



Creating the Information-Rich Lab:

*How We Handled Two Big Bangs When
Implementing and Integrating an LIS and EHR to
Support Better Lab Workflow and Clinical
Outcomes*

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The University of Texas MD Anderson
Cancer Center, Houston, TX

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Today's Talk

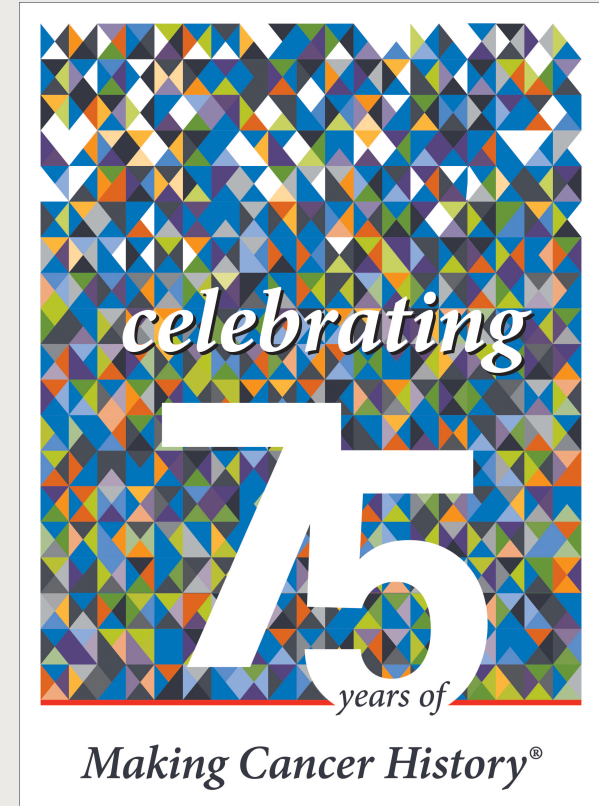
- Session Purpose:
 - To convey the lessons learned from MD Anderson during our recent LIS (Cerner) and EMR (Epic) implementation and integration
- Key Learning Objectives:
 - To describe our experience with:
 - Integrating an LIS and EMR from different vendors
 - Enhancing care and lab data content without sacrificing functionality
 - Developing a set of QA/QC monitors to assist in effective evaluation of our system implementations



Who Is MD Anderson

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- The nation's leading cancer care hospital
- A top 150 Great Places to Work in Healthcare
- A workforce more than 20,000 strong, including:
 - Over 1,700 faculty members
 - More than 6,600 trainees/students at any given time
- MD Anderson is No. 1 in U.S. News & World Report's 2016 rankings of top hospitals for cancer care
 - It's been ranked No. 1 for nine of the past 10 years.



*Statistics quoted from FY2015 (Sept 2014-Aug 2015)



Fast Facts

Hospital admissions	28,167
Treated people in 2015	>135,000
Average number of inpatient beds	665
Outpatient clinic visits, treatments and procedures	1,440,684
Pathology/laboratory medicine procedures	12,334,917
Diagnostic imaging procedures	530,590
Surgery hours	69,987
Active clinical research protocols	1,197
Participants in clinical trials	9,400

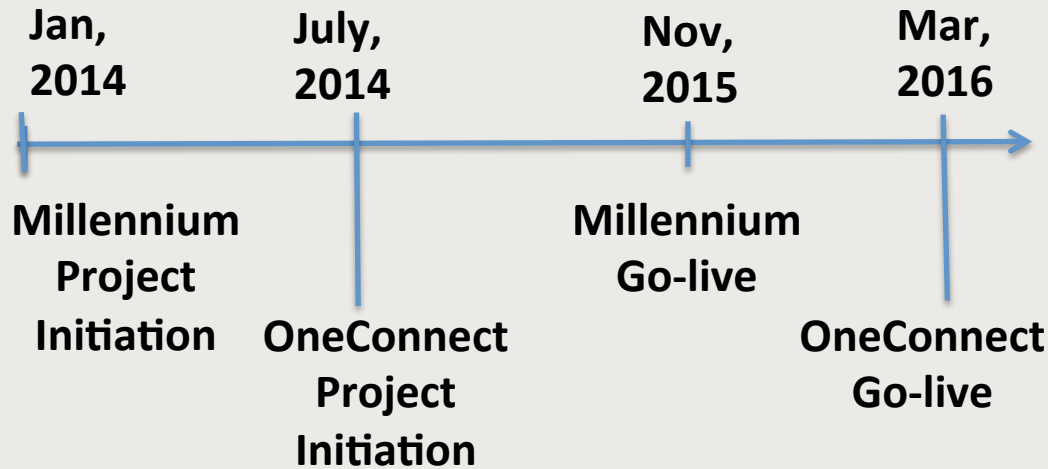
*Statistics quoted from FY2015 (Sept 2014-Aug 2015)



2014 - 2016

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A Rapid Environment of Change



OneConnect Mission:

“We will collaboratively implement an integrated electronic health record environment that empowers our patients and equips our employees with the meaningful data and tools they need to enhance the safety and efficiency of patient care and ultimately eliminate cancer.”



Prior to Nov 6th 2015

Laboratory Medicine

- Cerner Classic
- MAK Progesa Donor/ Transfusion

Pathology

- PowerPath AP Pathology
- Aperio Digital Pathology
- PathStation (Application integration Engine)

HemePath

- PowerPath
- Cerner Classic
- HLA Project 2



Nov 6th 2015- March 4th 2016

Laboratory Medicine

- **Cerner Millennium connect to Clinicstation**
- **Haemonetics Donor Suite**
- **Bridge (partial rollout – handheld device only)**

Pathology

- PowerPath AP connected to Clinicstation
- Aperio Digital Pathology
- PathStation (Application integration Engine)

HemePath

- PowerPath
- **Cerner Helix connected to Clinicstation**
- HLA Project 2 connected to clinicstation



After March 4th 2016

Laboratory Medicine

- **Cerner Millennium connect to Epic**
- **Haemonetics Donor Suite**
- **Bridge (Full Rollout – handheld and web)**

Pathology

- **PowerPath connected to Epic**
- Aperio Digital Pathology
- PathStation (Application integration Engine)

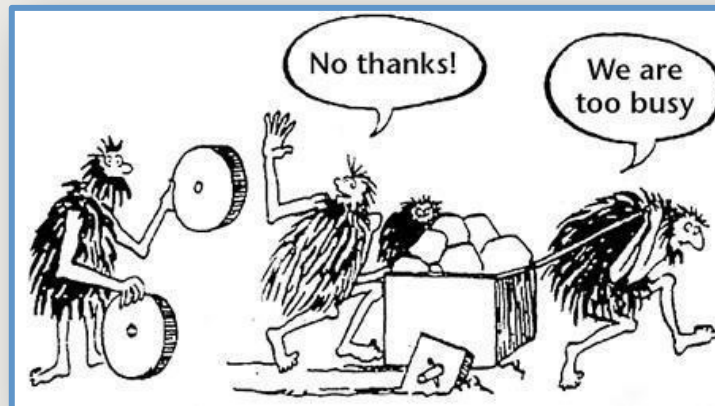
HemePath

- PowerPath
- **Cerner Helix connected to Epic**
- **HLA Project 2 connected to Epic**



Legacy Architecture

System Name	Function	Launch Year	Years Used
Cerner Classic	LIS – Clinical	1997	18 yrs.
MAK Progesa	Donor / Transfusion	2008	7 yrs.
Clinicstation	EMR	2002	14 yrs.
Picis	Periop	2001	15 yrs.
Siemens RIS	Radiology	1992	23 yrs.
Siemens Envision	ADT/Tech billing	1991	25 yrs.
GE Centricity	Pharmacy	1998	17 yrs.
IDX/GE Billing	Professional Billing	1985	31 yrs





Change for Lab 2016!

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Quality Objectives / Challenges

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Handheld PPID Specimen Collection

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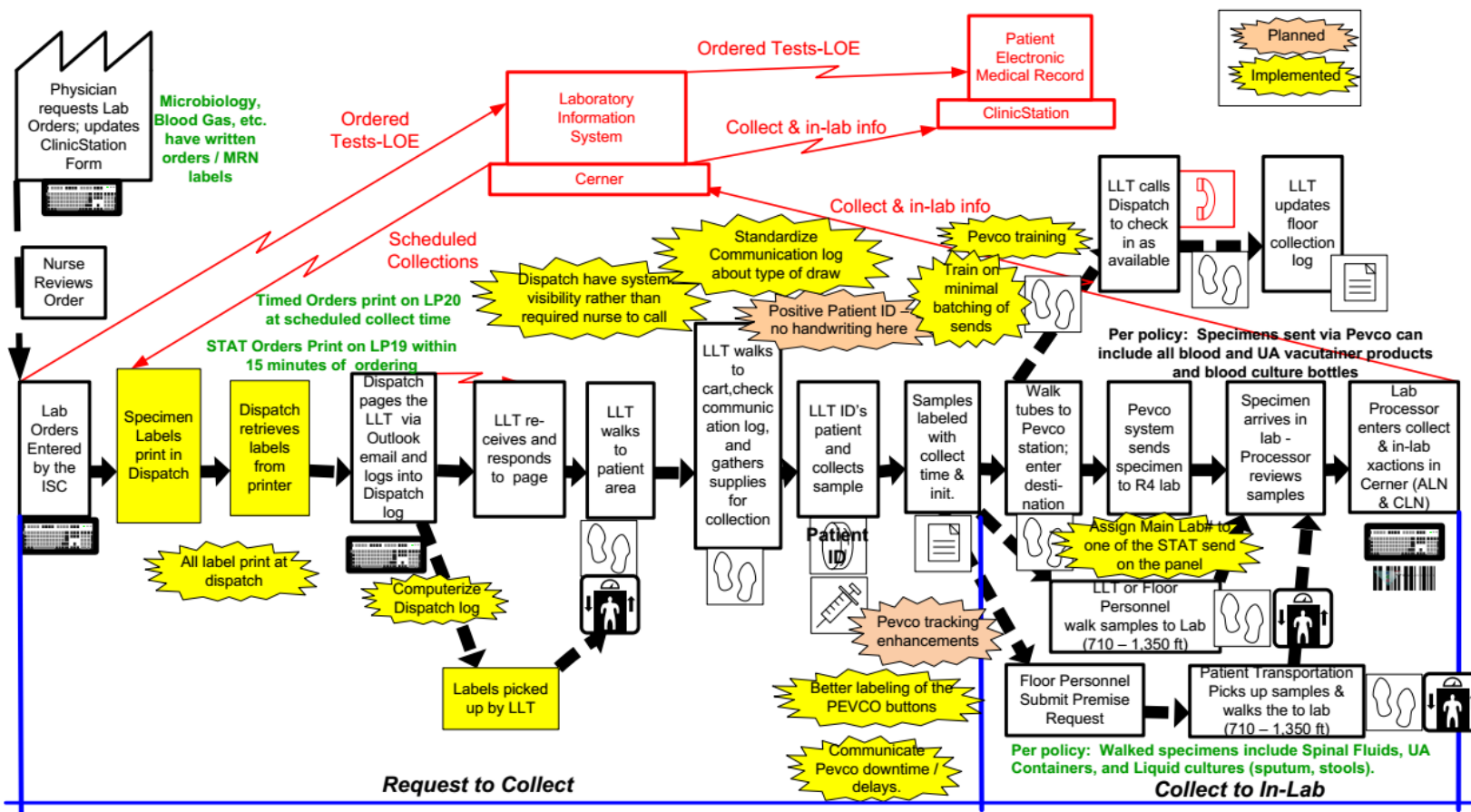
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Phlebotomy Prior to ML Go-Live

