# Radiology Image Sharing Pilot

## Business Background


## Dr Antonio Sek

Senior Health informatician (eHR), Hospital Authority

# EHR: A Global Trend

## UK

- NHS embarks on £12 billion programme to computerize the NHS

## Canada

- Health Infoway investment total cost expected CAD 10-12 billion

## AUSTRALIA

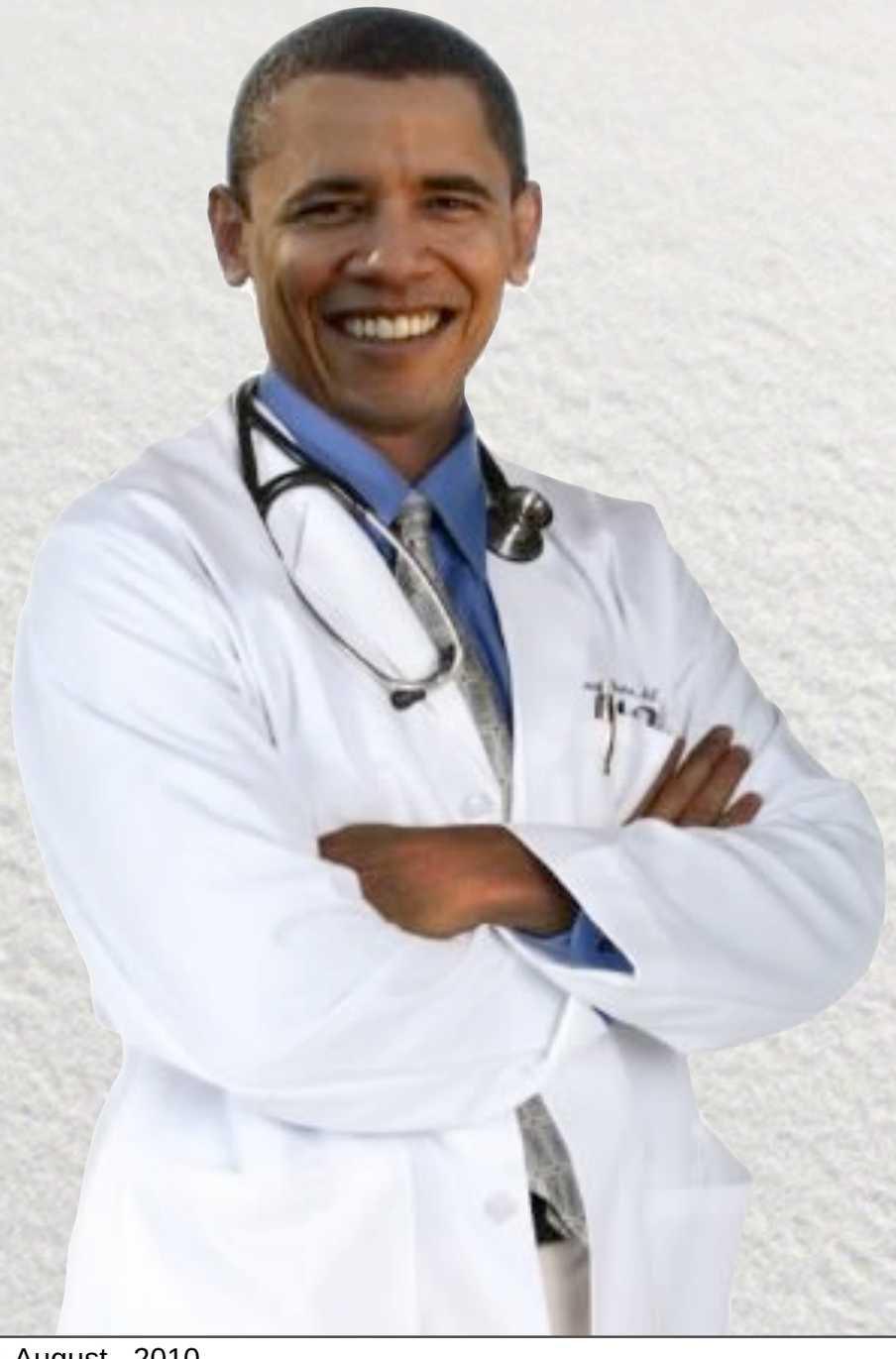
- Over A$1B in state initiatives

## USA

- Kaiser Permanente invested US$4 billion in electronic patient record project

# "Dr Obama" Aims to Treat the US Economy …

…and the US healthcare system!



We take pride in our current health care system. We will develop a territory-wide, **patient-oriented** electronic health record, through public-private-partnership.

