

eHealth Asia 2015 Conference

Health Information Systems and Clinical Teaching

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Clinical Teaching

- **Teaching in the clinical environment is defined as teaching and learning focused on, and usually directly involving, patients and their problems**

Spencer, J., 2003. Learning and teaching in the clinical environment. *BMJ* 326, 591–594

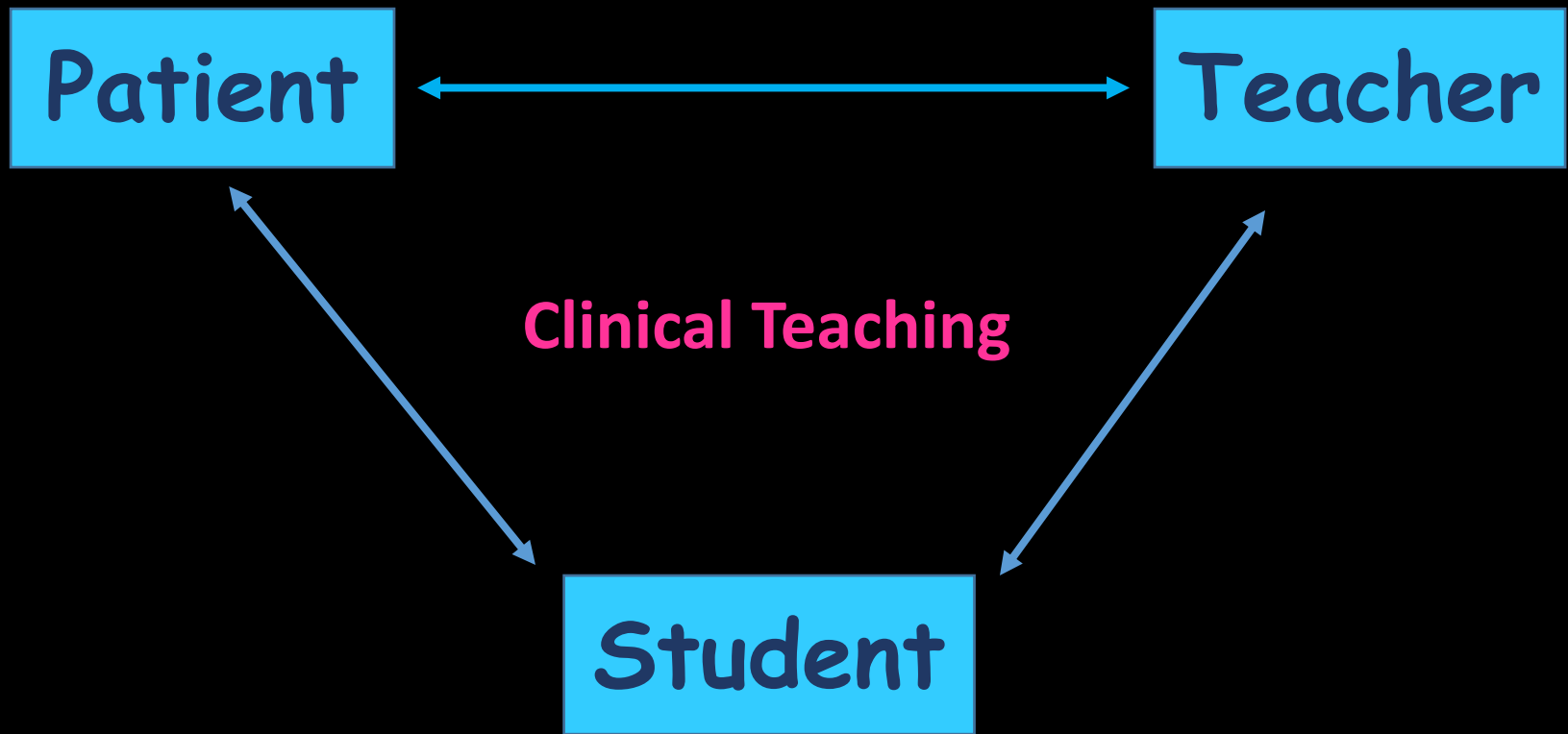
- **Teaching in the clinical setting often takes place in the course of routine clinical care where discussion and decision-making take place in real time**

Ramani, S., Leinster, S., 2008. AMEE Guide no. 34: Teaching in the clinical environment. *Med. Teach.* 30, 347–364.

