Being a System Administrator of a Clinical Information System

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Administrator of CIS
ICU, PYNEH

What is System Administration?

- <<Project Manager during establishment>>

- Over look the computer systems and the ways people use them
  - Knowledge of the purposes of using the computers
  - Understand the behaviour of hardware / software

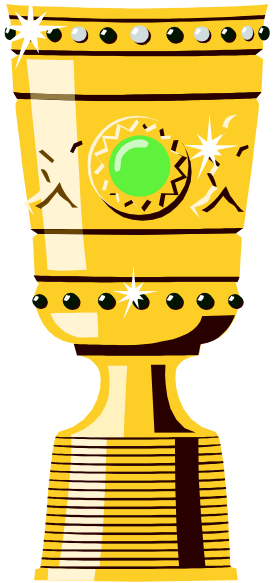
- Problem solving under constraints and stress
  - Quickly & correctly diagnose what is wrong
  - Offer the best to fix it

Project Management

- Difficulties
  - No previous experience by project team members
  - Scope vaguely defined
  - Reluctance to change
  - Big-bang vs. Phased approach
  - Limitation of resources
  - Meeting deadlines

Factors for Successful Project

- Commit the organization to the project
  - Involve the stakeholder/system owner early (HCE/Pathology/Pharmacy/COSs)
  - Risk assessment and management
- Communicate with team members
  - Changing requirements
  - Check progress
  - Handle unexpected issues

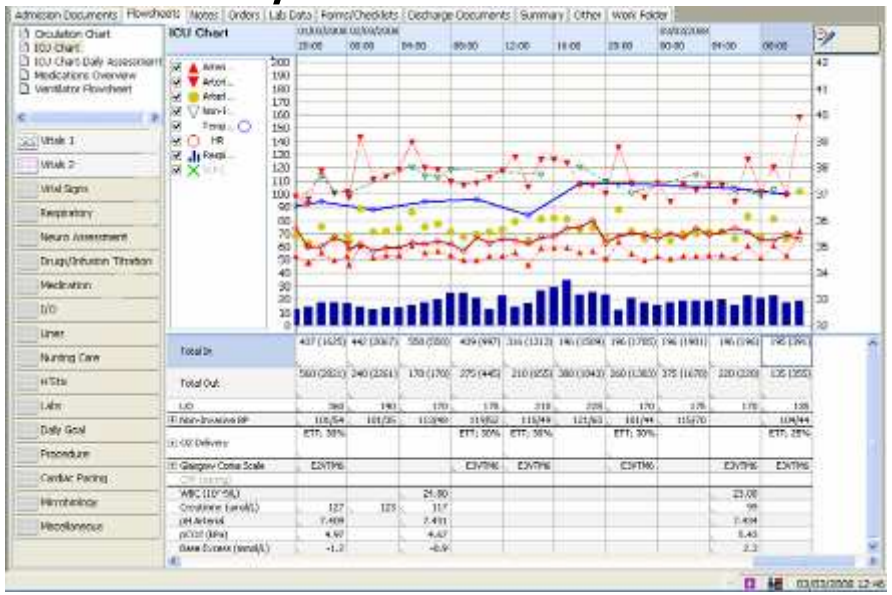


Who You Needed to Contact

- COS of Pathology
  - Release of lab data
- COS of Radiology
  - Release of X-ray
- Drug Committee / Pharmacy
  - Approving the use eMAR
- Hospital's/HA IT
  - Network/Hardware/Data transfer
- Facility Management
  - Air-con
  - Cabling
- Non-ICU doctors
  - Briefing sessions (15-30min)
- DOM/WM of other departments
  - Handling of record/MAR

Design New Workflow

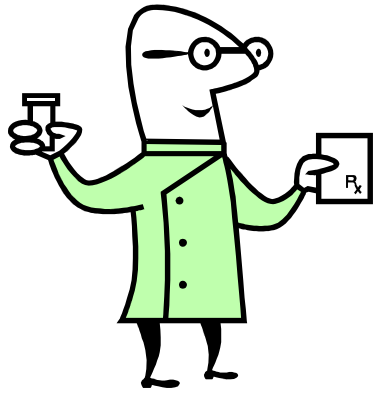
- Charting System
  - Decide on layout / how to read / handover
  - Mapping of data
    - Physiological Monitor
    - Ventilator
    - Laboratory Result
    - Patient's Demographics



