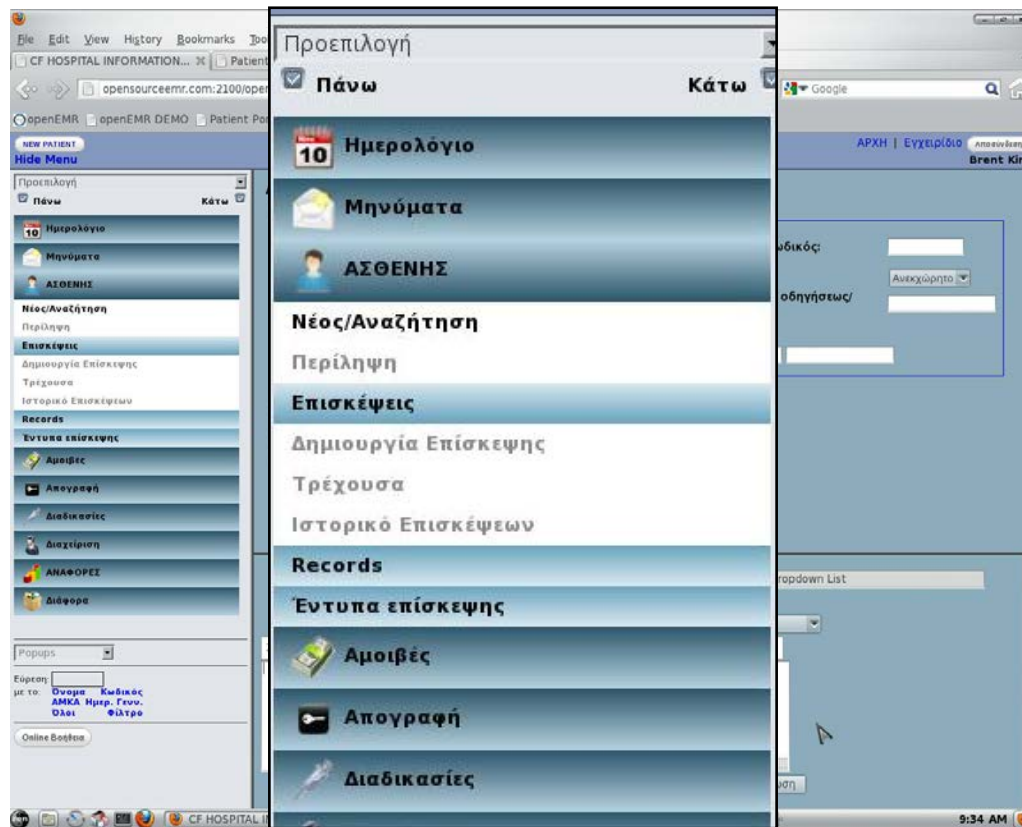


# Data Before It's Big: EHR as Visualization Platform

Dr. Peter Killoran

The first time I used an EHR  
(circa 2005)

You've got to be kidding me....



# Disclaimer

Screenshots used in this presentation were obtained using Google images without consideration of the vendor.

***Images are shown out of their original context and without consideration for their intended purpose.***

The goal is to illustrate challenges faced by clinicians when interpreting individual patient data rather than critique a particular product.

# An Intern's Challenge (circa 2008)

## Did the Lasix make him pee?

Information needs

**Medications Administration Record (MAR)**

**Martinez, Olivia** DOB:03/12/40 Age:71 years Sex:Female MRN:0070024051 Attending:Richards, Mario  
 Allergies: penicillins Wt: Inpatient FIN: 40000016439 [Admit Dt: 05/18/2011 7:30] Loc: Adult II Medical, School of Health Prof

Menu **MAR** Print 0 minutes ago

- Diagnoses & Proble...
- Allergies + Add
- Results Review
- Notes + Add
- Form List
- Direct Chart / I&O
- Orders + Add
- MAR**
- MAR Summary
- Medication Profile
- Tasks / Interventions
- Histories
- Immunization Schedu...
- Growth Chart
- Reference
- Demographics

22 May 2011 21:05 CDT - 24 May 2011 21:05 CDT (Clinical Range)

- ☑ Show All Rate Change Documen...
- Time View
- ☑ Scheduled
  - ☑ Unscheduled
  - ☑ PRN
  - ☑ Continuous Infusions
  - ☑ Future
  - ☑ Discontinued Scheduled
  - ☑ Discontinued Unscheduled
  - ☑ Discontinued PRN
  - ☑ Discontinued Continuous Infusions

