QUALITY IMPROVEMENT

CODE ORANGE

Emergency Radiology workflow analysis during a simulated MCI in a level 1 trauma centre

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Mass Casualty Incidents

- Large number of casualties, short time period
- Exceeds normal capacities
- Paradigm shift to the greatest good for the greatest number of patients

Roles of Radiology

- **Image** critically injured patients for immediate medical/surgical intervention
- **Communicate** relevant findings in a fast, appropriate and accurate manner

Quality Improvement

Aim Statement

We have no idea how good or effective our current response is in an MCI setting and this is crucial for service planning!

Problem Statement

To determine our baseline response in an MCI and iteratively improve this over 18 months, led by Emergency Radiology

PDSA

Plan:

- Simulate an MCI scenario and examine workflow.
- Act as a road test for team, workflow, CT protocol and network
- Help estimate maximum capacity and establish where delays happen

PDSA

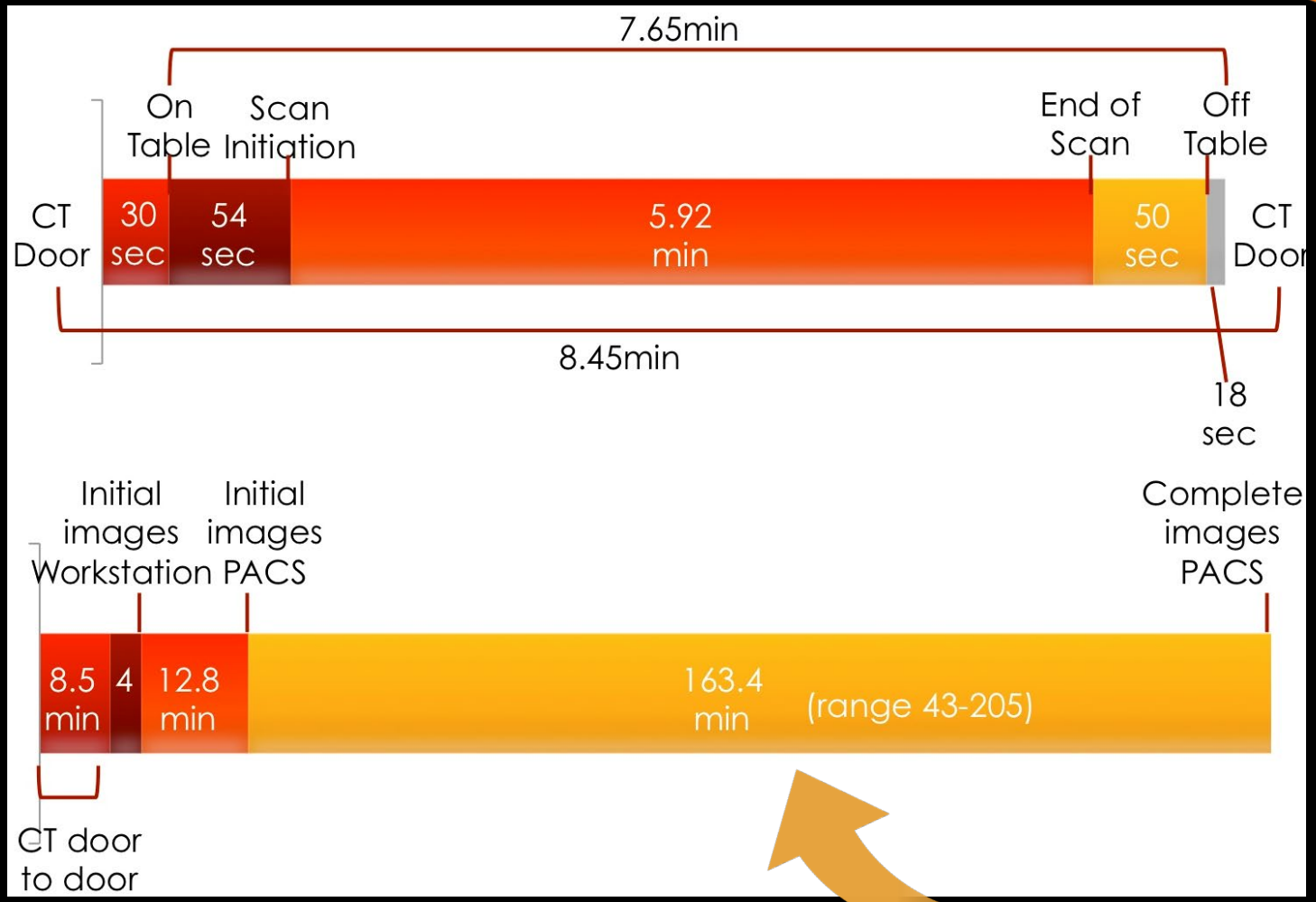
Do:

- 6 ‘patients’ requiring whole body CT in rapid succession
- Volunteer used for transfer to/from CT, spinal lifts, scan positioning/set-up with phantom substituted for scan acquisition.
- Scan acquired as per routine trauma WBCT, images reformatted and sent to PACS.
- Time for each step in process documented.
- Post-exercise debrief for team.

