## **EMR Orders Interface for Anatomic Pathology**



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#### J. Mark Tuthill, MD

## Objectives

Understand why you would implement an AP orders interface

Describe our implementation experience

Present challenges encountered

Describe what we learned

Understand future opportunities

## **Background and Development**





## The Value of EMR Ordering

- Such systems will enable clinical orders to be sent to the anatomic pathology information system as well as supporting:
  - Decision support
  - Gathering of accurate and required information
  - Positive patient identification
  - Generation of laboratory ready labels to the point of service
  - Tracking of samples to the laboratory including monitoring of conditions

## The Value of EMR Ordering

- Similar to the clinical laboratory, a flow of orders to the LIS will enable:
  - Sample receipt
  - Tracking
  - Routing
  - Processing
  - Automation of several elements of case accessioning
    - Decrease errors
    - Increased throughput

## Concept

- Order initiated at EPIC: tests to be done
- Electronic information communicated via the orders interface (also results interface)
- Bidirectional Interface:
  - EPIC to CoPath: Communicate order <u>and related information</u> to CoPath
  - CoPath to EPIC: Communicate status and results to EPIC on order number

### Where we started

- EPIC phased implementation without orders interface (2013)
- All part types already in EPIC (specimen sources)
- EPIC already sending ADT to Sunquest CoPath
- EPIC already generating order numbers
- Paper-based orders from EPIC (requisition w/ specimen)
- Already sending electronic <u>results</u> to EPIC
- Meaningful Use results interface October 2015

... But were not yet sending order information <u>electronically</u> to CoPath

### Reasons to Pursue

- Transmission of results to mid-level providers in EPIC
- Order numbers don't transmit to CoPath, so orders remain unfulfilled in EPIC
- Significant manual data entry at CoPath accessioning
- Lab currently "blind" to EPIC orders until specimen is received
- No order status update in Epic

## Cost/ Funding/ ROI

- Project funded at institution level for resulting to midlevel providers
- Significant cost for interface (\$11K)
- Annual support fees (\$2K)
- ROI: Projected ~ 700%
- A separate interface required for Atlas (outreach)

## Scope

- Goal is to implement without modifying current orders in EPIC but capture minimal data in Sunquest CoPath
- Engine triggers on EPIC order to send
  - An order to Sunquest Lab for label logic and specimen tracking
  - An order to Sunquest CoPath
- Paper requisitions will be maintained
- All types of specimens included in single implementation: Surgical, FNA, Gyn, Non-Gyn, Hematopath, Molecular, DNA Lab, Cytogenetics
- Transmission of Part Types and EPIC text (ex. Clinical History) with order was deferred to Phase II

## Development team – meet weekly

HFHS Anatomic Pathology (AP) Pathology Informatics Team

HFHS Clinical Pathology (CP) Pathology Informatics Team

HFHS IT – Integration Team

HFHS IT – Interface Engine Team

HFHS IT – Interface Team

HFHS Helios – Inpatient

HFHS Helios – Ambulatory

HFHS Helios - Optime

HFHS Helios – ASAP (ER)

HFHS Genetics Team (DNA Lab, Cytogenetics Lab)

Sunquest Project Manager

Sunquest – Interface Analysts

Sunquest – Interface Programmer

## **Anticipated Gains**





## Anticipated gains - required

- Provide for "solicited" orders where the Sunquest CoPath result will fulfill the EPIC order#
  - Will provide a status update back to Epic
- Facilitate transmission of Sunquest CoPath results to mid-level provider In Baskets via report distribution <u>within EPIC</u>
- Provide for notification of EPIC orders to lab staff before specimen receipt allowing for realtime resolution of specimens not received
- Improve efficiency/accuracy of Sunquest CoPath orders by electronically providing information previously entered manually
- Simplification of EPIC order/result display

# Anticipated gains Phase 2

Sending part types and text in the order message expected to be potentially more difficult

- Part types ~ 1000
- EPIC Text Clinical Diagnosis, Clinical History, etc
- To be included only if development fits overall timeline

