a patient all in one view for physicians

By Ridge Zhang Donny Wu **Mentors** Lyn Bartram Shaolin Tsui **Initiated by** Fraser Health

Who are we

Fraser Health

One of the six publicly funded health regions of British Columbia and Initiated this project

Ridge Zhang

Donny Wu

4th year interactive systems student

4th year interactive systems student

Lyn Bartram

Professor at the School of Interactive Arts and Technology

Shaolin Tsui

Manager of User Experience and Visual Design System Optimization at Fraser Health

What's the problem

The hospital environment

A patient goes through the hospital and interacts with many doctors

The main way of communication between these doctors are the tests and notes left behind from the previous doctor

It is hard for an individual doctor to see the patient's big picture as they are handed off from doctor to doctor

What's the problem

Current implementation Meditech and UCI

Records are scattered across the tabs requiring the physician to search and collect them first making it difficult for the physician to comprehend the patient journey as they cannot view sections of the patient journey simultaneously

A patient journey is a set or diagnostic notes, labs tests, imaging, and so on for 1 chief complaint

What Meditech and UCI looks like

🖗 Enterprise Medical Record - Boyd, Monica				Stanic, Kristina		ELL Olivier	111000		. Grant	history
Roberts, Vivian DOB: 1/19/95			y		The Clinic	al Summ	ary na	ge shows a s	ummary of	-
F000005330 / H000000202 / DEMOVID000	0214	Name: CCUCIONE, ONETEST		PHN:97461900						
Ht: 62 in / Wt: 125 lb BSA: 1.57 m2 BMI: 22.9 kg/m2 2 North Medical 230-2 AD Allergy/AdvReac: No Known Allergies	Record List	Summary Encounters Co	nditions * Alle	rgies Medications	clinical da	ata from ite	ems th	at you select	, including	
Summary	Other Visit				En	counters				
	Special Panels	Clinical Summary								-
Summary List Disgnoses (Indicators) Risk/Legal Demographics	24 Hour OI				Pr	oblems				
Providers Visit Contacts Insurances Abstract	Vital Signs	Sum Ary Document			• Di	agnoses				
Patient Summary	18.0									
+ Visit History	Notes				• All	ergies				
Patient Problems	Medications (1)	Clinical Data Subse	et		Er:	aser Healti	hlaho	ratory Result	•	~
Medical Migraine, Allergic gastroenteritis and colitis,	Order History					asci inculu	Labo	ratory nesure	3	
Medical Shortness of breath, Nausea alone, Chest pain Family History Family history of migraine headaches, Family history of allergies					Diagnose	s				
Social History Other social stressor	Laboratory 🧳				Diagnooo	<u> </u>				
Medications	Microbiology (Blood Bank (_							_
Active Ibuprofen (Ibuprofen)		Date	Туре		Diagnoses		Code	Facility	Unit	
O Ambulatory Medications RXM - CMC last updated 3/19/2014 1106 at FRAM	Pathology		1.10		-					
Albuterol Sulfate (Albuterol Sulfat (2 INH 2-3X 30 days 1 Mont	Imaging 😰	8/Dec/2017 09:40:00	Discharge Dia	agnosis	Toothache		K0887	Eagle Ridge Hospital	ERH_ER.ASTHMA	
Digoxin 0.125 Mg Tab (0.125 Mg PO DAILY #20)	Other Reports 🧾	-								_
Preferred Pharmacy	Care Trends 📩				Encounter					
Care Team	Care Activity 📩				Encounter	s				
Date Administered Eligible Date Recommended Schedule	History 🔎									
Influenza 3/13/14 8/28/14 3/13/15	Summary 😂	Admission Date	Туре	Facility	Location	Attending	Servio	e Discharge	Date	
- Health Maintenance	Encounters 90	Aumission Date	Type	raciity	Location	Attenuing	Servic	e Discharge	Date	
Hob_Mar 19, 2014	Referrals	8/Dec/2017 09:40	Emergency	Eagle Ridge	ERH_ER.ASTHMA			8/Dec/2017	09:45	
Growth Charts Substance Use	Problem List			Hospital						
Alcohol Use None Mar 11, 2014	Discharge 5									_
Drug Abuse None Mar 11, 2014	Orders 🗳				Allergies					
Nicotine Dependence Ouit Mar 11, 2014	Document Ø				Ancigica					
Procedures	Reconcile Meds TA									_
O My Personal Notes Patient likes to be called Viv	Sidn	Data	lergy to	Reactio	. Do	cumented By	Facility	Severity	Resolved	
texternal Medical Summary Documents	Refresh C	Date	iergy to	Reacuc	•• 00	cumented by	raciiity	seventy	Resolved	
g	Refresh	Other								- L
							7			- V
		23/Mav/2017 ac	etaminophen	swoller	throat		Roval	Mild	_	.
									,	<u> </u>
Graph Cancel S	aye ? @ 🕹 🍵 📼	Quality of medical images in UCI	may not be equiva	alent to images viewed	on a radiology depar	tment PACS works	tation	CVI	D: 185/7.0	Motion
My Data		the second	,, oo equite	ges nenes	and a second second	and the second second		0.4.1	• db/	Motion