Mr Donald Tsang, CE, HKSAR
Policy Address 2007

**Participation of all stakeholders**

# Institutional Setup
# Government-led model

**Steering Committee**

Provide guidance and inputs to the work of the eHR Office

**eHR Office**

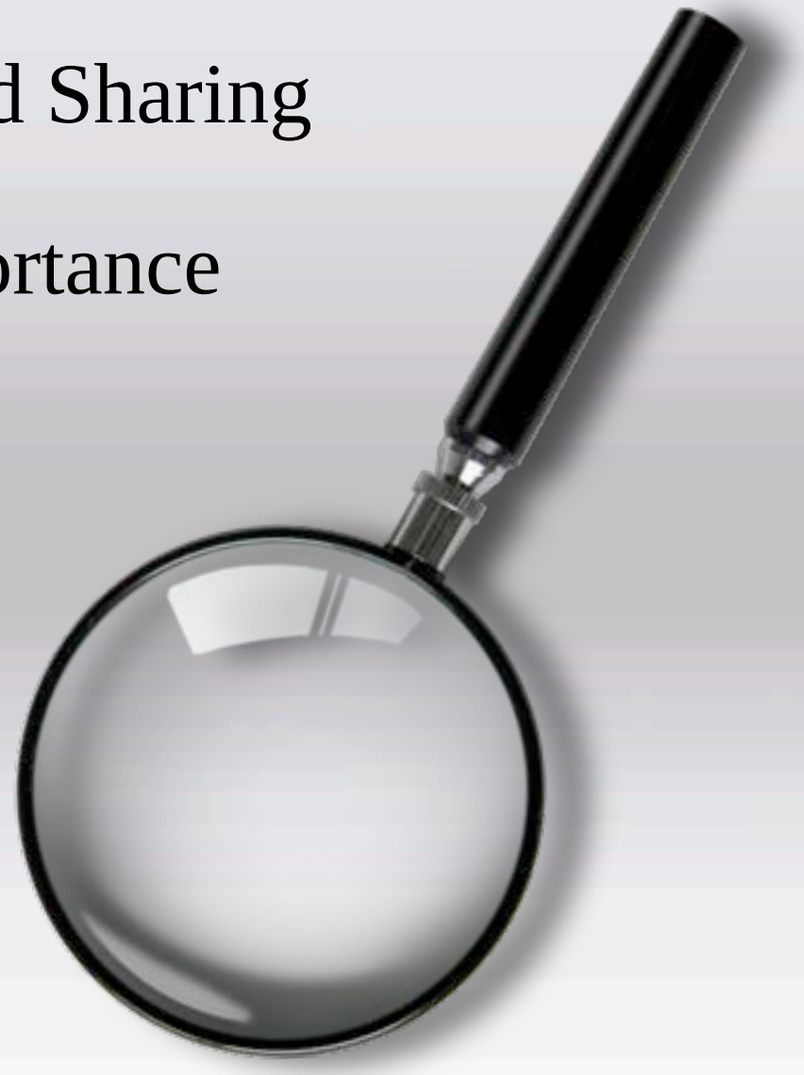
Gov't office responsible for -

1. Legal framework
2. eHR standardization
3. Design, develop, operate and maintain eHR sharing infrastructure
4. Administer partnership models with private sector

**HA as technical agent**

# Guiding principles of eHR development

1. Government-led model
2. Compelling But Not Compulsory Record Sharing
3. Privacy and Security of Paramount Importance
4. Open Technical Standards
5. Building Block Approach



# 3 streams, 2 phases

Workstreams

- eHR Infrastructure
- CMS adaptation
- Standards

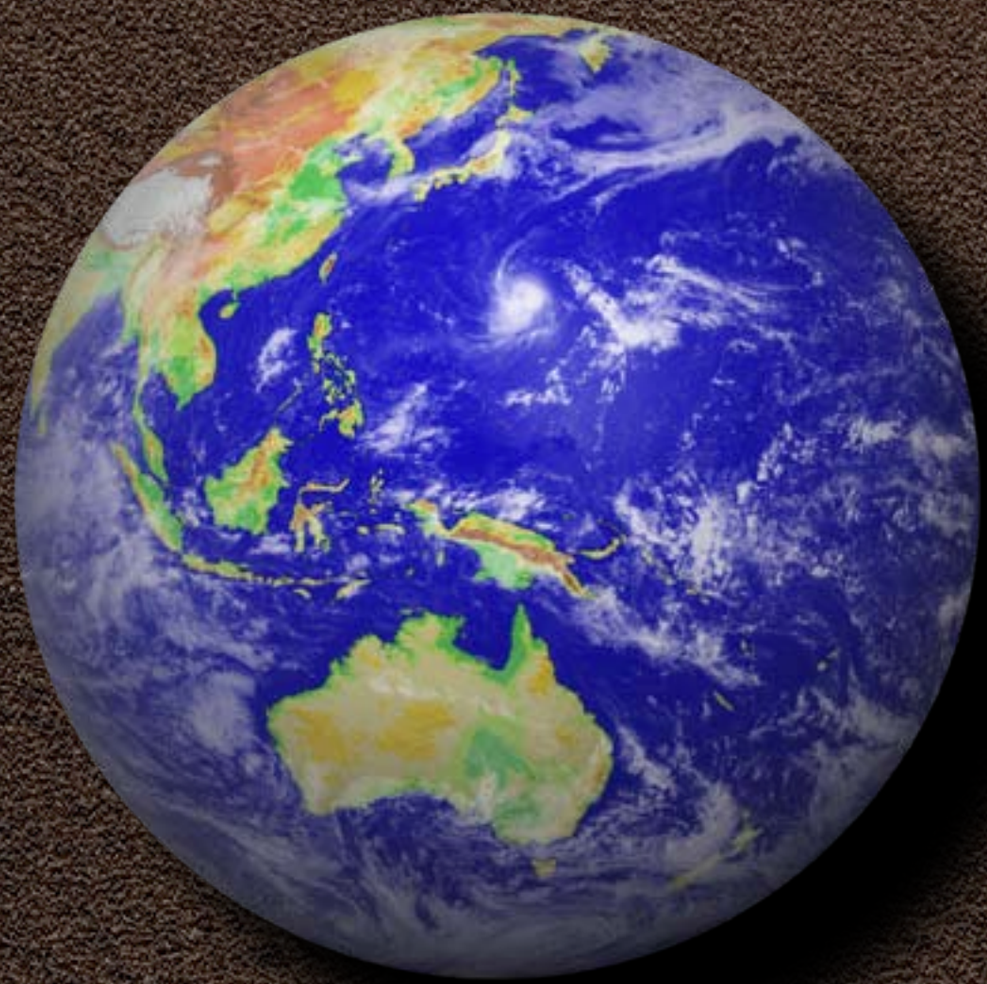
Phases

- Phase I
  - Sharing infrastructure
  - Doctor portal
- Phase II
  - Clinical modules
  - Patient portal