## System Setup - A New World



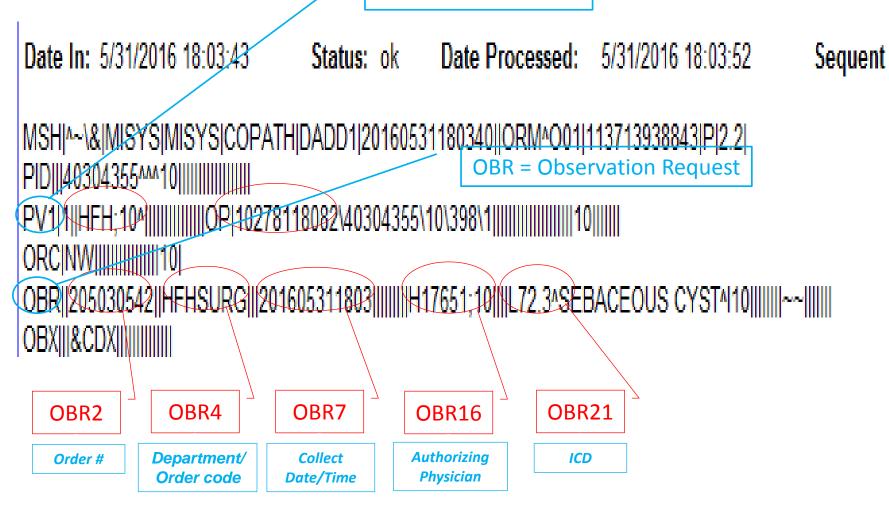


## A complex new world...

- Not "just between friends" any more
- Each step of the process from Epic order through Sunquest CoPath results is sent across the interface – electronic documentation
- Things that didn't used to have impact now do (deletereorder)
- Complexity reinforced every day (EPIC workflow)

## **HL7** segments

**PV1= Patient Visit** 



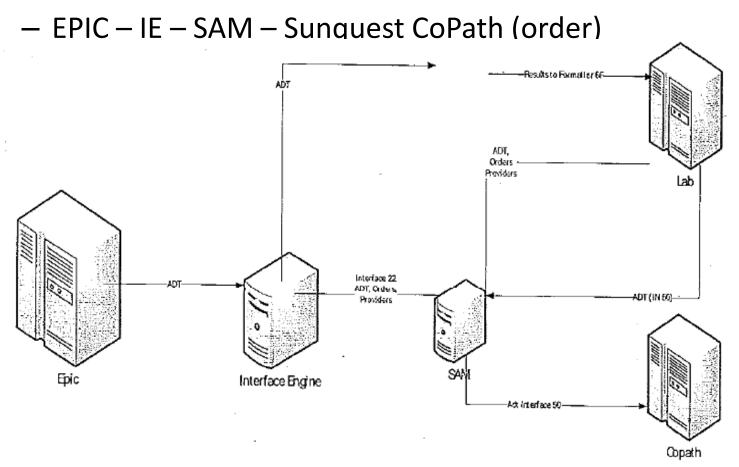
### Information Placement in HL7

- Sending system needs to put the right information where the receiving system expects it consistently
  - Options for modification
    - Orders Interface in Epic
    - Interface Engine
    - SAM
      - Sunquest Application Manager
        - » Effectively a Sunquest engine

## System Interfaces

Order message split

EPIC- IE - SAM - Sunquest Lab (labels/tracking)



## **Sunquest** Teams and Setup

#### Application Interfacing HIO Specification Review

Questions, Interface/ HL7 Specs

#### Al Team

- Configure orders interface, SAM, Lab interface
- Changed system setting to allow order entry interface
- Added required parsing rules to pull data from ORC, OBR, OBX, ZCp segments
- Added parsing changes to send the order # outbound on accession notification and result messages

#### CoPath Team

- Set CoPath Order Entry Number Population system setting how orders present
- Added Order Data AUO and Client to accession windows
- Hidden popup window painted on each accession window
- Window painting for order receipt activities

