Decreasing ED CT Interpretation Turn Around Times in An Academic Radiology Department

Audrey Verde, MD, PhD; Yoan Kagoma, MD; Vera Mayercik, MD; L Jake Mickelsen, MBA; Bryan Lanzman, MD; Larry Chow, MD

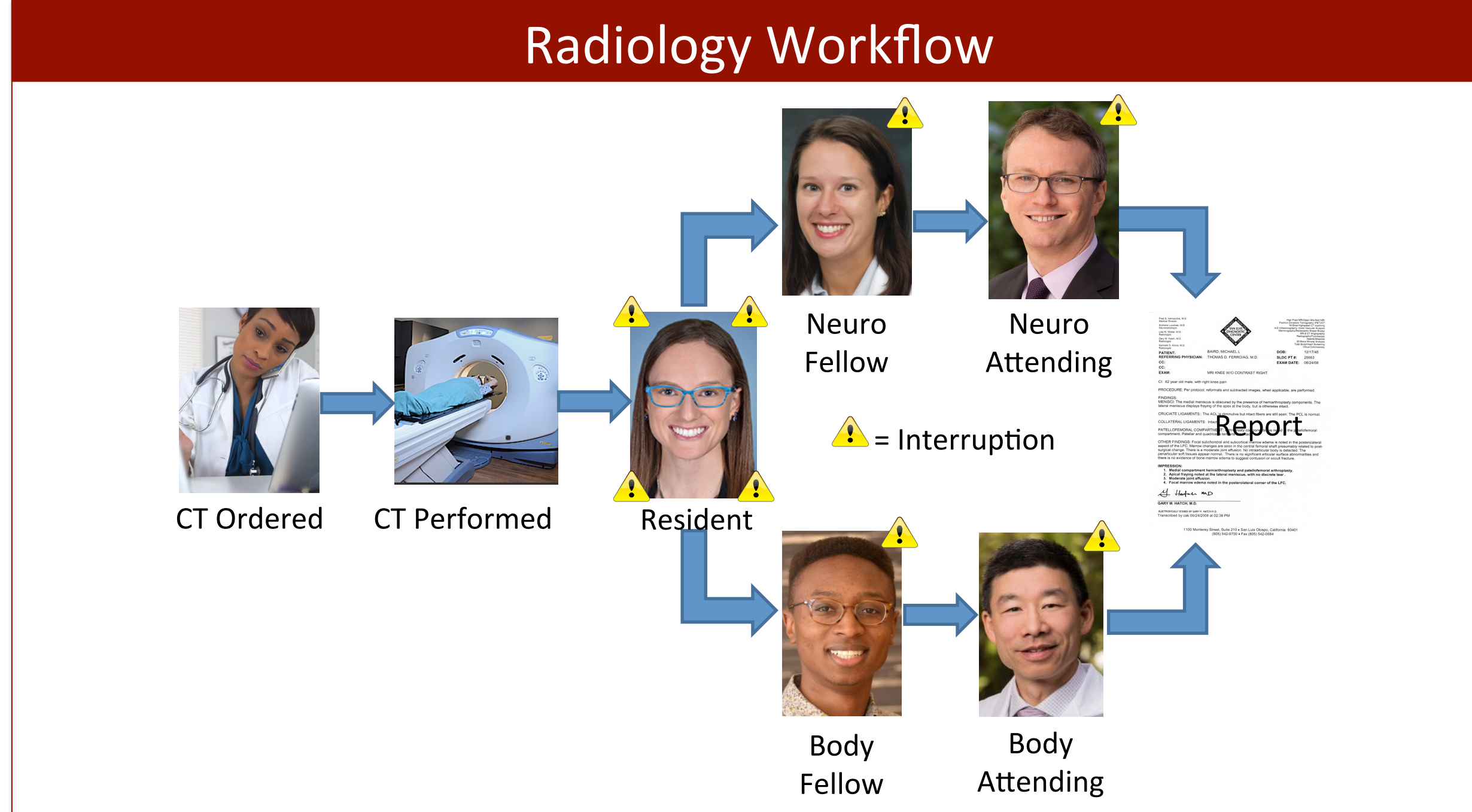*Stanford University Department of Radiology, Stanford, CA*
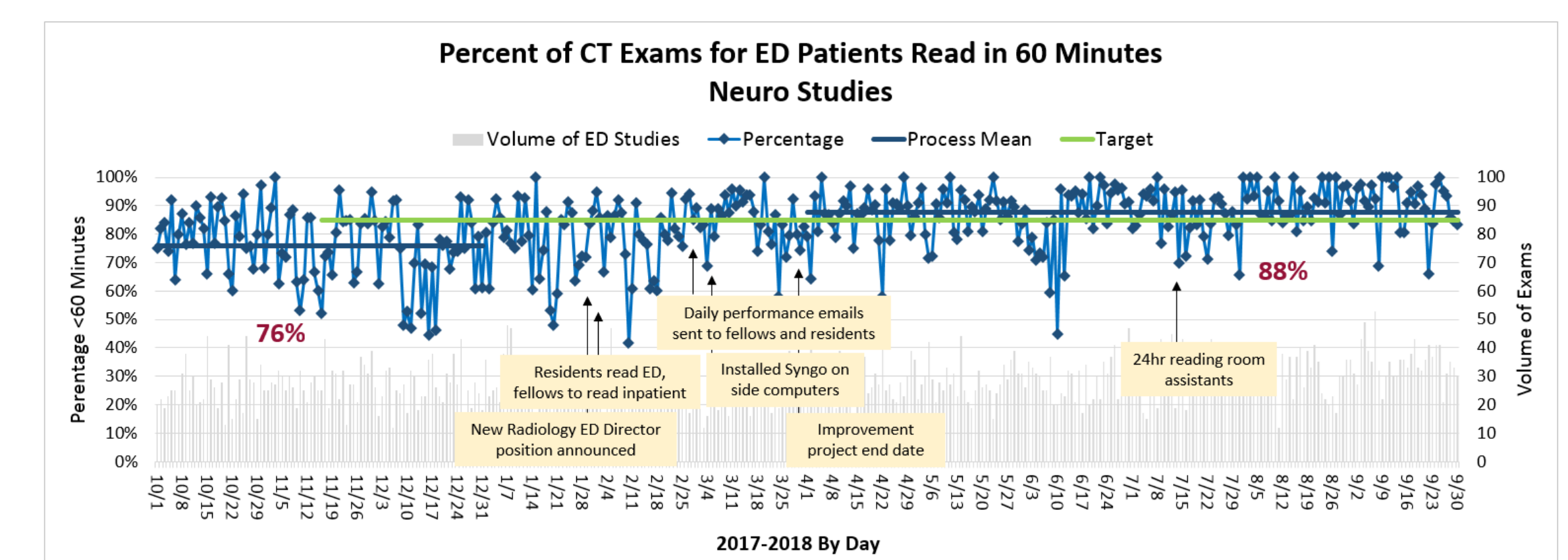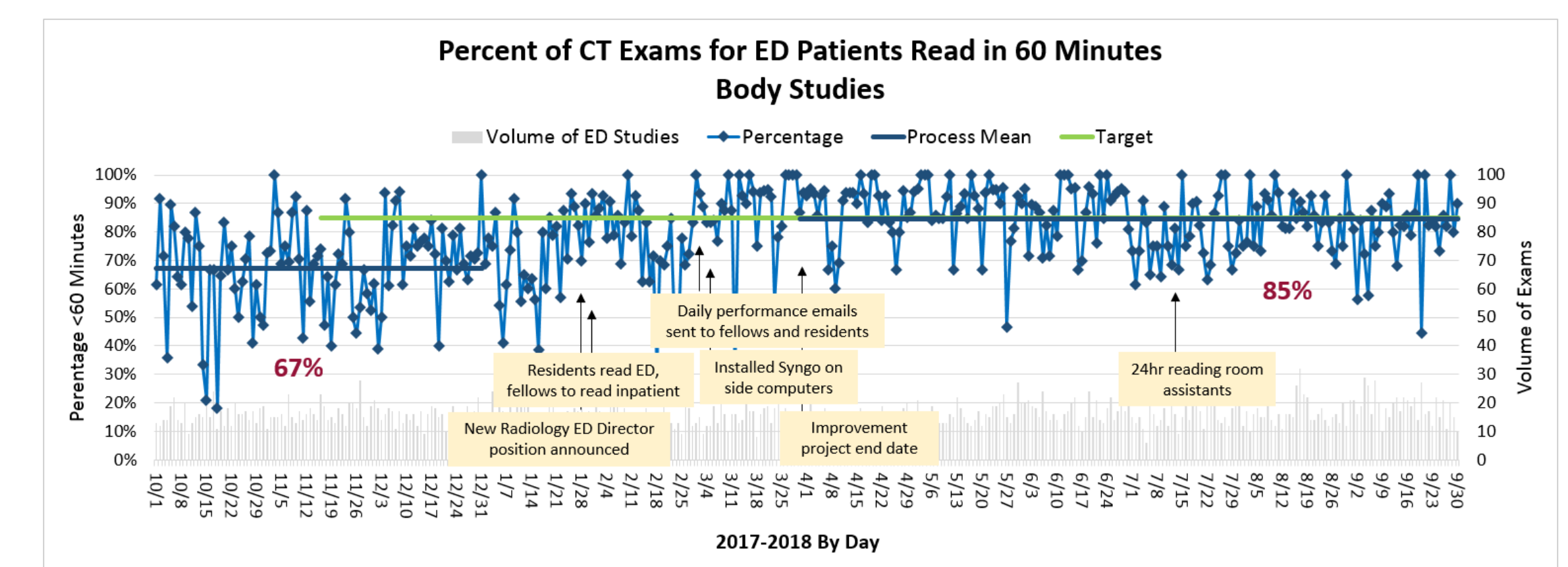
Background

