

Vincent La and Omar Khalid, PhD

LABKEY AND ORIEN INFORMATICS AT CITY OF HOPE

October 3, 2019

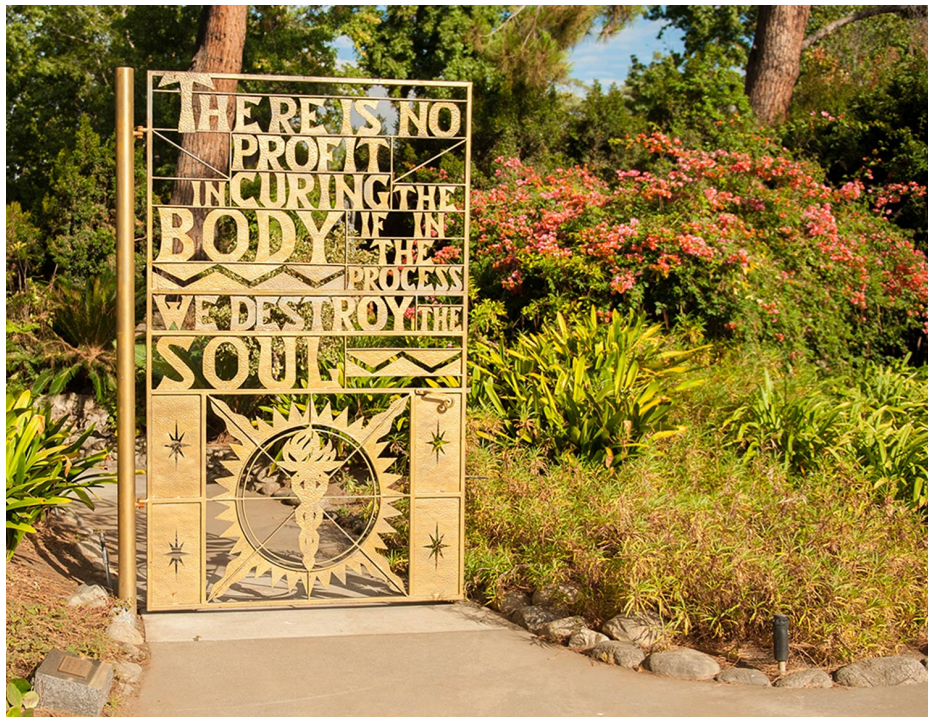
LabKey User Conference

Overview

1. City of Hope and ORIEN
2. LabKey Adoption
3. Lessons Learned & Future Plans
4. Q&A

City of Hope and ORIEN

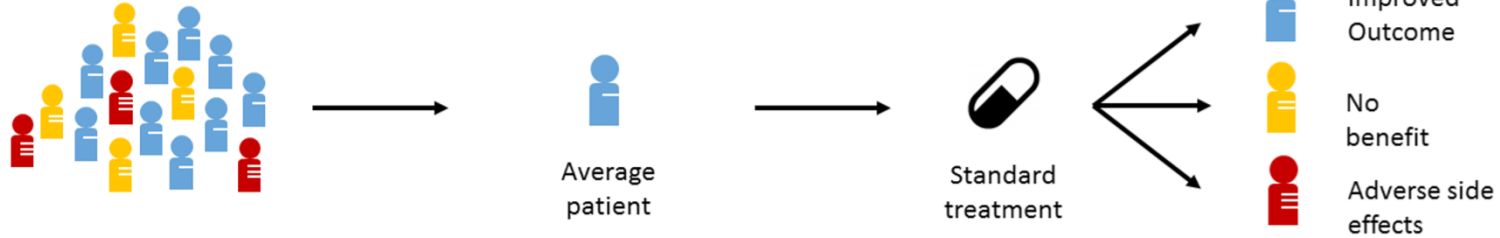
City of Hope National Medical Center



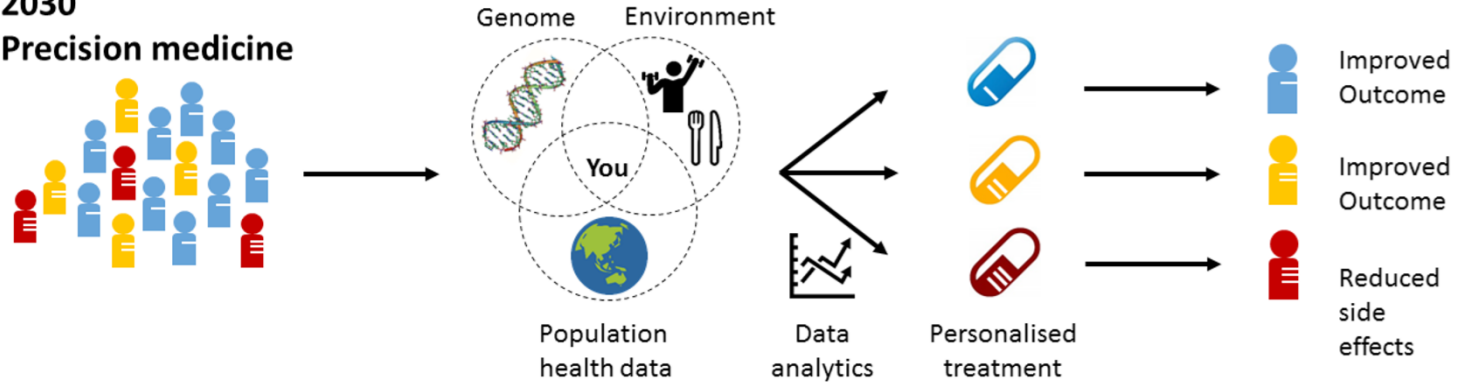
- National Cancer Institute
- CAR-T Therapies
- Diabetes
- **Precision Medicine and ORIEN**

Precision Medicine

Today



2030
Precision medicine



ORIEN: Oncological Research Information Exchange Network



ORIEN: Oncological Research Information Exchange Network

- City of Hope is 3rd of 19 other institutions within the network
- Over 100,000 patients consented for clinical and genomic data across the network
- Matches cancer patients to clinical trials

Total Cancer Care Protocol (TCC)

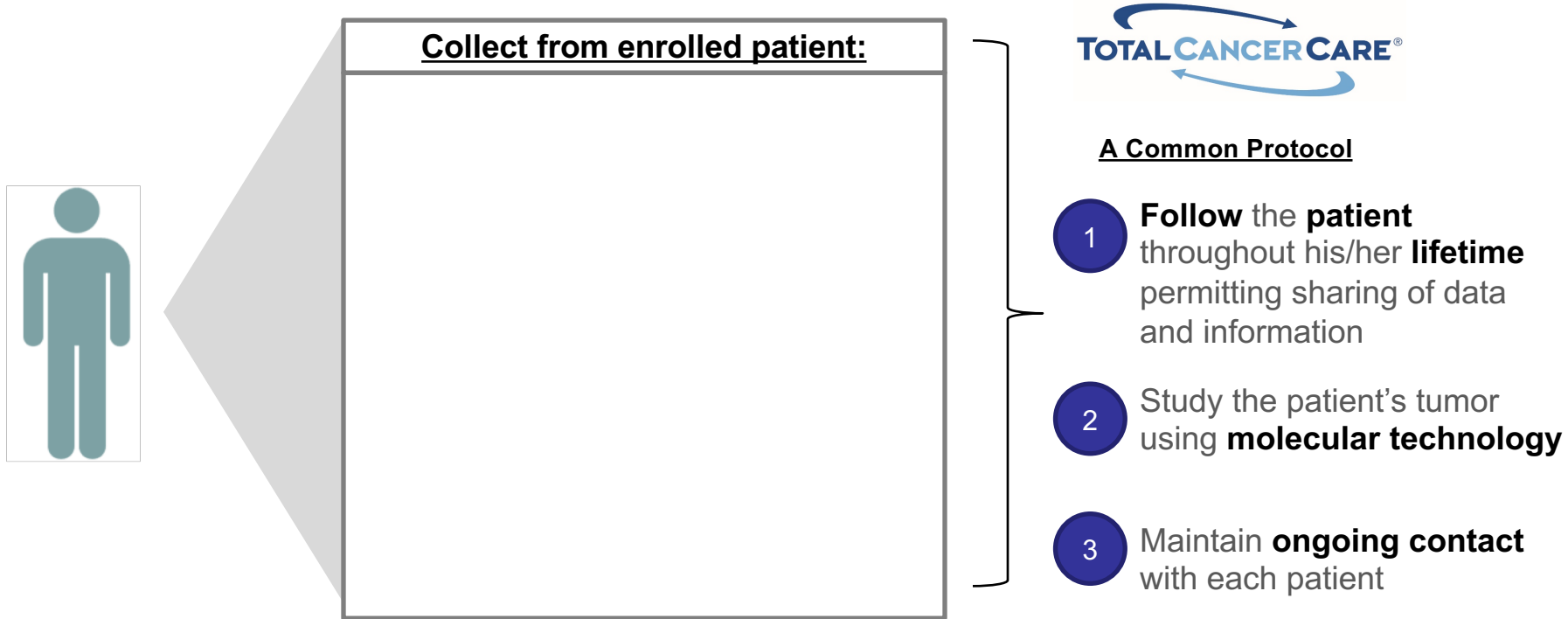
- A Common Protocol for Patient Enrollment

- 1 **Follow** the **patient** throughout his/her **lifetime** permitting sharing of data and information
- 2 Study the patient's tumor using **molecular technology**
- 3 Maintain **ongoing contact** with each patient



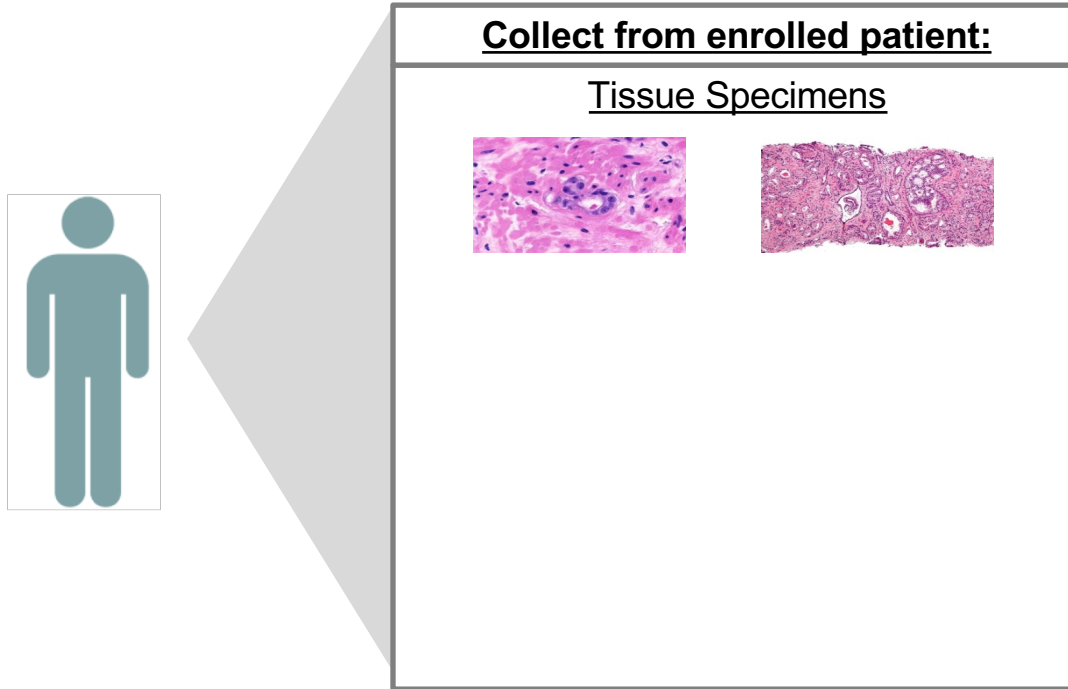
Total Cancer Care Protocol (TCC)