Medications	05/23/11 21:05 CDT
PRN acetaminophen 650 mg, PR, q4hr, PRN for fever 1 day(s). Start date 05/18/11 9:00:00 CDT, Stop date 05/19/11 8:59:00 CDT, may also give orally for temp > 101 F	PRN 650 mg Not given within 5 days.
acetaminophen Temperature Oral Pain Intensity Medication Administration Follow Up	
PRN morphine 2 mg, IV Push, q4hr, PRN for pain 1 day(s). Start date 05/18/11 9:00:00 CDT, Stop date 05/19/11 8:59:00 CDT	PRN 2 mg Not given within 5 days.
morphine Numeric Pain Scale Pain Thermometer Scale Present Pain Inventory Scale Verbal Descriptor Pain Scale Medication Administration Follow Up	
PRN ondansetron (Zofran) 4 mg, IV Push, q4hr, PRN for nausea/vomiting day(s). Start date 05/18/11 9:00:00 CDT, Stop date 05/19/11 8:59:00 CDT	PRN 4 mg Not given.
ondansetron Continuous Infusions	
Dextrose 5% with 0.45% NaCl 1000 mL Total volume (mL): 1000, Infuse at: 125 mL/hr, day(s). Start date 05/18/11 9:00:00 CDT, Stop date 05/19/11 8:59:00 CDT, Routine, Infuse over: 8 hr	
Administration Information Dextrose 5% with 0.45% NaCl	

- Order Info...
- Event/Task Summary
- Reference Manual...
- Med Request...
- Additional Dose...
- Create Admin Note...
- Alert History...

Therapeutic Class View

# An Intern's Challenge (circa 2008)

## Did the Lasix make him pee?

Information needs

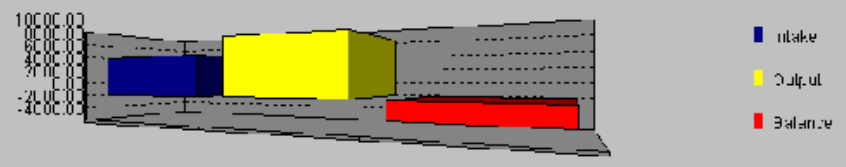
Medications Administration Record (MAR)

**Input and Output Flow sheet**

- Total
- IV Intake
- Urine Output
- Stool Output

	FLUID BALANCE								
	Intake				Output				
	Orel Intake	IV 1 Volume Infused	IV 2 Volume Infused	IVPD Intake	Total	Urine Voided	Stool Count	Total	Balance
7/19/2004 12:00 AM-12:59 AM					0.00			0.00	0.00
1:00 AM-1:59 AM					0.00			0.00	0.00
2:00 AM-2:59 AM					0.00			0.00	0.00
3:00 AM-3:59 AM					0.00			0.00	0.00
4:00 AM-4:59 AM					0.00			0.00	0.00
5:00 AM-5:59 AM					0.00	300.00		300.00	-300.00
6:00 AM-6:59 AM		1,815.00			1,815.00	250.00		2,065.00	1,765.00
Night Total 7/19/2004	0.00	1,815.00	0.00	0.00	1,815.00	1,050.00	0.00	2,865.00	263.00
7:00 AM-7:59 AM					0.00	400.00		400.00	-400.00
8:00 AM-8:59 AM	50.00			250.00	300.00			300.00	0.00
9:00 AM-9:59 AM					0.00			0.00	0.00
10:00 AM-10:59 AM					0.00			0.00	0.00
11:00 AM-11:59 AM					0.00			0.00	0.00
12:00 PM-12:59 PM					0.00			0.00	0.00
1:00 PM-1:59 PM					0.00			0.00	0.00
2:00 PM-2:59 PM	50.00				50.00			50.00	0.00
Day Total 7/19/2004	100.00	0.00	0.00	250.00	350.00	400.00	0.00	750.00	-400.00

**Summary**





# An Intern's Challenge (circa 2008)

## Did the Lasix make him pee?

Information needs

Medications Administration Record (MAR)

Input and Output Flow sheet

**Vital Signs**

Intergy EHR by Sage: Madison Medical Center P. A. - David Ford    Supervising Provider: Depak E. Shah

IEHR   Patient   Tools   Setup   Medscape   Reports   Help

Provider Desktop   Patient Chart   Orders/Charges   Encounter Note

**Aaron, Alice B.**   03/11/1936 67yo F  

Summary   Cardiology Summary   Patient Info   Health   Immunizations   Tasks   Problems   Meds   Allergies   **Vitals**   Documents   Lab Ri

