Interoperability MATTERS

an initiative of The Sequoia Project

Data Usability Lab Tiger Team

October 12, 2023

the sequoia project

Agenda

- Welcome, Introductions, Membership, Agenda - Bill Gregg, MD – 5 minutes
- Overview of Future Efforts Bill Gregg, MD & Adam Davis, MD (regrets) – 10 min
- Laboratory Tiger Team Proposed work items – 40 minutes
- Tiger Team Discussion & Q&A – Didi Davis, Co-chairs and Workgroup

Adam Davis, MD, Co-chair
Sutter Health

Bill Gregg, MD, Co-chair
HCA Healthcare

Didi Davis, VP
The Sequoia Project

Tiger Team Roster
38 members
32 organizations

Who is missing?

First Name	Last Name	Email	Company	Job Title
Maria	Moen	mmoen@advaultinc.com	ADVault, Inc.	SVP, Innovation & External Affairs
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Holly	Miller	hmiller@medallies.com	MedAllies, Inc.	Chief Medical Officer
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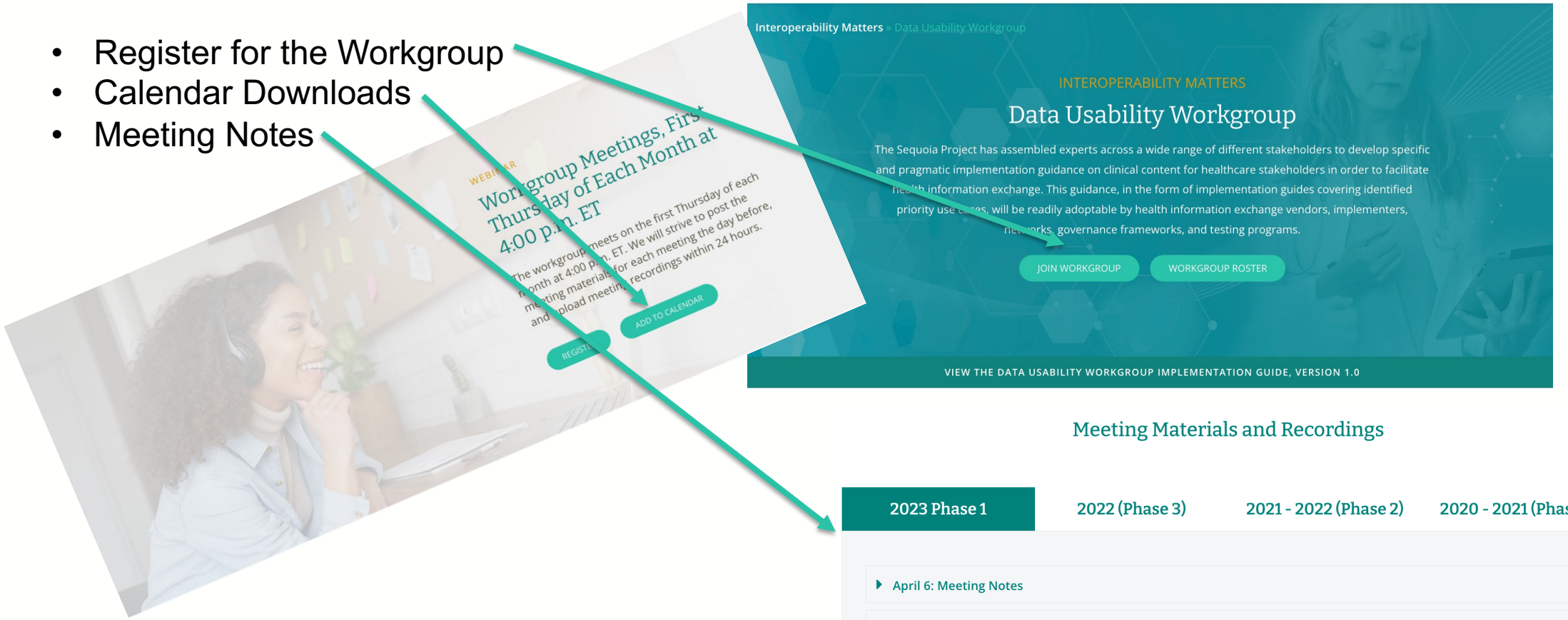
Katherine	Lusk	katherine.lusk@thsa.org	Texas Health Services Authority	
Didi	Davis	ddavis@sequoiaproject.org	The Sequoia Project	VP, Informatics, Conformance & Interoperability
Elizabeth	McElhiney	emcelhiney@verisma.com	Verisma	Director of Compliance and Government Affairs
Sandra	Mitchell	sandi.mitchell@jpsys.com	VHIE, contractor JP Systems	Data Quality
Aaron	Berdofe	aberdofe@zushealth.com	Zus Health	

Website, Meeting and Workgroup Logistics

- Register for the Workgroup
- Calendar Downloads
- Meeting Notes



https://sequoiaproject.org/interoperability-matters/data-usability-workgroup/
Interopmatters@sequoiaproject.org

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Overview of Future Lab Focused Efforts for Version 2.0 of the Implementation Guide

2023-2024 Sequoia DUWG - Proposed Work Items

- Google Spreadsheet used for tracking
  - Anyone with the link can comment within the document
  - Contains Phase 2 IG Development – Parking lot of existing pain points
- Add FHIR guidance in addition to C-CDA – technology agnostic
- Laboratory Data Exchange
- Receiving System Guidance
- Alignment with USCDI v3

Laboratory Tiger Team Launch – October 12, 2023

- Open call for Participation to workgroup members who are Laboratory subject matter experts and consumers of lab data
  - Ordering Physicians
  - Pathologist
  - Standards Development Organizations (i.e. HL7, SHIELD, LOINC, etc.)
  - Laboratory Information Systems
  - Reference Laboratory Stakeholders
  - Hospital and Health System Users
- Expectation is that Tiger Team will meet monthly starting 10/12/23
- Purpose of the Tiger Team – work on Lab focused paint points to advance sending and receiving system guidance to improve usability for all stakeholders

Meeting Logistics and Timeline

- 2023 – 2024 Planned Schedule
  Kickoff Call: February 2, 2023
  - Ongoing calls: 1ST Thursday each month
- Next Phase of Activities - Process & Timeframe
  - Phase 1 - Administration and Prioritization
    - February 2023 – June 2023
  - Phase 2: Developing Initial Draft Guidance
    - July 2023 – July 2024
  - Phase 3: Public Comment Period/Recommended Next Steps
    - July 2024 – August 2024
  - Phase 4: Finalizing Implementation Guide and Call to Action
    - August 2024 – December 2024

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Laboratory Pain Points

Effective Use of Codes
Future Efforts

- Prioritized list of laboratory results to be shared
  - **Expand guidance for Laboratory Test Lifecycle**: JDCWG C-CDA Whitepaper section 2.5.1
  - **Interoperable Laboratory Results:** JDCWG C-CDA Whitepaper section 2.5.2
  - Consider transmission of **results from a Laboratory to a Public Health Agency**
  - **Investigate the differences among vendors for consumption and display of translational fields**
  - Guidance for the translation of lab result codes and nomenclature
- Guidance for codes in discrete data elements
- Guidance will **go beyond content exchanged for HL7 C-CDA to include HL7 v2.x and HL7 FHIR**
- Create guidance for various use cases: **Descriptions/codes for document/data types to filter** (i.e., Lab Data to allow indexing or filtering by date)
- **Investigate consumption and display of translation fields across vendors**

Effective Use of Codes

Scenario

- Code and the specificity/granularity must be standardized within the exchange process. The source and the receiver may maintain data at different specificity levels and need to eliminate the confusion. An example is laterality within the code yet across health care organizations, there are diverse configuration strategies.