- A Common Protocol for Patient Enrollment



Total Cancer Care Protocol (TCC)

- A Common Protocol for Patient Enrollment

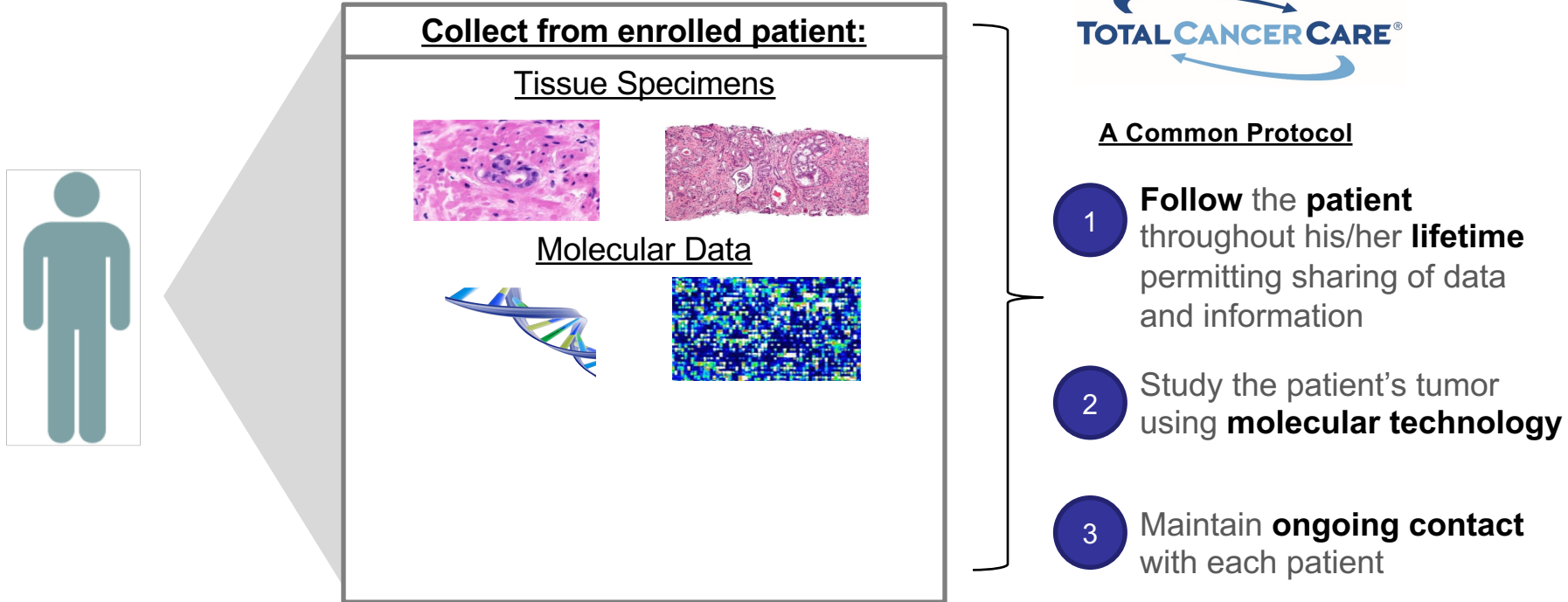


A Common Protocol

- 1 **Follow the patient** throughout his/her **lifetime** permitting sharing of data and information
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Total Cancer Care Protocol (TCC)

- A Common Protocol for Patient Enrollment



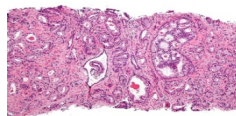
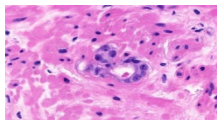
Total Cancer Care Protocol (TCC)

- A Common Protocol for Patient Enrollment

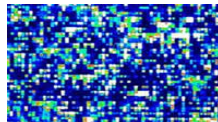
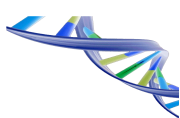


Collect from enrolled patient:

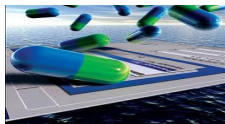
Tissue Specimens



Molecular Data



Longitudinal Clinical Data



A Common Protocol

- 1 **Follow the patient** throughout his/her **lifetime** permitting sharing of data and information
- 2 Study the patient's tumor using **molecular technology**
- 3 Maintain **ongoing contact** with each patient

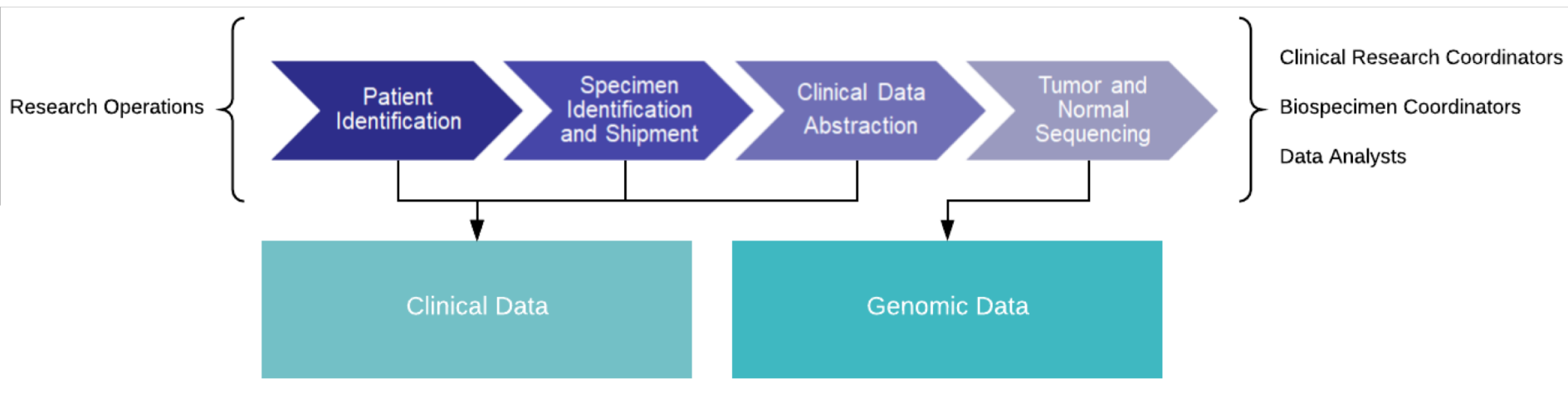
ORIEN Research Operations Workflow



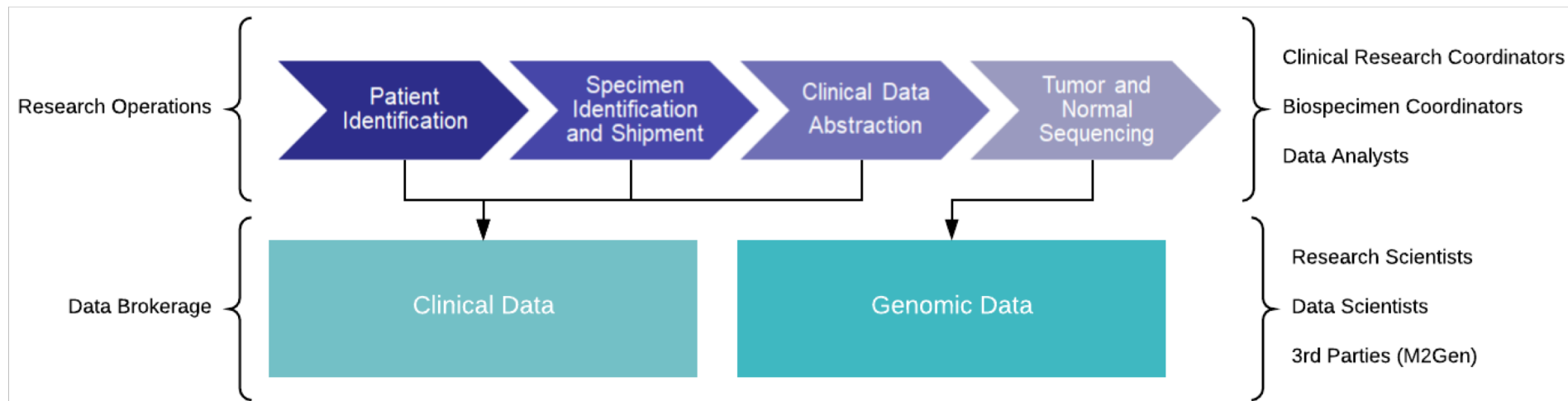
ORIEN Workflows



ORIEN Workflows



ORIEN Workflows



Platform Fatigue

Patient Identification

The screenshot displays the Epic EMR interface for a patient named Test Monday, Melissa A. The patient's MRN is E1404897, and the room is 1500. The interface includes a left sidebar with navigation options such as Summary, Flowsheets, Manage Orders, Care Plan, Education, Notes, Results Review, Chart Review, History, Demographics, Snapshot, Review Flows, Order Review, Week at a Glance, Pathway Review, and Pastoral Care. The main area shows the patient's information and a list of flowsheets. A modal window for OnCore is overlaid on the bottom right, showing a login form with a 'Username' field and a 'Next' button.

Platform Fatigue

Patient Identification

Testimony, Melissa A
MRN: E1404807
DOB: 01/12/1960
Room: 500P NONE
Readmit Risk: 0
Code: Not on file
HCL: None
AD Lvl: received: 01/2018
AD PCL: declined: 01/2018
Admit Date: 02/12/2018
Patient Class: Inpatient
Attending: Sp. B. Physics

Flowsheets
Add Rows, Add LQA, Cascade, Add Col, Insert Col, Lgt File, Reg Doc, Graph, Gg to Date, Responsible, Refresh

Pastoral Services
Hide All Show All
Reason For Visit: Religious Affiliation
Visit Information: Reason For Visit: 1500
Reason For Visit: Follow-up
Religious Affiliation
Pastoral Care Identified Faith Community?
Visit Information

OnCore
Username
Next

Specimen Identification

SAMPLE PATHOLOGY REPORT

Specimen and patient identification

PATIENT: Patient Name
MEDICAL RECORD NUMBER: Patient's hospital number
DATE OF BIRTH: 01/01/1960
GENDER:
SPECIMEN COLLECTION DATE/TIME: 01/01/2019 12:00h
CASE NUMBER: Pathology case number
SPECIMEN RECEIPT DATE/TIME: 01/01/2019 13:00h

SPECIMEN LABEL(S): Specimen site and medical procedure (such as "Appendix, appendectomy")

PATIENT HISTORY: Information the clinical team think the Pathologist should know about the patient, especially as it pertains to the specimen being evaluated.

