

Prime Time for OSS HIS in ASEAN

KS Chin

Technology Consultant

sains OSS Healthcare Products & Services

Situation

- Government and healthcare providers have become aware of the advantages of HIS and are taking all possible steps to improve the healthcare delivery structure. This is evident from the 36.4 percent growth in government spending on healthcare from 2000-2005.....
Apart from Singapore, only a few healthcare facilities in Malaysia, Thailand, and Philippines have any kind of computerized HIS and most medical providers here are struggling to even guarantee an acceptable standard of healthcare. Although this could be an enormous market opportunity, most healthcare providers in this region are in no position to invest in Healthcare IT. *Frost & Sullivan 2006*

Today's situation

- IT systems in healthcare have become a key consideration for
 - policy makers,
 - medical and
 - nursing staff and
 - hospital administrators
- Removing paperwork and streamlining processes offers huge benefits.
- Effective IT solutions can greatly improve the quality of care provided, and enhance the overall patient experience.
- These are the positives, after the system is up and running,

Today's situation

- Implementing an IT system is expensive!
 - In the current financial climate, cost is likely to prove to be prohibitive in many cases..
- Hospitals in several regions of the world will now reconsider their strategies.
- Everyone knows about the potential benefits of IT in healthcare, and there are many success stories.
- But there have also been poor results in some cases, with ineffectual, expensive and burdensome technical systems adopted.
- Most often installation stuck in the phase of implementing only the administrative part.

Today's situation

- With those systems we are far away from having an Electronic Healthcare Record (eHR) system available.
- But there is a need for eHR systems to keep costs down.
- In developing countries with large population computerization of the hospitals must be the next step in healthcare for its citizens.

Costs of computerisation of hospitals

- Malaysia
 - Estimated USD 30,000 per bed for implementation of HIS/eHR
 - Generally implementation services only
 - 134 Public hospitals 35,000 beds
 - Excess of USD 1 billion required for implementation in all hospitals
 - Costs of solution evaluation !

Healthcare in Indonesia

- Statistics/Information
 - 1,269 Hospitals with 132,857 beds (source www.Infomedix.it 2006)
 - 664 public hospitals
 - 7,621 public health centres
 - 1 bed per 1,689 citizens
 - **(WHO site on NHIS Indonesia)** *Some constraints identified regarding the development of NHIS includes fragmented HIS i.e. different HIS for different programme purposes, lack of regional capacity, minimum use of information for management purposes, minimum use of information by community, minimum usage of Information Technology. These constraints have been more burden to the fact that financial support for the implementation and maintenance of HIS facility and equipment are considered as the least priority in the budgetary line items and provision of an adequate and dedicated HIS personnel is in fact not an evidence in most units either at the point of services or health management level.*

Healthcare in Indonesia

- Prospect
 - USD 2 billion required for Government Public Hospitals implementation of HIS/EMR (estimated 67,000 beds)
 - If standard tender and evaluation process, prospect of 60 years to implement for all of Indonesia (based on optimistic 10 hospitals a year)
 - What about annual maintenance?
 - Application User Licensing
 - Web Server Licensing
 - DBMS licensing
 - OS and OS user licensing
 - There will be many more hospitals in the future!

New business model

- Less than USD 3,000 per bed
 - USD 555,555 for 200 bed hospital including servers, workstations and network! (full system implementation)
 - Much less for smaller hospitals
- Standardisation of HIS
- Rapid Implementation
- Local ownership
- Low development/customisation costs
- Localisation of solution
- Fixed annual maintenance
 - Not based on implementation cost (15-20%) or number of users

OSS?