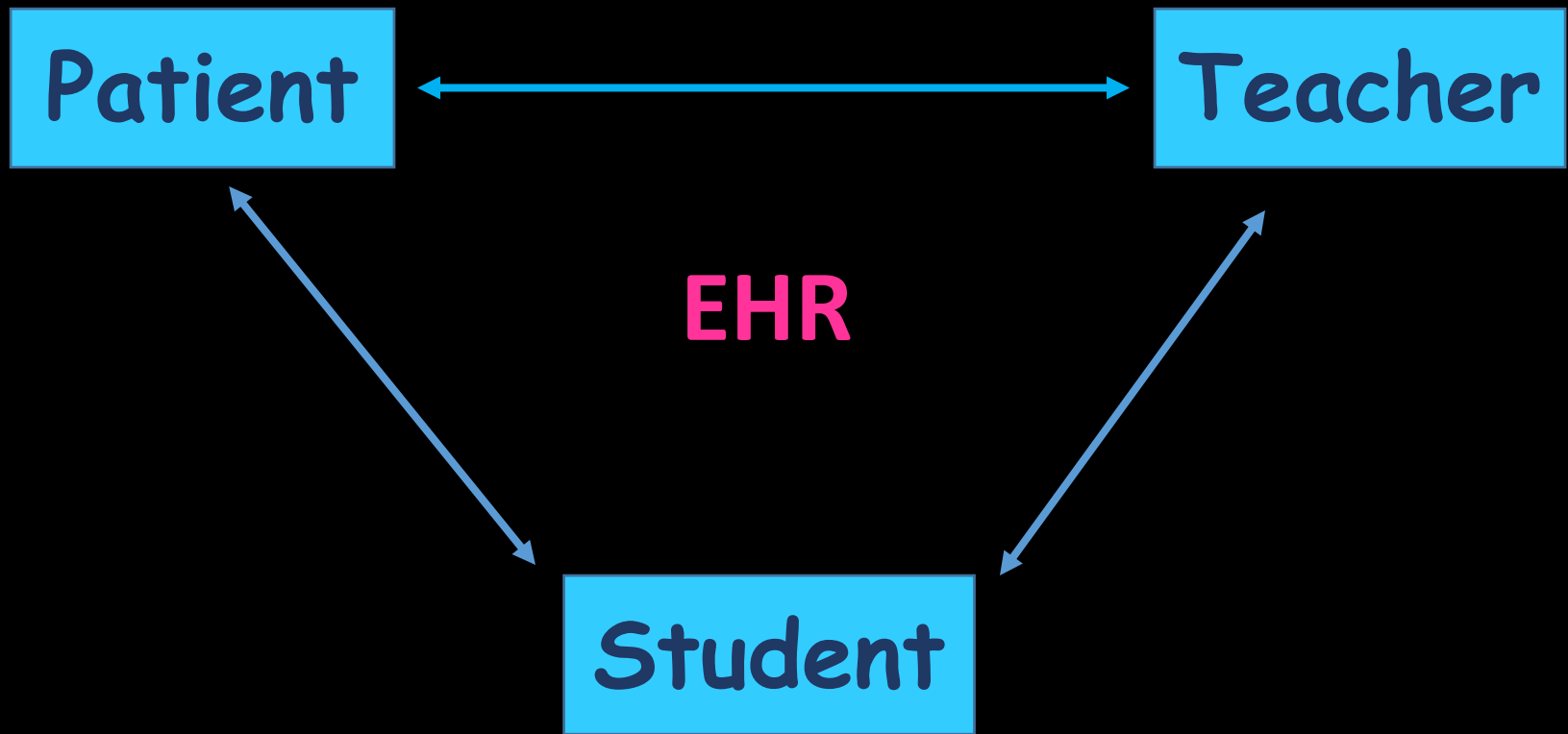
Electronic Health Records

- The Electronic Health Record (EHR) is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. Included in this information are patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports.

Clinical Teaching



Clinical Teaching



Models of clinical teaching settings

- **Shadowing**
- **Patient-centered model**
- **Apprenticeship model**
- **Demonstrator model**
- **Clinical conference**
- **Ward rounds**

EHR's are here to Stay !

