

Radio Frequency Identification (RFID) in Anatomic Pathology

Lab Quality Confab

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Specimen Management GI/CRS Endoscopy

- System details
 - Practice Area
 - Three separate units
 - Gonda 9, Charlton 8, SMH/Alfred Main
 - Practitioners
 - Medicine and Surgery
 - Allied Health Staff
 - RN and LPN
 - Patients
 - Procedures
 - Databases



Specimen Management Anatomic Pathology

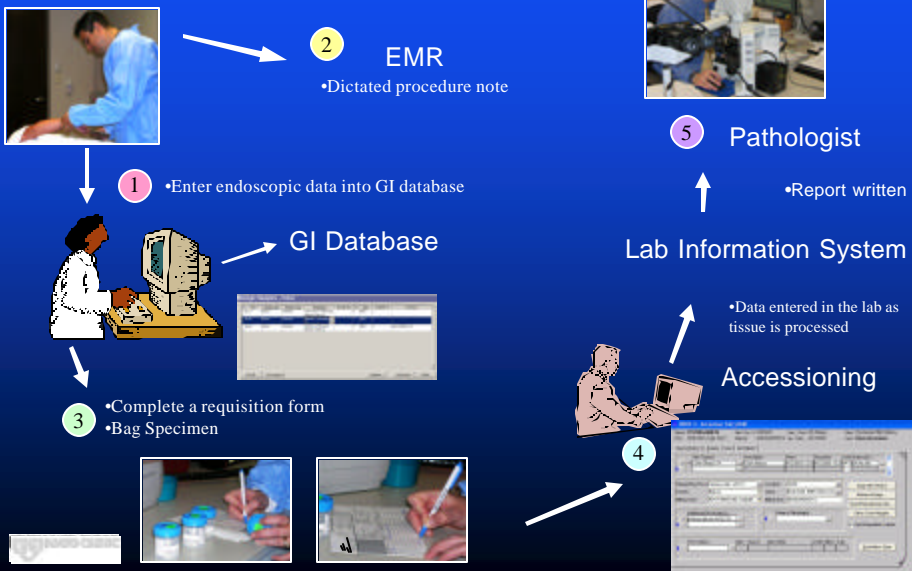
- System details

- Practice Area
 - Single Laboratory
 - Hilton 10
- Practitioners
 - Pathologists, primary and secondary
- Allied Health Staff
 - Accessioning, secretarial, HTs
- Cases
- Procedures/Stains
- Databases



Prior Process: Flow of specimens and patient information

Clinical Procedure



Specimen Management

- System complexities
 - Managing
 - Highest Quality
 - Guaranteed safety
 - High volume
 - Fast TAT
 - Numerous professionals
 - Varied databases
 - Labeling errors

Specimen Management

- Labeling error problems
 - Impact- Clinical Patients
 - Misidentification
 - Wrong site surgery/medical treatment
 - Delay in treatment


Specimen Management

- Labeling error problems
 - Impact- Clinical Practice
 - Procedures delay
 - Corrective action/termination
 - Treatment confusion
 - SOP modifications


Specimen Management

- Labeling error problems
 - Impact- Laboratory
 - Accessioning/processing delay
 - Diagnosis/Report delay
 - Corrective action/termination
 - Garbage holds

