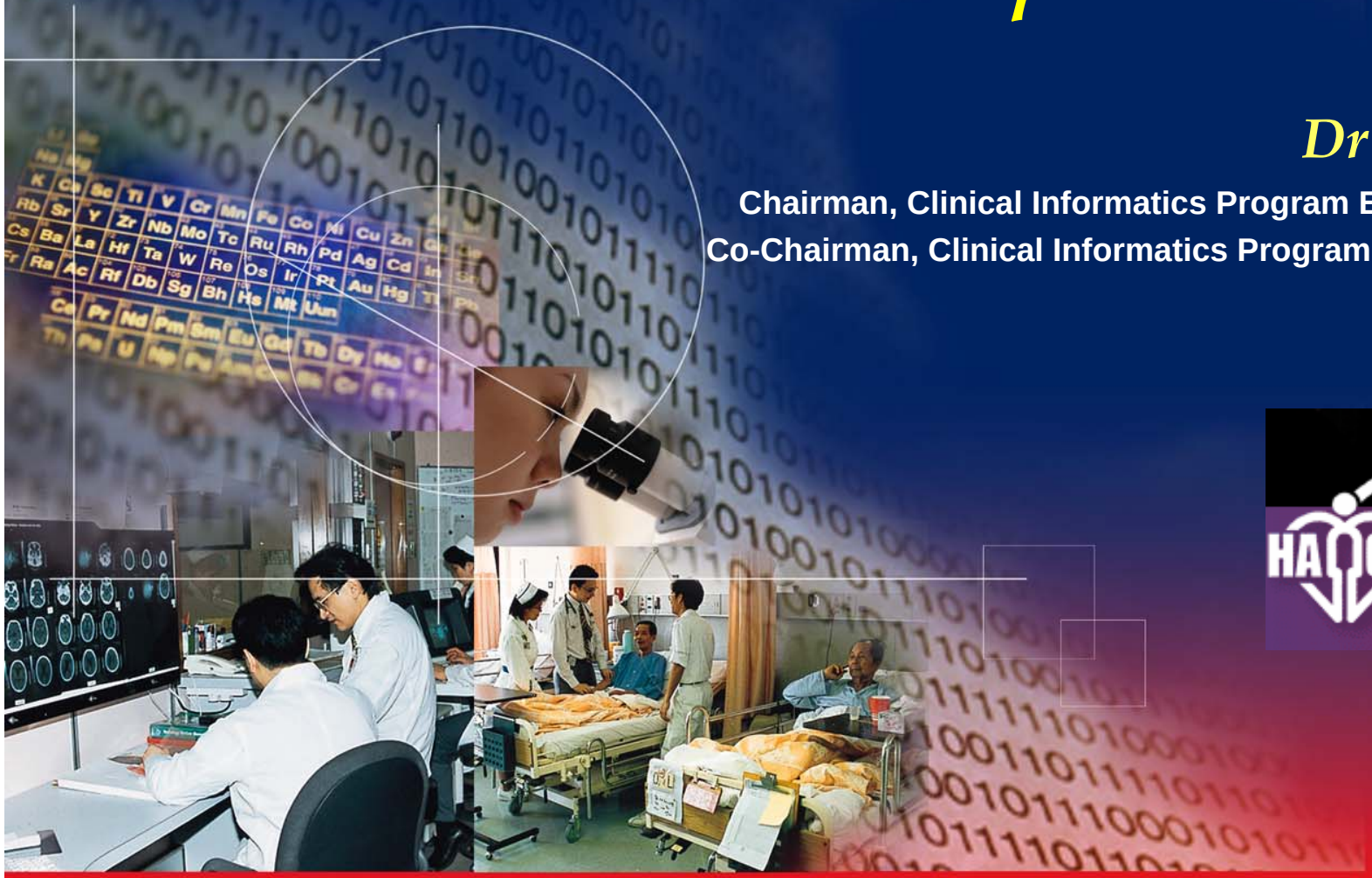
Health Informatics Development in the Hospital Authority

Dr CP Wong

Chairman, Clinical Informatics Program Executive Group

Co-Chairman, Clinical Informatics Program Steering Group



HA CONVENTION
Hospital Authority Convention 2006

HEALTH 醫療信息 INFORMATICS

- Begin to take off in the US as medical informatics in 1950
- In Hong Kong, before 1990, the term was unheard of in healthcare field

The Hospital Authority Approach to Clinical IT

Objectives

- Enable Reform
  - Facilitate Virtualisation of Health Care Delivery
- Better Governance
  - Approval Process, IT Policies, Standards etc.
- Value for Money
  - Better Business Cases, ROI, Benefit Realisation
- Reduce Costs
  - Consolidate, Rationalise & Standardise IT
- Improve Service
  - Customer Focused ITD, More Communication
- Integrate IT and Business
  - Business to Own/Sponsor/Drive IT Solutions
  - ITD the Advisor, Custodian & Operator of IT

Hospital Authority

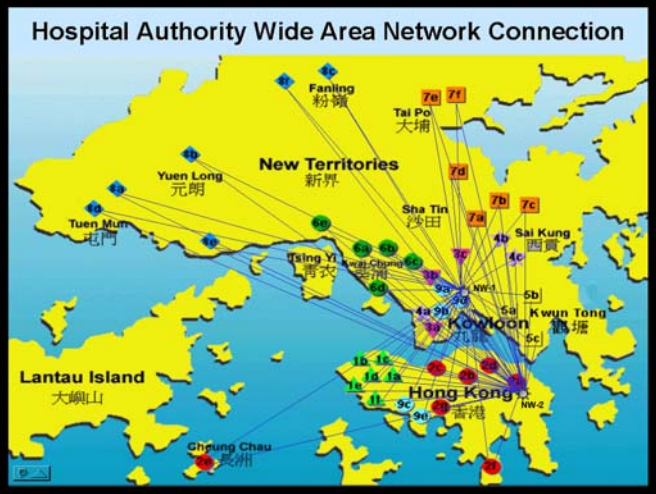
- 6.8 million population
  - 43 Public Hospitals
  - 46 Specialists Clinics
  - 74 General Clinics
  - 8.9m Outpatient attendances
- 28,176 Beds (90% market share)
  - 2.4m AED attendances
  - 1.2m Inpatient Discharges
- 52,000 Staff
  - 4,800 Doctors
  - 19,000 Nurses
  - 4,800 Allied Health Staff
- Annual Allocated Budget
  - HK$30 billion
- Annual IT budget 1.5%

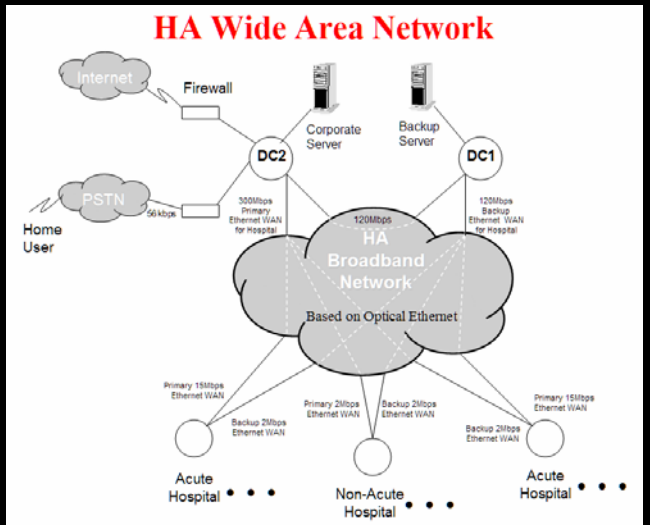
A long journey of development

- 1990 “Green field” – no legacy system
- 1991 Patient Administration only
- 1992 Pharmacy System added
  - Dispensing & Labeling
- 1993 Lab results online
- 1994 Radiology Information System
- 1995 Clinical Management System
  - Order Entry & Outpatient Progress Notes
- 2000 Electronic Patient Records
  - Territory wide retrieval of information
- 2004 Radiology Images online

The First IT/IS Strategy 1992-2002

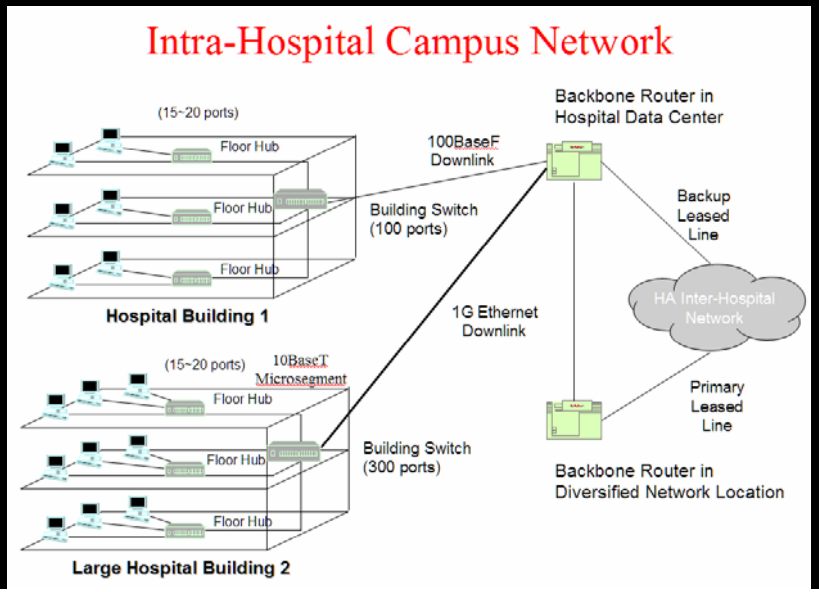
- Stage 1 -- Wide Area Network linked all HA institutions electronically
- Established the core operational systems that enabled the collection of data for the 4 key databases of Patients, Staff, Finance and Assets

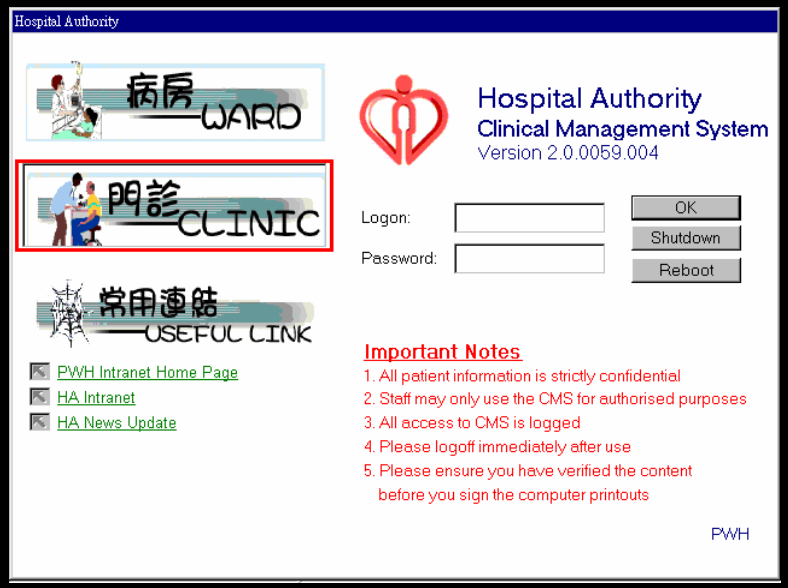




The First IT/IS Strategy 1992-2002

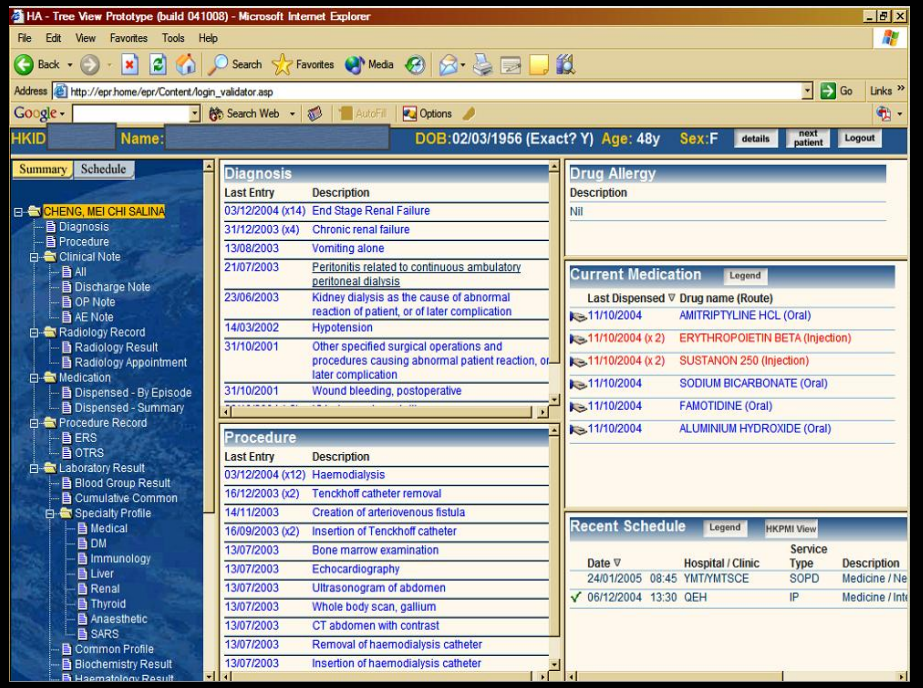
- Stage 2 -- clinical support systems at the hospital and clinic levels
- Local Area Networks built in all major hospitals

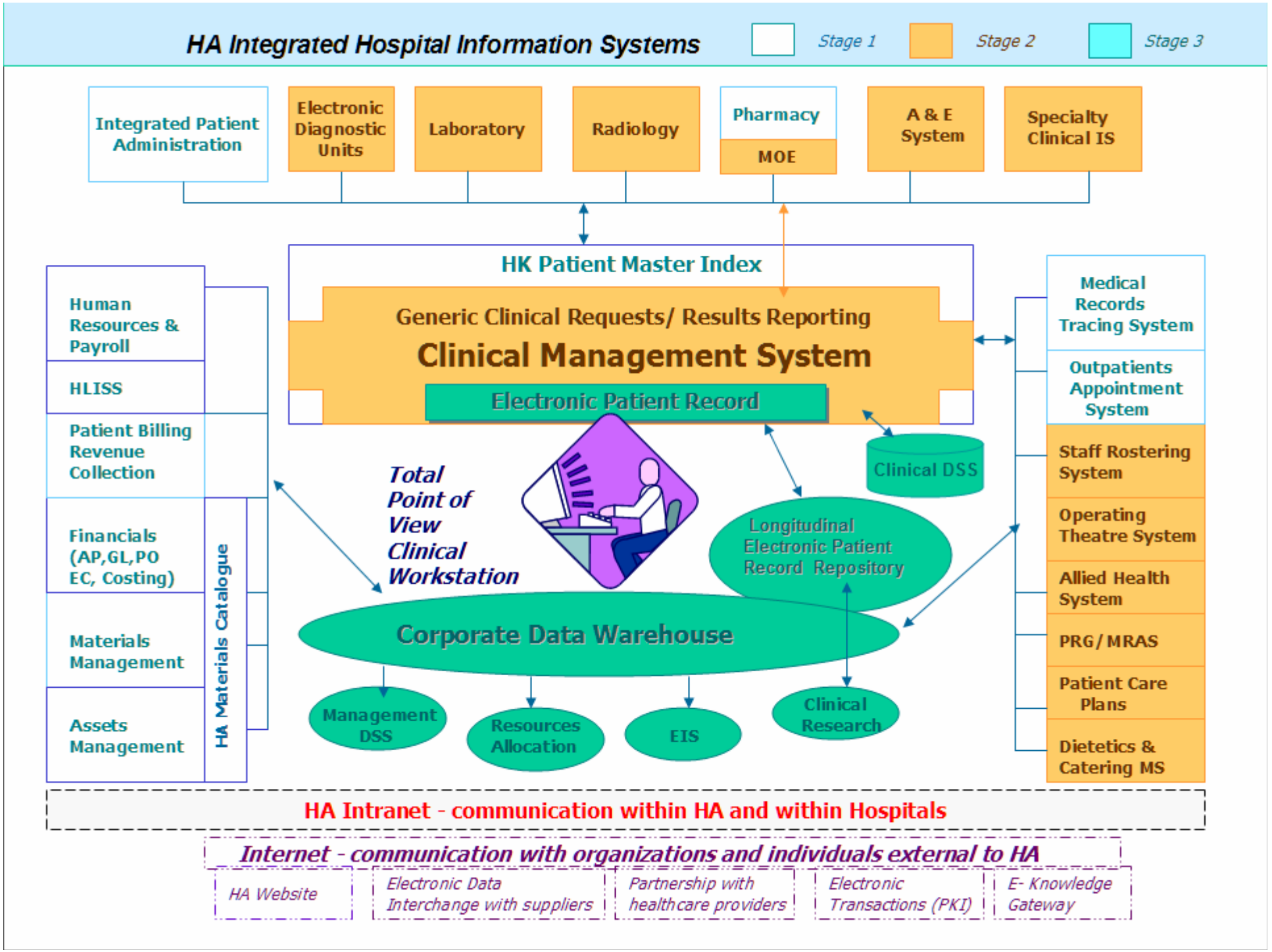




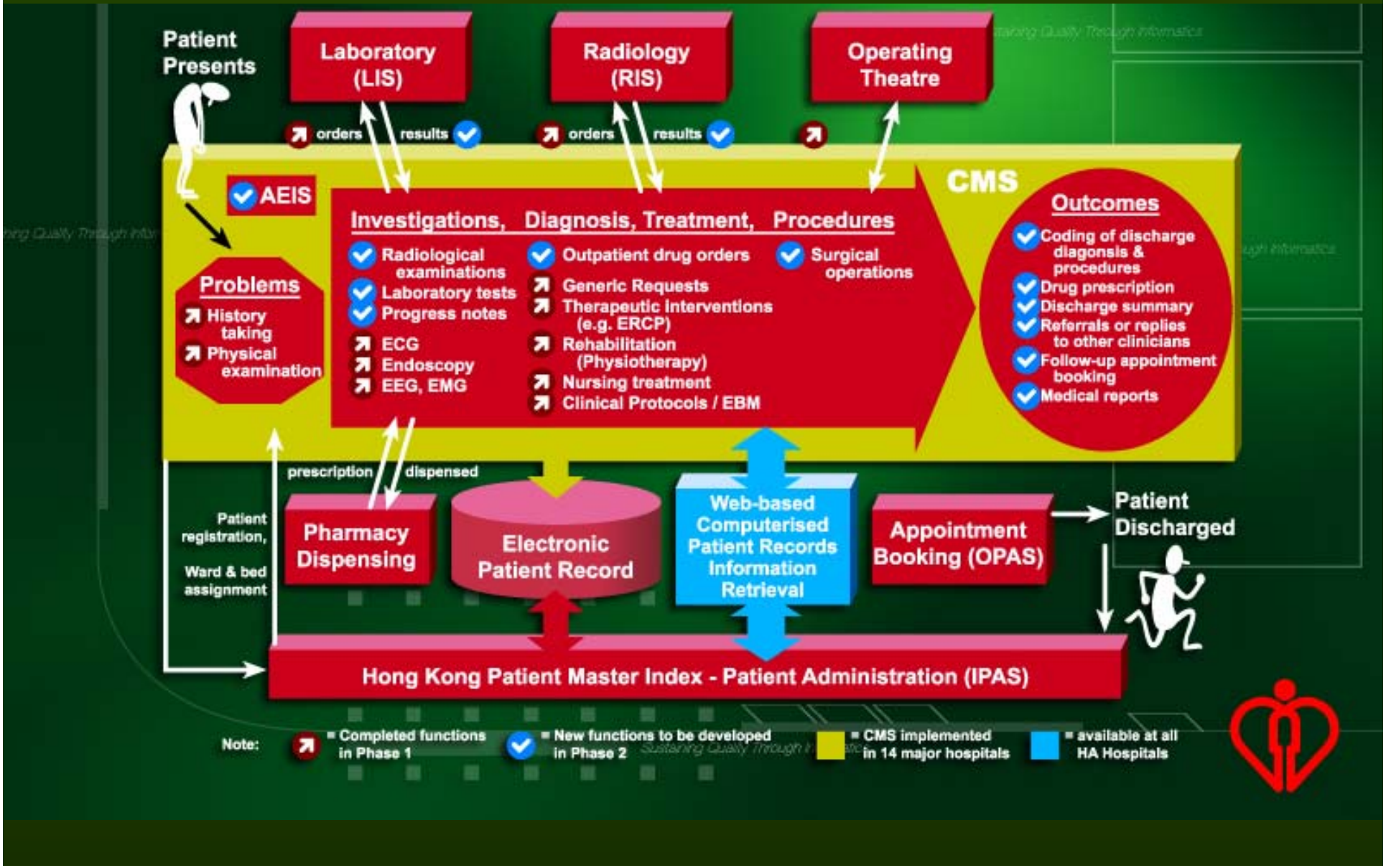
The First IT/IS Strategy 1992-2002

- Stage 3 -- the Informational Systems and the electronic Patient Record (ePR).