Screenshot from official Meditech training video

From Meditech's official website

Screenshot from Fraser Health training video From Shaolin Tsui

Proposed solution

Patient Overview

An all in one patient dashboard so that the physicians can easily see and understand the patient journey

With features such as

- view the records in detail
- add and view notes of a record
- build a workspace encompassing the records of their selection
- search for a particular record with filters, name or time period
- travel through time of the patient's journey
- view the records from that perspective, and highlight abnormal results

Let's see it in action

Scenario

- Patient has a chief complaint of abdominal pain and is admitted to the ER
- Doctor wants to see the most recent tests before beginning a surgery

lets try the scenario with UCI and our prototype...

UCI \lor S Our implementation

			-						
Allergies	More data i	s available			Medication	\$	There	is no data available.	
	Allower To	Reaction		50	Date		Medication	SIG	
Date * 12/Oct/2017	Allergy To Bee Pollen	AGRANULOCY		Severity A	Date	No re		ibly due to your sear	rch critoria
12/0ct/2017	BLUE-GREEN ALGAR			levere		1010	sons round, poss	ing due to your sear	
12/Oct/2017	AMARYL	2 HALLUCINATIC		levere loderate					
29/May/2017	FREE TEXT ALLERG			roderate foderate					
Admission Date 19/Feb/2018 13/Feb/2018 16:12 5/Jan/2018 14:28	NEW REFERRAL Emergency	Facility Public Health BC Childrens Ho St. Pauls Hospital	Attendi David W Eric Jona	ensley				overview of and Labora	Allergies, atory Results
19/Feb/2018 13/Feb/2018 16:12 5/Jan/2018 14:28 19/Dec/2017	NEW REFERRAL Emergency Emergency Unknown	Public Health BC Childrens Ho St. Pauls Hospital VCHA Community	David W	ensley	Encount		Problems,	and Labora	
19/Feb/2018 13/Feb/2018 16:12	NEW REFERRAL Emergency Emergency	Public Health BC Childrens Ho St. Pauls Hospital VCHA Community	David W	ensley athan			Problems,		atory Results
19/Feb/2018 13/Feb/2018 16:12 5/Jan/2018 14:28 19/Dec/2017 Problems	NEW REFERRAL Emergency Emergency Unknown More data	Public Health BC Childrens Ho St. Pauls Hospital VCHA Community is available	David W Eric Jona	ensley	Encount	ers, f	Problems,	and Labora	atory Results
19/Feb/2018 13/Feb/2018 16:12 5/Jan/2018 16:12 19/Dec/2017 Problems Date *	NEW REFERRAL Emergency Unknown More data	Public Health BC Childrens Ho St. Pauls Hospital VCHA Community is available Problem	David W Eric Jona	ensley athan	Encount Labs Collected	ers, f	Problems, More	and Labora	atory Results
19/Feb/2018 13/Feb/2018 16:12 5/Jan/2018 16:12 19/Dec/2017 Problems Date ~ 6/Apr/2018 08:37:19	NEW REFERRAL Emergency Unknown More data	Public Health BC Childrens Ho St. Pauls Hospital VCHA Community is available Problem Known M	David W Eric Jona	ensley athan	Labs Collected - 8/Jan/2018	ers, F	Problems. More Test Sodium	and Labora	atory Results
19/Feb/2018 13/Feb/2018.16:12 5/Jan/2018.16:12 19/Dec/2017 Problems Date ▼ 6/Apr/2018.06:37:19 20/Oct/2017.01:22.00	NEW REFERRAL Emergency Unknown More data Category ALERT ALERT	Public Health BC Childrens Ho St. Pauls Hospital VCHA Community is available Problem Known N Aggressi	m MRSA and ive/ Violen	enstey athan	Labs Collected • 8/Jan/2018 8/Jan/2018	ers, F	Problems, More Test Sodium Potassium	and Labora	Facility Abbotsford Region
19/Feb/2018 13/Feb/2018 16:12 S/Jan/2018 16:12 S/Jan/2018 16:22 19/Dec/2017 Problems Date • 6/Apr/2018 06:37:19 20/Oct/2017 01:22:00 13/Oct/2017 01:51:00	NEW REFERRAL Emergency Emergency Unknown More data Category ALERT ALERT ALERT	Public Health BC Childrens Ho St. Pauls Hospital VCHA Community is available Problem Known N Aggressi Do Not A	MRSA and Acknowled	ensley athan	Labs Collected • 8/Jan/2018 8/Jan/2018	ers, F	Problems, More Test Sodum Potassium Chloride	and Labora	Aboostord Region
19/Feb/2018 13/Feb/2018.16:12 5/Jan/2018.16:12 19/Dec/2017 Problems Date ▼ 6/Apr/2018.06:37:19 20/Oct/2017.01:22.00	NEW REFERRAL Emergency Unknown More data Category ALERT ALERT	Public Health BC Childrens Ho St. Pauls Hospital VCHA Community is available Problem Known h Aggress Do Not A	MRSA and Acknowled	ensley athan VRE It Behaviour ige t Organism	Labs Collected • 8/Jan/2018 8/Jan/2018	ers, F	Problems, More Test Sodium Potassium	and Labora	Facility Abbotsford Region

