Using a Pareto Approach to Better Match Radiology Staffing to Inpatient Care and Service Needs

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HOME OF SIDNEY KIMMEL MEDICAL COLLEGE

Background

- Delayed radiologic diagnoses contribute to poor outcomes, patient safety events and higher costs.

- After hours coverage at academic institutions varies widely, with the majority having long turnaround times (TAT).[1]

- Academic models of after hours trainees providing preliminary reports has become unsustainable.

Off Hours TATs (Chan et al 2015)

*Stat

Legend: Expected, Observed, Difference
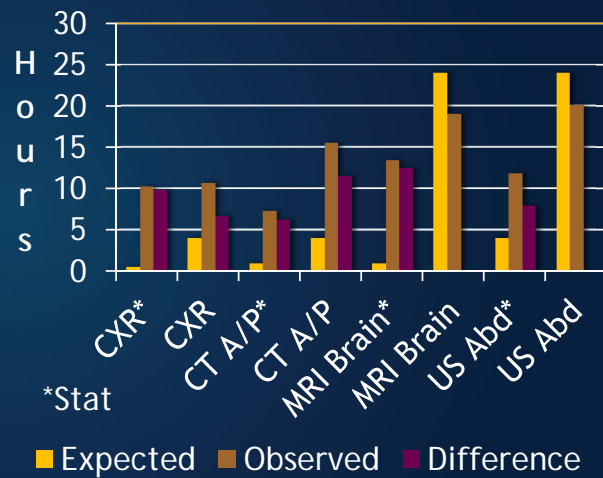
1. Chan KT, Carroll T, Linnau KF, Lehnert B. Expectations among academic clinicians of inpatient imaging turnaround time. Does it correlate with satisfaction? Acad Radiol 2015; 22: 1449-56.

Objectives

Improve the quality and safety of inpatient radiology services at a large tertiary academic medical center by identifying opportunities to improve the staffing model and implement staffing changes and measure using the Donabedian approach:

- Structure ➔ optimize staffing and develop clinical teams
- Process ➔ improve off-hours inpatient turnaround times (TATs)
- Outcome ➔
  1. Improve critical results reporting
 2. Stakeholder perceptions

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Methods

- A Kaizen event utilizing critical findings reporting (CFR) and TAT's to understand gaps in coverage occurred.
- A Pareto analysis conducted to identify areas of improvement regarding volume of uncovered inpatient studies and inpatient studies with highest turnaround times.
- Data was used to propose staffing changes designed to optimize maximal TAT, CFR, workflow and trainee educational improvements.

Inpatient CTs FY2016)

Totals Cases — Time of Day

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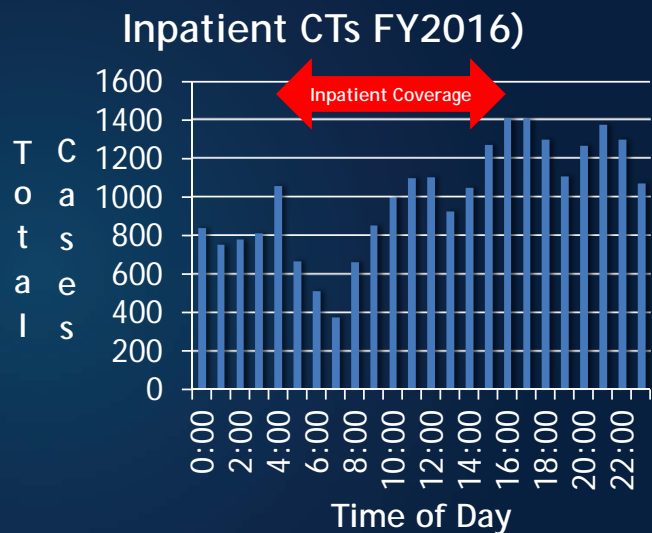
Methods

- The plan was presented using a "Burning Platform" approach to create a sense of urgency.
- The plan was implemented 7/5/16.
- 3 months post implementation staff surveys conducted and inpatient TATs and CFR were collected and compared to pre-implementation data.