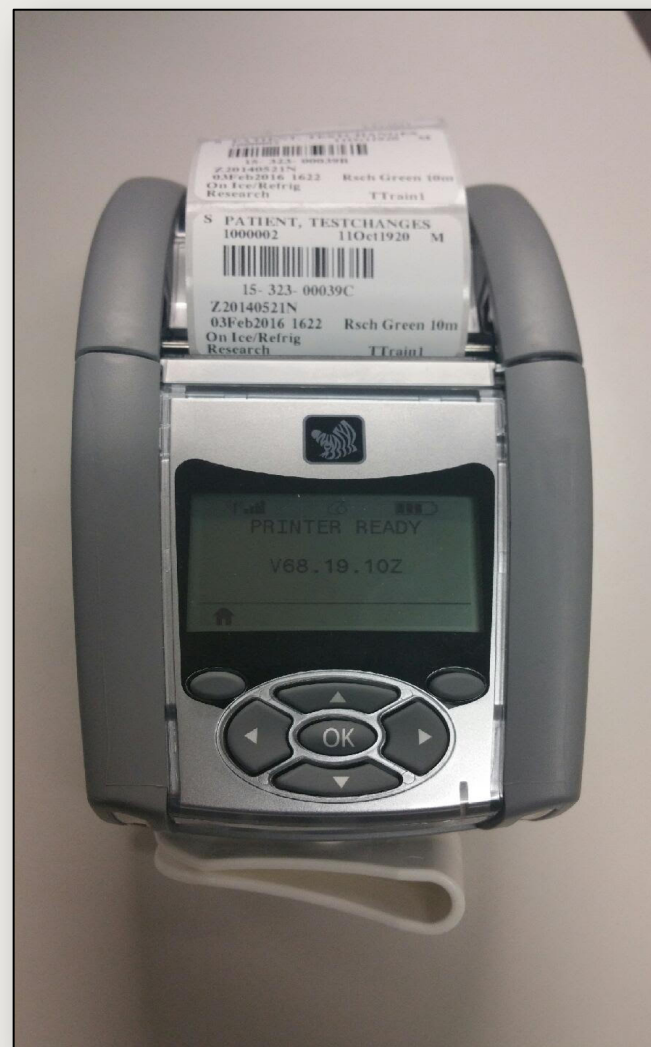
Inpatient Pre-Analytic Lab Process Flow – Current State as of April 2011





Post ML Go-Live Tools

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Handheld
PPID
Specimen
Collection



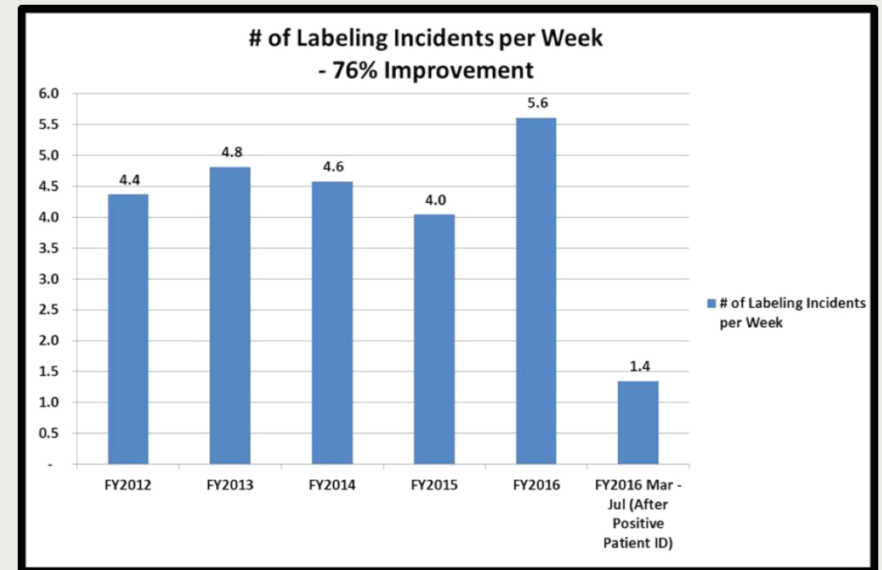
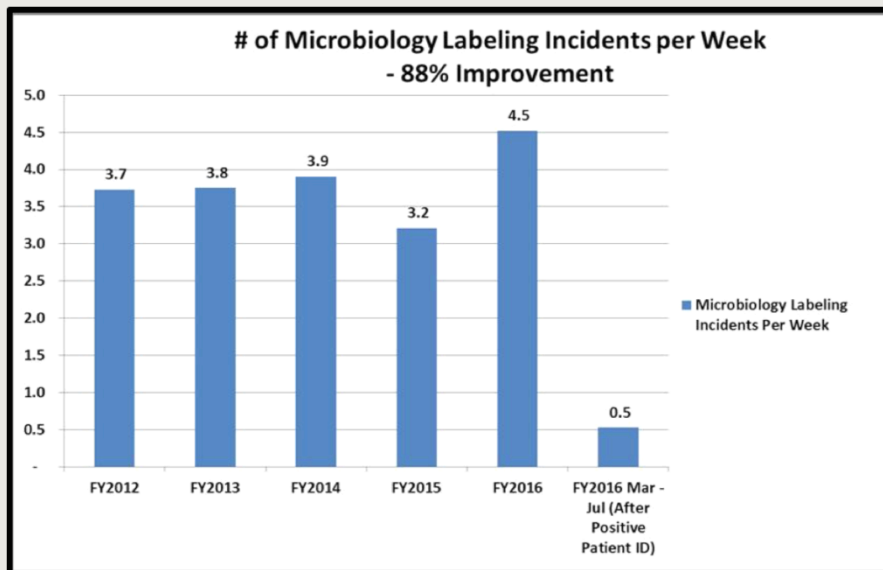
Benefits to New Workflow

- Eliminated batch label printing
- Allowed for positive patient ID
- Allowed phlebotomist to know ALL tests ordered (scheduled and immediate)
- Just in time label printing and labeling of collected specimens
- Eliminated the need to hand-write information on the labels
 - Some of the critical information was not available in the order prior to Millennium and this had to be added every time manually to the label including site, source and phlebotomist
- Allowed for electronic confirmation of collection in real time
- Allowed for electronic capture of comments
- Allowed for electronic capture of uncollected specimens and the reasons



Specimen Collection Post-Implementation

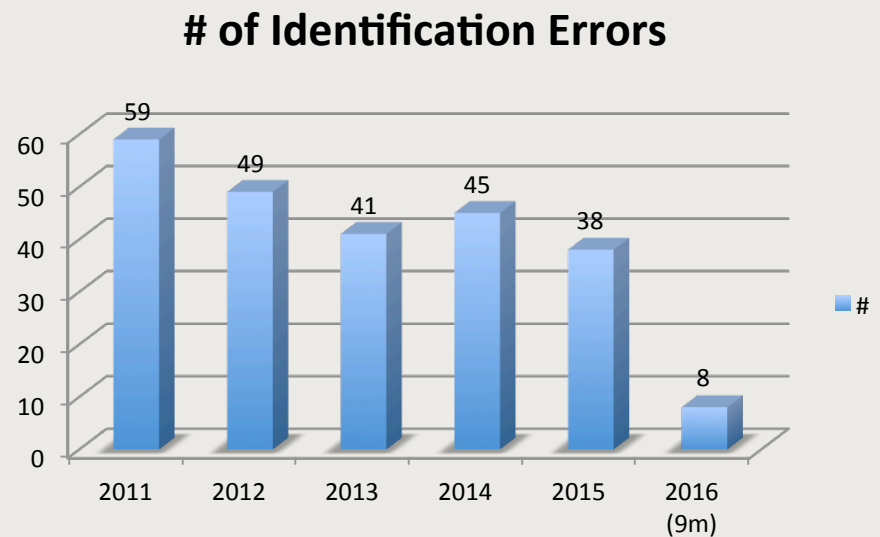
- 88% reduction in Micro specimen labeling errors post implementation of Bridge for Nursing (with Epic go-live)
- 76% reduction in overall specimen labeling errors post implementation of Bridge for Nursing (with Epic go-live)





General Services ID Errors

- None of the 2016 incidents involved system failure:
 - Patients getting incorrect wristband
 - Collector failed to perform proper verbal confirmation
 - Collector failed to visually perform a wristband check
 - **Zero identification errors from Nursing***



* In past years, ID errors were evenly distributed between phlebotomists and nursing staff



Point of Care Implementation

- 67% reduction in pre-Bridge to post-Bridge implementation errors
 - 15.3 annualized errors → 5.2 annualized errors
- POC safety incidents:
 - Wrong patient entered into the POC device



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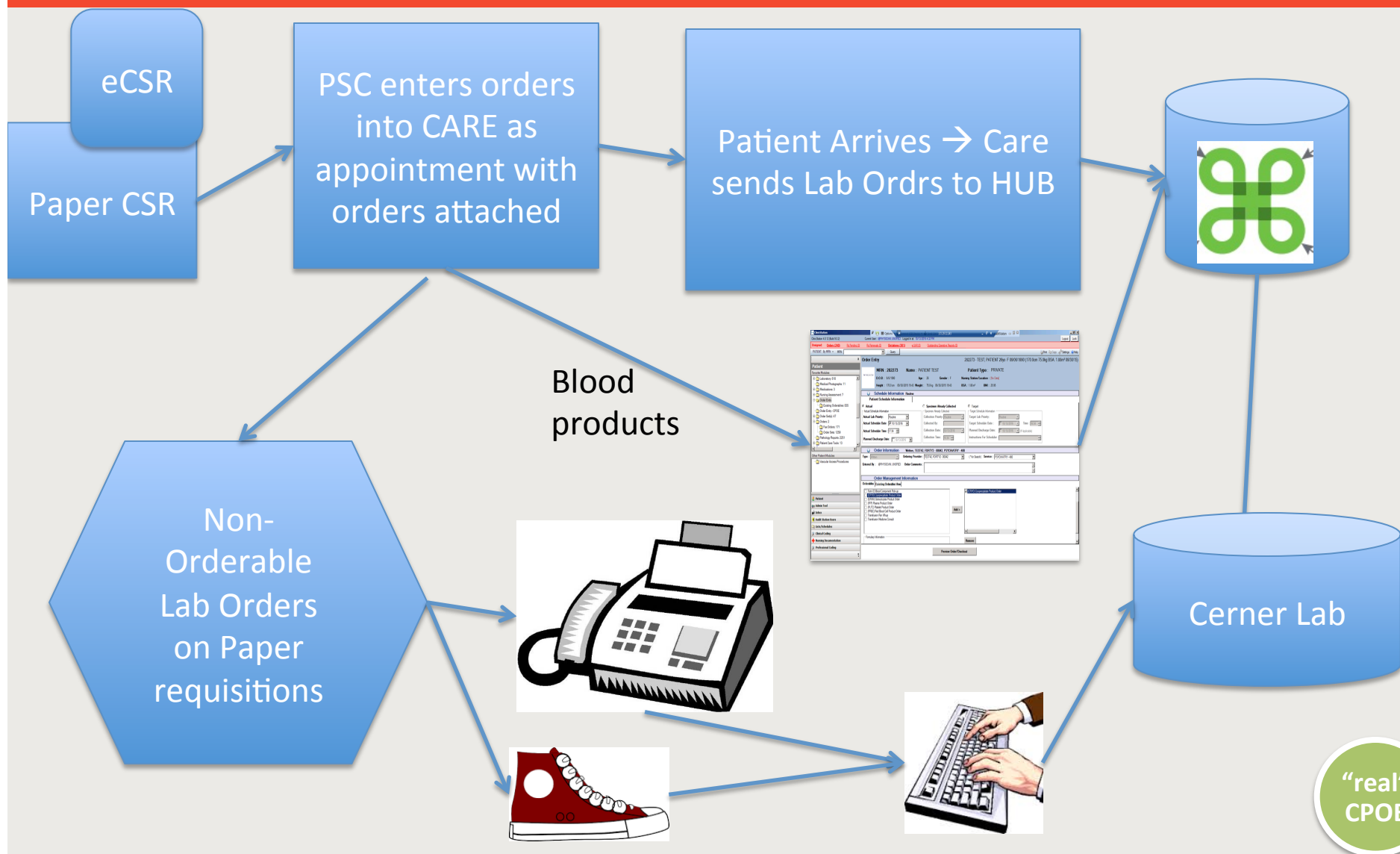
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**“Real” Clinician
Lab Order Entry**