- **The world moves towards HER**
- **The recent US stimulus package “The American Recovery and Reinvestment Act of 2009” includes 17 billion USD in incentives for health providers to switch to electronic health records (EHRs). (Out of 25.8 billion USD allocated for Health Information Technologies)**

Investments, J.-C., 2009. The American Recovery and Reinvestment Act of 2009.

eHealth Policy in Sri Lanka

“Using electronic systems appropriately, effectively, universally and in a co-ordinated manner”

- National eHealth Policy of Sri Lanka (DRAFT) Version 1.6.0, 2011

Benefits of EHRs

A study done using 60 third year Medical Students in the United states on their attitudes towards clinical learning using the EHRs in primary care clinics, showed EHRs

- **Organizes Information Better**
- **Improved History taking**
- **Improves documentation**
- **Improves doctor patient communication**
- **Easy to locate the patients**

Rouf, E., Chumley, H.S., Dobbie, A.E., 2008. Electronic health records in outpatient clinics: Perspectives of third year medical students. BMC Med. Educ. 8, 13.

Benefits of EHRs

- EHRs can offer creative ways to enhance the instruction of medical students and residents
 - EHR can enhance physician–patient communication (But physicians may not spontaneously acquire EHR-specific communication skills.)
 - Immediate access to clinical data prompts students to practice and demonstrate their clinical reasoning skills in real time
-
- Peled, J.U., Sagher, O., Morrow, J.B., Dobbie, A.E., 2009. Do Electronic Health Records Help or Hinder Medical Education? PLoS Med 6, e1000069

Drawbacks of EHRs

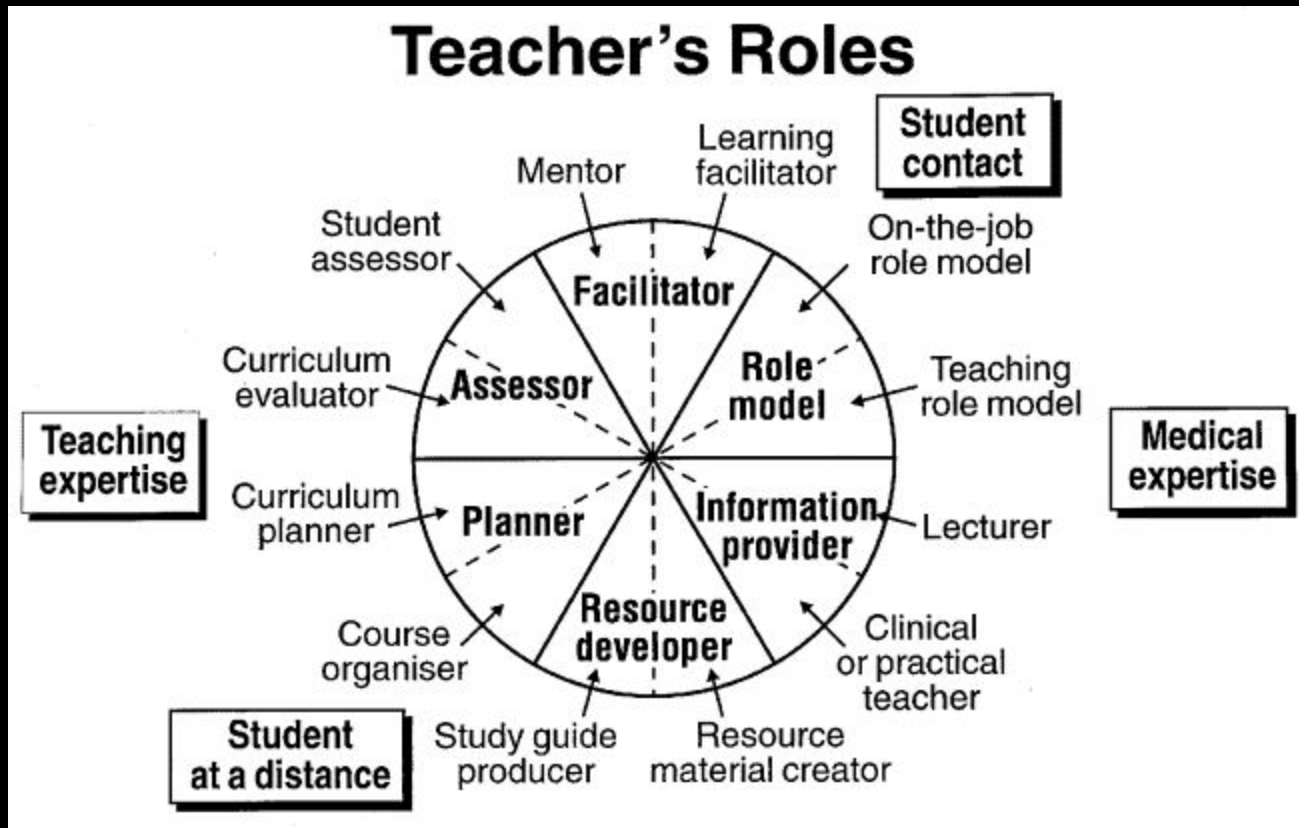
- **EHRs Bypass the Need for Trainees To Synthesize Clinical Information**
- **Today, in many cases, the attending physician has access to, and will have looked at, the diagnostic studies independently before meeting with the trainee.**
- **EHRs eliminate the need for the trainee to describe these patient data in words.**