FIVE STAGES OF ADOPTION	
Stage	Symptoms of Progression
Denial that open source is already in use	<ul style="list-style-type: none"> • No recent audits of custom software • Low awareness of popular OSS components • No official company policy for OSS usage
Anger over a surprise loss of control	<ul style="list-style-type: none"> • Software in use with no record of adoption • Management looks to assign accountability • Developers practice "don't ask, don't tell."
Bargaining to re-establish existing controls and processes	<ul style="list-style-type: none"> • Crash program to identify total exposure • Program put in place to remove existing OSS • Lawyers spend hours meeting with application development teams
Depression on realizing the point of no return has been reached	<ul style="list-style-type: none"> • Realization that extracting open source would bring IT to a halt • Recognition that the experience involved in extracting OSS would be prohibitive
Acceptance of open-source software	<ul style="list-style-type: none"> • Implementation of a formal OSS strategy • Adjustments to policies and processes • An attitude shift from tolerance to exploitation

Source: Forrester Research, Inc.

Traditional problems with OSS

- Poor professional or commercial support
- Issues on quality of code
- Unreliable and irregular upgrades
- No ownership

The Future ...

- Open Source Solutions offer a way out for addressing large number of hospitals and eHR as there is no costly annual licensing.
- Costs for implementation, customization and support can be driven down by breaking away from traditional vendor model.
- Another Key to lower costs is standardization and reduced customizations.

The Future is Today

- Today myCare2x as an Open Source solution provides efficient tools to the healthcare community.
- myCare2x as an internet based platform offers the eHR to hospitals, doctors and the patient.
- **myCare2x as a proven Open Source solution for the healthcare market does this today.**
 - 7 Hospitals in Germany
 - Cardiac Hospital, Kuching, Sarawak
 - (soon) Dumaguete Provincial Hospital, Philippines

myCare2x?

- Where have I heard this before?
- No relation to care2x !
 - Code entirely rewritten
 - Comprehensive functionality
 - Local, regional and International support

Modules

- Functions for
 - Doctors and Nurses
 - Ward and departments
 - Inpatient and outpatients,
- Patient administration
 - Hotel Services
 - Route planning
- Scheduling
- Patient EMR
- Order Entry System
- Result reporting
- ICD / Procedure Coding
DRG / Case-Mix
- Medication / Prescription
- Medical and nursing documentation
- Clinical Pathways and Workflow
- Medical Dashboard
- Reports
- Billing
- Surgery
 - Planning
 - Documentation
- Pharmacy
- Radiology Information System
- PhilHealth Module
- Patient Portal
- eDictation
- eLearning Tool
- Communication
 - HL7 interface
 - Dicom interface
 - ERP interfaces
 - eHealth Cards

A Note

- Healthcare systems are critical systems
- Systems that may not fail (like aero planes, or nuclear facilities), because if they fail people might die.
- Healthcare supporting IT should be stable and bug free. But it is an unavoidable fact of life that every piece of software has bugs. It is up to us to eliminate those bugs.
- That's why we certify and quality assure the myCare2x solution.