View: Last 10 results    Expand Blood Pressure   Graph

Vital Name	04/08/03 04:10pm	03/21/03 09:32am	02/06/03 09:03am	01/29/03 11:17am	11/25/02 10:49am	11/13/02 11:34am	03/21/02 09:30am	02/21/02 09:30am
<input type="checkbox"/> All Items								
<input type="checkbox"/> Systolic BP-Sitting (mmHg)	160	150	130	170	140	130	132	136
<input type="checkbox"/> Diastolic BP-Sitting (mmHg)	88	88	80	90	80	80	76	78
<input type="checkbox"/> Pulse Rate (bpm)	80	64	64	76	72	78	76	82
<input type="checkbox"/> Respiration Rate (per min)	38	30	24	36	32	24	24	20
<input type="checkbox"/> Temp-Oral (F)	102.5	98.8		98.3	98.7	98.8	98.2	97.8
<input type="checkbox"/> Temp-Tympanic (F)			98.6					
<input type="checkbox"/> Height (in)	65	65	65	65	65	65	65	65
<input type="checkbox"/> Weight (lbs)	175	174	170	172	170	170	170	172
<input type="checkbox"/> Body Mass Index	29.1	29.0	28.3	28.6	28.3	28.3	28.3	28.6
<input type="checkbox"/> Body Surface Area	1.87	1.86	1.85	1.86	1.85	1.85	1.85	1.86
<input type="checkbox"/> Vitals Notes	Patient's te...							

New   Edit

# An Intern's Challenge (circa 2008)

## Did the Lasix make him pee?

Information needs

Medications Administration Record (MAR)

Input and Output Flow sheet

Vital Signs

**Laboratory Results**

Flowsheet: HIV FLOWSHEET

Level: HIV FLOWSHEET

Table Group List

04 March 2008 12:39 - 05 March 2010 12:39 (Clinical Range)

Navigator

- HEMATOLOGY - HIV VIEW
- CHEMISTRY - HIV VIEW
- MICRO-VIROLOGY - HIV VIEW
- FLOW CYTOMETRY - HIV VIEW

HIV FLOWSHEET	2/25/2009 14:41	2/25/2009 14:40	5/23/2008 10:24	3/25/2008 9:38	3/25/2008 9:36
<input checked="" type="checkbox"/> Alkaline Phosphatase		64	66		71
<input checked="" type="checkbox"/> Amylase			101 H		
<input checked="" type="checkbox"/> Lipase			43		
<input checked="" type="checkbox"/> AST (SGOT)		20	34		35
<input checked="" type="checkbox"/> ALT (SGPT)		27	40		50 H
<input checked="" type="checkbox"/> Bilirubin, Total		0.2	0.3		0.3
<b>MICRO-VIROLOGY - HIV VIEW</b>					
<input checked="" type="checkbox"/> Hepatitis C Virus Genotyping					2* (m)
Hepatitis C Virus Genotyping Interp					TEST PERFO
HIV RNA Ultrasensitive	HIV 1 RNA N			HIV 1 RNA N	
HIV RNA Ultrasensitive Interpretation	FOR LABCOF			FOR LABCOF	
<b>FLOW CYTOMETRY - HIV VIEW</b>					
<input checked="" type="checkbox"/> % Cd4+ T Lymph		21 L			23 L
<input checked="" type="checkbox"/> Abs Cd4+ T Lymph		427 L			389 L
<input checked="" type="checkbox"/> % Cd8+ T Lymph		54 H			56 H
<input checked="" type="checkbox"/> Abs Cd8+ T Lymph		1,097 H			946 H
<input checked="" type="checkbox"/> Cd4/Cd8 Ratio		0.389 L			0.411 L

# An Intern's Challenge (circa 2008)

## Did the Lasix make him pee?

June 6/9-

Lasix — 1000  
W/P 7p-7a — 400  
U/P 7a-7p — 1200

Run in                    1000

---

— 200

vs 160/90 → 130/70

↳ ⊕ 3.8 — 3.4

↳ significant 20 mEq

**CONTEXT IS CRITICAL**

# My EHR needs (today)

## Patient Evaluation

What's the current state?

Is treatment effective?

What's the next step?

Visual display should amplify (and not impair)  
cognition

A Critical Care EHR (circa) 2006

Some things could have been better...