Kea David E. ID 17772278 Male, Age 43 Chief Complain

Allergies
Patient Notes
New note here..
add to patier
no notes for this p

	Details (nothin		Work Space (0 flagged)	Clinical Documents	
Laboratories				Imaging	Contrast Chest Portable KUB Kidneys Ureters
		Jrea Crea Lytes Com hromboplastin Time	plete CBC Glu	Search Abdomen Pelvis Bladder Dopp Low Extr Ven Blat/se	
C02 Glucose Serum chloride	a,Lytes Labouatory Feb 12th, 2001 17.54 mg/dl. 20.07 mmol/L 106.73 mg/dl. 4.78 mEq.L 143.94 mEq.L	Complete Blood Cel Last completed 8 days ago Red Blood Cell Count Hernotobin Hernotobin White blood cell Coust Planafeet count Planafeet count	Feb 12th, 2031 5.62 cells/L 14.01 grams/dL 43.06 procent 9.12 billion cells/L 144.95 billion/L	Abdomen Pelvis Contrast Last completed a menth ago Then is evidence of affuse heats hypotatesuation compatible with fairly influences there is no intra or exertastructic biotunces cholecystectomy. The spitem is normal. The	Last completed 2 months ago Jan 4th,
	tells 1 results not shown trph Random Lebosstory Jan 28th 2031	Planeters	alls 15 results not shown	Flag 4 notes Details 2 results not at Abdomen Utrascrop Last completed 2 months ago Jan Std	Prephy Dopp Low Extr Ven Ultrassonogr 2031 Bilat/scan
fake volue 0 - fake volue 1 - fake volue 2 - fake volue 3 -	 7.26 mL/s 4.41 mL/s 9.31 mL/s 1.25 mL/s 	Alanine Aminotransferase -			Last completed 2 months ago Jan 2nd, Verouge duplex goan is a painless exam that uses high-frequency sound waves (ultrasound) to castum images of internal views of verse that
Alkaline Phosphatase	AST (SGOT)	Bilindin Total	Gamma Glatarry	Others	
24 days ago	24 days ago	24 days ago	Transferase 24 days ago	Search Referral Culture Lead Infectious Disease Consult Unine	Social Work Albumin Wound Gram ECG Ad Care
Calcium 24 days ago	Lactate Dehydrogenase (LDH) 24 days ago	Partial Thromboplastin Time 24 days ago	Peripheral Blood Film Smear 24 days ago	Social Work Referral Social Last completed 3 days ago Feb 17th	
Retic Count 24 days ago	Protein Electrophoresis 24 days ago	Creatine Kinase (CPK) a month ago	C-Reactive Protein (CRP) a month ago	Flag no notes Details 3 results not sh	own Flag no notes Details showing the only res
Liver Function Tests (LFT) a month ago	Urine Drugs of Abuse Screen a month app	Magnesium a month ago	Phosphorus (Phosphate) a month aga	Infectious Disease Infectious Disease Consult	SMH) Urine Culture Microbie Last completed a month ago Jan 5th,
amoninajo			Ammocia	Last corroleted a month ago Jan 12th	