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Standardizing Laboratory Result Display in C-CDA

Presented by:

Texas Health Services Authority (THSA)

Texas Health Services Authority Interoperability Collaborative is multi-disciplinary, vendor agnostic supporting safe-secure electronic exchange of clinical data. The Collaborative serves to address challenges with timely, trusted data exchange across multiple public and private healthcare venues, public health, and vendor platforms. The goal is to assure that clinical information travels with an individual, is trusted and efficiently available to a clinician.

C-CDA Standardization

Problem:

Inconsistent CCDA content is impacting transitions of care in the Texas community.

- Although C-CDA was implemented to make data transfer between various EMR/EHR easier, that is not always the case. C-CDA data received by the clinical community is inconsistent creating frustration with the community and lack of trust in the data received.
- Clinicians have vocalized that data transfer between different EMR / EHR vendors and organizations is inconsistent. When sending patient information from one group to another, fax or printed papers are still used.
- Even if the electronic method of the transfer is used, topics/parts that are filled may differ between organizations.
- There are policy requirements for C-CDA and transitions of care but the application is inconsistent across the ecosystem as such not optimally supporting transitions of care between various healthcare providers.

The final goal of this project is to recommend clinical content to be included in the C-CDA that can be implemented as a standard throughout Texas.

This project aims to identify and suggest a modification to various parts of the C-CDA that will benefit transitions of care.

We are also targeting to pick components of C-CDA that can be made standard so that there is parity between all the patient data transferred between varied health care organizations.

Summary

- Clinicians should view laboratory results in a standardized manner for optimal clinical communication. Laboratory test results received from external sources are inconsistent by EHR vendor. This inconsistency leads to patient safety concerns, data distrust and clinician dissatisfaction.
- EHR vendors should send laboratory results to external organizations in a standard format based on core test with components organized consistent with the manner that laboratory result components are organized internal to the resulting EHR.
- A consistent, standardized view of laboratory test results supports patient safety, efficiency and clinician satisfaction.
- Direction regarding order of laboratory information in the C-CDA Implementation Guide is missing. We are proposing the order be as follows: Result lines first by order type such as microbiology or hematology and then by date / time with components of a given order listed together.

Problem

- Laboratory results received on a C-CDA are grouped inconsistently based on EHR vendor. Athena and Epic are grouped in like manner based on the components of a test i.e. all CBC components are grouped together. Cerner is sending results based on timing of results.
- This inconsistency is leading to distrust in the data, concern that critical information will be missed and requests for “faxed” results to assure appropriate clinical care. This factor is also contributing to clinician dissatisfaction with EHRs and burn-out as they search for the “needle in the hay stack – i.e. laboratory results”.
- Sending laboratory results in a consistent manner from all EHRs will assure a standardized view of laboratory results in a logical clinical grouping regardless of EHR vendor. Creating a safer environment for transitions of care and removing a digital health equity component that is based on vendor.
- The cost would be a one-time cost for each vendor to implement. However, it should ease the burden on integration upon receipt if all sent in a standard manner.

Feedback from Survey pertinent to Laboratory Result Display

- “Entire encounter if it can look succinct, i.e. be in a table that is easy to read”
- “Lab values should be in analyze form.”
- “Standardizing "how" things are displayed is as important as "what" the C-CDA contains.
- “Lab reporting is very slow for cultures, gram stains, sensitivities”

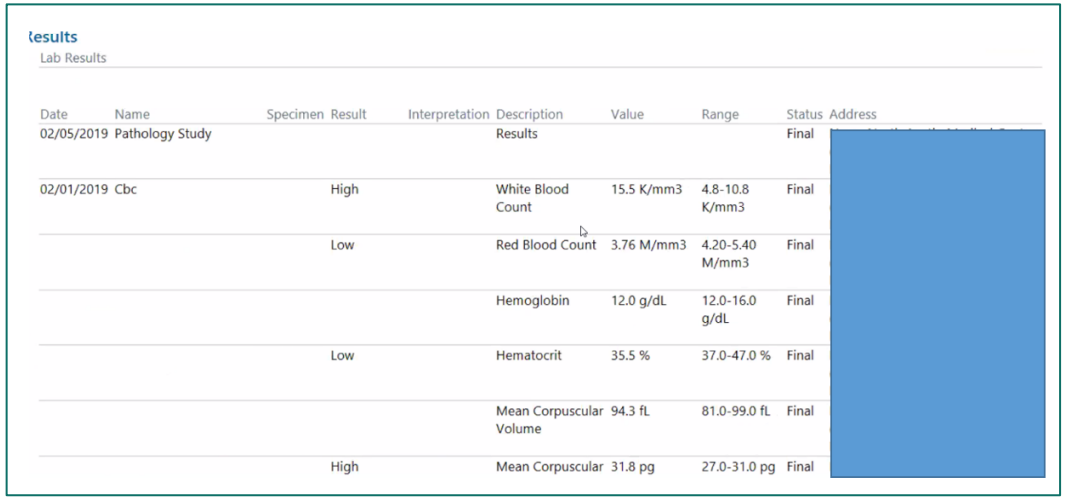
Clinical Scenario

- Clinicians viewing laboratory tests resulted in an external organization is inconsistent leading to distrust in the EHR, cognitive overload searching through data, continuing to ask for a “fax of the lab test” to minimize patient safety concerns. The laboratory results are not grouped with the order and appear to be reported as resulted.
- There are EHRs sending results in a manner consistent with how they are resulted in the organization.
- Laboratory results received from external organizations should be organized in the same manner as provided for the internal organization to standardize user consumption of data.

