RE-ENVISIONING ON-CALL RESIDENT WORKFLOWS:
IMPACT ON RESIDENT EXPERIENCE

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BACKGROUND & AUDIT TARGET

- Based on a program internal review, residents:
  - Viewed their on-call experience as a valuable learning experience
  - Requested more feedback on their on-call reports
- On-call feedback is high-yield area for targeted improvement because:
  - High-acuity diagnoses with sufficient volumes for each resident
  - Allows residents to gauge progress and identify areas for improvement
- Prior studies have shown that automated tools such as report change comparison can help to facilitate meaningful feedback, motivate residents to compare reports more frequently, and increase satisfaction.[1-4]

Audit Target

Improvement in resident satisfaction regarding on-call report feedback as quantified by improvement in pre- and post-intervention surveys

OUR INSTITUTION

- Total 26 radiology residents (PGY 2 - PGY 5) responsible for covering call
  - 2 on-call residents responsible for reporting overnight STAT/Urgent CT and US imaging requests
  - 4 hospital teaching sites within city, including pediatrics, trauma, and stroke centers. Coverage also includes 2 urgent care centers.
  - Tertiary referral site for Central West region of Ontario with total catchment population > 2.2 million
- Software Used
  - Picture Archiving Communication System (PACS): GE Centricity[5]
  - Dictation/Voice Recognition: Powerscribe 360[6]
  - Electronic Medical Record (EMR): Meditech[7] & Epic[8]

Prior state: No standardized feedback process

- Implied expectation for residents to review their on-call cases on their own as an informal form of feedback
- No automated tool for comparison of preliminary resident and final attending report

