The Next Evolution of Healthcare Informatics
It's Not About Physician Adoption

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My Journey

ORLANDO FLORIDA TO SAO PAULO
Distance
Orlando, Florida to Sao Paulo, Brazil
6880 km (4275 mi)
Florida Hospital Journey
Florida Hospital Overview

• Founded in 1908 (the year paper cups were invented)
• Part of the faith-based Adventist Health System
  – 44 hospitals – 23 in the Florida Division
  – 21 across the middle and eastern United States
• Medical Staff of 2287 physicians
• Florida Hospital Medical Group - 350 in 34 specialties
• Home of the Disney Pavilion
Florida Hospital Overview

- Inpatients: 135,000
- A&E Visits: 550,000
- Outpatient Visits: 575,000
- Deliveries: 9,837
- Surgeries: 69,433
- Critical Care Beds: 435
- Inpatient Beds: 2,409
- Physicians: 2,287
- PAs and ARNPs: 571
- Employees: 19,316
Florida Division
Florida Hospital

• Florida Hospital is affiliated with the University of Central Florida, College of Medicine

• Graduate Medical Education Training Programs
  – Family Medicine, Internal Medicine, Emergency Medicine, Neuromuscular Medicine, Podiatry, General Surgery, Gynecologic Oncology, Advanced Robotics, Pediatrics, Radiology

• Areas of Excellence - Cancer Institute, Cardiovascular Institute, Global Robotics Institute, Neurosciences Institute, Orthopaedic Institute
Florida Hospital

TECHNOLOGY JOURNEY
Florida Hospital Technology Journey

2007: Initial EHR Go-Live
2008: CPOE in A&E
2009: CPOE in Hospital
2010: 
2011: X

Major Lesson Learned
The Lesson

- Dr. Kubler-Ross “On Death and Dying” – 5 Stages
  - Denial, Anger, Bargaining, Depression, Acceptance
- Physicians had to complete the 5 Stages of Grieving
- Physician could now begin the 5 stages of Involvement
  - Physician Acceptance
  - Physician Participation
  - Physician Engagement
  - Physician Adoption
- Physician Ownership
The Lesson

• In Order to Achieve Success
  • Number 1
    • We Must Create Physician Owners
  • Number 2
    • We Must Develop Physician Leaders
Number 1

CREATING PHYSICIAN OWNERS
Creating Physician Owners

• Step One
  – Identify influential and respected physicians who want to solve clinical problems and are willing to invest their time

• Step Two
  – Facilitate discussions on clinical issues where Information Technology can be used to help solve the problem
Clinical Issue #1
Clinical Issue #1
Post Spinal Anesthesia
Anticoagulation
Clinical Issue #1

- Patients who have spinal anesthesia should not have anticoagulants for 24-48 hours
- In the paper chart, there were stickers and warning labels but they could be missed
- Once a year, a patient would have a significant bleed
- An influential senior physician had been trying to solve this, unsuccessfully, for 7 years
Clinical Issue #1 – The IT Solution

• We built an order, “No Anticoagulants/No Antiplatelet Drugs”

• The physician could choose the timeframe during which the order would stay active

• Another physician could not order an anticoagulant or antiplatelet drug

• Not only would the physician be stopped, he would be told who wrote the original order
Orders

Order Name: Anticoagulants/Antiplatelet Agents
Status: Active
Start: 10/30/2015 18:00
End: 10/30/2015 18:00

Details for No Anticoagulants/Antiplatelet Agents

Requested Start Date/Time: [10/30/2015 18:00]
No anticoagulants until:
Enter Verbatim Order

1 Missing Required Details
Orders For Nurse Review

Sign
Requested Start Date/Time: [10/30/2015 18:00]

No anticoagulants until: [11/01/2015 18:00]
Enter Verbatim Order
<table>
<thead>
<tr>
<th>Order Name</th>
<th>Status</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticoagulants/Anti...</td>
<td>Ordered</td>
<td>10/30/15 18:00:00, No anticoagulants until 11/01/15 18:00:00</td>
</tr>
</tbody>
</table>
No Ordered 10/30/15 18:00:00, No anticoagulants until: 11/01/15 18:00:00
Orders

Order Name: warfarin
Status: Order
Start: 10/31/2015 17:00
Details: 5 mg PO qDay

Details for warfarin

Order details
- Dose: 5 mg
- Drug Form: Tab
- Route of administration: PO
- Frequency: qDay
- PRN: No
- PRN Reason