Wrong organ designation

Request for Surgical Pathological Exam			
Container ID: 48 years, F Feb-24-2008		Date: _____ itioner: _____ Pager No. _____	GI Biopsy Suite: <input type="checkbox"/> SMH-M430 <input type="checkbox"/> CH-8A <input checked="" type="checkbox"/> Gonda-9S Pt. Status <input checked="" type="checkbox"/> Outpatient <input type="checkbox"/> SMH-MED <input type="checkbox"/> RMH-MED
Requesting: CZA,JA, ALBERT J. (00047516) Endoscopist: Alexander, J. A., MD (49540)		itioner: _____ Pager No. _____	
Do not write in this space		Date: _____	
History of: (Circle) PRIOR / CURRENT <input type="checkbox"/> Chemotherapy <input type="checkbox"/> Steroids <input type="checkbox"/> Non-steroidal anti-inflammatory <input type="checkbox"/> Other drugs: _____ <input type="checkbox"/> Infection: specify _____ <input type="checkbox"/> Immunosuppressed <input type="checkbox"/> Malignancy - specify _____ <input type="checkbox"/> S/P Resection: Indication _____ Date: _____		Clinical Impression: R/O <input type="checkbox"/> Colitis <input type="checkbox"/> Collagenous vs microscopic <input type="checkbox"/> Dysplasia <input type="checkbox"/> CUC <input type="checkbox"/> Barrett's <input type="checkbox"/> H. pylori <input type="checkbox"/> S/P H. pylori Rx <input type="checkbox"/> Lymphoma <input type="checkbox"/> Immunostain sent <input type="checkbox"/> Carcinoma <input type="checkbox"/> Frozen section <input type="checkbox"/> Recurrent disease: specify _____ <input type="checkbox"/> Infection <input type="checkbox"/> Culture done <input type="checkbox"/> _____	
Specimen From: Organ	Specific Site:	Endoscopic Findings	Histology Use Only <i>AW</i>
1. <i>colon</i>	<i>terminal ileum</i>	<i>negative</i>	<i>Spec o.i. ens</i>
2. <i>colon</i>	<i>random</i>	<i>negative</i>	<i>Apr o.i. ens</i>
3.			
4.			
5.			
6.			
<i>tissue present 10/1 (Colon)</i>		Time taken: <i>11:00</i>	Initials: <i>SP/SM</i> MC0190-019

Wrong organ designation with misspelling

Request for Surgical Pathological Exam			
Container ID: 28 years, F Apr-19-2008		Date: _____ itioner: _____ Pager No. _____	GI Biopsy Suite: <input type="checkbox"/> SMH-M430 <input type="checkbox"/> CH-8A <input checked="" type="checkbox"/> Gonda-9S Pt. Status <input checked="" type="checkbox"/> Outpatient <input type="checkbox"/> SMH-MED <input type="checkbox"/> RMH-MED
Requesting: ALEXANDER, JEFFREY A. (00046640) Endoscopist: Lazaridis, Konstantinos, MD (47374)		itioner: _____ Pager No. _____	
Do not write in this space		Date: _____	
History of: (Circle) PRIOR / CURRENT <input type="checkbox"/> Chemotherapy <input type="checkbox"/> Steroids <input type="checkbox"/> Non-steroidal anti-inflammatory <input type="checkbox"/> Other drugs: _____ <input type="checkbox"/> Infection: specify _____ <input type="checkbox"/> Immunosuppressed <input type="checkbox"/> Malignancy - specify _____ <input type="checkbox"/> S/P Resection: Indication _____ Date: _____		Clinical Impression: R/O <input type="checkbox"/> Colitis <input type="checkbox"/> Collagenous vs microscopic <input type="checkbox"/> Dysplasia <input type="checkbox"/> CUC <input type="checkbox"/> Barrett's <input type="checkbox"/> H. pylori <input type="checkbox"/> S/P H. pylori Rx <input type="checkbox"/> Lymphoma <input type="checkbox"/> Immunostain sent <input type="checkbox"/> Carcinoma <input type="checkbox"/> Frozen section <input type="checkbox"/> Recurrent disease: specify _____ <input type="checkbox"/> Infection <input type="checkbox"/> Culture done <input type="checkbox"/> _____	
Specimen From: Organ	Specific Site:	Endoscopic Findings	Histology Use Only
1. <i>duodenum</i>	<i>ileum</i>	<i>normal</i>	<i>Spec 0.3-0.4</i>
2. <i>colon</i>	<i>entire colon</i>	<i>normal</i>	<i>Spec 0.2-0.4</i>
3.			
4.			
5.			
6.			
<i>tissue present 10/1</i>		Time taken: <i>13:15</i>	Initials: <i>SP/DR</i> MC0190-01rev004

Patient name crossed off

Request for Surgical Pathological Exam

Container ID: 37 years, F, Mar-17-2006

Body/Antrum - Normal
 Requesting: CHAHAL, PRABHLEEN (12708311)
 Endoscopist: Kamath, P. S., MD (46045)

