Structured Reporting in the Academic Setting: What the Referring Clinician Wants

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DESCRIPTION OF THE PROBLEM

Both accurate interpretation and effective communication of imaging findings are key facets to the practice of radiology, and excellent patient care can only be realized when both aspects are achieved. There is a strict, standardized approach toward obtaining competency during residency, as set forth by the ACGME. However, this approach does not extend to quality communication of information, which is only as effective as the system that conveys it—the radiologist's report.

The ACR has developed practice parameters outlining suggestions for communication of findings to referring clinicians. Although these parameters describe the type of information that should be included, they do not describe how the information should be presented [1], resulting in significant differences in report readability and structure. In addition, this document emphasizes that a departure from ACR guidelines cannot be equated with an approach that is below standard of care [1], which illustrates the independence that radiologists have in adopting varying formats of report.

In practice, the organization of the findings portion of the diagnostic radiology report is variable. Some radiologists produce reports with the findings organized in paragraphs, which we will refer to as prose. Others choose to organize reports in structured templates, which are always reported in a similar manner for a given imaging protocol [2].

Studies are divided on the diagnostic accuracy of structured reports compared with prose formatting. It has been suggested that structured reports neither improve diagnostic accuracy nor report clarity in trainees [2,3]. Others have suggested that utilizing structured reports as part of a resident curriculum provides a means of longitudinally following resident advancement and competency [4]. Furthermore, when used appropriately, diagnostic reports in a standardized format can improve diagnostic accuracy and report quality [5,6]. Attention needs to be given not only to clinical utility, but also to readability, because structured impressions have been shown to improve clinician understanding of certain types of reports [7]. Our study aims to assess both the readability and the clinical utility of structured reports compared with prose reports at our academic institution by polling our entire referral population.

RECOGNIZING THE PROBLEM

Surveying Our Referral Population

The study was first sent to the Institutional Review Board for approval and was subsequently approved under waiver. Using Google Forms, an anonymous survey was distributed to varying clinicians at our academic hospital.

The survey focused on two fictitious radiology reports for the same study and presented identical content but in a different format (Fig. 1). The organization of each respective report was meant to simulate either a more structured report (report A) or one that is in a more traditional, prose style (report B). Participants were asked to read reports A and B and choose which report was easier to read and which report was more clinically useful. Polling occurred from January 2015 to March 2015, during which time 218 respondents completed the survey out of a possible 1,058, a response rate of 20.6%.

After examining the total population, the participants were subdivided into smaller cohorts: novice,

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Report A: Strutured	Report B: Prose
Findings: Thoracic Inlet/Thyroid: Normal Mediastinum: Midline, No mass Heart: Not enlarged. Moderate, diffuse coronary arterial calcification. Aorta/Great Vessels: No dissection or aneurysm. Normal branching. Pulmonary Artery: No pulmonary embolism. Normal in caliber. Pleura: No pleural effusion. Lungs: Right lower lobe consolidation. No mass. Pulmonary Nodule: Axial 114, left upper lobe, 4 mm noncalcified pulmonary nodule. Lymph Nodes: No adenopathy. Bones: Healed posterior left 8th and 9th rib fractures. Upper Abdomen: Included portions normal. Impression: 1. Right lower lobe pneumonia with parapneumonic effusion. 2. Old, healed left 8th and 9th rib fractures. 3. Noncalcified pulmonary nodule in the left upper lobe. Follow up CT in 12 months is recommended if the patient is at high risk for malignancy (e.g. smoker).	Findings: The thoracic inlet is normal. The thyroid is homogeneous. The mediastinum is in the midline and without mediastinal mass. The heart is not enlarged. There is no pericardial effusion. There is moderate, diffuse coronary arterial calcification. There is no aortic dissection or aneurysm. The great vessels have normal branching pattern. The pulmonary artery is not enlarged. There is no evidence of pulmonary embolism. There is a small right pleural effusion. There is no pneumothorax. The central airways are patent and without thickening or obstruction. There is a right lower lobe consolidation. A noncalcified pulmonary nodule on axial image 114 measure 4 mm in the left upper lobe. There is no mediastinal, axillary, supraclavicular, or hilar adenopathy. There are healed rib fractures of the posterior 8th and 9th ribs. The upper abdominal viscera are normal. Impression: 1. Right lower lobe pneumonia with parapneumonic effusion. 2. Old, healed left 8th and 9th rib fractures. 3. Noncalcified pulmonary nodule in the left upper lobe. Follow up CT in 12 months is recommended if the patient is at high risk for malignancy (e.g. smoker).

Fig 1. Fictitious radiology reports used in surveying. Report A represents a structured format, and report B represents a prose format.

intermediate, and advanced. Those in the novice group included medical students in their third and fourth years and postgraduate year (PGY)-1 residents. Intermediate-level participants included PGY-2 through PGY-4 residents, as well as physician assistants and nurse practitioners. Advanced practitioners included PGY-5 residents and above, as well as attending physicians.

Analysis of the Referral Population

First, we assessed which report had better readability. Figure 2 shows which report had superior readability, expressed as a percentage of total respondents within each respective cohort. The majority of respondents in the novice group felt that a structured report using a template had better readability (70 of 102, 68.6%, $P < .0001$). Similarly, the intermediate group favored structured reports in terms of readability (38 of 53, 71.7%, $P < .0001$). The advanced group also felt that the structured report was more easily read (41 of 63, 65.1%, $P < .0001$).

We also assessed the clinical utility of the structured report versus the prose report. Figure 3 shows which report had superior clinical

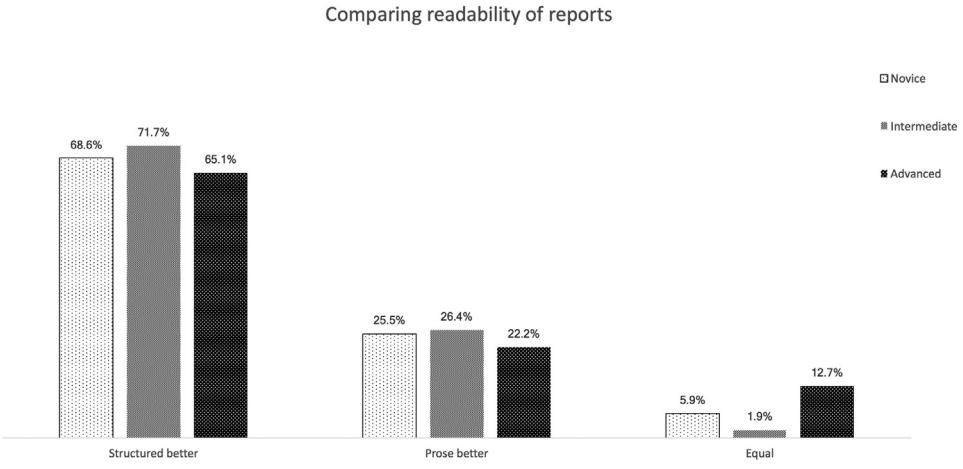

Fig 2. Assessment of which report had superior readability as a percentage of respondents from each expertise category of novice, intermediate, and advanced.