PRE-OPERATIVE DIAGNOSIS: The current clinical diagnosis relating to the specimen, if the true diagnosis is

DIAGNOSIS
NOTE
SPECIAL
GROSS DE
NAME OR DR
Date and Time

ColPathPlus (PLIVE32)
File Edit Options Window Help
Patient: Smith, Mike
DOB: 5/5/1950 (Age: 60) M
MRN: 3249823944
Spec: Class: S-R, Routine
Acq. Date: 7/7/2010
Client: General Hospital
Care: Final Complete

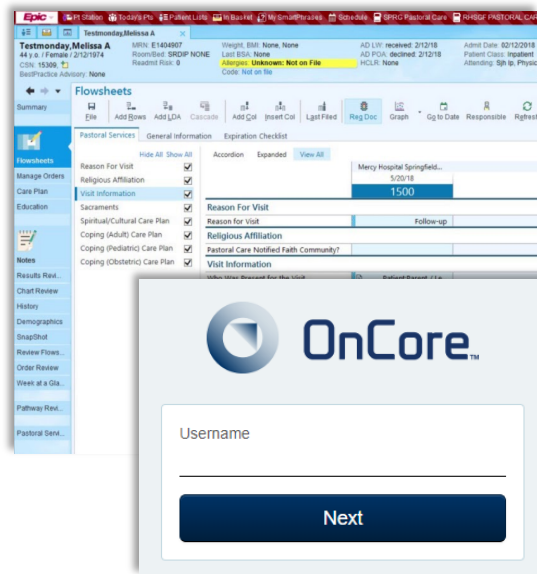
S10-16 - Final Diagnosis Entry/Edit
Worksheets: Test | SNOMED | Source/Shift | Billing
Part: Last Edited: By
1: LIVER: Resection, 2006
A: P6/2010.12.06
ERIC
Worksheet Entry... Regenerate Final Text Print Worksheets... Save/Print Specimens Edit Text

Synoptic Diagnosis
A. LIVER, NEEDLE BIOPSY
Specimen Type: Extended right lobectomy
Focality: Solitary: right lobe
Tumor Size: Greatest dimension: 2.3 cm
Histologic Type: Cholangiocarcinoma, intrahepatic
Histologic Grade: G3: Cannot be assessed
PATHOLOGIC STAGING (pTMO): pT0: No evidence of
pN0: No regional lymph node metastasis
Number of nodes examined: 1
Number of nodes involved: 1

S10-16 (Smith, Mike) - PKCSPlus Gallery Manager
Worksheet #1 of 1
DiagPartA_Liver_Needle Biop
Image Gallery
Gross A Micro A
GA BA
SPECIMEN TYPE
A1 Right lobectomy
A2 Extended right lobectomy
A3 Medial segmentectomy
A4 Left lateral segmentectomy
A5 Total left lobectomy
A6 Explanted liver
A7 Other (specify):
A8 Not specified
FOCALITY
B1 Solitary (specify location):
right lobe
B2 Multiple (specify location):

Platform Fatigue

Patient Identification



Specimen Identification

Specimen and patient identification			
PATIENT: Patient Name	DATE OF BIRTH: 01/01/1960		
MEDICAL RECORD NUMBER: Patient's hospital number	GENDER:		
SPECIMEN COLLECTION DATE/TIME: 01/01/2019 12:00h	CASE NUMBER: Pathology case number		
SPECIMEN RECEIPT DATE/TIME: 01/01/2019 13:00h			
SPECIMEN LABEL(s): Specimen site and medical procedure (such as "Appendix, appendectomy")			
PATIENT HISTORY: Information the clinical team think the Pathologist should know about the patient, especially as it pertains to the specimen being evaluated.			
PRE-OPERATIVE DIAGNOSIS: The current clinical diagnosis relating to the specimen. If the true diagnosis is			

DIAGNOSIS

NOTE:

SPECIALT

GROSS DE

NAME OF DISC

Date and Ti

CoPathPlus (PLIVE32)

File Edit Options Window Help

S10-16 - Final Diagnosis Entry/Edit

Patient: **Smith, Mike** Acc. No.: 12345678 Spec. Case: S-16, Routine Clinic: General Hospital Case: **Final Complete**

DOB: 5/51/90 (Age: 60) M Billing #: 324982944 Acc. Date: 7/7/2010

Worksheets: [Test] [SHOMED] [Source/Start] [Billing]

Synoptic Diagnosis Worksheet

1 LIVER, Resection, 2006

Part	Last Edited	By
A	7/6/2010 12:06	BRC

[Worksheet Entry] [Regenerate Final Text] [Print Worksheets] [Saved Specimen] [Edit Text]

Synoptic Diagnosis:

A. LIVER, NEEDLE BIOPSY:

Specimen Type: Extended right lobectomy

Focality: Solitary; right lobe

Tumor Size: Greatest dimension: 2.3 cm

Histologic Type: Cholangiocarcinoma, intrahepatic

Histologic Grade: GX - Cannot be assessed

PATHOLOGIC STAGING (pT) pT0: No evidence of

pN0: No regional lymph node metastasis

Number of nodes examined: 1

Number of nodes involved: 1

Synoptic Diagnosis: Worksheet for S10-16

Worksheet #1 of 1

DiagPart A: Liver, Needle Bio

MACROSCOPIC

SPECIMEN TYPE

A1 Right lobectomy

A2 Extended right lobectomy

A3 Medial segmentectomy

A4 Left lateral segmentectomy

A5 Total left lobectomy

A6 Explanted liver

A7 Other (specify):

A8 Not specified

FOCALITY

B1 Solitary (specify location):


right lobe

B2 Multiple (specify location):

Gross A

GA

Clinical Data Abstraction



Logged in as iREDCap | Log out

- My Projects
- Project Home
- Project Setup
- Project status: **Production**

Data Collection

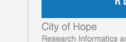
- Record Status Dashboard
- Add / Edit Records
- RedCap Record Number **123456789**
- Select other record

Data Collection Instruments:

- Avatar Ctm Initial Record Key V31**
- Avatar Ctm Initial Demographics V31
- Avatar Ctm Initial Staging V31
- Avatar Ctm Initial Metastatic V31
- Avatar Ctm Initial New Therapy NewCtde

Functions

- Practice Management
- Patient Management
- Scheduling
- Appointment Scheduling
- Scheduling Activities
- Scheduling Reports
- Schedule Planning
- Referrals
- Financial Processing
- Billing
- Collections
- Reporting
- Automation Management
- System Administration



RESEARCH • TREATMENT • CURES

City of Hope
Research Information and Systems

ORIEN Avatar v3

Actions: [Download PDF of instrument\(s\)](#) [Share instrument in the Library](#)

Avatar Ctm Initial Record Key V31

Adding new RedCap Record Number **123456789**

RedCap Record Number **123456789**

James R Masterson P# 250 - Bal. \$0.00
Registration

James R Masterson

Patient: James R Masterson Patient#: 250 Enrollment

Patient Information

<p>James R Masterson</p> <p>PO Box 123</p> <p>252 Charles Road</p> <p>Nashua, NH 03063-0123 US</p> <p>Home#: (603) 951-1642</p> <p>Work#: (603) 214-6284</p> <p>Cell#: (603) 998-2241</p> <p>Employer: Alboright Healthcare Solutions</p>	<p>Sex: Male SSN: *****268</p> <p>Birth Date: (05/17/1960) Age: 58 years</p> <p>Usual Provider: Hoppa MD, Henry J</p> <p>Referring DR: Hoppa MD, Henry J</p> <p>Referral From: Hoppa MD, Henry J</p> <p>Referral To: Hoppa MD, Henry J</p> <p>Referral Date: 12/20/2019</p> <p>Referral Reason: Newspaper</p> <p>HPPA Consent Contact: No</p> <p>Language: English</p>
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Account Information

Contact	Type	Home#
James R Masterson	Sample Sub	(603) 951-1642

Policy Information

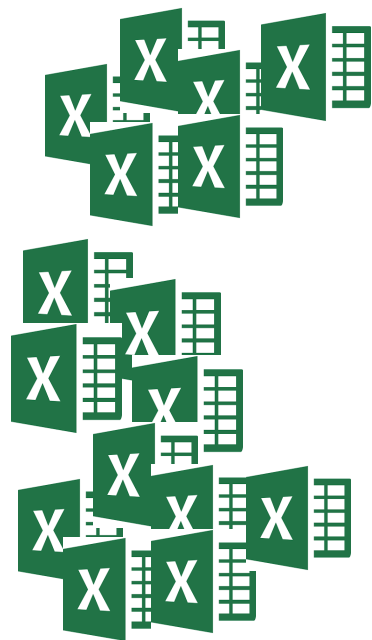
Coverage	Center	Status
Primary	Medical	
Secondary	8335 New Hampshire	
	Nutrition Research Agency	

Account#: 250 Act Type: STANDARD
 James R Masterson
 PO Box 123
 252 Charles Road
 Nashua, NH 03063-0123 US
 Home#: (603) 951-1642
 Work#: (603) 214-6284
 Cell#: (603) 998-2241

Subscriber: James R Masterson
 Certificate ID: 22453224
 Group Name: Alboright
 Group Number: 12345
 Carrier Contact: Betty Cad
 Carrier #: 01/62/2019 Ext 7676