Screenshot from Fraser Health training video

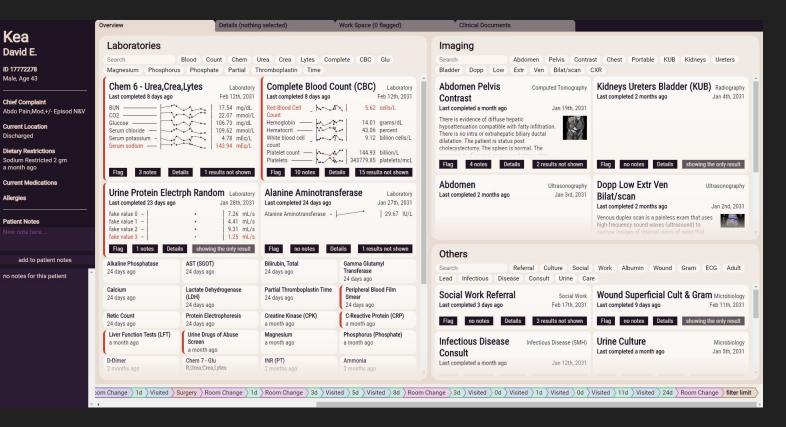
From Shaolin Tsui

Screenshot from our implementation

UCI's summary page

	ONETEST		PHN:97461	9		der:M				
ummary 🔻 Encou	Inters Conditions	 Allergies 	Medication	ns Laborator	ry ▼ Imaging	Procedures	Clinical Do	ocuments		
Summary Pa	ige									
Allergies	More data	a is available			Medications		There is	no data availabl	e.	
				80						
Date 🔻	Allergy To	Reaction		Severity A	Date	Med	dication	SIG		
12/Oct/2017	Bee Pollen	AGRANUL	OCYTOSIS	Severe		No results f	ound, possibl	ly due to your s	earch criteria	
12/Oct/2017	BLUE-GREEN ALG	AE HALLUCIN	ATIONS	Severe						
17/Oct/2017	AMARYL			Moderate						
29/May/2017	FREE TEXT ALLER	GY		Moderate						
Encounters Admission Date ▼ 19/Feb/2018 13/Feb/2018 16:12	Type NEW REFERRAL Emergency	a is available Facility Public Health BC Childrens H		ding Wensley	hen acce It prov Encounte	ides a (quick o\	verview c	of Allerg	ies,
Encounters Admission Date 19/Feb/2018 13/Feb/2018 16:12 5/Jan/2018 14:28 19/Dec/2017	Type NEW REFERRAL Emergency Emergency Unknown	Facility Public Health BC Childrens H St. Pauls Hosp VCHA Commu	Ho David	ding	lt prov Encounte	ides a (quick o\ blems, a	verview c and Labo	of Allerg	ies,
Encounters Admission Date 19/Feb/2018 13/Feb/2018 16:12 5/Jan/2018 14:28	Type NEW REFERRAL Emergency Emergency Unknown	Facility Public Health BC Childrens H St. Pauls Hosp	Ho David	ding Wensley onathan	lt prov	ides a (quick o\ blems, a	verview c	of Allerg	ies, Results
Encounters Admission Date Instructure 19/Feb/2018 13/Feb/2018 16:12 Solan/2018 14:28 19/Dec/2017 Problems	Type NEW REFERRAL Emergency Emergency Unknown More data	Facility Public Health BC Childrens H St. Pauls Hosp VCHA Commu	Ho David 1 bital Eric Jo unity	ding Wensley	It prov Encounte	vides a o ers, Prot	quick ov blems, a More da	verview o and Labo	of Allerg	ies, Results ■€
Encounters Admission Date Admission Date Admission Date Admission Date Problems Date	Type NEW REFERRAL Emergency Unknown More data	Facility Public Health BC Childrens I St. Pauls Hosp VCHA Commu a is available Pro	Ho David bital Eric Jo unity	ding Wensley waathan	It prov Encounte	vides a o ers, Prot	quick ov blems, a More da	verview c and Labo	of Allerg oratory I	ijes, Results ≣€