Examples of Laboratory Data

- Athena
- Cerner
- Epic
- Meditech

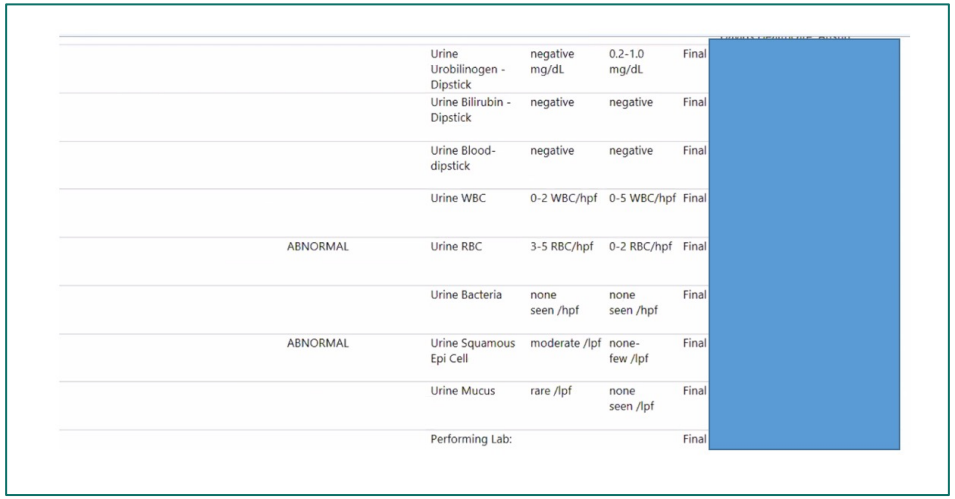
Athena Org A to Epic Org A



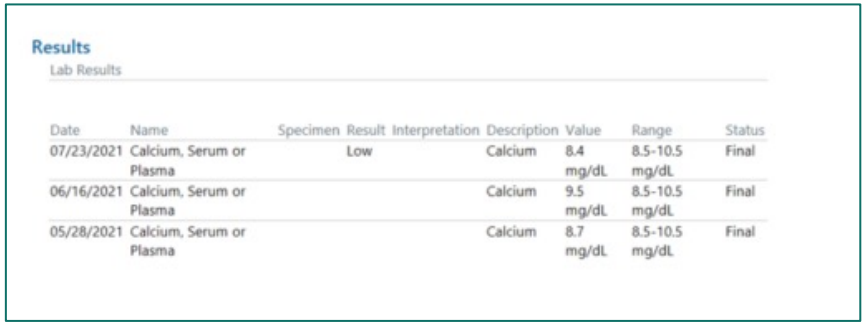
lesults

Lab Results

Date	Name	Specimen	Result	Interpretation	Description	Value	Range	Status	Address
02/05/2019	Pathology Study				Results			Final	
02/01/2019	Cbc		High		White Blood Count	15.5 K/mm3	4.8-10.8 K/mm3	Final	
			Low		Red Blood Count	3.76 M/mm3	4.20-5.40 M/mm3	Final	
					Hemoglobin	12.0 g/dL	12.0-16.0 g/dL	Final	
			Low		Hematocrit	35.5 %	37.0-47.0 %	Final	
					Mean Corpuscular Volume	94.3 fL	81.0-99.0 fL	Final	
			High		Mean Corpuscular	31.8 pg	27.0-31.0 pg	Final	



	Urine Urobilinogen - Dipstick	negative mg/dL	0.2-1.0 mg/dL	Final	
	Urine Bilirubin - Dipstick	negative	negative	Final	
	Urine Blood-dipstick	negative	negative	Final	
	Urine WBC	0-2 WBC/hpf	0-5 WBC/hpf	Final	
ABNORMAL	Urine RBC	3-5 RBC/hpf	0-2 RBC/hpf	Final	
	Urine Bacteria	none seen /hpf	none seen /hpf	Final	
ABNORMAL	Urine Squamous Epi Cell	moderate /lpf	none-few /lpf	Final	
	Urine Mucus	rare /lpf	none seen /lpf	Final	
	Performing Lab:			Final	



Results

Lab Results

Date	Name	Specimen	Result	Interpretation	Description	Value	Range	Status
07/23/2021	Calcium, Serum or Plasma		Low		Calcium	8.4 mg/dL	8.5-10.5 mg/dL	Final
06/16/2021	Calcium, Serum or Plasma				Calcium	9.5 mg/dL	8.5-10.5 mg/dL	Final
05/28/2021	Calcium, Serum or Plasma				Calcium	8.7 mg/dL	8.5-10.5 mg/dL	Final

Cerner Org A to Epic Org A

Results

Laboratory List

Name
.Auto Diff
Basic Metabolic Panel
CBC with Diff
Glomerular Filtration Rate

Most recent to oldest [Reference Range]: 1

eGFR [>=60 mL/min/1.73m2]	>60 mL/min/1.73m2 (3/20/23 8:25 AM)
Creatinine [0.5-1.2 mg/dL]	0.8 mg/dL (3/20/23 8:25 AM)
AGAP [4-12]	10 (3/20/23 8:25 AM)
Basophil Auto [<=1.0 %]	0.3 % (3/20/23 8:25 AM)
BUN [6-20 mg/dL]	14 mg/dL (3/20/23 8:25 AM)
Calcium [8.5-10.5 mg/dL]	9.0 mg/dL (3/20/23 8:25 AM)
Chloride [98-107 mmol/L]	107 mmol/L (3/20/23 8:25 AM)

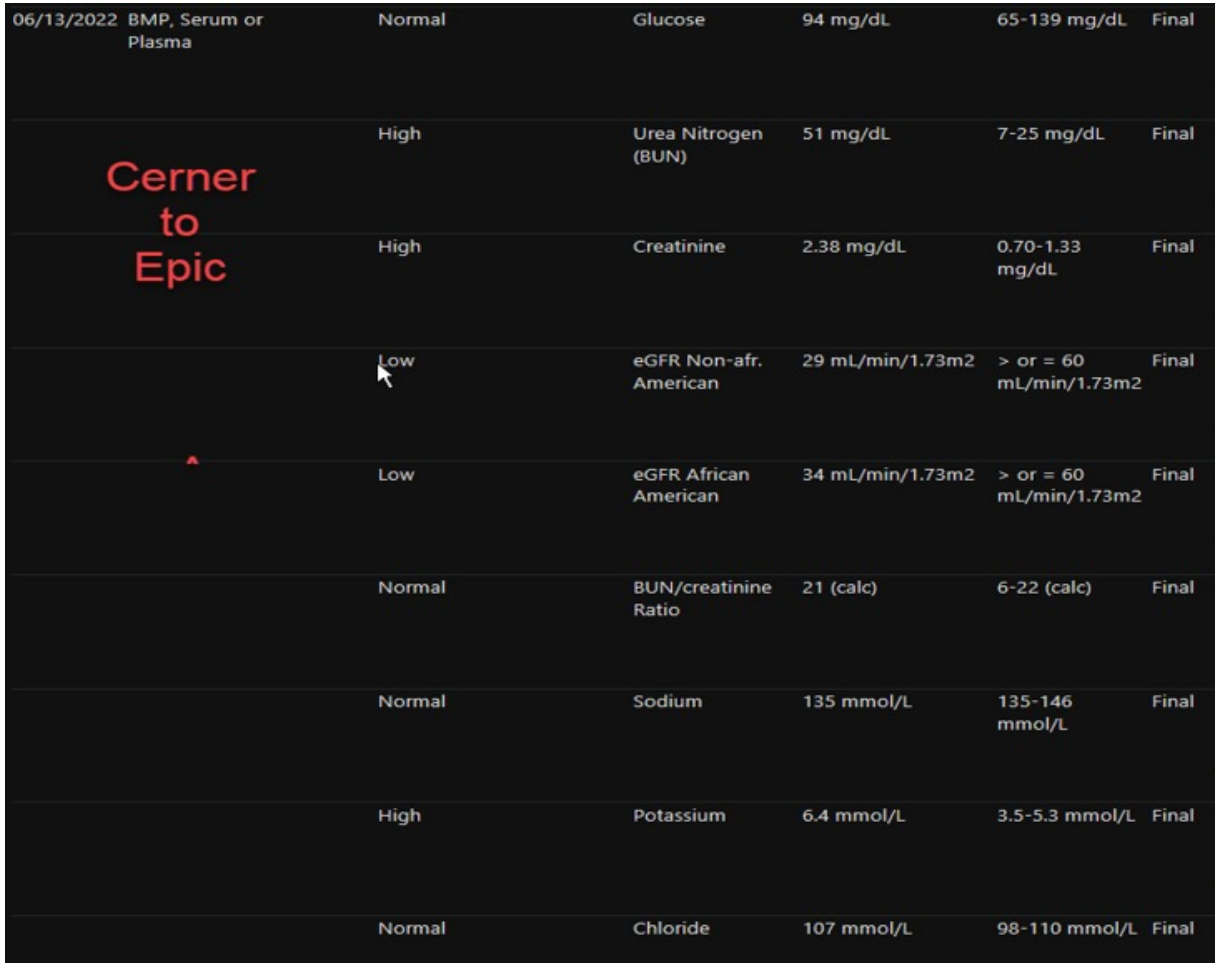
CO2 [21-31 mmol/L]	22 mmol/L (3/20/23 8:25 AM)
Eos Auto [<=4.0 %]	1.5 % (3/20/23 8:25 AM)
Glucose Level [70-110 mg/dL]	101 mg/dL (3/20/23 8:25 AM)
Sodium Level [136-145 mmol/L]	139 mmol/L (3/20/23 8:25 AM)
WBC [4.5-11.0 Thou/cu mm]	6.8 Thou/cu mm (3/20/23 8:25 AM)
Hct [37.0-47.0 %]	41.5 % (3/20/23 8:25 AM)
Hgb [12.0-16.0 g/dL]	13.9 g/dL (3/20/23 8:25 AM)
Lymph Auto [30.0-40.0 %]	22.3 % *LOW* (3/20/23 8:25 AM)
MCH [27.0-31.0 pg]	29.3 pg (3/20/23 8:25 AM)
MCHC [32.0-37.0 g/dL]	33.5 g/dL (3/20/23 8:25 AM)
MCV [81.0-99.0 fL]	87.6 fL (3/20/23 8:25 AM)
Mono Auto [<=10.0 %]	10.2 % *HI* (3/20/23 8:25 AM)
MPV [8.8-13.5 fL]	9.7 fL (3/20/23 8:25 AM)
Neutro Auto [50.0-65.0 %]	65.1 % *HI* (3/20/23 8:25 AM)
Platelet [150-450 Thou/cu mm]	334 Thou/cu mm (3/20/23 8:25 AM)
Potassium Level [3.5-5.1 mmol/L]	4.3 mmol/L (3/20/23 8:25 AM)
RBC [3.80-5.40 Mill/cu mm]	4.74 Mill/cu mm (3/20/23 8:25 AM)
RDW [11.5-14.5 %]	13.5 % (3/20/23 8:25 AM)

