Graphical Exam: A Marriage Between Visual Ease of Use and Structured Data

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Abstract

Clinicians often want to enter abstract drawings into medical notes, while systems designers and administration prefer structured data. In prior EHR implementations designers have implemented either one or the other method for graphical information entry. We have developed a technique for combining these together.

Background

Since the dawn of the written medical record, clinicians have used hand-drawings to provide a visible record of findings. These follow the “a picture is worth 1000 words” dictum. However, there is now demand for structured data to provide meaningful use of the data, forcing clinicians to either use non-freehand drawings, such as point-and-click graphical forms or allow PACS-system style markup of uploaded photographs, which are awkward to use.

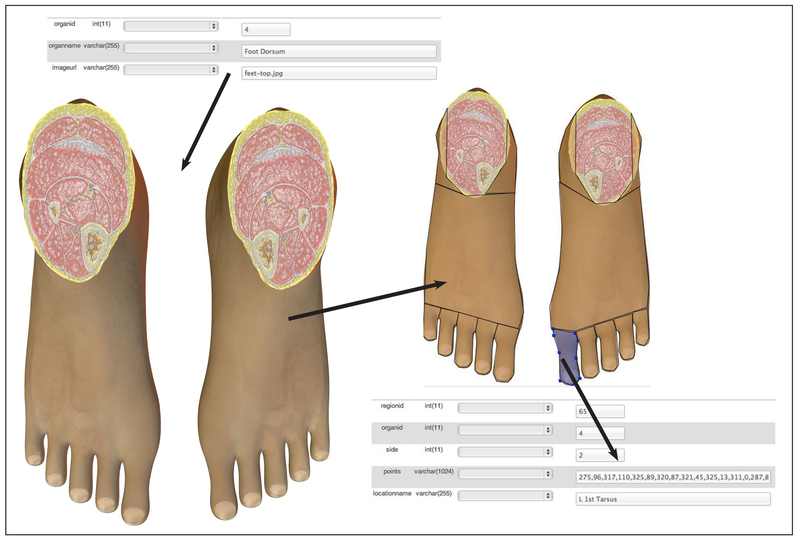


Figure 1: How a region on an organ is defined

Methods

The authors have developed a module to be used in EHRs which allows the feeling of freehand drawing techniques, while automatically producing structured data in the background for the clinician.

The system uses a background image of the organ or body system, which has regions defined on it, which are organ specific (such as the Left 1st Tarsus) and a pallet of lesions, which are associated with various diagnoses from our clinical terminology (e.g. Foot Laceration). Each lesion can have multiple diagnoses associated with it.

The clinician *drags and drops*, scales and stacks lesions to form the picture of what they see. In *real-time* the system modifies the problem list and enters the problems and regions into the assessment and plan section. We found that the prior designs that use clicking on landmarks to be very limiting to clinicians.

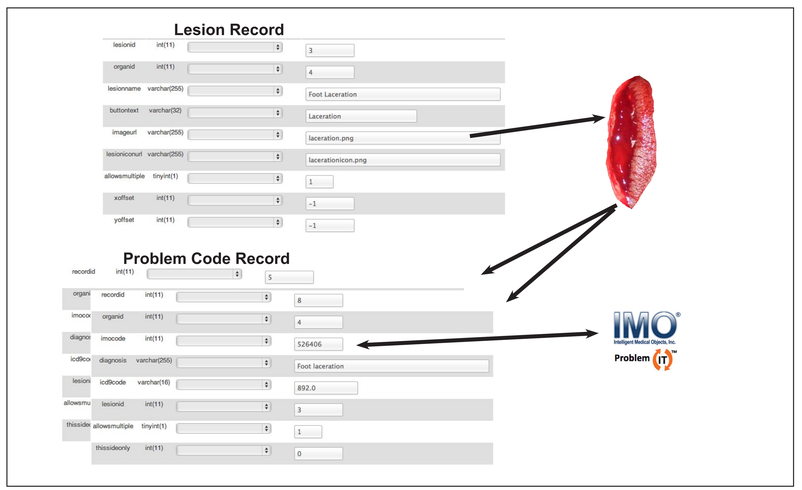


Figure 2: How a lesion is defined

Results

The system is currently deployed in test for use in Ophthalmology and Podiatry at 2 clinics, although in reality there is no limitation to even the medical field for this method, as it could be used for such tasks as as marking up dents and scratches on rental cars or other similar graphical + structured tasks.

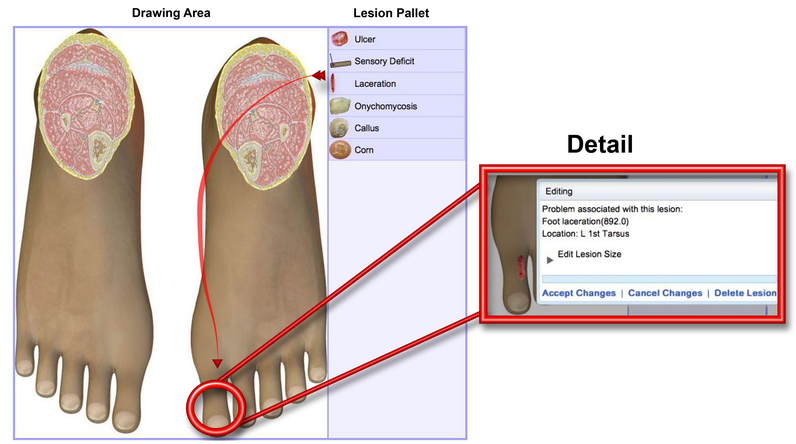


Figure 3: System in use

Conclusion

Through automated association between drag-and-drop pathology, anatomy and background clinical terminology we can greatly ease graphical documentation for clinicians and provide structured data for data analysis and coding without burdening the clinician during the documentation process.

This results in both an improved structured content of the EHR, and for highly technical areas such as ophthalmology, the names of lesions are often not known by other specialists and generalists, but seeing a visual representation of the documented problems is highly valuable, and allows progress tracking by non-specialists.