Timely imaging is important in the Emergency Department (ED). Computed Tomography (CT) plays a key role given its speed of acquisition and the actionable information provided. In 2017, a total of 22,043 ED CTs were performed at Stanford.

Decreasing CT report turn around time (TAT) can be difficult for several reasons; namely, a complex patient population, a desire for sub-specialty interpretations, and a dedication to preserving resident education opportunities.

In October 2017, ED TATs were targeted for improvement with a goal of increasing CTs read within 60 minutes from 72% to 85% by April 2018. Read time was defined from exam completion to first published report.
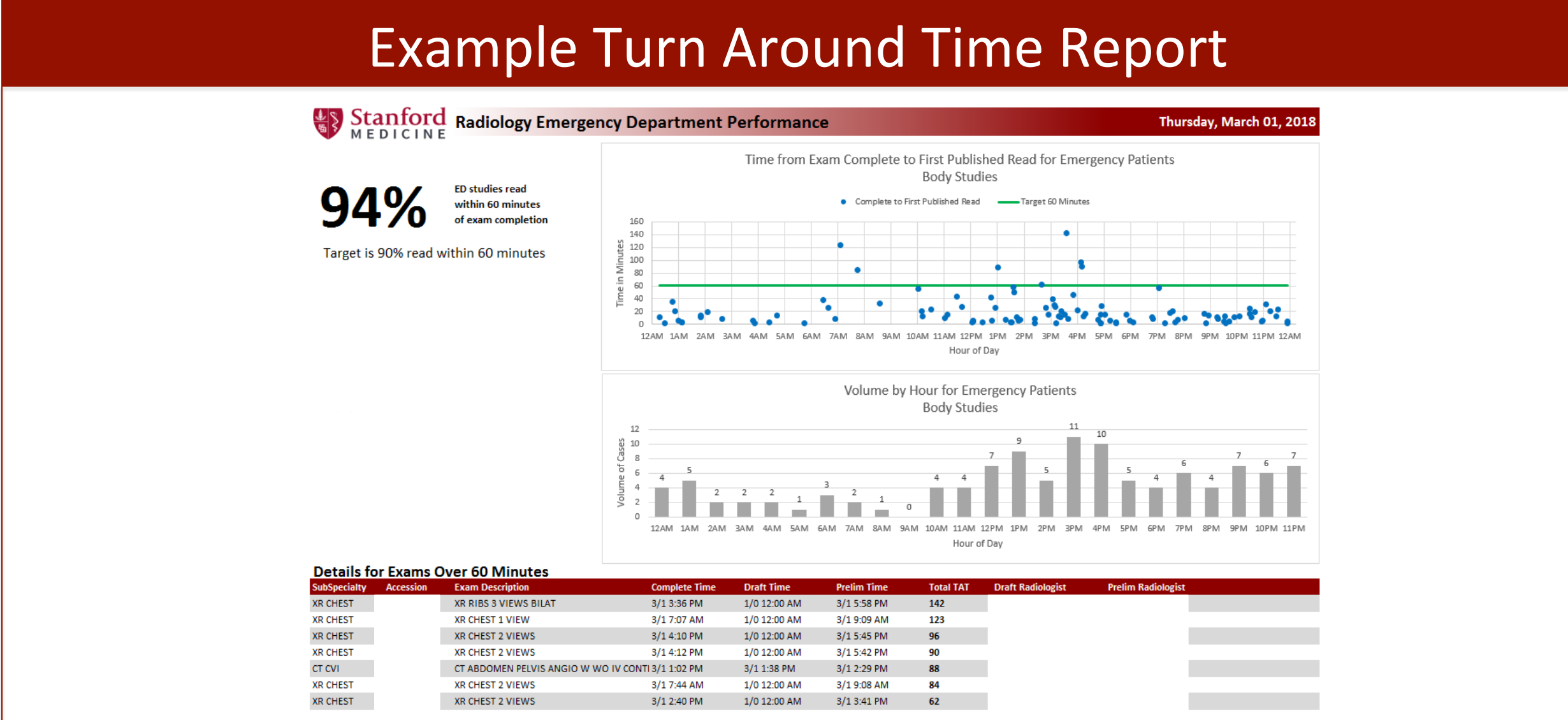
Aims