Abs Lymph	1.53 Thou/cu mm *NA* (3/20/23 8:25 AM)
Abs Monocyte	0.70 Thou/cu mm *NA* (3/20/23 8:25 AM)
Abs Immature Grans	0.04 Thou/cu mm *NA* (3/20/23 8:25 AM)
Immature Grans Auto	0.6 % *NA* (3/20/23 8:25 AM)
Automated Nucleated RBC's	0.0 /100 WBC *NA* (3/20/23 8:25 AM)

Glucose Level [70-110 mg/dL]	127 mg/dL *HI* (5/10/22 3:42 PM)
Sodium Level [136-145 mmol/L]	141 mmol/L (5/10/22 3:42 PM)
Total Protein [6.7-8.2 g/dL]	7.3 g/dL (5/10/22 3:42 PM)
UA pH [5.0-9.0]	6.0 (5/10/22 6:56 PM)
Specific Gravity Urine [<=1.030]	1.015 (5/10/22 6:56 PM)
WBC [4.5-11.0 Thou/cu mm]	8.4 Thou/cu mm (5/10/22 3:42 PM)
Troponin-I [<=0.04 ng/mL]	<0.01 ng/mL (5/10/22 3:42 PM)
HCO3 Ven [23.0-27.0 mmol/L]	25.1 mmol/L (5/10/22 3:44 PM)
Hct [40.0-54.0 %]	48.1 % (5/10/22 3:42 PM)
Hgb [14.0-18.0 g/dL]	16.1 g/dL (5/10/22 3:42 PM)
Lipase Level [8-78 unit(s)/L]	30 unit(s)/L (5/10/22 3:42 PM)
Lymph Auto [30.0-40.0 %]	18.3 % *LOW* (5/10/22 3:42 PM)

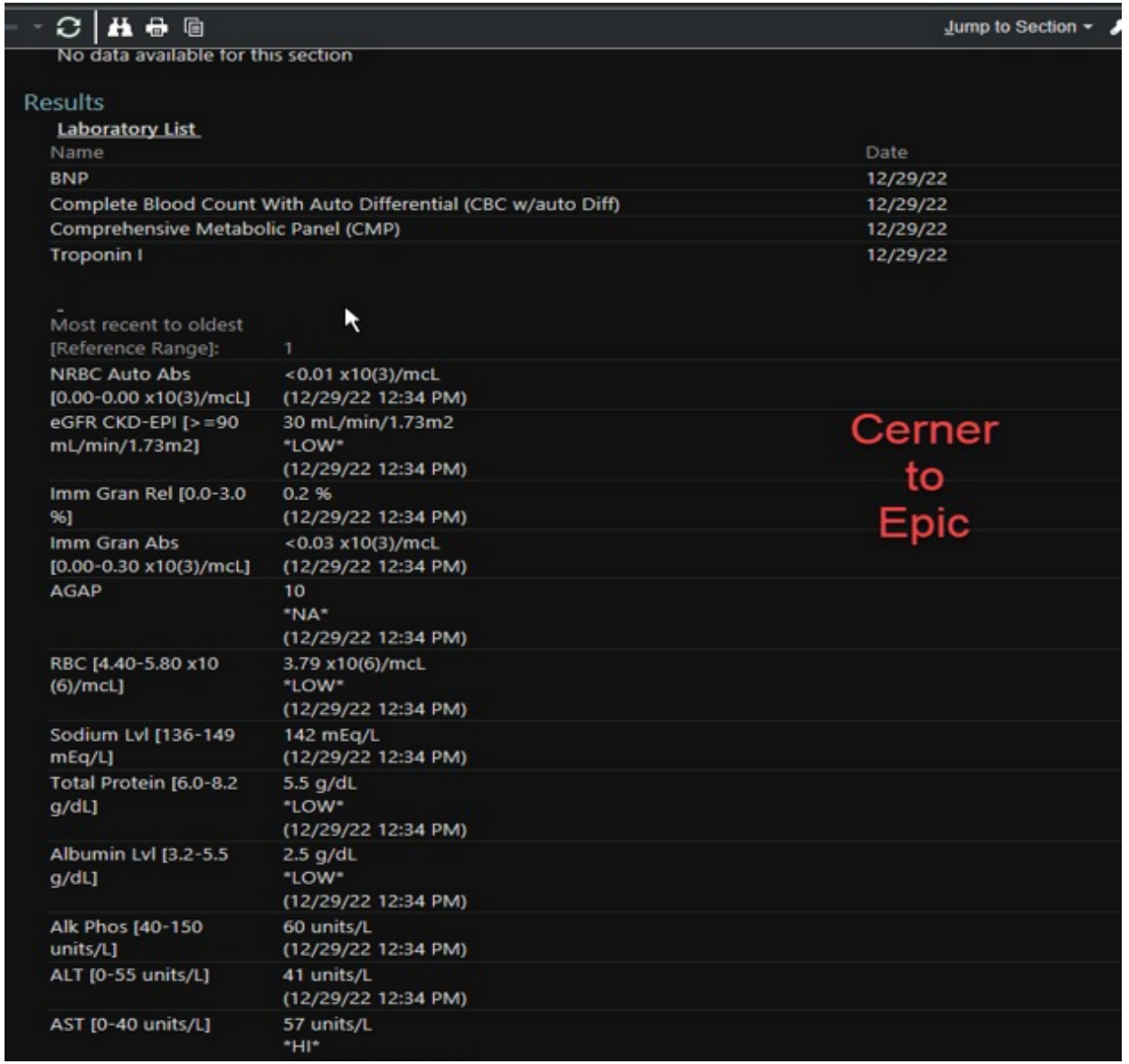
	(5/10/22 3:42 PM)
eGFR (AA) [>=60 mL/min/1.73m2]	>60 mL/min/1.73m2 (5/10/22 3:42 PM)
Abs Immature Grans	0.04 Thou/cu mm *NA* (5/10/22 3:42 PM)
Immature Grans Auto	0.5 % *NA* (5/10/22 3:42 PM)
Influenza A (rapid) [Negative]	Negative (5/10/22 3:44 PM)
Influenza B (rapid) [Negative]	Negative (5/10/22 3:44 PM)
Influenza A/B (rapid) Interp	Negative: No Influenza A or Influenza B antig A negative result does not completely rule o As recommended by the CDC, use clinical sig influenza activity in the community to decide Initiate antiviral treatment as soon as possibl progressive disease, or is being admitted to t Consider additional influenza testing if indica Consider additional diagnostic testing for oth *Unknown* (5/10/22 3:44 PM)
Service Resource	Comment [2] *NA*