## Sunquest Lab Setup by **HFHS**

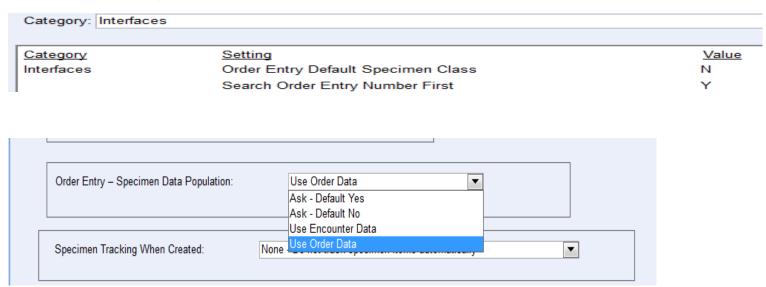
 HMA maintenance - forward order codes to CoPath

Translation table on SAM – Sunquest Lab/ CoPath

 Code added to block mid-level providers from lab physician table

## Sunquest CoPath Setup by HFHS

System Settings – customer accessible

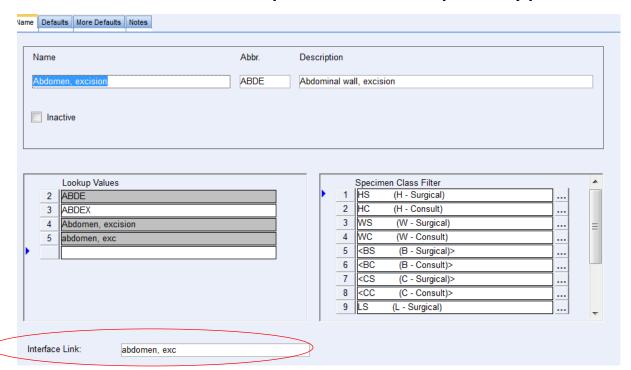


Dictionary interface links to support interface

	Name	<u>Abbr</u>	<u>Description</u>
•	Order Entry Purge for CoPath		Purge used and/or old CoPath order entry messag

## Part Types

- Part types in order message optional
- Associate EPIC specimen source to Sunquest CoPath part type via interface link
- EPIC abbreviation as Sunquest CoPath part type interface link



## Setup **HFHS** Epic and Interface Engine

- Helios Optime: Modify OTX logic at EPIC Optime (no HL7 to SAM)
- Interface Engine:
  - Spawn an additional order for Sunquest CoPath orderables to support the both Sunquest Lab and CoPath orders
  - ORC2 to OBR2 to match results to EPIC order#
  - OBR 15 (Specimen Source) gets nulled in order message until
     EPIC HL7 output variation is addressed

## Workflow in Our New World





## **Basic workflow**

- ADT generated at EPIC = reg at CoPath
- Order generated at EPIC = order to CoPath
- CoPath specimen ordered against EPIC order number
- CoPath results include EPIC order #
- Results distribution to mid-level providers associated with order
- CoPath results fulfills order

## Accession - requisition

- Receive paper requisition with specimen
- Scan barcode for positive patient identification

Henry Ford Health System Order Sheet From: HFMC Main Surgical Pathology

P: 313-916-2319 F: 313-916-9113 2799 W. Grand Blvd.

E&R-6

Detroit MI 48202

Patient: Hema Hema DOB: 01/02/1954

Sex: M

MRN #: 40304355

Patient Address: 1 FORD PLACE DETROIT MI 48202 313-555-7968

**Authorizing Provider:** Joseph Tuthill, MD NPI#: 1376691089 HDoc#: 49095

Epic ID#: H17651

Ordering Provider: Ron Brown

NPI#: HDoc#: Epic ID#: Primary Insurance Information

Payor: BLUE ADVANTAGE Plan: 102003002 Group Number:

Subscriber ID:12132 - (HAP) Secondary Insurance Information

Payor: GroupNumber: Subscriber ID:12132

Surgical Specimen Exam Order ID: HFHSURG

Diagnosis: L72.3 Priority: Routine

Order Date: May 31, 2016 Order Number: 205030542

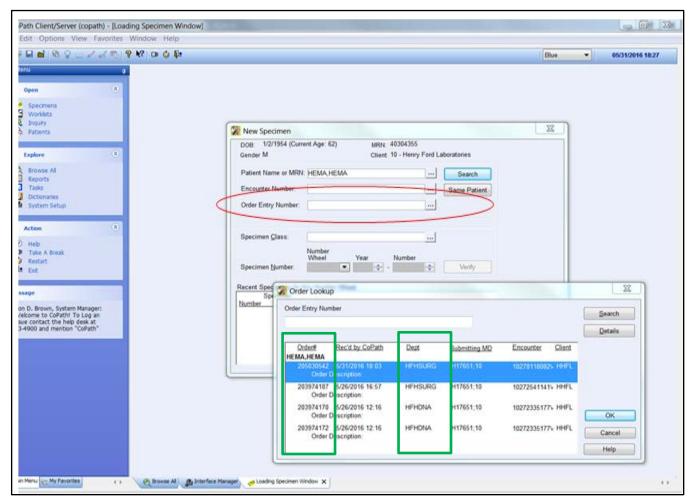
Specimen Source: Collected By: Ron Brown Collection Date: May 31, 2016 Collection Time: 6:03 PM Specimen A: Skin, cyst [822]

Comments: Clinical History/Pre-OP/Post-OP/Radiologic Findings: Testing for SUG preparation



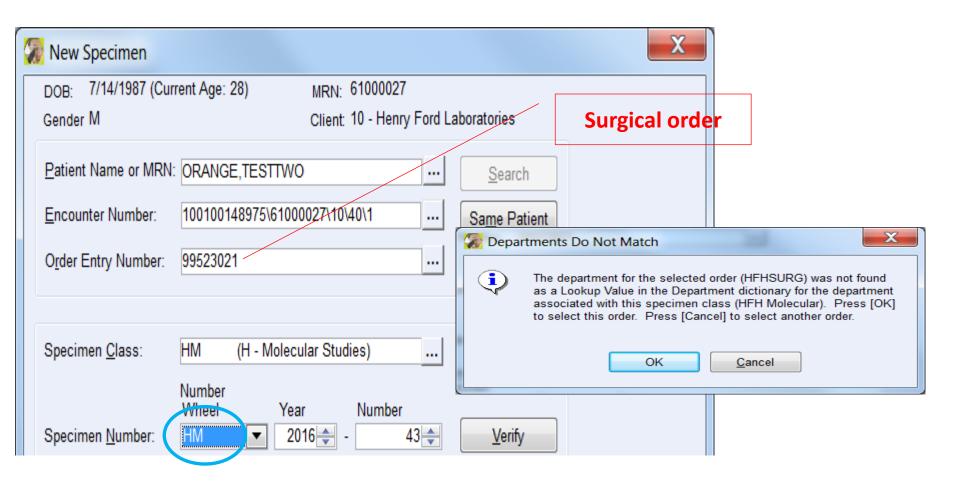
### Accession – order # selection

Select proper order referencing (1) Order Number (2) Department



### Accession – Department Mismatch

- Notification if specimen class department does not match EPIC order code
- Correct encounter selected with order



## Accession: Specimen class selection

## Can be automated by system setting <u>if</u> each specimen class has a unique department

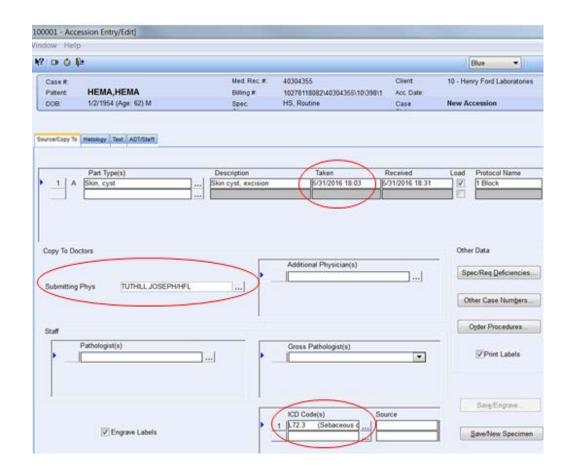
#### At HFHS:

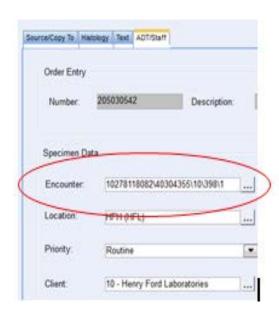
- Multiple hospitals on same Sunquest CoPath system
- Consolidated accessioning at Detroit main campus
- Shared Sunquest CoPath departments across specimen classes

Specimen Type	CoPath Dept int.link EPIC Order Code	Specimen classes
Cytology FNA	HFHCYTOFNA	HF, LF, MF,WF
Cytology Gyn	HFHCYTOGYN	HG, LG, MG,WG
Cytology Non-Gyn	HFHCYTONGYN	HN, LN, MN, WN
Hematopath	HFHHEME	HH, LH, MF,WH
Surgical	HFHSURG	HS, LS, MS, WS
Molecular	HFHMOL	HM, LM, MM, WM
DNA	HFHDNA	GD
Cytogenetics	HFHGCG	GX

# Accession Automated Field Updates

- Fields auto-populated by EPIC order
  - Significant time savings and error reduction

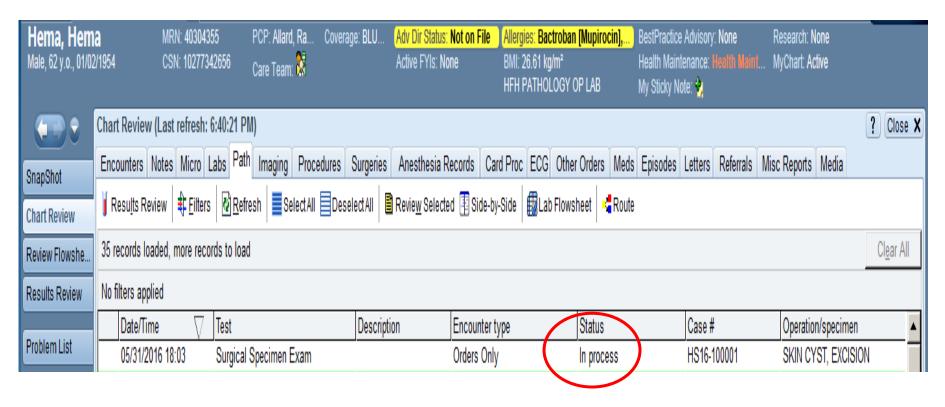




## **Epic Status Update**

Order status message sent to EPIC on results interface

 Status updated by Sunquest CoPath from "Collected" to "In Process"