1. To fully understand the workflow from CT exam complete to first published read.

2. To implement interventions to increase the percent of ED CTs read within 60 minutes from 72% to 85% by April 1, 2018.
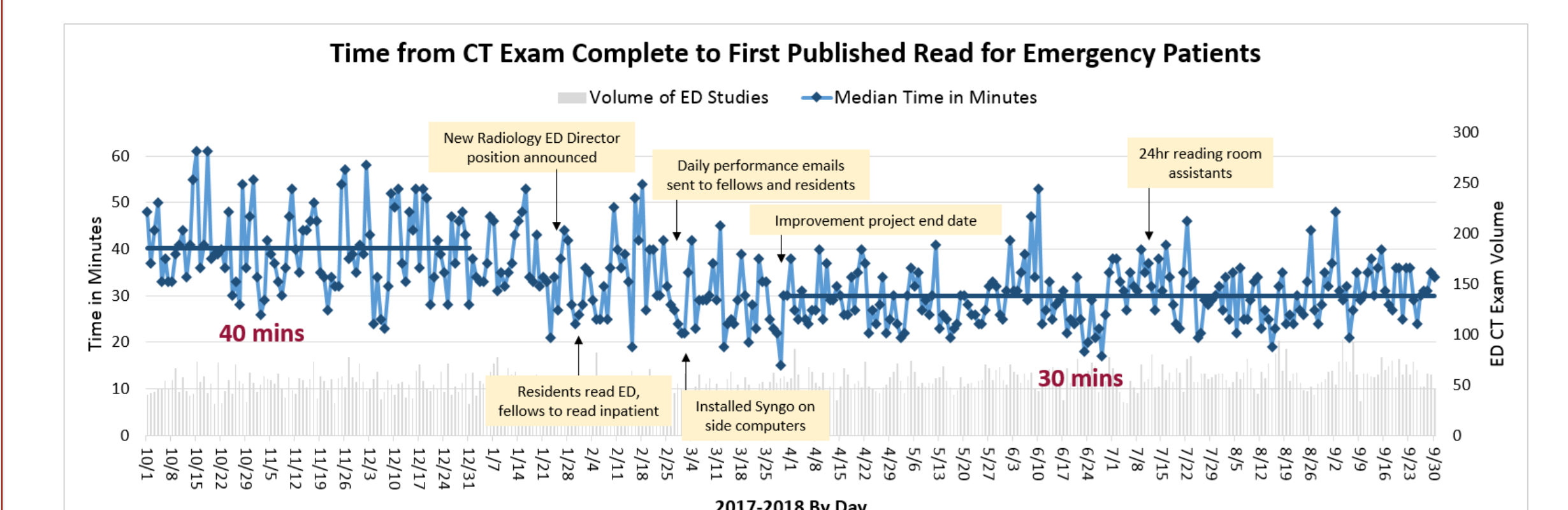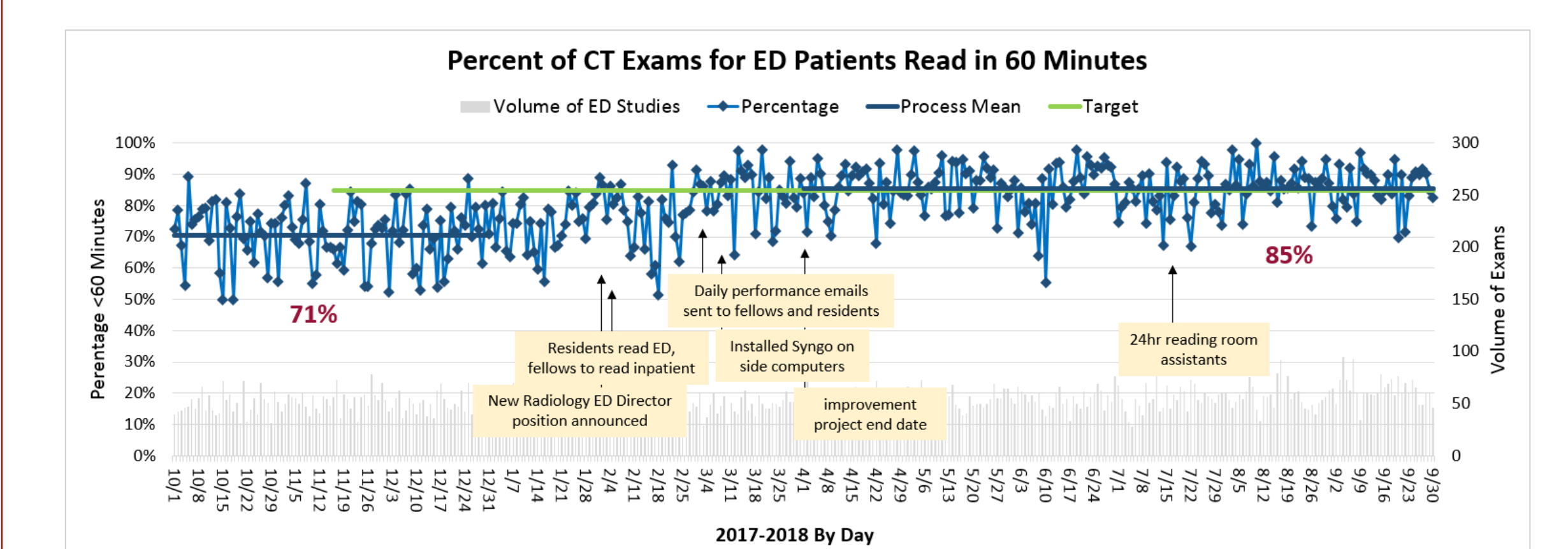
Methods

Key Drivers / Interventions / Countermeasures

Key Drivers	Interventions / Countermeasures	
Maximizing efficiency in interpretation workflow	Create a DRAFT COMPLETE button in PowerScribe. ⚠	2
Good communication between Residents & Fellows	Fellows read out with residents to create prelim read while waiting for attending. 12/18/17	2
	Fellows look at ED cases in parallel with residents. 12/18/17	2
Indication in PACs when a study is complete & contains all images and reformats ⚠	Keep list up during read out. If ED cases pop up, take it next. 12/18/17	2
	Dr. Chow as Director of Emergency Radiology Dept. 1/29/18	3
Minimize unnecessary interruptions for Radiologists	On call resident and fellow establish a method of communication at beginning of shift. 1/31/18	2
Visualize Performance and Results	Residents to focus on ED exams. Fellows to read non-urgent inpatient exams after hours. 1/31/18	2
	Residents & Fellows TAT emails. 2/27/18	2
Good relationship between Radiology & the ED	Install Syngo on side computers for ultrasound. 3/1/18	2
	24 hour reading room assistants to field phone calls.	3