Drawbacks of EHRs

An article by Peled on the Plos Medicine in 2009 highlightes the following drawbacks via qualitative inputs.

- Prior to EHRs, the attending physician was largely dependent upon the trainee for data about the patient, and medical students and residents learned quickly to distill facts and present them in a cogent and effective fashion.
- Environment looks more artificial with the digital inputs :not suitable for all settings
- Her distracts the teacher : Teacher busy with the HER
- Since the data is readily available; might skip information seeking using clinical skills

Teacher – Student Relationship



Crosby, R.M.H., Joy, 2000. AMEE Guide No 20: The good teacher is more than a lecturer - the twelve roles of the teacher. *Med. Teach.* 22, 334–347. doi:10.1080/014215900409429

EMR's to Improve , to be Researched on

A systematic review of 50 articles with evidence on their use in medical education by Keenan et al., 2014

- **EMRs have great potential as an educational tool, but thus far, no strong data to support their use for this are lacking.**
- **As the usage of EMRs rises, educators must continue to study how best to use technology as an educational tool and to improve the daily work of residents and medical students.**

EHRs to Improve

1. Teach students to document electronically from their earliest clinical experiences.

Early instruction allows direct transfer of students' developing skills into the clinical environment, and avoids the added burden of learners needing to assimilate the EHR as they apply their clinical skills in earnest for the first time.

2. Emphasize improved communication opportunities.

We must train students to communicate synchronously and asynchronously using the EHR.

3. Conduct faculty development around teaching with the EHR.

Many clinical faculty have personally received suboptimal training in using the EHR. Until faculty are expert EHR users, they are unlikely to be expert teachers.

- Peled, J.U., Sagher, O., Morrow, J.B., Dobbie, A.E., 2009. Do Electronic Health Records Help or Hinder Medical Education? PLoS Med 6, e1000069

Alternatives

Simulated EMRS

The screenshot displays a simulated EMR system interface. At the top left, the logo for 'simEMR' is visible. The main content area is titled 'Providers Orders' and 'Medscape'. Below this, there is a section for 'Order Entry' with a search bar and a list of orders. The orders are presented in a table with columns for 'Order ID', 'Order Description', 'Status', 'Priority', 'Quantity', 'Start Date', 'End Date', and 'Last Modified'. The table contains three rows of data. Below the table, there is a 'History' section with a list of items and a search bar. On the right side of the interface, there is a vertical sidebar with several colored markers (blue, green, red, yellow, purple, pink, orange, brown, grey, black, white, yellow, red).

Order Entry

Order ID	Order Description	Status	Priority	Quantity	Start Date	End Date	Last Modified
1	Aspirin 81mg	Open	1	1	01/01/2012	01/01/2012	01/01/2012
2	Aspirin 81mg	Open	1	1	01/01/2012	01/01/2012	01/01/2012
3	Aspirin 81mg	Open	1	1	01/01/2012	01/01/2012	01/01/2012

History



Simulated Electronic Medical Records
Where Learning Documentation Begins

Home | Instructor Admin | My Info | Course Work | Support | Education

Admissions



Admissions

Advance Directives

Consent to Treat

SimEMR Inc. Patient Admission

Scenario: CHF Template Patient Discharge Patient

Today's Date: 05/15/2011	Attending Physician: Bob Smith	ER/ADM Physician: Ryan Medle
Department: Emergency Room (ER)	Other Physician:	Family Physician: Jan Riley
LOS: 4 Days	Discharge Physician:	Admitting Diagnosis: SOB

PATIENT INFORMATION

Patient's last name: Singh First: Jack Int: C Mr. Miss. Marital status:
 Mrs. Ms. Single Mar Div Sep Wid
 Medical Record Number: 1000000325
 Account Number: 9000000325

Is this your legal name? Yes No If not, what is your legal name?
 Religion: Catholic Date of Birth: 04/27/1966 Age: 45 Sex: M F Weight: 88.6 kg Height: 188 cm

