Automated Generation of Patient-Friendly Multimedia Reports for Whole Body MR Studies from Text-Only Radiology Reports

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Background/Problem Being Solved

Radiology reports traditionally are text-only and use terminology that patients have difficulty understanding. Patients can benefit from a patient-friendly multimedia report containing key images of findings.

Intervention(s)

We created a system to assist in creating patient-friendly multimedia reports for Whole Body MR. The radiologists insert a Key Image macro in their report in the form "Key Image: {Series: 2, Image: 6, Description: 3mm left thyroid nodule, Follow-up: No}" for each finding. We use mirth-connect as an HL7-interface engine to monitor our HL7 results feed. Mirth find these dictated exams in prelim status and launches a REST API call to a flask HTTP listener that calls the script to construct the patient-friendly report.

We create a docx report from a template with python-docx. We parse the radiologist report into report sections and identify key images. Key images and their annotations are queried and pulled from PACS using pynetdicom and store data locally using sqlite. DICOM metadata is read using pydicom. Images and their annotations are recreated using matplotlib using window level and rescaling from the DICOMheader. We replace each body-part section of the report text with no identified key findings with the text "no significant findings." We then upload the docx to an internal webserver and send an email with a link to the report to our internal team within about 30 seconds of the report being saved.

Barriers/Challenges

Manual proofreading and editing are currently part of the workflow to ensure that the multimedia text and images are accurate. We are also working on automating the insertion of patient-friendly explanations of important and incidental findings using a RAG-based LLM workflow.

Outcome

These patient-friendly multimedia reports can be distributed to patients via Epic including the Epic patient portal and app.

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Conclusion/Statement of Impact/Lessons Learned

We have an automated system for generating patient-friendly multimedia reports from standard text-only radiology reports.
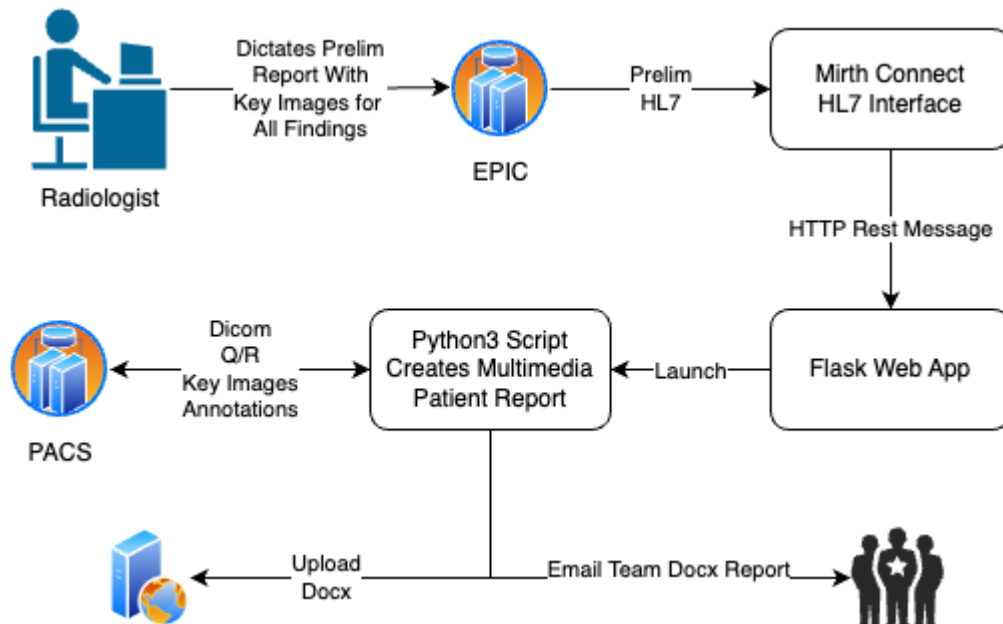
Figure(s)

Figure 1. Workflow for generating Patient-Friendly Multimedia Reports

Keywords

Clinical Workflow & Productivity; Communication Data Management; Patient/Family Experience

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