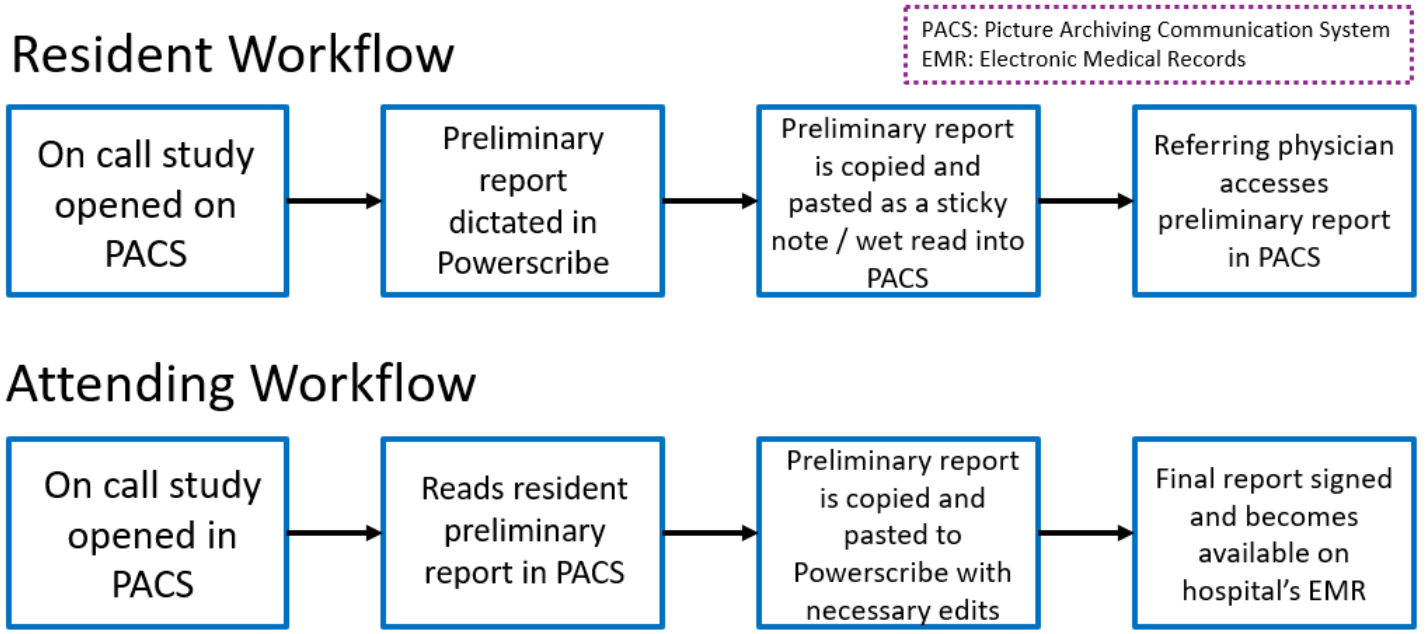


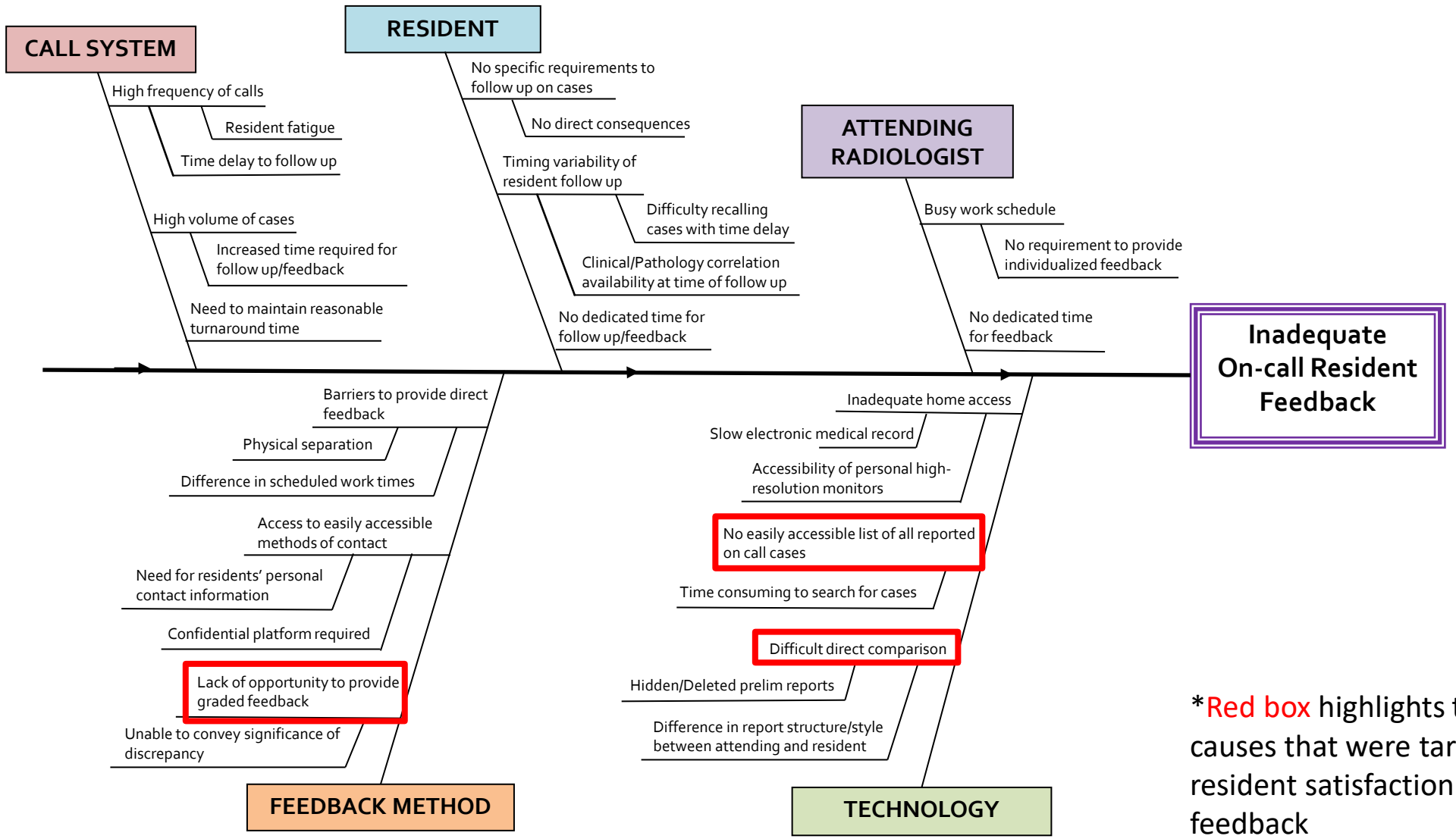
Figure 1. Prior State Workflow.

