Improving “Order-to-Scan Time” for Emergency Department Unenhanced CT Examinations Through Auto-Protocolling & Expedited Clinical/Imaging Communication
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BACKGROUND

Reducing emergency department length-of-stay (ED LOS) has become increasingly important as our ED volume continues to rise by approximately 4% each year. In an effort to meet this goal, decreasing “order-to-scan time” has become a major quality improvement effort in our emergency radiology division.

THE PROBLEM

Baseline data included:

1. Surveys of technologists inquiring about reasons for CT exam delays.
2. Timestamps of “exam ordered” and “exam begun” which were extracted from the electronic medical record, subtracted from each other (OtB or “order-to-scan” time), and averaged daily.

A Pareto chart of survey responses showed that issues with patient readiness - including waiting for labs to result and for an IV to be placed – accounted for 75% with patient readiness - including waiting for labs to result and for an IV to be placed – accounted for 75%

THE INTERVENTION

Our team brainstormed potential solutions and created a prioritization matrix to classify interventions by ease of implementation and potential impact. By vote, the team decided to focus our PDSA cycles on the interventions in red.

The Plan-Do-Study-Act (PDSA) methodology was employed and two interventions were executed:

1) The implementation of auto-protocol algorithms for the two exam types in question, along with educational presentations to ED PA/NPs, physician staff, and trainees to instruct them how to place exam orders (see example algorithm below). This automation removed an unnecessary manual step in our process map, as identified by our multidisciplinary team.

2) The launch of a text-communication system and design of a standardized communication workflow between CT RTs and ED RNs regarding patient readiness for transport, addressing the most common causes for delays as identified by our baseline data survey.

RESULTS

The SPC charts show that our interventions resulted in an immediate, significant decrease in OtB time from 92 minutes to 67 minutes for unenhanced C-spine CT examinations (p=0.03), and from 90 minutes to 74 minutes for unenhanced stone protocol abdomen/pelvis CT examinations (p=0.05). We also observed decreases in variation in system performance, as evidenced by narrowing of the 3-sigma control limits.

Updated data analysis has shown that these improvements have been sustained over time. As of 10/1/2017, 91% of C-spine exams and 72% of I-Stone exams are being captured by the auto-protocolling algorithms. Average OtB times are 66 minutes and 73 minutes for C-spine CT exams and I-Stone CT exams, respectively.

CONCLUSION

Using classic process improvement tools and interventions focused on automation, standardization, and communication, we decreased the exam ordered-to-scan time for unenhanced cervical spine CT examinations and unenhanced stone protocol abdomen/pelvis CT examinations for non-acute trauma patients in our emergency department.

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