Street address: 26 Pearl Drive Social Security no.: 123-45-6789 Home phone no.: 333-285-4478

P.O. box: City: Key Largo State: FL ZIP Code: 12345

Occupation: sales Employer: self Employer phone no.: - -

Referred to hospital (Please check one box): Dr. Insurance Plan Hospital

Family Friend Close to home/work Yellow Pages Other

Admissions

Consults

Progress Notes

Providers Orders

Nurses Notes

Vitals

I & O

MAR

Labs

Care Plan



D, J

Sex: M Weight: 202 lbs
Age: 45 Y Height: 5' 10"

Code Status: 0 0
Alerts: 0 0

Isolation: 0 0
Drug Allergies: 0 0

Food Allergies: 0 1 Diet: 0 1
Env. Allergies: 0 0 BMI: 29

Health Care Provider: H D

Hospital Floor:
Medical-Surgical

Documenting in Current Date/Time [Change Date/Time]

Comments (2 New)

INFO PANEL

Vital Signs

Pain Assessment: [View](#)

- Summary
- Patient Charting
- Vital Signs**
- Vital Signs
 - Intake/Output
 - Height/Weight
 - Blood Glucose
- Order Entry
- Order Results
- Patient Card
- MAR
- Patient Teaching
- Care Plan
- Patient Data
- Reports
- Resources
- Pre-Clinical Manager

Chart Inputs

Temperature:

Fahrenheit: Site:

Celsius:

Pulse: Site:

Respiration:

Blood Pressure:

Systolic: Site:

Diastolic: Position:

Oxygenation:

Saturation %: Site:

Oxygen Delivery:

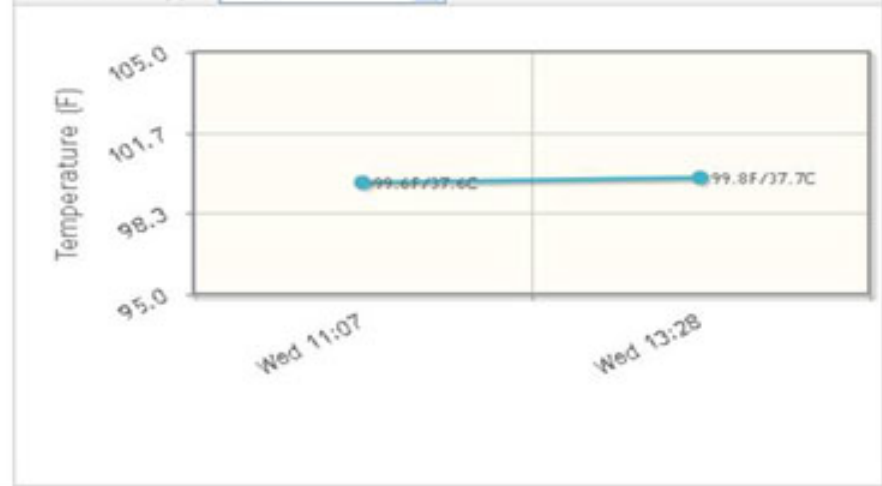
- Room Air
- Oxygen in Use (Amount in L/min):
- Oxygen in Use (Amount in %):

Chart Time	Temp	Resp	Pulse	BP	Sat%	Entry By	
Wed 13:28	99.8					S Copeland, SN	<input type="checkbox"/>
Wed 11:07	99.6					S Copeland, SN	<input type="checkbox"/>

Showing 1 to 2 of 2 entries

First Previous 1 Next Last

Select Chart Type:



Save

Cancel

Effectiveness of Simulated EMRs

- 2011 at Oregon Health & Science University (OHSU)
- Simulated EHR (Sim-EHR) curriculum was introduced
- Learners review and correct a simulated medical chart for complex virtual patients with chronic diseases
- 406 third-year OHSU medical students
- Sim-EHR curriculum was an effective, interactive method for providing learners with EHR skills education while demonstrating how a well-organized chart helps ensure safe, efficient, and quality patient care.

Milano, C.E., Hardman, J.A., Plesiu, A., Rdesinski, R.E., Biagioli, F.E., 2014. Simulated Electronic Health Record (Sim-EHR) Curriculum: Teaching EHR Skills and Use of the EHR for Disease Management and Prevention. *Acad. Med. J. Assoc. Am. Med. Coll.* 89, 399–403

RIME/EMR scheme:

“The Reporter-Interpreter-Manager-Educator scheme is one approach to teach and evaluate clinical documentation skills using EMRs in the context of the Accreditation Council for Graduate Medical Education core educational competencies.”