# Present

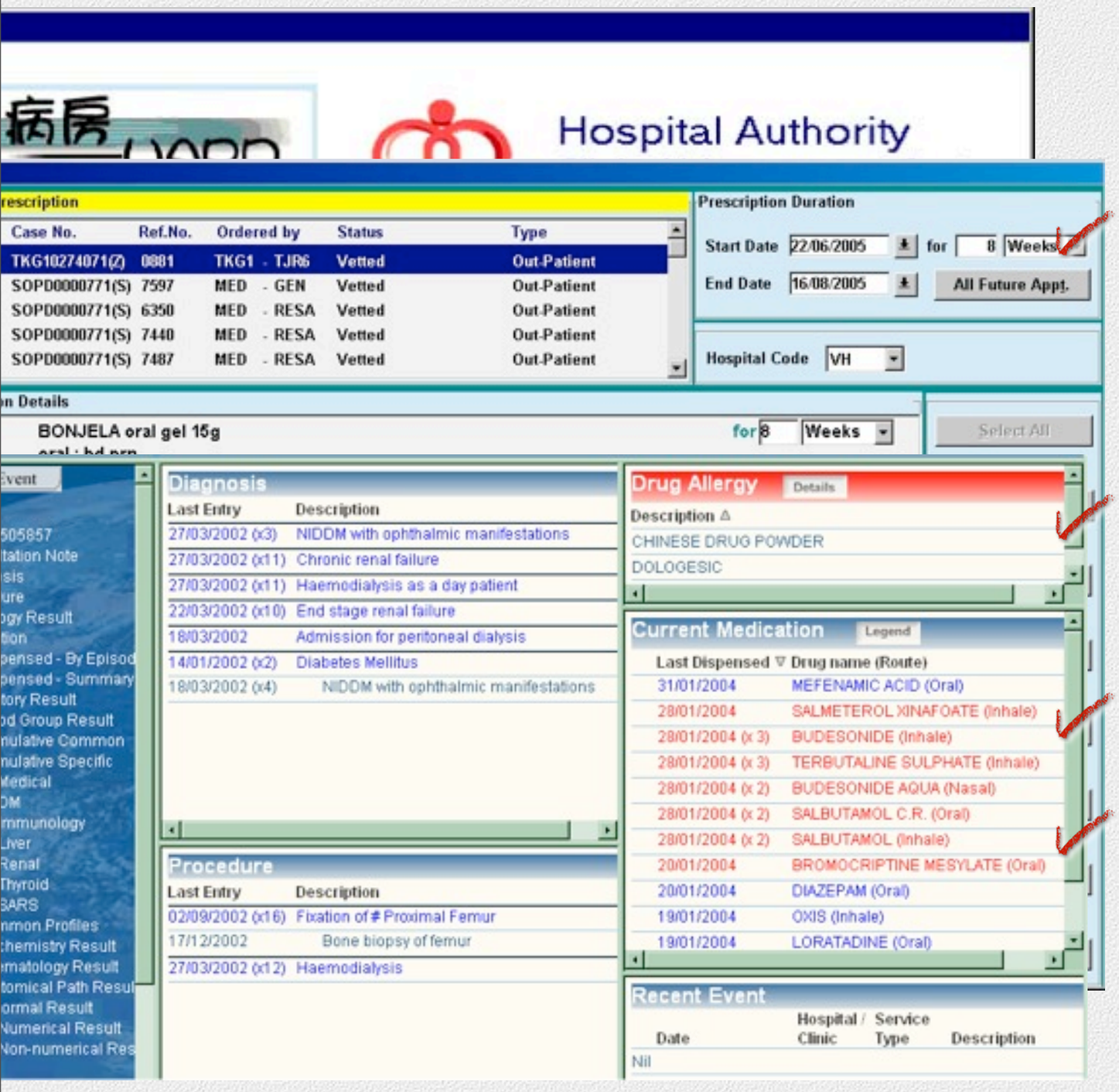
## CMS & ePR

# HA’s CMS is the largest medical record system in the world!



Health Informatics

# Clinical Systems in the HA




Comprehensive functionality developed in-house since early 90's

High utilization by clinicians

Mission critical systems

Increasing strategic importance

# PPI-ePR project

Patient receives SMS informing of access to record

HA

Patient key

364098

CMS

DM Zone

Private Doctor

Patient key

364098

Secure

1. Token
2. User password
3. Patient key

ePR

Shared record

Firewall

Firewall

Secure Platform with FIREWALL and ENCRYPTION

# Future

CMS III & eHR (一人一病歷）

# Vision

DH

HA
ePR

PPP

CMS
onramp

EHR
Repository

Private
Hospitals

Clinics
software

Access Portal

# eHR Time Line

| 09/10 | 10/11 | 11/12 | 12/13 | 13/14 | 14/15 | 15/16 | 16/17 | 17/18 | 18/19 |
|---|---|---|---|---|---|---|---|---|---|
| Sharing Coverage | 0.1M | 0.2M | 0.3M | 0.5M | 1M | 2.5M | 4.5M | 5.5M | 6M |
| | HA CMS adaptation (Basic) | | | | CMS adaptation (Advanced) | | | | |
| | DH ePR and computerizations | | | | | | | | |
| | PH systems upgrade | | | | | | | | |
| Interface pilots | | | | | | | | | |
| | eHR infrastructure | Phase 1 eHR (Dr portal) | | | | Phase 2 eHR (Patient portal) | | | |
| | | CMS on ramp | | | | | | | |
| | eHR Certification Scheme | | | | | | | | |
| PPI-ePR and pilots | | | | | | | | | |
| Standardization - ongoing | | | | | | | | | |

# Benefits of eHR

HA

Private Hospitals

## Patient benefits

- Whole record always available online
- Timely and accurate information for care

## Clinician benefits

- Efficient clinical practice
- Avoid errors associated with paper records

## Society benefits

- Disease surveillance
- Monitor outcomes, performance and resource utilization

# eHR sharable scope

- eHR sharable scope – pre-defined, no safe deposit box or exclusion.
- HA/DH data sharable upon patient's registration.