- Logical & familiar to users

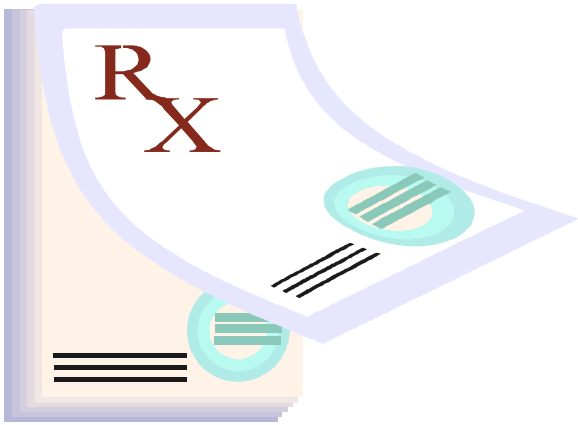
Design of New Workflow

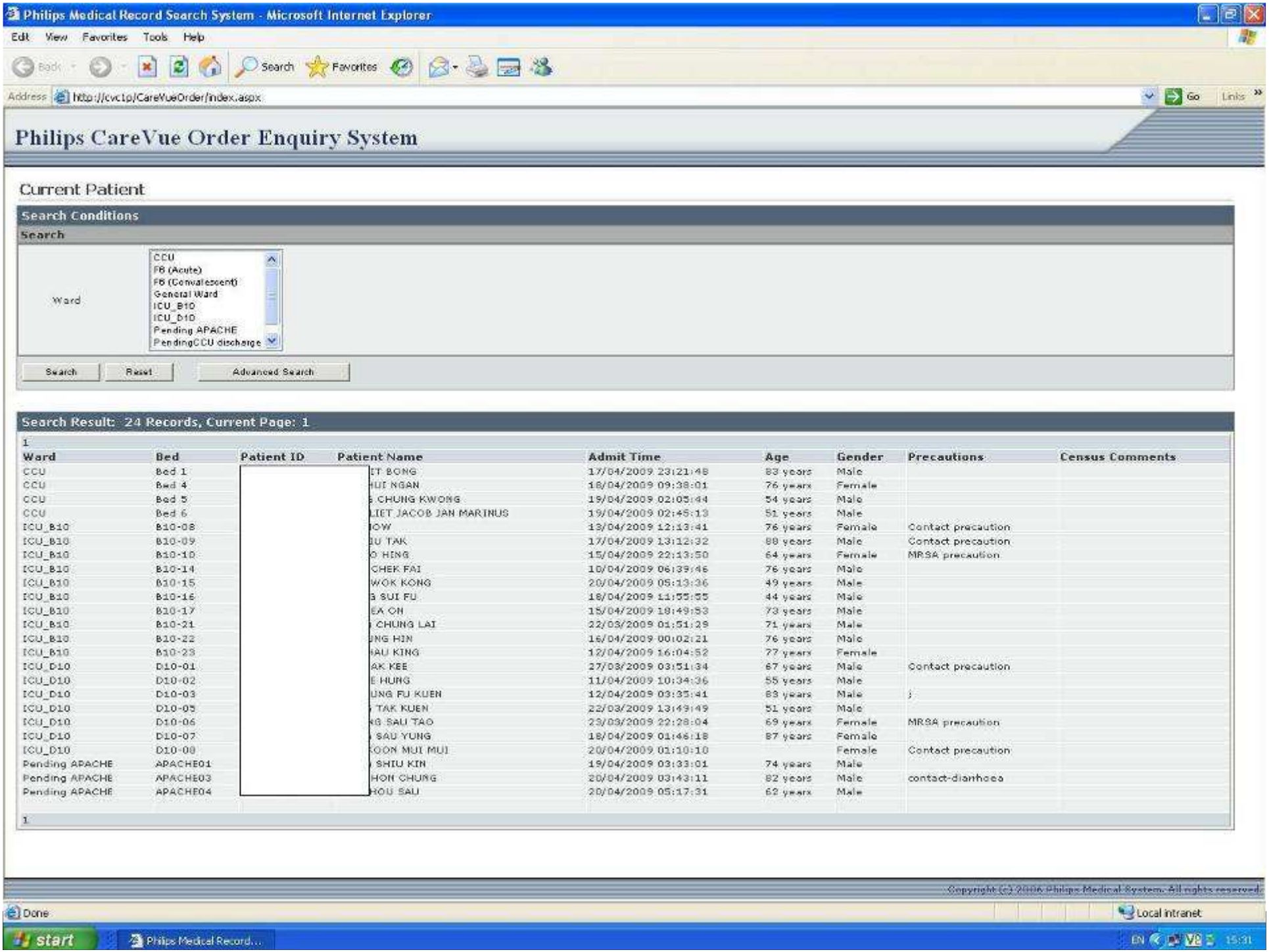
- Ordering System
  - Physician
    - Medication
    - Blood transfusion
    - TPN
    - Lab test
    - Ventilator
    - Dialysis
    - Defibrillation
    - Pacemaker
    - other treatment
  - Nurse
    - MAR
    - I/O chart
    - Nursing Prescription
  - Pharmacy
    - Drug dispensing



Drug Dispensing

- Prescription rights
- Doctor do most prescription on CIS
  - Paper + CIS entry with TPN, Blood
  - Drug Scheduling
- Nurse informed
  - By system + By doctor
  - First check point
- Prescription sent to Pharmacy
  - Semi-automatic process