Verified Date: 01/02/2019
 Coverage Type: Medical

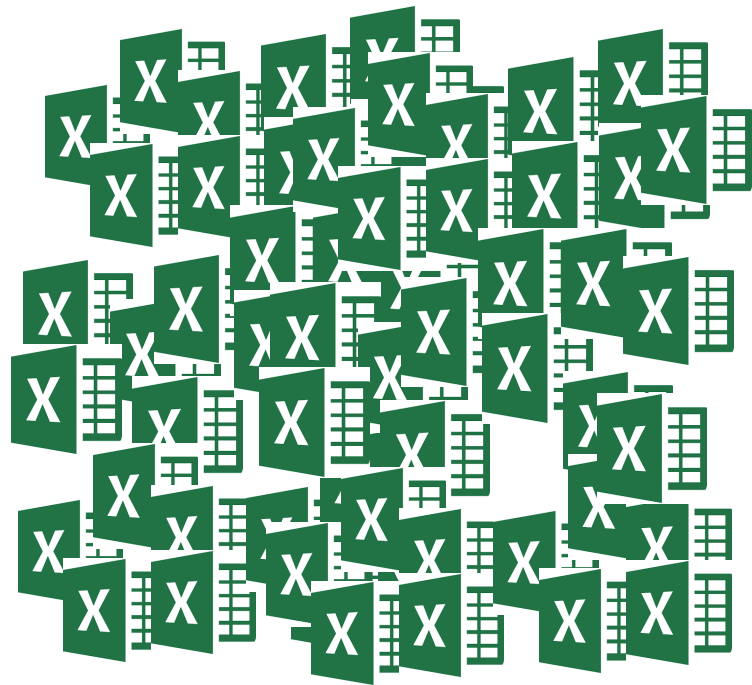
Brokering the data



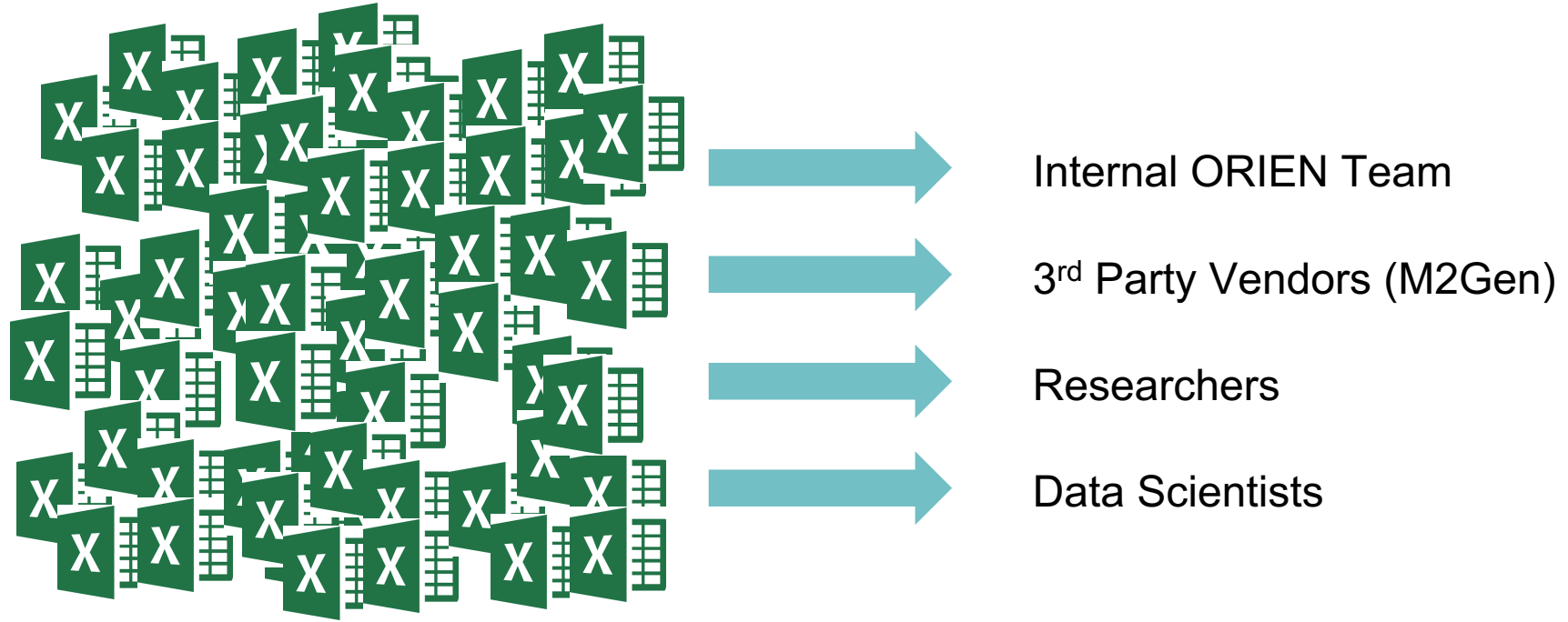
Brokering the data



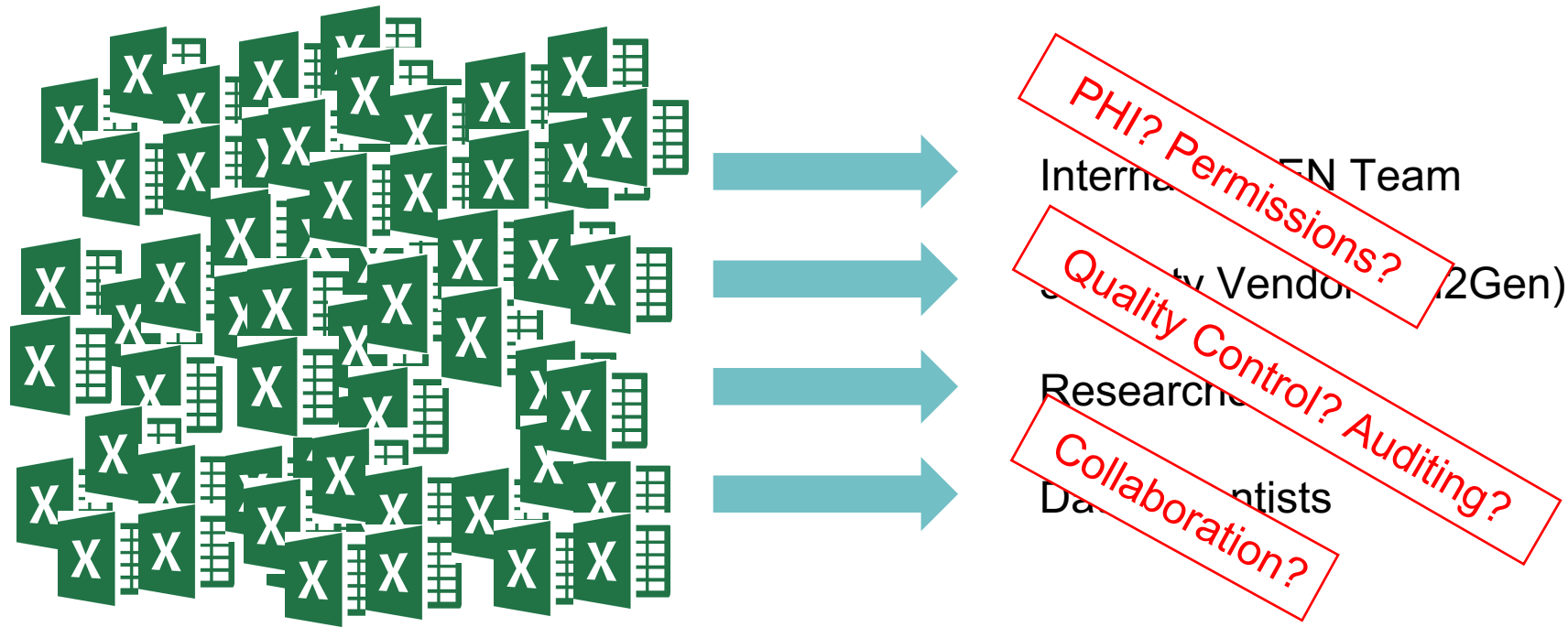
Brokering the data



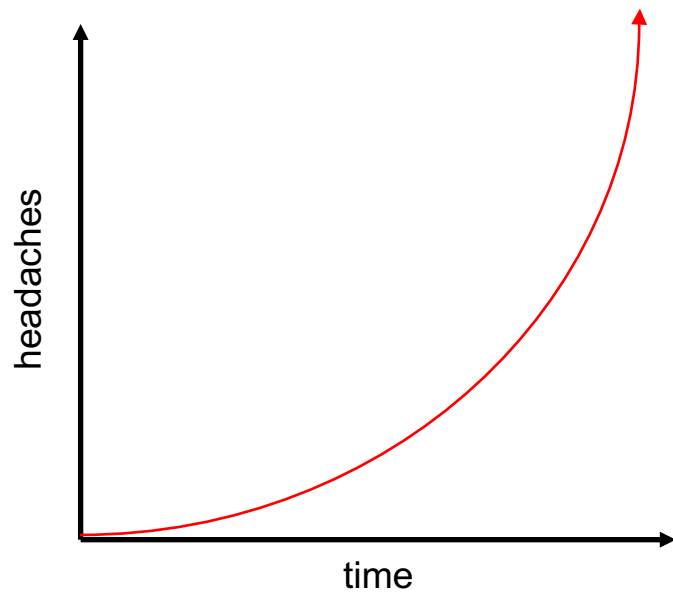
Brokering the data



Brokering the data



Struggle is real





EHR data available through the EDW



Image from Lightbeam Health Solutions

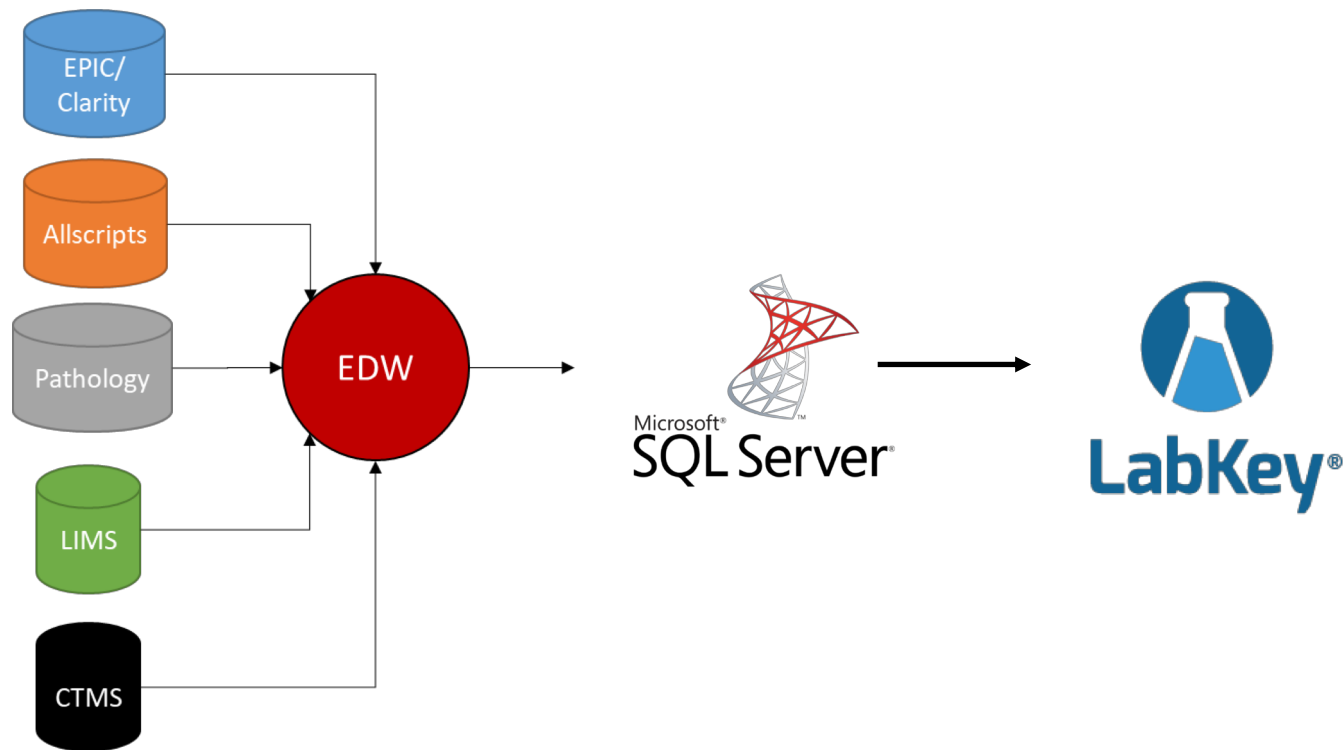
Specimen Data Elements

- Tumor Specimens (Pathology Reports)
 - Final Diagnosis
 - Gross Description
 - Type of Biopsy
 - Specimen Site of Origin
 - Primary/Metastatic
 - Tumor Content
- Normal Specimens (LIMS)
 - Patient Sample ID
 - Quantity
 - Collection Time
 - Sub Sample Type