Esophageal Perforation

Sengstaken-Blakemore tube Placement x-ray 4AM Interpreted 10AM
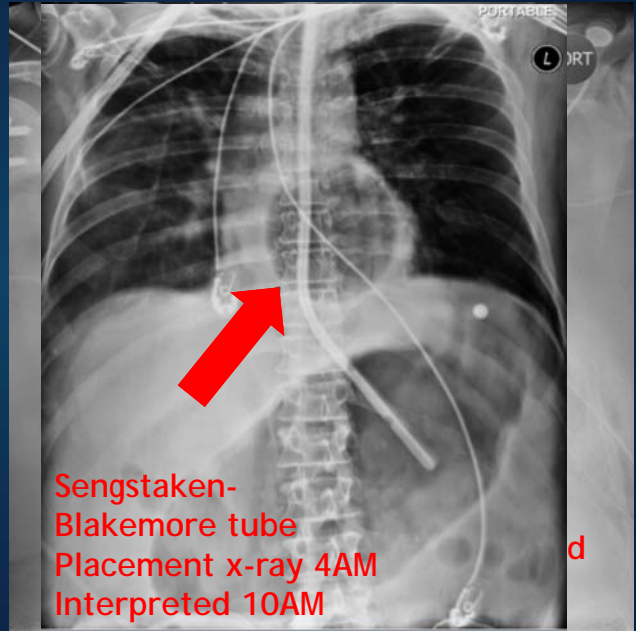
Results: Structure

- Extended subspecialty team coverage to 8PM
  - Neuroradiology
  - Body Imaging
  - General (x-ray)
- Added 3 faculty members to evening shift

Pre-implementation

Neuroradiology

X-Ray

Body Imaging

Post-implementation
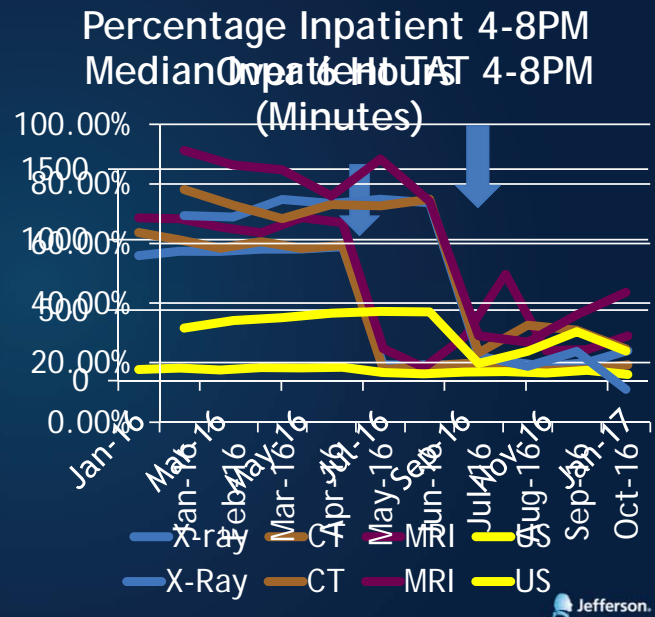

Neuroradiology

X-Ray

Body Imaging

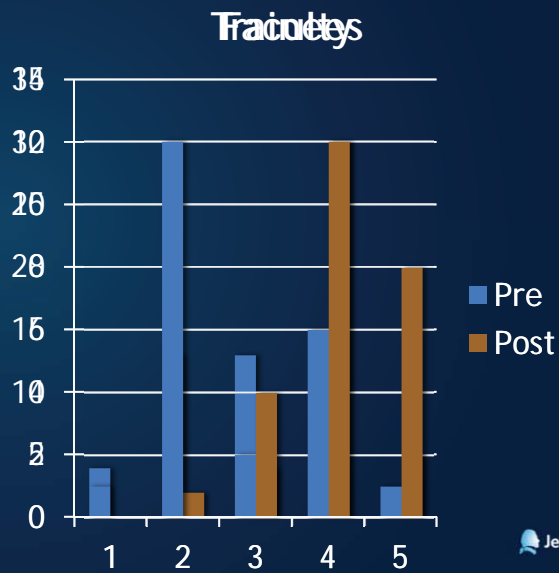Jefferson.