GI Biopsy Suite:
 SMH-M430 CH-SA
 Gonda-9S
Pt. Status:
 Outpatient
 SMHMED
 RMHMED

History of: (Circle) PRIOR / CURRENT
 Chemotherapy
 Steroids
 Non-steroidal anti-inflammatory
 Other drugs:
 Infection: specify
 Immunosuppressed
 Malignancy - specify
 S/P Resection: Indication
 Date:

Clinical Impression: R/O
 Colitis Collagenous vs microscopic
 Dysplasia CUC Barrett's
 H. pylori #2 S/P H. pylori Rx
 Lymphoma Immunostain sent
 Carcinoma Frozen section
 Recurrent disease: specify
 Infection Culture done
 ? Sprue #1

Specimen From: Organ	Specific Site:	Endoscopic Findings	Histology Use Only
Small bowel	duodenum	normal	A1 4 frags 0.2-0.3cm
Stomach	Body, Antrum	normal	B1 3 frags 0.2-0.3cm 5cs

Time taken: 335 Initials: TP/

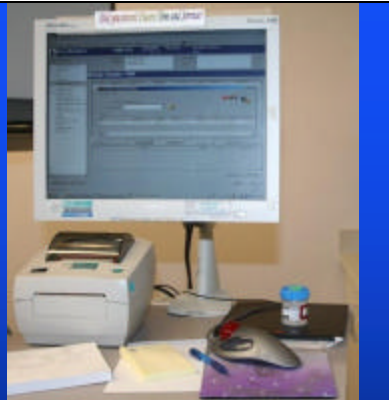
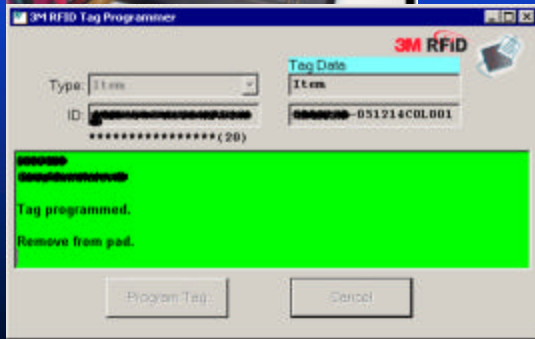
1 of 1

MCC050-01rev

RFID Specimen Management

- Phase I: Jan '06 – May '06
 - Scope (Tissue for AP):
 - RFID tag stickers placed on specimen bottles
 - 3M File Tracker
 - Data capture and transfer
 - MERGE-3M-CoPath
 - RFID tags as unique identifier
 - Simultaneous tag reading
 - 8 data fields present

RFID System



Pilot Process: Flow specimens, patient information, and RFID

Clinical Procedure



2 EMR
•Dictated procedure note



5 Pathologist
•Report written

1 •Enter endoscopic data into GI database



GI Database/MERGE



Lab Information System

•Data entered in the lab as tissue is processed

3 •Complete a requisition form
•Bag Specimen

RFID



Accessions



RFID Specimen Management

- **Phase I: Jan '06 – May '06**
 - **Scope (Tissue for AP):**
 - 5 Endoscopy Suites
 - Gonda 9
 - Delivery routes
 - Tube rooms, Central Processing Lab
 - AP Laboratory
 - Parallel to paper requisition form



RFID Specimen Management

- **Phase I: Results**
 - Bottles ~3000
 - Cases ~1800
 - Paper comparison
 - 9.2 % discrepancy
 - MERGE, Paper, CoPath
 - Nursing feedback
 - Promising
 - Lab impact
 - 2.2 % Accessioning checks



RFID Specimen Management

- **Phase II: March '07 – March '08**
 - **Scope (Tissue for AP):**
 - 41 Endoscopy Suites
 - Gonda 9, Charlton, SMH/Alfred Main
 - Delivery routes
 - Tube rooms, Central Processing Lab
 - AP Laboratory



RFID Specimen Management

- **Phase II: Results**
 - Bottles/tags ~30,000 (no failures)
 - Cases ~20,000
 - Paper comparison
 - 10.1 % discrepancy
 - MERGE, Paper, CoPath
 - Nursing feedback
 - Progressive buy-in
 - Lab impact
 - 2.0 % Accessioning checks