# CHRISTINE TEST

31 year(s), Gender:F, Kg:55.0, Cm:172.7, BSA:1.65, 6 day(s) LOS

Medication allergies:  
Other allergies: ALMONDS; LATEX, NATURAL RUBBER  
Precautions:



## Flowsheets

Real Time Variables

Lab Results

Medications

All Medications

All Fluids

Combined Med/Fluid  
Flowsheet

ICU Flowsheet

Nursing  
Assessments/Cares

Nursing  
Diagnosis/Education

Admission/Discharge

Cardiac Assist Devices

Labs/Interventions

Labs/Interventions II

Preventive Cares

Pain/Sedation

Hemodynamics

Pulmonary

Demographics

Resolution:

1 hour

Show only rows with data

Show subheadings

## Lab Results

ICU (SICU)

7/14/2006

	06	07	08	09	10	11	12	13	14	15	16	17
▼ ARTERIAL BLOOD GASES												
PH, ARTERIAL				7.36	7.31 L		7.55 H*	7.35				
PCO2, ARTERIAL				45	45		40 *	35				
PARTIAL PRESSURE O2, ARTE..				89	87		95 H*	88				
BASE EXCESS, ARTERIAL				2	0		1 *	2				
BICARBONATE, CALCULATED				33 H			39 H*					
TOTAL CO2, ARTERIAL				34 H	20 L		39 H*	24				
TEMPERATURE, ARTERIAL				36.5	37.3		38.0 *	37.2				
FRACTIONAL INSPIRED O2, ART				NOT S..	NOT S..		NOT S..	NOT S..				
PULSE OXIMETRY, ART				NOT S..	NOT S..		NOT S..	NOT S..				
END TIDAL CO2, ART				NOT S..	NOT S..		NOT S..	NOT S..				
BICARBONATE, ARTERIAL					20 L			24				
▶ VENOUS BLOOD GASES												
▶ FINGERSTICK BLOOD GASES												
▼ CRITICAL CARE/NICU LAB TESTS												
SODIUM, WHOLE BLOOD				144			145					
TRANSPORT SODIUM, WHOLE ...					145							
POTASSIUM, WHOLE BLOOD				4.5								
TRANSPORT POTASSIUM, WB					5.4 H							
POTASSIUM, OTHER				2.5 *								
GLUCOSE, WHOLE BLOOD							400 R					
TRANSPORT GLUCOSE, WHOL..					350 R							
HEMOGLOBIN, CCL								10.4 L				
HEMATOCRIT, CALCULATED								29 L				
LACTIC ACID, WHOLE BLOOD							5.7 H*	4.5 H*				
BILIRUBIN TOTAL, WHOLE BLO..				0.9								
METHEMOGLOBIN								4.5 C*				
▼ HEMOGRAM (CBC) AND BLOO..												
WHITE BLOOD CELL COUNT								17.0 R				
RED BLOOD CELL COUNT								3.13 L				
HEMOGLOBIN								9.5 R				

When were the blood gases done?

What are the ventilator settings?



2 Picis Car...



5:17 PM

**DATA + CONTEXT = ACTION**

**CRAIG TEST**

41 year(s), Gender: M, Kg: 100.0, Cm: 180.0, BSA: 2.20, 4 day(s) LOS

Medication allergies: Aspirin; Cephalosporins; Codeine; Erythromycin; Morphine; Penicillin  
 Other allergies:  
 Precautions:



- Flowsheets
- Real Time Variables**
- Lab Results
- Medications
- All Medications
- All Fluids
- Combined Flowsheet
- ICU Flowsheet
- Nursing Assessments/Cares
- Nursing Diagnosis/Education
- Admission/Discharge
- Cardiac Assist Devices
- Preventive Cares
- Pain/Sedation
- Hemodynamics
- Pulmonary
- Demographics