Results: Process

- Inpatient evening turnaround times dropped precipitously
  - Formerly inpatient studies with the longest TAT
  - Relatively big gain because of relatively large number of studies
- Percentage of cases exceeding 6-hour inpatient TAT target dropped precipitously

Percentage Inpatient 4-8PM Median Inpatient Off-Hours TAT 4-8PM (Minutes)

Legend: X-ray, CT, MRI, US / X-Ray, CT, MRI, US
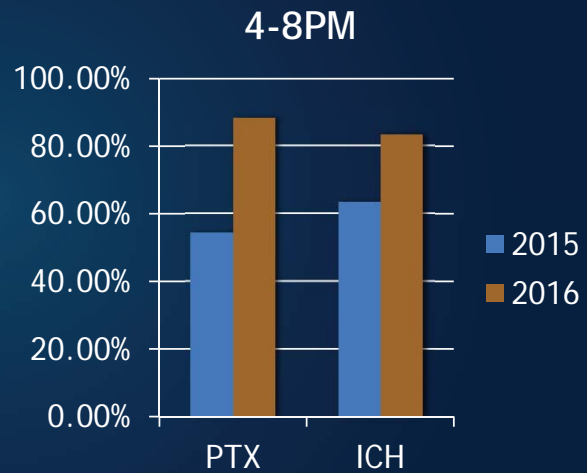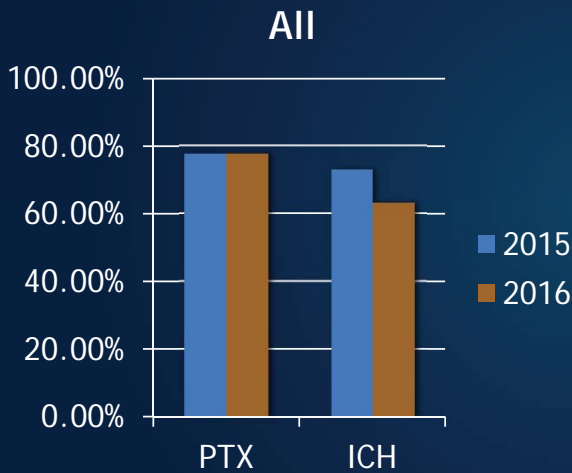
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Results: Outcome

Stakeholder perceptions
- Faculty survey:
  - Improvement in off-hours coverage
  - Slightly negative impact on morale
- Trainee survey:
  - Improvement in off-hours coverage
  - Slight improvements in education and autonomy
  - Neutral-slight improvement on morale
- Technologist survey:
  - Minimal positive impact on off-hours efficiency
  - Pronounced improvement in daytime operational efficiency

Critical Findings Reporting (CRF)
- Surrogate for patient outcomes
  - Intracranial hemorrhage
  - Pneumothorax
- Marked improvement in CRF off-hours (4-8PM)

On a scale of 1-5 (1 = poorly and 5 = optimally), how well are inpatient studies covered off hours?

Trainees / Faculty

Legend: Pre, Post

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Results: Outcome

PTX = Pneumothorax
ICH = Intracranial Hemorrhage

All

4-8PM

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Conclusion

- Substantial inpatient care gaps often exist in off hours academic radiology departments.
- The "burning platform" approach helps to underscore the urgency to implement change.
- A Pareto analysis highlights opportunities for improvement through modest shifts in staffing.
- While resistance to change is often daunting, the negative impact on morale is mitigated with engagement by all involved stakeholders.

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