

Improving Access to Pediatric MR performed under General Anesthesia— Benefits of a Rapid Improvement Event (RIE)

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Disclosures

- N Sarwani – No financial disclosure
- M Bruno - Book royalties Oxford University Press and Elsevier
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Background

- Timely access to imaging services for our most vulnerable patient population – children – is a vital aspect of radiology care.
- For small children, MR imaging must often be performed under general anesthesia (GA) to allow diagnostic quality images to be obtained.



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Background

- Organizing a combined service to provide MRI under GA requires a complex interplay between the referring physician and the departments of anesthesiology and radiology, and scheduling backlogs will result when demand exceeds supply.



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Background

- In December 2014, at our tertiary academic medical center, the backlog for the 1st, 2nd and 3rd available MRI appointment to be performed under GA was > 87 days. This resulted in significant “downstream” delays in patient’s clinic appointments, especially for Pediatric Neurology and Neurosurgery, as MRI results are required at the time of clinic visit.



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Background

- A dedicated MR scanner was used to scan patients under GA, 5 days a week.
- An additional MR scanner was allocated one day a week to scan more patients



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Background

- As additional scanner time and technologists resources were redirected to help address the backlog of GA cases, there was less scanner availability for other MRI studies, creating a broader patient access problem.



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Purpose

- Accordingly, our 3 SMART goals were as follows:
 1. Increase throughput of pediatric, out-patient, GA cases through the MRI scanner
 2. Reduce both the average time and the variability of patient contact times for each appointment slot
 3. Reduce the GA MRI waiting list to < 30 days.



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Methods

- A Rapid-Improvement Event (RIE), also known as a kaizen event, was co-sponsored by the departments of Radiology and Anesthesiology and coordinated by the institutional process improvement team utilizing Lean methodology.
- Key stakeholders in attendance included radiologists, anesthesiologist, technologists, radiology nursing, radiology schedulers and image management (IT) personnel.



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Methods

- RIE team members dedicated 5 continuous days to allow for an intense, focused effort to complete the process improvement exercise



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Methods

- The DMAIC process was used as follows:
 - Define
 - Mapping of existing processes, identifying pain points of the process from all stakeholders (radiology, anesthesiology, scheduling and nursing), and value analysis
 - Measure
 - The group performed Gemba walks to observe the current processes, performed Takt-time analysis, and completed a waste inventory



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Methods

- The DMAIC process was used as follows:
 - Analyze
 - Brainstorming sessions were performed, with root cause identification, benefit and effort analysis
 - Improve
 - Finalize action items, future state map, develop implementation and roll-out plan, pilot solutions
 - Control
 - Create 30 day action list, development of control plan



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Methods

- Additionally, a representative from radiology met individually with all stakeholders to further understand their processes, clarify available resources, explore options for improvement and coordinate efforts



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Areas of Concern

- Lack of availability of Anesthesia resources
- Large gaps between patients during the workday, wasting MR scanner time
- Not infrequent number of patient “no-shows”
- Parents not following dietary instructions
- Patients scanned by appointment times, with no regard to the age of the patient being scanned.