Encounters Admission Date Admission Date	Type NEW REFERRAL Emergency Emergency Unknown More data Category ALERT	Facility Public Health BC Childrens I St. Pauls Hosp VCHA Commu a is available Product Knot	Ho David V pital Eric Jo unity Doblem Down MRSA ar	ding Wensley mathan	It prov Encounte	vides a c ers, Prob	quick ov plems, a More da	verview o and Labo	of Allerg pratory I Faci Abbo	ijes, Results Bord Region
Encounters Admission Date	Type NEW REFERRAL Emergency Emergency Unknown More data Category ALERT ALERT	Facility Public Health BC Childrens I SL Pauls Hosp VCHA Commu a is available Prr Knc Agg	Ho David 1 bital Eric Jo nity bblem bwn MRSA ar gressive/ Viole	ding Wensley mathan	It prov Encounte	vides a c ers, Prob	quick ov plems, a More da at ium assium	verview o and Labo	of Allerg pratory I Faci Abbo Abbo	ies, Results ity Isford Region
Encounters Admission Date Admission Date I3/Feb/2018 13/Feb/2018 16:12 5/Jan/2018 14:28 19/Dec/2017 Problems Date Advnr/2018 08:37:19 20/Oct/2017 01:22:00 13/Oct/2017 10:51:00	Type NEW REFERRAL Emergency Unknown More data Category ALERT ALERT ALERT	Facility Public Health BC Childrens I St. Pauls Hosp VCHA Commu VCHA Commu a is available From King King King King King King King King	Ho David 1 bital Eric Jo Inity Doblem Down MRSA arr gressive/ Viole Not Acknowle	ding Wensley mathan Band VRE ent Behaviour edge	It prov Encounte Collected = 8/Jan/2018 14 8/Jan/2018 14	vides a c ers, Prot tas Sout tas Pot	quick ov plems, a More da at ium assium oride	verview o and Labo	Faci Abbo Abbo	ies, Results ity Isford Region Isford Region
Encounters Admission Date ▼ 19/Feb/2018 13/Feb/2018 16:12 5/Jan/2018 14:28 19/Dec/2017	Type NEW REFERRAL Emergency Unknown More data Category ALERT ALERT ALERT ALERT ALERT	Facility Public Health BC Childrens St. Pauls Hosp VCHA Commu a is available Pro Agg Do Anti	Ho David 1 bital Eric Jo Inity Doblem Down MRSA arr gressive/ Viole Not Acknowle	ding Wensley onathan	It prov Encounte	vides a (ers, Prob 48 Sod 48 Chit 48 Chit 48 Sod	quick ov plems, a More da at ium assium oride	verview o and Labo	Faci Abbo Abbo Abbo Abbo	ies, Results ity Isford Region