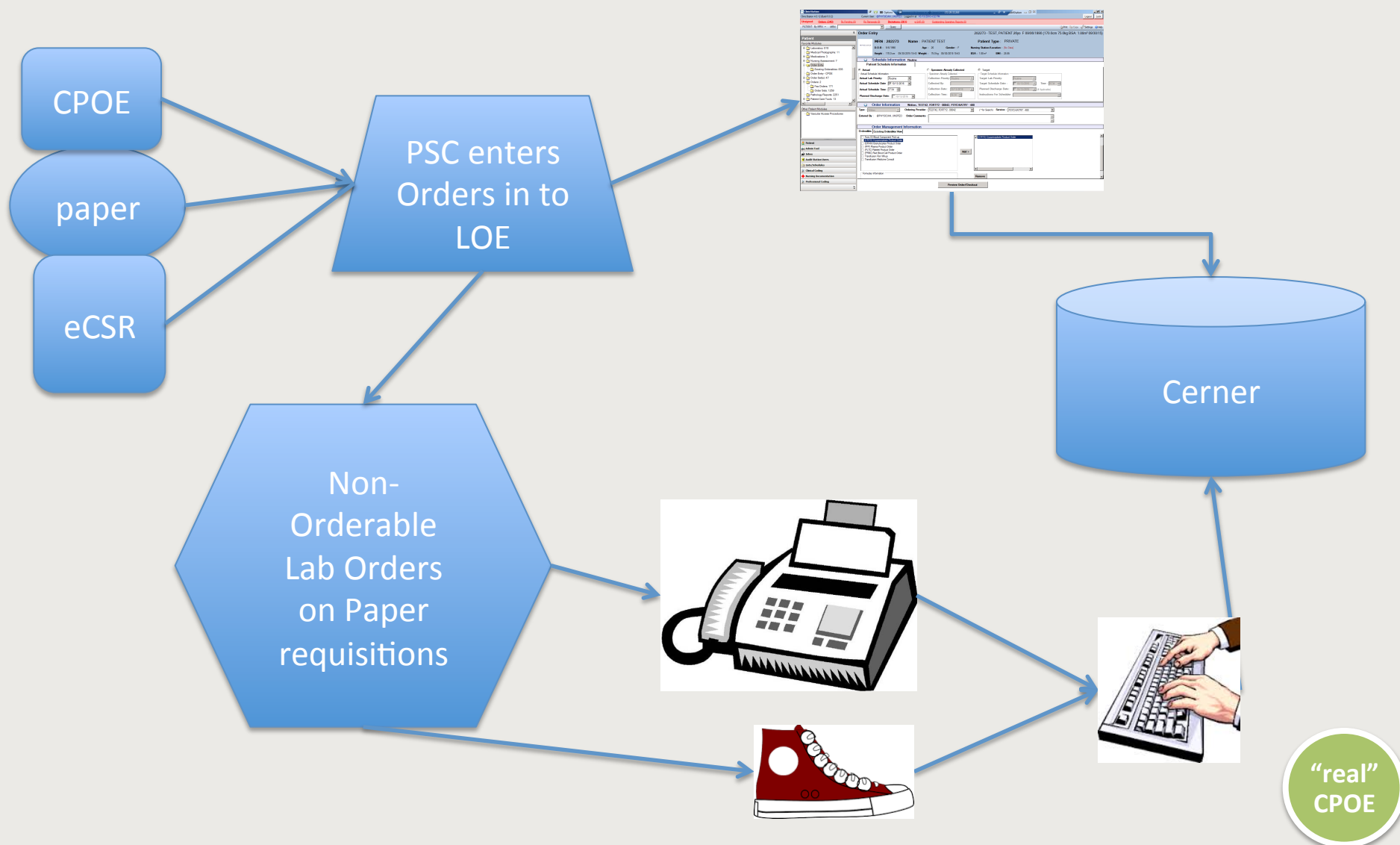
Lab Orders Outpatient





Lab Orders Inpatient

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Critical Biological Interface Engine

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IMPORTANT: All requisitions must contain the following data to be accepted.

1. Physician Signature 2. Physician I.D. Number 3. Diagnosis 4. Physician/Clinic Location 5. Patient Name 6. Patient DOB 7. Clearly Marked Test Code

Please submit patients to check with their insurance regarding coverage of Express Testing services

SWAB TESTING	GLUCOSE STUDIES	APP	CHEMISTRY	CHEMISTRY (continued)
SWAB - SWEAT ANALYSIS	484	GLUCOSE - FASTING	487	535
SWAB - SWEAT COLLECTION	489	GLUCOSE - 1 HOUR	487	536
EKG	533	GLUCOSE - 2 HOUR	487	537
	534	GLUCOSE - 3 HOUR	487	538
	535	GLUCOSE - 4 HOUR	487	539
	536	GLUCOSE - 5 HOUR	487	540
	537	GLUCOSE - 6 HOUR	487	541
	538	GLUCOSE - 7 HOUR	487	542
	539	GLUCOSE - 8 HOUR	487	543
	540	GLUCOSE - 9 HOUR	487	544
	541	GLUCOSE - 10 HOUR	487	545
	542	GLUCOSE - 11 HOUR	487	546
	543	GLUCOSE - 12 HOUR	487	547
	544	GLUCOSE - 13 HOUR	487	548
	545	GLUCOSE - 14 HOUR	487	549
	546	GLUCOSE - 15 HOUR	487	550
	547	GLUCOSE - 16 HOUR	487	551
	548	GLUCOSE - 17 HOUR	487	552
	549	GLUCOSE - 18 HOUR	487	553
	550	GLUCOSE - 19 HOUR	487	554
	551	GLUCOSE - 20 HOUR	487	555
	552	GLUCOSE - 21 HOUR	487	556
	553	GLUCOSE - 22 HOUR	487	557
	554	GLUCOSE - 23 HOUR	487	558
	555	GLUCOSE - 24 HOUR	487	559
	556	GLUCOSE - 25 HOUR	487	560
	557	GLUCOSE - 26 HOUR	487	561
	558	GLUCOSE - 27 HOUR	487	562
	559	GLUCOSE - 28 HOUR	487	563
	560	GLUCOSE - 29 HOUR	487	564
	561	GLUCOSE - 30 HOUR	487	565
	562	GLUCOSE - 31 HOUR	487	566
	563	GLUCOSE - 32 HOUR	487	567
	564	GLUCOSE - 33 HOUR	487	568
	565	GLUCOSE - 34 HOUR	487	569
	566	GLUCOSE - 35 HOUR	487	570
	567	GLUCOSE - 36 HOUR	487	571
	568	GLUCOSE - 37 HOUR	487	572
	569	GLUCOSE - 38 HOUR	487	573
	570	GLUCOSE - 39 HOUR	487	574
	571	GLUCOSE - 40 HOUR	487	575
	572	GLUCOSE - 41 HOUR	487	576
	573	GLUCOSE - 42 HOUR	487	577
	574	GLUCOSE - 43 HOUR	487	578
	575	GLUCOSE - 44 HOUR	487	579
	576	GLUCOSE - 45 HOUR	487	580
	577	GLUCOSE - 46 HOUR	487	581
	578	GLUCOSE - 47 HOUR	487	582
	579	GLUCOSE - 48 HOUR	487	583
	580	GLUCOSE - 49 HOUR	487	584
	581	GLUCOSE - 50 HOUR	487	585
	582	GLUCOSE - 51 HOUR	487	586
	583	GLUCOSE - 52 HOUR	487	587
	584	GLUCOSE - 53 HOUR	487	588
	585	GLUCOSE - 54 HOUR	487	589
	586	GLUCOSE - 55 HOUR	487	590
	587	GLUCOSE - 56 HOUR	487	591
	588	GLUCOSE - 57 HOUR	487	592
	589	GLUCOSE - 58 HOUR	487	593
	590	GLUCOSE - 59 HOUR	487	594
	591	GLUCOSE - 60 HOUR	487	595
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	593	GLUCOSE - 62 HOUR	487	597
	594	GLUCOSE - 63 HOUR	487	598
	595	GLUCOSE - 64 HOUR	487	599
	596	GLUCOSE - 65 HOUR	487	600
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	607	GLUCOSE - 76 HOUR	487	611
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	617	GLUCOSE - 86 HOUR	487	621
	618	GLUCOSE - 87 HOUR	487	622
	619	GLUCOSE - 88 HOUR	487	623
	620	GLUCOSE - 89 HOUR	487	624
	621	GLUCOSE - 90 HOUR	487	625
	622	GLUCOSE - 91 HOUR	487	626
	623	GLUCOSE - 92 HOUR	487	627
	624	GLUCOSE - 93 HOUR	487	628
	625	GLUCOSE - 94 HOUR	487	629
	626	GLUCOSE - 95 HOUR	487	630
	627	GLUCOSE - 96 HOUR	487	631
	628	GLUCOSE - 97 HOUR	487	632
	629	GLUCOSE - 98 HOUR	487	633
	630	GLUCOSE - 99 HOUR	487	634
	631	GLUCOSE - 100 HOUR	487	635
	632	GLUCOSE - 101 HOUR	487	636
	633	GLUCOSE - 102 HOUR	487	637
	634	GLUCOSE - 103 HOUR	487	638
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	677	GLUCOSE - 146 HOUR	487	681
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	683	GLUCOSE - 152 HOUR	487	687
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	696	GLUCOSE - 165 HOUR	487	700
	697	GLUCOSE - 166 HOUR	487	701
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	700	GLUCOSE - 169 HOUR	487	704
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	750	GLUCOSE - 219 HOUR	487	754
	751	GLUCOSE - 220 HOUR	487	755
	752	GLUCOSE - 221 HOUR	487	756
	753	GLUCOSE - 222 HOUR	487	757
	754	GLUCOSE - 223 HOUR	487	758
	755	GLUCOSE - 224 HOUR		



After go live....

How do I order the
Chem 7 now ?



Hmmm...ummm...we
haven't had a chem 7 lab
order for 25 yrs...???



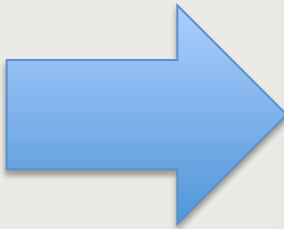
"real"
CPOE



How?

- The Biological Interface Engine!