Detail values
- Custom Dose
- (Type Dose Here...)
- Common Doses
- 5 mg
You are attempting to order warfarin and this patient has an active order for NO ANTICOAGULANTS/NO ANTIPLATELET AGENTS until November 1, 2015 at 18:00. Ordering physician is OLIVIERA, MD EDUARDO on October 30, 2015 at 18:00. In order to complete order entry of this anticoagulant, you must either discontinue the NO ANTICOAGULANTS order or change the start date and time of this order to begin after the stop date/time listed above.
Clinical Issue #1 – Results

• Zero post spinal anesthesia bleeds were found after the order and alert were implemented

• We had our first Physician Owner
Clinical Issue #2
Clinical Issue #2
Surgical Documentation
Clinical Issue #2

• About 15% of surgeons were not completing their immediate post surgery notes
• Nurses in the post surgery recovery unit and other physicians did not know what happened during the surgical procedure
• The Chief of Surgery asked nurses to stop the surgeons before leaving the surgical area and have them write the surgical note
• That was not successful
Clinical Issue #2 – IT Solution

• Create an electronic note that will automatically bring in all of the necessary information from data that has already been documented
• Do not make the surgeon repeat the documentation that already exists in the electronic medical record
• Make it quick and simple
Click if PostOp/Procedure Information is Correct and Complete

Case Number: ORL2 2015-6789
Primary Surgeon: SURGEON MD, SURG
Assistants: Name
ASSIST, PAC, NAME
Role: Physician Assistant
Preop Dx: Rheumatic mitral stenosis
Postop Dx: SAME AS PREOP: MITRAL VALVE REGURGITATION PER DR. SURGEON
Anesthesia Type: General
Procedure: Mitral Valve Replacement or Repair with Transesophageal Echocardiogram (N/A)
Blood Loss: 600.0 mL
Blood Admin: See Anesthesia Record
Specimens: Number/Name Verified at Debrief
Grafts and Implants: See IntraOp/Procedure Nursing Record
Procedure w/o Complications: Yes
Case # ORL – 2015-8966 Mitral Valve Replacement
Surgeon: SVETLY MD, ANDREW B
Physician Assistant: Rodrigues, PAC, Juan R
PreOp Dx: Rheumatic Mitral Stenosis
PostOp Dx: Same with Mitral Valve Regurgitation
Anesthesia Type: General
Procedure: Mitral Valve Replacement with Transesophageal Echo
Blood Loss: 600 ml
Blood Admin: See Anesthesia Record
Specimens: Number/Name verified at debrief
Grafts and Implants: See IntraOp/Procedure Nursing Record
Procedure w/o Complications: Yes

I have reviewed the Post Op/Post Procedure Note and confirm that it is correct and complete.
* Final Report *

Immediate PostOp/Post Procedure Note Sign Off Entered On: 11/1/2015 13:40
Performed On: 11/1/2015 13:39 by Svetly, MD, Andrew

PostOp/Proc Note
Immedicate PostOp/Posy Proc Sign Off Case # ORL – 2015-8966
Surgeon: Svetly MD, Andrew B
Assistant: Rodrigues, PAC, Juan R
PreOp Dx: Rheumatic Mitral Stenosis
PostOp Dx: Same with Mitral Valve Regurgitation
Anesthesia Type: General
Procedure: Mitral Valve Replacement with Transesophageal Echo
Blood Loss: 600 ml
Blood Admin: See Anesthesia Record
Specimens: Number/Name verified at debrief
Grafts and Implants: See IntraOp/Procedure Nursing Record
Procedure w/o Complications: Yes
Clinical Issue #2 – Results

- An immediate post surgery note was created using documentation that already exists in the electronic medical record with two clicks.
- The Surgery Department leadership became Physician Owners.
Clinical Issue #3
Clinical Issue #3
Sepsis
Clinical Issue #3

• Sepsis was responsible for 39% of all mortality at Florida Hospital

• To make a difference in sepsis, it is necessary to:
  • Recognize the signs and symptoms of sepsis as early as possible
  • Treat aggressively (BLAS)
    • Blood cultures
    • Lactic acid level
    • Antibiotics
    • Saline bolus
Clinical Issue #3 – IT Solution

• A Sepsis Alert for early identification of patients at risk for sepsis, was made available by our electronic medical record vendor.

• We created an electronic form for our Rapid Response Team so they could quickly and appropriately evaluate patients on whom the Sepsis Alert fired.