Resolution: 1 hour

Show only rows with data

Show subheadings

**Real Time Variables**

ICU (SICU)											
7/2/2006											
01	02	03	04	05	06	07	08	09	10	11	12

Vital Signs

Ventilator Settings

All Real-Time Variables												
Real-Time Variables												
Monitor Respiratory Rate per min.	9	12	14	14	15	10	11	8	12	16	23	23
Airway Respiratory Rate	18	13	14	14	22	16	11	17	13	18	0	
SpO2	99	100	100	100	100	99	99	100	99	82	100	100
ETCO2	33	29	28	27	28	30	30	36	36	17	31	
Heart Rate	74	77	74	76	57	77	66	68	76	94	67	61
Pulse Rate Pulse Oximeter	73	75	71	72	60	76	64	58	73	64	69	62
Systolic Arterial Pressure	134	134	150	123	133	105	140	145	144	145	147	154
Diastolic Arterial Pressure	60	58	69	58	59	46	65	71	66	83	67	65
Mean Arterial Pressure	83	81	93	79	81	65	89	94	94	108	93	90
***NON-INVASIVE MONITORING...***	----	----	----	----	----	----	----	----	----	----	----	----
***MECHANICAL VENTILATION***	----	----	----	----	----	----	----	----	----	----	----	----
Mode	PSIMV	PSIMV	PSIMV	PSIMV	PSIMV	PSIMV	PSIMV	PS	PS	PS	PS	
Respiratory Rate Set SIMV	9	9	9	9	9	9	9	9				
Respiratory Rate Actual	9	15	14	14	11	9	12	3	6	15	31	
Tidal Volume Inspiratory	706	417	772	1012	798	778	1082	576	503	219	1637	
Tidal Volume Expiratory	849	479	866	828	885	851	765	622	518	905	0	
Minute Volume Exhaled	8.4	11.0	11.9	11.8	11.6	7.9	8.7	0.2	5.8	9.8	9.0	
Inspiratory Time Set	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Pressure Control Total	20	20	20	20	20	20	20	20				
PIP Measured	19	20	20	20	19	20	20	14	14	10	9	
Mean Airway Pressure	6	7	7	11	6	6	16	8	8	7	8	
Pressure Support	15	15	15	15	15	15	15	9	9	6	6	
PEEP	5	5	5	5	5	5	5	5	5	5	5	
FiO2-Vent	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	
FiO2 For Apache	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	
Rise Time %	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	
Peak Flow	dem	dem	dem	dem	dem	dem	dem	dem	dem	dem	dem	dem
Compliance Dynamic	45	24	49	63	51	49	69	58	50	35	369	
***AL ADMS***												

View/Chart



11:18 AM

**WHAT'S THE PATTERN?**

**CRAIG TEST**

41 year(s), Gender: M, Kg: 100.0, Cm: 180.0, BSA: 2.20, 4 day(s) LOS

Medication allergies: Aspirin; Cephalosporins; Codeine; Erythromycin; Morphine; Penicillin  
Other allergies:  
Precautions:



- Flowsheets
- Real Time Variables**
- Lab Results
- Medications
- All Medications
- All Fluids
- Combined Flowsheet
- ICU Flowsheet
- Nursing Assessments/Cares
- Nursing Diagnosis/Education
- Admission/Discharge
- Cardiac Assist Devices
- Preventive Cares
- Pain/Sedation
- Hemodynamics
- Pulmonary
- Demographics

Resolution: 1 hour

Show only rows with data

Show subheadings

**Real Time Variables**

ICU (SICU)											
7/2/2006											
01	02	03	04	05	06	07	08	09	10	11	12

Vital Signs

Ventilator Settings

All Real-Time Variables												
Real-Time Variables												
Monitor Respiratory Rate per min.	9	12	14	14	15	10	11	8	12	16	23	23
Airway Respiratory Rate	18	13	14	14	22	16	11	17	13	18	0	
SpO2	99	100	100	100	100	99	99	100	99	82	100	100
ETCO2	33	29	28	27	28	30	30	36	36	17	31	
Heart Rate	74	77	74	76	57	77	66	68	76	94	67	61
Pulse Rate Pulse Oximeter	73	75	71	72	60	76	64	58	73	64	69	62
Systolic Arterial Pressure	134	134	150	123	133	105	140	145	144	145	147	154
Diastolic Arterial Pressure	60	58	69	58	59	46	65	71	66	83	67	65
Mean Arterial Pressure	83	81	93	79	81	65	89	94	94	108	93	90
***NON-INVASIVE MONITORING...***	----	----	----	----	----	----	----	----	----	----	----	----
***MECHANICAL VENTILATION***	----	----	----	----	----	----	----	----	----	----	----	----
Mode	PSIMV	PSIMV	PSIMV	PSIMV	PSIMV	PSIMV	PSIMV	PS	PS	PS	PS	
Respiratory Rate Set SIMV	9	9	9	9	9	9	9	9				
Respiratory Rate Actual	9	15	14	14	11	9	12	3	6	15	31	
Tidal Volume Inspiratory	706	417	772	1012	798	778	1082	576	503	219	1637	
Tidal Volume Expiratory	849	479	866	828	885	851	765	622	518	905	0	
Minute Volume Exhaled	8.4	11.0	11.9	11.8	11.6	7.9	8.7	0.2	5.8	9.8	9.0	
Inspiratory Time Set	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Pressure Control Total	20	20	20	20	20	20	20	20				
PIP Measured	19	20	20	20	19	20	20	14	14	10	9	
Mean Airway Pressure	6	7	7	11	6	6	16	8	8	7	8	
Pressure Support	15	15	15	15	15	15	15	9	9	6	6	
PEEP	5	5	5	5	5	5	5	5	5	5	5	
FiO2-Vent	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	
FiO2 For Apache	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	
Rise Time %	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	
Peak Flow	dem	dem	dem	dem	dem	dem	dem	dem	dem	dem	dem	dem
Compliance Dynamic	45	24	49	63	51	49	69	58	50	35	369	
***AL ADMS***												

View/Chart



11:18 AM

# A Critical Care EHR (circa) 2006

What we should have learned...

