

Imaging OHDSI WG

From pixels to Phenotypes

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Imaging WG Goals

- 1.The ability to bring features derived from medical images into the OMOP data model while maintaining provenance.
- 2.Ability to perform cohort definitions in OHDSI for medical imaging research studies
- 3.Supporting deep learning research on medical images as part of the prediction modeling in Atlas.
- 4.Develop infrastructure for reproducible research on medical images.
- 5.Evaluate federated learning as part of a network study.

2022 OKRs (Objective and key results)

- Objectives: Defining feasible medical imaging data model for OMOP-CDM
- Key Results
 - Get an Imaging Data Model proposed to and accepted by the CDM WG
 - Publish a paper on the Imaging Data Model
 - Get a reference implementation of the Imaging Data Model

Use cases

- Lung Cancer and Tracking pulmonary nodules in CT.
 - Looking at the doubling rate of nodules volume is a key predictor of malignancy. For patients having serial Chest CT imaging Studies(CPT). Where the analysis looks at the morphology of nodules and their locations and tracks to see how they change over time.
 - Outcomes defined by pathology biopsy and lung cancer DX. OMOP model has the diagnosis and the biopsy results. The goal is to bring automated measurements of the morphology of nodules into OMOP with direct provenance to the algorithm and the original images that created that feature. We can then validate algorithms as well as use these measurements to study progression of disease.
- Breast Cancer and Mammogram
 - Retrospective analysis looking at Cancer DX identified for cohort discovery. Using supervised training techniques to evaluate prediction models based on pixel data. Mammogram analysis extracting new phenotypes on breast density, calcifications into the OMOP database and see how they are predictive of disease for patients.
- Brain tumor and brain MR
 - Pre and post operative imaging analysis. Neuro fixed body registration between pre and post surgery to look at change in tumor size. This requires identification of both imaging studies as well as an able to fix the reference orientation between.