Chem 7



"real"
CPOE



Epic Ordering

Preference List Search - Achilles,Keith

ZOF

☒ Medications ☒ Procedures ☐ Order Panels ☐ Split

	Name	Type	Dose	Route	Frequen	Phase of Ca	Pref List	Code
2	ondansetron (ZOFRAN) IV injection	Medic	4 mg	Intraver	Once		IP GENERA	
	ondansetron (ZOFRAN) oral solution	Medic	4 mg	Oral	Once		IP GENERA	
	ondansetron (ZOFRAN) tablet	Medic	8 mg	Oral	Once		IP GENERA	

Order Entry (Enc Date: 5/3/2015) - Wt: (Not entered for this visit) Ht: 1.753 m

New order:

Procedures (6 Orders)

Glucose, fasting ☐ Expires-5/3/2015

Hemoglobin A1c ☐ Expires-5/3/2015

Microalbumin, urine, 24 hour ☐ Expires-5/3/2015

Calcium, urine, 24 hour ☐

Diagnoses

Add Diagnosis

P Diagnosis

1. Diabetes mellitus

Order -- Associate Diagnoses

Alban, Richard

Diabetes mellitus

P ☐

<input checked="" type="checkbox"/> Glucose, fasting	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Hemoglobin A1c	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Microalbumin, urine, 24 hour	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Calcium, urine, 24 hour	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Creatinine Clearance	<input checked="" type="checkbox"/>

Diagnosis:

"real"
CPOE



Epic Order Entry

- Electronic order sets entered by clinicians
 - Proprietary order sets to help clinician order the correct test for the patient's conditions and disease states
 - Substantially reduced unnecessary lab orders
 - Clinical trial order sets created and ensure accurate ordering for patients on trials
- Eliminated biologic interface engine
- Allowed for real time decision support at the time of ordering for providers
 - Front end duplicate checking → decreased duplicate ordering
- Order/Diagnosis association upfront instead of by back end coders





Loss of Result Display Ownership

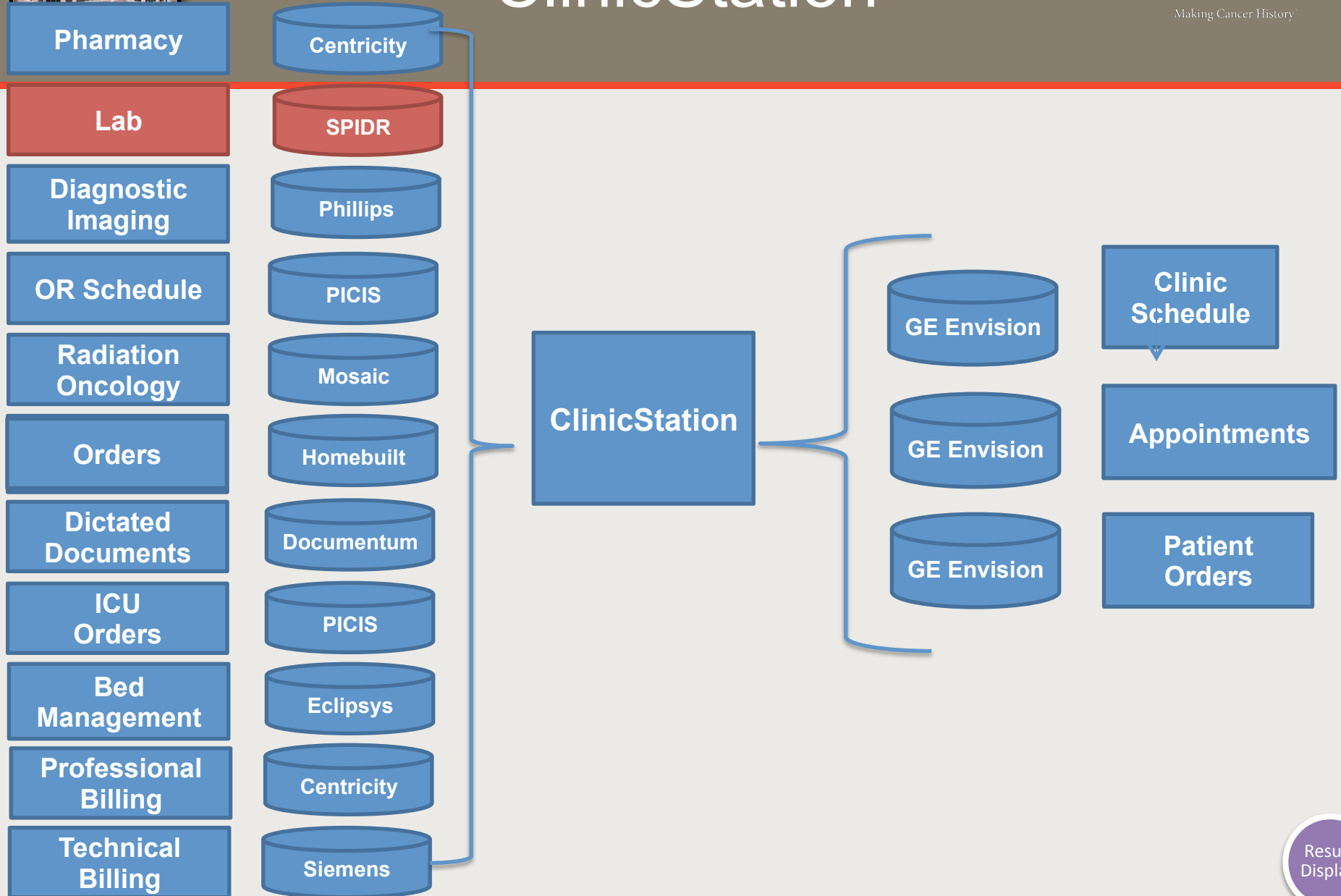
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ClinicStation





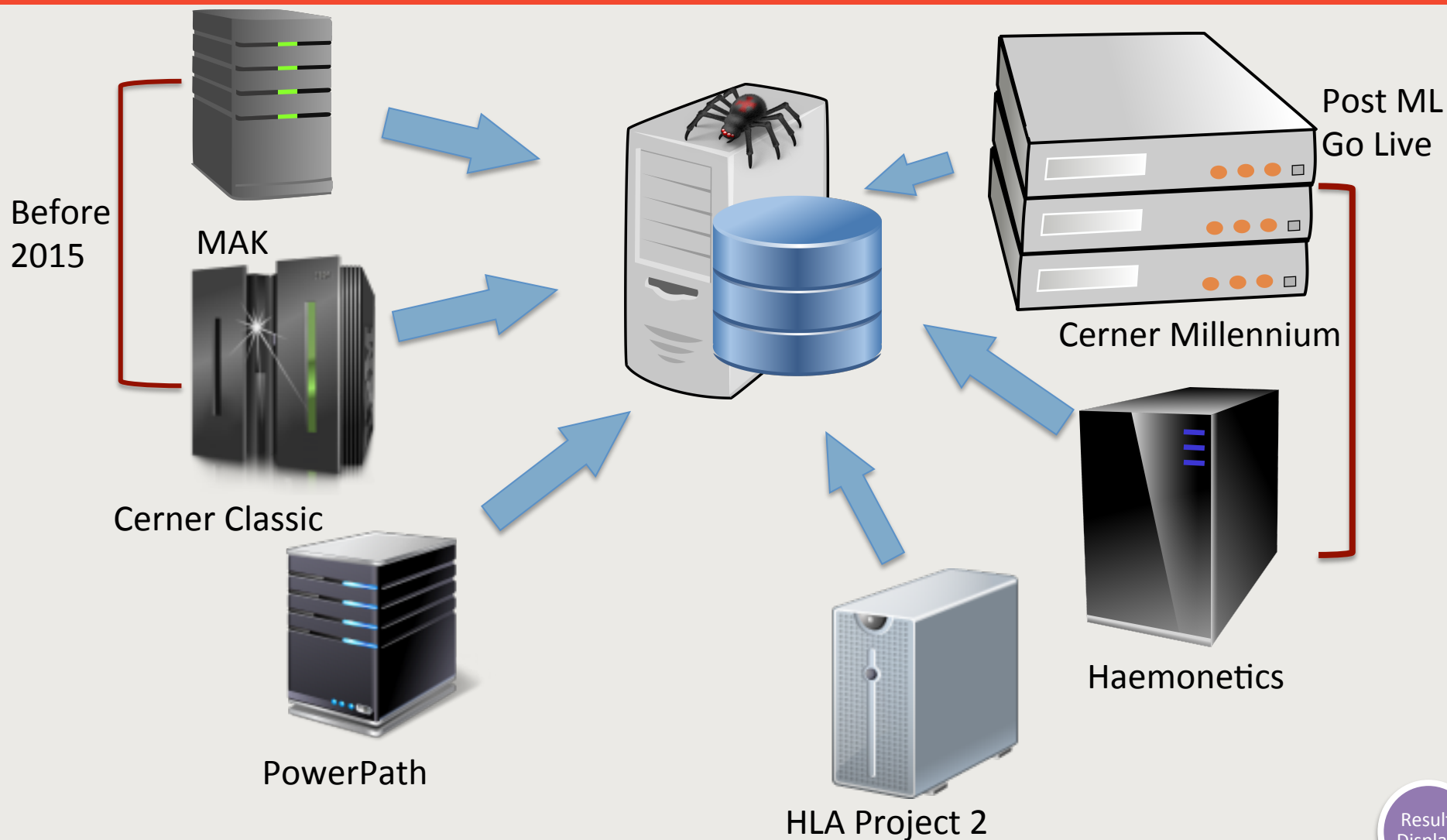
Lab Data Ownership

- Prior to Epic, all lab results were stored in a laboratory “owned” data repository and made available to the EMR via a Web Service interface
 - ***NO LAB DATA RESIDED IN THE “EMR”***
 - Dynamic query delivered lab data as requested by clinicians in the EMR
 - Approach allowed multiple systems to use a single result Interface to the EMR
- Viewer in ClinicStation EMR was developed by the Laboratory Informatics Group
- Simple paradigm: View all tests chronologically by time of result



Spidr

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Result
Display



ClinicStation Results

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DI Images: 207

Laboratory: 225

Cytogenetics: 0

Microbiology: 1

HLA: 0

HLA Summary: 0

HLA Match: 0

HLA Samples: 0

HLA Reports: 0

Molecular Diagnostics: 2

Flow Cytometry: 2

Chemistry/Special Chemistry: 183

Hematology/Coagulation: 20

Serology: 0

Point of Care: 5

Coumadin Clinic: 0

Other: 12

Historical Data (Pre-1997): 0

Blood Bank/Transfusion: 67

Pathology Reports: 1136

Transcribed Documents: 659

Clinic Note: 79

IR Procedures: 31

IR Notes: 12

Clinical Ethics: 2

Code Blue: 6

Code Status: 2

Consultation: 12

Consultation Request: 1

Discharge Summary: 2

Emergency Room Note: 19

History and Physical: 12

Letter: 2

Nutrition Follow-Up Note: 1

Patient Alert Note: 1

Primary Medical Evaluation: 2

Patient

Lists/Schedules

Inbox

Nursing Documentation

Laboratory: 225

2 Months

Procedure	Date	Status	Accession	Ordering Physician	Test Number
* URINALYSIS, MACROSCOPIC	06/30/2009 09:05	Final	09-181-2303	10184 - HANDY, BEVERLY C., M	5300500
* URINALYSIS, MICROSCOPIC	06/30/2009 09:05	Final	09-181-2303	10184 - HANDY, BEVERLY C., M	5300600
AMYLASE, SERUM	06/26/2009 15:09	Results Pending	09-177-4156	334 - LIGHTIGER, BENJAMIN.	5300300
LIPASE, SERUM	06/26/2009 15:09	Results Pending	09-177-4156	334 - LIGHTIGER, BENJAMIN.	5300305
* COMPLETE BLOOD CNT/DIF/PLT	06/26/2009 09:19	Final	09-177-2336	334 - LIGHTIGER, BENJAMIN.	5500312
REAL TIME MBR.BM	06/25/2009 10:57	Cancelled	09-176-3353	11589 - CHEN, SU S. MD	2629550
ACTIVATED PROTEIN C RESISTANCE	06/24/2009 10:13	Final	09-175-2864	967 - HIRSCH-GINSBERG,CHER	5501700
* INTRAOPERATIVE PTHI, MISC	06/22/2009 14:00	Final	09-173-5237	650 - ALEXANIAN, RAYMOND.	5400730
* INTRAOPERATIVE PTHI, MISC	06/22/2009 13:00	Final	09-173-5229	11131 - PERRIER, NANCY MD	5400730
* INTRAOPERATIVE PTHI, BASELINE	06/22/2009 13:00	Final	09-173-5233	11311 - MEYMACH, JOHN MD,...	5400720
HEMOGLOBIN	06/22/2009 10:17	Cancelled	09-173-3092	334 - LIGHTIGER, BENJAMIN.	5500020

Accession View

AMYLASE, SERUM in progress. The results are pending

Other tests ordered on the same accession number are available below.

LIPASE, SERUM in progress. The results are pending

Other tests ordered on the same date with different accession numbers are available below.