# Principles on participation

- Participation on a voluntary basis.
- Express and informed consent for eHR system and providers.
- Consent to providers during first consultation.
  - –One year rolling / indefinite consent.
  - –Referral arrangement.
  - –Special consent arrangement.

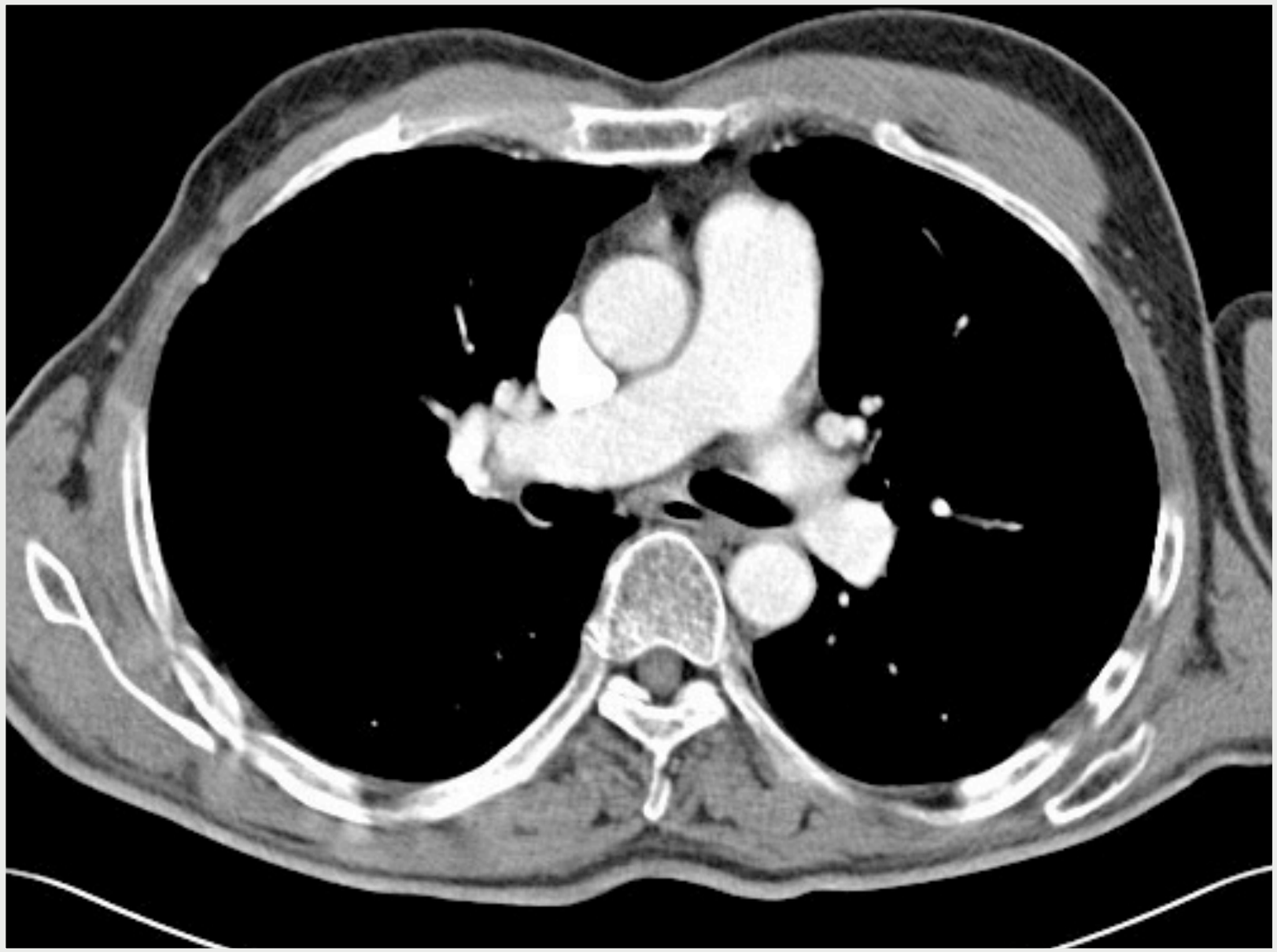
# Withdrawal

- Patients may withdraw any time.
- Frozen eHR of deceased/ withdrawn patients kept for 3/10 years before de-identification.
- Rejoining arrangement.

# Use of eHR data

- Primary: clinical use, “need-to-know”, “patient-under-care”.
- Secondary: public health research and surveillance.
  - Anonymised: approved by eHR authority;
  - Identifiable: approved by SFH on recommendation by research board

# Radiological Sharing From Private



# Agenda

- Business Flow
- Legal Requirement
- Technical Requirement
- List of private providers for radiology service

# Video Demo

# Legal Requirement & Limitation

- Memorandum of Understanding (MOU)
- Patient’s consent
- Patients without HKID cannot join this pilot

# Technical requirement

- Proposed Technical Solution
  - 2D barcode for patient identification
  - Standards
    - HL7 for data and report in pdf
    - Radiology images in DICOM III
      - Requires DICOM workstations capable of sending images
- Security
  - Site SSL / VPN

# On referring out

## Radiological Sharing with Private

# Referral to Private

- Invitation to all private radiologists for service listings in Nov 08 (updated regularly)
- Starting Jan 09, GCRS for private radiology is available
- Details of referral will be printed out in standard forms
- Patient Demographics in 2D barcode

CMS VH 3 - MetaFrame Presentation Server Client [SpeedScreen On]

Clinical Management System [CMS] Last successful logon: 5-Nov-2009 17:49 (VH_HAHO)

File Clinical Investigation Enquiry Booking DT Report Doc./Print Other System Info. Admin.