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Edit View Favorites Tools Help
Search Favorites
Address http://cvc1p/CareVueOrder/index.aspx
Go Links
Philips CareVue Order Enquiry System
Current Patient
Search Conditions
Search
Ward
CCU
F6 (Acute)
F6 (Convalescent)
General Ward
ICU_B10
ICU_D10
Pending APACHE
PendingCCU discharge
Search
Reset
Advanced Search
Search Result: 24 Records, Current Page: 1
1
Ward Bed Patient ID Patient Name Admit Time Age Gender Precautions Census Comments
CCU Bed 1 IT BONG 17/04/2009 23:21:48 83 years Male
CCU Bed 4 HUI NGAN 16/04/2009 09:38:01 76 years Female
CCU Bed 5 CHUNG KWONG 19/04/2009 02:05:44 54 years Male
CCU Bed 6 LIET JACOB JAN MARINUS 19/04/2009 02:45:13 51 years Male
ICU_B10 B10-08 IOW 13/04/2009 12:13:41 76 years Female Contact precaution
ICU_B10 B10-09 IU TAK 17/04/2009 13:12:32 88 years Male Contact precaution
ICU_B10 B10-10 O HING 15/04/2009 22:13:50 64 years Female MRSA precaution
ICU_B10 B10-14 CHEK FAI 10/04/2009 06:39:46 76 years Male
ICU_B10 B10-15 WOK KONG 20/04/2009 05:13:36 49 years Male
ICU_B10 B10-16 SUI FU 16/04/2009 11:55:55 44 years Male
ICU_B10 B10-17 EA ON 15/04/2009 18:49:53 73 years Male
ICU_B10 B10-21 CHUNG LAI 22/03/2009 01:51:29 71 years Male
ICU_B10 B10-22 NG HIN 16/04/2009 00:02:21 76 years Male
ICU_B10 B10-23 AU KING 12/04/2009 16:04:52 77 years Female
ICU_D10 D10-01 AK KEE 27/03/2009 03:51:34 67 years Male Contact precaution
ICU_D10 D10-02 E HUNG 11/04/2009 10:34:36 55 years Male
ICU_D10 D10-03 UNG FU KUEN 12/04/2009 03:35:41 83 years Male
ICU_D10 D10-05 TAK KUEN 22/03/2009 13:49:49 51 years Male
ICU_D10 D10-06 G SAU TAO 23/03/2009 22:28:04 69 years Female MRSA precaution
ICU_D10 D10-07 SAU YUNG 18/04/2009 01:46:18 87 years Female
ICU_D10 D10-08 OON MUI MUI 20/04/2009 01:10:10 Female Contact precaution