Accession: 09-177-2336

COMPLETE BLOOD CNT/DIF/PLT

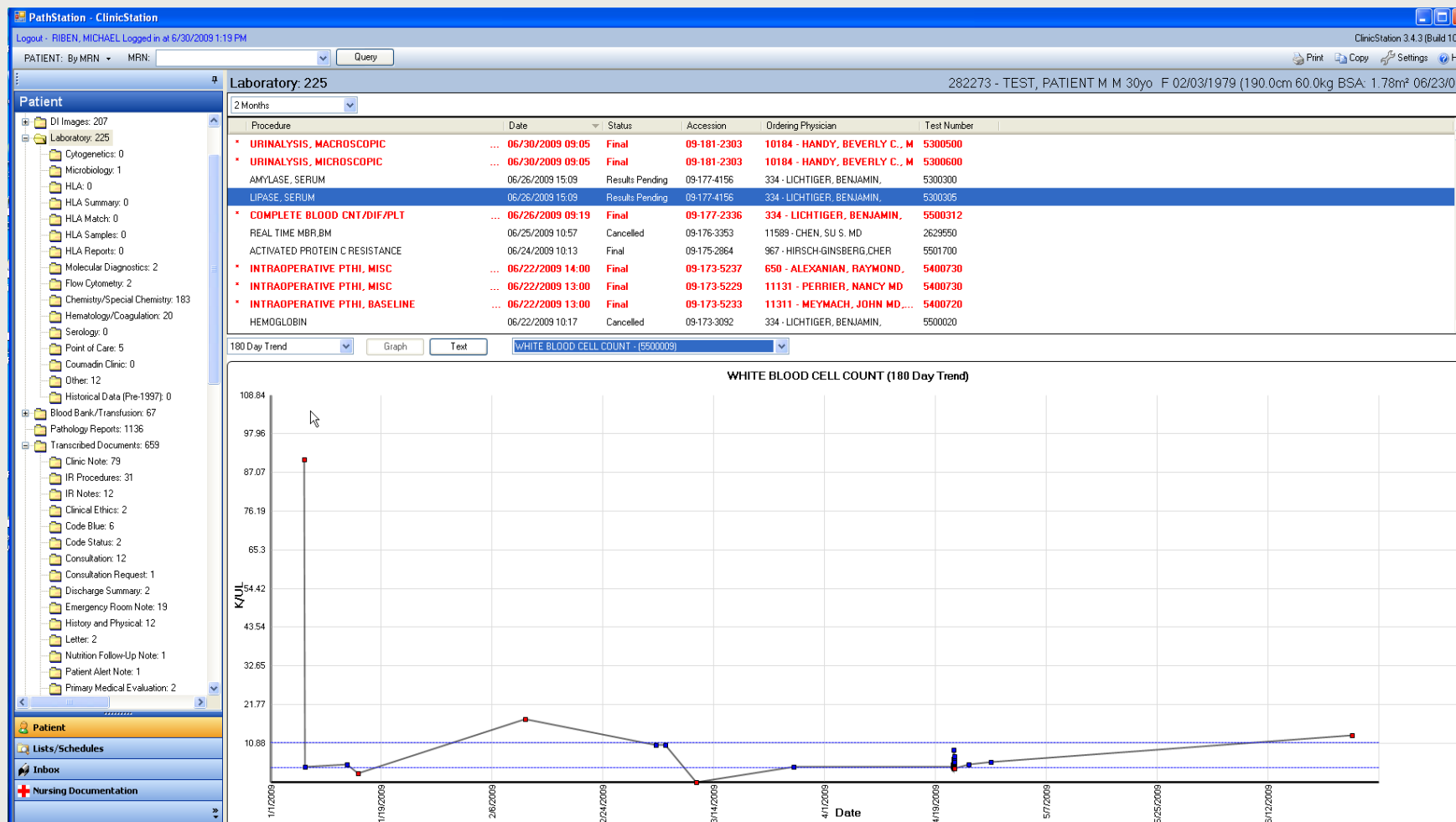
WHITE BLOOD CELL COUNT	13.2 H	K/UL	(4.0- 11.0)
RED BLOOD CELL COUNT	5.00	M/UL	(4.00- 5.50)
HEMOGLOBIN	15.0	G/DL	(12.0- 16.0)
HEMATOCRIT	45.0	%	(37.0- 47.0)
MEAN CORPUSCULAR VOLUME	95	FL	(82- 98)
MEAN CORPUSCULAR HGB	35.0 H	PG	(27.0- 31.0)
MEAN CORPUSCULAR HGB CONCENTRN	34.0	G/DL	(31.0- 36.0)
RED CELL DISTRIBUTION WIDTH	15.0	%	(12.0- 15.5)
RDW STANDARD DEVIATION	55.0 H	FL	(35.1- 46.3)
PLATELET COUNT	225	K/UL	(140- 440)
MEAN PLATELET VOLUME	15.0 H	FL	(4.0- 10.4)
DIFFERENTIAL-METHOD	MANUAL		
TOTAL CELLS COUNTED	100		
NEUTROPHIL PERCENT	88.0 H	%	(42.0- 66.0)
A Neutrophil count includes Bands.			
LYMPHOCYTE PERCENT	5.0 L	%	(24.0- 44.0)
MONOCYTE PERCENT	1.0 L	%	(2.0- 7.0)
BASOPHIL PERCENT	1.0	%	(0.0- 1.0)
METAMYELOCYTE PERCENT	5.0 H	%	(0.0- 0.0)
Metamyelocyte count now includes Myelocytes.			
NUCLEATED RBC	0		
DWARF MEGAKARYOCYTE	0		
ANISOCYTOSIS	1+ *		
POIKILOCYTOSIS	1+ *		

Result
Display



ClinicStation Results

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MD Anderson
Cancer Center
 Making Cancer History™



Result
Display



How Can We Enhance Epic's Result Display?

- Embedded viewers to access our high efficiency high quality lab controlled views of the lab data
 - Including custom HLA reporting viewer
- Embedded viewers for Pathology reports to mimic for rapid pathology review
- Embedded whole slide image viewing in Epic



Embedded Lab Results Viewer

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Hyperspace - MAIN FNA - MD Anderson Production Environment - MICHAEL R.

Epic | Patient Lookup | Remind Me | My Reports | Personalize | Prep for Surgery | Cerner Bridge | Telephone Call | Patient Education Link | Patient Transport | Dept Appts | Appts | Departmental Calendar | Print | Secure | Log Out

ZzProdTestExisting, ProOne

Male, 26 y.o., 09/06/1990

MRN: 0282273

CSN: None

Code Status: Not on file

Allergies: No Known Allergies

FYI: FYI

Isolation, Organism: None, Clostrid...

Current Location: None

Last Height: 178 cm (5' 10.08")

Last Weight: 56 kg (123 lb 7.3 oz)

BSA: 1.66 m²

Last BMI and %ile: 17.67 kg/m²

PCP Gen: None

Care Team: Research: None

24Hr Blood Total (Clin+Rsch) max 1...

8 Wk Blood Total (Rsch Only) max...

Pref Language, Need Interp: Sign L...

Out of Hospital DNR?: .received

Implants: PACEMAKER

MyMDAnderson: Active

Blood Type: O POS

CrCl: None

Patient Class: None

Patient Type: Employee

Home Center: Sugarland

Laboratory Results

LABORATORY

282273 - ZzProdTestExisting, ProOne

2 Months | Chemistry/Special Chemistry 86

Procedure	Date	Status	Accession	Ordering Physician	Test Number
* T3 Free	10/13/2016 10:54	Final	16-287-03827	1 - TEST, Pathologist Cerner	5400762
* Triiodothyronine	10/13/2016 10:54	Final	16-287-03827	1 - TEST, Pathologist Cerner	5400768
* Thyroxine Free	10/13/2016 10:54	Final	16-287-03827	1 - TEST, Pathologist Cerner	5400783
OR ABG+	10/12/2016 15:27	Cancelled	16-286-05195	1 - TEST, Pathologist Cerner	21741947
Blood Gas Arterial	10/12/2016 15:27	Cancelled	16-286-05195	1 - TEST, Pathologist Cerner	5301240
Human Chorionic Gonadotropin Qualitative, Urine	10/12/2016 14:20	Final	16-286-04981	1 - TEST, Pathologist Cerner	5300825

Accession View

Accession: 16-287-03827 10/13/2016 10:54

T4 Free >7.77 H ng/dL (0.93-1.70)

Other tests ordered on the same accession number are available below.

T3 Total >651 H ng/dL (80-200)

Note: New methodology and reference ranges effective 5/23/2013

T3 Free >32.6 H pg/mL (2.4-4.2)

Note: New methodology and reference range effective 5/23/2013

Other tests ordered on the same date with different accession numbers are available below.

Accession: 16-287-05491 10/13/2016 13:11

GLU SCRN 50 L mg/dL (70-110)

MD/RN Notified

Capillary blood samples, e.g. obtained by fingerstick, may have inaccurate results in patients with decreased peripheral blood flow.

Result
Display



Epic HLA Viewer

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ZzProdTestExisting, ProdOne
Male, 26 y.o., 09/06/1990, MRN: 0282273, CSN: None

Code Status: Not on file
Allergies: No Known Allergies
FYI: FYI
Isolation, Organism: None, Clostrid...

Current Location: None
Last Height: 178 cm (5' 10.08")
Last Weight: 56 kg (123 lb 7.3 oz)
BSA: 1.66 m²

Last BMI and %ile: 17.67 kg/m²
PCP Gen: None
Care Team:
Research: None

24Hr Blood Total (Clin+Rsch) max 1...
8 Wk Blood Total (Rsch Only) max...
Pref Language, Need Intep: Sign L...
Out of Hospital DNR?: .received

Implants: PACEMAKER
MyMDAnderson: Active
Blood Type: O POS
CrCl: None

Patient Class: None
Patient Type: Employee
Home Center: Sugarland

HLA

282273 - ZzProdTestExisting, ProdOne

Summary

Last Name	First Name	Relation	RBC	Haplot...	A	B	C	DRB1	DRB3	DRB4	DRB5	DQB1	DPB1
0 - TEST PATIENT X													
0 - TEST	PATIENT	X		a	02:01:01	07:02:01	07:02:01	15:01:01			01:01	06:02:01	04:BDKS
0 - TEST	PATIENT	X		c	03:01:01	08:01:01	07:01:01	08:01				04:02	04:01
1 - TEST MD DONOR 1 Brother													
1 - TEST MD	DONOR 1	Brother		a	02:01:01	07:02:01	07:02:01	15:01:01			01:01	06:02:01	04:BDKS
1 - TEST MD	DONOR 1	Brother		d	29:02:01	49:01:01	07:01:01	03:01:01	01:01:02			02:01	02:01:02
2 - TEST MD DONOR 2 Sister													
2 - TEST MD	DONOR 2	Sister		a	02:xx	07:xx	07:xx	15:xx			01:xx	06:xx	
2 - TEST MD	DONOR 2	Sister		d	29:xx	49:xx	07:xx	03:xx	01:xx			02:xx	
3 - TEST MD DONOR 3 Sister													
3 - TEST MD	DONOR 3	Sister		c	03:xx	08:xx	07:xx	08:xx				04:02	
3 - TEST MD	DONOR 3	Sister		d	29:xx	49:xx	07:xx	03:xx	01:xx			02:xx	
4 - ZZZHLATYPING TEST 7 Brother													
4 - ZZZHLATYPING	TEST 7	Brother		a	02:01	07:02	07:02	15:01			01:01	06:02	
4 - ZZZHLATYPING	TEST 7	Brother		c	03:01	08:01	07:01	08:01				04:02	
5 - TEST PATIENT U													
5 - TEST	PATIENT	U		x	02:01:01	07:02:01	07:02:01	15:01:01			01:01	06:02:01	04:BDKS
5 - TEST	PATIENT	U		y	29:02:01	49:01:01	07:01:01	03:01:01	01:01:02			02:01	02:01:02
6 - TEST who U													
6 - TEST	who	U		x									
6 - TEST	who	U		y									
7 - test1 testing U													

Result
Display



Epic Lab Tab

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Eplic PatientLookup Remind Me My Reports Personalize Prep for Surgery Cerner Bridge Telephone Call Patient Education Link Patient Transport Dept Appts Appts Departmental Calendar Print Secure Log Out

ZZProdTestExisting.Pro... Code Status: Not on file Current Location: None Last BMI and %ile: 17.67 kg/m² 24Hr Blood Total (Clin+Rsch) max 1... Implants: PACEMAKER Patient Class: None
Allergies: No Known Allergies Last Height: 178 cm (5' 10.08") Last Weight: 56 kg (123 lb 7.3 oz) PCP Gen: None Care Team: MyMDAnderson: Active Blood Type: O POS
MRN: 0282273 CSN: None FYI: FYI Scan on: 7/23/2016 by: of: Gyn C-16-213936 Patient Type: Employee Home Center: Sugariand

Chart Review

Snapshot Encounters Notes Labs

Refresh (4:56 PM) Route Review Selected

Filters Hide Canceled Blood Bank

Medications and orders also exist in active tree

Attachment Type Episode
Authorizing Provider Order Status
Department Specialty Ordering Proc
Encounter Department Order
Encounter Research St
Encounter Type

Order contains...