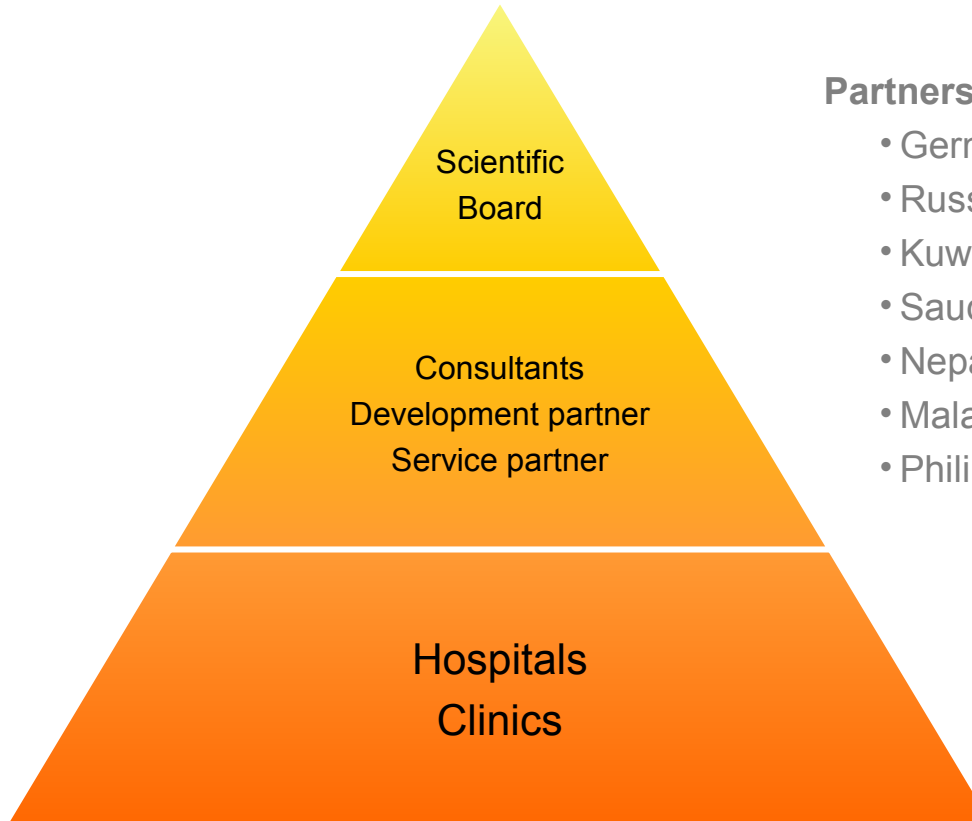
The myCare2x Network

- Is independent
- No funding from the government
- No financial donations from the commercial Healthcare Industry
- Completely financed by the fees of
 - Supporting Partners
 - Hospitals

myCare2x Network

Scientific board

- supported by Universities in Germany and Malaysia



Partners in

- Germany
- Russia
- Kuwait
- Saudi Arabia
- Nepal
- Malaysia
- Philippines

Support Network for myCare2x in ASEAN



Philippines

Malaysia

Cambodia

Others?