Pending APACHE APACHE01 SHIU KIN 19/04/2009 03:33:01 74 years Male
Pending APACHE APACHE03 HON CHUNG 20/04/2009 03:43:11 82 years Male contact-dianhoea
Pending APACHE APACHE04 HOU SAU 20/04/2009 05:17:31 62 years Male
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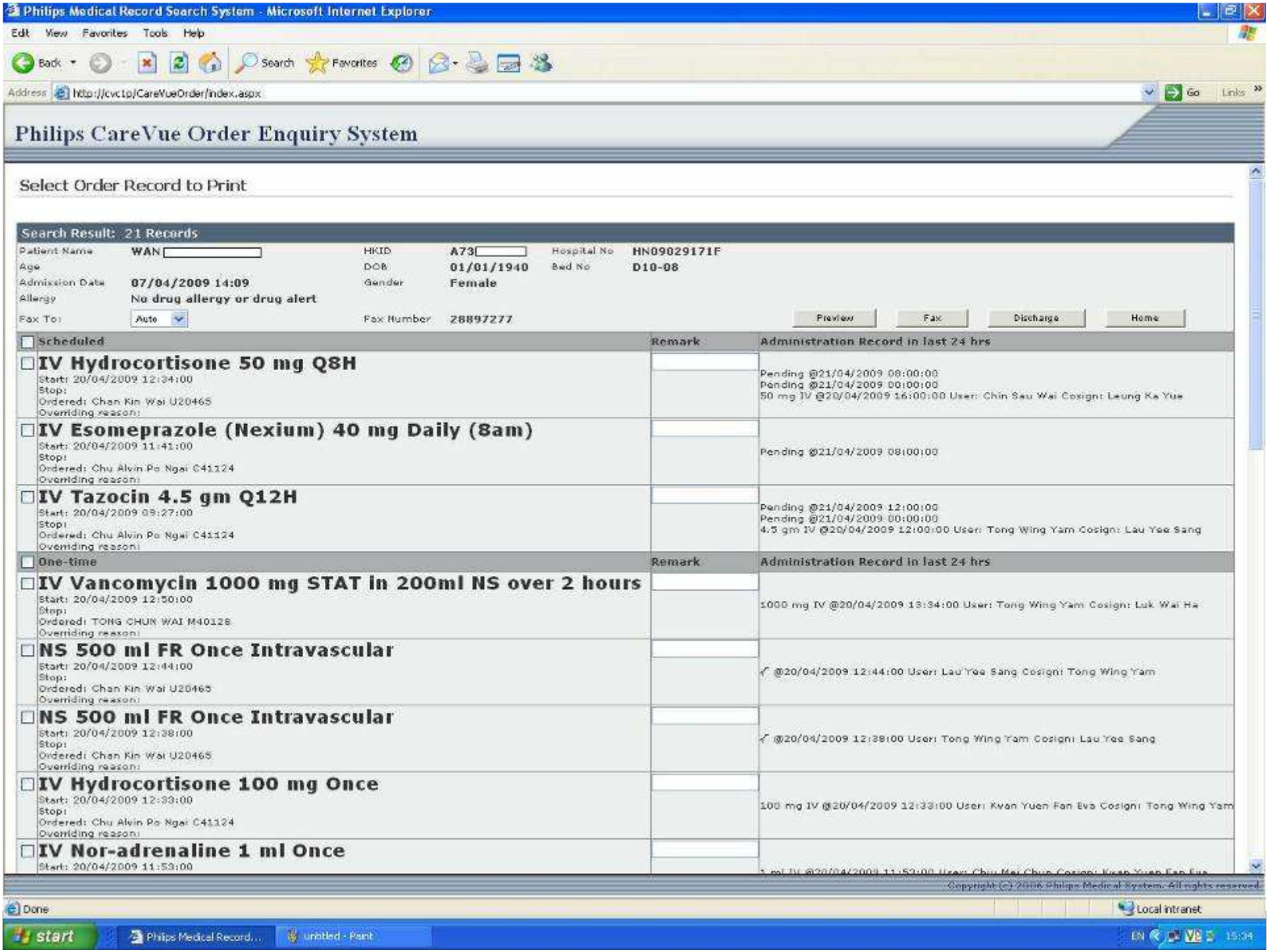
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Back Search Favorites
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Go Links
Philips CareVue Order Enquiry System
Select Order Record to Print
Search Result: 21 Records
Patient Name WAN
HKID A73
Hospital No HN09029171F
Age
DOB 01/01/1940
Bed No D10-08
Admission Date 07/04/2009 14:09
Gender Female
Allergy No drug allergy or drug alert
Fax To: Auto
Fax Number 28897277
Preview
Fax
Discharge
Home
Scheduled
Remark
Administration Record in last 24 hrs
IV Hydrocortisone 50 mg Q8H
Start: 20/04/2009 12:34:00
Stop:
Ordered: Chan Kin Wai U20465
Overriding reason:
Pending @21/04/2009 08:00:00
Pending @21/04/2009 00:00:00
50 mg IV @20/04/2009 16:00:00 User: Chin Sau Wai Cosign: Leung Ka Yue
IV Esomeprazole (Nexium) 40 mg Daily (8am)
Start: 20/04/2009 11:41:00
Stop:
Ordered: Chu Alvin Po Ngai C41124
Overriding reason:
Pending @21/04/2009 08:00:00
IV Tazocin 4.5 gm Q12H
Start: 20/04/2009 09:27:00
Stop:
Ordered: Chu Alvin Po Ngai C41124
Overriding reason:
Pending @21/04/2009 12:00:00
Pending @21/04/2009 00:00:00
4.5 gm IV @20/04/2009 12:00:00 User: Tong Wing Yam Cosign: Lau Yee Sang
One-time
Remark
Administration Record in last 24 hrs
IV Vancomycin 1000 mg STAT in 200ml NS over 2 hours
Start: 20/04/2009 12:50:00
Stop:
Ordered: TONG CHUN WAI M40128
Overriding reason:
1000 mg IV @20/04/2009 13:34:00 User: Tong Wing Yam Cosign: Luk Wai Ha
NS 500 ml FR Once Intravascular
Start: 20/04/2009 12:44:00