Stephens, M.B., Gimbel, R.W., Pangaro, L., 2011. Commentary: The RIME/EMR scheme: an educational approach to clinical documentation in electronic medical records. *Acad. Med.* 86, 11–14.

Academic EMRs (AEMR)

IAWARE, TEST1 : iAware

IAware Personalization Help

MyList Patient Search ICU Summary Meds Review Vitals/Infusions (24hr) I/O (7 Day) Reset Perspective 0 minutes ago

IAWARE, TEST1 21 M DOB: 1/1/1989 MRN: M685 FIN: V000001905
Admit: 8/9/2010 Unit LOS: 22 days Location: INTENSIVE CARE UNIT-1803ICU-1

Dose Weight: No Result **Actual Weight: 95lbs** **Allergies: Latex, Morphine, h2o, Dimethicone (From A & D Emollient), Glycerin (From A...**

Vitals, CV, Neuro, Infusions (12 hr) Labs Active Medications (Single)

Vital Signs (8/31/2010 20:20 ----> Current)

RR [18-19] T (tymp) [37.1141-37.1141] HR [66-79] O2 Sat [85-98]

Hemodynamics (8/31/2010 20:20 ----> Current)

CVP [3-8]

Blood Pressures (8/31/2010 20:20 ----> Current)

SBP [71-113] MAP [53-87] DBP [47-74]

Vasoactive Infusions (8/31/2010 20:20 ----> Current)

DOPamine ((mL/hr))

Blood Gases (Last 2 in 24 hours)

Lab	9/1 06:41	Previous
pH	7.34 ↓	
PO2	68.1 ↓	
PCO2	42.9	
HCO3	22.6	
BE	-3.2 ↓	
FiO2	80.0	
O2 %	91.8 ↓	

Chemistry

Lab	Latest	Previous
Lactate	1.7 8/31/2010 05:10	1.7 8/30/2010 23:50
Na	134 ↓ 9/1/2010 06:08	132 ↓ 8/31/2010 05:14
K	4.2 9/1/2010 06:08	4.8 ↑ 8/31/2010 05:31
Cl	105 9/1/2010 06:08	102 8/31/2010 05:14
CO2	22 9/1/2010 06:08	22 8/31/2010 05:14
BUN	34 ↑ 9/1/2010 06:08	47 ↑ 8/31/2010 05:14
Creat	1.3 9/1/2010 06:08	1.9 ↑ 8/31/2010 05:14
Glu	104 9/1/2010 06:08	142 ↑ 8/31/2010 05:14
Ca	7.9 ↓ 9/1/2010 06:08	7.7 ↓ 8/31/2010 05:14
T Bilir	0.4 9/1/2010 06:08	0.5 8/31/2010 05:14
AST	24 9/1/2010 06:08	47 8/31/2010 05:14
ALT	16 9/1/2010 06:08	20 8/31/2010 05:14
Alk Phos	82 9/1/2010 06:08	61 8/31/2010 05:14

Scheduled

ALBUTEROL/IPRATROPIUM INHALER None INH Q4
Last Dose: 2 EA (9/1/2010 07:54)

ARTIFICIAL TEARS OPHTH SOLN 15ML BTL. None OP Q2
Last Dose: 2 DROP (9/1/2010 05:44)

ENOXAPARIN 40 MG/0.4 ML SYR 40 MG SUBQ 1200
Last Dose: 40 MG (8/31/2010 11:57)

FAMOTIDINE IVPB 20 MG/50 ML BAG 20 MG IV Q12
Last Dose: 20 MG (8/31/2010 21:26)

NICOTINE 14 MG/24 HR TDSY 1 EA TD DAILY
Last Dose: 1 EA (8/31/2010 08:11)

PIPERACILLIN/TAZO 3.0 (ZOSYN) IVPB 3.375 G
Last Dose: 3.375 GM (9/1/2010 08:11)

Vanco. 1 GM FROZEN (Only) 200 MLS/HR IV Q4
Last Dose: 200 MLS/HR (9/1/2010 08:11)

PRN

0.9% NAACL 1000 ML IV .00M
Last Dose: 0 MLS/HR (9/1/2010 08:11)
Given 2 times in la

System Time: 9/1/2010 08:21 CDT User: gab3309@fas.test5.f



Thank You

Dr. Nishan Silva



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Dr. Nishan Silva