Radiology Information System (RIS) Integrated Faculty Scoring and Feedback System for After Office Hours (AOH) On-Call Resident Provisional Radiology Reports

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BACKGROUND

- Radiology residents in our acute care referral centre are rostered on subspecialty-based rotations as per ACGME.
- They issue provisional reports for all urgent cross-sectional diagnostic imaging across different subspecialties while performing after office hours (AOH) on-call duties.
- In the next working day, provisional reports are reviewed and approved by various attending faculty radiologists based on scan subspecialty. This is done independently without face-to-face readout, unlike office hours workflow (Fig 1).

Fig 1: Comparison of office & on-call hours workflow & education impact.

PROBLEM

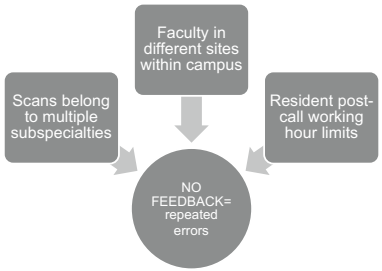

Fig 2: Cause and effect map of poor error feedback in AOH calls.

- Feedback to residents on AOH provisional reports is limited due to 3 main challenges (Fig 2).
- Feedback can change clinical performance when systematically delivered [1]. It facilitates the self-reflection phase within self-regulated learning theory, leading to formulation of strategies to improve performance [2].

PURPOSE

Our pilot study is a novel approach to **generate continuing feedback** on preliminary reports issued by residents in AOH calls, using a scoring feedback form **build into our electronic Radiology Information System (RIS) software**.

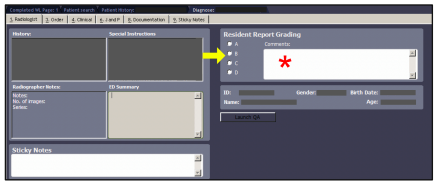

Fig 3: Grading form built into RIS reporting platform. Signing radiologist will choose score A – D (arrow) based on standard of report and provide free text explanation in comments (*).

METHOD & INTERVENTION

- We created a faculty report scoring and feedback form module integrated into our RIS software, Carestream Vue RIS version 11 (*Carestream Health, Rochester, New York, USA*) (Fig 3).
- Instructions were conveyed to attending radiologists and residents via department meeting and email.
- Attending radiologists were encouraged to voluntarily score resident AOH CT and MRI provisional report accuracy.
- Scoring scale (Table 1) was derived from established radiology error classification model [3].
- A free text box was included to allow explanation or comments.
- At the end of each month, the RIS application generated log is processed by residency office. Individualized report cards were emailed to each resident in a spreadsheet file, comprising of:
  - Mean monthly score;
  - Number of discrepancies graded (grade C and D);
  - List of scored reports including free text comments by various verifying attending faculty.
- Summative cohort data were reviewed in monthly residency faculty meetings and shared in monthly department meetings.

Grade	A	B	C	D
Score	4	3	2	1
Type	Excellent Report	Normal Report	Minor Discrepancy	Major Discrepancy
	Accurate report w/o need for modification; identified difficult finding	Default for most scans; minor non-significant misses	Clinically significant misdiagnosis but not life threatening	Life threatening misdiagnosis
Example	NA	- Calcified granuloma - Simple renal cyst - Tendinosis - Facet arthrosis	- Pulmonary Nodule - Liver Metastasis - Lacunar Infarct - Spinal Stenosis	- PE - Appendicitis - Intestinal obstruction - ICH - Spine fracture

Table 1: Scoring Scale Guide.

RESULTS

- Pilot project ran for 9 months from July 2018 to March 2019. A total of 2972 CT and MRI scans were scored - mean of 330.2 scans per month, range from 232 to 393 (Fig 4).
- Most of the scans scored were from neuroradiology subspecialty (2491, 83.8%), followed by body (thorax and abdominal) subspecialty (331, 11.1%) and musculoskeletal subspecialty (150, 5%).
- Total of 146 reports scored as minor discrepancy (mean 16.2 per month) and 1 report scored as major discrepancy (mean 0.1 per month).
- Total of 361 reports were given free text comments (mean 40.1 per month).
- Mean of 19.7 residents were graded per month (range 14 to 23) and the individual mean scores per month range from 2.9 to 4.

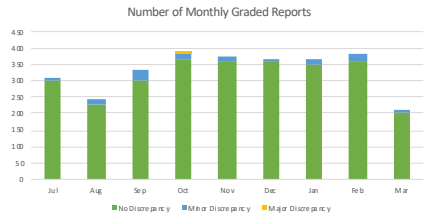

Fig 4: Resident reports scored by faculty per month.

CONCLUSION

We demonstrated feasibility to embed report feedback to residents within routine workflow using an integrated module in our RIS system. It provides consistent feedback to residents on errors made during AOH calls and brings measurable error data, setting foundation for future quality improvement projects.

REFERENCES

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