Improving Imaging Pathways for NICE CT Head Injury Guidelines

Raheel Baig1, Sandeep Karthikeyan2, Elizabeth Vincent1, Halah Al-Dubbasis1, Anna Rixon1, Bhavna Khanna1, Philip Sparrow2, Richard Yorke2, Claire Gray2 & Mona Sriraman2

1 King’s College London, GKT School of Medical Education, London, UK; 2 King’s College Hospital, London, UK

PROJECT AIM

To create and implement a series of interventions to increase compliance with NICE CT head injury guidelines to 95% or higher across the hospital over this 44 week time period.

IMPROVEMENT PROCESS

Root-Cause Analysis:
- Radiographer vetting of CT head requests constituted a significant point of delay in the imaging pathway.
- As a result, the following interventions focused on making the vetting process more efficient.

Data Collection:
- Data was collected electronically via weekly reports between September 2017 and July 2018.
- Scans were only included if their request detailed a “fall”, “head injury” or “query bleed”.
- Scans were categorised into 1 or 8 hour scans according to NICE guidelines and determined to be compliant if the time between scan request and scan completion was within the allocated time categories.
- Baseline compliance was measured between September 2017 and November 2017.
- Statistical analysis with SPSS was performed using Chi-squared tests to determine significance.

Interventions:
- The project was carried out as an ongoing series of changes structured as 3 Plan-Do-Study-Act (PDSA) cycles with regular data analysis and team meetings to review changes (Figures 2 & 3).

RESULTS

- A total of 7,419 scans were reviewed for their compliance over a 44 week period.
- Analysis of baseline data revealed a pre-intervention mean of 84.52%.
- Following the implementation of PDSA 1,2 and 3, compliance rates rose to 87.82% (p<0.05), 88.31% (p<0.05) and 92.06% (p<0.001) respectively. Compliance rose by 7.54% from baseline (Figure 4).
- The introduction of the CDSS improved the percentage of CT head requests with adequate clinical information from 40% to 89%.
- Compliance rates were sustained over 4 months following introduction of PDSA 3 indicating sustainability.

SUSTAINABILITY

- This project scored 88/100 using the NHS Institute for Innovation and Improvement Sustainability Model (Figure 5).
- Key factors supporting sustainability included: the presence of clinical and senior leader support, the project alignment with hospital goals, systems in place to monitor progress and the introduction of staff training.
- Changes to staff, clinical guidelines and inter-hospital IT systems were identified as future barriers to sustainability. However, if these changes do occur, the CDSS will be integrated into the project.

DISCUSSION

Feedback:
- Feedback was obtained from radiographers and emergency clinicians throughout this project through departmental meetings and questionnaires.
- Following PDSA 3, feedback was universally positive with staff expressing the introduction of the CDSS improved their knowledge of the guidelines.

Lessons Learned:
- Relatively small interventions such as a simple electronic form can have a significant impact and should not be underestimated.
- Appreciation that a hospital is a dynamic environment and therefore some interventions may take longer than anticipated to implement.
- Working with different professions provides unique insights allowing for further project improvement.

Next Steps:
- Subsequent interventions could target improving porter availability, radiographer education and developing a more efficient CT scanning schedule.
- The addition of a CDSS for NICE CT head injury guidelines into other trusts may improve compliance across the UK.
- The development of tailored order forms for other imaging investigations may improve compliance with their own guidelines nationally and internationally.

CONCLUSION

- Over the length of this project 3 PDSA cycles were implemented.
- Mean compliance rose from 84.52% to 92.06% over 44 weeks.
- Although the initial improvement target of 95% was not achieved, PDSAs 2 and 3 resulted in statistically significant improvements in compliance with NICE CT head injury guidelines.
- The interventions are cost effective and have shown to have a sustained impact on compliance rates.