sains, Malaysia

healthcare consulting,
Germany

Local Partners

- Project Management
- Equipment
- Local Services
- Level 1 Support

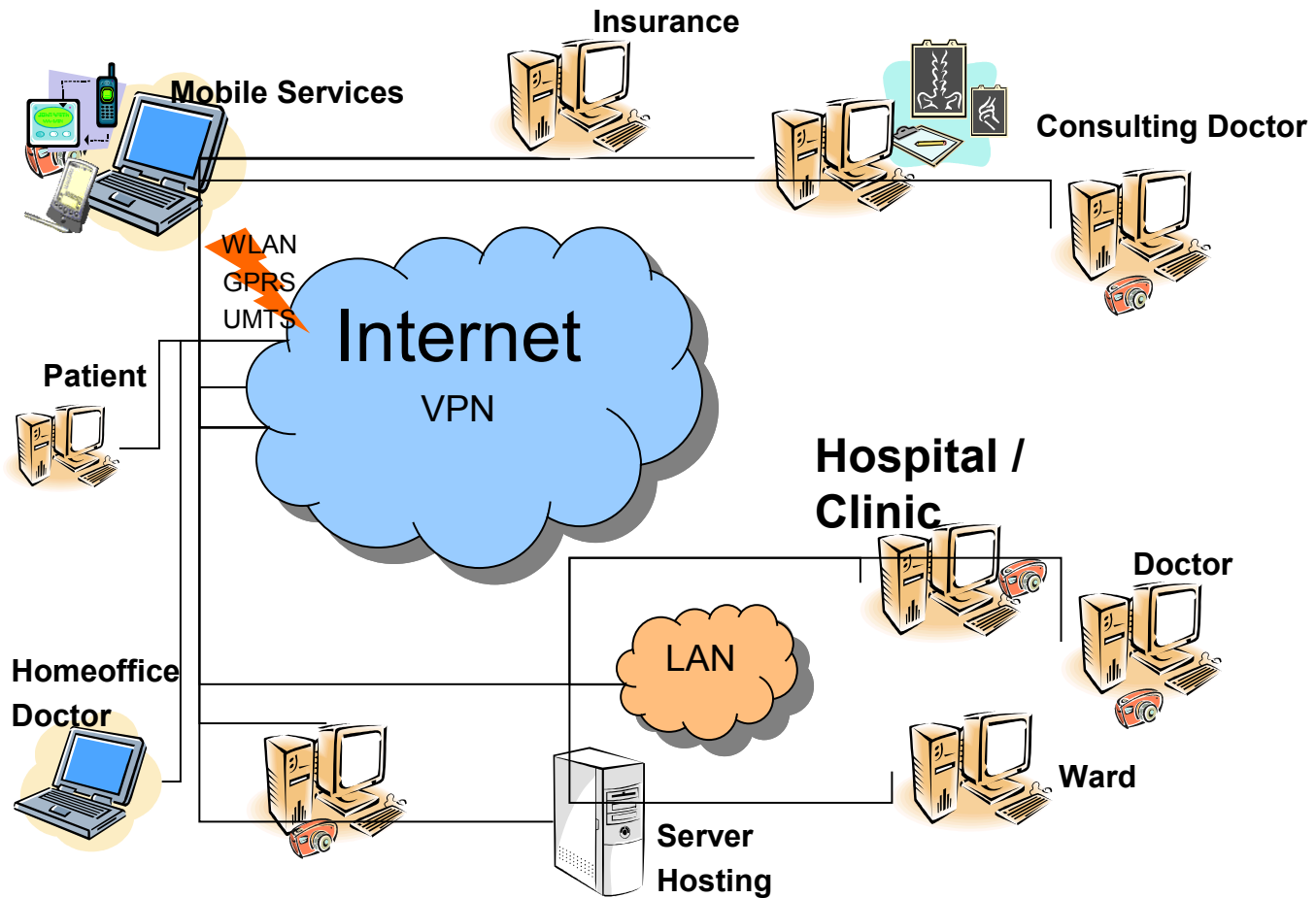
Regional Centre

- Project Management
- Implementation
- Level 2 & 3 Support
- Customisation
- Research & Development

Main Support

- Consulting
- Implementation
- Level 3 Support
- Customisation
- Research & Development

The Advantage of eHR



Ward Management

The screenshot displays the 'myCare2x' interface for 'Ward Internal medicine 1'. The top status bar shows 'Occupancy 09.03.2007: Occupied 18 (72%)' and 'Free 7 M 10 F 7'. The main area is divided into two sections: 'Gynäkologie' and 'Viszeralchirurgie'. Each section contains a grid of beds, each with a patient name and a color-coded bar representing their status. On the right, a 'Waiting list' table shows scheduled activities.

Name	Activity	Date
Ehab, Ahmed	Clinical Treatment	17.11.2006
Ehab, Ahmed	Physical Examination	17.11.2006
Tabala, Manfred	Nursing assessment ADL	20.01.2006
Tabala, Manfred	mdoc_klin_untersuchungsb	15.11.2006
Hubertus, Hubert	Anforderung Radiologie	05.03.2007
Harrison, Marianne	Anforderung Sono / Endo	29.01.2007

Callouts in the image identify the following elements:

- Beds:** Points to the grid of patient beds in the 'Gynäkologie' section.
- Patient:** Points to a specific patient name (e.g., 'Roibusch, Mathilda') within a bed.
- Room:** Points to the right-hand side of the interface, which represents the room's activity log.