Stop:
Ordered: Chan Kin Wai U20465
Overriding reason:
@20/04/2009 12:44:00 User: Lau Yee Sang Cosign: Tong Wing Yam
NS 500 ml FR Once Intravascular
Start: 20/04/2009 12:38:00
Stop:
Ordered: Chan Kin Wai U20465
Overriding reason:
@20/04/2009 12:38:00 User: Tong Wing Yam Cosign: Lau Yee Sang
IV Hydrocortisone 100 mg Once
Start: 20/04/2009 12:33:00
Stop:
Ordered: Chu Alvin Po Ngai C41124
Overriding reason:
100 mg IV @20/04/2009 12:33:00 User: Kwan Yuen Fan Eva Cosign: Tong Wing Yam
IV Nor-adrenaline 1 ml Once
Start: 20/04/2009 11:53:00
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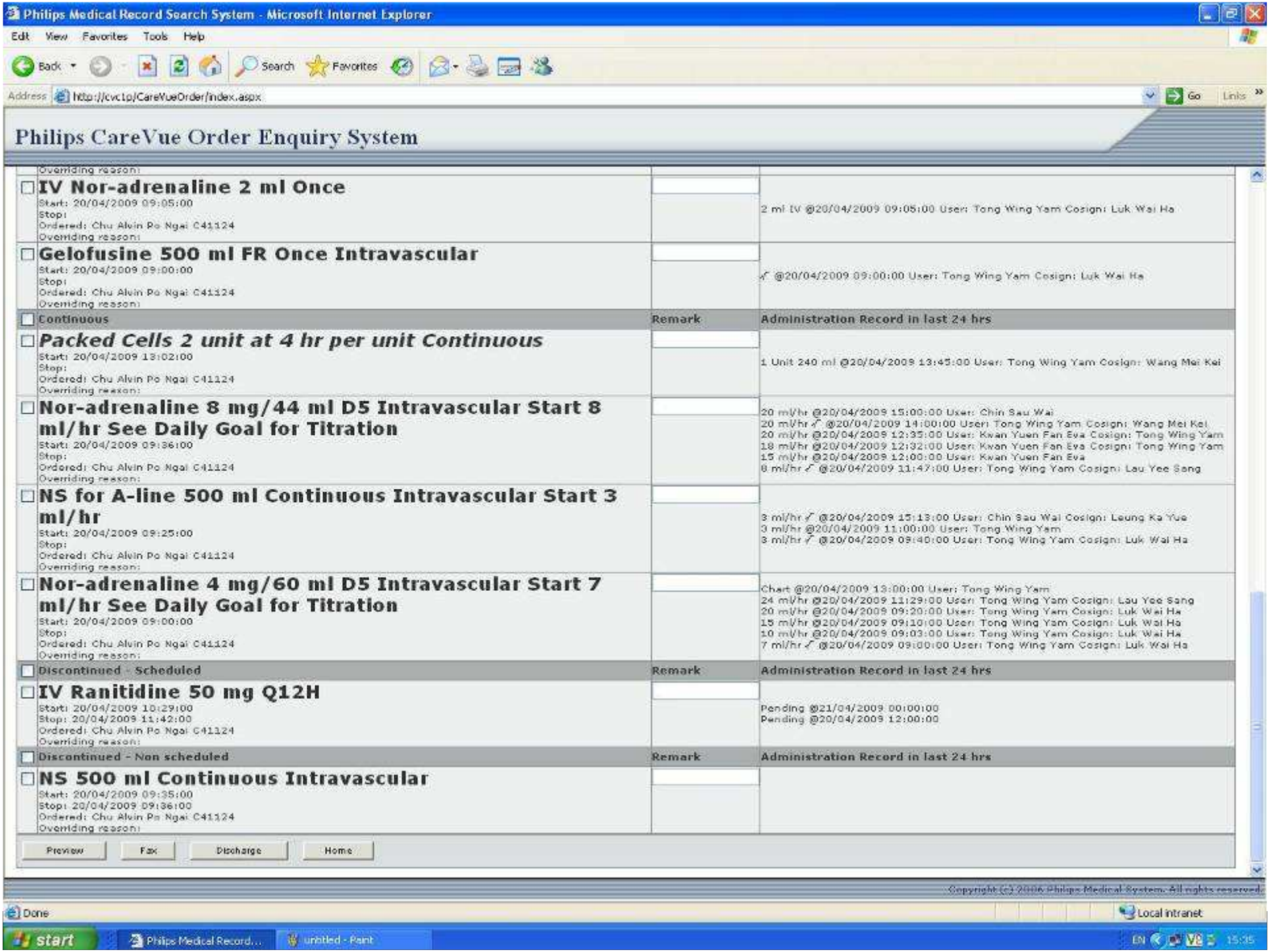
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Edit View Favorites Tools Help
Back Search Favorites
Address http://cvc1p/CareVueOrder/index.aspx
Go Links
Philips CareVue Order Enquiry System
Overriding reason:
IV Nor-adrenaline 2 ml Once
Start: 20/04/2009 09:05:00
Stop:
Ordered: Chu Alvin Po Ngai C41124
Overriding reason:
2 ml IV @20/04/2009 09:05:00 User: Tong Wing Yam Cosign: Luk Wai Ha
Gelofusine 500 ml FR Once Intravascular
Start: 20/04/2009 09:00:00
Stop:
Ordered: Chu Alvin Po Ngai C41124
Overriding reason:
✓ @20/04/2009 09:00:00 User: Tong Wing Yam Cosign: Luk Wai Ha
Continuous
Remark
Administration Record in last 24 hrs
Packed Cells 2 unit at 4 hr per unit Continuous
Start: 20/04/2009 13:02:00
Stop:
Ordered: Chu Alvin Po Ngai C41124
Overriding reason:
1 Unit 240 ml @20/04/2009 13:45:00 User: Tong Wing Yam Cosign: Wang Mei Kei
Nor-adrenaline 8 mg/44 ml D5 Intravascular Start 8 ml/hr See Daily Goal for Titration
Start: 20/04/2009 09:36:00
Stop:
Ordered: Chu Alvin Po Ngai C41124
Overriding reason:
20 ml/hr @20/04/2009 15:00:00 User: Chin Sau Wai
20 ml/hr ✓ @20/04/2009 14:00:00 User: Tong Wing Yam Cosign: Wang Mei Kei
