Text Messager App for Reduction of Phone Interruptions in Cardiac CT

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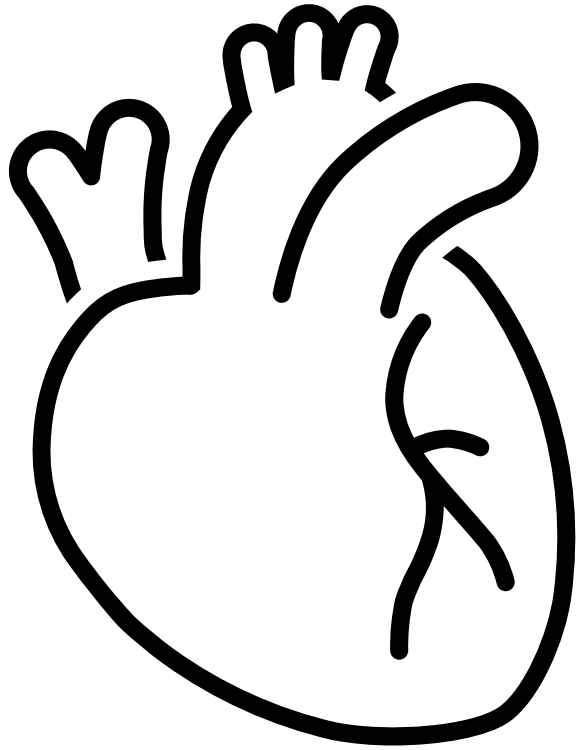


Background

- Since the IOM's report *To Err Is Human* effectively launched the modern patient safety movement, a variety of methods for patient safety focused on minimizing disruptions have been rolled out in a wide range of medical and surgical specialties.
- Less studied is the impact of frequent disruptions in a complex modern radiology workflow on patient safety. However, it is established that frequent interruptions in cognitively complex tasks increase error rate and decrease overall efficiency.
- In modern radiology workflow, phone interruptions represent a large portion of overall interruptions to active study interpretation.

Specific factors that increase phone interruptions in Cardiac CT Imaging

- High percentage of studies requiring phone-based image checks while the patient is on the CT table
- Questions from nursing regarding safe administration of nitroglycerin
- Unique needs of congenital cardiac protocols

Major Categories of Phone Calls Received

- Calls requesting image check while patient is on the table
- Protocols
  - Requests for protocols to be entered into the system
  - Clarification questions on protocols
- Logistics Regarding Scan Execution
  - Nitroglycerin administration questions
  - IV Contrast concerns (allergies, GFR)
  - Issues regarding appropriate IV access
- Consults from ordering providers
- Other / Miscellaneous