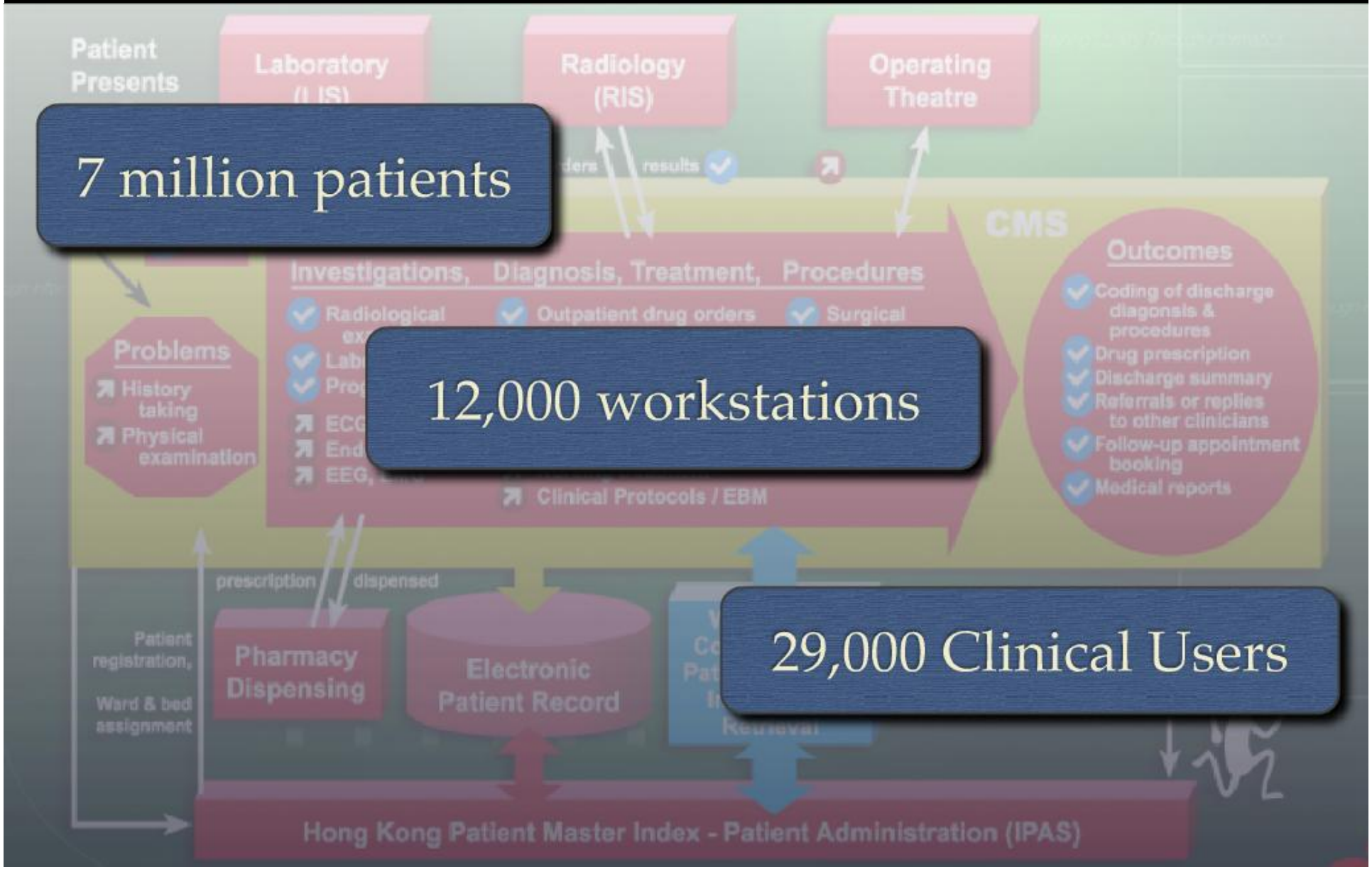



HA Integrated Hospital Information Systems
Stage 1
Stage 2
Stage 3
Integrated Patient Administration
Electronic Diagnostic Units
Laboratory
Radiology
Pharmacy
MOE
A & E System
Specialty Clinical IS
HK Patient Master Index
Generic Clinical Requests/ Results Reporting
Clinical Management System
Electronic Patient Record
Human Resources & Payroll
HLISS
Patient Billing Revenue Collection
Financials (AP,GL,PO EC, Costing)
Materials Management
Assets Management
HA Materials Catalogue
Total Point of View Clinical Workstation
Clinical DSS
Longitudinal Electronic Patient Record Repository
Corporate Data Warehouse
Management DSS
Resources Allocation
EIS
Clinical Research
Medical Records Tracing System
Outpatients Appointment System
Staff Rostering System
Operating Theatre System
Allied Health System
PRG/MRAS
Patient Care Plans
Dietetics & Catering MS
HA Intranet - communication within HA and within Hospitals
Internet - communication with organizations and individuals external to HA
HA Website
Electronic Data Interchange with suppliers
Partnership with healthcare providers
Electronic Transactions (PKI)
E- Knowledge Gateway

On a Single Platform



The 2nd Largest IT Network in HK



Characteristics

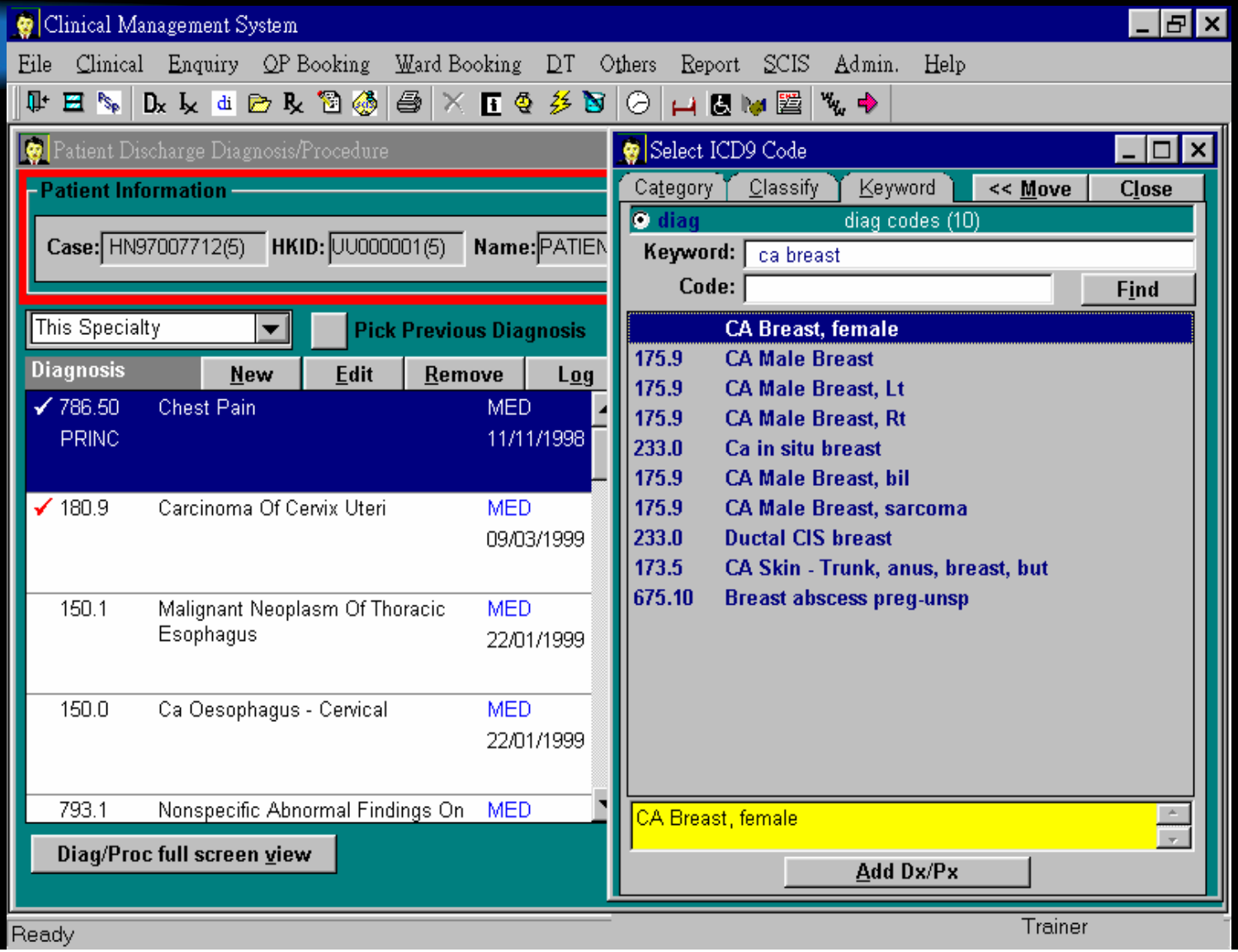
- Wide range of Applications in use
- Enterprise PMI and Unique Patient ID (HK ID)
- Only 1.5% of Budget per annum
- Technology Standardisation Focus
- Clinical Management System that is used by most Clinicians
- Centralised Management Focus
- Single Platform
- Built in-house

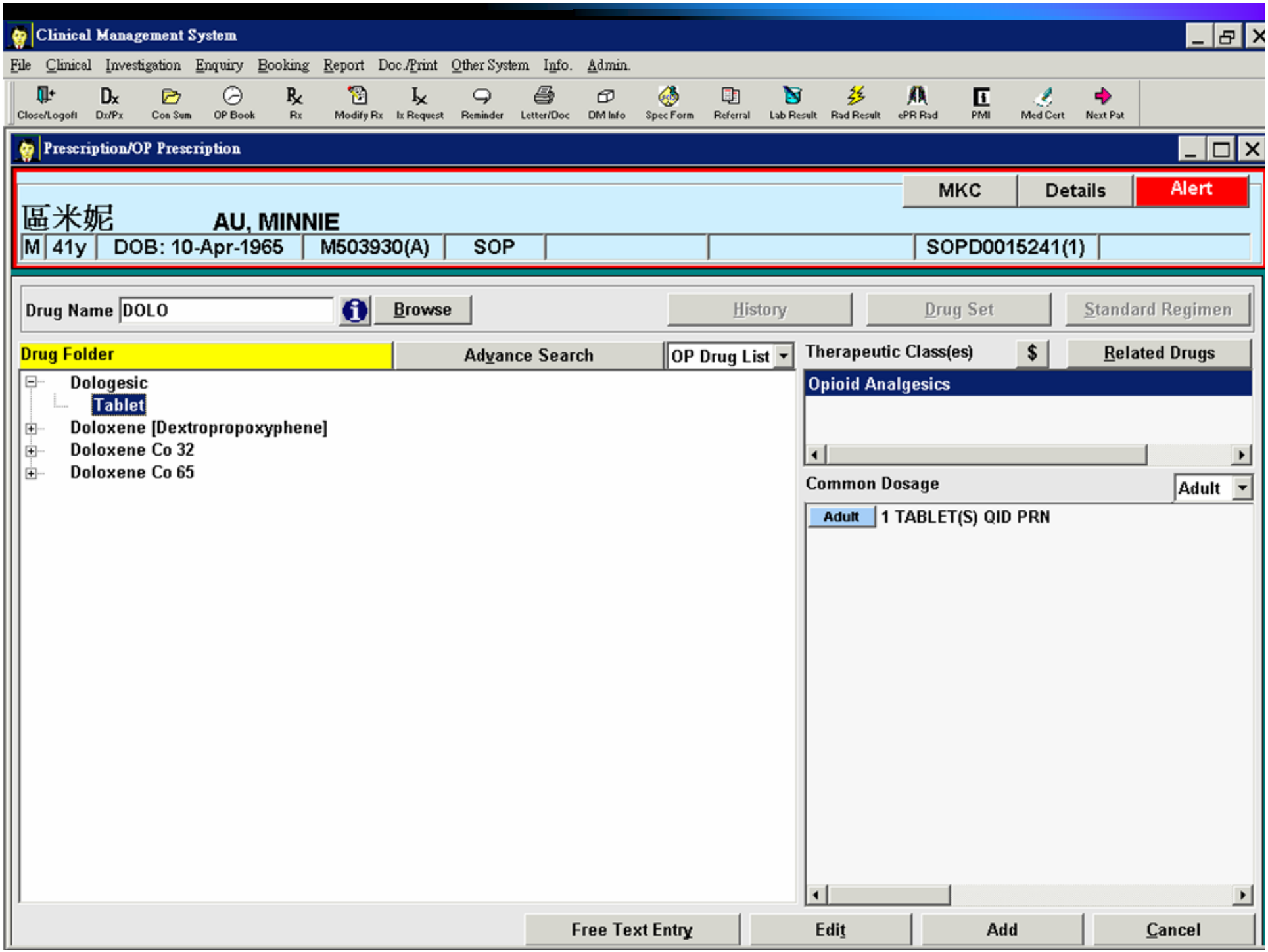
Health IT Around The Globe

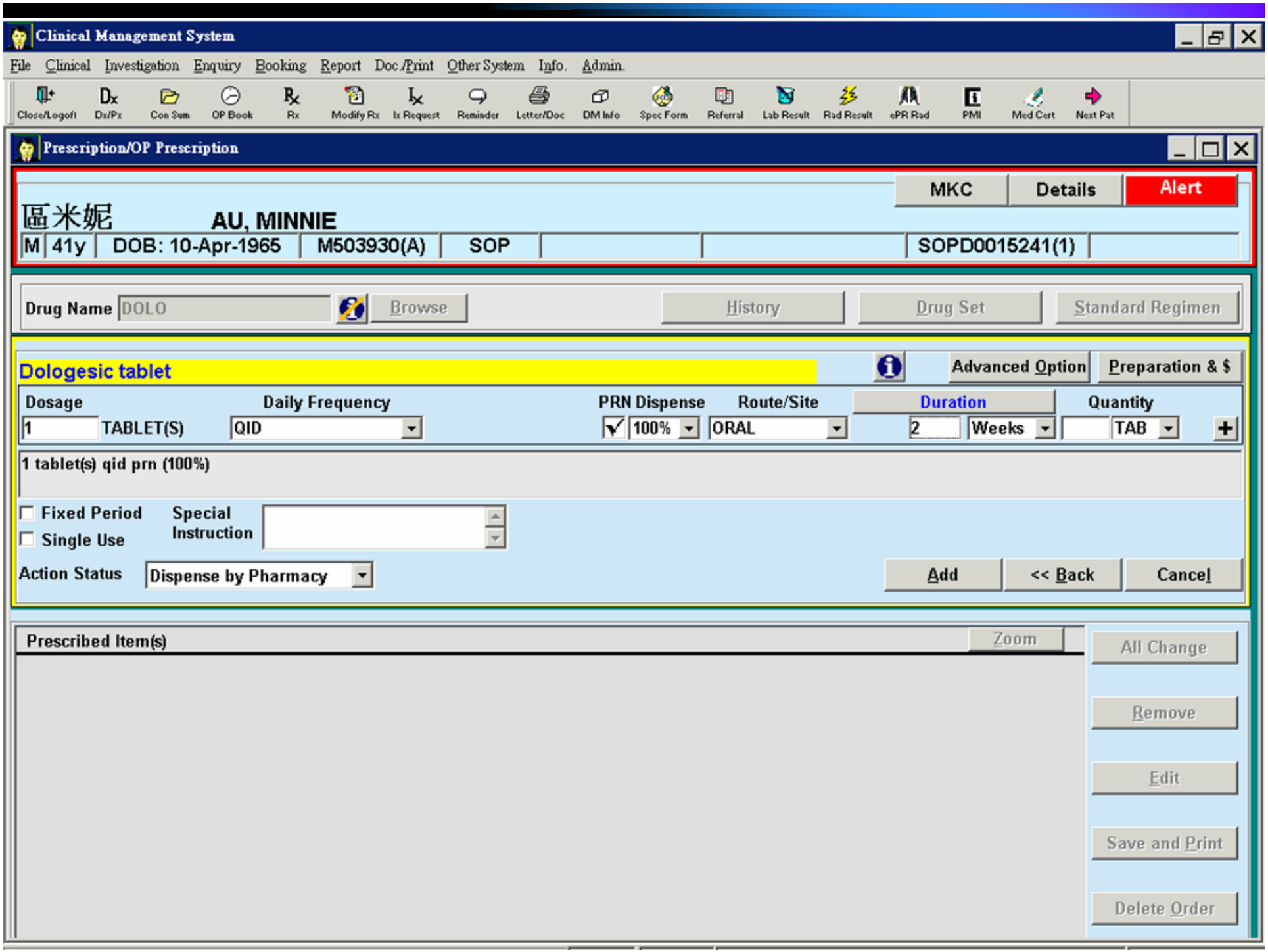
	HK	Australia	UK	USA
Manage	Corporate	Corporate	Local	Local
Funding	1.5% (5%)	2% (9%)	2% (6%)	4% (14%)
Operations	> Central	> Central	> Central	> Central
Software	In-House	Packages	Packages	Packages
ERP System	No	Yes	Yes	Yes
CPR System	Advanced	Implement	Implement	Advanced
Doctors Use	Most	Few	Few	Few
Outsource	No	Yes	Yes	Yes
ASP's	No	No	No	Yes
Local Vendor	No	Yes	Yes	Yes