# Specimen Sign-out Results

# EPIC Order Number in outbound result message (OBR2)

#### Scan Interface Data

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Table Name: i\_seq\_out\_a

Date formatted: 5/31/2016 18:46:39

OBXI9ITXIHS16-100001&rpt^99DHTIIPatient Name: HEMA, HEMA

Status: SEND Date sent: 5/31/2016 18:46:40

Sequential Number: 5400003456633

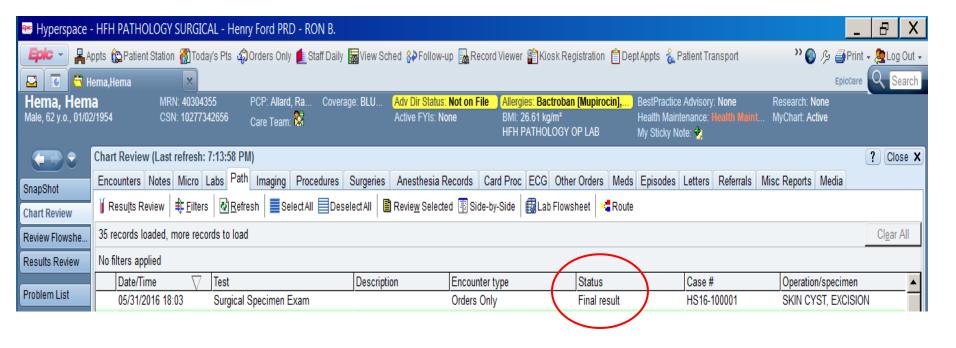
Accession #: HS16-100001|||||F

```
MSH|^~\&|COPATHPLUS|HFH|||20160531184600||ORU^R01|5500003446256|P|2.2
PIDI1|3843413|40304355^^^10||HEMA^HEMA||19540102|M|||||(313)555-7968||||||999-99-9999
ORC|RE|205030542|HS16-100001^CoPathPlus||CM||||201605311839|^Brown^Ron||H17651;10^TUTHILL^JOSEPH
OBR|1|205030542|HS16-100001^CoPathPlus|HFHSURG^HFH Surgical Pathology|||201605311803|||||||201605311831|^^Skin cyst,
excision|H17651;10^TUTHILL^JOSEPH|||||F|201605311846||HFHSURG^HFH Surgical Pathology|F||||||H17651^Tuthill^J.|^Brown^Ron
                                            Henry Ford Hospital|||||F
OBX|1|TX|HS16-100001&rpt^^99DHT||
                                       OBX|2|TX|HS16-100001&rpt^^99DHT||
OBX|3|TX|HS16-100001&rpt^^99DHT||
                                       2799 W Grand Blvd Detroit, MI 48202||||||F
                                       Tel: (313) 916-LABS Fax: (313) 916-3971|||||F
OBX|4|TX|HS16-100001&rpt^99DHT||
OBX|5|TX|HS16-100001&rpt^^99DHT|||||||F
OBXI6|TX|HS16-100001&rpt^^99DHT|||||||F
                                           Surgical Pathology Report|||||F
OBX|7|TX|HS16-100001&rpt^^99DHT||
OBX|8|TX|HS16-100001&rpt^^99DHT|||||||F
```

## Sunquest CoPath result display/ distribution at EPIC

#### Result is filed against order number in EPIC:

- Result distributed to InBaskets of all staff associated with order in EPIC (including mid-level providers)
- Result fulfills EPIC order
- Results display on same line item as EPIC order



## **Order Cancel Scenarios**

Three scenarios tested \*

(1) Sunguest CoPath delete: EPIC status updated from Collected to Canceled



(2) EPIC cancel: Order # not available in Sunquest CoPath



(3) EPIC cancel after Sunquest CoPath accession: Cannot cancel at EPIC

# Implementation Challenges





### HL7

#### Location

- HFHS uses *patient* location for AP (PV1-3)
- SQ looking in ORC13 for ordering location
- SQ change use PV1 only if ORC13 is empty
- Can't blank out ORC13 completely as it's used for SQ Lab
- SQ Parsing change to use PV1 regardless of ORC13 value

#### • ICD Code

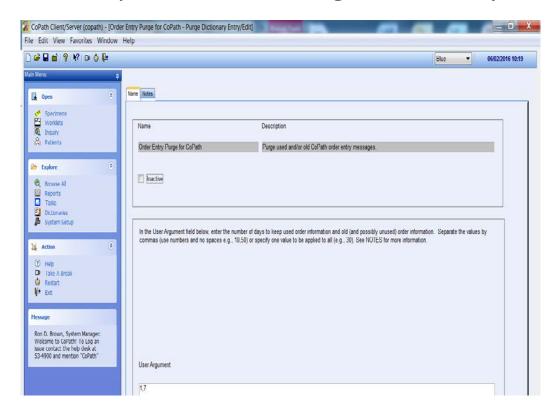
- Coded diagnosis initially in DG1
- Sent to Clinical History field in CoPath
- Want ICD from EPIC order to drop into CoPath ICD field
- Sunquest modified to send to ICD field not Clinical History

# HL7 Part Types — unique HFHS issue?

- Part type interface link must be in OBR15.1
- EPIC transmits in OBR15.4
- Sunquest changed OBR format inbound to Sunquest Lab
- IE –changed code to support OBR15.1
- Inconsistent EPIC build revealed re: outbound HL7
- Similar issues for text in wrong HL7 segments ex.NTE or OBR vs OBX
- Implementation deferred to Phase II

# **Purge Dictionary**

- Orders "disappearing" over weekends
- Not EPIC or SQ Lab purges
- Sunquest CoPath Purge Dictionary



Enter the number of days to retain used orders and un-used orders in the following format:

arg1,arg2

where

arg1 = retention days for used orders (e.g. a specimen was accessioned that selected the order). It is measured based upon when the order was linked to a specimen.

arg2 = retention days for all orders, regardless of whether or not they were used. It is measured based upon when the order was received by CoPath.