Main Patient Display

myCare2X

Menu

- Logout
- Information
- Administration
- wards
 - Select a ward
 - Surgery 1
 - D9A
 - Internal medicine
 - Internal medicine
 - Orthopady
 - Urologie
 - ICU
 - Info to technical Dept
 - Staff
- Controlling
- Ambulatory
 - www.myCare2x.com
 - Ambulatory Dr. Nieder
- Laboratories
 - Reports
- Radiology
 - Sonography
- Technical Support
- Special Tools
 - User configuration
 - Referrer
 - Global Config
 - Fehler und Wünsche
 - Editor house catalog
 - Forms Editor
 - Menue editor
 - IT Support EDP
 - Editor departments
 - Tracing
 - Insurance
 - Patientencheck
 - Change PID/ FID
- Workflow
 - Login Status
 - Change DB
 - DB Update
 - Dicom Worklist
 - Depot Verwaltung
- Translation
 - Get Info form Lan
 - Start translation
 - Edit Translation
 - Do Menu Translati
 - Create new Lang I
 - myCare2x Exchange
 - alle Rechnungen lösc
- Monitoring

Patient Info

Tabala, Manfred - 02.05.1937

Person

- Patient ID: 10000000
- Mr. Manfred Tabala**
- Additional names: tabala
- * 02.05.1937
- 85560 Ebersberg, Hans-Sachs-Strasse 12
- Phone: 08092 709910 | 0171 8017700
- Fax: 08092 709920
- Email: tabala@mycare2x.de
- Civil status: married
- Contact person
- View forms for Patient
- View patient appointments (click here)
- X-Ray Pre Results
- Archive
- Archive dvelop d.3
- Age 69

Case / Visit

- Outpatient admission: 01.06.2005
- Inpatient admission: 15.06.2006 | Estimated discharge date: 31.12.2006
- Case ID: 2004000000
- Sent in by: Dr.med. Heidersberger, 94121 Salzburg...
- Insurances
- Ward: Innere 1 (1), Room: 214 Bed: 1 - Internal Medicine
- Department: Internal Medicine
- Marker
- View visit
- Medical Data Collection
- View patient appointments (click here)
- View test requests
- Laboratory request

Date	Time	Category	Status	Notes	End Date
19.08.2006	17:41	Sonography	at work		
22.06.2005	13:48	Radiology	at work	Kommt der Patient zwischenzeitlich auf die Station? Nein er verbleibt im Wartezimmer der Radiologie	2006-12-23 09:10:00
23.01.2006	09:25	Radiology	at work		2006-12-23 10:00:00
16.11.2006	14:56	Radiology	at work		2006-11-16 11:00:00
28.06.2006	10:48	Radiology	at work		2006-08-22 10:00:00
30.03.2006		Radiology	done		2006-04-01

Actions for case: 2004000000 - Internal Medicine

- Transfer/discharge
- Workflow
- Record services
- Appointments for other departments
- Nursing process documentation
- Wound and aditus visualization
- EPA
- Test requests
- Documentation and forms
 - Doctor
 - Nursing
 - Oncology
 - Actual Anamnesis - History
 - Basic documentation
 - Clinical Treatment
 - Diagnostics
 - History (Family, Social, Veget
 - Medical History
 - Medication
 - Oncological Treatment
 - Physical Examination
- BQS
 - Monitoring protocols
 - Printouts
 - Info CTS
 - Info Review
 - Patient Barcode
 - Departmental Printouts
 - PICS
 - Mail Service
 - Test results
 - Extern documents and pictures
 - Diagnosis and procedures
 - Therapy
 - Medical Data Collection
 - Respiration
 - Haemo Filter
 - ICU Score
 - Blood Products
 - Score
 - Complete case

Available Actions

Episodes

Patient Dashboard (diabetic)

The screenshot displays the myCare2X Patient Dashboard for Salman (ID: 1000973). The interface includes a navigation menu on the left, a patient information section, a laboratory results section with multiple charts, and a schedule section.

Patient Info: Salman 19.10.1920. Additional names: salman. * 19.10.1920. 24235 Kuwait, Strandstr. 90. Phone number not present. Contact person. X-Ray Pre Results. Age 85.