Cerner Org B to Epic Org B

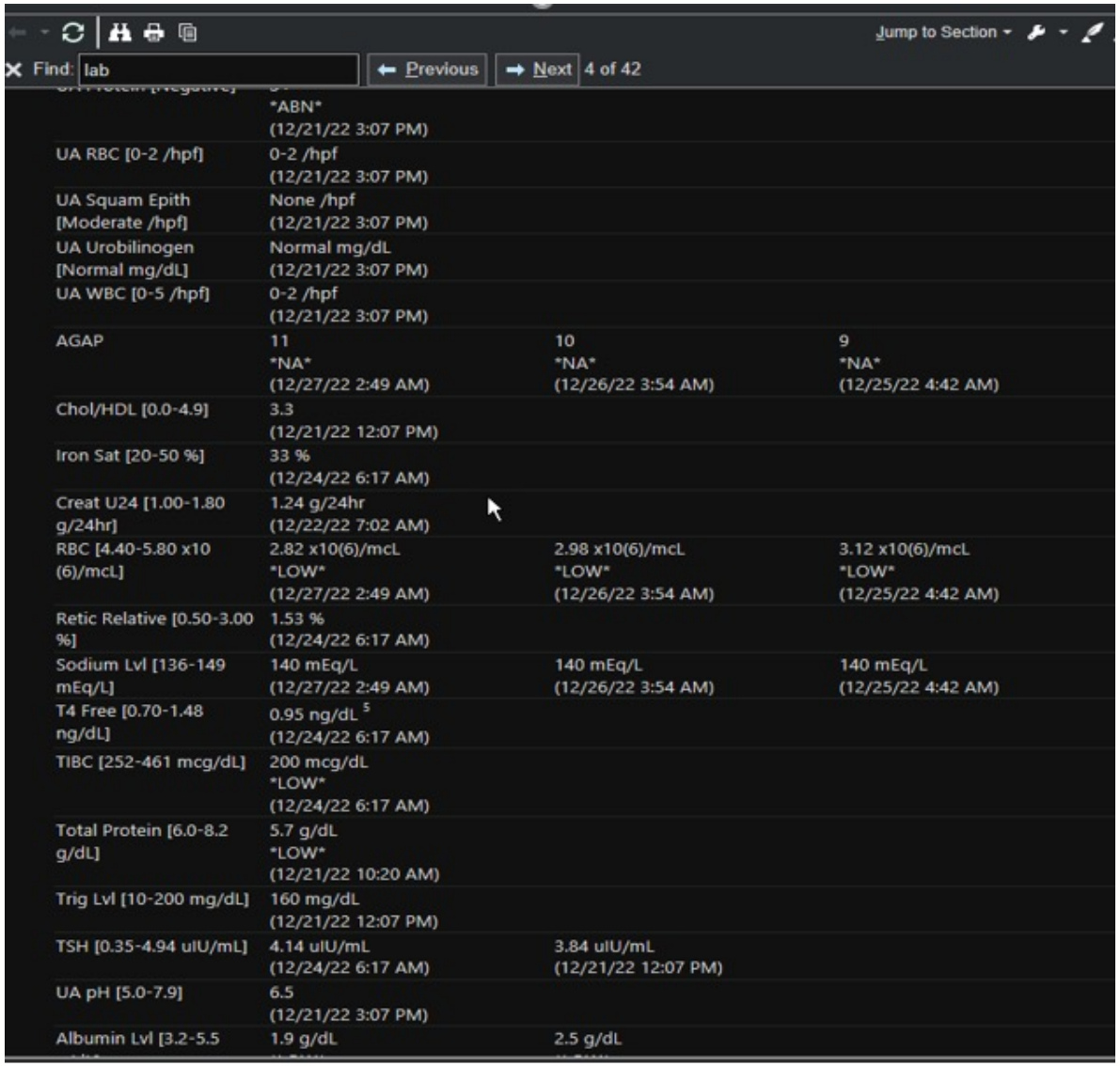


06/13/2022	BMP, Serum or Plasma	Normal	Glucose	94 mg/dL	65-139 mg/dL	Final
		High	Urea Nitrogen (BUN)	51 mg/dL	7-25 mg/dL	Final
		High	Creatinine	2.38 mg/dL	0.70-1.33 mg/dL	Final
		Low	eGFR Non-afr. American	29 mL/min/1.73m2	> or = 60 mL/min/1.73m2	Final
		Low	eGFR African American	34 mL/min/1.73m2	> or = 60 mL/min/1.73m2	Final
		Normal	BUN/creatinine Ratio	21 (calc)	6-22 (calc)	Final
		Normal	Sodium	135 mmol/L	135-146 mmol/L	Final
		High	Potassium	6.4 mmol/L	3.5-5.3 mmol/L	Final
		Normal	Chloride	107 mmol/L	98-110 mmol/L	Final

Cerner Org C to Epic Org B



Cerner Org D to Epic Org B



	ABN (12/21/22 3:07 PM)		
UA RBC [0-2 /hpf]	0-2 /hpf (12/21/22 3:07 PM)		
UA Squam Epith [Moderate /hpf]	None /hpf (12/21/22 3:07 PM)		
UA Urobilinogen [Normal mg/dL]	Normal mg/dL (12/21/22 3:07 PM)		
UA WBC [0-5 /hpf]	0-2 /hpf (12/21/22 3:07 PM)		
AGAP	11 *NA* (12/27/22 2:49 AM)	10 *NA* (12/26/22 3:54 AM)	9 *NA* (12/25/22 4:42 AM)
Chol/HDL [0.0-4.9]	3.3 (12/21/22 12:07 PM)		
Iron Sat [20-50 %]	33 % (12/24/22 6:17 AM)		
Creat U24 [1.00-1.80 g/24hr]	1.24 g/24hr (12/22/22 7:02 AM)		
RBC [4.40-5.80 x10 (6)/mcL]	2.82 x10(6)/mcL *LOW* (12/27/22 2:49 AM)	2.98 x10(6)/mcL *LOW* (12/26/22 3:54 AM)	3.12 x10(6)/mcL *LOW* (12/25/22 4:42 AM)
Retic Relative [0.50-3.00 %]	1.53 % (12/24/22 6:17 AM)		
Sodium Lvl [136-149 mEq/L]	140 mEq/L (12/27/22 2:49 AM)	140 mEq/L (12/26/22 3:54 AM)	140 mEq/L (12/25/22 4:42 AM)
T4 Free [0.70-1.48 ng/dL]	0.95 ng/dL [5] (12/24/22 6:17 AM)		
TIBC [252-461 mcg/dL]	200 mcg/dL *LOW* (12/24/22 6:17 AM)		
Total Protein [6.0-8.2 g/dL]	5.7 g/dL *LOW* (12/21/22 10:20 AM)		
Trig Lvl [10-200 mg/dL]	160 mg/dL (12/21/22 12:07 PM)		
TSH [0.35-4.94 uIU/mL]	4.14 uIU/mL (12/24/22 6:17 AM)	3.84 uIU/mL (12/21/22 12:07 PM)	
UA pH [5.0-7.9]	6.5 (12/21/22 3:07 PM)		
Albumin Lvl [3.2-5.5	1.9 g/dL	2.5 g/dL	