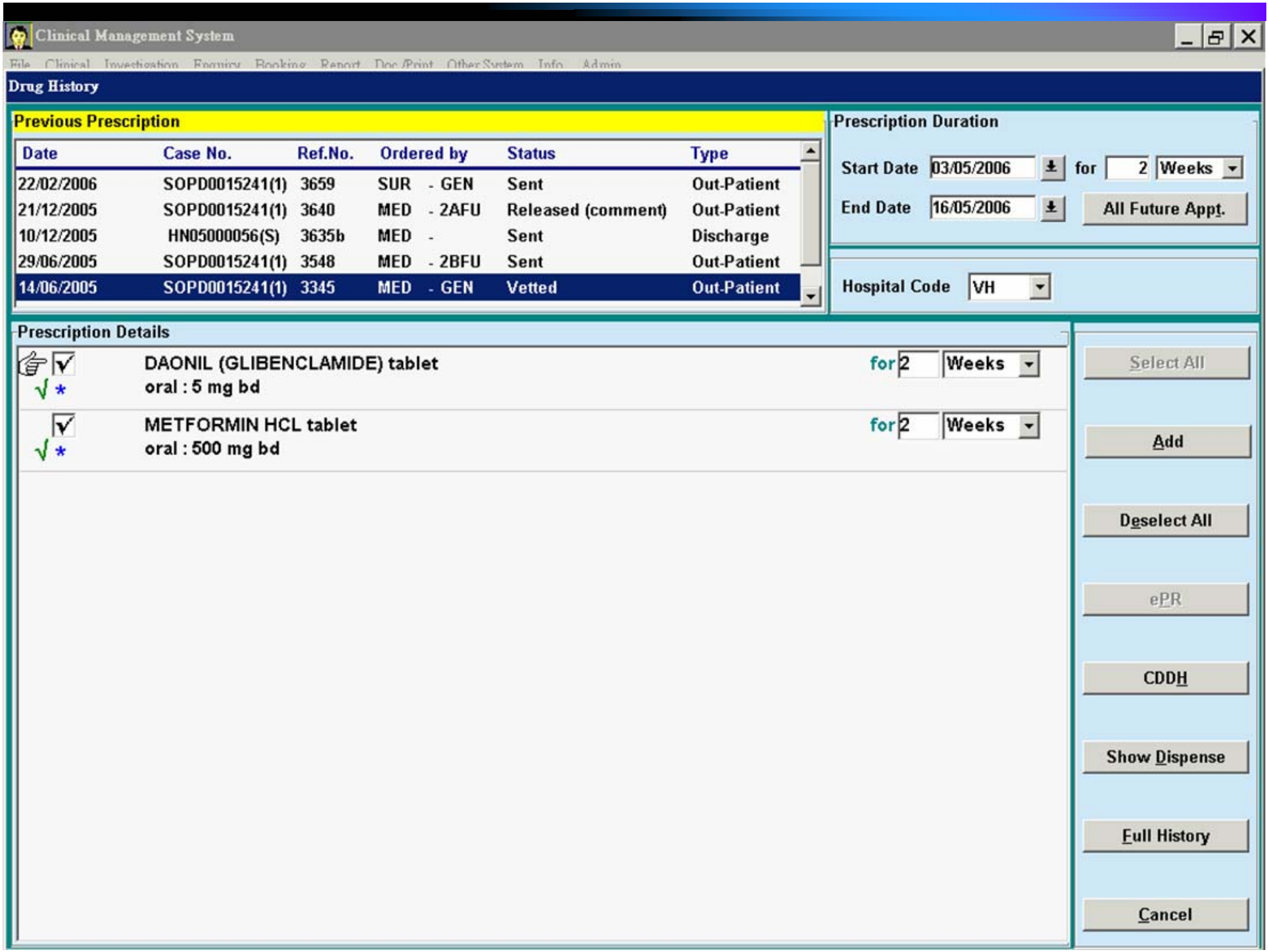
Single Log On

Diagnosis Coding ICD-9CM

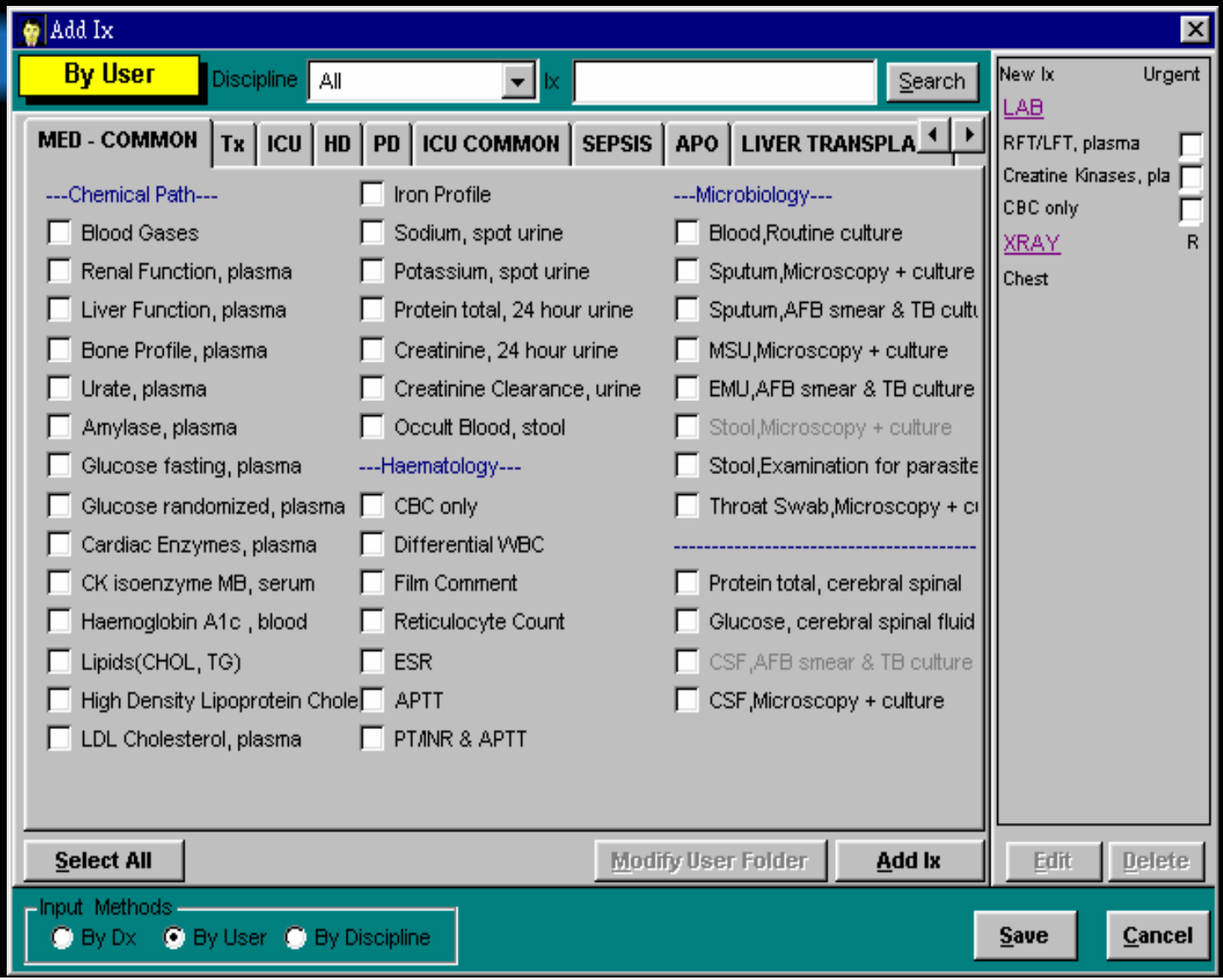



Clinical Management System
File Clinical Investigation Enquiry Booking Report Doc./Print Other System Info. Admin.
Close/Logoff Dx/Px Con Sum OP Book Rx Modify Rx Ix Request Reminder Letter/Doc DM Info Spec Form Referral Lab Result Rad Result ePR Rad PMI Med Cert Next Pat
Prescription/OP Prescription
MKC
Details
Alert
區米妮
AU, MINNIE
M
41y
DOB: 10-Apr-1965
M503930(A)
SOP
SOPD0015241(1)
Drug Name
DOLO
Browse
History
Drug Set
Standard Regimen
Drug Folder
Advance Search
OP Drug List
Dologesic
Tablet
Doloxene [Dextropropoxyphene]
Doloxene Co 32
Doloxene Co 65
Therapeutic Class(es)
$
Related Drugs
Opioid Analgesics
Common Dosage
Adult
Adult
1 TABLET(S) QID PRN
Free Text Entry
Edit
Add
Cancel

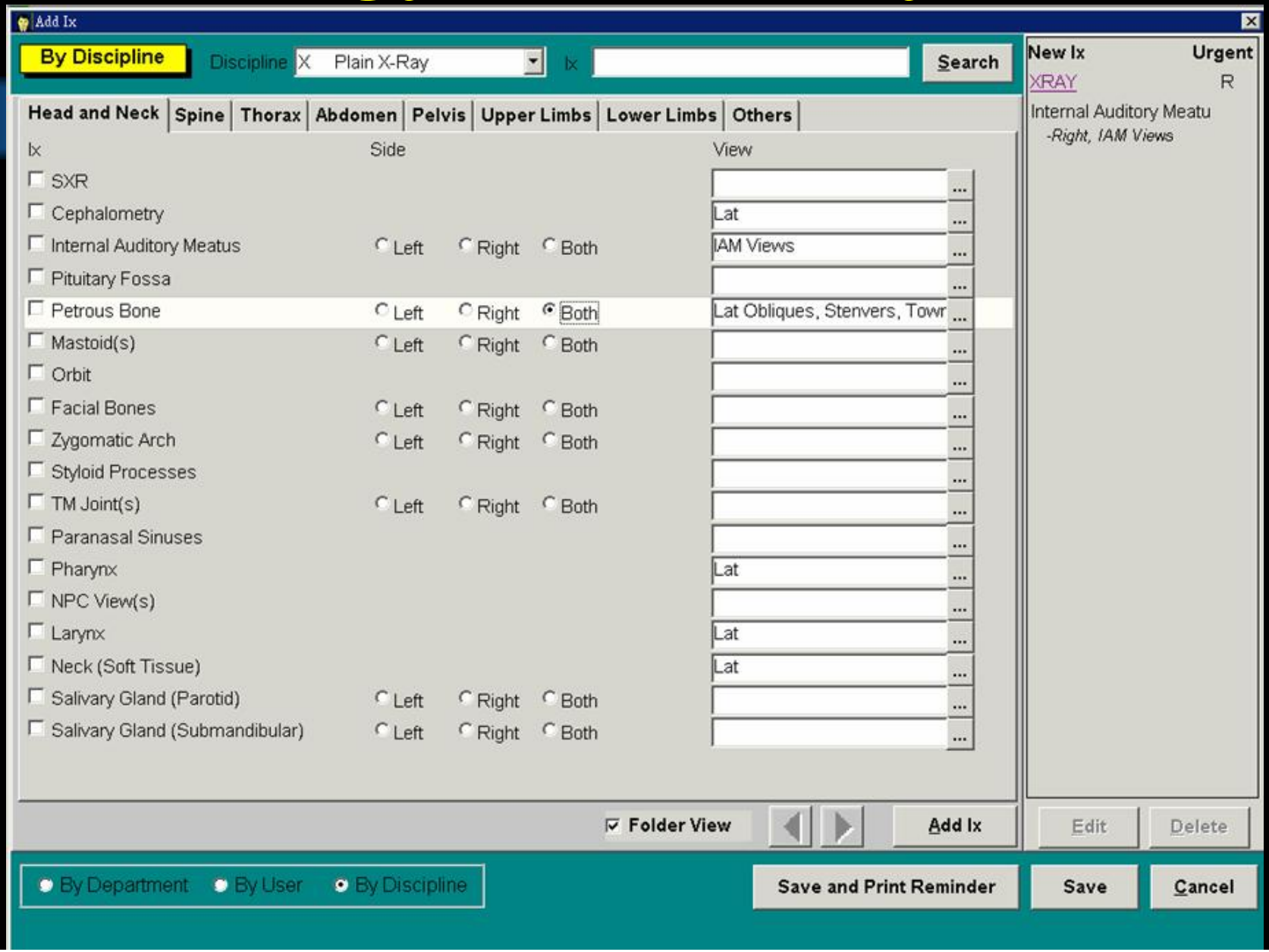

Clinical Management System
File Clinical Investigation Enquiry Booking Report Doc./Print Other System Info. Admin.
Close/Logoff Dx/Px Con Sum OP Book Rx Modify Rx Ix Request Reminder Letter/Doc DM Info Spec Form Referral Lab Result Rad Result ePR Rad PMI Med Cert Next Pat
Prescription/OP Prescription
MKC
Details
Alert
區米妮 AU, MINNIE
M 41y DOB: 10-Apr-1965 M503930(A) SOP SOPD0015241(1)
Drug Name DOLO
Browse
History
Drug Set
Standard Regimen
Dologesic tablet
Advanced Option
Preparation & $
Dosage
Daily Frequency
PRN Dispense
Route/Site
Duration
Quantity
1 TABLET(S)
QID
100%
ORAL
2 Weeks
TAB
1 tablet(s) qid prn (100%)
Fixed Period
Single Use
Special Instruction
Action Status
Dispense by Pharmacy
Add
<< Back
Cancel
Prescribed Item(s)
Zoom
All Change
Remove
Edit
Save and Print
Delete Order


Clinical Management System
File Clinical Investigation Enquiry Booking Report Doc /Print Other System Info Admin
Drug History
Previous Prescription
Date Case No. Ref.No. Ordered by Status Type
22/02/2006 SOPD0015241(1) 3659 SUR - GEN Sent Out-Patient
21/12/2005 SOPD0015241(1) 3640 MED - 2AFU Released (comment) Out-Patient
10/12/2005 HN05000056(S) 3635b MED - Sent Discharge
29/06/2005 SOPD0015241(1) 3548 MED - 2BFU Sent Out-Patient
14/06/2005 SOPD0015241(1) 3345 MED - GEN Vetted Out-Patient
Prescription Duration
Start Date 03/05/2006 for 2 Weeks
End Date 16/05/2006 All Future Appt.
Hospital Code VH
Prescription Details
DAONIL (GLIBENCLAMIDE) tablet for 2 Weeks
oral : 5 mg bd
METFORMIN HCL tablet for 2 Weeks
oral : 500 mg bd
Select All
Add
Deselect All
ePR
CDDH
Show Dispense
Full History
Cancel

Laboratory Order Entry



Radiology Order Entry



Bookmarks | Thumbnails | Comments | Signatures

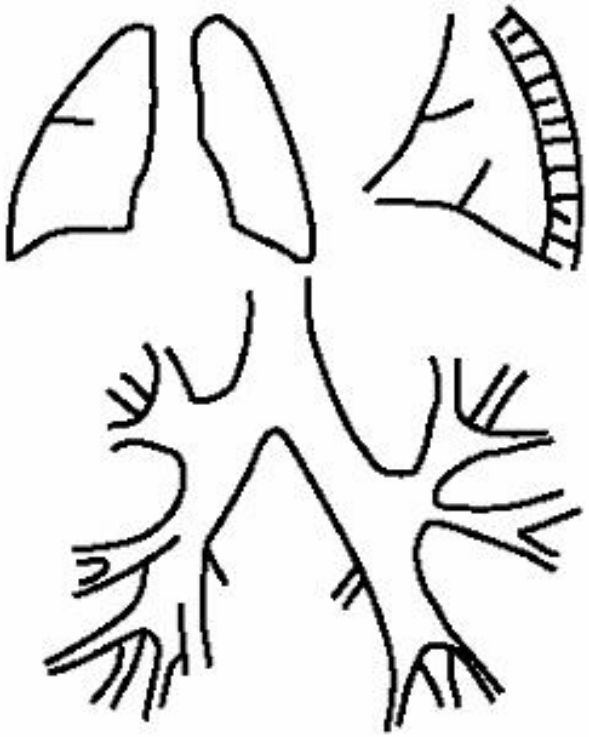
Hospital Authority
Tung Wah Hospital
Endoscopy

Duplicate Copy

Case No: RM 95000013 HKID: A282552(2)
Name: PATIENT, 28587
病人 MRN: DOB: 03/07/1932
Sex : F Age: 70y
Ward: E1 Specialty: HASC (Case No)

Bronchoscopy

Exam. Date/Time: 21/02/2000 11:45
Condition: Elective
Endoscopist / Nurse:
[C] EDS CHAN T M
[E] YEUNG TAK TIM
([C] = Chief; [S] = Supervisor; [E] = Endoscopist; [N] = Nurse)
Medication: Nil



Indication / History
Diffuse CXR abnormality

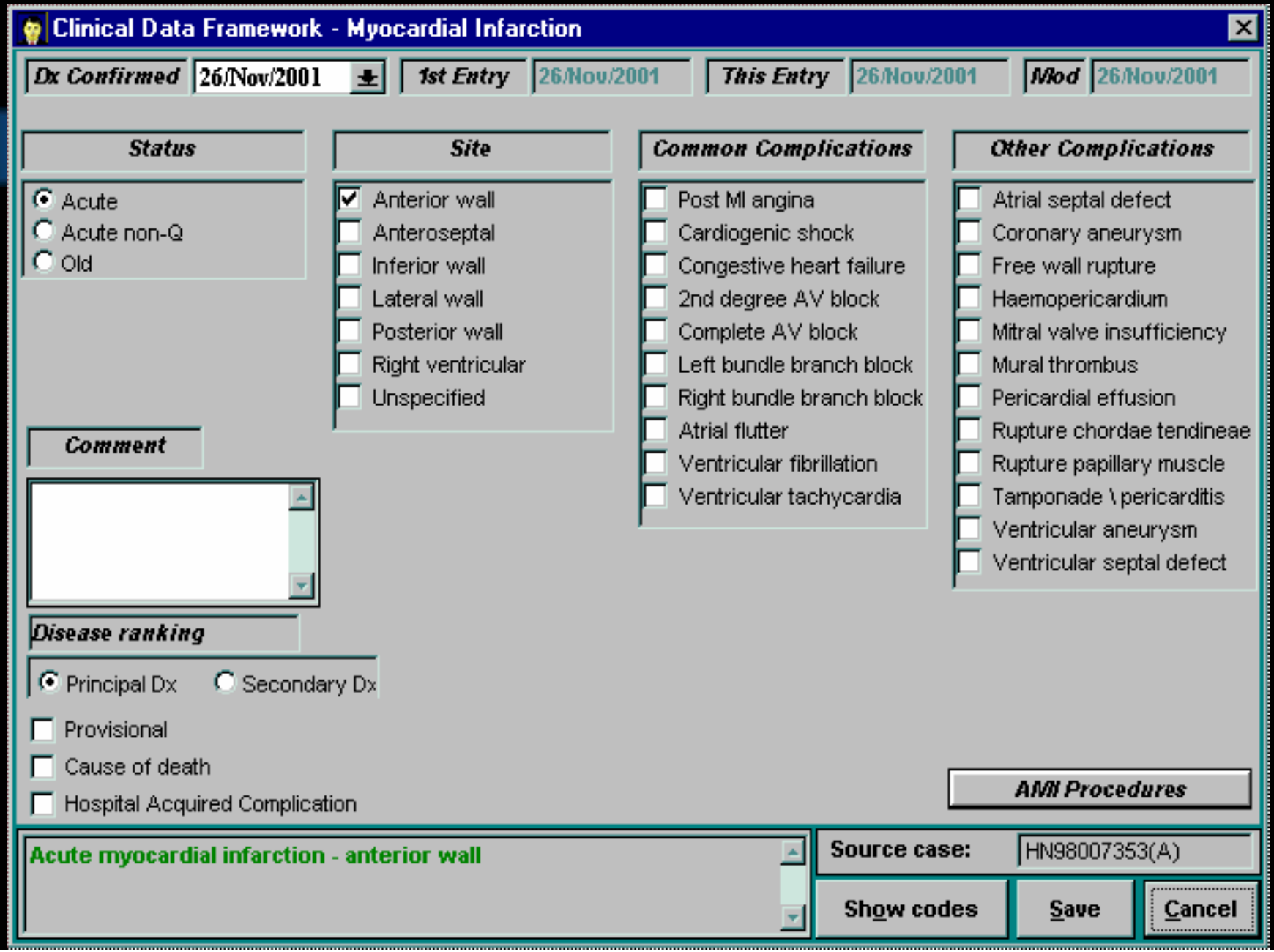
Finding and Endoscopic Procedure
finding

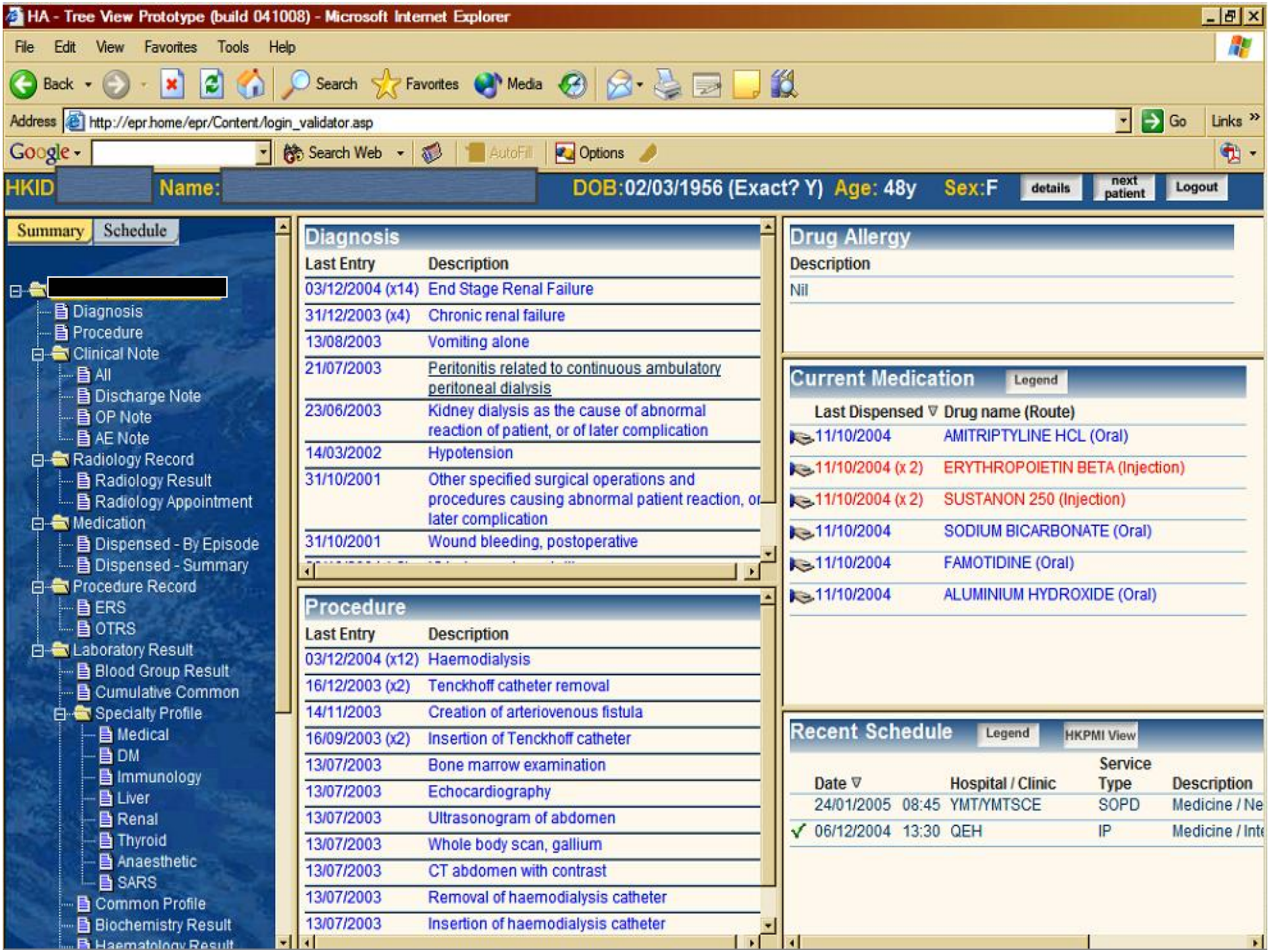
Endoscopic Diagnosis:
Rupture colon, non-traumatic (569.89)