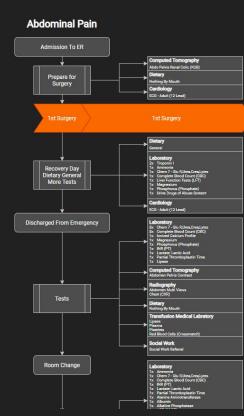
Our Overview tab

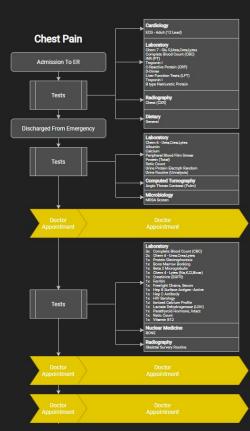


Design based on the Most asked questions from health care workers

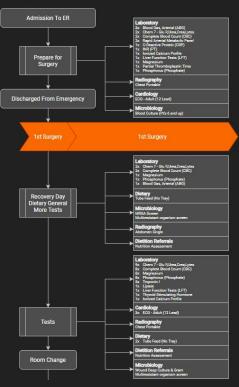
Clinical Documents		Laboratory		Imaging		Encounters		Patient Contacts		Provider Contacts		Conditions: Problems	
How do I find documents from a specific hospital?	9	How do I find a patient's recent lab results?	16	How do I find diagnostic images and reports?	7	How do I see if a patient receives community care?	5	How do I view patient contact information?	2	How do I find contact information for clinicians involved in the patient's care?	3	Can I seeif a patient has had MRSA or VRE?	2
How do I find documents from VCH, PHSA & PHC?	5	How do I find lab resultsFrom LifeLabs or BC Bio?	12	How do I find diagnostic reports created by BCCA?	5	How do I view a patient'shealth care encounters?	3						
How do I view documents from VCH, PHSA & PHC?	5	How do I find lab resultsfrom LifeLabs or BC Bio?	12	How do I find the most recent CT Scan?	3	How do I see if my client has been discharged?	2						
How do I find documents from VCH, PHSA, & PHC?	4	How do I search for specific lab results?	12	How do I find the most recent diagnostic imaging?	3	How do I see if my clienthas been admitted?	2						
How do I find a MOST and ACP document?	3	How do I find a patient's lab results?	8	How do I find a patient's recent imagingreports?	2	How do I see if a patient receives community care?	1						
How do I find documentsfrom a specific hospital?	3	How do I find lab results From LifeLabs or BC Bio?	6	Can I see the facility a procedure was performed?	1	How do I see providers involved in a patient's care?	1						
How do I find familiar faces care plans?	3	How do I find lab results from LifeLabs or BC Bio?	6	Can I seethe facility a procedure was performed?	1	How do I view a patient's health care encounters?	1						
How do I find documentsfrom BCCW Hospitals?	2	How do I find a patient's lab results from BCCDC?	4	How do I find recent medical imaging results?	1								
How do I view documents from VCH, PSHA,&PHC?	2	How do I find a patient's lab results from BCCA?	2	How do I find a patient's recent imaging reports?	1								
How do I view Wound ManagementPlans from FH Community?	2	How do I quickly identify abnormal lab results?	2	How do I find a patients recent imagingreports?	1								
How do I viewFH community documents?	2	How do I quickly find pathology reports?	1	How do I find diagnostic reports and images?	1								

Informed by **3 patient journeys**





Shortness of Breath

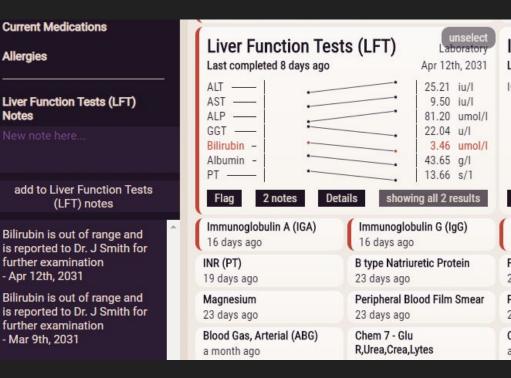


- view the records in detail
- add and view notes of a record
- build a workspace encompassing the records of their selection
- search for a particular record with filters, name or time period
- travel through time of the patient's journey
- view the records from that perspective, and highlight abnormal results

- view the records in detail
- add and view notes of a record
- build a workspace encompassing the records of their selection
- search for a particular record with filters, name or time period
- travel through time of the patient's journey
- view the records from that perspective, and highlight abnormal results

verview	Deta	ils (Chem 6 - Urea,Crea,Lytes)	Work S	Space (O flagged)	Clinical Do	cuments	
Chem 6 - Urea	a,Crea,Lytes						
Feb 12th, 2031 8 days ago - Ordered Feb	o 12th, 2031 - Laboratory			Feb 7th, 2031 13 days ago - Ordered Feb 6	5th, 2031 - Laboratory		
Results		Notes		Results		Notes	
BUN	17.54 mg/dL	New note	save note	BUN		New note	save note
CO2		Serum sodium is out of range and	is reported to	CO2		no notes for this test	
Glucose		Dr. J Smith for further examination		Glucose			
Serum chloride		8 days ago - Feb 12th, 2031		Serum chloride			
Serum potassium ——— Serum sodium ————				Serum potassium			
Jan 27th, 2031 24 days ago - Ordered Ja	an 26th, 2031 - Laboratory	Mataa		Jan 25th, 2031 a month ago - Ordered Jan	24th, 2031 - Laboratory	Natas	
Results	17.04	Notes		Results	10 (1)	Notes	
BUN	-	New note	save note	BUN	<u> </u>	New note	save note
Glucose		no notes for this test		Glucose		no notes for this test	
Serum chloride				Serum chloride			
Serum potassium				Serum potassium			
Serum sodium				Serum sodium	- 137.97 mEq/L		
Jan 24th, 2031	an 23rd, 2031 - Laboratory			Jan 17th, 2031 a month ago - Ordered Jan			