Outgoing Epic Org A

Results - documented in this encounter

Table of Contents for Results

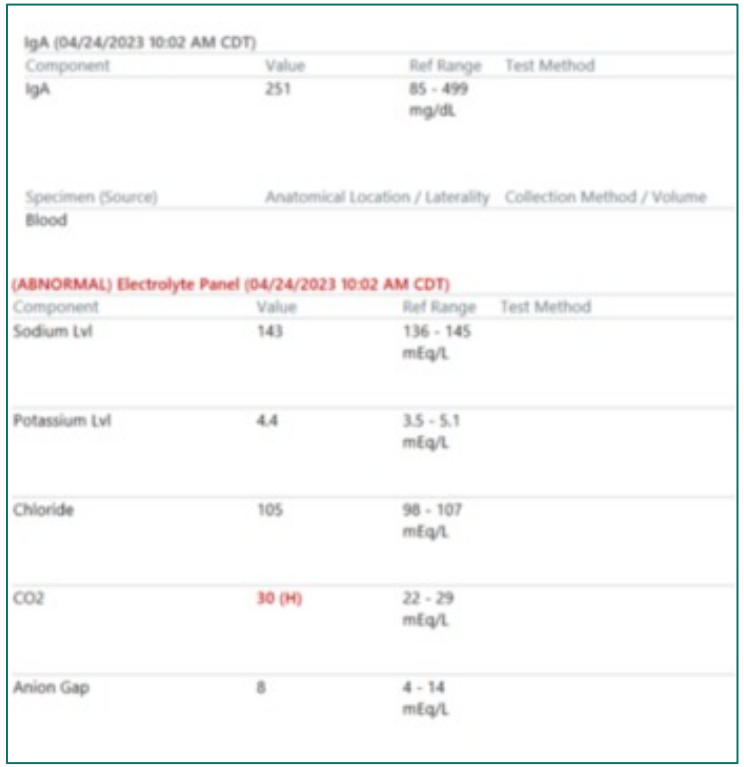
(ABNORMAL) UA WITHOUT CULTURE (ASYMPTOMATIC) (04/21/2023 9:21 AM CDT)

Component	Value	Ref Range	Test Method
Color, UA	YELLOW	Yellow	
Appearance, Fluid	CLEAR	Clear	
U/SG	<=1.005	1.005 - 1.030	
Leukocytes (#/Volume) in Urine	NEGATIVE	Negative	
Nitrite, UA	NEGATIVE	Negative	
pH	6.0	5 - 9	
Protein, Ur	NEGATIVE	Negative-Trace	
Glucose, Ur	NEGATIVE	Negative	
Ketones, Urine	NEGATIVE	Negative	
Urobilinogen, UA	0.2	0.2 - 1.0 E.U./dL	
U/Bili	NEGATIVE	Negative	
Erythrocytes, Urine	2+ (A)	Negative	
Urine Microscopic	See Below (A)		
WBC	0-2	0 - 5 /HPF	
RBC	2-5 (A)	0 - 2 /HPF	
Epi Urine	0-2 (A)	None /HPF	
Bacti Urine	Trace (A)	None	
Mucus, Urine	None	None	

METABOLIC, COMPREHENSIVE (04/07/2023 1:41 PM CDT)

Component	Value	Ref Range	Test Method
Sodium	141	135 - 145 mm/L	
Potassium	3.6	3.5 - 5.4 mm/L	
Chloride	105	96 - 109 MM/L	
ECO2	23	19 - 31 mm/L	
Glucose	86	74 - 109 mg/dL	
Comment: Nonfasting Range: 70-130 mg/dl			
BUN	11	7 - 22 mg/dL	
Creatinine Plus	0.78	0.60 - 1.40 mg/dL	
eGFR	112.83	>60.00 mL/min/1.73m^2	
Calcium	9.8	8.4 - 10.2 mg/dL	
Total Bilirubin	0.6	0.0 - 1.2 mg/dL	
ALT	22	5 - 50 U/L	
AST	20	9 - 50 U/L	
Alkaline Phosphatase	96	40 - 129 U/L	
Total Protein	7.8	6.7 - 8.8 g/dl	
Albumin	4.5	3.5 - 5.2 g/dL	
Globulin Total	3.3	2.1 - 3.8 g/dl	
A/G Ratio	1.4	0.7 - 2.3 ratio	
Anion Gap	13	8 - 16 mmol/L	
B/C Ratio	14.2	8.0 - 28.0 ratio	

Epic Org D to Epic Org A



IgA (04/24/2023 10:02 AM CDT)

Component	Value	Ref Range	Test Method
IgA	251	85 - 499 mg/dL	

Specimen (Source)	Anatomical Location / Laterality	Collection Method / Volume
Blood		

(ABNORMAL) Electrolyte Panel (04/24/2023 10:02 AM CDT)

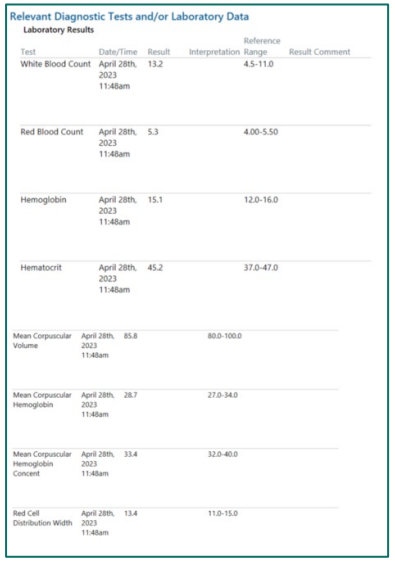
Component	Value	Ref Range	Test Method
Sodium Lvl	143	136 - 145 mEq/L	
Potassium Lvl	4.4	3.5 - 5.1 mEq/L	
Chloride	105	98 - 107 mEq/L	
CO2	30 (H)	22 - 29 mEq/L	
Anion Gap	8	4 - 14 mEq/L	