Laboratory Results:

- Glucose measurement:** Bar chart showing glucose levels over time from 06-04-05 to 06-04-17.
- Insulin Injection:** Bar chart showing insulin injection levels over time from 06-04-05 to 06-04-17.
- Leukozyten:** Line chart showing white blood cell counts from 24.07.2006 to 31.07.2006.
- Erythrozyten:** Line chart showing red blood cell counts from 24.07.2006 to 31.07.2006.
- Hämoglobin:** Line chart showing hemoglobin levels from 24.07.2006 to 31.07.2006.

Schedule: Diabetic department. Schedule table for 13.05.2006:

Time	Room 2	Room 1
08:00		
08:30		
09:00		
09:30		
10:00		

Summary Metrics:

- average Glucose Measurement: before Eating 81.26, after Eating 204
- average Glucose Measurement total: 140.4444444444
- average Carbon Hydrate: Breakfast 220, Dinner 500, other 150

Lab Results

Schedules

Sample Forms

Forms - myCare2x - Microsoft Internet Explorer

Order Radiology (Version 7:) for **Tabaluga, Max (male, *02.05.1936)**

Not released!

Order Radiology

Please do the following diagnostic with: Priority: Normal
 High
 Emergency

Herr Max Tabaluga
*02.05.1936 male Innere 1

Diagnosis: J18.9 Pneumonie, Erreger nicht näher bezeichnet:Pneumonie, nicht näher bezeichnet

cannot go Contrast Medical Allergy Secure pregnancy Week
 will be brought Possible pregnancy

Declaration of consent ok verbally in writing

Order:
Skeletn
Head Head in 2 levels, nose beside caves, Stenvers re/le, Schueller and Stenvers 1 side.
Thorax Schultergelenk re / li, 2 Ebenen, Schulterblatt, ergänzende Ebenen, Rippen re / li, 1 Ebene.

Question:
OR Prep

15.06.2005 21:16 admin Innere 1

myCare2x Forms by Gerald Wick, mycare2x@gwick.de

Radiology Order

Forms - myCare2x - Microsoft Internet Explorer

Investigations CTS (Version 9:) for **Tabaluga, Max (male, *02.05.1936)**

Not released!

Investigations CTS

Herr Max Tabaluga 15.06.2005 21:17
02.05.1936 male admin

Diagnosis: J18.9 Pneumonie, Erreger nicht näher bezeichnet:Pneumonie, nicht näher bezeichnet

Clinical features

- patients commonly present in the 30-55 year old age group
- numbness, pain, tingling in regions innervated by median nerve (thumb, index and long fingers)
- symptoms worse at night (often awakening)
- weakness without associated pain

findings inconsistent with diagnosis

- numbness, pain, tingling in regions not innervated by median nerve (small finger, dorsum)
- ulna intrinsic weakness and atrophy

commonly patients will describe methods such as

- shaking and massaging their hands and arms
- hanging their arms off the side of the bed
- running hands under running tap water

physical signs of carpal tunnel syndrome are few, but are present in advanced cases:

- test for Tinel's sign (tapping the wrist along the path of the median nerve as it passed through the carpal tunnel)
- Phalen's test (forced wrist flexion)
- look for thenar eminence wasting
- dystrophic changes and dry skin
- physical examination: look for stigmata of other underlying disease process (eg. myxoedema, rheumatoid arthritis)

Diagnosis is based on clinical signs and symptoms, but when these are equivocal, a nerve conduction study may be of value. In occupation history is important as CTS is very often caused by overuse especially bricklaying, carpet beating, typing, rock drilling etc. In the majority, no underlying cause is found (idiopathic) Other conditions that can cause carpal tunnel syndrome includes: Previous trauma, especially dorsally angulated fractures / corticosteroid use / pregnancy / myxoedema / rheumatoid arthritis / tenosynovitis