**MAKE IT VISUAL**



**CRAIG TEST**

41 year(s), Gender: M, 4 day(s) LOS

Medication allergies: Aspirin; Cephalosporins; Codeine; Erythromycin; Morphine; Penicillin  
 Other allergies:  
 Precautions:

- Flowsheets
- Hemodynamics
- Pulmonary
- Respiratory Care Documentation
- ECMO Flowsheet
- Nutrition
- Skin Preventative Care
- SICU Physician View
- Preventive Care Orders
- Pulmonary Trends**
- Neurological View
- Hemodynamic Trends
- PA Catheter Trends
- Demographics

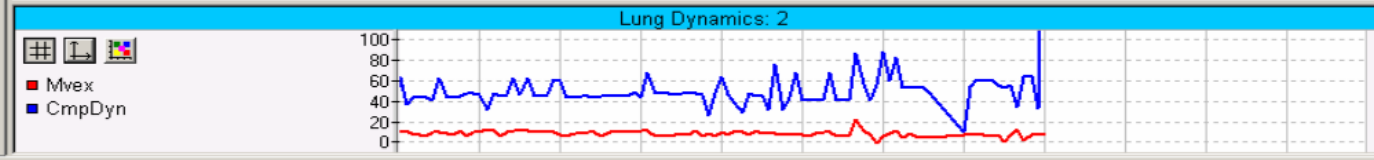
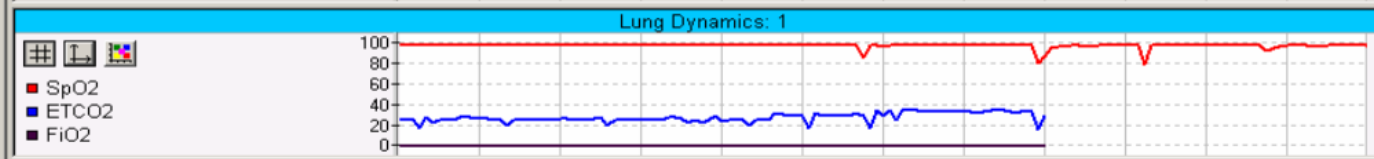
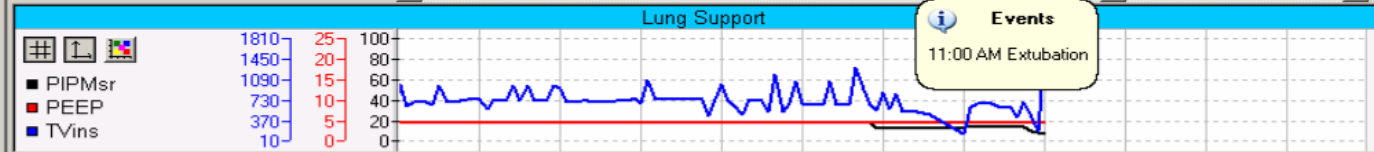
Resolution: 1 hour

Show only rows with data

Show subheadings

**Pulmonary Trends**

ICU (SICU)													
7/2/2006													
03	04	05	06	07	08	09	10	11	12	13	14		



Date-Time	User	Type	Event	Comment
6/29/2006 8:40 AM	JEG	Invasive Lines	Arterial Line Insertion	
6/29/2006 6:53 PM	JEG	Code Blue Events	CPR Initiated	2000
6/29/2006 6:53 PM	JEG	Code Blue Events	Emergency Med: Epinephri...	5mg 2001
6/29/2006 6:55 PM	JEG	Code Blue Events	Emergency Med: Epinephri...	
6/29/2006 6:56 PM	JEG	Code Blue Events	Emergency Med: Esmolol	
7/2/2006 11:00 AM	JEG	Respiratory Events	Extubation	
7/3/2006 8:00 AM	JEG	Activity	Physical Therapy Visit	

Add...

Edit...

Memo...

Delete

Audit Trail...