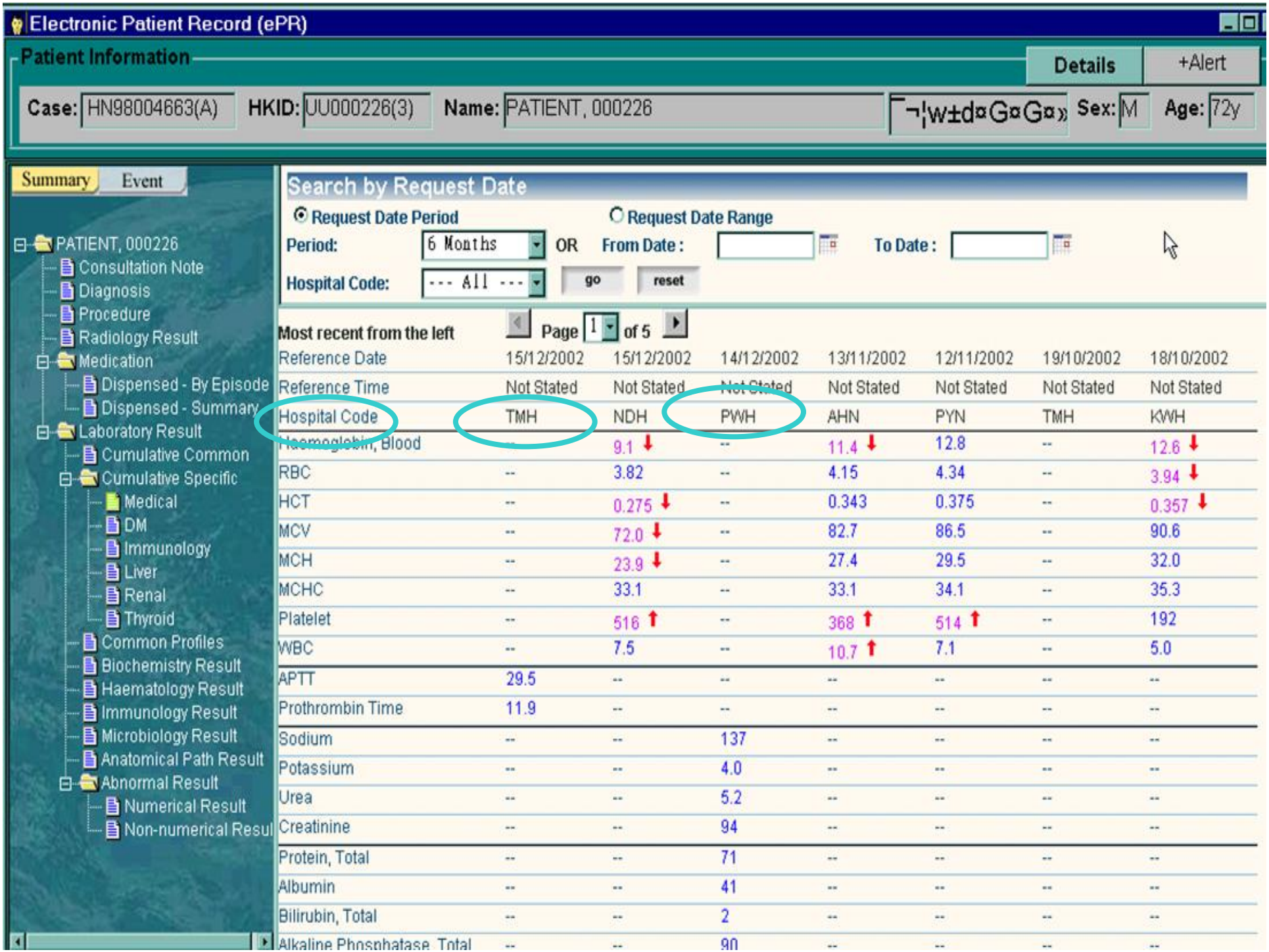
*(*Modifier: ?=Provisional; C=Complications)*

Procedure:

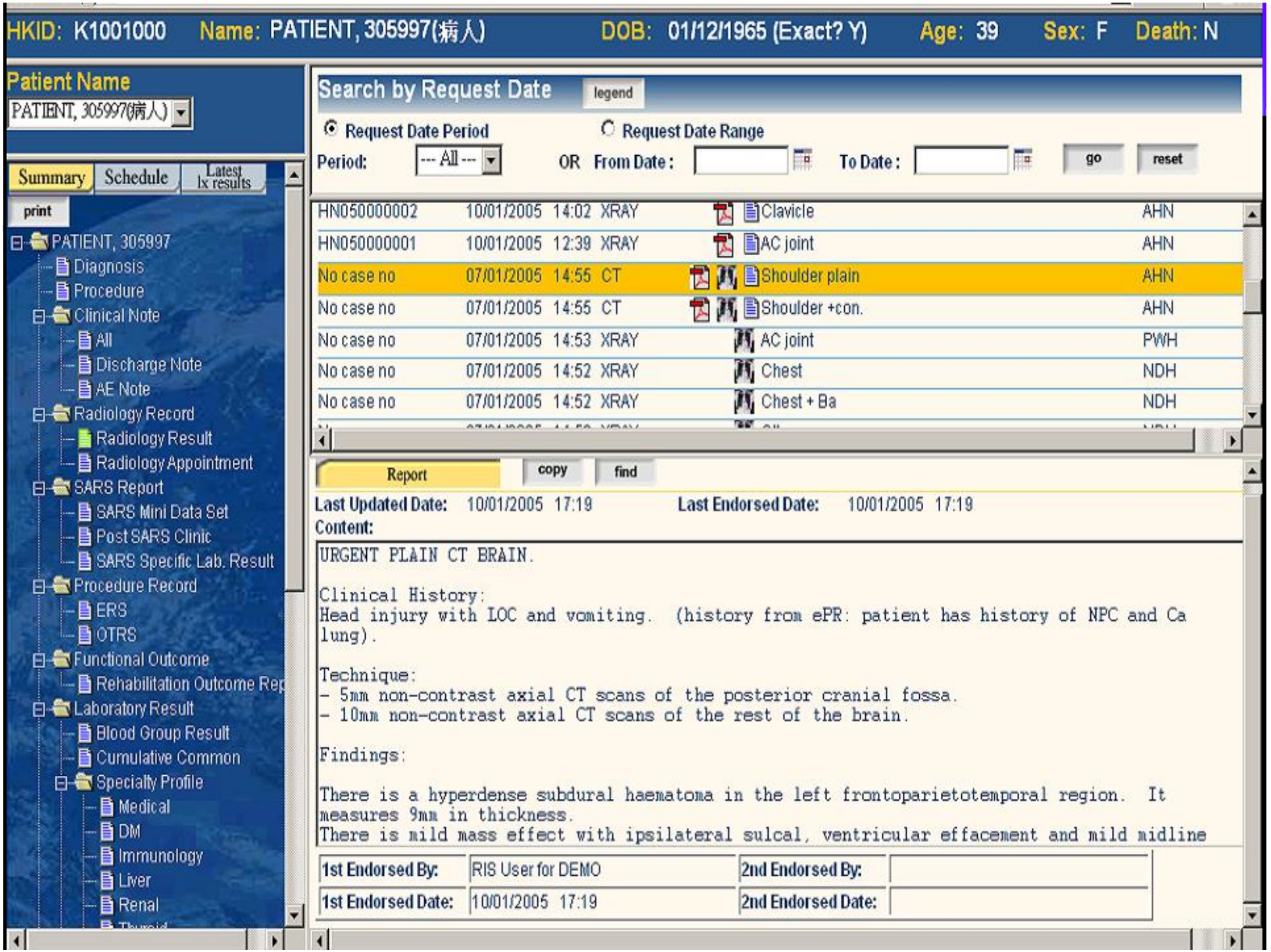
Clinical Data Framework




HA - Tree View Prototype (build 041008) - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://epr.home/epr/Content/login_validator.asp
Go Links
Google Search Web AutoFill Options
HKID Name: DOB:02/03/1956 (Exact? Y) Age: 48y Sex:F
details next patient Logout
Summary Schedule
Diagnosis
Procedure
Clinical Note
All
Discharge Note
OP Note
AE Note
Radiology Record
Radiology Result
Radiology Appointment
Medication
Dispensed - By Episode
Dispensed - Summary
Procedure Record
ERS
OTRS
Laboratory Result
Blood Group Result
Cumulative Common
Specialty Profile
Medical
DM
Immunology
Liver
Renal
Thyroid
Anaesthetic
SARS
Common Profile
Biochemistry Result
Haematology Result
Diagnosis
Last Entry Description
03/12/2004 (x14) End Stage Renal Failure
31/12/2003 (x4) Chronic renal failure
13/08/2003 Vomiting alone
21/07/2003 Peritonitis related to continuous ambulatory peritoneal dialysis
23/06/2003 Kidney dialysis as the cause of abnormal reaction of patient, or of later complication
14/03/2002 Hypotension
31/10/2001 Other specified surgical operations and procedures causing abnormal patient reaction, or later complication
31/10/2001 Wound bleeding, postoperative
Procedure
Last Entry Description
03/12/2004 (x12) Haemodialysis
16/12/2003 (x2) Tenckhoff catheter removal
14/11/2003 Creation of arteriovenous fistula
16/09/2003 (x2) Insertion of Tenckhoff catheter
13/07/2003 Bone marrow examination
13/07/2003 Echocardiography
13/07/2003 Ultrasonogram of abdomen
13/07/2003 Whole body scan, gallium
13/07/2003 CT abdomen with contrast
13/07/2003 Removal of haemodialysis catheter
13/07/2003 Insertion of haemodialysis catheter
Drug Allergy
Description
Nil
Current Medication
Legend
Last Dispensed Drug name (Route)
11/10/2004 AMITRIPTYLINE HCL (Oral)
11/10/2004 (x 2) ERYTHROPOIETIN BETA (Injection)
11/10/2004 (x 2) SUSTANON 250 (Injection)
11/10/2004 SODIUM BICARBONATE (Oral)
11/10/2004 FAMOTIDINE (Oral)
11/10/2004 ALUMINIUM HYDROXIDE (Oral)
Recent Schedule
Legend
HKPMI View
Date Hospital / Clinic Service Type Description
24/01/2005 08:45 YMT/YMTSCE SOPD Medicine / Ne
06/12/2004 13:30 QEH IP Medicine / Inte



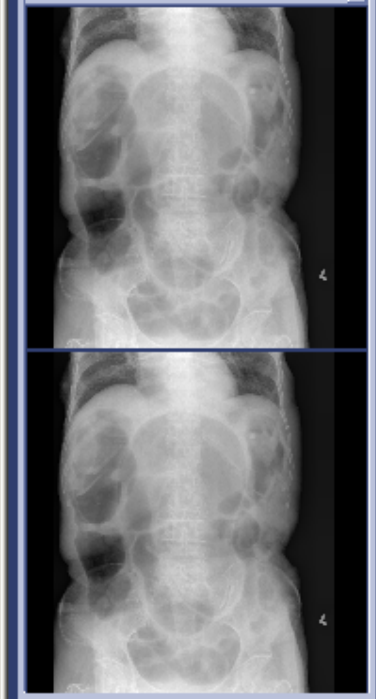
Reference Date	15/12/2002	15/12/2002	14/12/2002	13/11/2002	12/11/2002	19/10/2002	18/10/2002
Reference Time	Not Stated	Not Stated	Not Stated	Not Stated	Not Stated	Not Stated	Not Stated
Hospital Code	TMH	NDH	PWH	AHN	PYN	TMH	KWH
Haemoglobin, Blood	--	9.1 ↓	--	11.4 ↓	12.8	--	12.6 ↓
RBC	--	3.82	--	4.15	4.34	--	3.94 ↓
HCT	--	0.275 ↓	--	0.343	0.375	--	0.357 ↓
MCV	--	72.0 ↓	--	82.7	86.5	--	90.6
MCH	--	23.9 ↓	--	27.4	29.5	--	32.0
MCHC	--	33.1	--	33.1	34.1	--	35.3
Platelet	--	516 ↑	--	368 ↑	514 ↑	--	192
WBC	--	7.5	--	10.7 ↑	7.1	--	5.0
APTT	29.5	--	--	--	--	--	--
Prothrombin Time	11.9	--	--	--	--	--	--
Sodium	--	--	137	--	--	--	--
Potassium	--	--	4.0	--	--	--	--
Urea	--	--	5.2	--	--	--	--
Creatinine	--	--	94	--	--	--	--
Protein, Total	--	--	71	--	--	--	--
Albumin	--	--	41	--	--	--	--
Bilirubin, Total	--	--	2	--	--	--	--
Alkaline Phosphatase, Total	--	--	90	--	--	--	--


HKID: K1001000 Name: PATIENT, 305997(病人) DOB: 01/12/1965 (Exact? Y) Age: 39 Sex: F Death: N
Patient Name
PATIENT, 305997(病人)
Summary
Schedule
Latest lx results
print
PATIENT, 305997
Diagnosis
Procedure
Clinical Note
All
Discharge Note
AE Note
Radiology Record
Radiology Result
Radiology Appointment
SARS Report
SARS Mini Data Set
Post SARS Clinic
SARS Specific Lab. Result
Procedure Record
ERS
OTRS
Functional Outcome
Rehabilitation Outcome Rep
Laboratory Result
Blood Group Result
Cumulative Common
Specialty Profile
Medical
DM
Immunology
Liver
Renal
Search by Request Date
legend
Request Date Period
Request Date Range
Period: --- All ---
OR From Date :
To Date :
go
reset
HN050000002 10/01/2005 14:02 XRAY Clavicle AHN
HN050000001 10/01/2005 12:39 XRAY AC joint AHN
No case no 07/01/2005 14:55 CT Shoulder plain AHN
No case no 07/01/2005 14:55 CT Shoulder +con. AHN
No case no 07/01/2005 14:53 XRAY AC joint PWH
No case no 07/01/2005 14:52 XRAY Chest NDH
No case no 07/01/2005 14:52 XRAY Chest + Ba NDH
Report
copy
find
Last Updated Date: 10/01/2005 17:19
Last Endorsed Date: 10/01/2005 17:19
Content:
URGENT PLAIN CT BRAIN.
Clinical History:
Head injury with LOC and vomiting. (history from ePR: patient has history of NPC and Ca lung).
Technique:
- 5mm non-contrast axial CT scans of the posterior cranial fossa.
- 10mm non-contrast axial CT scans of the rest of the brain.
Findings:
There is a hyperdense subdural haematoma in the left frontoparietotemporal region. It measures 9mm in thickness.
There is mild mass effect with ipsilateral sulcal, ventricular effacement and mild midline
1st Endorsed By: RIS User for DEMO
2nd Endorsed By:
1st Endorsed Date: 10/01/2005 17:19
2nd Endorsed Date:

Centricity Enterprise Web V2.1 - Microsoft Internet Explorer

PATIENT, 305997
ID: K1001000

Abdomen
4/11/2004 12:36:37 — 1 series
abdomen non-bucky — 2 images

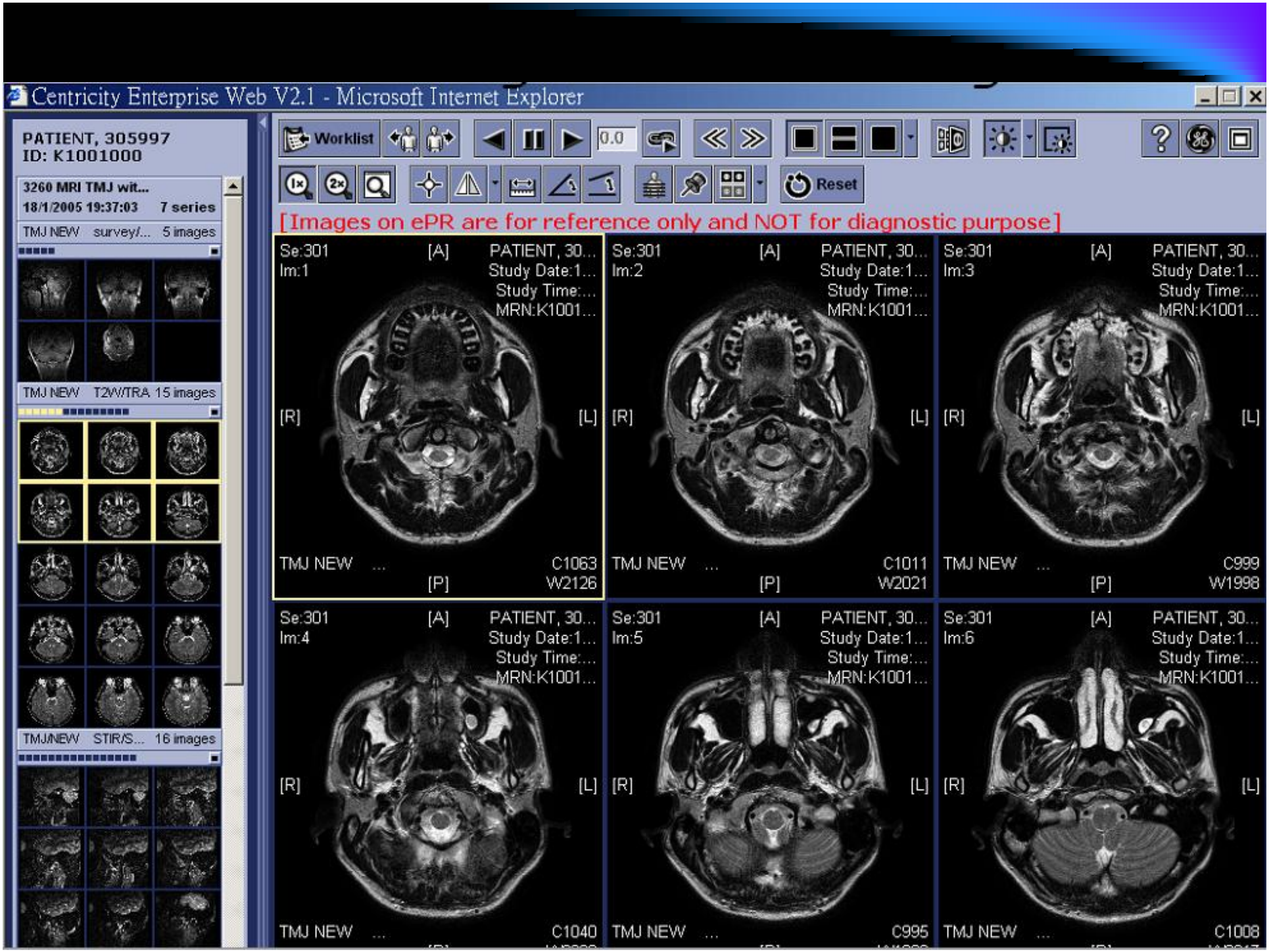


[Images on ePR are for reference only and NOT for diagnostic purpose]

Studies on Lossless ARCH

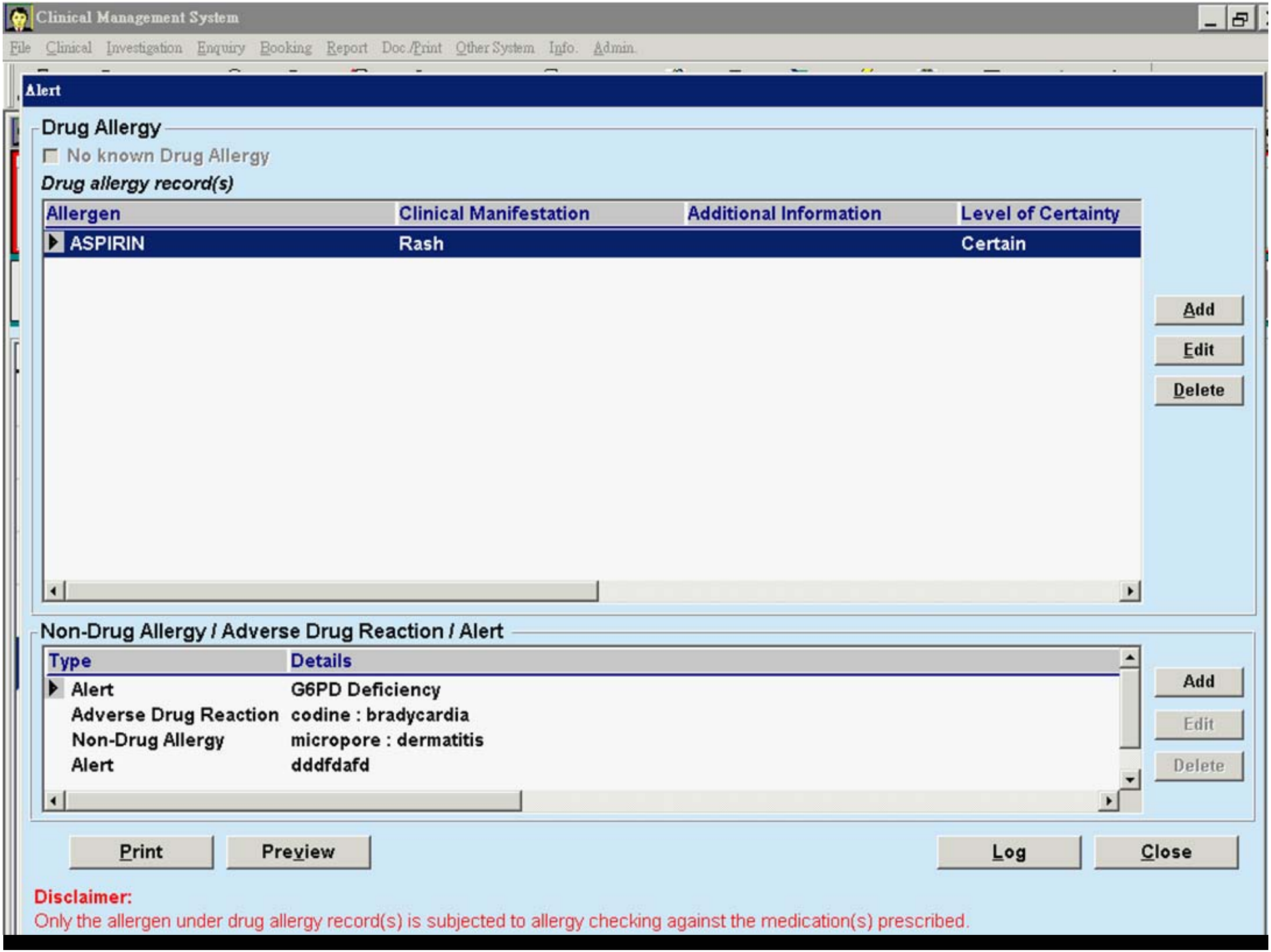
Loc	Patient Name	Mod	Study Description	Study Date	Study Time
	PATIENT, 305997	CT	Abdomen plain,Abdomen+con.	3/11/2004	14:00:03
	PATIENT, 305997	CR	Abdomen	4/11/2004	12:36:37
	PATIENT, 305997	CT	Thorax+con.	18/11/2004	10:01:01
	PATIENT, 305997	CR	Abdomen	26/1/2005	14:34:05
	PATIENT, 305997	CT	Right shoulder	7/4/1995	11:28:04
	PATIENT, 305997	CT	Spine fracture	5/1/2005	17:17:23
	PATIENT, 305997	RG	Fracture radius	7/1/2004	12:00:00
	PATIENT, 305997	MR	3260 MRI TMJ with contrast	18/1/2005	19:37:03
	PATIENT, 305997	CT	Abdomen^2_Pancreas	14/1/2005	12:59:42
	PATIENT, 305997	CT	Extremities^1_FootAnkle	11/1/2005	15:30:25
	PATIENT, 305997	RG	Thorax	7/1/2004	
	PATIENT, 305997	CR	Ped chest AP (pneumo thorax)	5/1/2005	17:11:00
	PATIENT, 305997	CT	Thorax plain,Thorax+co	18/11/2004	20:27:47
	PATIENT, 305997	CR	Ped chest AP (pneumo thorax)	5/1/2005	17:07:00