• An electronic order set was created so patients identified with sepsis could be treated with an aggressive standard regimen.
Sepsis Alert

NAME: Daniel Silva
DATE: 11/1/2015 00:25
MRN: 70930463
BIRTH DATE: 12/7/1964
AGE: 50
LOCATION: 1RMH

This patient had the following SIRS Criteria:

10/30/2015 23:00  WBC (32.1K)
10/31/2015 00:15  HR (100 BPM)
10/31/2015 00:15  RR (24)

This patient had the following Sepsis Organ Dysfunction:

10/31/2015 00:15  SBP (86 mmHg)

BLAS Sepsis Management orders currently ordered:

Sodium Chloride 0.9%

BLAS Sepsis Management orders:

Blood Culture: Not Ordered
Lactic Acid Level: Not Ordered
Antibiotics: Not Ordered
Saline (Min 1 ltr) 500 ml Still Required

System Inflammatory Response Syndrome Criteria

- Temp  <35C (96.8F) OR >38C (100.4F)
- Heart Rate > 96 BPM
- RR > 22
- Glucose  141-200 mg/dL without a documented diagnosis of diabetes
- WBC > 12.1K < 4k OR > 10.1 % bands

Organ Dysfunction Criteria

- Lactate  > 2.1 mmol/L
- Creatinine Increase from baseline > 0.5 mg/dL
- SBP < 90 mmHg OR MAP <65 mmHg
- Bilirubin 2.1-10.0 mg/dL
Sepsis Evaluation for Rapid Response Team

A. SIRS (Systemic Inflammatory Response Syndrome)

Does the patient meet any of the following SIRS criteria?

☐ Does not meet any of the listed criteria
☐ Temperature less than 36°C or greater than 38°C
☐ Heart rate less than 60
☐ Respiratory rate greater than 22 or PaCO2 less than 32
☐ WBC less than 4000, greater than 12000 or greater than 10% bands
☐ Acute change in level of consciousness
☐ Glucose greater than 140 and non-diabetic

IF TWO OR MORE boxes are checked in this section, you will be required to continue to section B.

B. Infection/Potential Infection Criteria

Are any of the following conditions present?

DOCUMENTED, SUSPECTED, OR NEW:
Examples include but not limited to: pneumonia, UTI, meningitis, endocarditis, immunosuppressed (chemo, post transplant), recent surgery/procedure, abdominal pain/infection, implantable device or infection (blood stream catheter, skin, bone, wounds)

ANTINFECTIVE THERAPY:
Receiving antibiotics, antifungal or other anti-infective therapy (non-p/p/oxytetracycline)

☐ No at risk condition or anti-infective therapies identified
☐ Yes, at risk condition or anti-infective therapy identified

C. Acute Organ Dysfunction Criteria

Are any of the following criteria indicating possible, new or advancing organ dysfunction present?

Only document NEW or CHANGE from baseline - not expected values, chronic conditions, or condition related to sepsis

If the patient screens POSITIVE for SEVERE SEPSIS and NOT in ICU, notify Rapid Response Team and Physician

Rapid Response Team Contacted?
☐ Yes - Called or paged rapid response team
☐ No - Currently in ICU
☐ No - Provider is bedside (Physician, PA, or ARNP)
☐ No - Positive sepsis in ED, treatment began within last 6 hrs

Provider Contacted?
☐ Yes - Called or paged provider
☐ No
### Sepsis Order Set

**Continuous Infusions**

- **Sodium Chloride 0.9% (NS Bolus)**
  
  2,460 ml, Soln, IVPB, Once, PRN other. Infuse Over: 60 Min. STAT. For SBP less than 90 mmHg or MAP less than 65 mmHg, or Lactic Acid level greater than 4. If after initial NS Bolus SBP remains less than 90 mmHg or MAP remains less than 65 mmHg, notify physician STAT for further recommendations. Target Dose: NS BOLU...

**Pneumonia, CAP Non- ICU Admit Antimicrobial**

- **Pneumonia, HAP/HCAp and VAP Antimicrobial**
  
  **Pneumonia, Suspected Pseudomonas Antimicrobial**

- **Feverile Neutropenia (First Line):** Use piperacillin/tazobactam (Zosyn). Consider adding tobramycin if pt has been admitted for 72 hr, admitted to the intensive care unit, or has a history of multi-drug resistant organism(s).

- **Tobramycin**
  
  7 mg/kg, IVPB, Once, Sepsis/Febrile Neutropenia, STAT, for CIC 30 ml/min or greater, PHARMACIST CONSULT to manage dosing and monitoring.