Standard: Timely and relevant feedback is a critical component of medical education and a core competency in radiology residencies [9]

METHODS

- Adapted the A3 thinking process which is a structured problem solving method focused on continuous improvement[10]
- Number of changes proposed to the on-call workflow based on modifiable factors identified through root cause analysis
- Stakeholders identified and contacted for approval and feedback of proposed changes
  - Attending radiologists (including program director), radiology residents, referring clinicians (i.e. ER), technologists, PACS administrators and IT support personnel
- Anonymous online surveys of the radiology residents were conducted pre- and post-implementation of the changes

FISHBONE ROOT CAUSE ANALYSIS



*Red box highlights the specific root causes that were targeted to improve resident satisfaction with on-call report feedback

PRE-IMPLEMENTATION SURVEY

- 22 out of 25 residents during the academic year of 2020-2021 completed the survey anonymously
- 82% strongly agreed that receiving feedback on on-call reports is an important part of their development and learning as a radiology trainee
- Strong support from resident group to redevelop on-call reporting workflow in order to improve feedback on:
  - Follow-up recommendations (77% strongly agreed/agreed)
  - Report content (82% strongly agreed/agreed)
- Any new process should remove barriers to feedback and be cognizant of the challenges that residents experience during on-call reporting period
  - One of the main concerns expressed by residents was a potential change in the expectation of preliminary reports to be the same standard (‘full reports’) as daytime final reports despite the high volume, acuity, and time pressures of on-call cases
  - Recurring themes for barriers to follow up included poor home accessibility and lack of easily accessible list of all on-call preliminary reports

INTERVENTIONS

- Resident reporting moved from sticky note/wet read method in PACS to Powerscribe in order to mirror the daytime reporting method (Figure 3)
  - Easy access to all preliminary on-call cases through a Powerscribe worklist
  - Allows residents to use automated report comparison function available in Powerscribe (Figure 4)
- Standardized templates for use by on-call residents to improve ease of report comparison
  - Adapted from RSNA and sent to attending radiologists for feedback prior to implementation[11]
  - Research shows less errors in structured reporting compared to freeform with no significant difference in report times between reporting styles[12]
  - Referring clinicians generally prefer structured reports for clarity and organization[13]