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Baseline Data

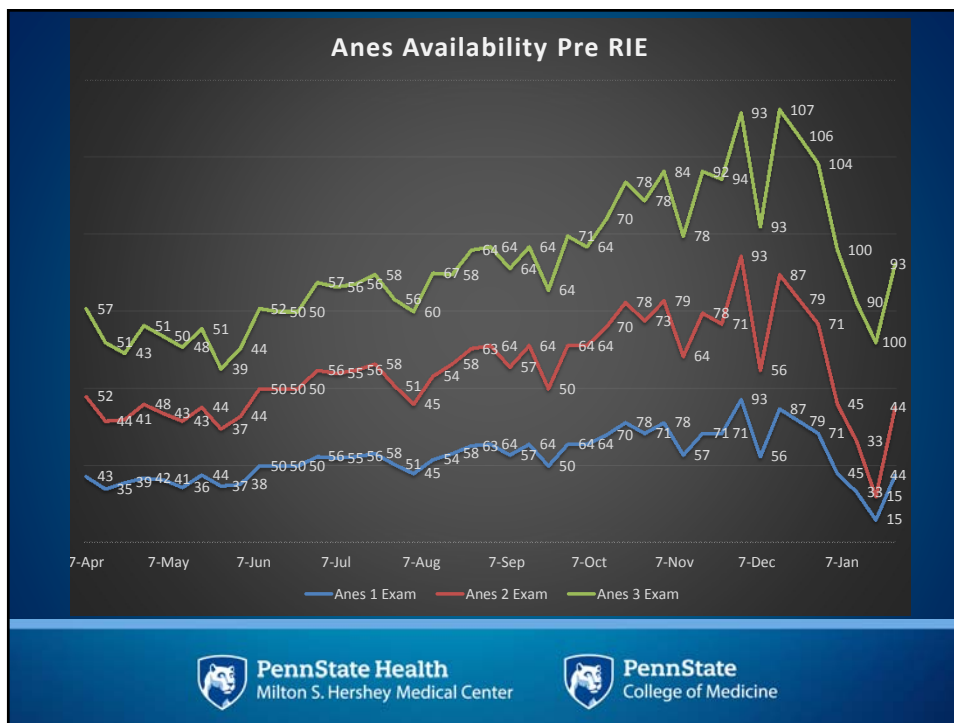
- The average wait time for the 1st and 3rd available MR exam to be performed under GA in December 2014 was 87 and 107 days, respectively.



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Intervention

- The resources made available by the department of anesthesia were not found to be limiting.
- We discovered that the throughput of patients was reduced, in part, by the presence of “blocks” in the radiology scheduling template, which severely limited the availability of the dedicated GA MR scanner. The MRI scheduling template was modified to remove these restrictions.



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Intervention

- We addressed the high number of “no shows” by making changes to the content of the pre-procedure phone calls and by requiring radiology nursing to speak directly to the patient or relative and not merely leave a message.
- Frequent failure of parents to follow dietary instructions leading to delayed/rescheduled cases was addressed by a re-design of written dietary instructions that are mailed to the patient.
- These interventions were all implemented simultaneously in May of 2015.

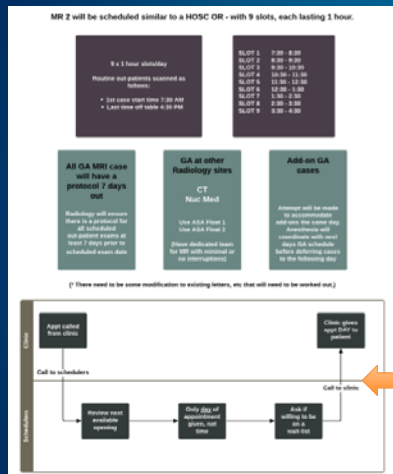


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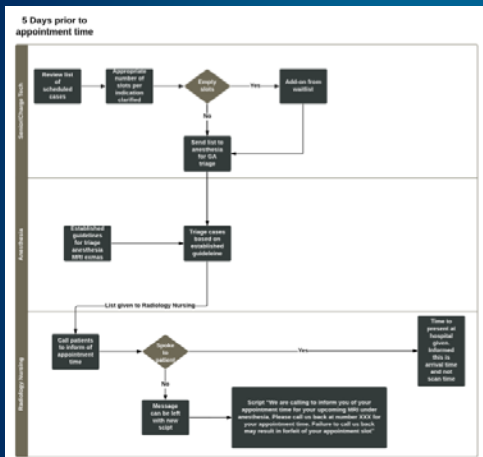
New Workflow



Clinics will be given an appointment date only at the time of scheduling, without an exact time of the scan.



New Workflow



5 days prior to the scan date, the exact order in which the patients will be scanned will be determined by the Dept of Anesthesia.