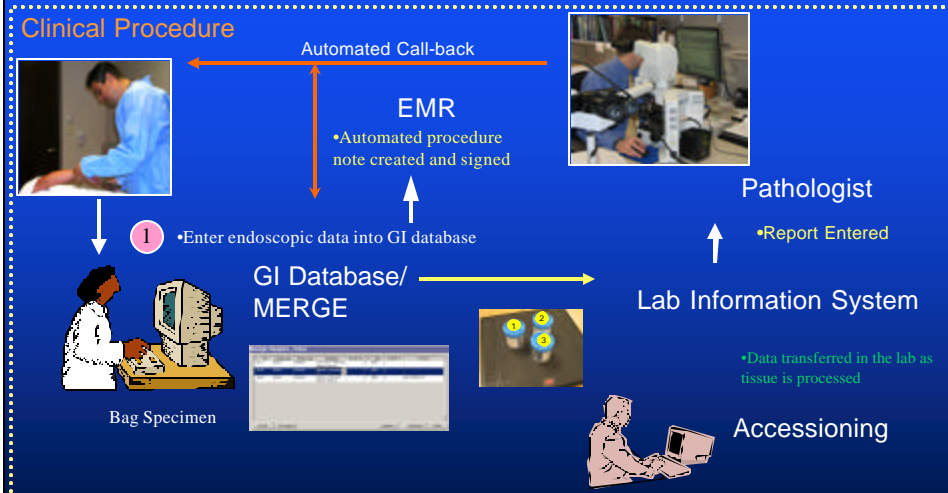


RFID Specimen Management

- **Phase II: Milestones**
 - Paperless Requisition
 - 9/10/07
 - CRS transition to GI
 - Estimated 1-5 min. saved/case
 - AP Laboratory
 - 12/07
 - 0.5 FTE cost avoidance



Current Process: Flow of specimens and patient information



RFID Specimen Management

- Phase II: Practice Improvements

- Paper Requisition Elimination
 - Specimen labeling discrepancies
 - Letter to letter match
 - No abbreviations

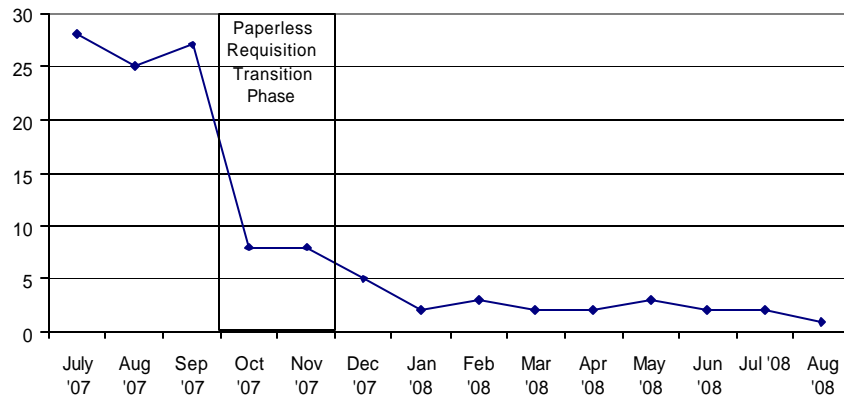
	Q1 '07	Q1 '08
Bottles-	8231	8539
Defects-	735	35
Error Rate-	8.93	0.41
Process sigma-	2.85	4.14

- Q2 and Q3 '08

- ~16K bottles with 32 discrepancies/defects (4.68)



Hard Stops
Patients Affected
GI/CRS Endoscopy



RFID Specimen Management Paperless

- **Phase II: Practice Improvements**
 - “Rule Out” request expansion
 - >45 clinical questions
 - Flexible/tailored by GI/CRS and AP
 - First Transcription point emphasis
 - Redirection to endoscopist
 - Elimination of second nurse
 - Institutional label standard
 - Complete compliance



RFID Specimen Management Paperless

- **Phase II: Practice Improvements**
 - Practice integration
 - Nurses’ white book
 - Details specifications for specimens
 - CMV, KOH, Sprue, etc
 - Collaborations across Divisions
 - Microbiology
 - AP/Cytopathology
 - Endoscopy