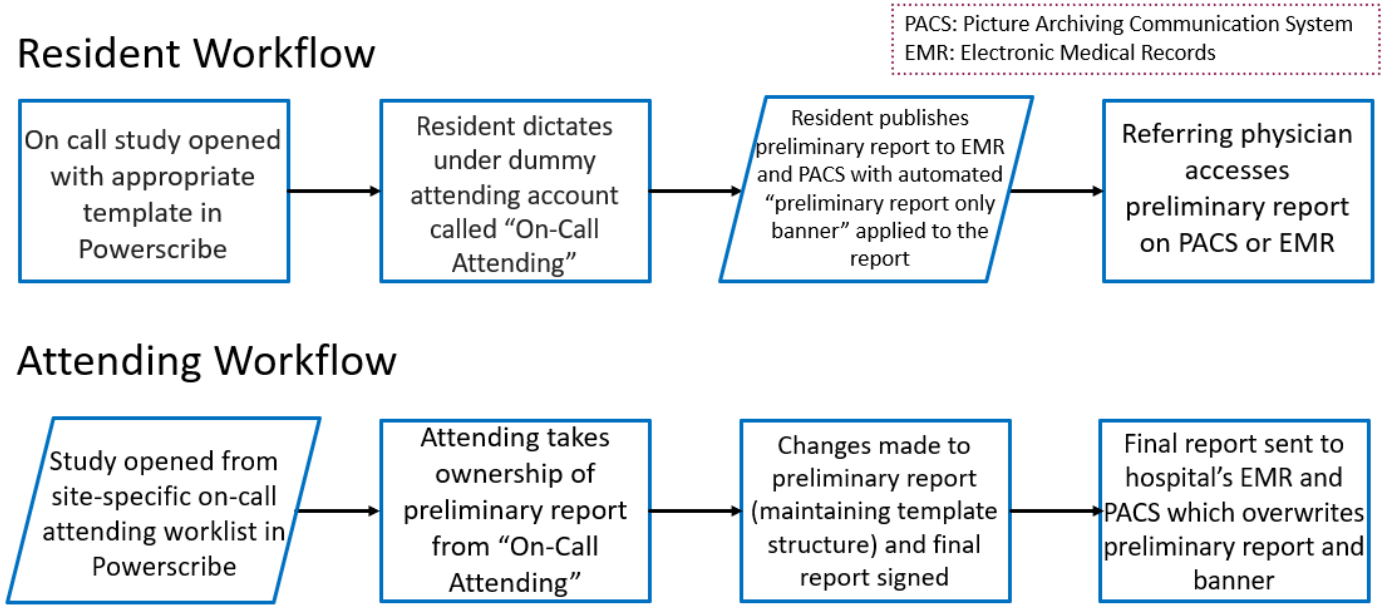


Figure 3. New Workflow.

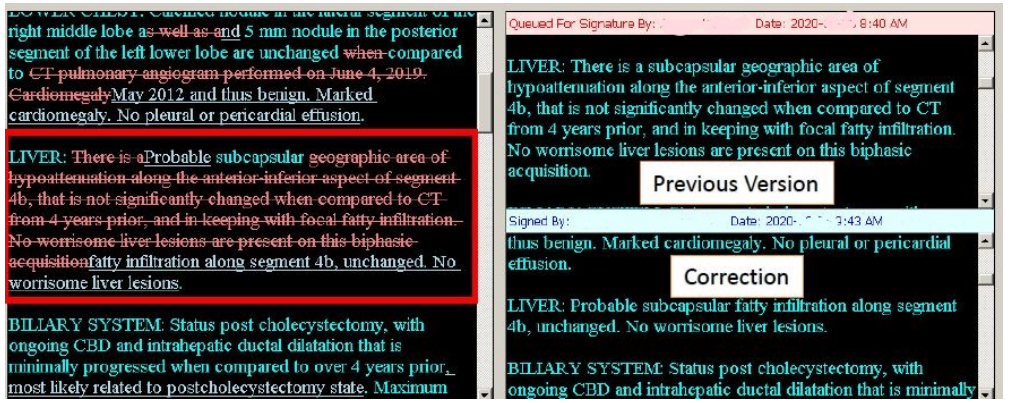


Figure 4. Report comparison function on Powerscribe.

POST-IMPLEMENTATION SURVEY

- 15 out of 21 residents who experienced new call workflow during the academic year of 2020-2021 completed the survey anonymously 7 weeks post-implementation
- Results were overall positive:
  - 87% strongly agreed/agreed that the changes were beneficial to overall call experience and learning
  - 55% felt they received adequate on-call feedback post-implementation compared to 23% pre-implementation (Figure 5)
  - Majority strongly agreed/agreed the changes help to provide more detailed feedback on follow up recommendations (60%), report content (60%), and report structure/spelling/grammar (67%) (Figure 6)
  - 73% strongly agreed/agreed that the report comparison function was beneficial
  - 40% strongly agreed/agreed that the use of structured templates is helpful to compare reports while another 40% were neutral to this change
- Post-implementation respondents identified technical barriers as the main ongoing limitation to case follow-up
  - Ex. Studies taken over by daytime resident/fellows no longer available on on-call resident case list on Powerscribe which makes follow-up difficult