- view the records in detail
- add and view notes of a record
- build a workspace encompassing the records of their selection
- search for a particular record with filters, name or time period
- travel through time of the patient's journey
- view the records from that perspective, and highlight abnormal results



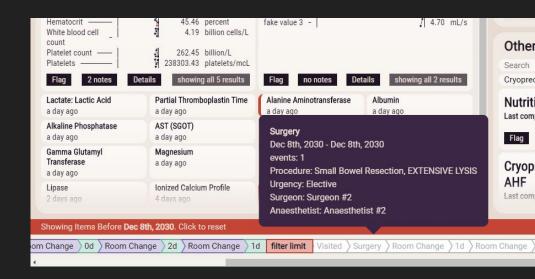
- view the records in detail
- add and view notes of a record
- build a workspace encompassing the records of their selection
- search for a particular record with filters, name or time period
- travel through time of the patient's journey
- view the records from that perspective, and highlight abnormal results

view		Details	(nothing	selected	I)		Work	Space (4 flagged)		C	dinical Doc	uments							
Details																				
earch	Complete	Blood	Count	CBC	Chem	Urea	Crea	Lytes	Alanine	Amino	transferase	Urine	Protein	Electrph	Random					
Chem 6 - Urea,Crea ast completed 8 days ago	a,Lytes								Labo Feb 12th,		Complet Last complet			(CBC)					Lab Feb 12th	oratory 1, 2031
UN U2 U2U2 U2 U2 U2U							//////		17.46 m 24.71 m 71.05 m 106.65 m 5.13 m 141.01 m	nol/L g/dL nol/L Eq/L	Red Blood Ce Hemoglobin Hematocrit White blood of Platelet coun Platelets	ell count -						/\	4.57 cells/L 15.62 grams/ 42.47 percent 9.08 billion of 255.00 billion/ 198077.40 platelet	dL t cells/L L
										- 1	Notes									
											White blood of - 24 days ago			e and is rep	orted to Dr. 、	Smith for fu	rther examination	n		
lotes											White blood - a month age			e and is rep	orted to Dr. 、	Smith for fu	rther examination	on		
erum sodium is out of range 13 days ago - Feb 7th, 2031												Platelet cou	nt are out o	of range and	is reported	o Dr. J Smith	for further exa	mination		
UN, Serum chloride are out o a month ago - Jan 17th, 203	1				ner examin	ation					Hematocrit is	out of rang	e and is rep	ported to Dr	J Smith for	urther exam	nation			
UN is out of range and is rep 2 months ago - Jan 2nd, 203	1										Platelets is o	ut of range a	and is repo	rted to Dr. J	Smith for fu	ther examina	tion			
02 is out of range and is rep 2 months ago - Dec 12th, 20:		Smith for fu	irther exam	ination						-	Platelet court			reported to	Dr. J Smith f	or further ex	mination			
Unflag	4 note	S		L.	Details			11	esults not sh	own	Unflag		1	7 notes			Details		15 results not sl	hown
Jrine Protein Elect	rph Rand	om							Labo		Alanine			ase						oratory
ast completed 23 days ago									Jan 28th, 4.08		Last complet Alanine Amir		-						Jan 27th	
ake value 0 - ake value 1 - ake value 2 - ake value 3 -					÷				4.08 4.24 4.31 3.05	mL/s mL/s	Aranırle Amir	otransferasi	e - (32.24	+ 1U/l
lotes									,	\$	Notes									\$
Unflag	no note:	S		De	tails			showi	ng the only re	suit	Unflag		1	no notes			Details		1 results not sl	hown
										,										

- view the records in detail
- add and view notes of a record
- build a workspace encompassing the records of their selection
- search for a particular record with filters, name or time period
- travel through time of the patient's journey
- view the records from that perspective, and highlight abnormal results