Results: 14


Centricity Enterprise Web V2.1 - Microsoft Internet Explorer
PATIENT, 305997
ID: K1001000
3260 MRI TMJ wit...
18/1/2005 19:37:03 7 series
TMJ NEW survey/... 5 images
TMJ NEW T2W/TRA 15 images
TMJ NEW STIR/S... 16 images
Worklist
Reset
[Images on ePR are for reference only and NOT for diagnostic purpose]
Se:301 Im:1 [A] PATIENT, 30... Study Date:1... Study Time:... MRN:K1001...
[R] [L] [P]
TMJ NEW ... C1063 W2126
Se:301 Im:2 [A] PATIENT, 30... Study Date:1... Study Time:... MRN:K1001...
[R] [L] [P]
TMJ NEW ... C1011 W2021
Se:301 Im:3 [A] PATIENT, 30... Study Date:1... Study Time:... MRN:K1001...
[R] [L] [P]
TMJ NEW ... C999 W1998
Se:301 Im:4 [A] PATIENT, 30... Study Date:1... Study Time:... MRN:K1001...
[R] [L]
TMJ NEW ... C1040
Se:301 Im:5 [A] PATIENT, 30... Study Date:1... Study Time:... MRN:K1001...
[R] [L]
TMJ NEW ... C995
Se:301 Im:6 [A] PATIENT, 30... Study Date:1... Study Time:... MRN:K1001...
[R] [L]
TMJ NEW ... C1008

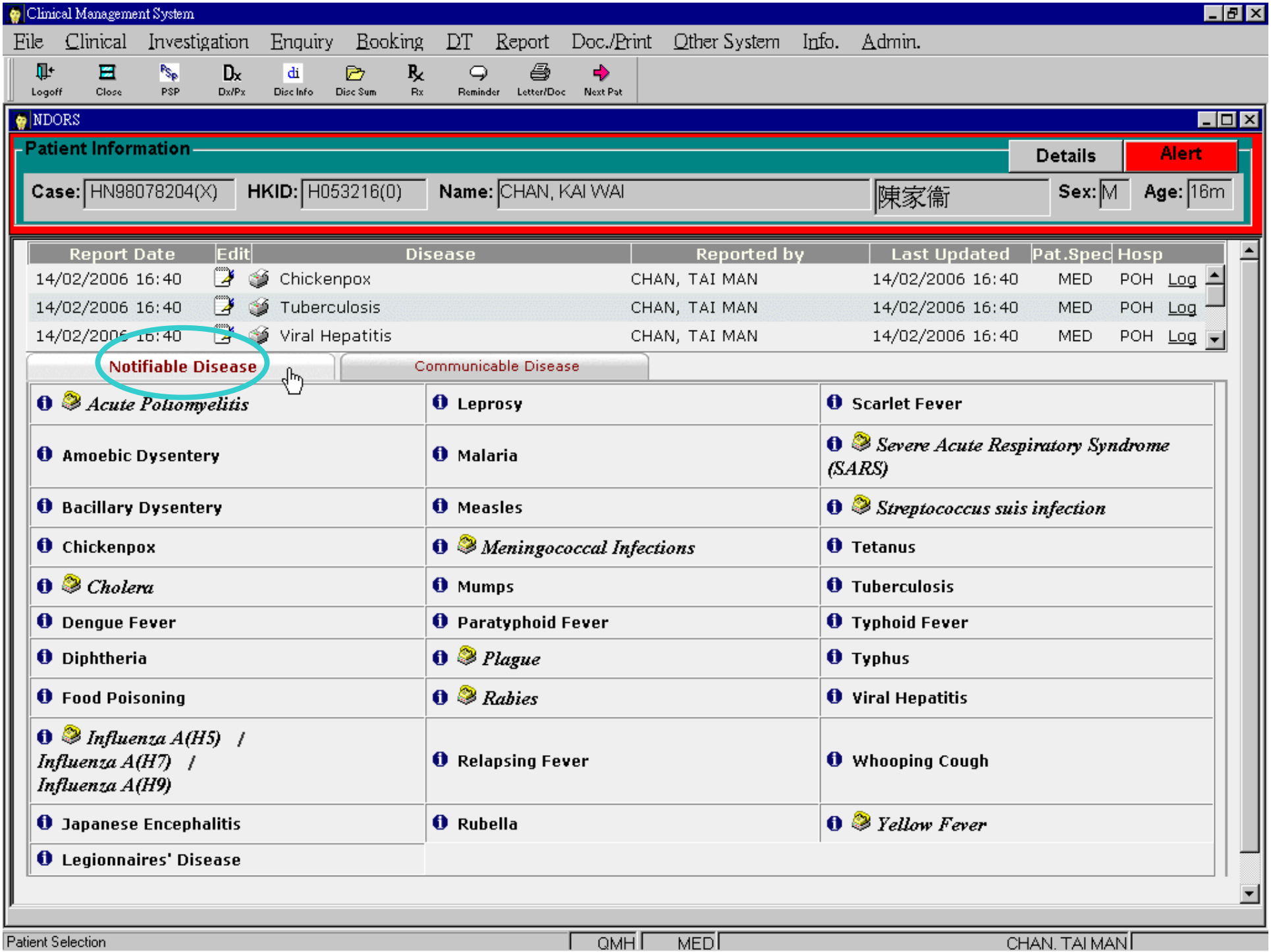
Risk Management

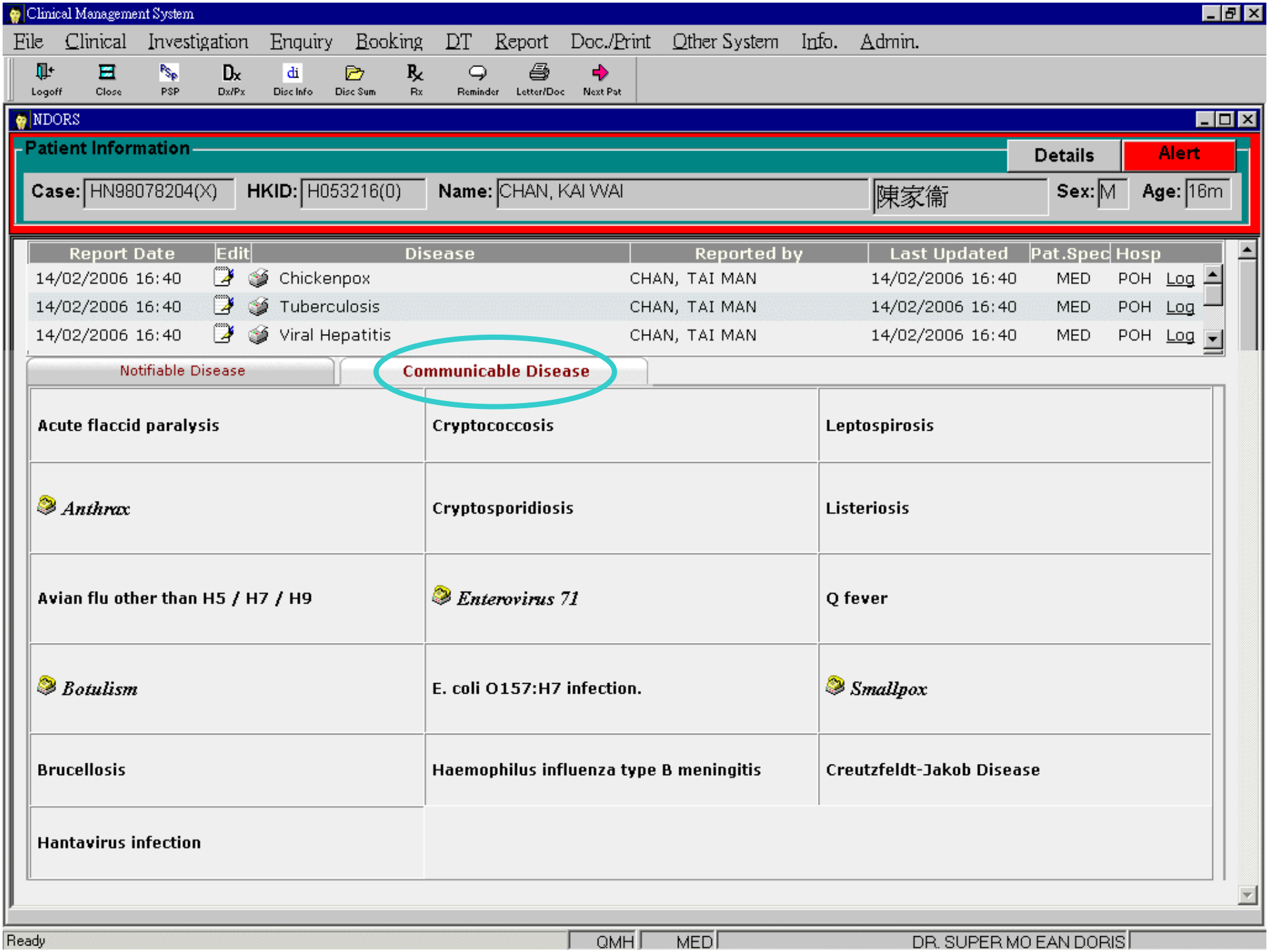
- Medication Allergy Checking
- High Risk Elderly Alert
  - Flagging Elderly Patients at Risk
  - Notifying on Admission / Discharge
- Diabetes Monitoring
- Infection Risk Alert
- Implanted Device Recalls
- Medication Recalls
- G6PD Deficiency Flag
- Auditing


Clinical Management System
File Clinical Investigation Enquiry Booking Report Doc./Print Other System Info. Admin.
Alert
Drug Allergy
No known Drug Allergy
Drug allergy record(s)
Allergen
Clinical Manifestation
Additional Information
Level of Certainty
ASPIRIN
Rash
Certain
Add
Edit
Delete
Non-Drug Allergy / Adverse Drug Reaction / Alert
Type
Details
Alert
G6PD Deficiency
Adverse Drug Reaction
codine : bradycardia
Non-Drug Allergy
micropore : dermatitis
Alert
dddfdafd
Add
Edit
Delete
Print
Preview
Log
Close
Disclaimer:
Only the allergen under drug allergy record(s) is subjected to allergy checking against the medication(s) prescribed.

eSARS

HA
Situation Reports
eSARS
Labs
CMS
ePR
eSARS
PMI
Data Warehouse
Firewall
DM Zone
SARS-CTS
Contacts
eSARS
PMI
Firewall
Dept Health
Telephone interviews
SARS-CCIS
Police
Hotspot Alert
MIIDSS
HKU


Clinical Management System
File Clinical Investigation Enquiry Booking DT Report Doc./Print Other System Info. Admin.
Logoff Close PSP Dx/Px Disc Info Disc Sum Rx Reminder Letter/Doc Next Pat
NDORS
Patient Information
Details
Alert
Case: HN98078204(X)
HKID: H053216(0)
Name: CHAN, KAI WAI
陳家衛
Sex: M
Age: 16m
Report Date
Edit
Disease
Reported by
Last Updated
Pat.Spec
Hosp
14/02/2006 16:40 Chickenpox CHAN, TAI MAN 14/02/2006 16:40 MED POH Log
14/02/2006 16:40 Tuberculosis CHAN, TAI MAN 14/02/2006 16:40 MED POH Log
14/02/2006 16:40 Viral Hepatitis CHAN, TAI MAN 14/02/2006 16:40 MED POH Log
Notifiable Disease
Communicable Disease
Acute Poliomyelitis
Amoebic Dysentery
Bacillary Dysentery
Chickenpox
Cholera
Dengue Fever
Diphtheria
Food Poisoning
Influenza A(H5) / Influenza A(H7) / Influenza A(H9)
Japanese Encephalitis
Legionnaires' Disease
Leprosy
Malaria
Measles
Meningococcal Infections
Mumps
Paratyphoid Fever
Plague
Rabies
Relapsing Fever
Rubella
Scarlet Fever
Severe Acute Respiratory Syndrome (SARS)
Streptococcus suis infection
Tetanus
Tuberculosis
Typhoid Fever
Typhus
Viral Hepatitis
Whooping Cough
Yellow Fever
Patient Selection
QMH
MED
CHAN, TAI MAN


Clinical Management System
File Clinical Investigation Enquiry Booking DT Report Doc./Print Other System Info. Admin.
Logoff Close PSP Dx/Px Disc Info Disc Sum Rx Reminder Letter/Doc Next Pat
NDORS
Patient Information
Details
Alert
Case: HN98078204(X)
HKID: H053216(0)
Name: CHAN, KAI WAI
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Report Date
Edit
Disease
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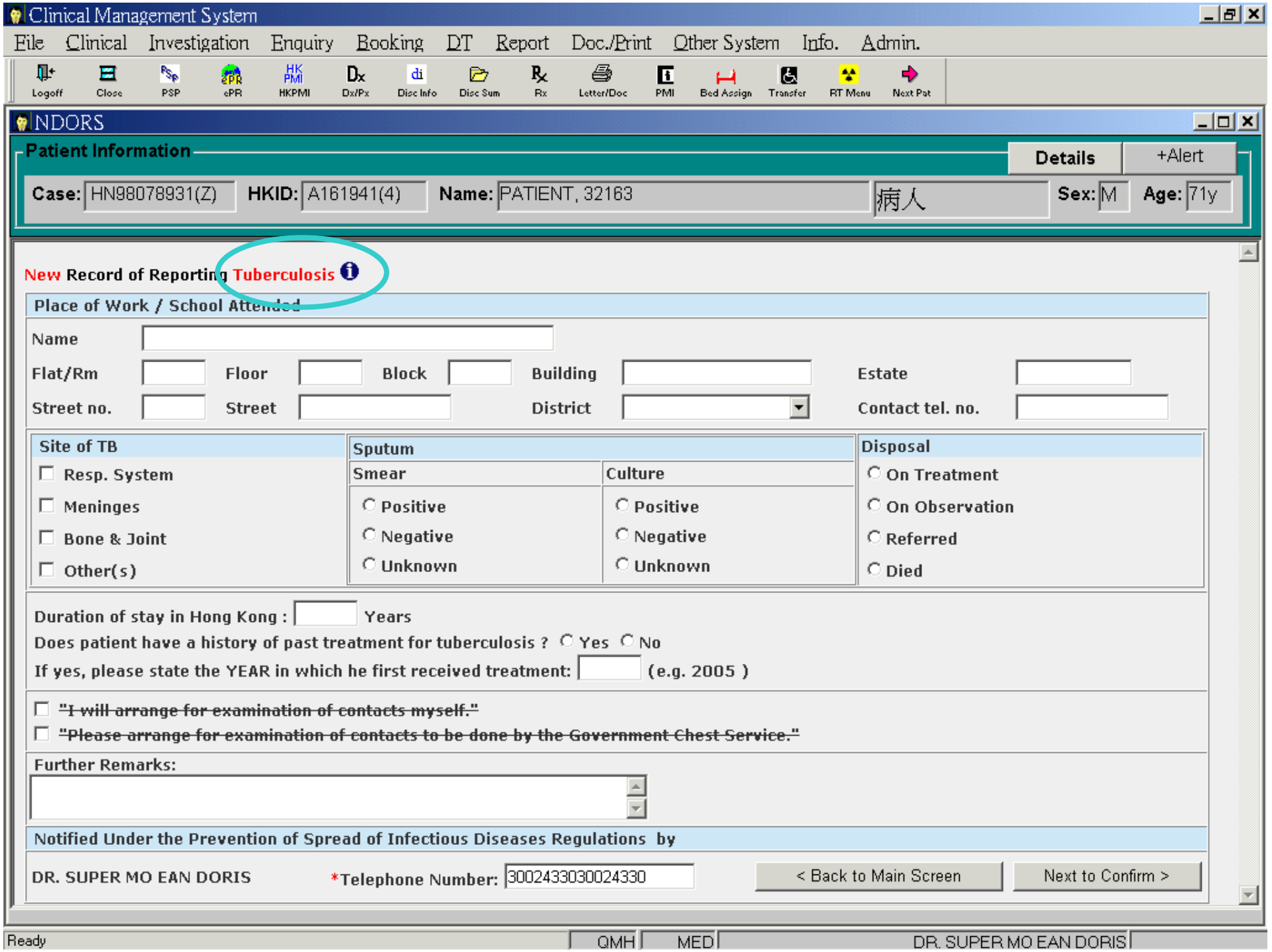
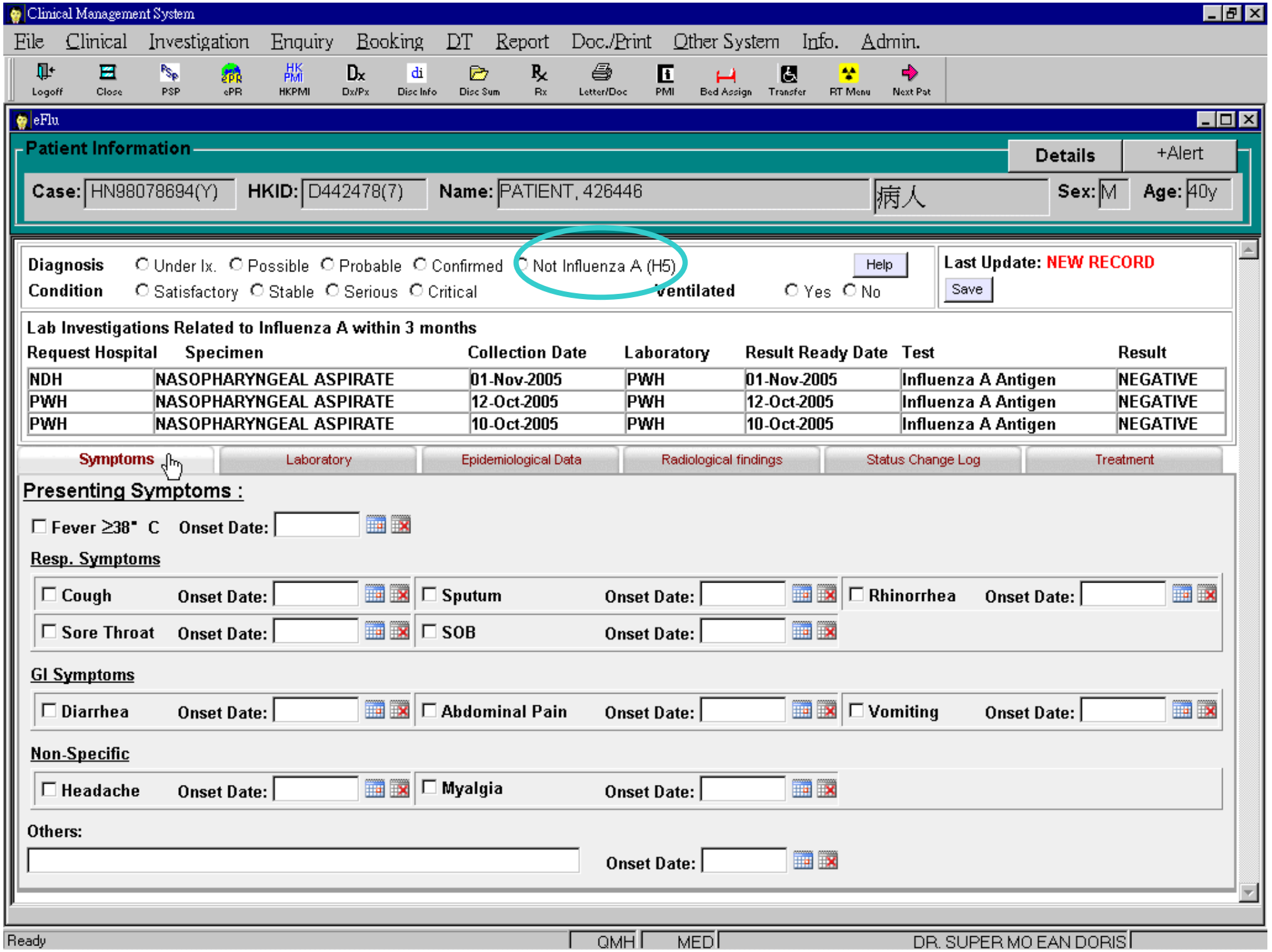
Last Updated
Pat.Spec
Hosp
14/02/2006 16:40 Chickenpox CHAN, TAI MAN 14/02/2006 16:40 MED POH Log
14/02/2006 16:40 Tuberculosis CHAN, TAI MAN 14/02/2006 16:40 MED POH Log
14/02/2006 16:40 Viral Hepatitis CHAN, TAI MAN 14/02/2006 16:40 MED POH Log
Notifiable Disease
Communicable Disease
Acute flaccid paralysis
Cryptococcosis
Leptospirosis
Anthrax
Cryptosporidiosis
Listeriosis
Avian flu other than H5 / H7 / H9
Enterovirus 71
Q fever
Botulism
E. coli O157:H7 infection.
Smallpox
Brucellosis
Haemophilus influenza type B meningitis
Creutzfeldt-Jakob Disease
Hantavirus infection
Ready
QMH
MED
DR. SUPER MO EAN DORIS