- Ix Request
- Print Ix Request
- Update Specimen Collection Time
- Consultation Request
- Allied Health Protocol Referral
- Ix Request Enquiry by Patient
- Ix Request Enquiry by Location
- Radiology Request Transaction Enquiry
- Laboratory Result
- Lab Result Charting/Trend
- Radiology Result
- Radiology Result (ePR)
- Lab Authorization Number Generation
- LRS LIS Interface Enquiry
- EMDU Data Download
- GCR-EMDU Interface Enquiry/Update

Logoff | Letter/Doc | PMI | Rad Ap Enq | Bed Assign | Rad Result | Lab Result | ePR | OP Book | Discharge | Transfer | Lab/Rd Rpt | Immunisation | ePR Rad | Next Pat

Patient Selec

Print | Refresh | English | <Re

Ward: 5A

of active patients in ward: 3

patient displayed in PSP: 3

| Bed | | | Name | Episode | Spec. | Cl | Admission date |
|---|---|---|---|---|---|---|---|
| 01 | | | YEUNG, FA LUNG | HN09000024(V) | MED | 3 | 25-05-2009 11: |
| 04 | | | WU, SIU KAT | HN09000019(Z) | MED | 3 | 25-05-2009 10: |
| 06 | | | CHENG, AH FOK | HN05000158(V) | PSY | 3 | 01-06-2005 11: |
| 09 | 張小姜 | M/82y | CHEUNG, SIU WAN | HN09000018(1) | MED | 3 | 25-05-2009 10: |
| 16 | 張滿足 | F/47y | SUGENG-WIDAYATI-KA | HN09000011(T) | MED | 3 | 25-05-2009 10: |
| 18 | 張丸美 | F/57y | CHEUNG, YUEN MEI | HN05000100(T) | OBS | 2 | 25-05-2005 12: |
| 21 | 張快樂 | F/11y | CHEUNG, PLEASURE | HN09000010(V) | MED | 3 | 25-05-2009 10: |
| 24 | 朱永澤 | M/30y | CHU, WING JAK | HN05000199(S) | MED | 3 | 01-06-2005 15: |
| 25 | 湯海棠 | F/25y | TONG, HOI TONG | HN05000188(X) | OBS | 1 | 01-06-2005 15: |
| 27 | 黃靈蘭 | F/25y | CHU, LING LAN | HN09000036(Z) | MED | 3 | 26-05-2009 09: |
| 28 | 李小丸 | F/82y | LEI, SIU YUEN | HN09000017(S) | MED | 3 | 25-05-2009 10: |

Select Patient :

Possible value : HKID/HN#/ AE#/ OPD#/ NAME/ %T+phone#

Ix Request | VH | MED | CMS IT (VH3)

Click 'Investigation' → 'Ix Request'

CMS VH 3 - MetaFrame Presentation Server Client [SpeedScreen On]

Add Ix

**M306243(6)** 胡小吉 **WU, SIU KAT**

By User | Discipline: All | Ix | Search | New Ix | Urgent

Olympic 2008 | My AH | chem te | 081217 | test01 | fu ah | my own | nm | abc

- [ ] Blood gas, venous
- [ ] XRAY - SXR, lat

Podiatry
Prosthetic&Orthotic
Speech Therapy
Spiritual Care
-----CONSULTATION----
Consultation
----------DH---------
PHLC
---------EDU--------
Neurophysiology
Non-Invasive Cardiac
Respiratory
---------LAB--------
A Histopathology
B Blood Bank
C Biochemistry
H Haematology
M Microbiology
------Endoscopy-----
Endoscopy
------RADIOLOGY-----
Angiography&Vas IR
Breast Imaging
CT Scan
Fluoro/Contrast XRay
General IR
MRI
Nuclear Medicine
PET-CT (QEH)
Private (Non-HA)

**In 'Discipline' drop down → 'Radiology' → 'Private (Non-HA)'**

Select All | Pay Code : EP1 | Modify User Folder | Add Ix | Edit | Delete

By Department | By User | By Discipline | Save and Print Label/Job Sheet | Save and Print Reminder | Save | Cancel

CMS VH 3 - MetaFrame Presentation Server Client [SpeedScreen On]

Add Ix

**M306243(6)** 胡小吉 **WU, SIU KAT**

**By Discipline** Discipline Private (Non-HA) Ix Search

| Ix | Site | Contrast |
|---|---|---|
| ☑ CT Scan | Brain | ○ Yes ◉ No |
| ☐ MRI | | ○ Yes ○ No |
| ☐ PET-CT Scan | | ○ Yes ○ No |
| ☐ Ultrasound | | |
| ☐ CT Coronary Angiography | | ○ Yes ○ No |
| ☐ Special X-Ray | | |

**Choose required exam**

New Ix Urgent

Pay Code : EP1 ☐ Folder View Add Ix Edit Delete

◉ By Department ◉ By User ◉ By Discipline | Save and Print Label/Job Sheet | Save and Print Reminder | Save | Cancel

CMS VH 3 - MetaFrame Presentation Server Client [SpeedScreen On]

Ix Information

**M306243(6)** 胡小吉 **WU, SIU KAT**

Information for **CT Scan**

**Clinical Information**

1) Clinical Information :

headache

**1. Enter specific information**

**Patient Information**

1) LMP : Menopause

(Please type the alternatives if not provided on the list)