NOTE: Do not include any spaces in the argument list, only numbers and commas. arg2 should usually be greater than arg1.

If you wish to have the same retention days for both arg1 and arg2, you can enter a single number.

# **Future Opportunities**





### **Future Opportunities**

- Part Types and Text on interface
  - EPIC reconfiguration so that HL7 is sent out <u>consistently</u> across all workflows/specimen types
- Optime Inbasket messages for mid-level providers
  - No opportunity to associate mid-level providers to EPIC order in Optime
- Use of Order List as a an effective EPIC orders pending log
  - Multiple EPIC Order numbers where there should be one
  - Similar issues confirmed with other users @ CoPath SIG
  - EPIC user education
  - SIG Enhancement SE-000030: next CoPath version beyond v6.3

# **Future Opportunities**

### Refinement of specimen cancel workflows

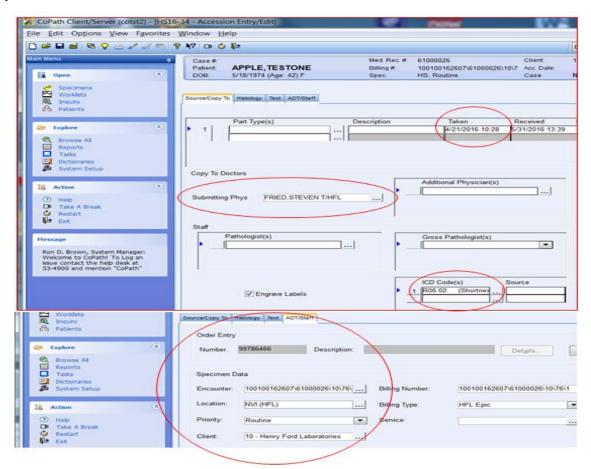
- EPIC ordering compliance
- Increase Sunquest CoPath accessioner understanding of cancels
- HFHS Unsuccessful in dissociating EPIC order # from case before case delete at Sunquest CoPath
  - Reuse of Sunquest CoPath specimen numbers (historical)?
  - Reuse of EPIC order numbers?
  - Analysis of Reorders at Sunquest CoPath and EPIC





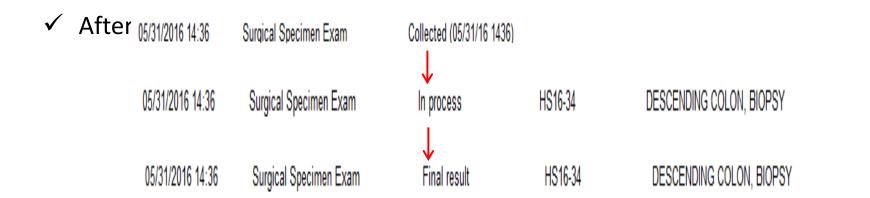
- ✓ Provide for "solicited" orders where the Sunquest CoPath result will fulfill the EPIC order# (match order filler number)
- ✓ Provide for notification of EPIC orders to lab staff before specimen receipt allowing for realtime resolution of specimens not received
- ✓ Facilitate transmission of Sunquest CoPath results to mid-level provider In Baskets via report distribution within EPIC
- ✓ Ease of selecting encounter
- ✓ Fail safe for correct specimen class

✓ Improve efficiency/accuracy of Sunquest CoPath orders by electronically providing information previously entered manually, saving 2 minutes per accession



### Simplification of EPIC order/result display





### **Team Members**

### **HFHS**

- Ron Brown-Project Lead
- Gary Kasperek
- Mike Czechowski
- Jackie Ribbentrop
- HFHS IT services
  - Esp Kelly Gonyea
- HFHS Epic Team (Helios)

### Sunquest

- Jamie Ritchie
- Dawn Lev
- Ryan Trottier
- Ken Wong

# EMR Orders Interface for Anatomic Pathology



### **Questions?**

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