Order	Count	Last
<input type="checkbox"/> OR URINE BETA HCG Q...	1	05/19
<input type="checkbox"/> OUTSIDE CONSULTATION	2	07/23
<input type="checkbox"/> OUTSIDE REFERRAL	5	07/23
<input type="checkbox"/> Partial Thromboplastin Time	1	08/03
<input type="checkbox"/> PATHOLOGY BIOPSY SP...	30	07/23
<input checked="" type="checkbox"/> PATHOLOGY REQUISITION	5	10/13
<input type="checkbox"/> PATHOLOGY SURGICAL...	12	09/29
<input type="checkbox"/> Peripheral Smear for Bone...	1	03/04
<input type="checkbox"/> Phosphorus	3	03/28
<input type="checkbox"/> Phosphorus Level	1	03/04
<input type="checkbox"/> Platelet Function Analysis	5	06/15
<input type="checkbox"/> Platinum Misc BF	2	06/15
<input type="checkbox"/> POC A1C	27	09/16
<input type="checkbox"/> POC ABG	6	08/12
<input type="checkbox"/> POC ABG + Lytes and Glu...	24	10/06
<input type="checkbox"/> POC ABG+Lact	3	06/20
<input type="checkbox"/> POC ABG+Lytes	19	08/25

Save this Filter for Quick Access La

Save as New Filter

Date Range Filter Options

FILE HOME COMMENT VIEW FORM PROTECT SHARE

Find

MD Anderson Cancer Center

Cytopathology Report

282273

ZZPRODTESTEXISTING, THREE
DOB: 09/06/1990 Sex: M
Physician: Referring Physician, MD

1515 HOLCOMBE BOULEVARD
HOUSTON, TX 77030-4095
Tel: 713-794-5625 Fax: 713-792-3738

Collected: 07/22/2016 Case Type: Gyn
Received: 07/23/2016 08:53:30 AM

***** MODIFIED REPORT - REVIEW ADDENDUM SECTION *****

SPECIMEN SOURCE
Vulva, liquid based prep

SPECIMEN ADEQUACY:
Satisfactory for evaluation
Endocervical/transformation zone component present

DIAGNOSIS:
Negative for intraepithelial lesion or malignancy

0 Note(s)

112765009

06/23/2016 07:51 06/23/2016
06/23/2016 07:38 06/23/2016
06/23/2016 07:33 06/23/2016

Nonative
Ordered by an unspecified provider.

Authorizing Provider Information

Result
Display



Embedded RTF Viewer

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ZzProdTestExisting, Pro...

ZzProdTestExisting, ProOne
Male, 26 y.o., 09/06/1990,
MRN: 0282273
CSN: None

Code Status: Not on file
Allergies: No Known Allergies
FYI: FYI
Isolation: Organism: None, Clostrid...

Current Location: None
Last Height: 178 cm (5' 10.08")
Last Weight: 56 kg (123 lb 7.3 oz)
BSA: 1.66 m²

Last BMI and %ile: 17.67 kg/m²
PCP Gen: None
Care Team:
Research: None

24Hr Blood Total (Clin+Rsch) max 1...
8 Wk Blood Total (Rsch Only) max...
Pref Language: Need Intep: Sign L...
Out of Hospital DNR?: . received

Implants: PACEMAKER
MyMDAnderson: Active
Blood Type: O POS
CrCl: None

Patient Class: None

Patient Type: Employee
Home Center: Sugarland

Search

Pathology Reports

282273 - ZzProdTestExisting, ProOne

Close X

PATHOLOGY REPORTS

282273 - ZzProdTestExisting, ProOne

Total Records: 2251

Zoom Level: Fit Width

☒ Group test by source material

☐ Non-clinical cases

☒ Side by Side View

Procedure	Procedu...	Status	Pathologist
Non-Gyn	10/04/2016	Incomplete	
Outside Referral	10/02/2016	Incomplete	
Surgical Case	09/28/2016	Final	
Outside Referral	09/27/2016	Incomplete	
Non-Gyn	09/21/2016	Incomplete	PATHOLOGI
Surgical Case	09/21/2016	Incomplete	PATHOLOGI
Surgical Case	09/06/2016	Incomplete	
Non-Gyn	09/01/2016	Incomplete	PATHOLOGI
Non-Gyn	09/01/2016	Incomplete	PATHOLOGI
Non-Gyn	08/30/2016	Incomplete	PATHOLOGI
Surgical Biopsy	08/09/2016	Incomplete	PATHOLOGI
Surgical Biopsy	08/09/2016	Incomplete	PATHOLOGI
Surgical Case	07/24/2016	Incomplete	PATHOLOGI
Sup FNA	07/22/2016	Incomplete	
Deep FNA	07/22/2016	Pending...	PATHOLOGI
Autopsy PAD	07/22/2016	Final	PATHOLOGI
Surgical Biopsy	07/22/2016	Pending...	PATHOLOGI
Autopsy FAD	07/22/2016	Final	PATHOLOGI
Bone Marrow Referral	07/22/2016	Amendm...	PATHOLOGI
Outside Referral	07/22/2016	Amendm...	PATHOLOGI
Outside Consultation	07/22/2016	Addend...	PATHOLOGI

FILE

HOME

COMMENT

VIEW

FORM

PROTECT

SHARE

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Cancer Center

**Surgical Pathology
Report**

282273

1515 HOLCOMBE BOULEVARD
HOUSTON, TX 77030-4095

Department of Pathology, Box 85
Tel: 713-792-3205 Fax: 713-794-4630

ZZPRODTESTEXISTING, THREE

DOB: 9/6/1990 Sex: M

Physician: Jorge E Cortes, MD

Collected: 9/28/2016

Received: 09/29/2016 14:16

Case type: Surgical Case

Accession: S-16-059531

DIAGNOSIS

(A) RIGHT ORAL PHARYNGECTOMY

INVASIVE NONKERATINIZING SQUAMOUS CARCINOMA

Tumor Features:

Gross: Exophytic

Size: 2.5 cm in largest dimension

Invasion: Present, depth 1.5 cm

Perineural Invasion: Absent

Vascular Invasion: Absent

Lymphocyte Infiltration: Marked

Mucosal Margin: (radial) Negative for invasive carcinoma

Deep Margin: (radial) Negative for invasive carcinoma

1/3

121.32%

Result
Display



Whole Slide Images

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hyperspace - MAIN HXA - MD Anderson Production Environment - MICHAEL K

Epic Patient Lookup Remind Me My Reports Personalize Prep for Surgery Cerner Bridge Telephone Call Patient Education Link Patient Transport Dept Appts Appts Departmental Calendar

ZzProdTestExisting, ProdOne

Male, 26 y.o., 09/06/1990, MRN: 0282273, CSN: None

Code Status: Not on file
Allergies: No Known Allergies
FYI: FYI
Isolation, Organism: None, Clostrid...

Current Location: None
Last Height: 178 cm (5' 10.08")
Last Weight: 56 kg (123 lb 7.3 oz)
BSA: 1.66 m²

Last BMI and %ile: 17.67 kg/m²
PCP Gen: None
Care Team: Research: None

24Hr Blood Total (Clin+Rsch) max 1...
8 Wk Blood Total (Rsch Only) max...
Pref Language, Need Interp: Sign L...
Out of Hospital DNR?..received

Implants: PACEMAKER
MyMDAnderson: Active
Blood Type: O POS
CrCl: None

Patient Class: None
Patient Type: Employee
Home Center: Sugarland

Pathology Images

Image 12258 Image 13088 Image 13695 Image 14126 Image 14595 Image 14954 Image 15281 Image 15619 Image 15762

Image 15837 Image 15841 Image 15843 Image 15845 Image 15848 Image 15850 Image 16274 Image 16389 Image 16431

Image 16562 Image 16675 Image 16920 Image 17267 Image 17348 Image 17721 Image 17722 Image 18244 Image 18539

Image 18540 Image 18984 Image 19297 Image 19434 Image 19785 Image 19994 Image 20231 Image 20285 Image 20332

2/24/2010
OUI5 OL7
CONTROL #1
DESMIN
S-09-009356

Customize

Result
Display



Whole Slide Imaging

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Cancer Center
Making Cancer History™

Epics Patient Lookup Remind Me My Reports Personalize Prep for Surgery Cerner Bridge Telephone Call Patient Education Link Patient Transport DepApps Apps Departmental Calendar Print Secure Log Out

ZzProdTestExisting, ProdOne
Male, 26 y.o., 09/06/1990
MRN: 0282273
CSN: None

Code Status: Not on file
Allergies: No Known Allergies
FYI: FYI
Isolation, Organism: None, Clostrid...

Current Location: None
Last Height: 178 cm (5' 10.08")
Last Weight: 56 kg (123 lb 7.3 oz)
BSA: 1.66 m²

Last BMI and %ile: 17.67 kg/m²
PCP Gen: None
Care Team:
Research: None

24Hr Blood Total (Clin+Rsch) max 1...
8 Wk Blood Total (Rsch Only) max...
Pref Language, Need Interp: Sign L...
Out of Hospital DNR? ..received

Implants: PACEMAKER
MyMDAnderson: Active
Blood Type: O POS
CrCl: None

Patient Class: None
Patient Type: Employee
Home Center: Sugarland

Pathology Images

Pathology

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1X
2X
5X
10X
20X
Fit

5596
045602
A
S-08-030129
SPECIMEN

Customize
More

Result
Display



Quality Actions Epic Go Live

- Continuous high volume order set review
- The Laboratory Medical Informatics Director built the result tree in Epic
 - By himself, in 2 weeks!
- Embedded Laboratory Results and Pathology Result Viewers (as well as Digital Pathology Viewers) into Epic Lab Tab
- Analytics around go live to analyze ordering patterns and discover anomalies



Epic Go-live

Before Vs After Test Activity Differences - Sorted By Volume

Weekday(s): Multiple Items)

Filtered for
 Ratios 2.5 and
 Higher

	Before	After
From	1/8/2016	3/4/2016
To	1/30/2016	3/5/2016

Per Day Metrics are rounded up

TEST	Tests Per Day Before	Tests Per Day After	Difference	% Difference	Ratio of % Change relative to Overall % Change	Mix - % of Total Before	Mix - % of Total After	After/Before Ratio of Mix
Calcium Level Ionized	35	111	76	217.1%	-19.62	0.22%	0.77%	3.57