Epic Org C to Epic Org B

Component	Value	Range	Test Method	Time	Performed At
WBC	8.01	4.90 - 13.40 K/mcL	COMPLETE BLOOD COUNT	02/07/2023 10:59 AM CST	UNIVERSITY HOSPITAL LABORATORY
Neutrophils Absolute Preliminary	5.83	2.10 - 8.90 K/mcL	COMPLETE BLOOD COUNT	02/07/2023 10:59 AM CST	UNIVERSITY HOSPITAL LABORATORY
Red Blood Cell Count	4.00	3.84 - 4.92 M/mcL	COMPLETE BLOOD COUNT	02/07/2023 10:59 AM CST	UNIVERSITY HOSPITAL LABORATORY
Hemoglobin	13.1 (H)	10.2 - 12.7 g/dL	COMPLETE BLOOD COUNT	02/07/2023 10:59 AM CST	UNIVERSITY HOSPITAL LABORATORY
Hematocrit	35.9	31.2 - 37.8 %	COMPLETE BLOOD COUNT	02/07/2023 10:59 AM CST	UNIVERSITY HOSPITAL LABORATORY
MCV	89.8 (H)	71.3 - 85.0 fL	COMPLETE BLOOD COUNT	02/07/2023 10:59 AM CST	UNIVERSITY HOSPITAL LABORATORY
MCH	32.8 (H)	23.7 - 28.6 pg	COMPLETE BLOOD COUNT	02/07/2023 10:59 AM CST	UNIVERSITY HOSPITAL LABORATORY
MCHC	36.5 (H)	31.8 - 34.7 g/dL	COMPLETE BLOOD COUNT	02/07/2023 10:59 AM CST	UNIVERSITY HOSPITAL LABORATORY
RDW	14.8	12.4 - 14.9 %	COMPLETE BLOOD COUNT	02/07/2023 10:59 AM CST	UNIVERSITY HOSPITAL LABORATORY
Platelet Count	215	186 - 403 K/mcL	COMPLETE BLOOD COUNT	02/07/2023 10:59 AM CST	UNIVERSITY HOSPITAL LABORATORY
Mean Platelet Volume	9.5	8.9 - 11.0 fL	COMPLETE BLOOD COUNT	02/07/2023 10:59 AM CST	UNIVERSITY HOSPITAL LABORATORY
NRBC Percent Auto	0.0	%	COMPLETE BLOOD	02/07/2023	UNIVERSITY

Meditech Org B to Epic Org A - 5 pages of scrolling

Page 1



Relevant Diagnostic Tests and/or Laboratory Data

Laboratory Results

Test	Date/Time	Result	Interpretation	Reference Range	Result Comment
White Blood Count	April 28th, 2023 11:48am	13.2		4.5-11.0	
Red Blood Count	April 28th, 2023 11:48am	5.3		4.00-5.50	
Hemoglobin	April 28th, 2023 11:48am	15.1		12.0-16.0	
Hematocrit	April 28th, 2023 11:48am	45.2		37.0-47.0	
Mean Corpuscular Volume	April 28th, 2023 11:48am	85.8		80.0-100.0	
Mean Corpuscular Hemoglobin	April 28th, 2023 11:48am	28.7		27.0-34.0	
Mean Corpuscular Hemoglobin Concent	April 28th, 2023 11:48am	33.4		32.0-40.0	
Red Cell Distribution Width	April 28th, 2023 11:48am	13.4		11.0-15.0	

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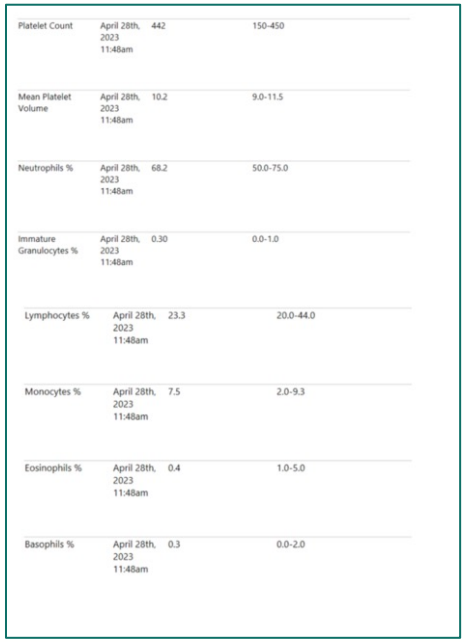

Platelet Count	April 28th, 2023 11:48am	442	150-450
Mean Platelet Volume	April 28th, 2023 11:48am	10.2	9.0-11.5
Neutrophils %	April 28th, 2023 11:48am	68.2	50.0-75.0
Immature Granulocytes %	April 28th, 2023 11:48am	0.30	0.0-1.0
Lymphocytes %	April 28th, 2023 11:48am	23.3	20.0-44.0
Monocytes %	April 28th, 2023 11:48am	7.5	2.0-9.3
Eosinophils %	April 28th, 2023 11:48am	0.4	1.0-5.0
Basophils %	April 28th, 2023 11:48am	0.3	0.0-2.0

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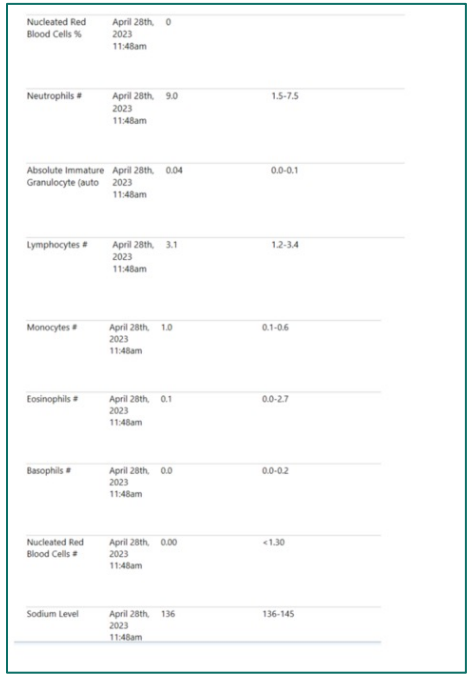

Nucleated Red Blood Cells %	April 28th, 2023 11:48am	0	
Neutrophils #	April 28th, 2023 11:48am	9.0	1.5-7.5
Absolute Immature Granulocyte (auto	April 28th, 2023 11:48am	0.04	0.0-0.1
Lymphocytes #	April 28th, 2023 11:48am	3.1	1.2-3.4
Monocytes #	April 28th, 2023 11:48am	1.0	0.1-0.6
Eosinophils #	April 28th, 2023 11:48am	0.1	0.0-2.7
Basophils #	April 28th, 2023 11:48am	0.0	0.0-0.2
Nucleated Red Blood Cells #	April 28th, 2023 11:48am	0.00	<1.30
Sodium Level	April 28th, 2023 11:48am	136	136-145

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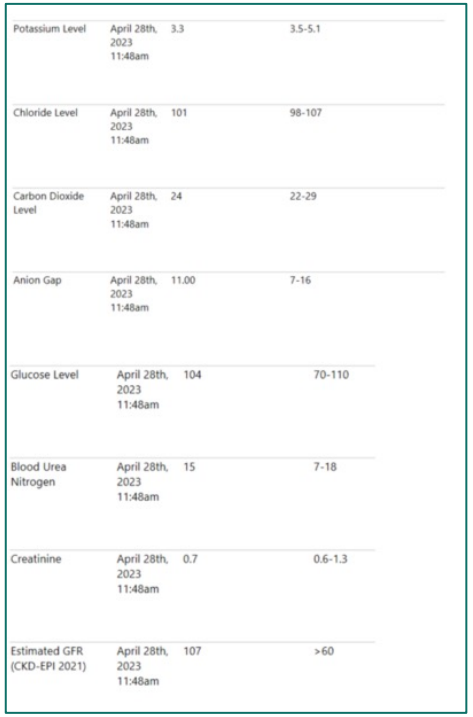

Potassium Level	April 28th, 2023 11:48am	3.3	3.5-5.1
Chloride Level	April 28th, 2023 11:48am	101	98-107
Carbon Dioxide Level	April 28th, 2023 11:48am	24	22-29
Anion Gap	April 28th, 2023 11:48am	11.00	7-16
Glucose Level	April 28th, 2023 11:48am	104	70-110
Blood Urea Nitrogen	April 28th, 2023 11:48am	15	7-18
Creatinine	April 28th, 2023 11:48am	0.7	0.6-1.3
Estimated GFR (CKD-EPI 2021)	April 28th, 2023 11:48am	107	>60

