Breast Imaging Fhir IG Document

Kurt W. Allen

Penrad Technologies, Inc.

# Purpose

The purpose of this document is to give information about the FHIR Breast Imaging FHIR IG Document.

# Tooling

This implementation guide uses C# based custom tooling that creates FSH files (see FHIR shorthand) and various files that are fed into the FHIR Implementation Guide Builder software to create a FHIR implementation guide.

The custom tooling includes

## MFSH

MFSH is a FSH preprocessor that takes in a .mfsh file and outputs a fsh file and certain other files that are used for custom processing.

MFSH adds an extended macro facility that FSH lacks.

## FGRAPH

FGraph takes custom output from the mfsh build and creates graphical svg files that are included in the final IG build.

## IGBuilder

IGBuilder patches the output of the mfsh build so the fhir IG builder works properly.

# Versions

## Version 0.1

Version 0.1 of the FHIR IG was an initial release to get comments.

## Version 0.2 (STU)

This version included substantive changes to the structure of the previous version, and creates the base structure of the FHIR IG. It implemented on the Breast Mammography sections of the FHIR IG. Other modalities will be added in the future.

Version 0.2 also only used ad hoc local terminology.

## Version 0.3

This version cleaned up some errors in the structure defined in version 0.2 and focused on converting the local codes defined in the previous version to LOINC and SNOMED codes.

### Change Log

This section contains information on the Medical Terminological changes to the Breast Radiology FHIR IG from Version 0.2 to 0.3.

This does not describe the non-medical structural changes made such as

1. Modifications to the MFSH files to support new tooling.
2. Non medically relevant internal documentation and comments.

#### Corrections

##### AbnormalityDuct ObservationCode

The AbnormalityDuct observation code was incorrectly set to AbnormalityCyst. Changed it to abnormalityDuctObservation.

#### Shape, Margin and Density

Removed Shape, margin, and density from profiles where thoses were not appropriate, including

* ArchitecturalDistortion
* Asymetry

#### Modifications

##### Units Of Measure

Removed UnitsofMeasure value set and modified all measurements to be only in millimeters (mm).

##### Breast Imaging Implementation Guide

Changed name from Breast Radiology to Breast Imaging.  
This was done to reflect that this FHIR IG will also, in future releases, include non radiological modalities such as Ultrasound, MRI, etc.

##### Density

Added optional radiological density observation to the following profiles.

* AbnormalityArchitecturalDistortion Profile
* AbnormalityAsymetry Profile
* AbnormalityCyst Profile
* AbnormalityDensity Profile
* AbnormalityDuct Profile
* AbnormalityFatNecrosis Profile
* AbnormalityFibroadenoma Profile
* AbnormalityLymphNode Profile
* AbnormalityMass Profile
* AbnormalitySkinLesion Profile

#### US Core Harmonization

US realm IG’s must now conform to US-Core. The following changes were made to implement this.

* All ValueSet’s and CodeSystems defined now set the required experimental value to false (previously value was not required)
* BreastImagingReport now derives from us-core-diagnosticreport-note.
* Breast Medication Request now derives from us-core-medicationrequest
* Breast Service Request now derives from us-core-servicerequest
* All observation derived profiles now derive from us-core-observation-imaging

#### Terminology Harmonization

* Updated BreastAssessmentCategory to use ACR codes instead of SnoMed codes. Removed BreastAssessmentCategoryVS.  
  Created map from ACR values to Snomed values.
* Modified CystAbnormality with ACR Terminology.
* Modified Margin Observation to use ACR terminology.
* Modified Orientation Observation to use ACR terminology.
* Modified Observed Count Observation to use ACR terminology.
* Modified Observed Sized Observation to use ACR terminology.
* Modified Associated Features Observation to use ACR terminology.
* Modified Observed Distribution Observation to use ACR terminology.
* Replaced BreastLateralityVS valueset with RadLex RDE1588\_BreastLaterality valueset.  
  Created ConceptMap from RDE1588\_BreastLaterality codes to snomed codes .  
  Modified BreastLateralityExtension to use new valueset.
* Modified BreastBodyLocationExtension to use new ACR valueset, including  
  Integrating RDE1563\_QuadrantOdfBreast  
  Integrating RDE1564\_RegionOfBreast

Integrated RDE1558\_BreastBodyLocationClockPosition  
Integrated RDE1559\_BreastBodyLocationDepth  
Integrated RDE1560\_BreastBodyLandmark

* Replaced local AssociatedFeature Codeset/Value set with ACR RDE1571 Associated feature ValueSet
* Replaced local Shape Codeset/Value set with ACR RDE1576 Shape ValueSet
* Replaced local Orientation Codeset/Value set with ACR RDE1580 Orientation ValueSet
* Modified CalcificationAbnormality to use ACR terminology.
* Changed BiRadsAssessmentCategory from Observation.hasmember to Observation.component in all occurrences.
* Changed Breast Composition Category from hasMember to Component.