TEST	Tests Per Day Before	Tests Per Day After	Difference	% Difference	Overall % Change	Total Before	Total After	After/Before Ratio of Mix
Calcium Level Ionized	35	111	76	217.1%	-19.62	0.22%	0.77%	3.57
PTH Intact	15	4	(11)	-73.3%	-5.62	0.09%	0.03%	3.33
Hemoglobin A1c	15	5	(10)	-66.7%	-5.02	0.09%	0.03%	2.67
Ionized Ca Whole Blood	15	2	(13)	-86.7%	-6.83	0.09%	0.01%	6.67
Prealbumin	12	4	(8)	-66.7%	-5.02	0.07%	0.03%	2.67
HCVAb	10	3	(7)	-70.0%	-5.32	0.06%	0.02%	2.96
Thyroglobulin	10	2	(8)	-80.0%	-6.23	0.06%	0.01%	4.45
HBcAb	10	2	(8)	-80.0%	-6.23	0.06%	0.01%	4.45
Protein Electrophoresis	10	1	(9)	-90.0%	-7.13	0.06%	0.01%	8.89
Reticulocyte Count Automated	9	3	(6)	-66.7%	-5.02	0.06%	0.02%	2.67
Iron Level	9	2	(7)	-77.8%	-6.03	0.06%	0.01%	4.00
CBC Pathology Review	8	2	(6)	-75.0%	-5.78	0.05%	0.01%	3.56
Transferrin	8	2	(6)	-75.0%	-5.78	0.05%	0.01%	3.56
Cell Count w/ Diff CSF	7	1	(6)	-85.7%	-6.74	0.04%	0.01%	6.23
ACTH	6	1	(5)	-83.3%	-6.53	0.04%	0.01%	5.34
TMP Interpretation Exception PreOp Expir	5	1	(4)	-80.0%	-6.23	0.03%	0.01%	4.45
Aspergillus Antigen Assay, Serum	4	1	(3)	-75.0%	-5.78	0.02%	0.01%	3.56
CTX Beta Crosslaps	4	1	(3)	-75.0%	-5.78	0.02%	0.01%	3.56
Rapamycin	4	1	(3)	-75.0%	-5.78	0.02%	0.01%	3.56
Troponin-I	4	16	12	300.0%	-27.10	0.02%	0.11%	4.50
.HSV/VZV Direct Ag Path Review	3	1	(2)	-66.7%	-5.02	0.02%	0.01%	2.67
FSH Level	3	1	(2)	-66.7%	-5.02	0.02%	0.01%	2.67
Protein CSF	3	1	(2)	-66.7%	-5.02	0.02%	0.01%	2.67
Glucose CSF	3	1	(2)	-66.7%	-5.02	0.02%	0.01%	2.67
Albumin Level Body Fluid	3	1	(2)	-66.7%	-5.02	0.02%	0.01%	2.67
Calcitonin Level	3	1	(2)	-66.7%	-5.02	0.02%	0.01%	2.67

Result
 Display



Investigation

E_MED_SERVICE_DISP	(All)	E_MED_SERVICE_DISP	(All)
FLOOR	(All)	FLOOR	(All)
Weekday	(All)	Weekday	(Multiple Items)
MNEMONIC	(Multiple Items)	MNEMONIC	Calcium Level Ionized

Row Labels	Sum of CountOfACC4	Row Labels	Sum of CountOfACC4
Wed 1/6/2016	10	Fri 3/4/2016	68
Thu 1/7/2016	73	Sat 3/5/2016	153
Fri 1/8/2016	69	Grand Total	221
Sat 1/9/2016	64		
Sun 1/10/2016	55		
Mon 1/11/2016	79		
Tue 1/12/2016	77		
Wed 1/13/2016	79		
Thu 1/14/2016	67		
Fri 1/15/2016	69		
Sat 1/16/2016	45		
Sun 1/17/2016	51		
Mon 1/18/2016	52		
Tue 1/19/2016	72		
Wed 1/20/2016	76		
Thu 1/21/2016	65		
Fri 1/22/2016	59		
Sat 1/23/2016	44		
Sun 1/24/2016	46		
Mon 1/25/2016	84		
Tue 1/26/2016	75		
Wed 1/27/2016	75		
Thu 1/28/2016	73		
Fri 1/29/2016	76		
Sat 1/30/2016	52		
Sun 1/31/2016	51		
Mon 2/1/2016	76		

Weekday	(Multiple Items)
MNEMONIC	Calcium Level Ionized

Sum of CountOfACC4			
Floor	Fri 3/4/2016	Sat 3/5/2016	Grand Total
07	27	51	78
09	3	3	6
10	7	13	20
12		2	2
15	1	6	7
16		5	5
17		7	7
18	1	2	3
19	2	12	14
P04	2	3	5
P06	2	2	4
P07	3	5	8
P08	1	2	3
P09	1	18	19
P11	2	6	8
P12		8	8
R.02	4	5	9
ACB	2		2
EC		1	1
Main Misc	10	2	12
Grand Total	68	153	221



Issue: The wrong “order” code had been associated with a commonly used Order set by a few high volume Specialties





Bone Marrow Workflow and Reporting Enhancement

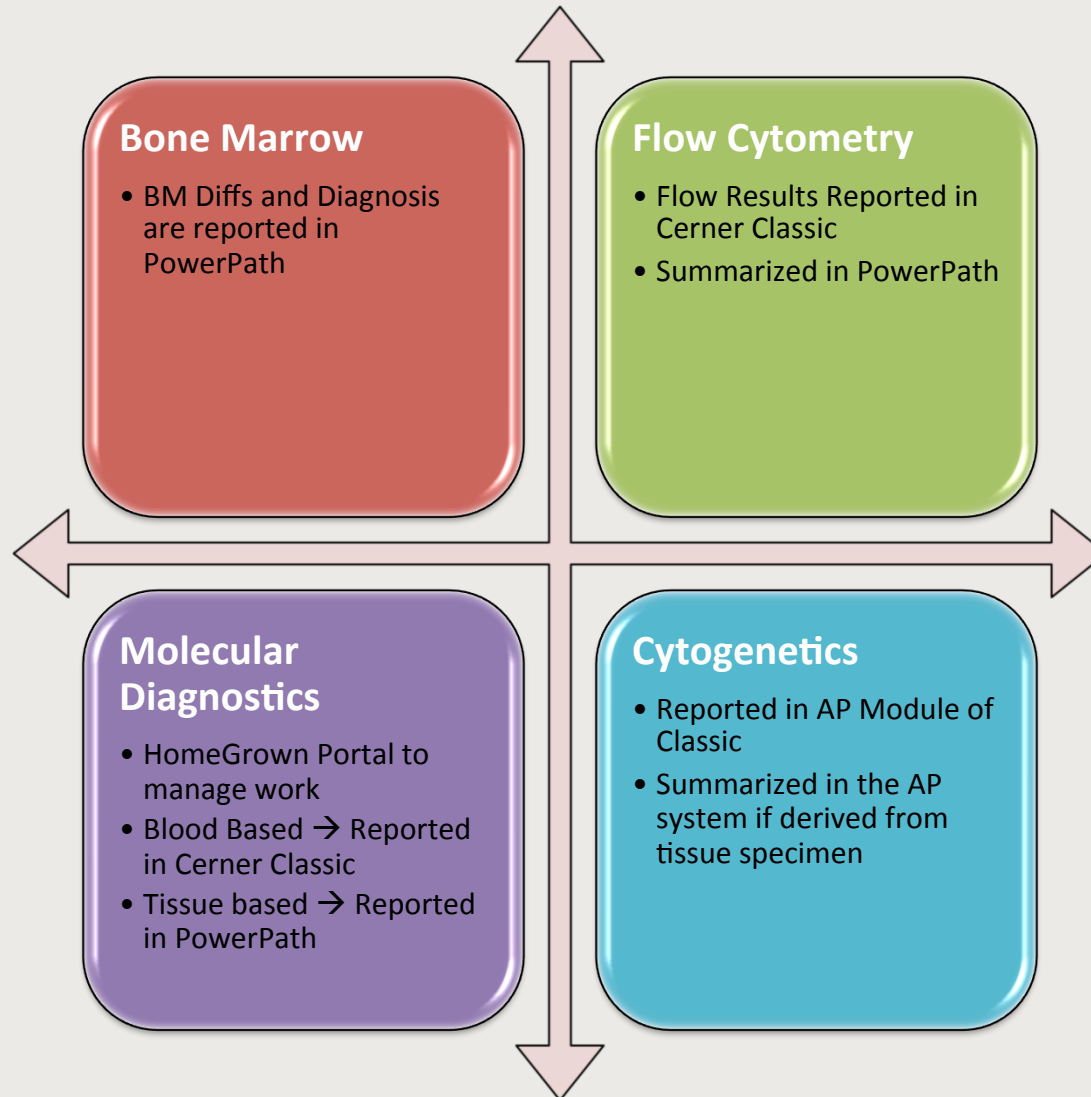
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Before ML Go live



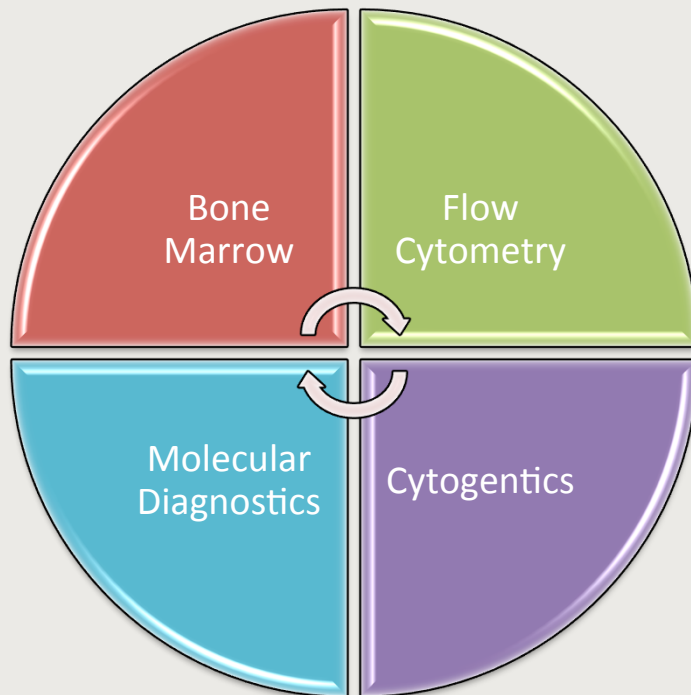


Challenges

- Hematopathology testing results (Flow, Molecular and Cytogenetics) were dictated into the originating Anatomic Pathology case, with **no electronic linkage**
- There was no integration or association of the various reports in the EMR
 - appeared in different folder structures
 - required pathologists and clinicians to search the EMR for all relevant diagnostic information



Post ML Go live



- All four Labs function in 3 **Interfaced** Systems
- All components of a BM workup share a **common accession** number with a distinct “BM” prefix
- Hematopathology **results are linked to AP results** through accession number linking in Millennium and displayed together in Clinicstation and now Epic due to this linking
- Specimen visibility and tracking allows for **more efficient sharing** of limited samples



Following the ML Launch

- At the first Epic MD Townhall prior to Epic go-live, the first audience question was from a physician from Leukemia :

“Ok, I need to have the biomarker testing on my patients linked to the pathology rept like it is now in Clinicstation!! This is vital to our practice! When I did my Epic training, it didn’t appear this was possible..So...Will we be able to see it this way in Epic ?”





With Epic and Cerner, we made it possible!

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yperspace - MAIN FNA - MD Anderson Production Environment - MICHAEL R.

Pathology Reports

282273 - ZzProdTestExisting, ProdOne

Male, 26 y.o., 09/06/1990, ...

Code Status: Not on file
Allergies: No Known Allergies
FYI: FYI
Isolation, Organism: None, Clostridium Dif...