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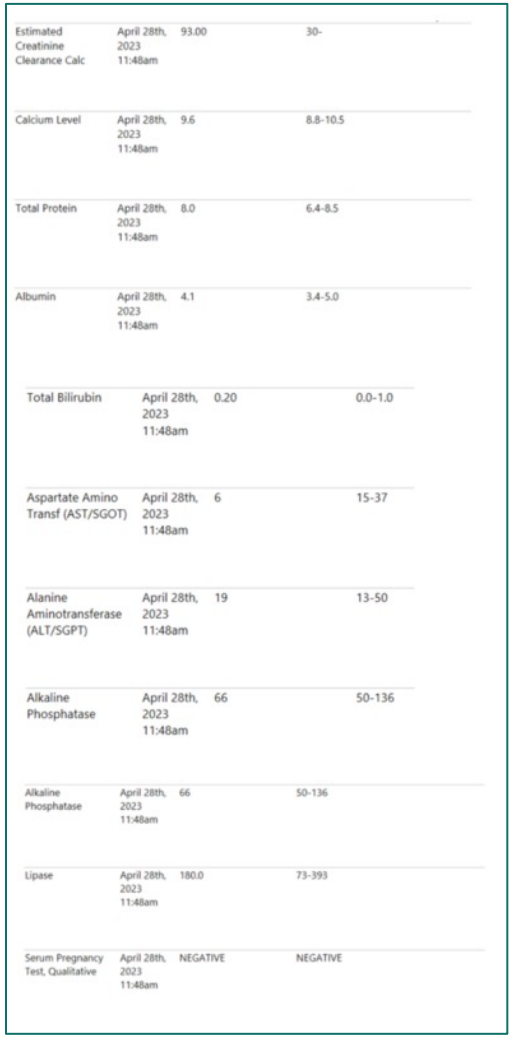
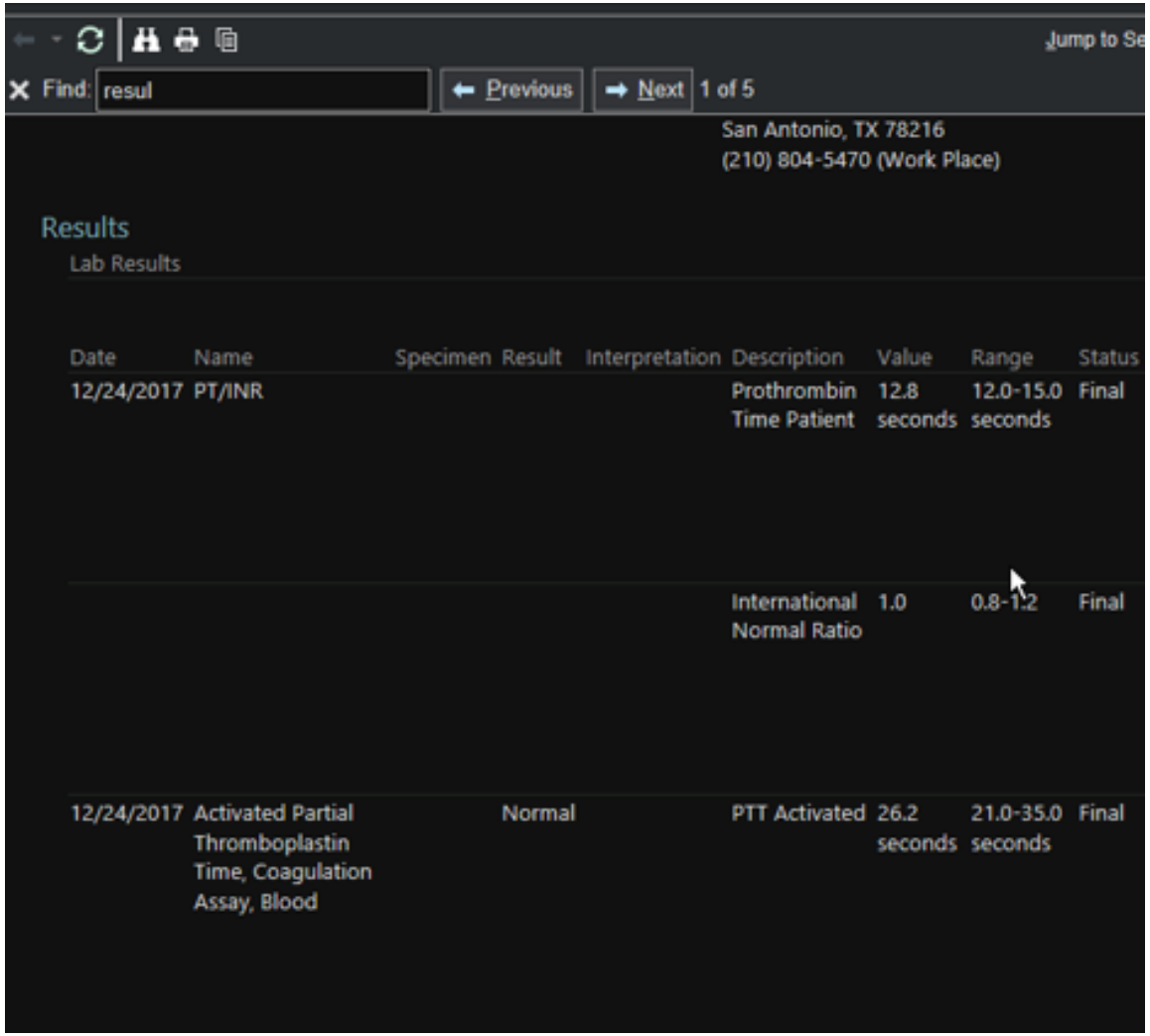


Estimated Creatinine Clearance Calc	April 28th, 2023 11:48am	93.00	30-
Calcium Level	April 28th, 2023 11:48am	9.6	8.8-10.5
Total Protein	April 28th, 2023 11:48am	8.0	6.4-8.5
Albumin	April 28th, 2023 11:48am	4.1	3.4-5.0
Total Bilirubin	April 28th, 2023 11:48am	0.20	0.0-1.0
Aspartate Amino Transf (AST/SGOT)	April 28th, 2023 11:48am	6	15-37
Alanine Aminotransferase (ALT/SGPT)	April 28th, 2023 11:48am	19	13-50
Alkaline Phosphatase	April 28th, 2023 11:48am	66	50-136
Alkaline Phosphatase	April 28th, 2023 11:48am	66	50-136
Lipase	April 28th, 2023 11:48am	180.0	73-393
Serum Pregnancy Test, Qualitative	April 28th, 2023 11:48am	NEGATIVE	NEGATIVE

Meditech Org A to Epic Org B



SHIELD – Standardization of Lab Data to Enhance Patient-Centered Outcomes Research and Value Based Care

- **Project Purpose & Goals:** This project aimed to improve the quality, interoperability, and portability of laboratory data within and across institutions so that diagnostic information can be pulled from different sources or shared between institutions to help illuminate clinical management and understand health outcomes.
- **Resources:** Are there SHIELD artifacts we need to review?

Monthly Meeting Schedule

- Doodle Poll will be distributed to determine monthly meeting date/time
- Please respond by timely
- This will allow Sequoia to push out a calendar invite for future meetings

Interoperability MATTERS
an initiative of The Sequoia Project

the sequoia project
https://sequoiaproject.org/about-us/become-a-member/

Data Usability Work Group

For more information:
www.sequoiaproject.org/interoperability-matters/data-usability-workgroup/

(571) 327-3640

Interopmatters@sequoiaproject.org

Convene Collaborate Interoperate

Thank You for your support of Interoperability Matters!