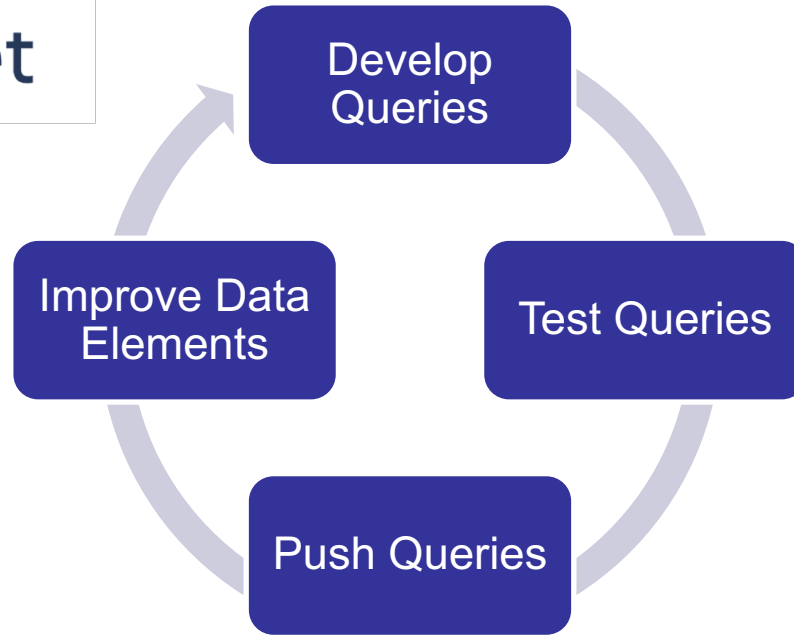
Clinical Data Elements

- Demographics
 - Gender, Ethnicity, Race
 - Date of First Contact
 - Date of Diagnosis
 - Primary Site of Diagnosis
 - Histology
- Clinical Staging
 - cT, cN, cM Stage
- Pathological Staging
 - pT, pN, pM Stage
 - Performance Status at Diagnosis
 - Most Recent Performance Status
 - Current Disease Status
- Comorbidities
- Drug-related Toxicities >Grade 2
- Family History of Cancer
- Treatment
 - Surgery/Biopsy History
 - Current Status on a Clinical Trial
- Treatment Medications
 - Immunotherapy
 - Anti-neoplastic
 - Hormone
 - Radiation
- Imaging
- Tumor Markers
- Vital Status

Integrate/Access the EDW for Data



Query Development






Query Development (cont.)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Variable / Field Name	Field Label	From Query?	QC Status	Description	Comments	Example Value	CancerRegistry	Alscripts	EPIC	Beaker (EPIC)	CoPath	EDMA	MIDAS
1														
2	variable_tcc_id	TCC ID	1	1	M									1
3	initial_1_avatar_id	Avatar Patient ID	1	1	O									
4	initial_1_abstractor	Abstracted By:	1	1	O									
5	initial_1_abstr_date	Date of Abstraction:	1	1	O									
6	initial_1_gender	Gender	1	1	AE			1	1					
7	initial_1_ethnicity	Ethnicity	1	1	AE			1	1					
8	initial_1_race	Race	1	1	E				1					
9	initial_1_date_contact	Date of First Contact	0	0	C			1			1	1	1	
		Date of First Contact Flag for Partial or												
10	initial_1_cntct_date_flag_1	Unknown	0	0	C			1			1	1	1	
11	initial_1_dx_date	Date of Diagnosis	1	2	AE				1	1				
		Date of Diagnosis Flag for Partial or												
12	initial_1_dx_date_flag_1	Unknown	1	2	AE				1	1				
		Was the Patient Diagnosed Within the												
13	initial_1_dx_6mo	Last Six Months?	1	2	AE				1	1				
14	initial_1_dx_site	Primary Site of Diagnosis	1	2	AEC			1	1	1	1	1	1	
15	initial_1_dx_site_txt	Details for Primary Site of Diagnosis	1	2	AE				1	1				
16	initial_1_histo	Histology	1	1	C			1			1	1	1	
17	initial_1_histo_txt	Details for Histology	1	1	C			1			1	1	1	
18	initial_1_ct_stage	cT Stage	1	2	C			1		1	1	1	1	
19	initial_1_cn_stage	cN Stage	1	2	C			1		1	1	1	1	
20	initial_1_cm_stage	cM Stage	1	2	C			1		1	1	1	1	
21	initial_1_cgroup_stage	Clinical Group Stage	1	2	C			1		1	1	1	1	
22	initial_1_pt_stage	pT Stage	1	2	C			1		1	1	1	1	
23	initial_1_pn_stage	pN Stage	1	2	C			1		1	1	1	1	
24	initial_1_pm_stage	pM Stage	1	2	C			1		1	1	1	1	
25	initial_1_pgroup_stage	Pathological Group Stage	1	2	C			1		1	1	1	1	
26	initial_1_stage_edition	TNM Edition Number	1	2	C			1		1	1	1	1	
27	initial_1_stg_type	Other Staging System/Type - Specify	0	0										
28	initial_1_stg_value	Other Staging/Grade Value - Specify	0	0										








Patient Identification



Dataset: Demographics, All Visits Operations (PRD)


 OnCore™ 



This section will capture basic patient information for the identified specimens.

      [Manage](#) [Groups](#) [View Specimens](#) 

1 - 100 of 7,060  

 default This grid view has been modified. [Revert](#) [Edit](#) [Save](#)

<input type="checkbox"/>	Patient ID	TCCID	Protocol Consent Date (Start Date)	RPN	Vital Status	Patient's Specimen Status	Consented?	EDW Add Change
<input type="checkbox"/>	*****		2017-02-23 00:00	259211	Alive		1	2018-07-17 00:02
<input type="checkbox"/>	*****		2018-07-12 00:00	259381	Alive		1	2018-07-17 00:02
<input type="checkbox"/>	*****		2017-01-17 00:00	259591	Alive	Not Yet Reviewed	1	2018-07-17 00:02
<input type="checkbox"/>	*****		2017-08-08 00:00	260118	Alive	Not Yet Reviewed	1	2018-07-17 00:02
<input type="checkbox"/>	*****		2018-06-06 00:00	260152	Alive		1	2018-07-17 00:02
<input type="checkbox"/>	*****		2016-09-21 00:00	260331	Alive		1	2018-07-17 00:02
<input type="checkbox"/>	*****		2017-02-27 00:00	260560	Alive	Not Yet Reviewed	1	2018-07-17 00:02
<input type="checkbox"/>	*****		2018-01-26 00:00	260566	Alive		1	2018-07-17 00:02
<input type="checkbox"/>	*****		2017-06-30 00:00	260689	Alive		1	2018-07-17 00:02
<input type="checkbox"/>	*****		2017-01-23 00:00	260830	Alive		1	2018-07-17 00:02
<input type="checkbox"/>	*****		2017-01-13 00:00	261000	Alive	Not Yet Reviewed	1	2018-07-17 00:02

Specimen Identification and Shipment

Tumor Specimens Operations (PRD)

1 - 100 of 25,136

Clean Pathology View (VL) This grid view has been modified. Revert Edit Save

	Patient ID	Date	Review State	Specimen Class	Specimen Number	Final Diagnosis	Gross Description
						<p>BREAST, RIGHT, PROPHYLACTIC MASTECTOMY (A):</p> <ul style="list-style-type: none"> - BENIGN BREAST TISSUE - NO EVIDENCE OF MALIGNANCY <p>BREAST, LEFT, PROPHYLACTIC MASTECTOMY (B):</p> <ul style="list-style-type: none"> - BENIGN BREAST TISSUE - NO EVIDENCE OF MALIGNANCY 	<p>A. RIGHT BREAST: Specimen labeled with the patient's name, designated 'right breast', received fresh and subsequently fixed in formalin is a 926-gram, oriented mastectomy. A double stitch indicates the superior margin, and a single stitch indicates the lateral margin. The specimen is 14.0 cm. from lateral to medial, 16.0 cm. from superior to inferior, 6.5 cm. average thickness from superficial to deep. There is an overlying, 10.5 x 6.5 cm., tan, wrinkled skin, with a 1.2 cm. in diameter and 1.0 cm. in thickness central nipple. The specimen is inked as follows: The deep margin is inked black. On sectioning, the cut surfaces consist of 80% tan-yellow lobular adipose tissue and 20% white dense fibrous tissue. Representative sections.</p> <p>CASSETTE SUMMARY:</p> <p>A1) Upper outer quadrant, peripheral - 1. A2) Upper outer quadrant, central - 1. A3) Lower outer quadrant, peripheral - 1. A4) Lower outer quadrant, central - 1. A5) Upper inner quadrant, peripheral - 1. A6) Upper inner quadrant, central - 1. A7) Lower inner quadrant, peripheral - 1. A8) Lower inner quadrant, central - 1. A9) Nipple and areolar skin - 1.</p> <p>The specimen collection time is 10:56 a.m., received in Pathology at 11:09 a.m., and placed in formalin at 11:15 a.m.</p> <p>Time to fixation: 19 minutes Time in formalin: Approximately 37 hours</p> <p>B. LEFT BREAST: Specimen labeled with the patient's name, designated 'left breast', received fresh and subsequently fixed in formalin is a 696-gram mastectomy specimen. A double stitch indicates the superior margin, and a single stitch indicates the lateral margin. The specimen is 13.5 cm. from lateral to medial, 14.5 cm. from superior to inferior, and 6.5 cm. from superficial to deep. Overlying the breast is an 8.5 x 6.5 cm., tan, wrinkled skin, with a 1.5 cm. in diameter and 1.0 cm. in thickness central nipple. The specimen is inked as follows: The deep aspect is inked black. The specimen is serially sectioned from lateral to medial. On sectioning, the cut surfaces consist of 80% of tan-yellow, lobular, adipose tissue, and 20% white, dense, fibrous tissue. Grossly, no mass-forming lesion is identified.</p> <p>Representative sections.</p> <p>CASSETTE SUMMARY:</p> <p>B1) Upper outer quadrant, peripheral - 1. B2) Upper outer quadrant, central - 1. B3) Lower outer quadrant, peripheral - 1. B4) Lower outer quadrant, central - 1. B5) Upper inner quadrant, peripheral - 1. B6) Upper inner quadrant, central - 1. B7) Lower inner quadrant, peripheral - 1. B8) Lower inner quadrant, central - 1. B9) Nipple and areolar skin - 1.</p> <p>The specimen collection time is 10:56 a.m., received in Pathology at 11:09 a.m., and placed in formalin at 11:20 a.m.</p> <p>Time to fixation: 24 minutes Time in formalin: Approximately 37 hours</p> <p>Examination of histologic sections was performed and contributed to the final diagnosis.</p>