# **MARKETING MATERIAL**

## **2014**

# Did the Lasix make him pee?

Mike Gonzales Gender: M DOB: 01/04  
This page is not a complete source of visit information

## Inpatient Summary

Patient Information	
Room/Bed:	3-18/1
Admitting Diagnosis:	Congestive Heart Failure (428.0)
Admit Date:	06/20/2009
Primary Physician:	Angela Brown, MD
Emergency Contact:	Carol Gonzales
Emergency #:	(913) 123-4455
Code Status:	<b>Full Code</b>

Vital Signs

Vitals Last 10 days					
	Latest	within	Since 06/23 07:00 Min / Max	Previous 24 hours Min / Max	
Temp, degC	↑39	15 min	↑36.5/39	37/37.5	
Systolic BP mm/Hg	120	15 min	↑120/190	120/120	
Diastolic BP mm/Hg	80	15 min	80/115	90/115	
RR br/min	18	15 min	18/20	14/20	
HR bpm	78	15 min	↑60/78	72/76	
O <sub>2</sub> Sat %	99	15 min	↓90/97		
Glu (Poc) mg/dL	--	Ordered	81/110		

Lab Results

Labs Last 10 days					
	Latest	within	Previous	within	
WBC x10(3)/mcl	6.5	15 min	↓4.0	16 h	
Hemoglobin gm/dL	15	15 min	15	16 h	
Hematocrit %	45	15 min	45	16 h	
Platelets x10(3)/mcl	250	15 min	280	16 h	
Sodium mEq/L	↑145	15 min	140	16 h	
Potassium mEq/dL	4.0	15 min	3.9	16 h	
CO2 mm/Hg	38	15 min	37	16 h	
Chloride mEq/L	100	15 min	99	16 h	
Creatinine g/24hr	1.0	15 min	1.0	16 h	
BUN mg/dL	↓6.0	15 min	8.0	16 h	
Glucose mg/dL	↓60	15 min	80	16 h	
Magnesium mg/dL	2.0	15 min	1.6	16 h	
Phosphorus mg/dl	3.0	15 min	3.0	16 h	
Calcium mg/dL	9.2	15 min	10.0	16 h	
PT s	13.0	15 min	13	16 h	
INR	1.0	15 min	1.0	16 h	
PTT s	22	15 min	24	16 h	
Troponin ng/mL	--	Ordered	0.3	5 h	
CK-MB ng/mL	--	Ordered	2	5 h	
CK	--	Ordered	2	5 h	

Diagnosis (4) Active	
Acute Renal Failure (584.9)	
Congestive Cardiomyopathy (425.9)	
Congestive Heart Failure (428.0)	
Unstable Angina (411.1)	

Problems (8) Active	
Alcoholism (303.90)	
Diabetes (249)	
Esophageal Reflux (530.81)	
Esophageal Varices (456.1)	
Hepatic Artery Embolism (902.22)	
Hypertension (997.91)	
Peripheral Vascular Disease (443.9)	
Site-specific Disorder of Skin (709.9)	

Fluid Intake

Urine Output

Measurements and Weights Last 14 days					
	Latest	within	Previous	within	Change
Weight kg	90	1h	91.4	2d	+1.4
Height cm	180	2d	180	2d	0
BMI	24.4	2d	24.4	2d	0

Intake and Output 06/22/09 09:00 - Current			
	Since 06/23 07:00	Previous 24 hours	
Total Fluid Intake mL	201.2	1.135	
- IV mL	72.5	140	
Total Urine Output mL	50	200.4	
- Urine mL/kg/hr	0.28	0.625	
Stools	0	2	
Last Diet Order	2000 kcal 1...	NPO	

Allergies (3) Active	
	Reaction
ACE Inhibitors	Lips Swelling
Peanuts	Rash
Dust	Sneezing

Medications

Diagnostics (7) Last 10 days				
	Latest	Status	Previous	Status
EKG (1)				
EKG 12-lead	1 hr	Completed	3 mg	Completed

Microbiology (3)			
Source/Site	Collected within	Normality	Status
Blood, Left Arm	2 d	Growth	Final
Blood, Right Arm	1 h	--	Pending
Urine	1 h	--	Pending