PDSA


PLAN
Define the objective, questions and predictions. Plan data collection to answer questions.
DO
Carry out the plan. Collect data and begin analysis of the data.
STUDY
Complete the analysis of the data. Compare data to predictions. Summarize what was learned.
ACT
Plan the next cycle. Decide whether the change can be implemented.

Study:


7.65min
On Table
Scan Initiation
End of Scan
Off Table
CT Door
30 sec
54 sec
5.92 min
50 sec
CT Door
8.45min
18 sec
Initial images Workstation
Initial images PACS
Complete images PACS
8.5 min
4
12.8 min
163.4 min
(range 43-205)
CT door to door

PDSA

Act:

Happy with our maximum capacity (6/hr) – in line with literature – no further action

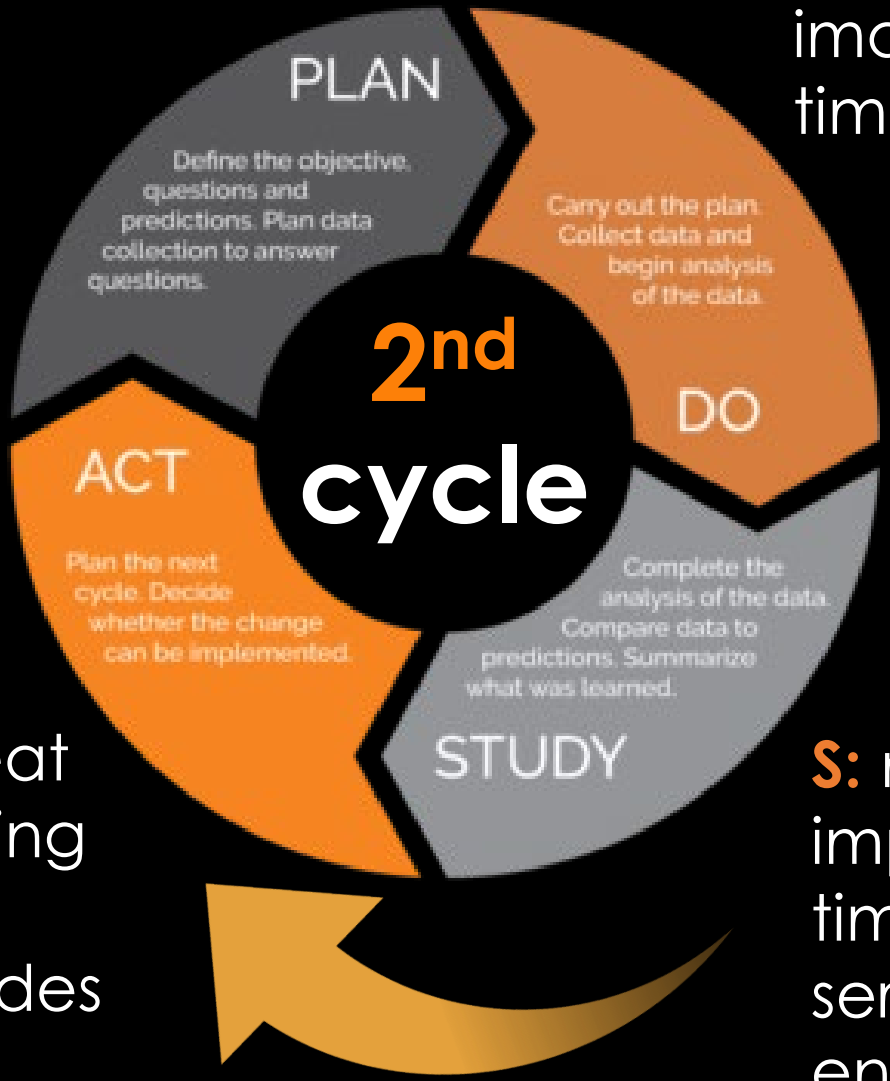
Not happy with network delays – something we had previously suspected but not quantified.

Dataset ➔ driving force behind institutional network upgrades.

- ➔ new dedicated server for Emergency CT
- ➔ backend software improvements
- ➔ network hardware installation in progress
- ➔ frontend software improvements Jan 2020,

P: same exercise (6 ‘patients’), all undergo WBCT

D: as before but collect data on image transfer times only



A: plan to repeat exercise following completion of network upgrades (early 2020)

S: no real improvement in times following server and back end upgrades

P: same exercise, 2 'patients' underwent pared back WBCT* without reformats

D: as before but collect data on image transfer times only

A: Research study in progress to validate and optimise 'disaster protocol'

S: faster transfer for 'disaster' WBCT protocol

*'disaster protocol', approx. 2200 images v 25000

Conclusions

- Even in Level 1 trauma centre with established Emergency Radiology service and proven algorithms for polytrauma imaging, there is potential for optimisation of workflows.
- Simulations allow for team familiarity with the MCI algorithm, streamlining of processes and workflows.
- In this case demonstration of previously unrecognised stumbling blocks to efficiency that may have remained occult without this real-time practice.