Epic



LabKey®



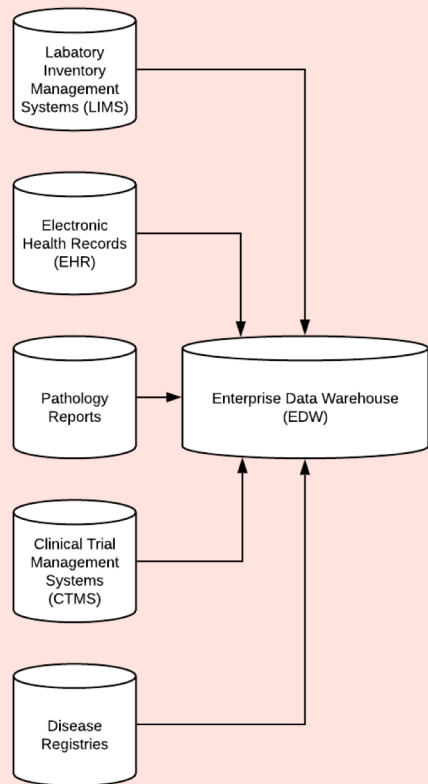
City of Hope®

Clinical Data Manual Abstraction

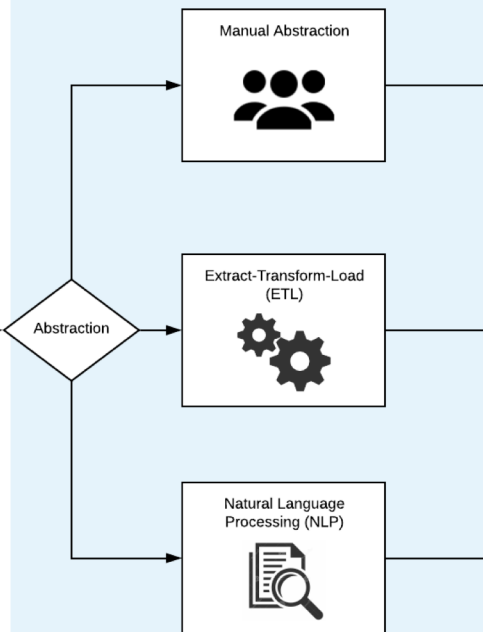
<div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <div> <div>Manage</div> <div>Groups</div> <div>View Specimens</div> </div> </div>																
Participant ID	Date	Intvl 1 Weight	Intvl 1 Phys Date Flag	Intvl 1 Bmi	Intvl 1 Smoke	Intvl 1 Alcohol	Intvl 1 Md Hx	Intvl 1 Phys Date	Intvl 1 Height	1 Aids	1 Op	1 Skin Ca	Anemia	1 Cva	In H	
	2017-12-01	93.44		27.94	2	2	2	2017-12-01 00:00	182.88							
	2018-01-29	60.1		22.9	3	999	2	2018-01-29 00:00	160							
	2019-01-22	63.3		23.5	3	999	2	2019-01-22 00:00	164							
	2019-01-08	82.1		28.24	3	999	2	2019-01-08 00:00	170.5							
	2018-08-09	82.5		32.22	2	999	2	2018-08-09 00:00	160							
	2017-07-25	75.2		27.6	3	999	2	2017-07-25 00:00	166							
	2019-01-08	69.7		30.01	2	999	2	2019-01-08 00:00	152.4							
	2017-08-05	89.5		40	3	3	2	2017-08-05 00:00	149.5							
	2018-05-03	80.8		27.31	3	2	2	2018-05-03 00:00	177.8							
	2019-01-03	98.9		28.6	3	3	2	2019-01-03 00:00	185.9							
	2019-01-16	98.2		31	2	2	2	2019-01-16 00:00	178							



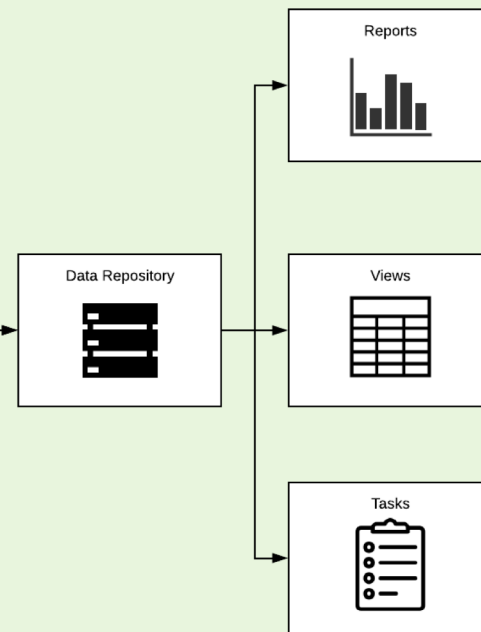
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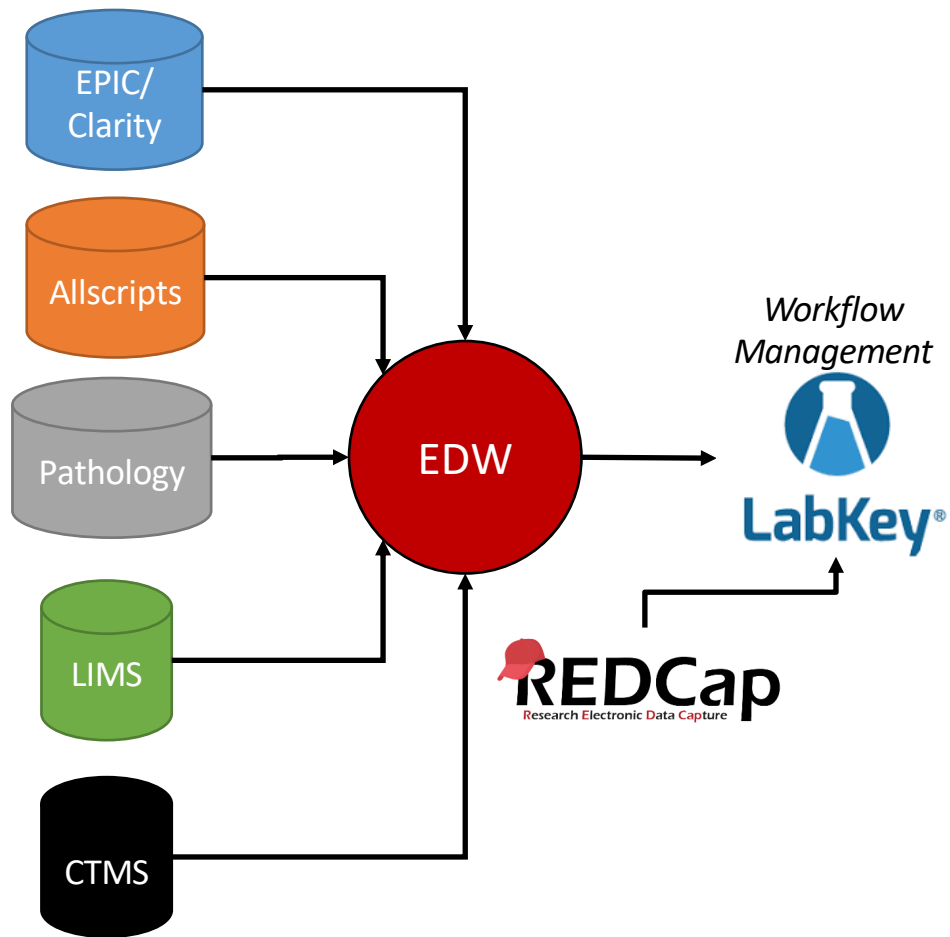