Pathology Last 5 results	
	Verified Date
Surgical Pathology Report	04/23/09

# Did the Lasix make him pee?

Time of Administration

Time UOP measured before administration

Elapsed time

Time UOP measured after administration

Volume of UOP before administration

Difference in volume

Volume of UOP after administration

Blood Pressure before administration

Difference in systolic blood pressure

Blood Pressure after administration

Difference in diastolic blood pressure

Heart rate before administration

Heart rate after administration

Difference in heart rate

Potassium before administration

Potassium after administration

Difference in serum potassium

17

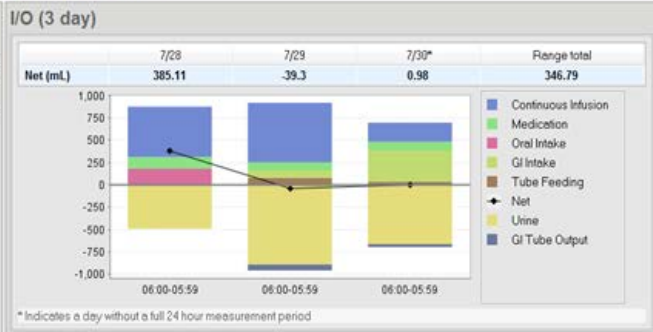
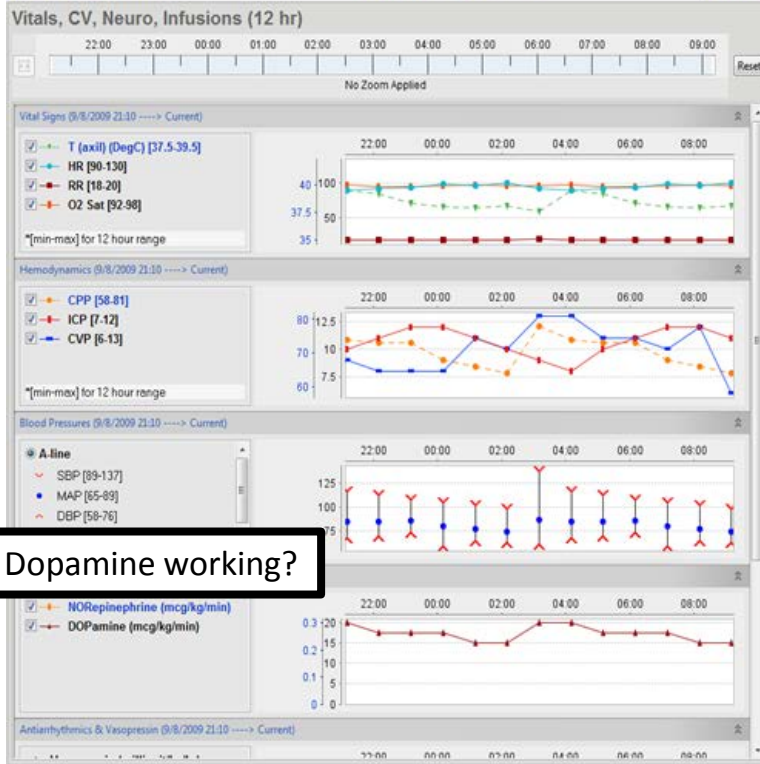
17 > 7 chunks (+/- 2)\*

\*Miller, G.A. 1956. The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review* 63(2): 81-87.

**MAKE IT VISUAL**

**Fraiser, Brenden L. 38 years M** DOB: 10/10/1970 MRN: 20378945 FIN: 050820934832 Admit: Unit LOS: 214 days Location: 7S-701-B

**Dose Weight: 32kg Actual Weight: 33.2kg Allergies: Codeine, Sulfa**



### Labs

Blood Gases (Last 2 in 24 hours)

Lab	13:51	12:52
pH	7.35 ↓	
PO2	80 ↓	
PCO2	41.0	
HCO3	18 ↓	
BD	3	
pH ven		7.44
PO2 ven		78
PCO2 ven		48
HCO3 ven		24

Chemistry

Lab	Latest	Previous
iCa	1.12	1.14
	7/30/2009 04:00	7/29/2009 16:00
Lactate	1.7 ↓	2.2 ↓
	7/30/2009 04:00	7/29/2009 16:00
Na	138	149 ↑
	7/30/2009 04:00	7/29/2009 16:00
K	5.5	2.8 ↓

### Respiratory Therapy (6 hr)

Respiratory 08:53

RR **18 bpm ↓**

O2 Delivery **BIPAP**

Mode

O2 % **40**

Ventilator 10:00 08:53

Mode **AC**

TV Set **40**

TV Inhaled **39 ML**

TV Exhaled **40 ML ↓**

Rate **12 L/min**

MAwP **12 cm H2O**

PIP **35 cm H2O** **35 cmH2O**

PEEP **5 cmH2O** **5 cmH2O**

PS **12 cmH2O ↓**

Is the Dopamine working?

**MAKE (THE CONTEXT) VISUAL**

# How to move forward?

**More research**

**What really works in clinical environments?**



**MAKE IT VISUAL**

# How to move forward?

More research

What really works in clinical environments?

**More Innovation**

**Open platforms to incorporate new designs**

**MAKE IT OPEN**

# How to move forward?

More research

What really works in clinical environments?

More Innovation

Open platforms to incorporate new designs

**More Flexible**

**Modular platforms for different environments**

**MAKE IT MODULAR**

**MAKE IT VISUAL**

**MAKE IT OPEN**

**MAKE IT MODULAR**

