Common Data Element (CDE) Implementation for CT Paranasal Sinusitis: Improved Disease-Specific Evidence-Based Clinical Reporting, Moving Towards a Community Standard, and Building a Foundation for Research in Artificial Intelligence/Machine Learning

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Introduction
The American Society of Neuroradiology (ASNR), American College of Radiology (ACR), and the North American Society for Pediatric Radiology (NAPR) have developed Common Data Elements (CDE) mandate for reporting of various diseases, including a comprehensive reporting for paranasal sinus disease (e.g., sinusitis, maxillary sinus disease, osteomeatal syndrome). Early implementation of CDE mandates has been facilitated by use of field-specific application programming interfaces (API), which incorporate the CDE mandate into the imaging study protocol. A recent initial study demonstrated that clinical reporting improved after adopting CDE protocols. However, the incorporation of the CDE mandate into our group's practice continues to be simplified and utilized for improving CT CDE macro reporting.

Materials and Methods
Institutional review board approved the waiver of informed consent for this project of quality improvement and quality assurance.

As a CDE mandates, we developed the original ASNR-ACR EA CT paranasal sinus CDE macro based on a baseline guide (Figure 1). We identified the CDE macro for reporting our radiology group's style of reporting using our institutional data. The CDE macro was utilized to collect metadata with minimal inclusion of non-CDE findings to make the complete exam template for example, discussion of the findings, secondary보고서와 similar findings, partially, increased irrelevant unimportant information.

Figure 1. Original ASNR-ACR EA CT Paranasal Sinus CDE Macro. The baseline represents field for raw input and/or selection from Pick List.

Methods and Materials (continued)
Osteomastoiditis was not included in the original ASNR-ACR EA CDE macro, but more descriptive terms were preferred by our radiology group.

One modification of the original CDE macro was the inclusion of sinus disease with regard to the frontal sinus Pick List. Radiologists and technicians were always attending to the clinical information that was displayed in the CDE macro. We also implemented that the actual sinus disease can be represented by the numbers that correspond to the key classes on the panel of the reading screen. The information of the actual disease is displayed in the same Pick List option (Figure 2).

Figure 2. Yale customization of the ASNR-ACR EA CT Paranasal Sinus Inflammatory CDE Macro. On the left is the ASNR-ACR EA CT Paranasal Sinus CDE Macro before implementation (accompanying baseline guide). On the right is the Yale customization of the CDE macro (for example, paranasal sinus mucosal or paranasal sinus spread of intracranial thrombus). In the middle, we include a descriptive term (for example, paranasal sinus mucosal or paranasal sinus spread of intracranial thrombus).

Table 1 (on next page).

Results (post-intervention)
After CDE macro implementation, 50 reports met inclusion criteria, and 30 met exclusion criteria. Thus, we analyzed 63 (91.5%) CDE macros, either 100% improved or improved in percentage: left maxillary sinusitis (74%), frontal sinusitis (78%), and perineural spread (10%).

Discussion
Implementation of the ASNR-ACR EA CDE macro for CT paranasal sinus inflammatory disease allows better disease-specific evidence-based, reporting, often desired by radiologists. The incorporation of the CDE macros into our group's practice continues to be simplified and utilized for improving CT CDE macro reporting.

Acknowledgments & Contact Information
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