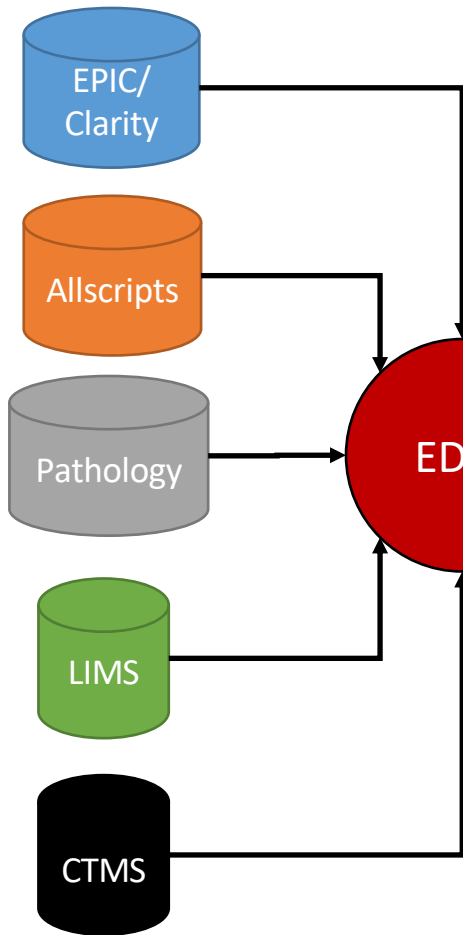
LabKey Data Curation



LabKey Workflows

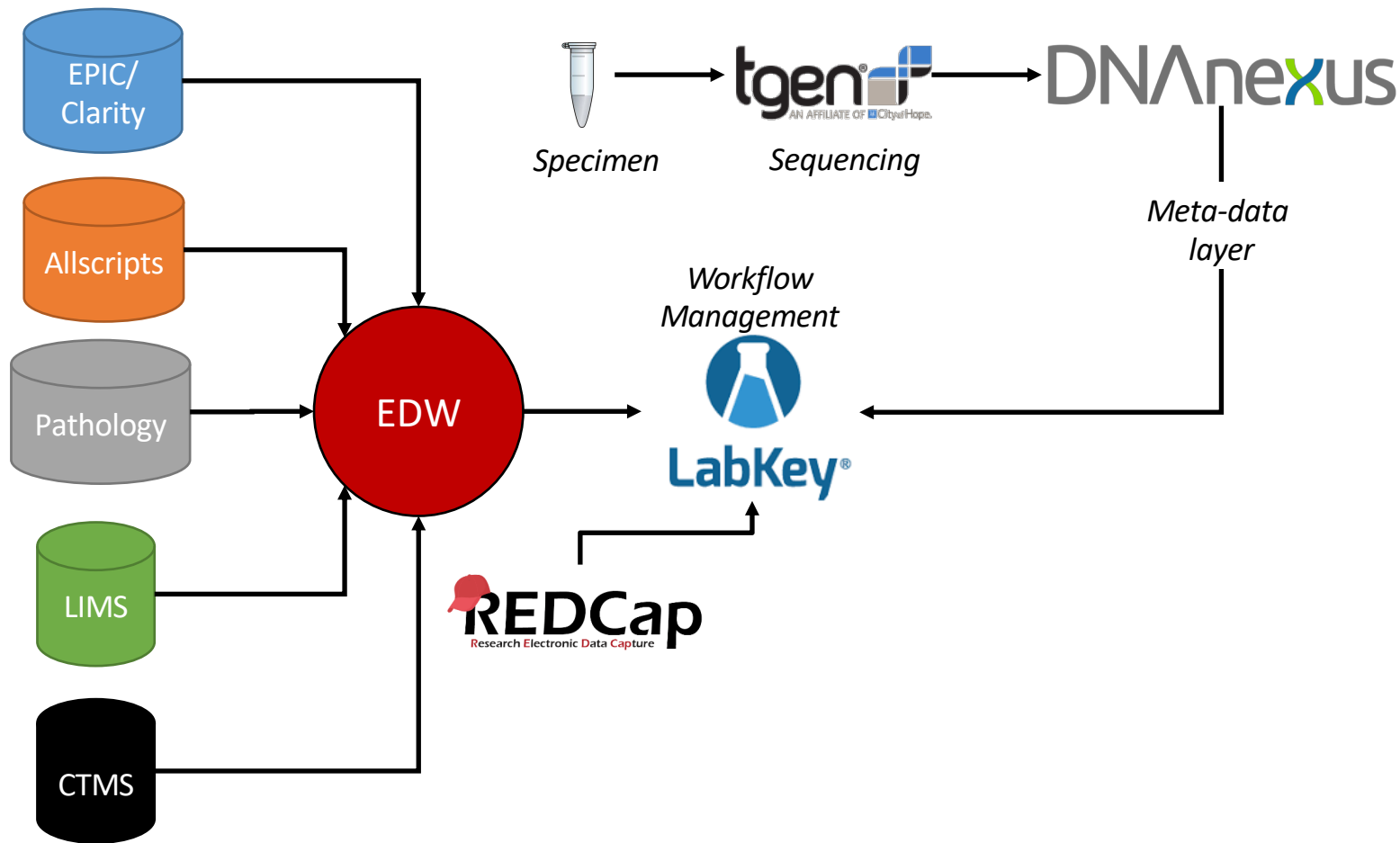


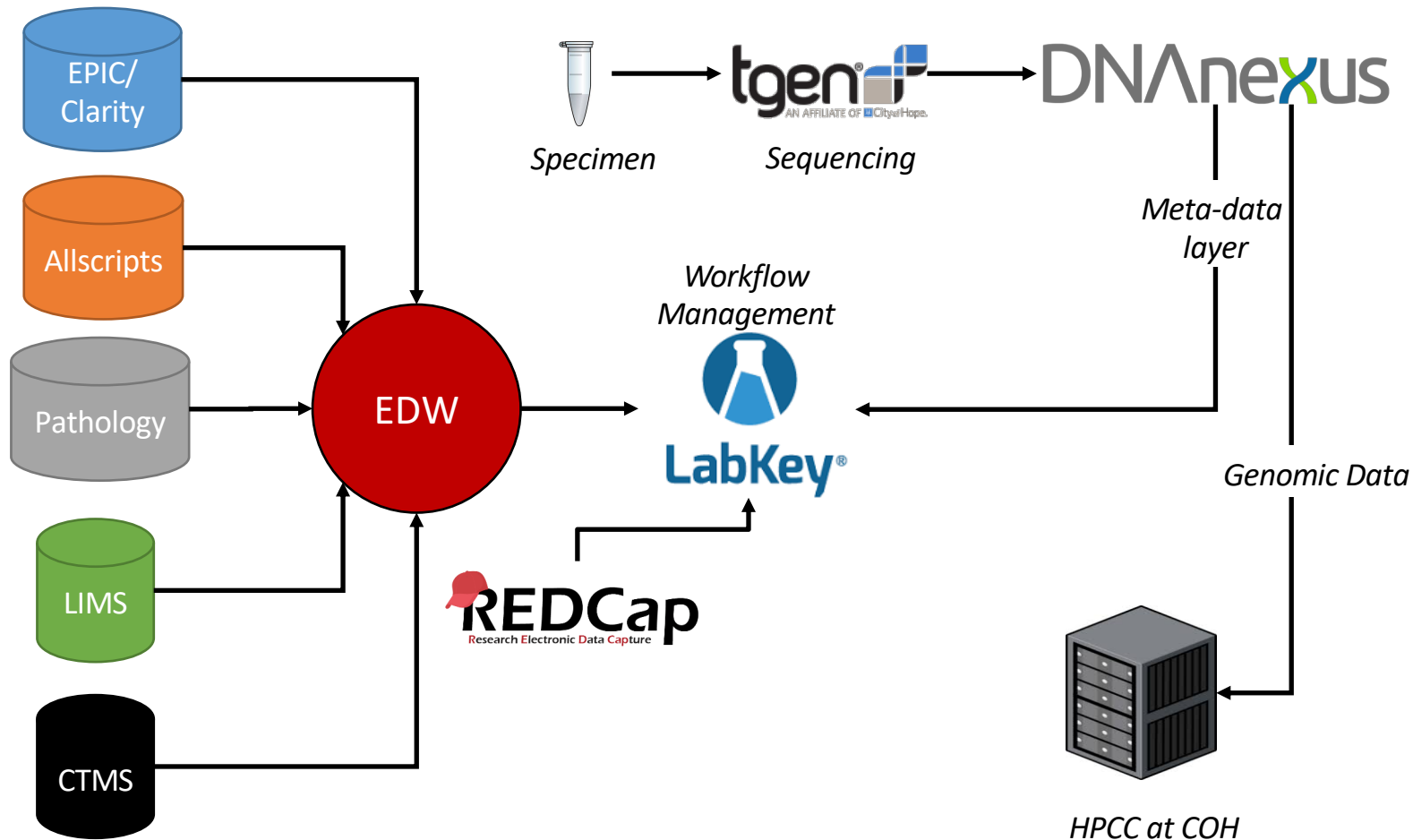


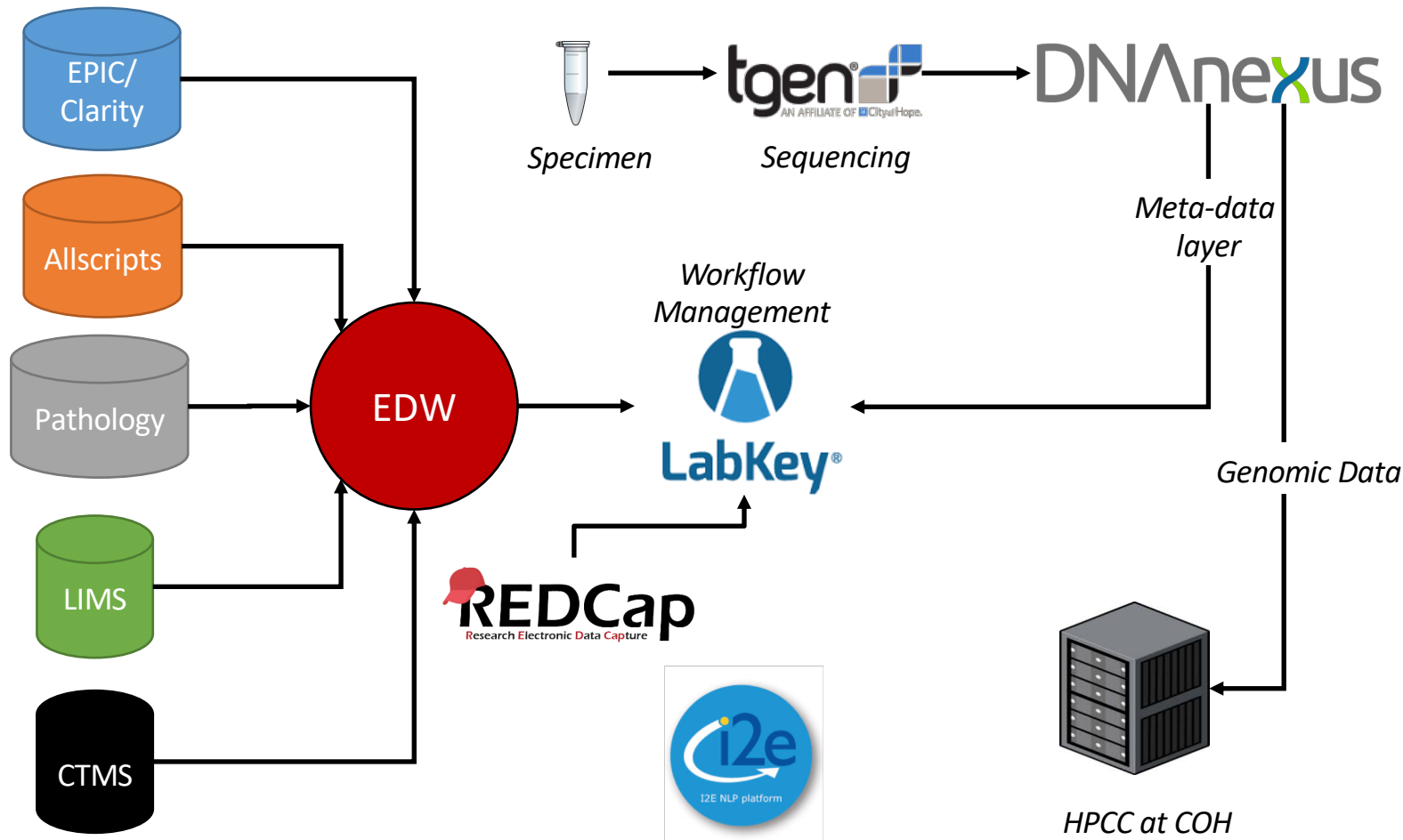


Workflow
Management











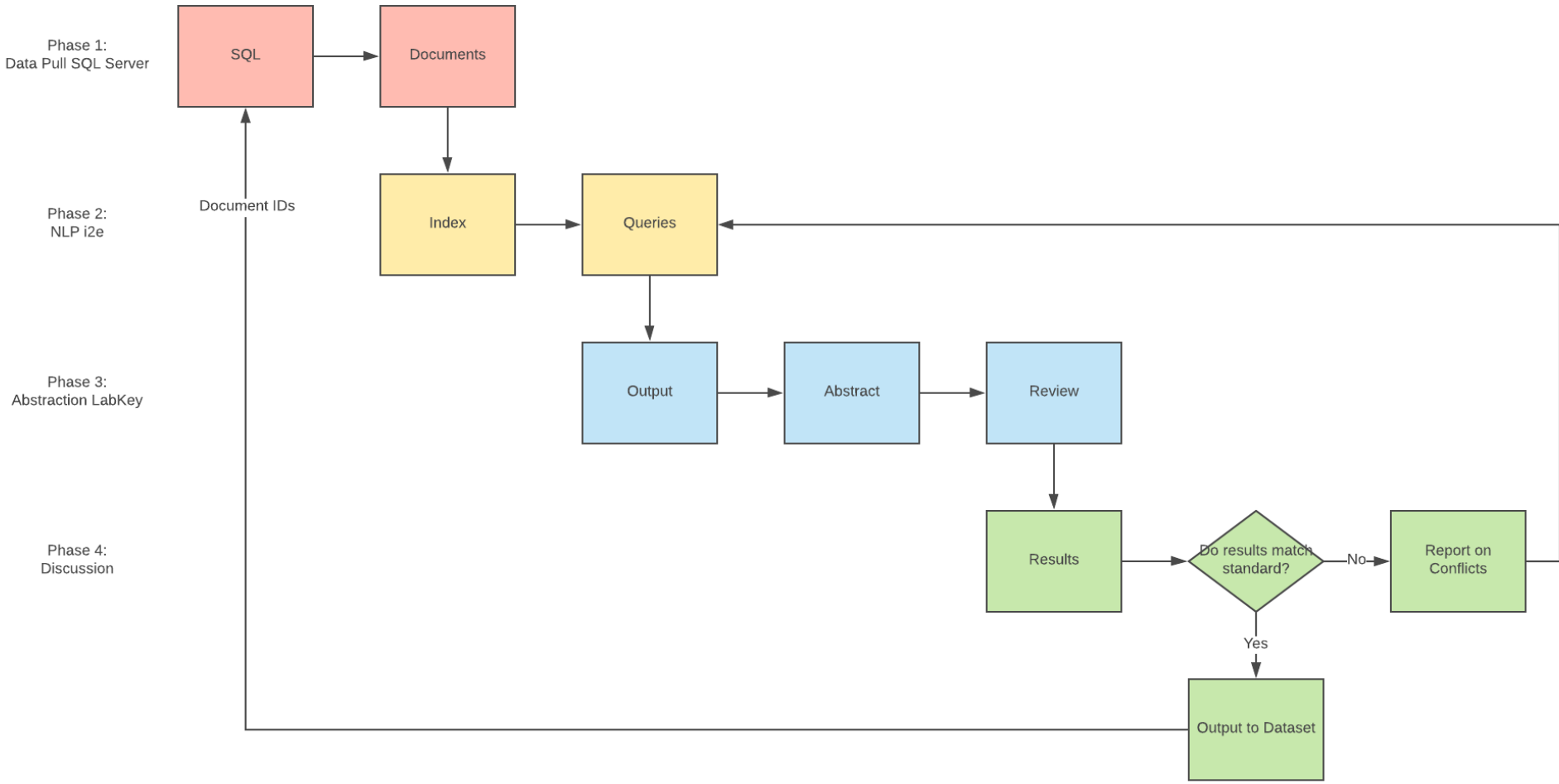
Natural Language Processing

NLP Demo NLP Demo

Pathology Report - 238 (Copy of PathReports_Demo (002).xlsx)

Batch 19

Field Results			Frozen Section Diagnosis	
Excel TNM_STAGE_MULTI			0	
Specimen A			Final Diagnosis	
Participant ID:	585514	1	RIGHT KIDNEY, NEPHRECTOMY: - Renal Cell Carcinoma, Clear Cell Type, Fuhrman grade 2, measuring 3.7 x 3.6 x 3.2 cm. - Tumor is confined to the kidney. - Margins of resection are free of tumor including ureter, vessels and soft tissue. - ign renal cysts (0.9 - 2.4 cm). - Focal chronic pyelonephritis in uninvolved parenchyma. Specimen Site: Kidney structure Procedure:	
Date:	2016-09-30 17:10:00	1	Other: simple nephrectomy Specimen ternity: Right Tumor Site:	
Location:	Final Diagnosis	1	Middle Tumor Focality: Unifocal Macroscopic Extent of Tumor: Tumor	
Stage Type:	Pathological	1	limited to kidney Histologic Type: Clear cell renal cell carcinoma Sarcomatoid	
T Stage:	T1	1	Features: Not identified Histologic Grade (Fuhrman Nuclear Grade):	
T Stage prefix:	p	1	G2: Nuclei slightly irregular, approximately 15 microns; nucleoli evident Tumor Size:	
T Stage suffix:	a	1	Greatest dimension: 3.7 cm Additional dimension: 3.6 cm	
			Additional dimension: 3.2 cm Microscopic Tumor Extension: Tumor limited to kidney Margin	
			Status: Margins uninvolved by invasive carcinoma mph-Vascular Invasion:	
			Not identified Other Tumors And/Or Tumor-Like Lesions: Cyst(s): simple Primary Tumor (pT):	
			pT1a: Tumor 4 cm or less in greatest dimension, limited to the kidney Regional mph (pN):	
			pNX: Regional lymph nodes cannot be assessed Number of regional	
			lymph nodes examined: 0 Number of regional lymph nodes positive:	
			0 Distant Metastasis (pM): Not applicable Pathologic Findings in Nonneoplastic Kidney:	
			Tubulointerstitial disease: chronic inflammation	
			Gross Description	
			A. RIGHT KIDNEY: Specimen is labeled with the patient's name "", "", medical record number "", and is designated "right kidney". Received fresh and subsequently fixed in formalin is an 835 gram, 10.4 x 5.7 x 5.2 cm right nephrectomy, which has abundant attached perinephric fibroadipose tissue ranging in thickness from 0.7 cm to 10.3 cm. Within the hilum, there is an 8.7 x 0.5 cm in length ureter with an adjacent renal vein and artery. The renal sinus fat margin is inked blue, and the perinephric soft tissue margin is inked black. On sectioning within the mid kidney, there is a 3.7 x 3.6 x 3.2 cm, well-	