RFID Specimen Management Paperless

- **Phase II: Practice Improvements**
 - Practice integration outcomes
 - All AP specimens RFID tagged
 - Unique specimens:
 - Endoscopic mucosal resections
 - Pancreas tru-cut biopsies
 - Refractory celiac disease



RFID Specimen Management

- **Specimen Labeling Costs- Clinical**
 - Discrepancies-
 - Minor: \$300/instance
 - Major: \$3000/instance
 - 2006 clinical estimate
 - \$36,000 in personnel time



RFID Specimen Management

- **Specimen Labeling Costs- Laboratory**
 - **Discrepancies-**
 - **Minor: \$2-3/instance (plus delay)**
 - **Major: \$225/instance (plus delay)**
 - **2006 laboratory estimate**
 - **\$73,000 in personnel time**



RFID Specimen Management

- **Specimen Tracking (pre-RFID)**
 - **Joint Commission-**
 - **Issue resolution**
 - **RN time day after procedure**
 - **Limited destination knowledge**
 - **365 personnel hours**
 - **Physicians, Nurses, Administrators**
 - **(\$30,000 to \$124,000)**



RFID Specimen Management

- **Specimen Tracking (RFID)**
 - Real time tracking
 - All points identified
 - Procedure room
 - Tube staging (refrigerator)
 - Central Lab
 - Accessioning Area
 - Destination verified
 - Near immediate resolution



RFID Specimen Management

- **Specimen Tracking (RFID) Case**
 - Patient with GI bleed
 - Emergent Endoscopy
 - Weekend case
 - Specimen labeled
 - Tagged, verified
 - Delivered
 - Accessioned
 - No issues during specimen movement



RFID Specimen Management

- Specimen Tracking (RFID) Case
 - Biopsy shows adenocarcinoma
 - Imperfect fit with Endoscopy
 - Dx Shared and communicated
 - Follow-up resection
 - Minute lesion
 - Secondary dx encountered
 - Gross specimen/exam questioned



RFID Specimen Management

- Specimen Tracking (RFID) Case
 - Biopsy tracking reviewed

3M RFID Locator - History

BottleID:

Group: **Default**

Clinic Number:

PatientName:

6 Rows

Location	Start Date	End Date	Source
Acc1	06/02/2008 10:10 AM	06/02/2008 10:10 AM	Pad
TCP2	06/02/2008 9:38 AM	06/02/2008 9:38 AM	Pad
TALM	06/01/2008 5:04 PM	06/02/2008 8:51 AM	Pad
EndoALM-425	06/01/2008 4:58 PM	06/01/2008 4:58 PM	Pad
EndoALM-425	06/01/2008 4:58 PM	06/01/2008 4:58 PM	Tagged
	06/01/2008 4:58 PM	06/01/2008 4:58 PM	Created



RFID Specimen Management

- Specimen Tracking (RFID) Case
 - Biopsy tracking integrity
 - Laboratory integrity
 - gross exam/glass slide
 - Conclusion
 - Match*



RFID Specimen Management

- RFID Specimen Benefits
 - Reduced
 - discrepancies
 - lost personnel time
 - clinical question delay
 - staff frustrations



RFID Specimen Management

- **RFID Specimen Benefits**
 - **LEAN Laboratory Operation**
 - Specimen delivery data
 - **Paperless Accessioning**
 - Transcription point elimination
 - **Launching pad**
 - **XR pilot**
 - **In-lab tracking**



RFID Specimen Management

- **Project financial estimates (annual)**
 - Discrepancy Resolution \$109,000
 - Lab Efficiency \$ 15,000
 - \$124,000
- **Non-financial gains**
 - Staff satisfaction
- **Additional procedures/day**
 - 99 minutes/day gained without requisition forms



RFID Specimen Management

- **Next Steps**
 - Expand to capture all specimens in GI/CRS Endoscopy
 - Microbiology
 - Cytopathology
 - Expand into Breast Imaging/Radiology
 - Investigate enterprise solution
 - Mayo Clinic Scottsdale
 - Mayo Health System
 - Expand software capabilities