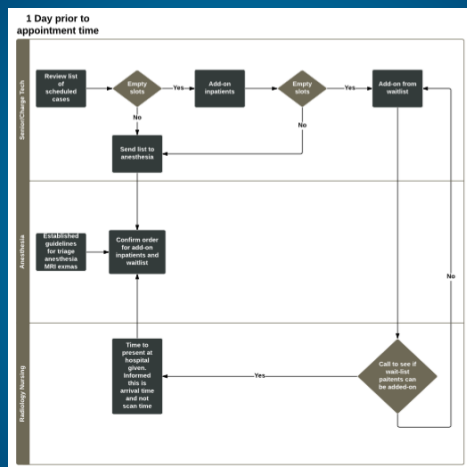
This process will allow the triage of our youngest, most vulnerable and complex patients to be preferentially scanned earlier during the day, while allowing our older, more able patients to be scanned later in the day.

Patients/guardians will be contacted by nursing staff, following existing standard of practice (SOP). In addition to providing dietary instructions for anesthesia, they will be given their appointment time.

3 attempts will be made to directly contact the patient/guardian.



New Workflow



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New Workflow

- Patients/guardians will receive a standard letter approximately 10 days prior to their scan, mentioning scan date, dietary requirements as well as a FAQ of what to expect.
- (10 day notice was difficult to do as appointment times were in the 2-3 day range)



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Results

- After implementation of our intervention regimen, the average wait time for the 1st and 3rd available MR exam to be performed under GA fell precipitously, ultimately reaching the current level of < 7 days, exceeding our target.

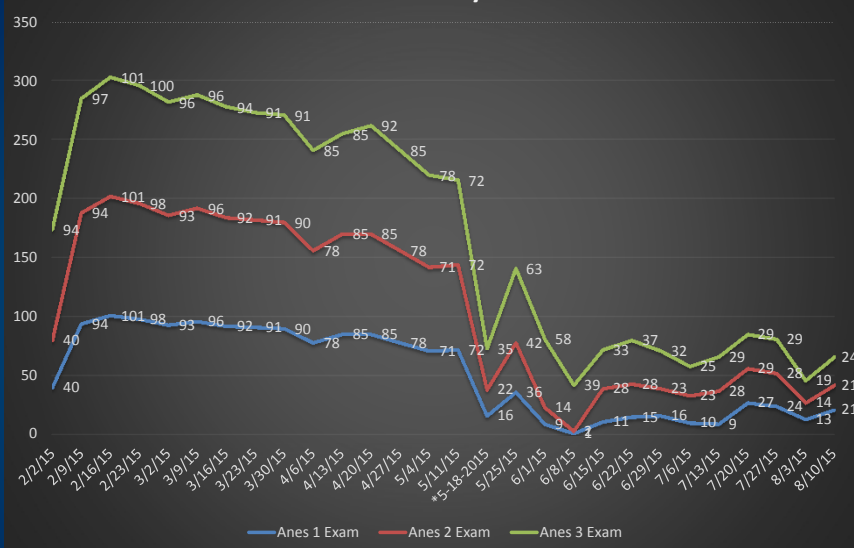


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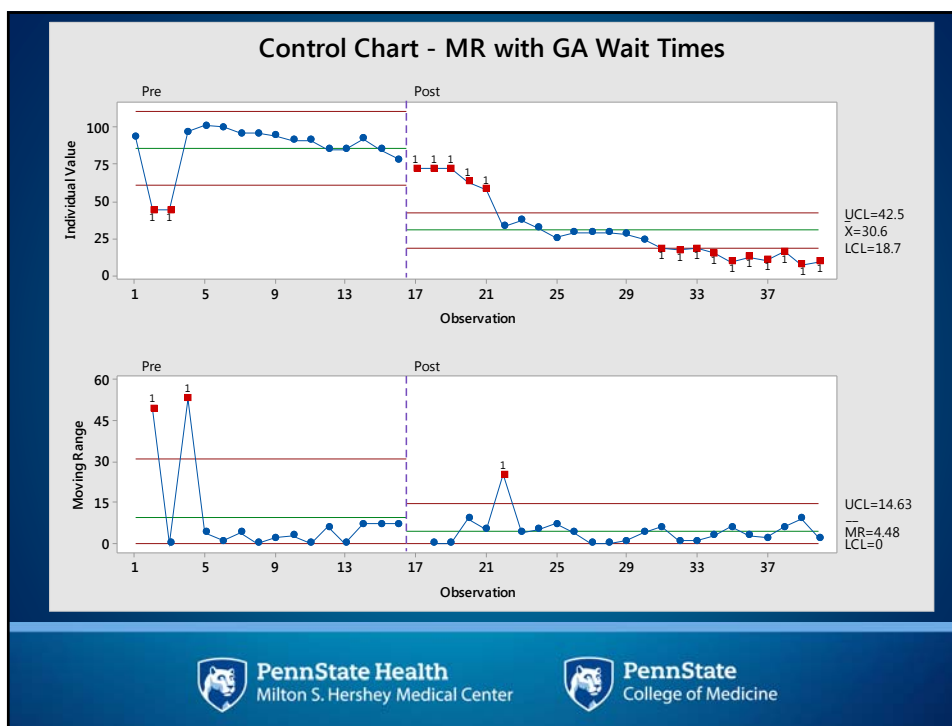
Anes Availability Post RIE