Proof of Concept Done but....

Development



MOMENTUM

Development

Development

The diagram consists of two large colored squares: a blue square on the left and a red square on the right. A yellow arrow points from the blue square to the red square. The word 'MOMENTUM' is written in bold black letters across the yellow arrow. The word 'Development' is written in black text inside the blue square, and 'Proof of Concept' is written in black text inside the red square.

MOMENTUM

Development

Proof of Concept

Development



The diagram consists of two large colored rectangles: a blue one on the left and a red one on the right. A yellow horizontal bar with a T-shaped end on the right side spans across both rectangles. The word 'MOMENTUM' is written in bold black letters on the yellow bar. The word 'Development' is written in black text inside the blue rectangle, and 'Proof of Concept' is written in black text inside the red rectangle.

MOMENTUM

Development

Proof of Concept

Development

MOMENTUM

Development

Proof of Concept

Production

No Man's Land

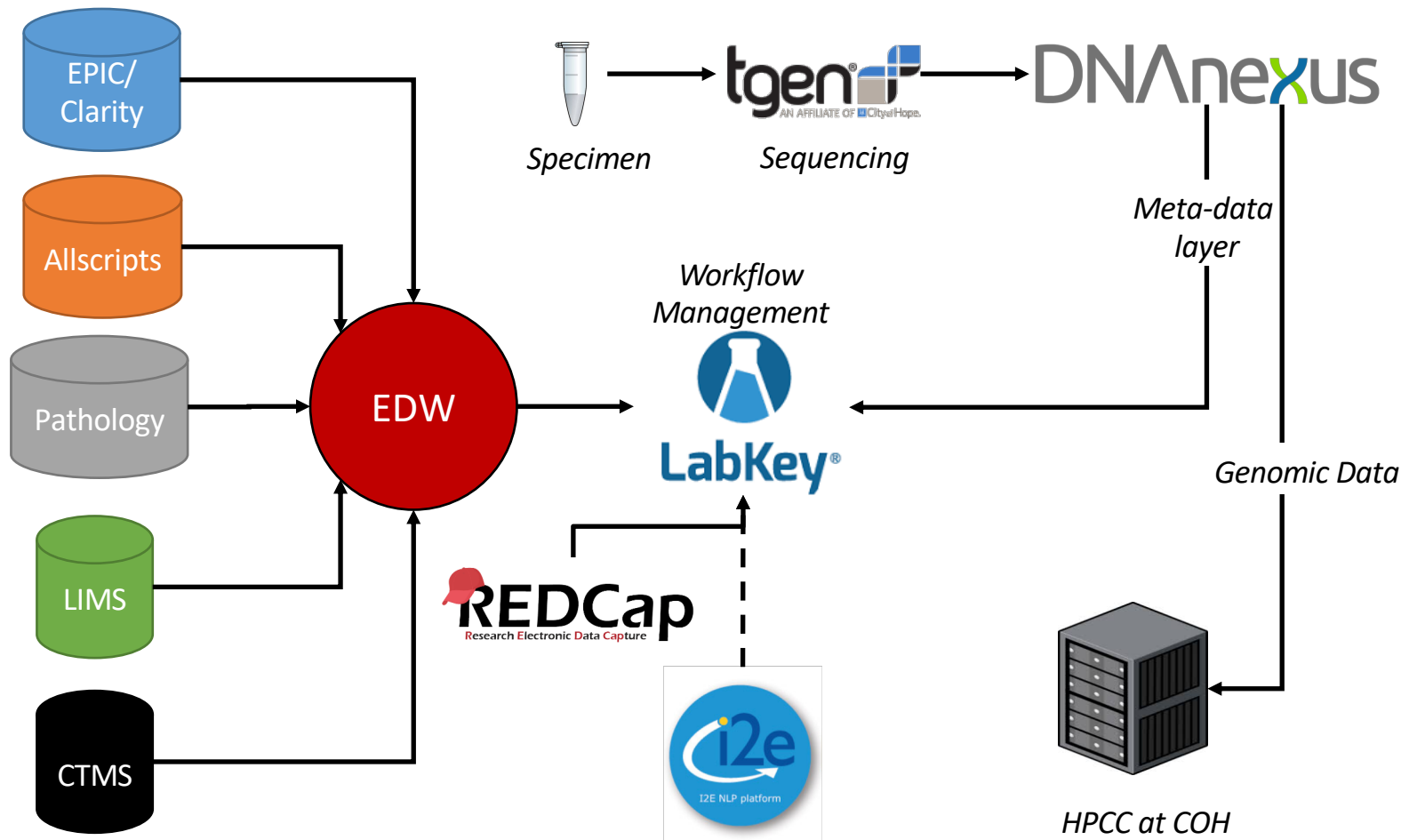
MOMENTUM

Development

POC: No Man's Land



Production



Lessons Learned & Future Plans

Lessons Learned

- Solve the data problems first
- Build opportunistically!
- Manage expectations
- Train your users

Future Plans

- User Permissions
 - Sync with IRB Access Systems, CTMS (OnCore) and DNAnexus via API
- Precision Imaging and Data Science
 - Use APIs to connect to LabKey datasets for Data Science
- Running genomic pipelines through LabKey
- Development
 - User Interface

Future Plans (Cont.)



Laboratory Inventory Management System (LIMS)



No Problem



Front Door



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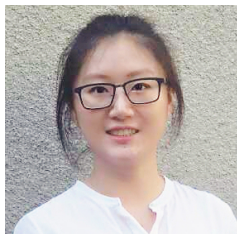
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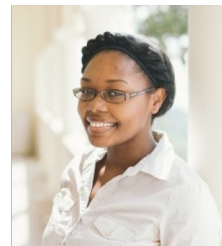
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Acknowledgements

Leadership

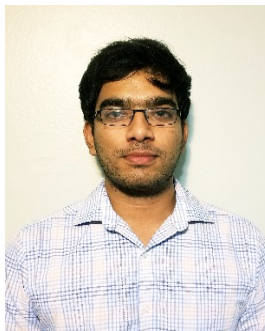
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Thank you! Questions?

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