20 ml/hr @20/04/2009 12:35:00 User: Kwan Yuen Fan Eva Cosign: Tong Wing Yam
18 ml/hr @20/04/2009 12:32:00 User: Kwan Yuen Fan Eva Cosign: Tong Wing Yam
15 ml/hr @20/04/2009 12:00:00 User: Kwan Yuen Fan Eva
8 ml/hr ✓ @20/04/2009 11:47:00 User: Tong Wing Yam Cosign: Lau Yee Sang
NS for A-line 500 ml Continuous Intravascular Start 3 ml/hr
Start: 20/04/2009 09:25:00
Stop:
Ordered: Chu Alvin Po Ngai C41124
Overriding reason:
3 ml/hr ✓ @20/04/2009 15:13:00 User: Chin Sau Wai Cosign: Leung Ka Yue
3 ml/hr @20/04/2009 11:00:00 User: Tong Wing Yam
3 ml/hr ✓ @20/04/2009 09:40:00 User: Tong Wing Yam Cosign: Luk Wai Ha
Nor-adrenaline 4 mg/60 ml D5 Intravascular Start 7 ml/hr See Daily Goal for Titration
Start: 20/04/2009 09:00:00
Stop:
Ordered: Chu Alvin Po Ngai C41124
Overriding reason:
Chart @20/04/2009 13:00:00 User: Tong Wing Yam
24 ml/hr @20/04/2009 11:29:00 User: Tong Wing Yam Cosign: Lau Yee Sang
20 ml/hr @20/04/2009 09:20:00 User: Tong Wing Yam Cosign: Luk Wai Ha
15 ml/hr @20/04/2009 09:10:00 User: Tong Wing Yam Cosign: Luk Wai Ha
10 ml/hr @20/04/2009 09:03:00 User: Tong Wing Yam Cosign: Luk Wai Ha
7 ml/hr ✓ @20/04/2009 09:00:00 User: Tong Wing Yam Cosign: Luk Wai Ha
Discontinued - Scheduled
Remark
Administration Record in last 24 hrs
IV Ranitidine 50 mg Q12H
Start: 20/04/2009 10:29:00
Stop: 20/04/2009 11:42:00
Ordered: Chu Alvin Po Ngai C41124
Overriding reason:
Pending @21/04/2009 00:00:00
Pending @20/04/2009 12:00:00
Discontinued - Non scheduled
Remark
Administration Record in last 24 hrs
NS 500 ml Continuous Intravascular
Start: 20/04/2009 09:35:00
Stop: 20/04/2009 09:36:00
Ordered: Chu Alvin Po Ngai C41124
Overriding reason:
Preview
Fax
Discharge
Home
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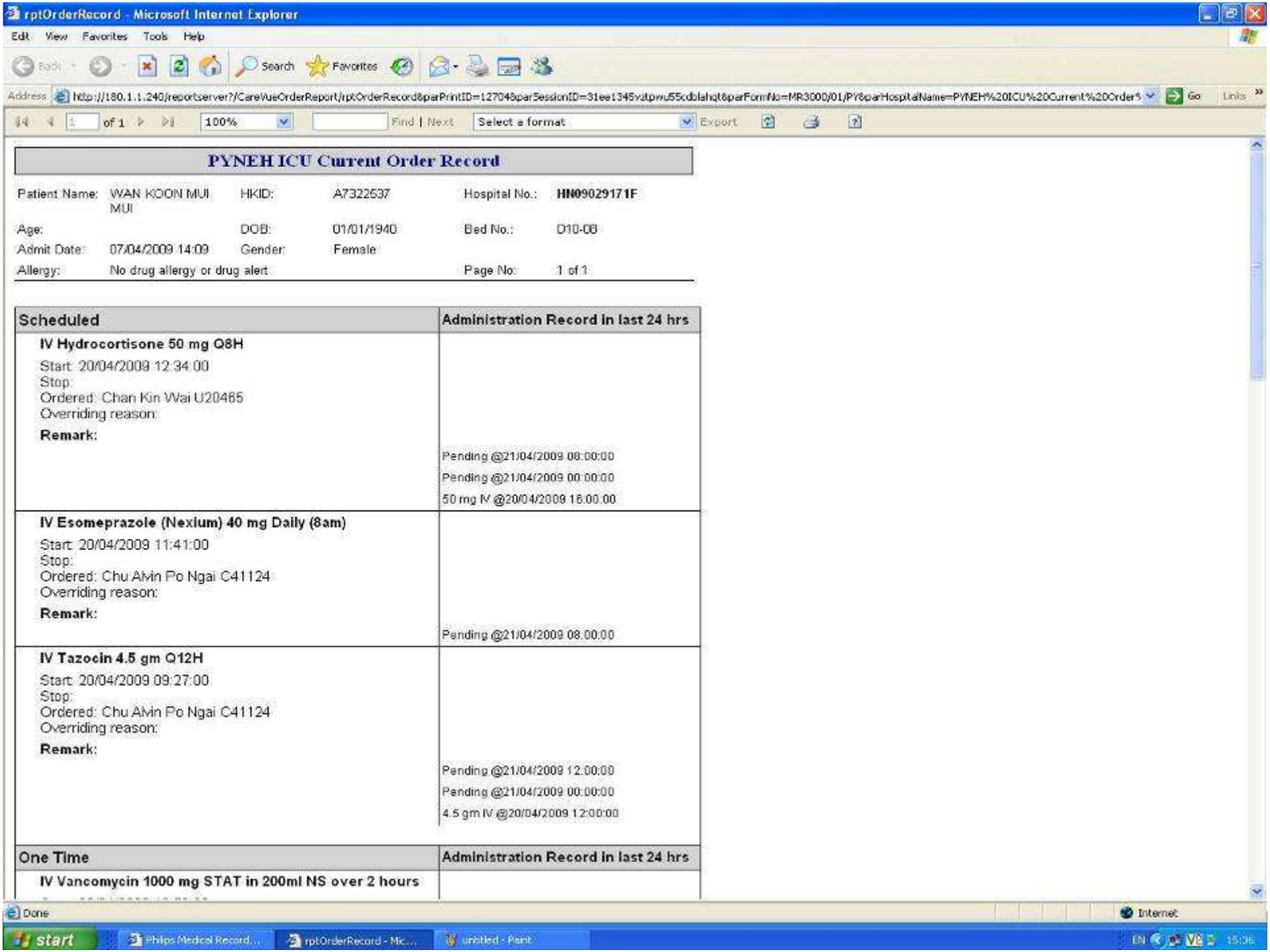