2) Pregnancy : Yes No Unknown

3) History of Allergies : Yes No Alert

4) History of Asthma : Yes No

5) Steroid premedication prescribed : Yes No

6) History of Reaction to Contrast Media : Yes No

7) Patient on Metformin : Yes No

8) Latest Serum Creatinine : 124

9) Pr

**2. Choose 'Private Hospital or Center' from the drop down list**

**Request Information**

1) Priority : Urgent Routine

2) Private Hospital or Centre :

Reset All Save Cancel

Virtual Hospital 3

**REQUEST INFORMATION SHEET**

Name : YEUNG, FA LUNG (楊花輪)
HKID : M933315(6)
DOB : 12/11/1938 Age : 70y Spec : MED
Request Date : 05/11/2009 Sex : F Requested Loc : VH/5A
Requested By : CHAN, DOC TONY (Senior Medical Officer) Request Number: VH OR0900013292
Episode No: HN09000024(V)
Remark :

Non-Drug Allergy: (1)PEAN
Alert: (1)G6PD Deficiency
Request Group : **Private (Non-HA) Radiology**

Clinical Information :
headache
Diagnosis :
esrf, haematuria, on conservative treatment
Investigations / Services :
> **MRI, Site:Brain, Plain**
Ix / Services Information :

Patient/Request Information :
> Priority -- (Routine)
> Private Hospital or Centre -- ()
> History of Allergies -- (No)
> Cardiac pacemaker or defibrillator -- (No)
> Brain clips or Vascular clips -- (No)
> Neurostimulators -- (No)
> Heart valve -- (No)
> Insulin pump -- (No)
> Implanted perfusion pump -- (No)
> Hearing aids or devices -- (No)
> Cochlear Implants -- (No)
> Ocular Implants -- (No)
> Shunts -- (No)
> Joint replacements -- (No)
> Fractured bone with metal rods, pins, screws, nails or clips -- (No)
> Prosthesis -- (No)
> Metal mesh -- (No)
> Wire sutures -- (No)
> Shrapnel or metallic fragments -- (No)
> Permanent eyeliner tattoos -- (No)
> Dentures -- (No)

**Print the 'Request sheet'**
**+ 'Referral letter'**
**Give them to patient to take to private hospital**

# The list for private radiology service providers

Access through http://ha.home/

HA Intranet - ha.home - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address http://ha.home/visitor/ Go Links

ha.home

Search Go! Advanced Search

Temp 25°C R.H. 65%

Our Internet | Home | Download | Staff Corner | Online Services | ESD | VNC | Webmail | HASLink | eLC | eKG | IDCTC | Sitemap | Help

Thematic View | Functional View

- Corporate Information
- Business Support Services
- Capital Planning
- Finance
- Group Internal Audit
- Human Resources
- Information Technology
- Medical Services Development
- Professional Services
- Public Affairs
- Quality and Safety
- Statistics & Research
- Clusters & Hospitals
- Public-Private Interface
  - Sharing of Private Practitioners' Information / Private Healthcare Services
  - PPI Initiatives
  - Suggestion Box
  - What's New
  - Useful Links
- Strategy & Service Planning

- 43798315 hits -

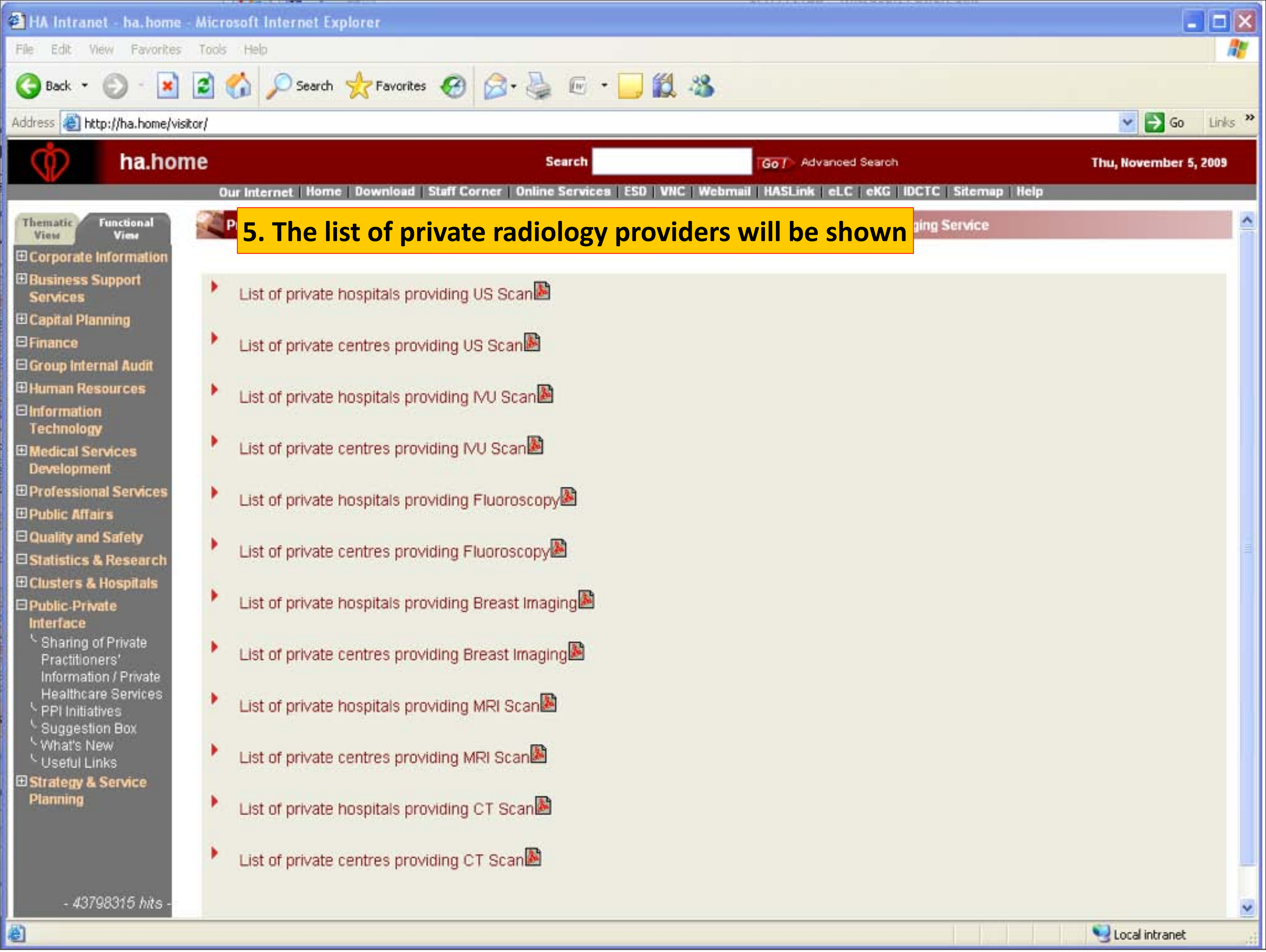
Public-Private Interface : PPI Initiatives : PPI Initiatives

