety and fewer opportunities for medication errors.

MEASURE

IMPROVEMENT MEASURE BASELINE AND SAMPLE SIZE

The BCMA process was followed appropriately 9% of the time in a sample of 33 CT exams with contrast on Mayo 3.

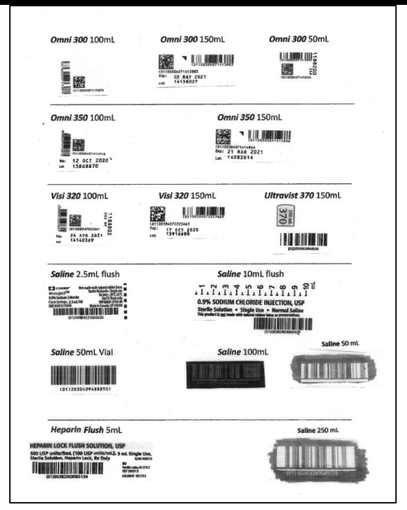
BALANCING MEASURE BASELINE AND SAMPLE SIZE

The team decided to use exam durations as the balancing measure for this improvement. Baseline exam durations were 19 minutes in the same sample of 33 CT exams with contrast on Mayo 3.

DATA COLLECTION PLAN FOR IMPROVEMENT AND BALANCING MEASURES

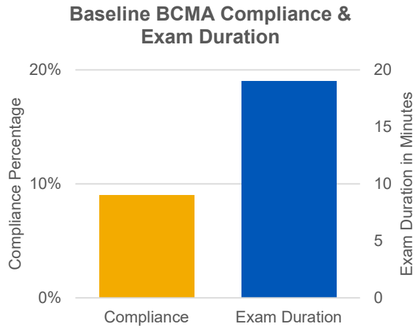
The team developed an audit form that was utilized in observation of the sampled patients for both the pre- and post-intervention samples. Exam durations were measured pre-intervention via exam events in Epic, post-intervention exam durations were measured via observational audit and timings.

FIGURE 1: CURRENT CONDITION



Laminated sheets were available at each CT scanning station in the Control Area. Technologists or nurses would scan these barcodes as part of the medication administration workflow, as opposed to the barcodes on the medications themselves.

FIGURE 2: BASELINE



The baseline compliance level for barcode administration of contrast was 9%. Baseline exam duration times were 19 minutes.

ANALYZE

KEY CAUSE SELECTED

- Lack of understanding of policies/procedures and what is required of staff
- BCMA equipment not available in an efficient location
- No standard process for documentation of contrast administration and waste
- No standard training or evaluation process for contrast administration competency
    - No standard training documents or resources

OTHER POTENTIAL CAUSES

- Documentation not in a standard location in EHR, depending on role (technologist vs R.N.)
- Not all types of contrast can be barcode scanned

IMPROVE

INTERVENTIONS SELECTED AND TESTED

The team tested three different workflows to test through PDSA (Plan, Do, Study, Act) cycles, with the goal of improving BCMA compliance while maintaining exam duration times.

- PDSA 1 involved following the correct BCMA and medication preparation workflows while maintaining current equipment and set-up.
- PDSA 2 utilized current equipment, but reduced movement back and forth between the exam room, where contrast is administered, and the control area, where it is documented.
- PDSA 3 tested at-the-elbow technology (Rovers & Workstations on Wheels).

COMPARISON FOR THE IMPROVEMENT MEASURE

All three tests of change resulted in a fully compliant BCMA and medication preparation workflow.

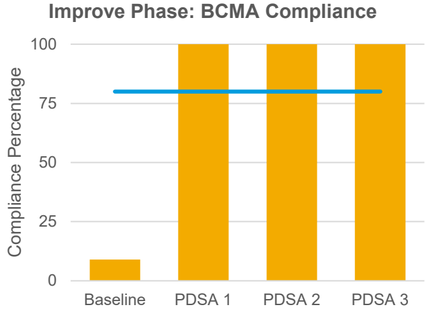
COMPARISON FOR THE BALANCING MEASURE

The PDSA 2 and PDSA 3 workflows resulted in a decrease in exam duration times, while PDSA 1 showed an increase.

IMPLEMENTATION PLAN

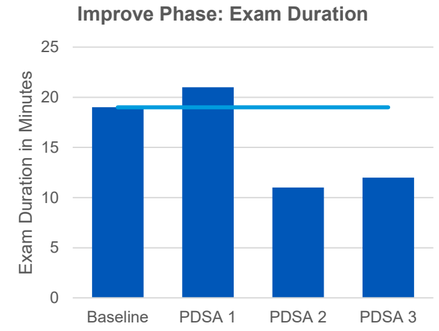
PDSA 2 was selected as the final workflow. It was translated into a swim lane document which was shared with staff via email, at daily huddles, and printed and available at each tech workstation.

FIGURES 3: IMPROVEMENT



The team tested three different potential workflows for improving BCMA compliance. Each workflow resulted in 100% compliance, well above the goal of 80%.

FIGURE 4: BALANCING MEASURE



Of the three workflows tested, PDSAs 2 and 3 reduced exam durations to 11 and 12 minutes, respectively. While PDSA 1 increased exam durations to 21 minutes.

CONTROL

LESSONS LEARNED

Helping staff understand why BCMA is important and why the process steps need to occur in a specific order helps to improve buy in with solutions.

The most desired solution at the start of a project is often not the end result. This team favored Rovers and tablets going into this project but ended up selecting a different solution.

Solutions can have a positive impact elsewhere. Contrast waste documentation has become more accurate, reducing rework for the Charge Champions.

COMMUNICATION

Results of the project and lessons learned were communicated to project sponsors. Ongoing compliance will be communicated to frontline staff via work unit huddle boards.

HAND-OFF PLAN

The monitoring and intervention plan was handed off to the operational team after the control plan was finalized.

MONITORING PLAN

Workflow audits will be performed by the Mayo 3 CT Hub Lead 3 times a week for the first month and then weekly. BCMA compliance will be monitored monthly by the CNS. Compliance below 90% will prompt the team to reconvene to seek root causes and barriers, and plan to next steps.