PYNEH ICU Current Order Record

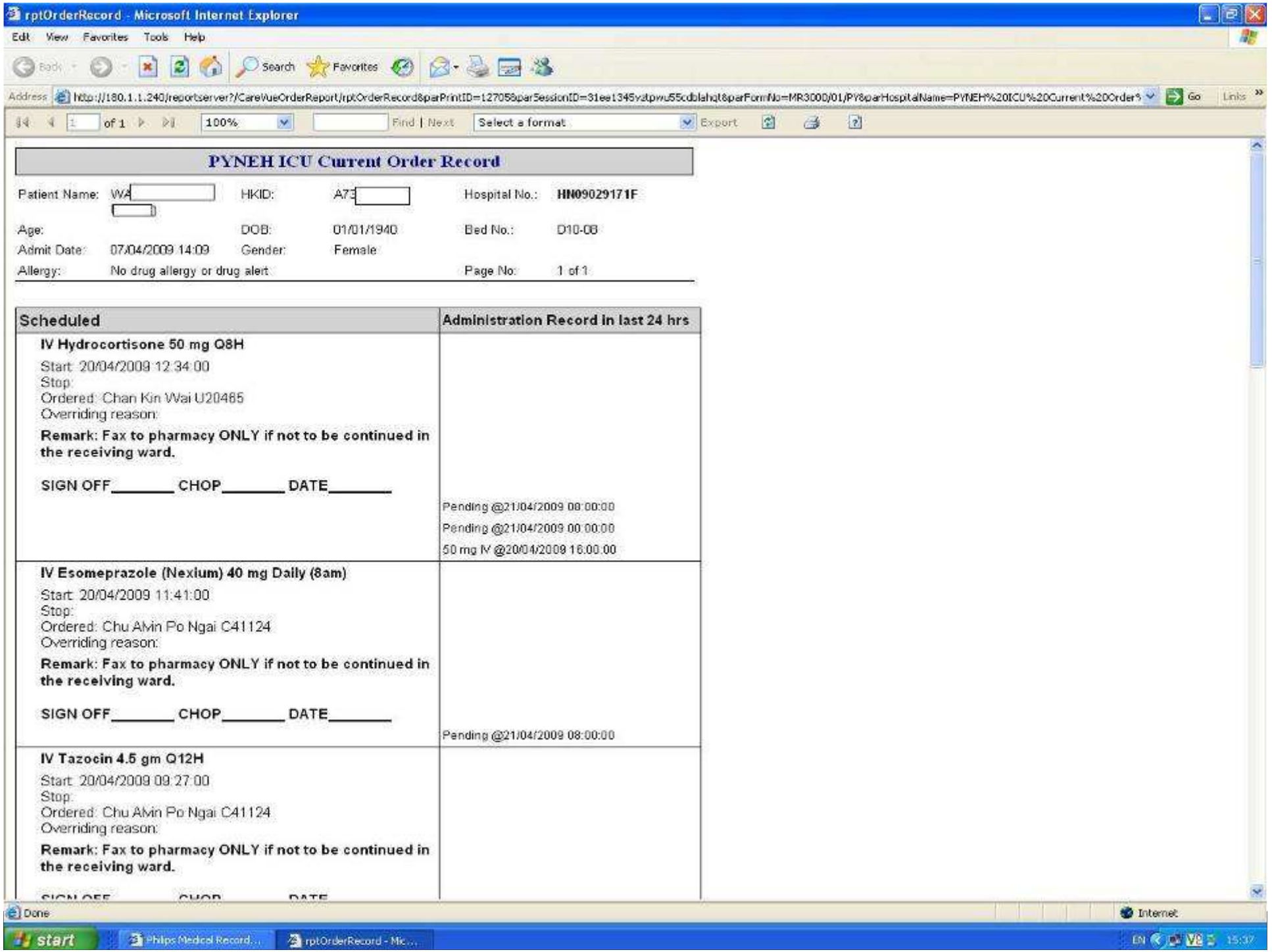
Patient Name:	WAN KOON MUI MUI	HKID:	A7322537	Hospital No.:	**HN09029171F**
Age:		DOB:	01/01/1940	Bed No.:	D10-08
Admit Date:	07/04/2009 14:09	Gender:	Female		
Allergy:	No drug allergy or drug alert			Page No:	1 of 1

Scheduled	Administration Record in last 24 hrs
IV Hydrocortisone 50 mg Q8H Start: 20/04/2009 12:34:00 Stop: Ordered: Chan Kin Wai U20465 Overriding reason: **Remark:**	Pending @21/04/2009 08:00:00 Pending @21/04/2009 00:00:00 50 mg IV @20/04/2009 16:00:00
IV Esomeprazole (Nexium) 40 mg Daily (8am) Start: 20/04/2009 11:41:00 Stop: Ordered: Chu Amin Po Ngai C41124 Overriding reason: **Remark:**	Pending @21/04/2009 08:00:00
IV Tazocin 4.5 gm Q12H Start: 20/04/2009 09:27:00 Stop: Ordered: Chu Amin Po Ngai C41124 Overriding reason: **Remark:**	Pending @21/04/2009 12:00:00 Pending @21/04/2009 00:00:00 4.5 gm IV @20/04/2009 12:00:00
One Time	**Administration Record in last 24 hrs**
IV Vancomycin 1000 mg STAT in 200ml NS over 2 hours	

Interface with Ward

- Admission
  - Review of all medications
  - Sign off unnecessary medications
  - Transcript all necessary medications

- Discharge
  - Transcript by ward MO
  - Mechanism for signing off by ward MO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Go Links
of 1
100%
Find | Next
Select a format
Export
PYNEH ICU Current Order Record
Patient Name: WA
HKID: A73
Hospital No.: HN09029171F
Age:
DOB: 01/01/1940
Bed No.: D10-08
Admit Date: 07/04/2009 14:09
Gender: Female
Allergy: No drug allergy or drug alert
Page No: 1 of 1
Scheduled
Administration Record in last 24 hrs
IV Hydrocortisone 50 mg Q8H
Start: 20/04/2009 12:34:00
Stop:
Ordered: Chan Kin Wai U20465
Overriding reason:
Remark: Fax to pharmacy ONLY if not to be continued in the receiving ward.
SIGN OFF_____ CHOP_____ DATE_____
Pending @21/04/2009 08:00:00
Pending @21/04/2009 00:00:00
50 mg IV @20/04/2009 16:00:00
IV Esomeprazole (Nexium) 40 mg Daily (8am)
Start: 20/04/2009 11:41:00
Stop:
Ordered: Chu Ahin Po Ngai C41124
Overriding reason:
Remark: Fax to pharmacy ONLY if not to be continued in the receiving ward.
SIGN OFF_____ CHOP_____ DATE_____
Pending @21/04/2009 08:00:00
IV Tazocin 4.5 gm Q12H
Start: 20/04/2009 09:27:00
Stop:
Ordered: Chu Ahin Po Ngai C41124
Overriding reason:
Remark: Fax to pharmacy ONLY if not to be continued in the receiving ward.
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Reminder Attached

On Arrival to RECEIVING WARD

1. Doctors of receiving wards should review the "Order Record" and transcribe appropriate medications to paper-based MAR forms for the continuing administration of medication in receiving wards
2. In case there is any **medication deemed unnecessary**, it should not be transcribed. Doctor of the receiving ward should chop and sign off in the "Order Record". Then, it should be faxed to the Pharmacy for profile update.
3. Nurses in ward should double check to see if all the medications are transcribed or signed off by the doctor.