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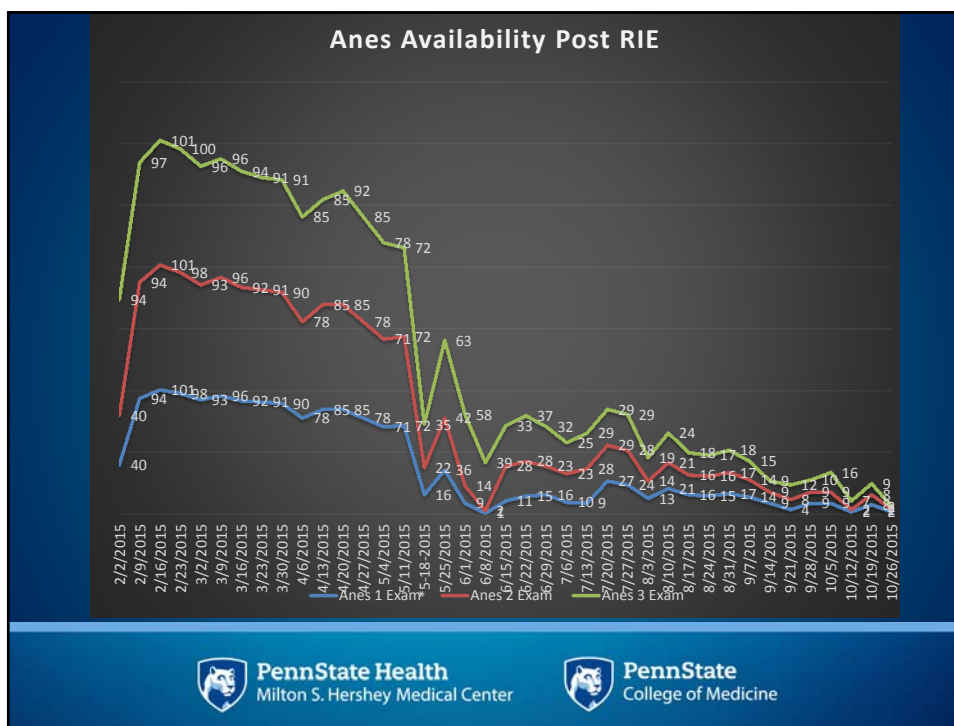


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Results

- As part of the control phase of the process, the wait times were continued to be monitored and showed a long lasting beneficial result of keeping wait time for GA MRI to less than 7 days.



Conclusion

- RIEs are a useful tool to bring together stakeholders to review complex healthcare delivery processes such as MR exams performed under GA.
- Identifying sources of inefficiencies as well as scheduling template errors led to a marked decrease in wait times for pediatric MR exams performed at our institution.

Conclusion

- Shared buy-in from stakeholders allowed us to maintain our gains by development of a novel scheduling technique for these cases, resulting in increased patient throughput on the MRI scanner by decreasing “wasted” scanner downtime, as well as decreased “no show” and last-minute cancellations.



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Conclusion

- Delays and rescheduled cases due to patients not following dietary restrictions also decreased.
- To date, the improvement has been long-lasting and sustained, with current data showing a wait of 2-3 days for a GA MRI.



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