SIIM 2016 Scientific Session
Posters & Demonstrations
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RepScan: Real-Time Radiology Report Validation

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Background

Radiologists face increasingly complex report requirements for examinations with intravenous contrast, for ultrasound examinations, and for reports that involve training of housestaff [1-3]. Improperly completed reports may lead to inadequate documentation of teaching, and/or reports being returned by Medicare and other insurers. Radiology reporting systems currently provide minimal validation support, usually at the time reports are signed. More commonly, reporting systems include templates that guide radiologists to include various items, or automated insertion of information about the examination into the report [4]. A flexible, real-time report validation system would facilitate the submission of accurate, complete reports [5-6].

Evaluation

We implemented a real-time report validation system in C++, called RepScan. Our prototype is integrated with Nuance's PowerScribe 360 Radiology reporting system [7]. Using PowerScribe's APIs, we can obtain real-time information about the type of examination(s), the presence of a resident, and other information relevant to report quality. We also implemented a rule engine, which reads a set of XML-formatted rules during RepScan's initialization, and applies these rules to the information obtained via the APIs described above. Finally, we implemented a simple graphical user interface, which provides real-time visual feedback to radiologists regarding the completeness of the current report: RepScan's main window changes between red (non-compliant) and green (compliant) as information about the current dictation (e.g., types of examination(s), presence of a resident, report text) changes.

In a preliminary evaluation of RepScan, we found that it did not distract radiologists as they used the PACS and reporting system, and that it did not perceptibly use computing resources, but that it did catch report errors that would otherwise have been missed. The time required to collect all necessary information about a dictation (e.g., accession numbers, report text, presence of a resident), apply the rules, and provide feedback to the dictating radiologist was typically under 100 msec. By repeating this process within RepScan at least twice per second, we found that radiologists perceived RepScan to be operating in real-time. We also found that, as report requirements changed, we could edit the rule base in a few minutes, thereby bringing all departmental versions of RepScan into compliance with minimal effort.

Discussion

Radiology departments and practices vary in what they (and their payers) consider to be valid reports. Despite the widespread availability of reporting templates, and checks for incomplete template fields as a report is signed, reports are regularly returned from payers due to inadequate documentation. As reporting requirements become more complex, the chance of compliance decreases, and the chance that fulfillment of these requirements will distract the radiologist from focusing on image interpretation--which is of the utmost importance to patients--increases. Factors important to the acceptance of real-time report validation include responsiveness, simplicity, and the degree to which validation is integrated into established workflows.

Conclusion

RepScan's XML-based rule engine and integration with a reporting system offer a novel, flexible means of ensuring that radiology reports comply with all reporting requirements, without diverting the radiologist's attention from patient care.

References

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Keywords

Report Validation, Report Quality, Efficiency, Workflow