- Public-Private Interface - Electronic Patient Record Sharing Pilot Project (PPI-ePR)...
  With Project Brief, Registration Materials, User Training Materials, Pamphlet, etc...
- Public-Private Interface - Provision of Radiological Imaging Service...
- Cataract Surgeries Programme...

**5. Public-Private Interface – Provision of Radiological Imaging Service**

- Collaborative Project to Enhance Information Flow for Referred Patients to the Hospital Authority...
- Community-based Falls Prevention and Hypertension Management Program
- CPO's Patient Referral Scheme on Drug Compliance and Counselling Service...
- Guidelines for Inter-departmental Consultations 1 June 2004...
- Operational Plans on Public - Private Collaboration during Influenza Pandemic, December 2005
- Shared Antenatal Care Program (NTEC)
- Shared Diabetes Mellitus Care Programme (NTEC)
- SOPD Triage Principles and Guidelines...
- Standardized Referral Form...

Local intranet


HA Intranet - ha.home - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://ha.home/visitor/
Go Links
ha.home
Search
Go ! Advanced Search
Thu, November 5, 2009
Our Internet | Home | Download | Staff Corner | Online Services | ESD | VNC | Webmail | HASLink | eLC | eKG | IDCTC | Sitemap | Help
Thematic View
Functional View
Corporate Information
Business Support Services
Capital Planning
Finance
Group Internal Audit
Human Resources
Information Technology
Medical Services Development
Professional Services
Public Affairs
Quality and Safety
Statistics & Research
Clusters & Hospitals
Public-Private Interface
Sharing of Private Practitioners' Information / Private Healthcare Services
PPI Initiatives
Suggestion Box
What's New
Useful Links
Strategy & Service Planning
- 43798315 hits -
5. The list of private radiology providers will be shown
ging Service
List of private hospitals providing US Scan
List of private centres providing US Scan
List of private hospitals providing IVU Scan
List of private centres providing IVU Scan
List of private hospitals providing Fluoroscopy
List of private centres providing Fluoroscopy
List of private hospitals providing Breast Imaging
List of private centres providing Breast Imaging
List of private hospitals providing MRI Scan
List of private centres providing MRI Scan
List of private hospitals providing CT Scan
List of private centres providing CT Scan
Local intranet

# At the private facility

- Register the patient (using 2D barcode)
- Get informed consent
- Perform the examination
- Send the images and report to HA once endorsed

Electronic Patient Record - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address http://w2k3eprx/eprtree_uat_new/Content/login_validator.asp Go Links

病人 PATIENT, 30 F 31y DOB:15-Apr-1979 A123456(7)

**Patient Name**

PATIENT, 30(病人)

Print Patient Summary

**Clinical Notes and Summary**

Nil.

**Operation / Endoscopy**

Nil.

**Laboratory**

Nil.