Clinical Management System
File Clinical Investigation Enquiry Booking DT Report Doc./Print Other System Info. Admin.
Logoff Close PSP ePR HKPMI Dx/Px Disc Info Disc Sum Rx Letter/Doc PMI Bed Assign Transfer RT Menu Next Pat
NDORS
Patient Information
Details
+Alert
Case: HN98078931(Z)
HKID: A161941(4)
Name: PATIENT, 32163
病人
Sex: M
Age: 71y
New Record of Reporting Tuberculosis
Place of Work / School Attended
Name
Flat/Rm
Floor
Block
Building
Estate
Street no.
Street
District
Contact tel. no.
Site of TB
Resp. System
Meninges
Bone & Joint
Other(s)
Sputum
Smear
Positive
Negative
Unknown
Culture
Positive
Negative
Unknown
Disposal
On Treatment
On Observation
Referred
Died
Duration of stay in Hong Kong : Years
Does patient have a history of past treatment for tuberculosis ? Yes No
If yes, please state the YEAR in which he first received treatment: (e.g. 2005)
"I will arrange for examination of contacts myself."
"Please arrange for examination of contacts to be done by the Government Chest Service."
Further Remarks:
Notified Under the Prevention of Spread of Infectious Diseases Regulations by
DR. SUPER MO EAN DORIS
*Telephone Number: 3002433030024330
< Back to Main Screen
Next to Confirm >
Ready
QMH
MED
DR. SUPER MO EAN DORIS


Clinical Management System
File Clinical Investigation Enquiry Booking DT Report Doc./Print Other System Info. Admin.
Logoff Close PSP ePR HKPMI Dx/Px Disc Info Disc Sum Rx Letter/Doc PMI Bed Assign Transfer RT Menu Next Pat
eFlu
Patient Information
Details
+Alert
Case: HN98078694(Y)
HKID: D442478(7)
Name: PATIENT, 426446
病人
Sex: M
Age: 40y
Diagnosis Under Ix. Possible Probable Confirmed Not Influenza A (H5)
Help
Last Update: NEW RECORD
Save
Condition Satisfactory Stable Serious Critical
Ventilated Yes No
Lab Investigations Related to Influenza A within 3 months
Request Hospital | Specimen | Collection Date | Laboratory | Result Ready Date | Test | Result
NDH | NASOPHARYNGEAL ASPIRATE | 01-Nov-2005 | PWH | 01-Nov-2005 | Influenza A Antigen | NEGATIVE
PWH | NASOPHARYNGEAL ASPIRATE | 12-Oct-2005 | PWH | 12-Oct-2005 | Influenza A Antigen | NEGATIVE
PWH | NASOPHARYNGEAL ASPIRATE | 10-Oct-2005 | PWH | 10-Oct-2005 | Influenza A Antigen | NEGATIVE
Symptoms
Laboratory
Epidemiological Data
Radiological findings
Status Change Log
Treatment
Presenting Symptoms :
Fever ≥38° C Onset Date:
Resp. Symptoms
Cough Onset Date:
Sputum Onset Date:
Rhinorrhea Onset Date:
Sore Throat Onset Date:
SOB Onset Date:
GI Symptoms
Diarrhea Onset Date:
Abdominal Pain Onset Date:
Vomiting Onset Date:
Non-Specific
Headache Onset Date:
Myalgia Onset Date:
Others:
Onset Date:
Ready
QMH
MED
DR. SUPER MO EAN DORIS

Standard Based

- Where possible, international health IT standards are used:
  - HL7, ICD-9CM, LOINC, SNOMED, DICOM
- Where necessary, local standards are developed:
  - Clinical Data Framework, EntityID

Security Measures: Network

- Security consultant to review security architecture
- Network based IDS & Corporate Firewalls
- VPN gateway with SSL encryptions
- 2-factor user authentication using SecureID
- Enable server-farm firewall service

Privacy Measures

- Role-based access control
- Need to know / patient under care basis
- Detailed audit trail logging
- Audit checking
- SMS codes and notifications
- Privacy ordinance

Daily Transactions

- Number of users
  - 12,000 per day
- Number of patient records accessed
  - 90,000 per day
- Number of online transaction
  - 2,000,000 per day
- System Availability
  - 99.98%

International Recognition

Best in Class Around The World

Project Implementation/ Scope Management	***Hong Kong***	•Focused Uniform Clinical Information Systems Project •Focus on Ancillary Integration •Probably not replicable anywhere else in the world
Components/ Innovations	***United States (Kaiser)***	•CPOE/Decision Support •Advanced Models For Clinical Documentation •CMV and sophisticated rules engine management.
Security/Privacy	***Canada, UK Brazil, US***	•Clear Regulations with Enforcement Mechanism •Active Engagement of Consumer Advocacy Groups •Smart Card Solutions For Authentication except in U.S.

Australia Healthcare Summit Conference in June 2003
Dave Garets, Executive Vice President of HealthLink Incorporated

Awards won

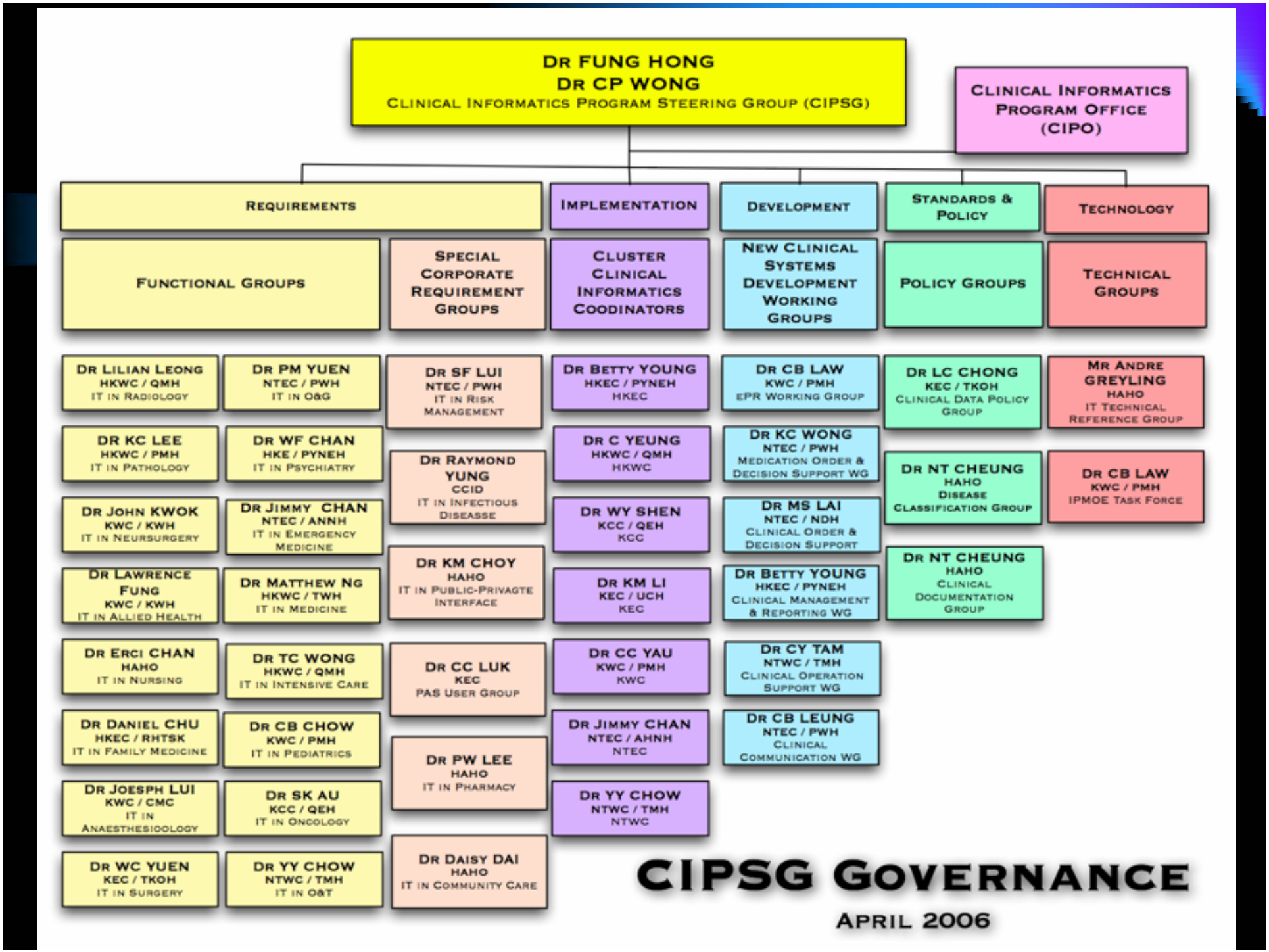
- 2004 Stockholm Challenge (Health)
- IT Excellence 2005
- APICTA 2005

Critical Success Factor

- Clinicians engagement
- Requested by the clinicians
- Designed by the clinicians
- Built for the clinicians
- Used by the clinicians
- Governed by the clinicians

Make the users the owners

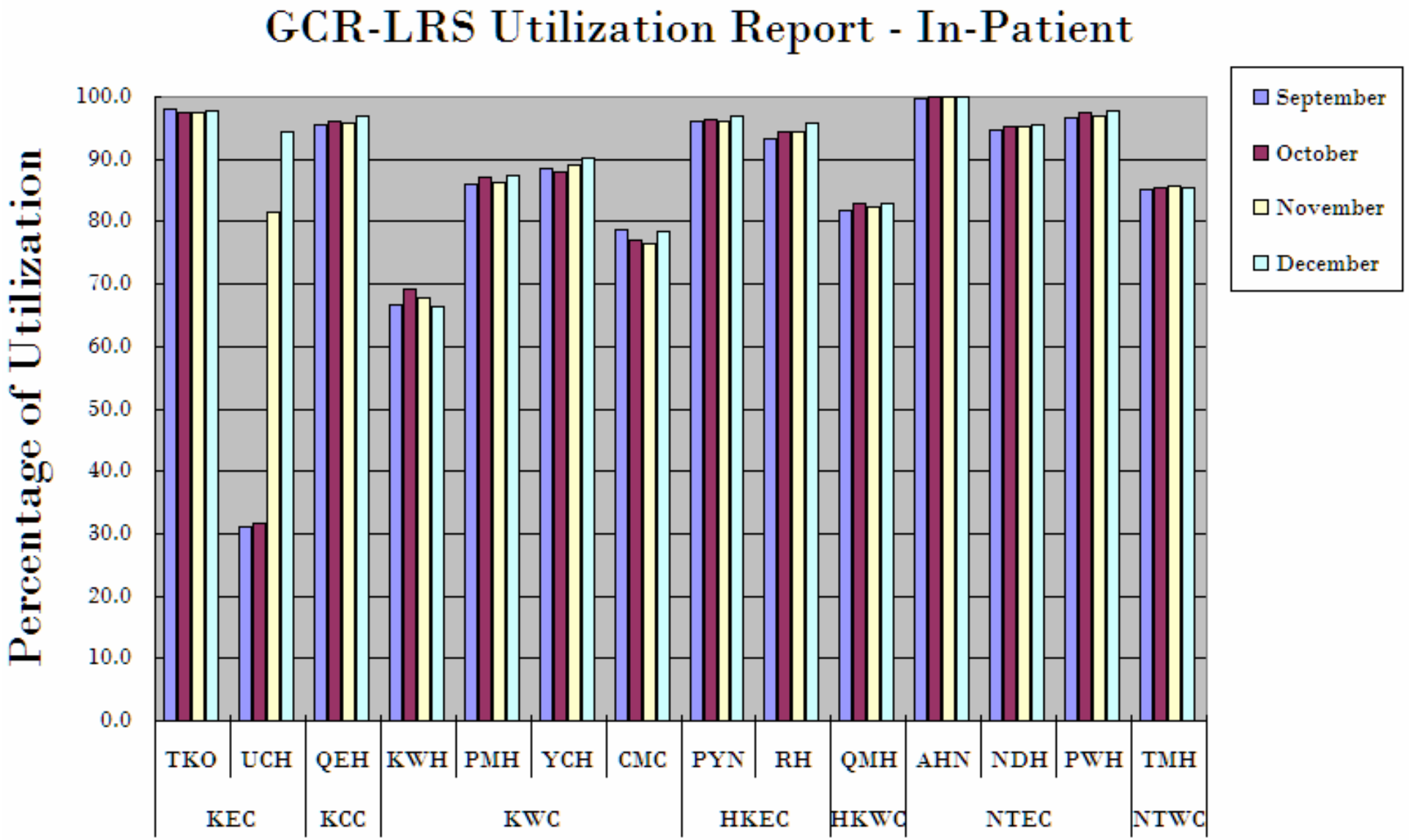
- Deliver value to the users
- Make the system bend to the user, not *vice versa*
- Build up an informatics culture
- *"Driven by clinicians, built for clinicians"*
- 80% data entry by clinicians


Dr FUNG HONG
Dr CP WONG
Clinical Informatics Program Steering Group (CIPSG)
Clinical Informatics Program Office (CIPO)
Requirements
Implementation
Development
Standards & Policy
Technology
Functional Groups
Special Corporate Requirement Groups
Cluster Clinical Informatics Coodinators
New Clinical Systems Development Working Groups
Policy Groups
Technical Groups
Dr Lilian Leong
HKWC / QMH
IT in Radiology
Dr PM Yuen
NTEC / PWH
IT in O&G
Dr KC Lee
HKWC / PMH
IT in Pathology
Dr WF Chan
HKE / PYNEH
IT in Psychiatry
Dr John Kwok
KWC / KWH
IT in Neursurgery
Dr Jimmy Chan
NTEC / ANNH
IT in Emergency Medicine
Dr Lawrence Fung
KWC / KWH
IT in Allied Health
Dr Matthew Ng
HKWC / TWH
IT in Medicine
Dr Erci Chan
HAHO
IT in Nursing
Dr TC Wong
HKWC / QMH
IT in Intensive Care
Dr Daniel Chu
HKEC / RHTSK
IT in Family Medicine
Dr CB Chow
KWC / PMH
IT in Pediatrics
Dr Joesph Lui
KWC / CMC
IT in Anaesthesiology
Dr SK Au
KCC / QEH
IT in Oncology
Dr WC Yuen
KEC / TKOH
IT in Surgery
Dr YY Chow
NTWC / TMH
IT in O&T
Dr SF Lui
NTEC / PWH
IT in Risk Management
Dr Raymond Yung
CCID
IT in Infectious Diseasse
Dr KM Choy
HAHO
IT in Public-Privagte Interface
Dr CC Luk
KEC
PAS User Group
Dr PW Lee
HAHO
IT in Pharmacy
Dr Daisy Dai
HAHO
IT in Community Care
Dr Betty Young
HKEC / PYNEH
HKEC
Dr C Yeung
HKWC / QMH
HKWC
Dr WY Shen
KCC / QEH
KCC
Dr KM Li
KEC / UCH
KEC
Dr CC Yau
KWC / PMH
KWC
Dr Jimmy Chan
NTEC / AHNH
NTEC
Dr YY Chow
NTWC / TMH
NTWC
Dr CB Law
KWC / PMH
ePR Working Group
Dr KC Wong
NTEC / PWH
Medication Order & Decision Support WG
Dr MS Lai
NTEC / NDH
Clinical Order & Decision Support
Dr Betty Young
HKEC / PYNEH
Clinical Management & Reporting WG
Dr CY Tam
NTWC / TMH
Clinical Operation Support WG
Dr CB Leung
NTEC / PWH
Clinical Communication WG
Dr LC Chong
KEC / TKOH
Clinical Data Policy Group
Dr NT Cheung
HAHO
Disease Classification Group
Dr NT Cheung
HAHO
Clinical Documentation Group
Mr Andre Greyling
HAHO
IT Technical Reference Group
Dr CB Law
KWC / PMH
IPMOE Task Force
CIPSG Governance
April 2006

Near 100% acceptance by doctors

	CMS utilization figures								
	MOE for OP			MOE for Discharged cases			Discharge Summary		
	Oct-05	Nov-05	Dec-05	Oct-05	Nov-05	Dec-05	Oct-05	Nov-05	Dec-05
HKEC	99.0%	99.0%	99.0%	97.0%	97.0%	97.0%	99.0%	99.0%	99.0%
HKWC	98.0%	98.0%	99.0%	97.0%	98.0%	99.0%	99.0%	99.0%	99.0%
KEC	98.0%	98.0%	98.0%	97.0%	97.0%	97.0%	99.0%	98.0%	99.0%
KCC	97.0%	98.0%	98.0%	96.0%	97.0%	97.0%	97.0%	97.0%	97.0%
KWC	98.0%	98.0%	98.0%	99.0%	99.0%	99.0%	98.0%	98.0%	98.0%
NTEC	98.0%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%	98.0%	99.0%
NTWC	98.0%	98.0%	98.0%	99.0%	98.0%	98.0%	98.0%	99.0%	98.0%
Overall	**98.0%**	**98.3%**	**98.4%**	**97.7%**	**97.9%**	**98.0%**	**98.4%**	**98.3%**	**98.4%**

Laboratory Order Entry



Other Success Factors

- Unique citizen identity card
- Non-Big Bang Approach
- Home-built system
- Careful implementation policies
- Pilot sites
- Dedicated User training teams

Clinician benefits

- Speed up Work Flow
- More efficient clinical practice
  - No need to search for data elsewhere
- Make decisions with comprehensive clinical information
- Avoid errors associated with paper records
- Access data and images at home or remote sites for expert consultations

Improved Service to the Community

- Scheduled appointments and faster admissions
- Reduced need to queue for each service
- Drug labels and drug history
- Test results available sooner
- Less duplication of tests
- Allergies and chronic conditions known
- Menu choice in some hospitals
- Consolidated medical records and shared access
- Medical records more available at time of treatment

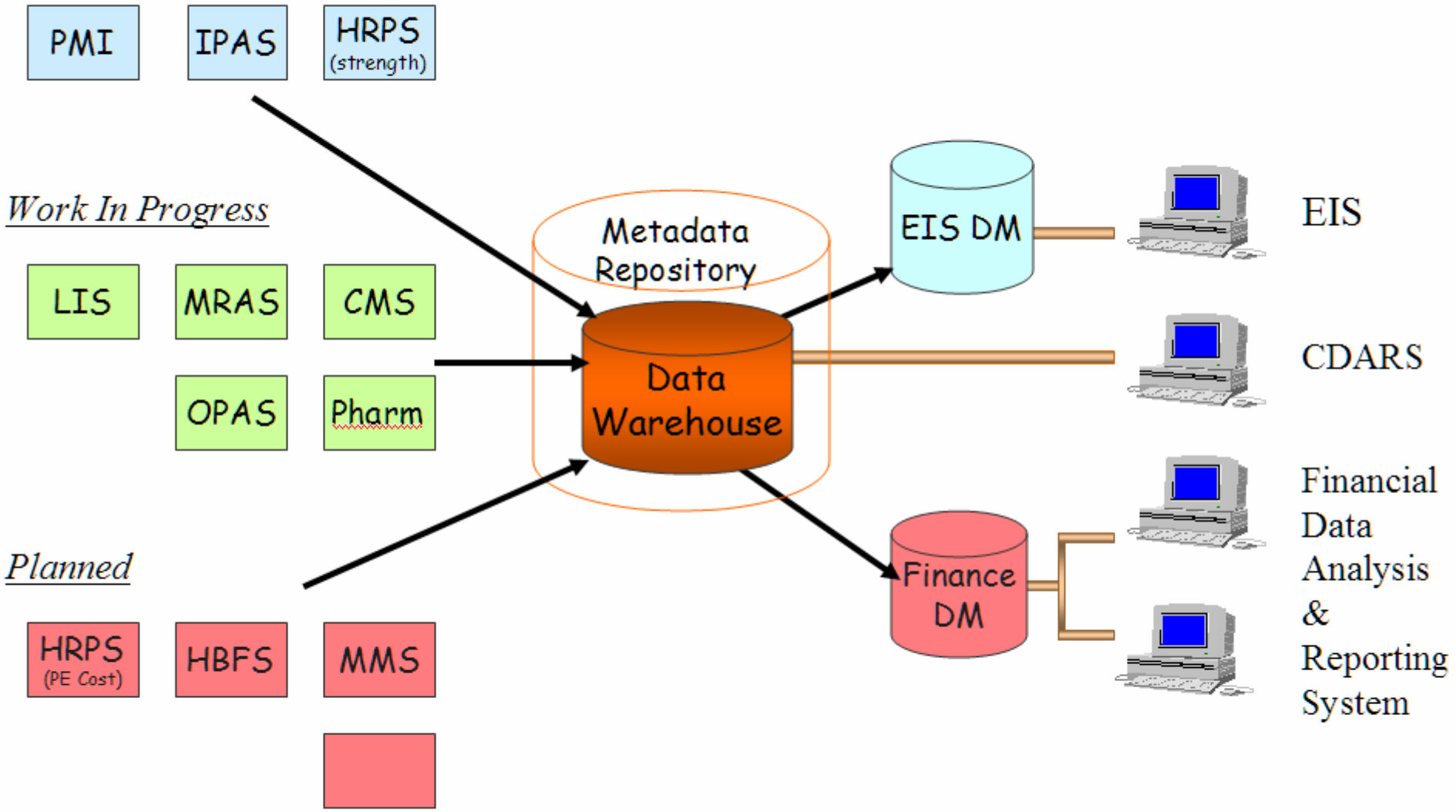
Data Available for Performance Review

- Corporate databases and corporate systems enable the HA to construct the Enterprise Data Warehouse
- The DW feeds the Executive Information System (EIS)
- The EIS allows all users to view standard or ad hoc reports on both operational data and performance indicators
- Each hospital or specialty can compare their performance against other similar hospitals
- Subject specific decision support systems are also being constructed for more detailed reviews