Blood Complete	CBC Chem Lyt	es Urea Crea Calcium
e Protein Profile	lonized	
Laboratory Apr 12th, 2031		,Urea,Crea,Lytes Laborator ago Mar 17th, 203
14.19 mg/dL 20.70 mmol/L 64.54 mg/dL 110.66 mmol/L 4.89 mEq/L 138.18 mEq/L	BUN C02 Greatinine Glucose Serum chloride Serum potassium - Serum sodium	16.30 mg/dL 25.58 mmol/ 0.87 mg/dL 119.13 mg/dL 103.53 mmol/ 4.62 mEq/L 143.34 mEq/L
	Flag no notes	Details showing all 2 results
2.68 mL/s 4.18 mL/s 2.09 mL/s 9.38 mL/s		
	e Protein Profile CS Laboratory Apr 12th, 2031 14.19 mg/dL 20.70 mmol/L 64.54 mg/dL 110.66 mmol/L 4.89 mEq/L 138.18 mEq/L Showing all 13 results Bicar) Laboratory Mar 14th, 2031 2.68 mL/s 4.18 mL/s 2.09 mL/s	Protein Profile Ionized Protein Intervention Intervention Protein 14.19 mg/L 20.70 mmol/L Gate Mareg/L Serum chloride Serum potassium - Serum sodium Serum sodium Intervention Bicar) Laboratory Mar 14th, 2031 2.68 mL/s 4.18 mL/s 2.09 mL/s

- view the records in detail
- add and view notes of a record
- build a workspace encompassing the records of their selection
- search for a particular record with filters, name or time period
- travel through time of the patient's journey
- view the records from that perspective, and highlight abnormal results



Allows the physicians to

- view the records in detail
- add and view notes of a record
- build a workspace encompassing the records of their selection
- search for a particular record with filters, name or time period
- travel through time of the patient's journey
- view the records from that perspective, and highlight abnormal results

Search Blood C	ount Chem U	Irea Crea Lytes Complete C	CBC Glu
Magnesium Phosphorus Phosph	ate Partial T	nromboplastin Time	
Chem 6 - Urea,Crea,Lytes Last completed 8 days ago	Laboratory Feb 12th, 2031	Complete Blood Count (C Last completed 8 days ago	BC) Laboratory Feb 12th, 2031
BUN CO2 Glucose Serum chloride Serum potassium Serum sodium Flag 2 notes Details 1 r	15.37 mg/dL 28.94 mmol/L 103.36 mg/dL 107.33 mmol/L 5.02 mEq/L 137.95 mEq/L esults not shown	Hematocrit	77.21 billion/L
Urine Protein Electrph Rand	lom Laboratory Jan 28th, 2031	Alanine Aminotransferase	Laboratory Jan 27th, 2031
fake value 0 - - fake value 1 - - fake value 2 - - fake value 3 - -	9.94 mL/s 2.31 mL/s 8.59 mL/s 5.18 mL/s	Alanine Aminotransferase -	• 32.11 IU/L
Flag 1 notes Details showi	ng the only result	Flag 1 notes Details	1 results not shown

Allows the physicians to

- view the records in detail
- add and view notes of a record
- build a workspace encompassing the records of their selection
- search for a particular record with filters, name or time period
- travel through time of the patient's journey
- view the records from that perspective, and highlight abnormal results

Search Blood C	ount Chem U	Irea Crea Lytes Complete C	CBC Glu
Magnesium Phosphorus Phosph	ate Partial T	nromboplastin Time	
Chem 6 - Urea,Crea,Lytes Last completed 8 days ago	Laboratory Feb 12th, 2031	Complete Blood Count (C Last completed 8 days ago	BC) Laboratory Feb 12th, 2031
BUN CO2 Glucose Serum chloride Serum potassium Serum sodium Flag 2 notes Details 1 r	15.37 mg/dL 28.94 mmol/L 103.36 mg/dL 107.33 mmol/L 5.02 mEq/L 137.95 mEq/L esults not shown	Hematocrit	77.21 billion/L
Urine Protein Electrph Rand	lom Laboratory Jan 28th, 2031	Alanine Aminotransferase	Laboratory Jan 27th, 2031
fake value 0 - fake value 1 - fake value 2 - fake value 3 -	9.94 mL/s 2.31 mL/s 8.59 mL/s 5.18 mL/s	Alanine Aminotransferase -	• 32.11 IU/L
Flag 1 notes Details showi	ng the only result	Flag 1 notes Details	1 results not shown

Tools used



Feedback

After user testing with 4 experts from system optimization division of FH

- What did they like?

- Web Platform (centralized, work from everywhere, compatible with any device)
- Capability to see details for a point in time
- Capability of highlighting results higher than normal
- Navigation using keys
- Ability of creating a workspace
- Very informative
- What did they not like?
 - Design aspects such as colour and hierarchy seen in the page
 - Tabs as one user believed that windows are better
 - Not friendly for first time users
 - Overwhelming at first glance

Future Directions

In the future, we will work on

- Testing with physicians on their experience with the software
- Incorporating graphic design principles resulting in a professional software