**Radiology** All images Local images

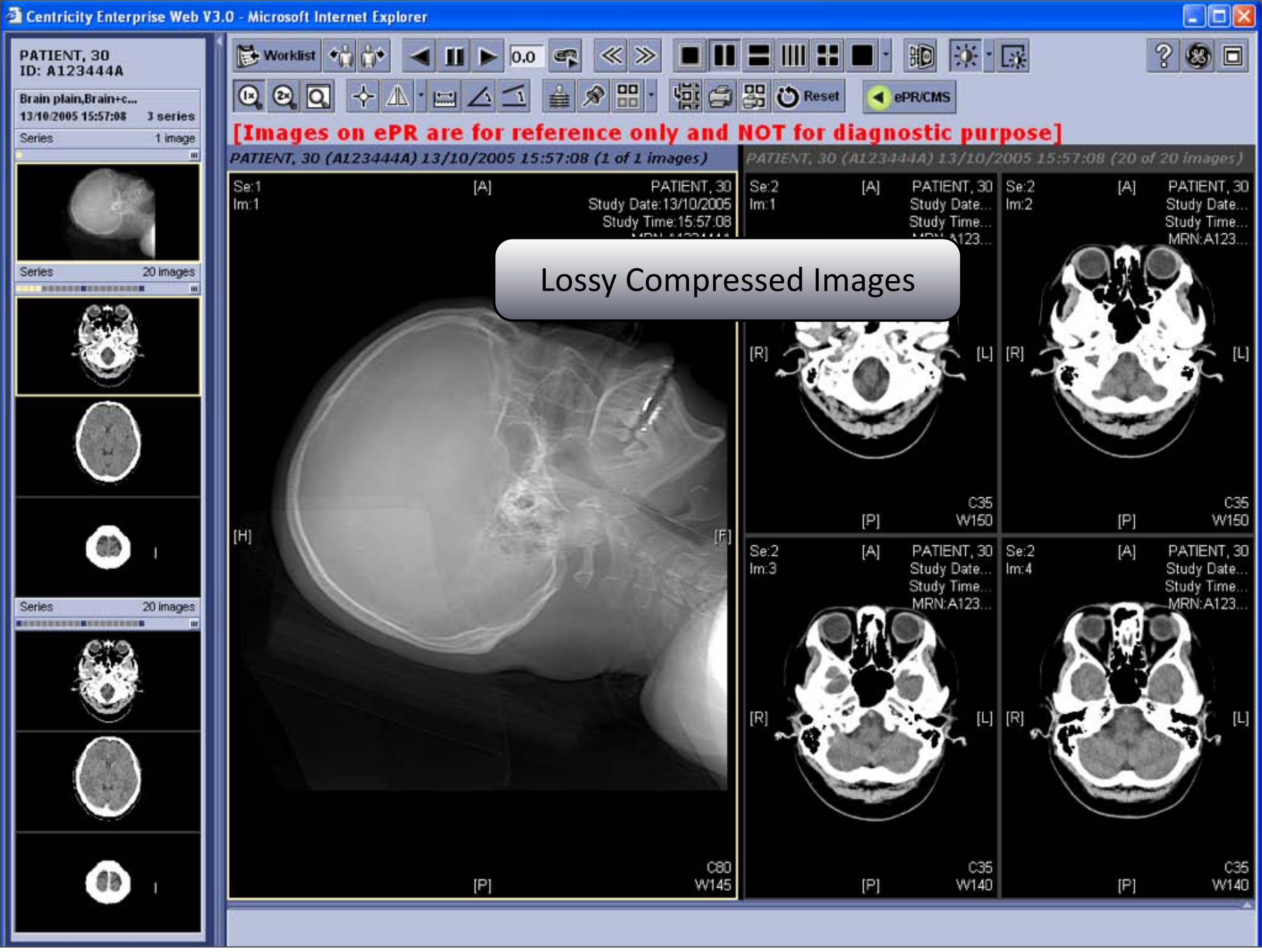
PWH 01/06/10 CT 3D-CT
AHN 01/06/10 CT 3D-CT
PWH 26/05/10 XRAY Carpal tunnel
NDH 07/05/10 XRAY Carpal tunnel
NDH 06/05/10 XRAY Shoulder

**Radiology** Show: All modalities Period: All Advanced Search

| Episode No. | Exam. Date ▽ | Modality | Exam. Name | Organization | Hospital |
|---|---|---|---|---|---|
| HN100100001 | 01/06/2010 07:30 | CT | 3D-CT | HA | PWH |
| HN100100002 | 01/06/2010 07:25 | CT | 3D-CT | HA | AHN |
| HN100100003 | 26/05/2010 07:55 | XRAY | Carpal tunnel | HA | PWH |
| No case no | 07/05/2010 07:50 | XRAY | Carpal tunnel | HA | NDH |
| No case no | 06/05/2010 08:37 | XRAY | Shoulder | HA | NDH |
| No case no | 06/05/2010 07:55 | XRAY | AC joint | HA | NDH |
| No case no | 06/05/2010 00:37 | CT | P plain | HA | NDH |
| HN100100006 | 05/05/2010 08:37 | XRAY | , Shoulder | HA | NDH |
| HN100100005 | 05/05/2010 06:55 | CT | plain, Neck plain, TMJ plain | HA | NDH |
| HN100100004 | 05/05/2010 02:07 | XRAY | | HA | NDH |
| No case no | 05/05/2010 01:37 | | | HA | NDH |

**Image Report**

Double-click on the chest icon to open a radiology study


Centricity Enterprise Web V3.0 - Microsoft Internet Explorer
PATIENT, 30
ID: A123444A
Brain plain,Brain+c...
13/10/2005 15:57:08
3 series
Series
1 image
Series
20 images
Series
20 images
Worklist
0.0
Reset
ePR/CMS
[Images on ePR are for reference only and NOT for diagnostic purpose]
PATIENT, 30 (A123444A) 13/10/2005 15:57:08 (1 of 1 images)
Se:1
Im:1
[A]
PATIENT, 30
Study Date:13/10/2005
Study Time:15:57:08
[H]
[F]
C80
W145
[P]
PATIENT, 30 (A123444A) 13/10/2005 15:57:08 (20 of 20 images)
Se:2
Im:1
[A]
PATIENT, 30
Study Date...
Study Time...
[R]
[L]
C35
W150
[P]
Se:2
Im:2
[A]
PATIENT, 30
Study Date...
Study Time...
MRN:A123...
[R]
[L]
C35
W150
[P]
Se:2
Im:3
[A]
PATIENT, 30
Study Date...
Study Time...
MRN:A123...
[R]
[L]
C35
W140
[P]
Se:2
Im:4
[A]
PATIENT, 30
Study Date...
Study Time...
MRN:A123...
[R]
[L]
C35
W140
[P]
Lossy Compressed Images

# Displaying radiology PDF reports from private

pdf report from private

| | |
|---|---|
| Left Main Artery (LMA) | |
| Left Anterior Descending (LAD) | |
| Left Circumflex (LCX) | |
| Right Coronary Artery (RCA) | |
| Posterior Descending Artery (PDA) | |
| **Total** | **0** |

The score cannot be directly compared to previous scores from a different CT machine.



Reprinted by Tester on 08/07/2008 18:56

Duplicate Copy

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Fax: 2892 7530

# Benefits

- Reduce time for delivery from private to HA
- Patients do not need to bring the films and reports to clinicians repeatedly
- Allow clinicians from different specialties to access radiological images done in private hospitals
- Ensure a more complete patient record