Figure 5

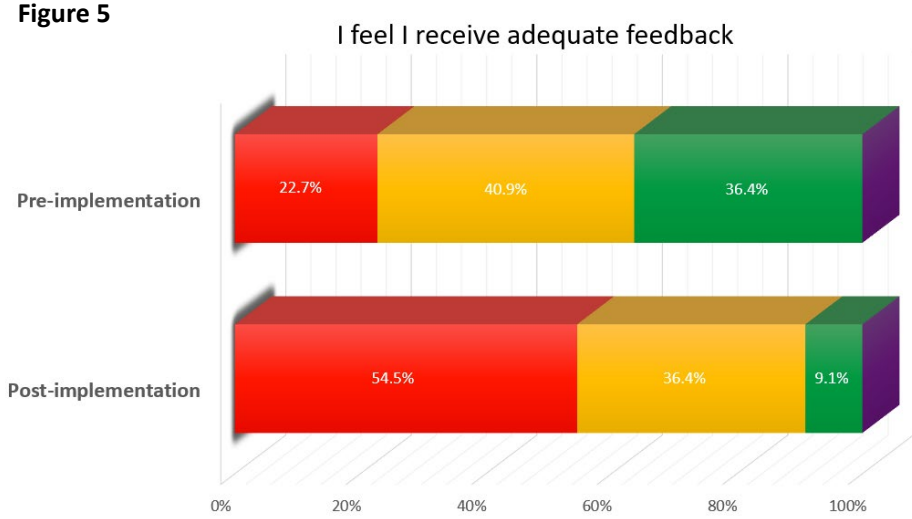
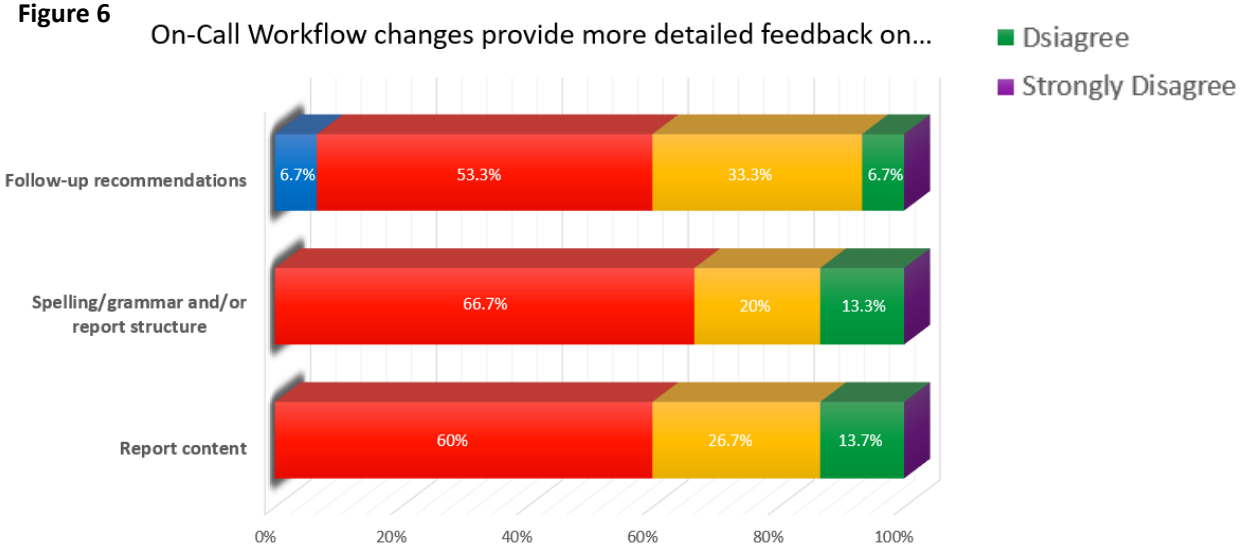


Figure 6



DISCUSSION

- Use of structured A3 problem solving method to identify root causes and targeted interventions was useful to improve resident satisfaction on the quality of feedback received on their on-call reports

- Facilitating automated and individualized feedback will be of increased importance as we approach the era of Competency Based Medical Education in radiology

- In the future, we plan to develop an interface for residents to access personalized statistics such as discrepancies, turn around times, and reporting volumes

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