Reliability Level:
(1) Individuals: Feedback, checklists, training, basic standards
(2) Procedures: Embedded standard work, reminders, constraints
(3) Systems/culture: Process redesign, built-in quality, automated systems, fail safes, physical structure, social norms, "mindfulness"

Maturity Bars:
0: Untested idea
1: Early tests / PDCA
2: Multiple PDCAs
3: Early implementation
4: Working well in operation

Progress / Barrier ⚠ / Abandoned ✗

Radiology Workflow

Neuro Fellow → Neuro Attending

CT Ordered → CT Performed → Resident

Body Fellow → Body Attending

⚠ = Interruption

Report

Example Turn Around Time Report

Stanford MEDICINE Radiology Emergency Department Performance — Thursday, March 01, 2018

94% ED studies read within 60 minutes of exam completion

Target is 90% read within 60 minutes

Time from Exam Complete to First Published Read for Emergency Patients — Body Studies

Volume by Hour for Emergency Patients — Body Studies

Details for Exams Over 60 Minutes

Results

Percent of CT Exams for ED Patients Read in 60 Minutes

Volume of ED Studies / Percentage / Process Mean / Target

71% ... 85%

New Radiology ED Director position announced / Residents read ED, fellows to read inpatient / Daily performance emails sent to fellows and residents / Installed Syngo on side computers / Improvement project end date / 24hr reading room assistants

2017-2018 By Day

Time from CT Exam Complete to First Published Read for Emergency Patients

Volume of ED Studies / Median Time in Minutes

40 mins ... 30 mins

New Radiology ED Director position announced / Residents read ED, fellows to read inpatient / Daily performance emails sent to fellows and residents / Improvement project end date / Installed Syngo on side computers / 24hr reading room assistants

2017-2018 By Day

Results

Percent of CT Exams for ED Patients Read in 60 Minutes — Body Studies

Volume of ED Studies / Percentage / Process Mean / Target

67% ... 85%

New Radiology ED Director position announced / Residents read ED, fellows to read inpatient / Daily performance emails sent to fellows and residents / Installed Syngo on side computers / Improvement project end date / 24hr reading room assistants

2017-2018 By Day

Percent of CT Exams for ED Patients Read in 60 Minutes — Neuro Studies

Volume of ED Studies / Percentage / Process Mean / Target

76% ... 88%

New Radiology ED Director position announced / Residents read ED, fellows to read inpatient / Daily performance emails sent to fellows and residents / Installed Syngo on side computers / Improvement project end date / 24hr reading room assistants

2017-2018 By Day

Sustaining Success

1. Make successful interventions permanent. ✔

2. Continue monitoring and analyzing CT TAT data to understand outliers. ✔

3. Integrate on call attendings in to TAT emails and automate daily email. ✔

4. Start analyzing TAT data for ED US and radiographs. ✔

5. Implement 24 hour reading room assistants. ✔

6. Choose a PACs with transparent ED study TATs. ✔

7. Revisit project in the future after new PACs installation in order to implement IT interventions for increased workflow efficiency.

Acknowledgements

References

1. Pandharipande P V., Reisner AT, Binder WD, et al. CT in the Emergency Department: A Real-Time Study of Changes in Physician Decision Making. Radiology. 2016;278(3):812-821. doi:10.1148/radiol.2015150473

2. Larson DB, Mickelsen LJ, Garcia K. Realizing Improvement through Team Empowerment (RITE): A Team-based, Project-based Multidisciplinary Improvement Program. Radiographics. 2016;36(7):2170-2183. doi:10.1148/rg.2016160136

3. Flug JA, Nagy P. The A3 Quality Improvement Project Management Tool for Radiology. J Am Coll Radiol. 2016;13(4):408-410. doi:10.1016/j.jacr.2015.12.028