Current Location: None
Last Height: 178 cm (5' 10.08")
Last Weight: 56 kg (123 lb 7.3 oz)
BSA: 1.66 m²

Last BMI and %ile: 17.67 kg/m²
PCP Gen: None
Care Team: ...
Research: None

24Hr Blood Total (Clin+Rsch) max 150 mL: 0
8 Wk Blood Total (Rsch Only) max 550 mL: 0
Pref Language, Need Interp: Sign Language...
Out of Hospital DNR?: ...received

Implants: PACEMAKER
MyMDAnderson: Active
Blood Type: O POS
CrCl: None

Patient Class: None
Patient Type: Employee
Home Center: Sugarland

PATHOLOGY REPORTS

Total Records: 2251 Zoom Level: Fit Width ☒ Group test by source material ☐ Non-clinical cases ☒ Side by Side View

Procedure	Procedure Date	Status	Pathologist
Deep FNA	12/31/2015	Final	PATHOLOGIST MD, T...
Bone Marrow			
Surgical Case			
Pathology Requisition			
Pathology Requisition			
Deep FNA			
Surgical Case			
Bone Marrow			
Bone Marrow		Incomplete	PATHOLOGIST MD, T...
Surgical Case	11/29/2015	Final	PATHOLOGIST MD, T...
Surgical Biopsy	11/15/2015	Incomplete	
Bone Marrow	11/08/2015	Incomplete	PATHOLOGIST MD, T...
HP CG RB1 FISH Final Report	11/09/2015	Cancelled	
Bone Marrow			
Bone Marrow	11/06/2015	Incomplete	PATHOLOGIST MD, T...
HP MD Cancer Mutation Scan 28 Genes...	11/15/2015	Cancelled	
HP CG 20q12 FISH Final Report	11/09/2015	Cancelled	
HP CG CEP 12 FISH Final Report	11/09/2015	Cancelled	
HP CG CEP 12 FISH	11/09/2015	Final	
Bone Marrow	11/06/2015	Incomplete	PATHOLOGIST MD, T...
Bone Marrow	11/06/2015	Incomplete	PATHOLOGIST MD, T...
Molecular Testing: Cancer Mutation - 50 g...	11/06/2015	Final	Routbort MD, PhD, Ma
Bone Marrow	11/05/2015	Final	PATHOLOGIST MD, T...
HP MD Cancer Mutation Scan 53 Genes...	11/06/2015	Corrected	

Bone Marrow Report has Cytogenetics linked

Bone Marrow Report Linked to both Cytogenetics and Molecular Diagnostics report

FILE HOME COMMENT VIEW FORM PROTECT SHARE

Bookmarks

Cytogenetics Reports

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1515 Holcombe Blvd., Houston, TX 77030

TEST, PATIENT A
282273
DOB/Age/Sex: 9/6/1989 26 years Male

Cytogenetics Reports

HP CG PML RARA FISH Final Report
11/6/2015 20:01 CST
Auth (Verified)
Richardson, David W (11/6/2015 21:48 CST)

PML RARA FISH Final Report

5-064043
ne: 11/6/2015 6:01 PM
Bone Marrow Smear

Summary:
THIS IS A NEGATIVE RESULT FOR PML/RARA REARRANGEMENT.
FLUORESCENCE IN SITU HYBRIDIZATION (FISH)
nuc ish(PML,RARA)x2[200]
3 Representative interphases photographed.

Interpretation:
The in situ hybridization (ish) technique was performed using a LSI PML/RARA dual color, dual fusion translocation probe from Abbott Molecular, Inc. A total of 200 interphases were analyzed. No fusion signal was observed in any of the interphases. The results are within the normal limits.
The 95% (P<0.05) confidence limit of the LSI PML/RARA probe established at the MDACC Cytogenetics Laboratory is 0.0-0.0%.



Blood Bank, Donor, Transfusion Enhancement

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BB is Busy!

	MDA	John Hopkins	Sloan Kettering	UCLA	University of Washington	Mayo Clinic	Dana Farber
Red Cells	55,384	48,770	22,816	31,000	8,000	36,943	34,678
Plateletpheresis	5,318	21,270	14,446	10,600	1,500	11,888	<i>Not reported</i>
Plasma	8,774	16,128	2,775	15,400	4,000	12,584	<i>Not reported</i>
Cryoprecipitate	3,062	8,422	<i>Not reported</i>	3,000	200	7,525	<i>Not reported</i>
Whole Blood Platelets	119,531	0	0	0	0	0	<i>Not reported</i>
TOTALS	192,069	94,590	40,037	60,000	13,700	68,940	34,678



Challenges

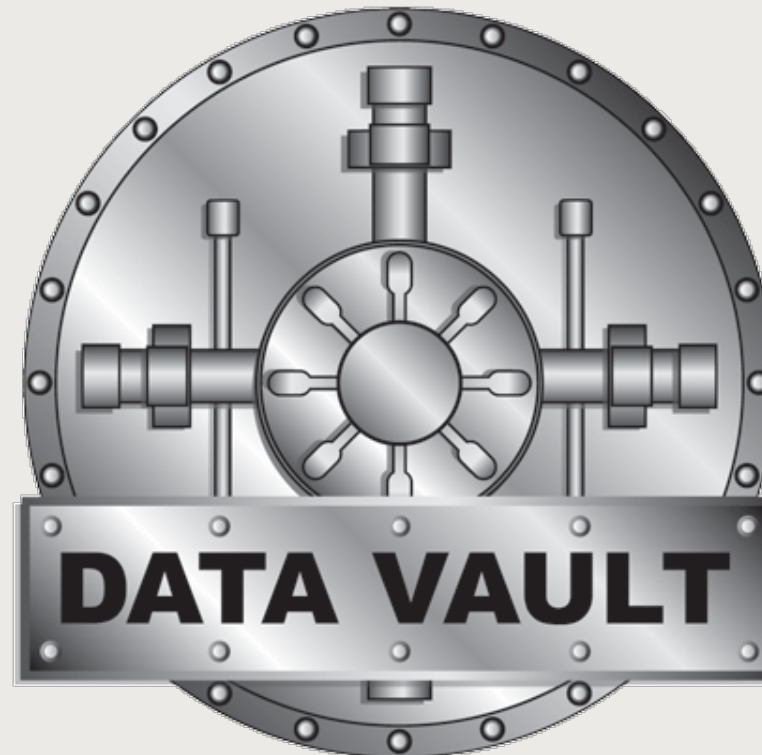
- Transfusion Medicine and Donor Center Operations co-existed on one sun-setted system (MAK Progesa) including infectious disease testing of patients and donors
 - Vendor ended support prior to go-live





Data Locked Away

- MAK Progesa- Proprietary database system created data extraction issues for historical uploads required for clinical care and regulatory purposes





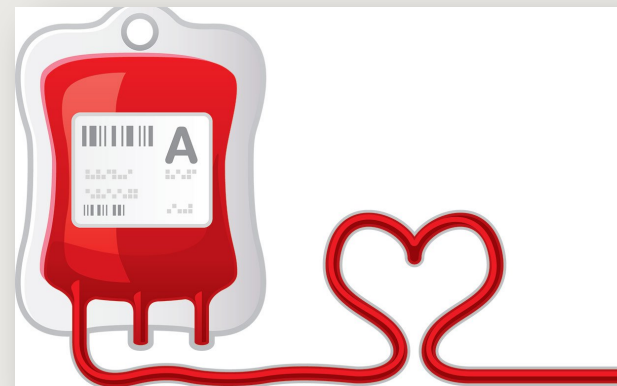
Unique Workflow Challenge

- Modular approach of Cerner PathNet created unique workflow challenges for Transfusion Medicine Physician (TMP) sign out
 - One view required for Blood Bank and Infectious Disease
- Specialized patient population required customized build of Cerner PathNet Blood Bank Transfusion
 - Very little of standard content used



Enhanced Donor Operations

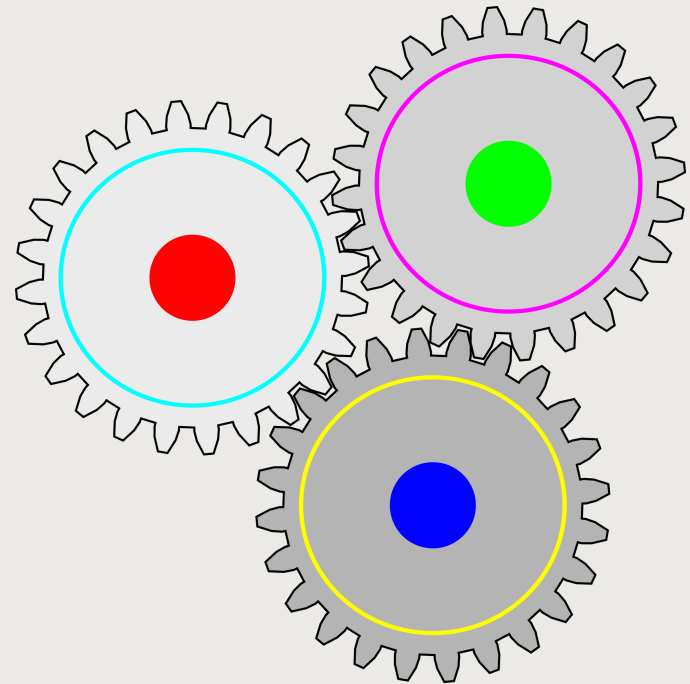
- Donor Center Operations is now supported by four modules of the Haemonetics system with bi-directional interfaces to Cerner Millennium
 - Online scheduling through an external portal allows for potential and repeat donor scheduling
 - Blood drive operations is now online through the Hemasphere module
 - Enhanced reporting capability through standardized data models with the new system using Crystal Reports





Process Automation

- Business rule driven workflows within Cerner PathNet have removed many technologist interactions





Increased Revenue

- Charge capture of additional charge points such as AHG crossmatches has increased revenue for the department





Enhanced TMP signout

- System generated interpretation capability has reduced TMP overhead on entering interpretations allowing focus on complex clinical consults





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Program Quality



Program Quality Assurance Conversion Monitors

- A number of key metrics and monitors were chosen for the conversion process, each of which had pre-conversion baseline data available at go-live:
 - Financial performance by lab and test to identify negative trends
 - TAT monitoring of key tests
 - Volume trending by lab and test
 - Pending lists by lab
 - Issue tracking, trending and aging
 - Real-time sample tracking (order to received to results released by LIS to results posted in EMR)
 - Cerner Lights On dashboard (indication of overall system health)

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Quality



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Ongoing Operational Integration Initiatives

- System Collaboration Meetings (2x/week):
 - Open integration items
 - Areas for more efficient collaboration
 - End-to-end troubleshooting, providing cross-training opportunities
- Change Control (2x/week):
 - Highly-structured, cooperative process
 - Openly discuss changes and approvals
 - Two defined change windows/week
- Team Integration Meetings (1x/month):
 - In person meetings to promote cross-functional exchanges and teamwork
 - Cross-training
 - Driving towards a single, *OneConnect* team approach

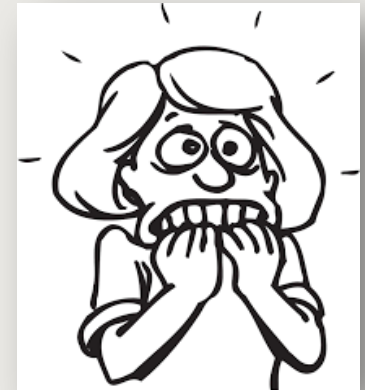
Quality



Outcome

- Fiscal year 2016 (sept 1 – Aug 30)
 - ICD10 Go-Live
 - Classic to Millennium Conversion (Big Bang)
 - Epic Go-Live (Institutional Big Bang)

Fiscal Year (Sept1-Aug30)	Variance to Budget Revenue
2013	-3.81%
2014	-0.78%
2015	-0.55%
2016	-1.04%





Successful Partnership

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Division of Pathology and
Laboratory Medicine



Lessons Learned

- Change Management Planning and Preparation are key
- Clearly documented and communicated requirements
- Current and future state workflow documentation
- Test, test, test.....and then test more
- Strict change control, especially leading to and following go-live



More Lessons Learned

- Training, training, training.....
- Tight integration of cross-functional teams representing each application
 - Including active leadership participation
- Pre-defined QA/QC indicators and current baseline data, including trending and seasonal fluctuations
 - Identify key quality indicators
 - i.e Test TAT, Volumes, Financial
- Communication:
 - Active communication with super users, and others
 - Assess “pulse” of their respective areas



Final Lessons Learned

- War room methodology utilization
 - Cross functional multi-disciplinary team for effective issue prioritization and resolution
 - Application and functional leaders assigned as issue owners
 - Daily leadership meetings





Thank You

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Questions?