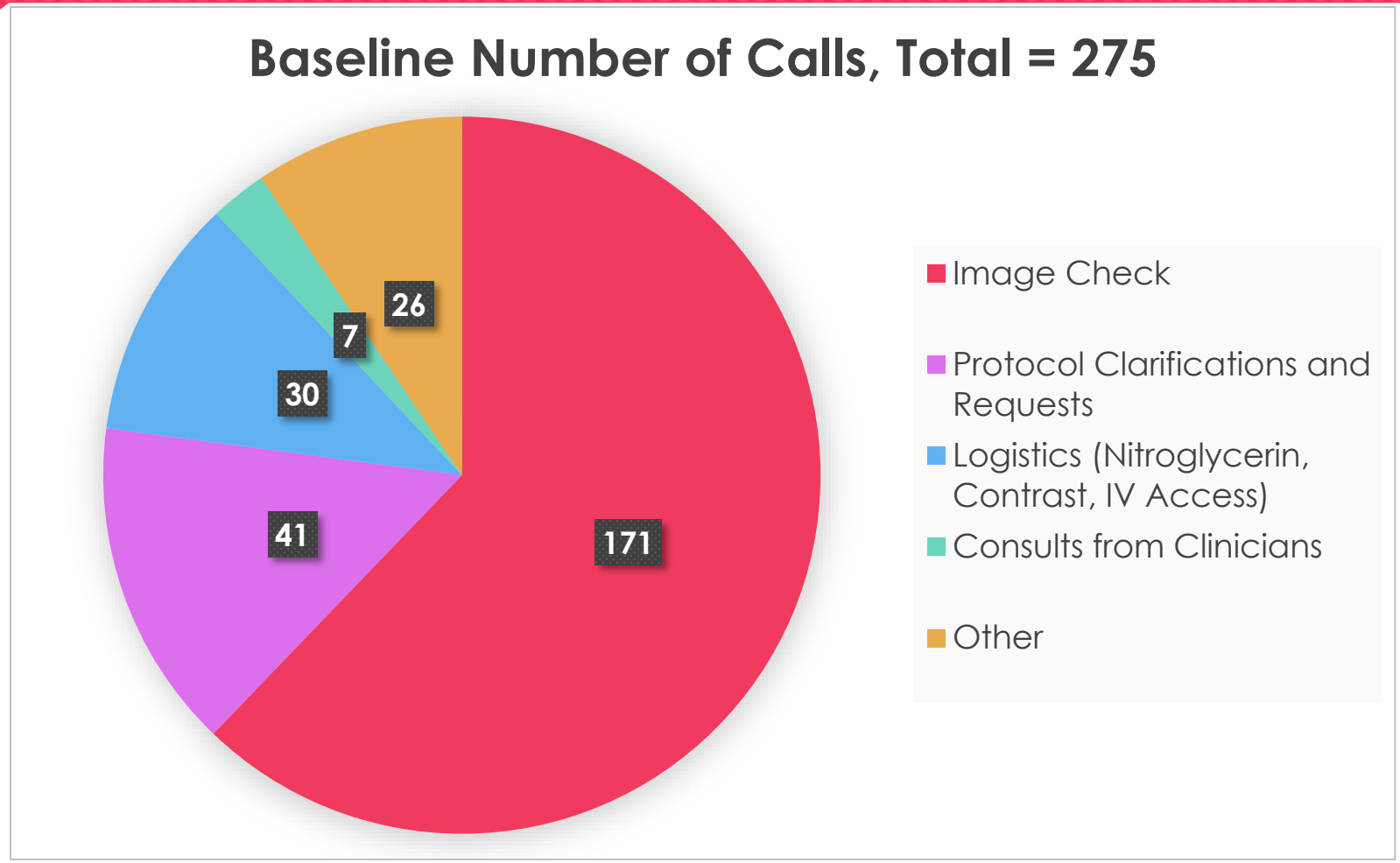
Methods

- Baseline phone calls were logged for 1 week, documenting category of call and timestamp from Monday – Friday between 8 AM and 5 PM
- Roles were established within the text messenger app to include a designated point of contact for Cardiac CT for easy communication with nursing and technologists
- Technologists were encouraged to reach out to the covering radiologist via text message for non-urgent queries.
- Following a short 1-week transition period, type and number of phone calls were again logged for 1 week, documenting category of call and timestamp

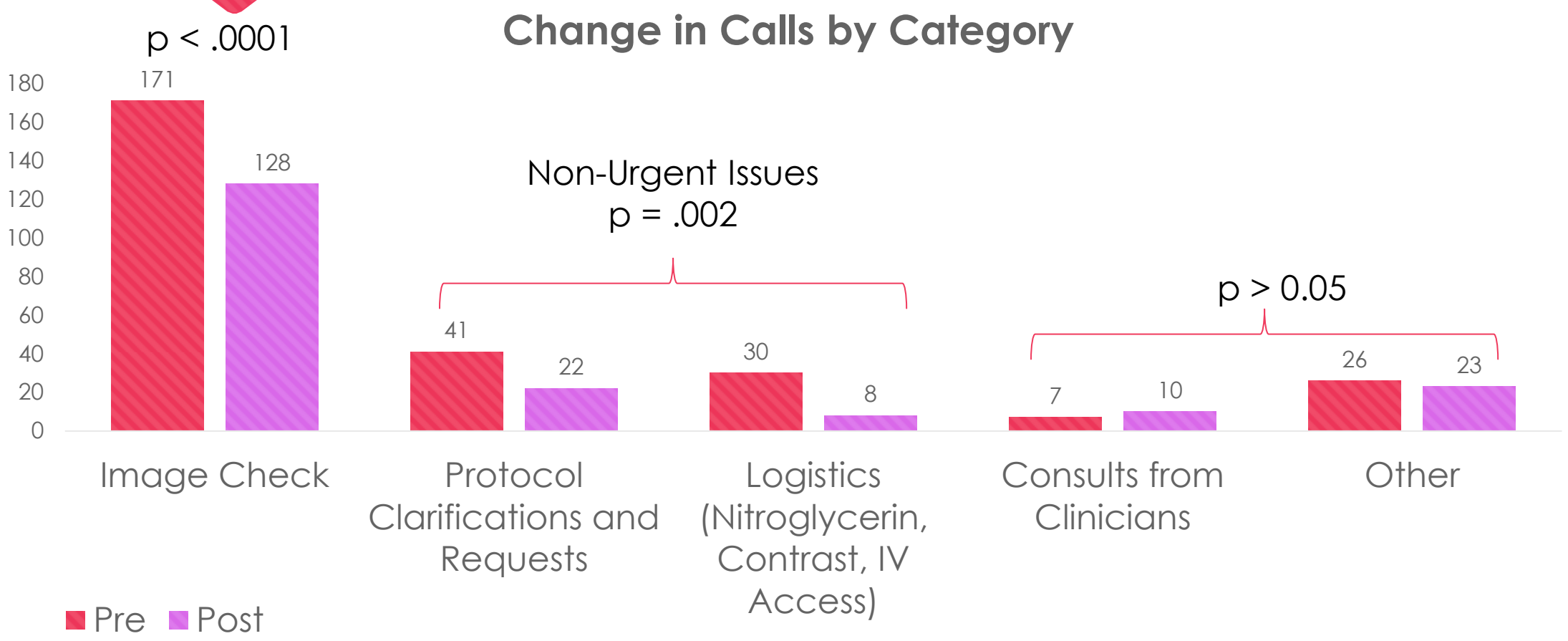
Statistical Methods

- Difference in call volume was compared with Chi-square test across different categories in the pre and post intervention period.
- Fisher's Exact Test was then applied for specific call types with lower frequencies, where the expected counts were less than 5.
- The average time between phone calls were compared using a T-test

Results – Baseline Data Collection



Results – Post-Intervention



Time Between Calls

- Time between calls increased from 9.8 minutes to 14.3 minutes

Discussion and Further Study

- A significant component of the decrease in calls was driven by non-urgent issues that require a prompt, but not necessarily immediate response (decrease from 71 to 30).
- There was also a substantial decrease in image check calls in the post intervention period, driven by decrease in studies requiring an image check in the second week, despite similar overall study volumes. This may be further investigated with a longer post-intervention period.
- A text app is a uniquely well-suited tool for discussion regarding non-urgent issues, as it allows the radiologist to respond to queries between times of active interpretation.
- Relative opportunities for further study in this area include assessment of a longer post-intervention period and evaluation of how diagnostic errors are correlated with overall phone interruptions over time.