Data Available for Planning & Research

- The Data Warehouse and the EIS provides data required to
  - Plan health services
  - Review fees and charges
  - Plan for new medical equipment and its location
  - Manpower planning
- The Clinical Data Repository provides data for
  - Clinical Audit and Quality Assurance Reviews
  - Medical Research
  - Drug Efficacy Research
  - Epidemiological studies

Data Warehouse Overview



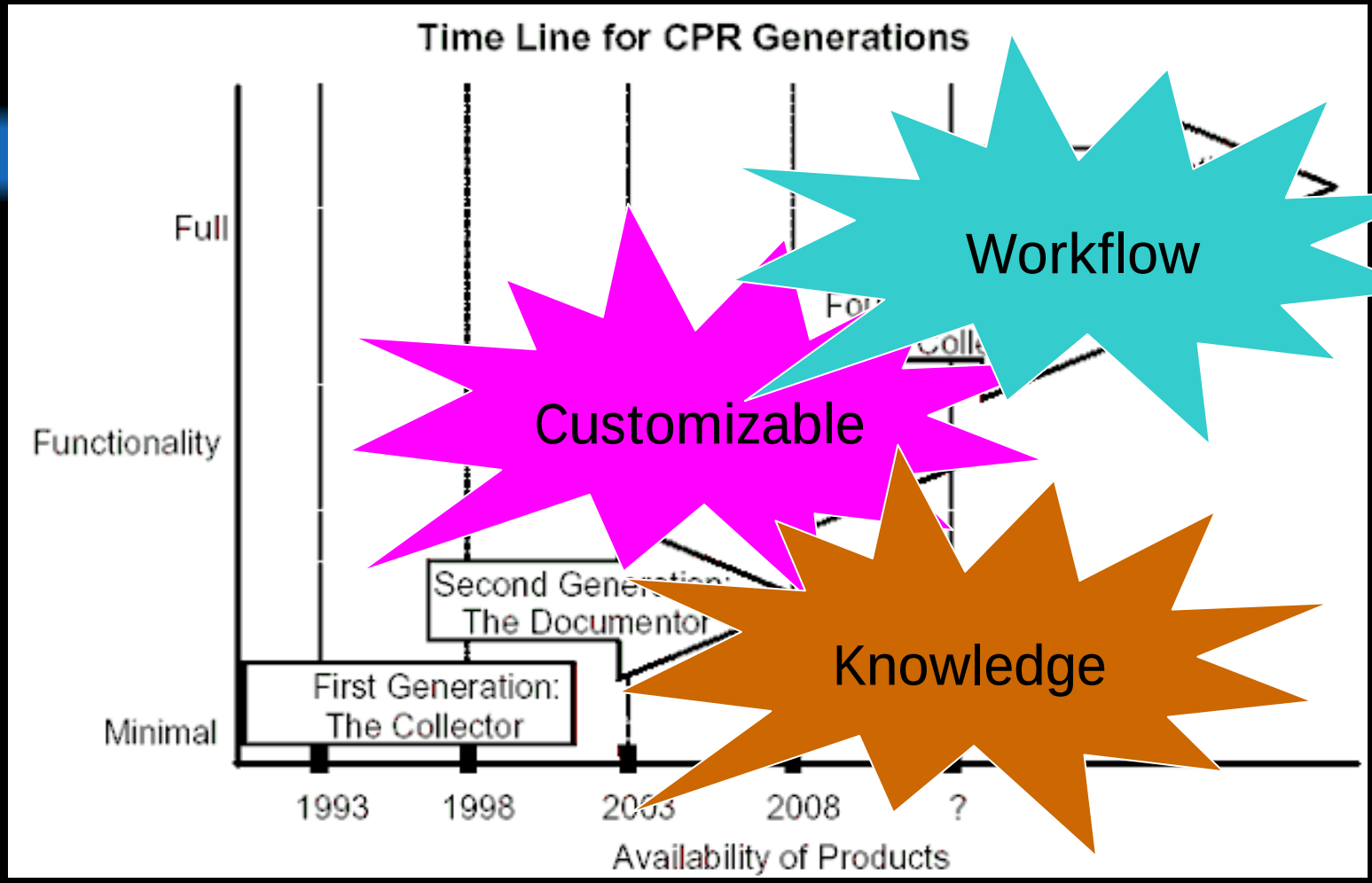
Huge Data Warehouse

- 80+ Terabytes
- 7.6 million patient records
- 57 million episodes of care
- 540 million lab results
- 34 million radiology results
- 400,000 image studies
- Sub-second response time
- Near real time update

The Future
CMS Phase III

The Clinical Systems Strategic Plan 2003-2008

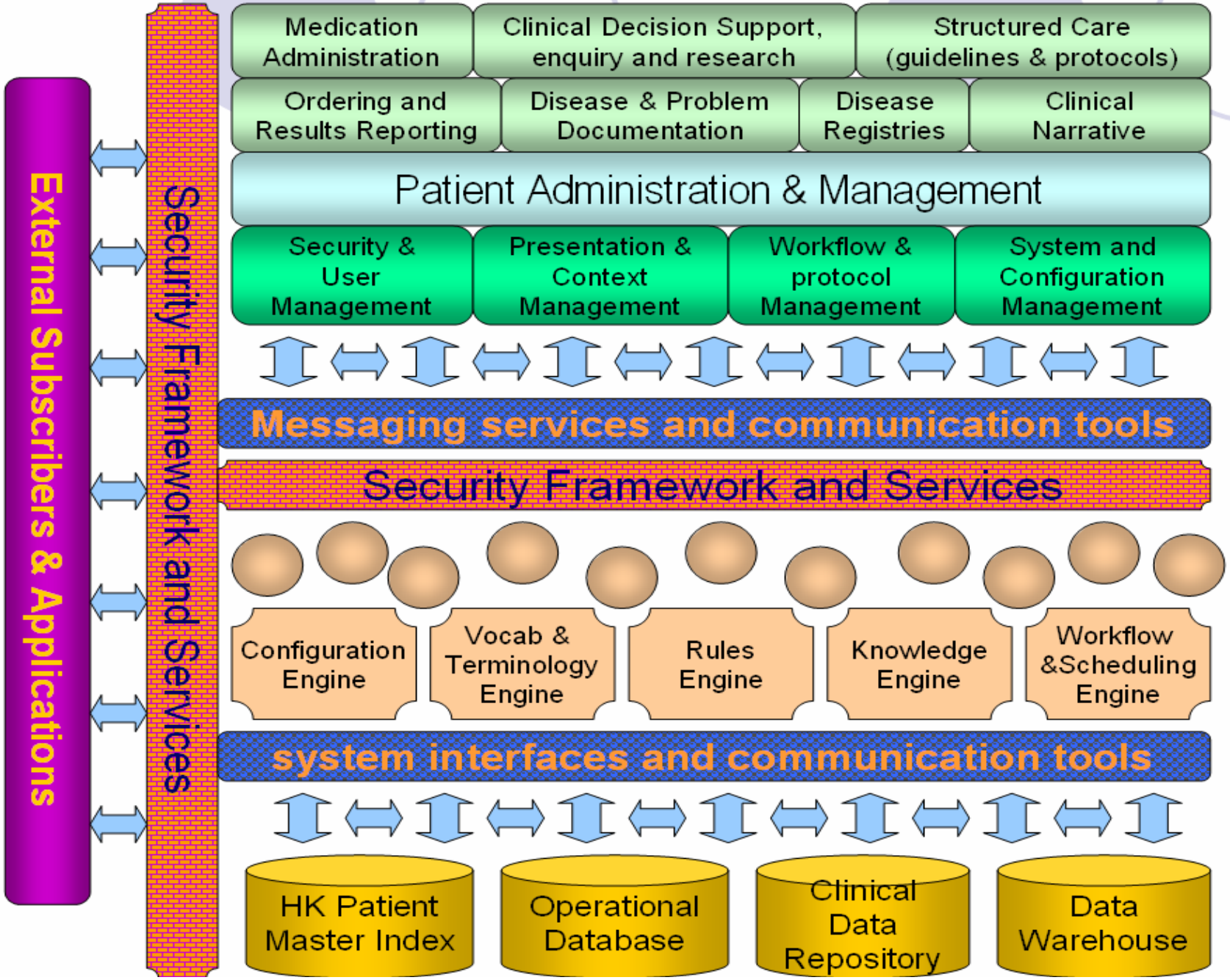
- Access to clinical information
- Support for patient care processes
- Knowledge management and decision support
- Internal governance and decision making
- Information management and standards
- Strengthening the technical infrastructure



Gartner Research, 2001

CMS Phase III

CMS Phase III - technical model



Dashboard

OPAS Appointments

RIS Appointment

OT appointment

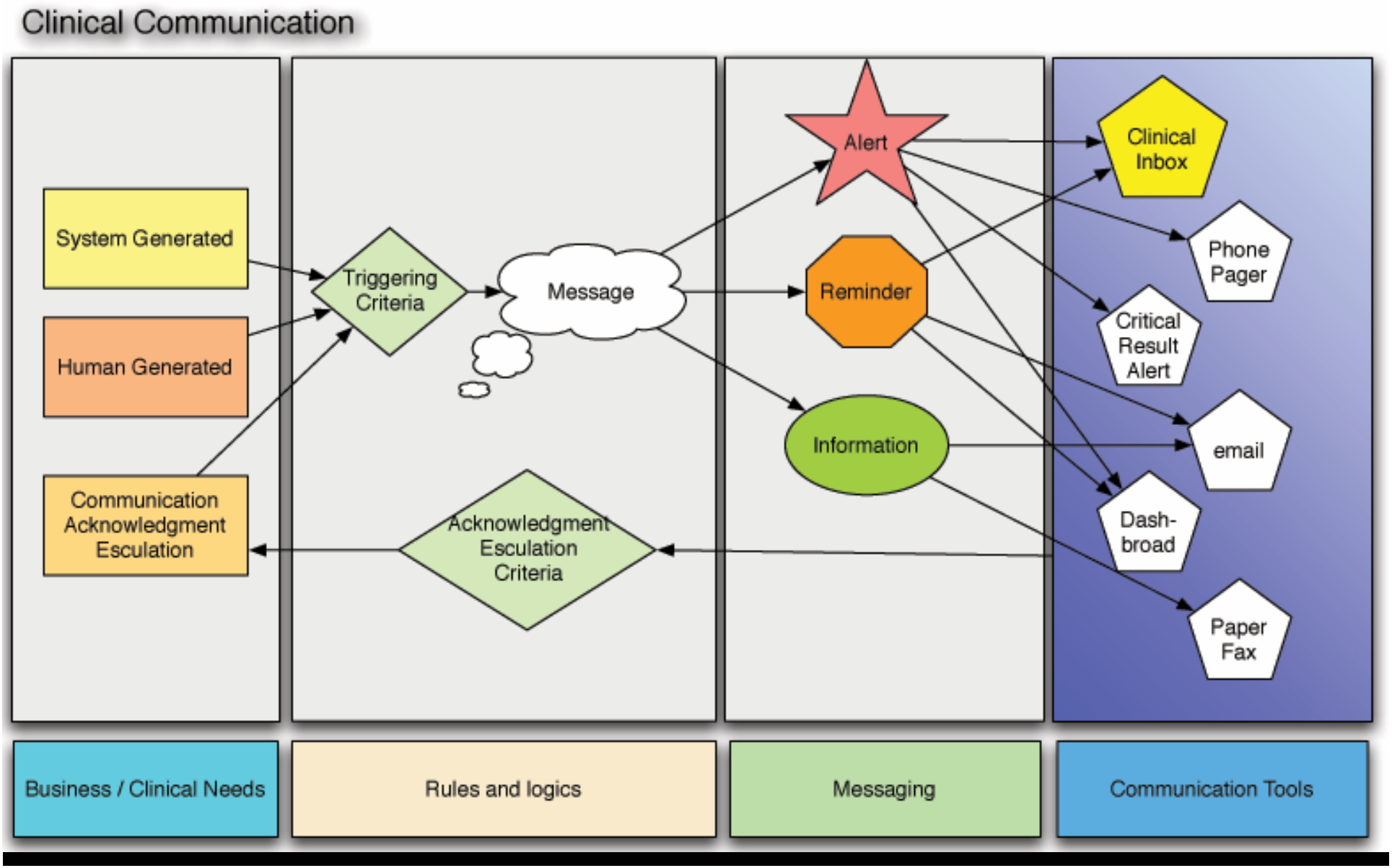
Outstanding Orders

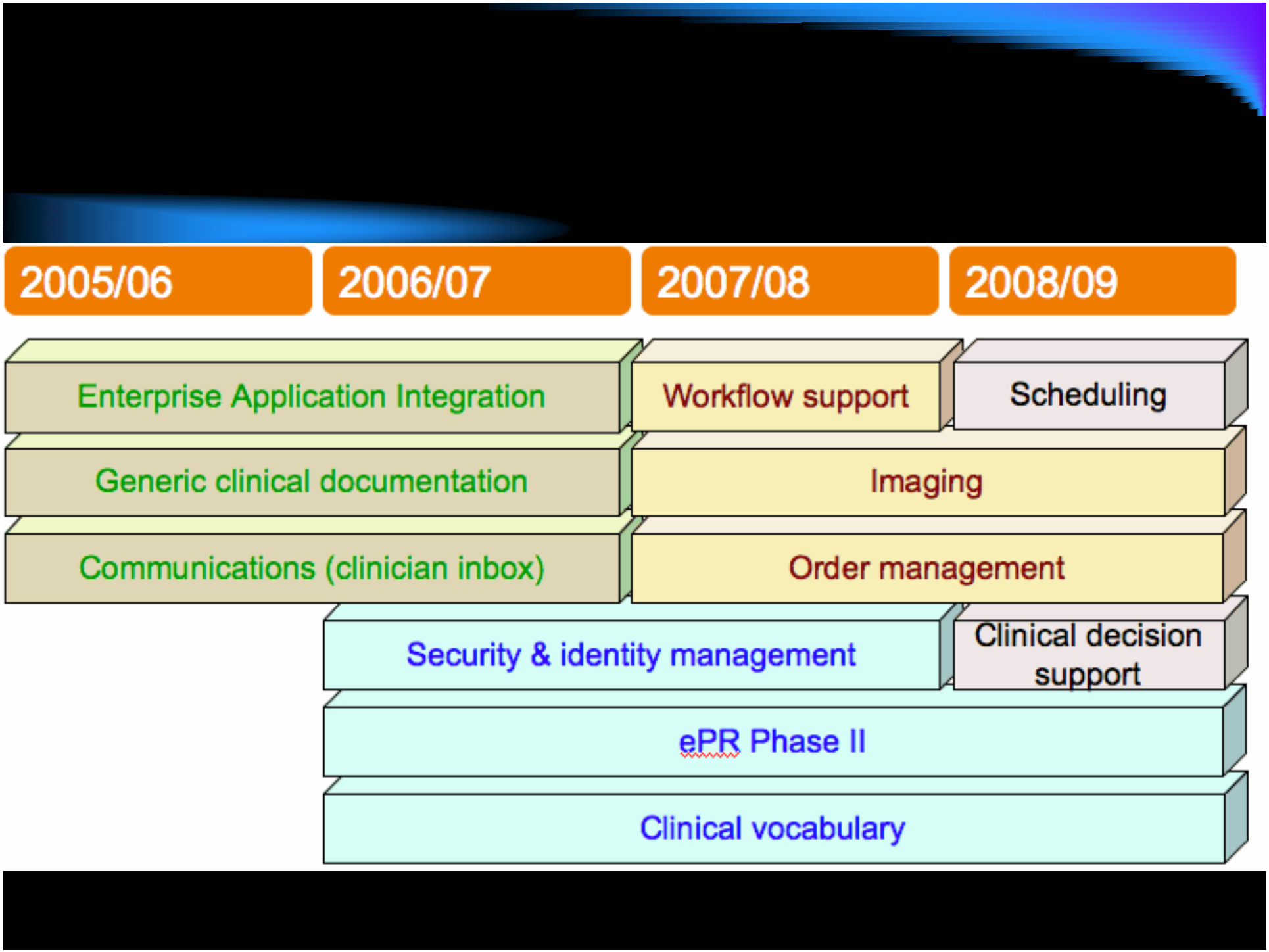
Lab. result a/v in last 4 hrs.

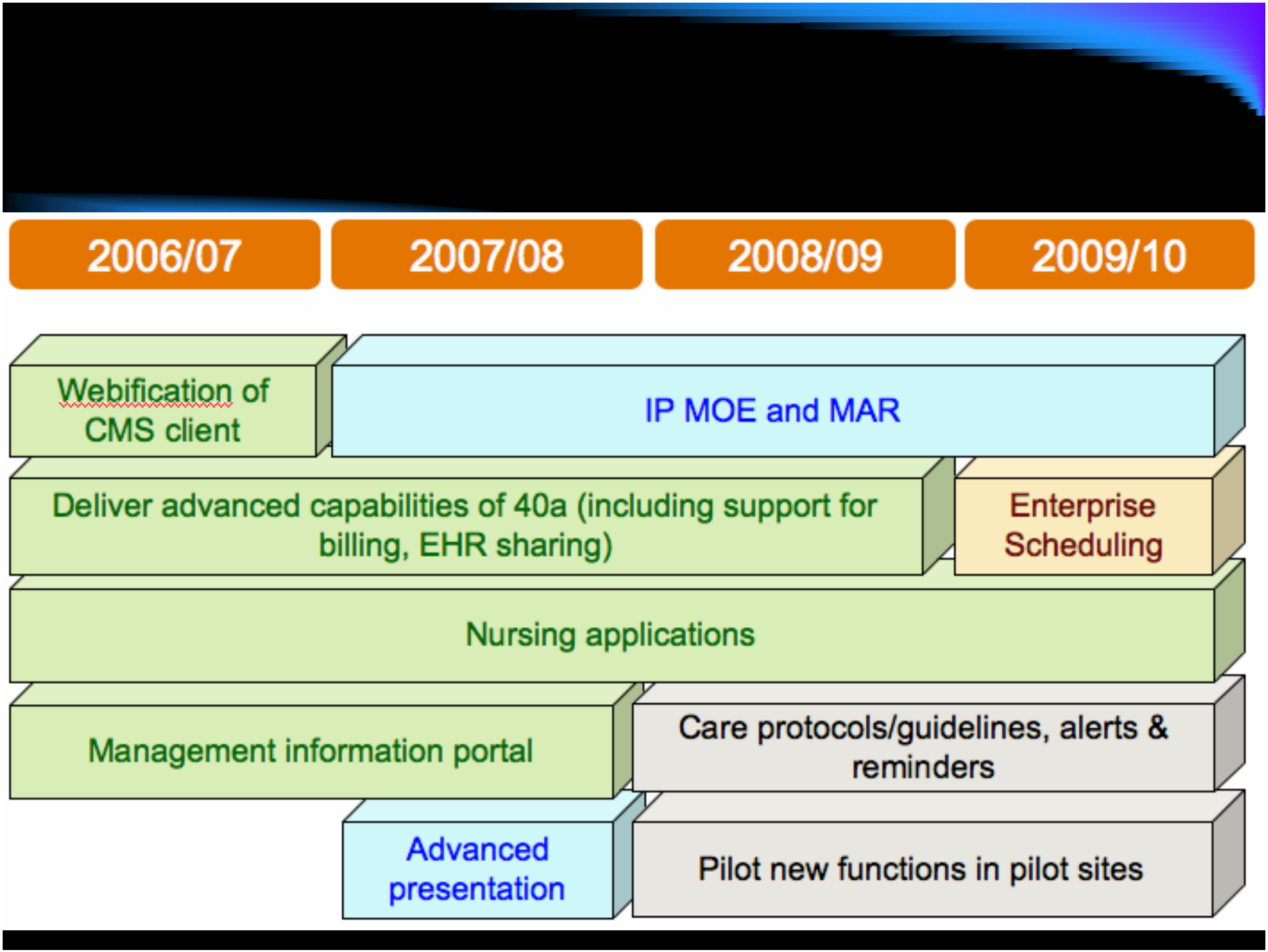
Radiology results a/v in last 4 hrs.

Film images a/v in ePR in last 4 hrs.