- **Feverile Neutropenia (Alternate Therapy):** Use cefepime (Maxipime). Consider adding tobramycin if pt has been admitted for 72 hr, admitted to the intensive care unit, or has a history of multi-drug resistant organism(s).

- **Tobramycin**
  
  7 mg/kg, IVPB, Once, Sepsis/Febrile Neutropenia, STAT, for CIC 30 ml/min or greater, PHARMACIST CONSULT to manage dosing and monitoring.

- **Feverile Neutropenia (PCN allergy, Anaphylactic):** Use aztreonam (Azactam) AND vancomycin AND tobramycin

- **Aztreonam (Azactam)**
  
  2 g, Injectable, IVPB, q6h, Sepsis/Febrile Neutropenia, STAT, for CIC 30 ml/min or greater, PHARMACIST CONSULT to manage dosing and monitoring.

- **Vancomycin (Vancomycin Ini)**
  
  25 mg/kg, IVPB, Once, Sepsis/Febrile Neutropenia, STAT, Rounded to nearest 250 mg. Max dose 3 gms. PHARMACIST CONSULT to manage dosing and monitoring.
Clinical Issue #3 – Results

• The new Sepsis Alert, new Sepsis Evaluation Tool for RRT, and new Sepsis Order Set were implemented in multiple units

• Sepsis was identified earlier

• Patients were treated earlier
Sepsis Mortality Rate in Study Units

- 705/3,316 (2013) = 21%
- 774/4,051 (2014) = 19%
- 230/1,495 (Q1 2015) = 15%

The mortality rates have shown a downward trend.
Clinical Issue #3 – Results

• The new Sepsis Alert, new Sepsis Evaluation Tool for RRT, and new Sepsis Order Set were implemented in multiple units

• Sepsis was identified earlier

• Patients were treated earlier

• The entire Infectious Disease Department became Physician Owners
Number 2

DEVELOPING PHYSICIAN LEADERS
Developing Physician Leaders

• Physicians are taught to
  • Act independently -- not as part of a team
  • Take action with limited information
  • Make difficult decisions
• Physicians are not taught to be leaders
Developing Physician Leaders

• Florida Hospital chose to develop true Physician Leaders and brought in Mark Hertling

General Mark Hertling

• Yes, we chose an three star US Army General, to teach physicians how to be leaders
Developing Physician Leaders

• General Hertling observed physicians and noted the following similarities between physicians and soldiers
  • Physicians live by a “Code of Ethics”
  • Physicians require unmatched competence in “Knowledge and Skills”
  • Physicians have “Standards of Performance”
  • Physicians have a unique responsibility which cannot be performed by others in society
  • Physicians must go through constant training and education to maintain and improve their skills
Developing Physician Leaders

- Gen’l Hertling developed a 10 month leadership course based on what he taught soldiers
  - 100 physicians applied - 34 were selected
- The most important lesson they learned
- Management is about processes and what you do
- Leadership is about people and who you are
Physician Leaders Take Ownership

• Our Physician Leaders took ownership of all clinical IT
• They formed and lead the Medical Staff Information Technology Committee (MSITC)
• All IT decisions affecting the medical staff go through the MSITC
• The MSITC chose to hold the medical staff to standards of performance for training, CPOE, and documentation
• Non performance results in loss of hospital privileges
Physician Leaders Take Ownership

Medical Executive Committee

- Medical Staff Officers
  - President
  - President-Elect
  - Secretary/Treasurer

Physician Ownership and Leadership Committee

- FH Altamonte Chief of Staff
- FH Orlando Chief of Staff
- FH Apopka Chief of Staff
- FH Celebration Chief of Staff
- FH Children’s Chief of Staff
- FH Kissimmee Chief of Staff
- FH Winter Park Chief of Staff
- FH East Orlando Chief of Staff
Physician Leaders Take Ownership

2007
- Initial EHR Go-Live

2008
- CPOE in A&E

2009
- CPOE in Hospital

2010
- Ambulatory EHR (FHMG)

2011
- Communication Portal

2012
- Electronic Notes
ePrescribe

2013
- Electronic ECG

2014
- Automated Vital Signs

2015
- Medication Bar Coding
Physician Leaders Take Ownership

2007
Initial EHR Go-Live

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CPOE in A&E

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CPOE in Hospital

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Ambulatory EHR (FHMG)

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Communication Portal

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Electronic Notes ePrescribe
Electronic ECG
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2015

THE LEAPFROG GROUP
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Thank you