Encounter-Based Imaging Workflow (EBIW)

IHE Radiology Domain
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What’s Encounter-Based Imaging?

**Enterpise Imaging**

- **Encounter-based Imaging**
  - [PoCUS, Camera, iPhone,…]
  - (Dermatology, Wound Care, Burn Unit, ER, etc., etc., etc.)

- **Order-based Imaging**
  - [CT, MR, PET, XA, MG, Echo]
  - (Radiology, Cardiology, etc.)

EBI = imaging captured in the context of an encounter between a patient and a care-provider (typically without an imaging order)
So What’s the Key?

ONE WORD: METADATA
To manage the images, and readily find & use them again

- **Patient Metadata**
  - Name, Date of Birth, Age, ID, Other IDs, ...
- **Encounter Metadata**
  - Department, Specialty, Physician, Referring Physician, Admission ID, Admission Date/Time, Reason for Admission, ...
- **Procedure Metadata**
  - Modality, Imaging Procedure, Body Part, Reason for Imaging, **Accession #**, Acquisition Date/Time, Device, Operator, Acquisition Parameters (more for PoCUS than cameras), ...
- **Pixel Metadata**
  - Rows, Columns, Bit Depth, Pixel Size, Encoding, ...

… turning a JPEG into a medical document
When acquisition is not integrated, complete and consistent, the quality and efficiency of care is negatively affected:

- Images buried in the paper record
- Images scanned into EMR without metadata
- Images lumped in one “folder" with no differentiation / navigation
- Imaging record fragmented across many departments
- Sharing between affiliated hospitals is limited / non-existent
- Images not readily available to the Care Team
- Time lost to awkward workflow/data capture; lack of automation
Profile Goals

Facilitate Clinical Use (and Billing and Analytics)
- Depends on good, consistent metadata
- Retrieval, Decision Support, Hanging Protocols, depend on consistent series names, procedure codes, etc.

Efficient Workflow
- Minimize manual data entry
- Electronic transfers

Use Cases
- **Point of Care Ultrasound**
- Dermatology
- Wound Care/Management
- Infectious Diseases
- Burn Care
- Plastic Surgery
- Nursing/Clinic Photography
Use Case 1:  
Point-of-Care Ultrasound (ER)

- Scan wristband
- [Gets metadata]
- Scan Patient
- [Adds metadata]
- [Stores Images]
- [Notifies EMR]
IHE EBIW Actors

Results Aggregator

(“EMR”)

Get Encounter Imaging Context [RAD-Y1]

Encounter Manager

→ Store Encounter Images [RAD-Y2]

Acquisition Modality

← Notify Imaging Results [RAD-Y3]

Image Manager/Archive
PoCUS Applications

**Inpatient Status Check** in ward by Nurse / Tech / Clinician
- determine the state of bladder (empty, partial, full)
- confirm placement of needle or catheter (e.g. PICC line)

**Emergency Room Evaluation** by ER physician
- diagnose, detect or confirm a disorder or disease state (especially localizing fluid and evaluating amount present)
  - e.g. internal bleeding, soft tissue infection, pulmonary edema, pericardial effusion, deep venous thrombosis, gallstones, residual urine, subcutaneous abscess

**Procedure Guidance** by Operator
- guide a biopsy, venous catheter placement, thoracentesis, …
- visualize device (needle, catheter, etc.) vs anatomy (tumor, blood vessel, abscess)

**Outpatient Supplemental Information** by Specialist
- during consultation on identified condition decides to take images
- evaluate/characterize, or document absence of suspected condition
  - e.g. breast surgeon evaluates lump detected by primary physician
Implementation Roadmap

- Connectathon is coming …