Clinical Communication




2005/06
2006/07
2007/08
2008/09
Enterprise Application Integration
Workflow support
Scheduling
Generic clinical documentation
Imaging
Communications (clinician inbox)
Order management
Security & identity management
Clinical decision support
ePR Phase II
Clinical vocabulary

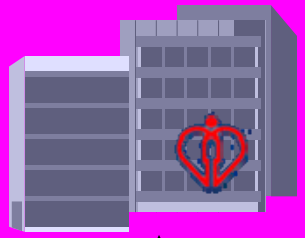

2006/07
2007/08
2008/09
2009/10
Webification of CMS client
IP MOE and MAR
Deliver advanced capabilities of 40a (including support for billing, EHR sharing)
Enterprise Scheduling
Nursing applications
Management information portal
Care protocols/guidelines, alerts & reminders
Advanced presentation
Pilot new functions in pilot sites

More Gaps to Fill

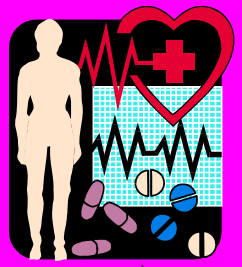
- In Patient MOE & Documentations
- The 10% private hospital market
- The 70% primary care market
- Sharing across whole territory – pilot in place
- Capacity Building
- R&D

Hospitals

Specialist Outpatient Clinics



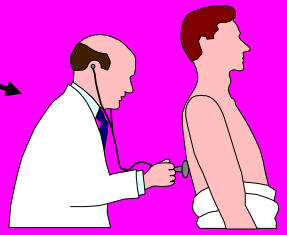
General Outpatient Clinics



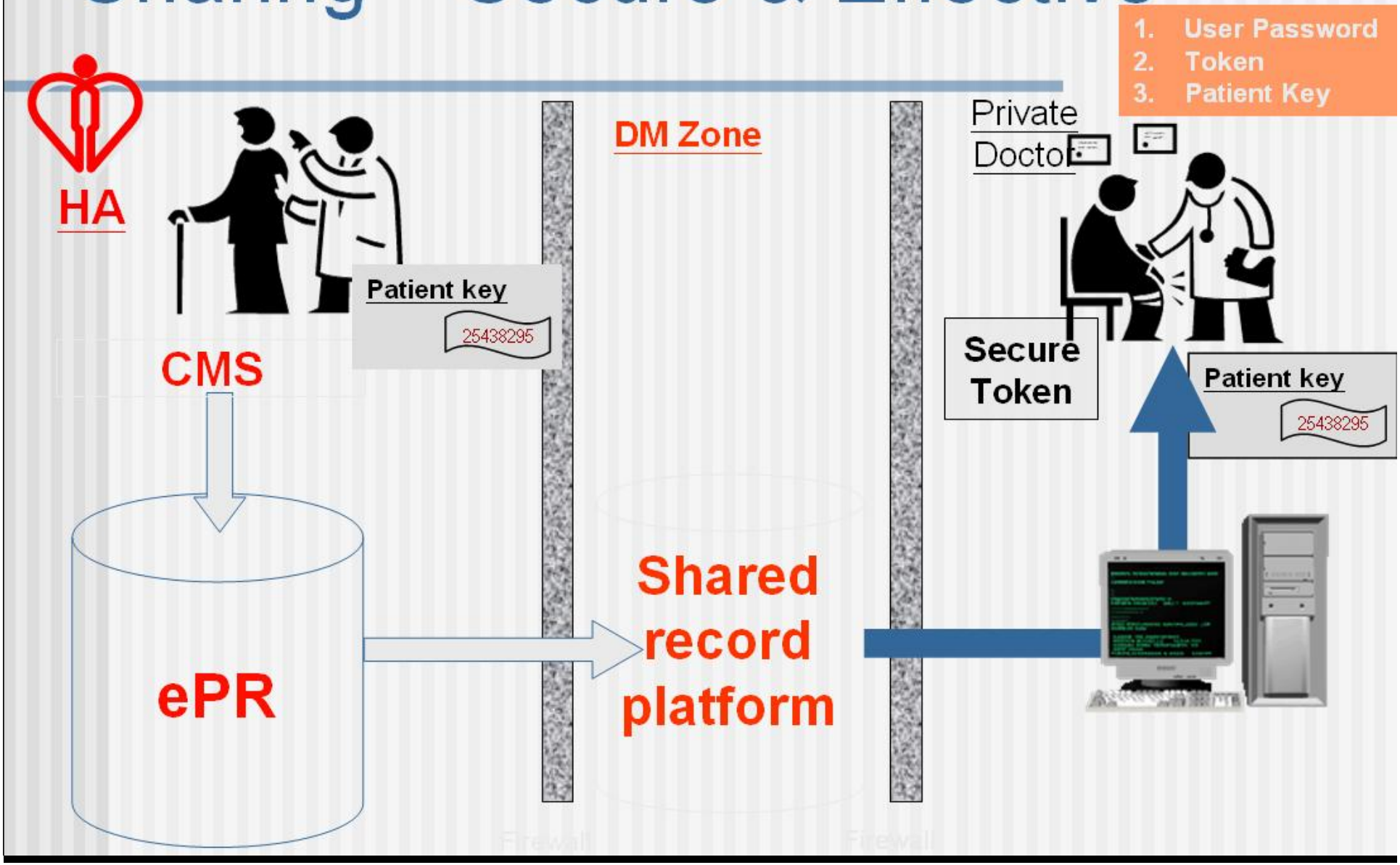
Elderly Homes

Private Group Practices

Private Practitioners



Sharing – Secure & Effective



Public-Private Interface - Electronic Patient Record Sharing Pilot Project
公私營醫療合作 - 醫療病歷互聯試驗計劃

Logon

User ID:

Continue

Log in to access this protected resource. If you don't remember your login information, contact your help desk or administrator.

醫院管理局
HOSPITAL AUTHORITY

Notice and Disclaimer for HA PPI-ePR Sharing Pilot Project

Hong Kong Hospital Authority
147B Argyle Street, Kowloon, Hong Kong Special Administrative Region, PRC.

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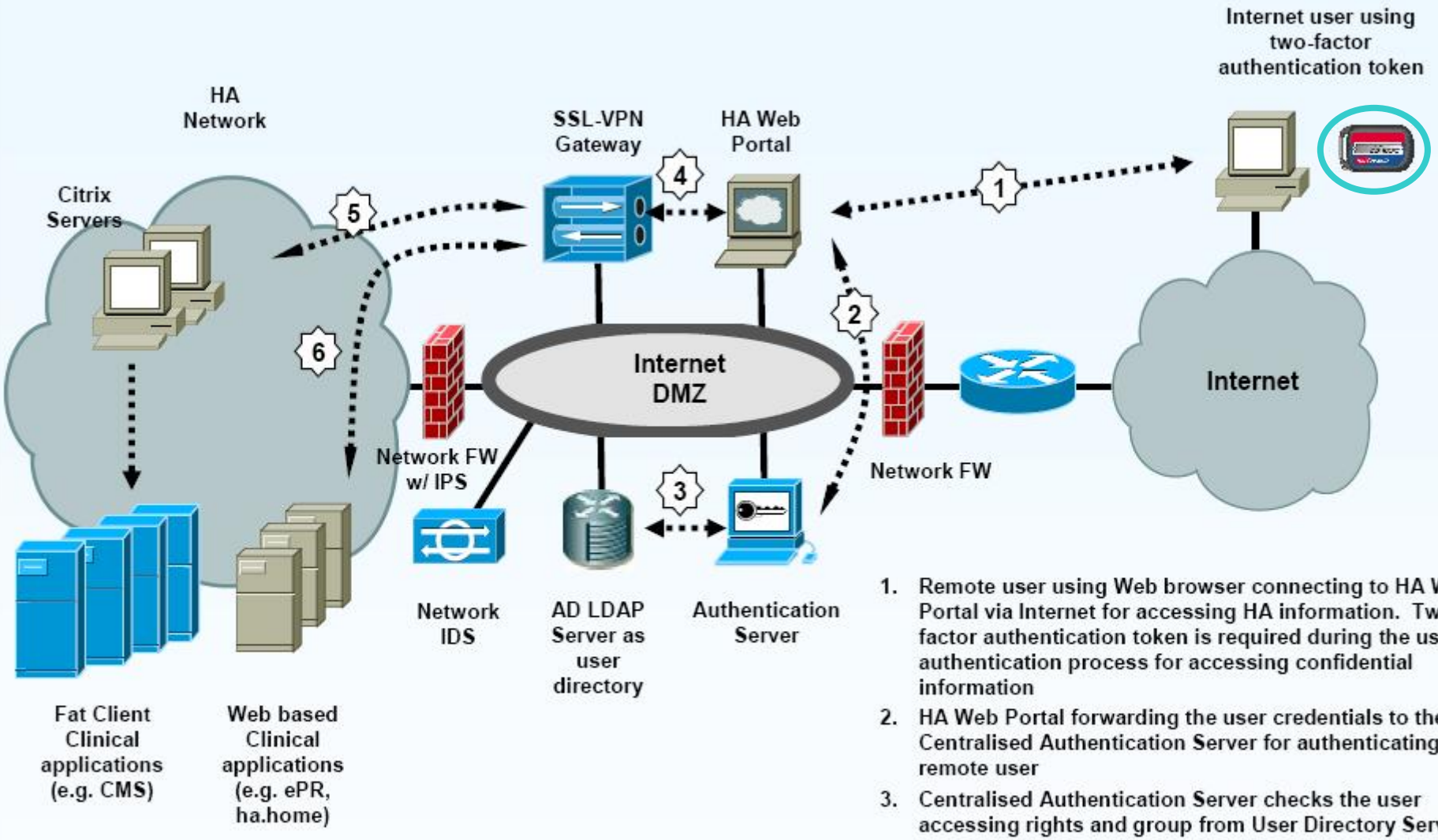
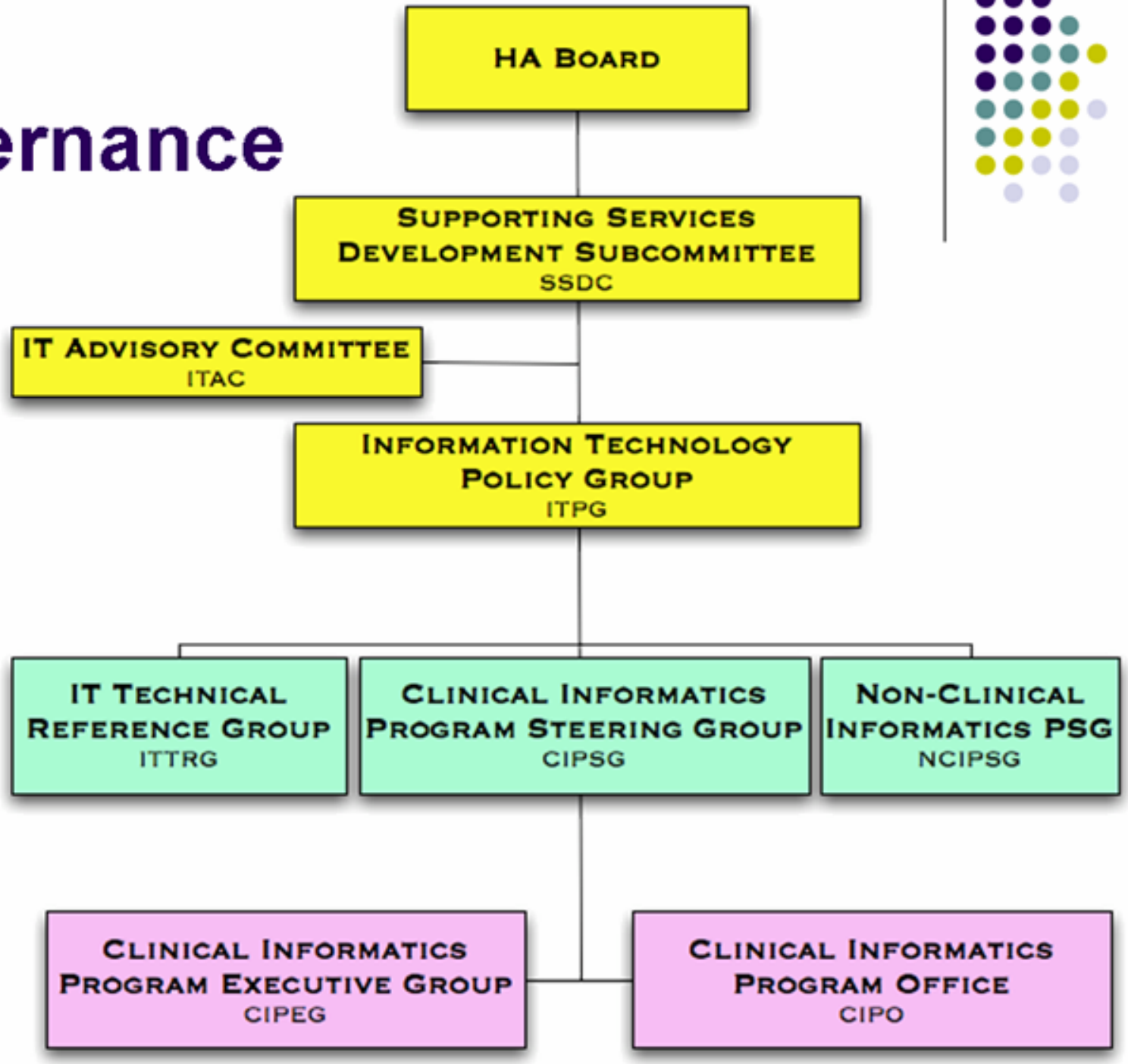
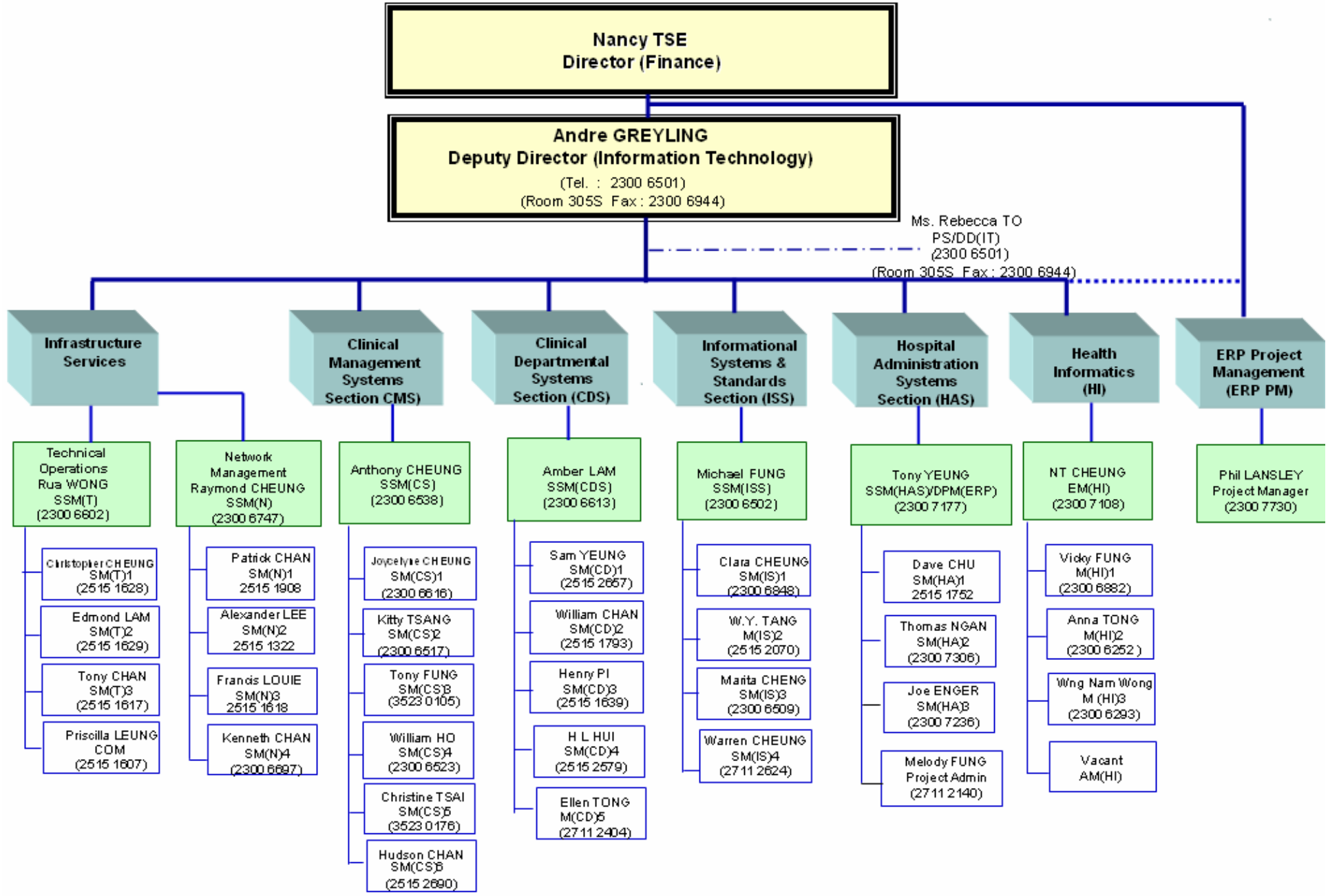
Internet Access of HA Clinical Systems



1. Remote user using Web browser connecting to HA Web Portal via Internet for accessing HA information. Two-factor authentication token is required during the user authentication process for accessing confidential information
2. HA Web Portal forwarding the user credentials to the Centralised Authentication Server for authenticating the remote user
3. Centralised Authentication Server checks the user accessing rights and group from User Directory Server
4. For accessing internal information, HA Web Portal passes the request to the SSL VPN Gateway for accessing the Internal Web Servers or Citrix
5. When connected to the Citrix Server, authorised application icons are shown for accessing the Clinical Servers
6. Clinical Web Servers are accessed directly via SSL VPN

IT Governance

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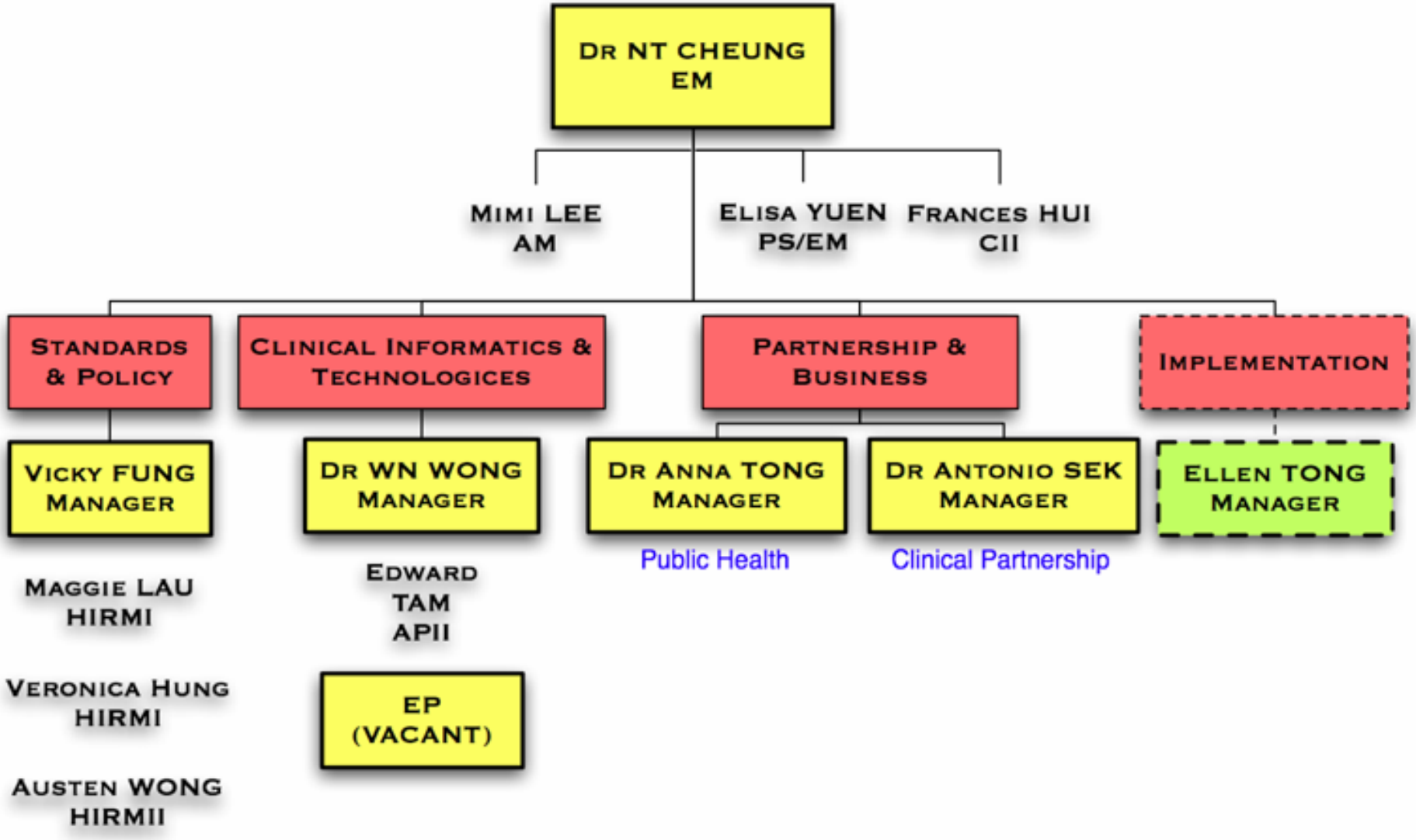
HEALTH INFORMATICS

ORGANIZATION CHART W.E.F. 1 APRIL 2006



In Conclusion

- All the developed economies of the world are striving for an interoperable electronic health record.
- The Hospital Authority has already achieved this for 90% of Hong Kong Citizens.

In Conclusion

- Innovative technology and implementation strategies have created 100% user acceptance and 100% reliability at an affordable cost.
- Gaps needs to be filled in the decision support, in-patient transactions & nursing informatics

In Conclusion

- Research & Development of expertise programs calls for capacity building & partnership with vendors.
- The future lies in sharing of electronic patient records between public and private sectors.

HA CONVENTION
Hospital Authority Convention 2006

Thank You !