Problems with Data Transfer

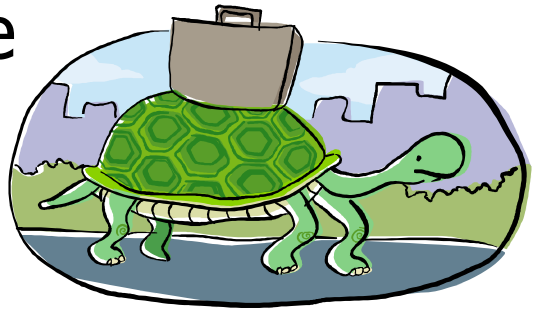
- Push vs. Pull technology
  - ADT
  - Lab result
  - APACHE physiology data
- Problem with data coding
  - Cancelled results
  - Results given as remarks

First Time Training

- Very detailed with lots of practice
  - No one to coach/check if someone make a mistake
  - Unanticipated scenarios
- Trial run
  - Not too useful as we are all too busy
- Double charting
  - Excessive workload
  - Risk of inconsistent data

Implementation Approach

- Phased Approach
  - 1 chart at a time / 1 bed at a time
  - Less prone to failure
  - Slow in achieving a critical mass
  - Loss of momentum



- Big-bang Approach
  - A package at a time
  - Frustration and confusion initially
  - Usually necessary at some time

Daily System Operation

- System policy & contingency plan
- User training
- User Account management
- Incidence handling
- Auditing of system usage

- Improvements
  - Configuration changes
  - Develop new functionality

System Policy

- Defines role and responsibility
- System/Data Owner
  - Director of Intensive Care
- Data Custodian
  - Administrator of CIS
- Users
  - Accountability & Confidentiality

Contingency Planning

- Business continuity planning
  - Isolated vs. global failure
  - Hardware vs. Network vs. Software failure
  - Short-term vs. medium-term vs. extended failure
- Disaster recovery planning
  - Backup
  - Redundancy
- Disaster drill

User Training

- Every shift of ICU MO rotation
  - 2 hours training on the morning when they come to ICU
  - On-the-job coaching
- No request for non-ICU MO training
  - Good support from ICU nurses

User Account Management

- Important for
  - data security / accountability
  - sense of ownership
- All doctors and AH
- ICU nurses + nurse specialists
- Informed by other departments for new staff rotation
- Remove every 6 months based on active user list by Hospital IT

One-Time User Account

- Legitimate user with no account
  - Pre-created one time account
  - Issue by ICU NO i/c with signature of user
  - Pass account creation request to Administrator
  - Create a new personal account
  - Inactivate the account

- Create one immediately

Incidence Handling

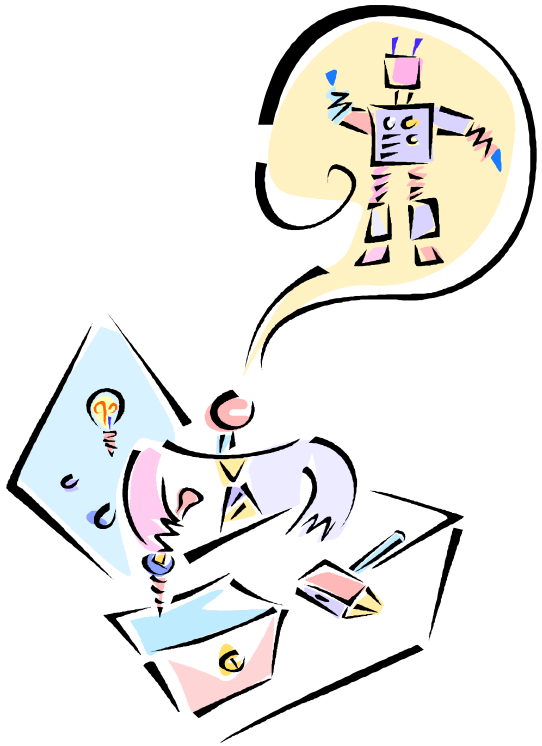
- Hardware failure – replacement
- Software failure
  - User error vs. true software bugs
- Security incidence
  - Preliminary tracing from application's audit trail
  - System's login and access log
    - May need help from vender
- Logging of incidences

Configuration Change

- Log book for suggestions
  - Few if any
- From Hospital administration
  - New form for whole hospital
- From ICU director / nurse manager
- Interview with users
  - Clarity & efficiency
- Proper authorization & validation before change
- Proper monitoring after change

Developing New Functionality

- New Forms
- Calculation rules
- Clinical advisory
- Integration with other system
  - PACS
  - eKG
  - Hospital's / HA's intranet
    - Webmail
    - Guidelines



Bring Home Message

- Administrator orchestrate the interaction between people & computer
- People & computer system are dynamic
- Workflow evolves with time

- Think and plan ahead of everything (if possible)
- Familiar with how people & computer work to provide solution when in trouble