Investigations

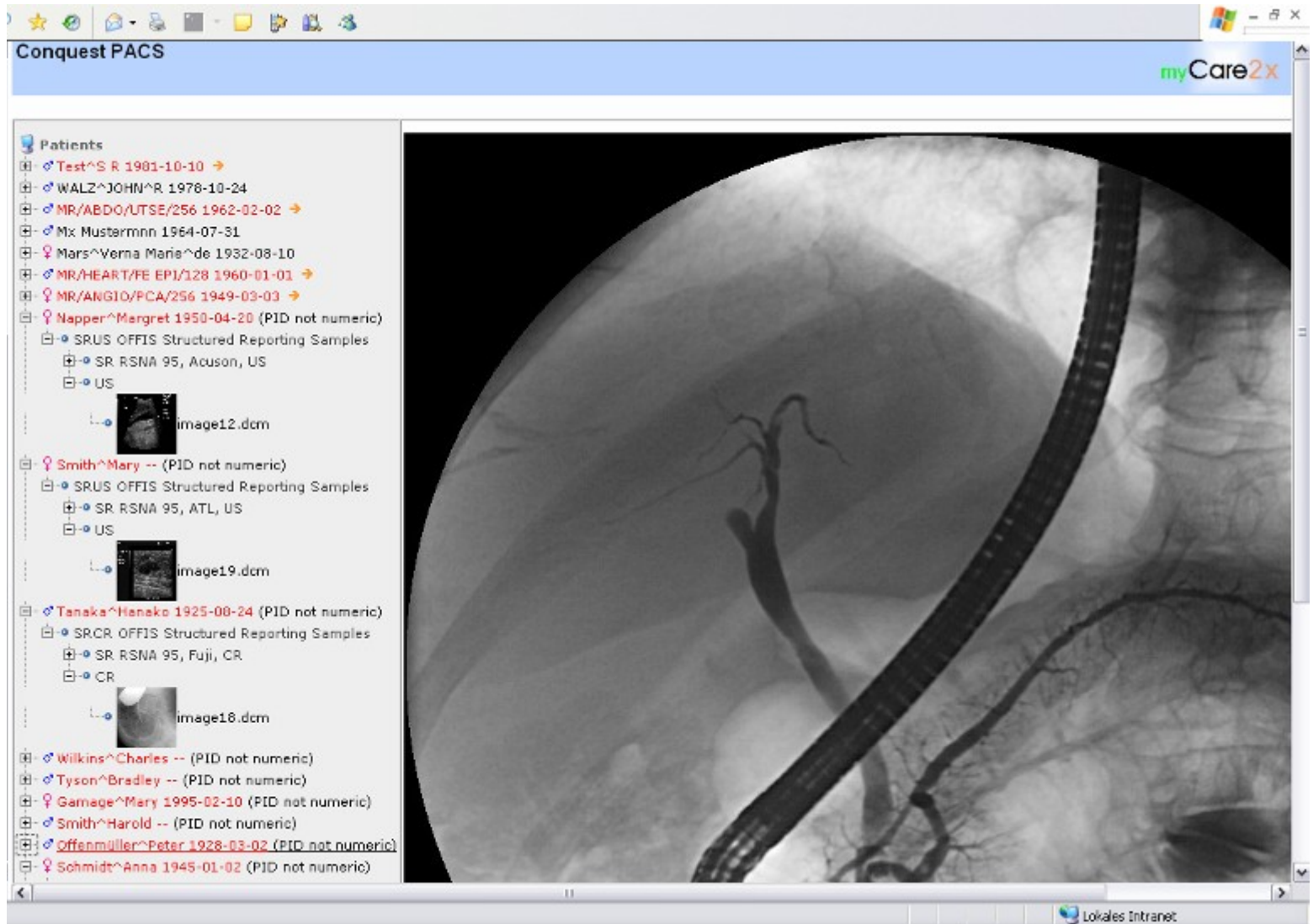
perform blood tests to evaluate a possible underlying cause:

- rheumatoid factor
- thyroid function test
- plasma glucose
- beta-HCG if appropriate
- inflammatory markers – C-reactive protein, erythrocyte sedimentary rate

myCare2x Forms by Gerald Wick, mycare2x@gwick.de

CTS Request

Connection to PACS



Scheduling

The screenshot displays three overlapping windows from the mycare2x system:

- Radiologie Schedule:** A grid showing appointments for three rooms (Raum 1, Raum 2 DL, Raum 3) from 08:00 to 11:00. Appointments include:
 - 09:00-09:30: Wallner, Karl (Raum 1)
 - 09:20-09:50: Tabaluga, Max (Raum 2 DL)
 - 09:40-10:10: gesperrt (Raum 1)
 - 10:10-10:40: Reservierung (Raum 2 DL)
 - 10:20-10:50: Reservierung (Raum 2 DL)
 - 09:00-10:30: Siegfried (Raum 3)
- Waitinglist - Microsoft Internet Explorer:** Shows a list of waiting patients for Radiology (19). The selected patient's order is:
 - Skelett
 - Schädel Schädel in 2 Ebenen.
- Service - Microsoft Internet Explorer:** Shows details for a specific service for Martina Bauer (139). The service list includes:
 - Panoramaaufnahme(n) eines Kiefers
 - Arm/Bein/Schulter u.a. jeweils in 2 Eben
 - Arm/Bein/Schulter u.a. ergänzende Ebene(
 - Teile des Skeletts in 1 Ebene, je Teil
 - Bestimmung des Skeletalters
 - Untersuchung, symptombezogen
 - Zähne je Projektion
 - Panoramascichtaufnahme der Kiefer
 - Finger/Zehen jeweils in 2 Ebenen
 - Finger/Zehen ergänzende Ebene(n)
 - Hand/Fuß/Kniescheibe u.a. jeweils in 2 E
 - Hand/Fuß/Kniescheibe u.a. ergänzende Ebe
 - Arm/Bein/Schulter u.a. jeweils in 2 Eben
 - Beckenübersicht, Erwachsener
 - Beckenübersicht, Kind
 - Schädelübersicht in 2 Ebenen
 - Schädelteileile, Spezialprojektion(en)
 - Nasennebenhöhlen ggf. in mehreren Ebenen
 - HWS in 2 Ebenen
 - HWS ergänzende Ebene(n)
 - BWS/LWS in 2 Ebenen, je Teil
 - BWS/LWS ergänzende Ebene(n)
 - Wirbelsäule/Extremität, Ganzaufnahme
 - Wirbelsäule/Extremität, Ganzaufnahme erg
 - Hand/Fuß, Teile in Feinstfokustechnik je
 - Rippen/Schulterblatt/Brustbein in einer

Callouts on the left side of the image point to the 'Radiology' and 'Waiting List' sections of the interface.

Specific Service

Diagnosis Related Group

DRG | ICD10 | OPS301 -- Mollin (Orthopady) myCare2x

Osnabrück, Florian (26.05.1950) - 100130

Quit Grouper Tree View Import Check DRG

Admit date: 23.05.2007 Admit source: Emergency

Admit type: Admit type Admit reason: Admit reason

Discharge date planned: 05.05.2009 Discharge reason: Discharge reason

Respiration i: 0.00 Weight at admit date: 0

Phil.Health - Case Type A - RVU: 6 (Next level by:81/75) 7%

Group	Actual Amount	max. Amount	%	Group description
Duration of stay	3 max=6	85	100%	Total
Room & Board	P18000	P18000	100%	
Drugs & Medicine	P3000	P3000	100%	
X-Ray, Lab & other	P1700	P1700	100%	
Operating Room	P1060	P1060	100%	
General Practitioner	P600	P600	100%	
Specialist	P1000	P1000	100%	
Surgeon	P240	P16000	1%	
Anesthesiologist	P72	P5000	1%	

Search for Procedures - Windows Internet Explorer

Search for Procedures

Osnabrück, Florian

Procedures	Description
10050	Incision and drainage of abscess (eg, carbuncle, suppurative hidradenitis, cutaneous or subcutaneous abscess, cyst, furuncle, or paronychia)
10080	Incision and drainage of pilonidal cyst
10120	Incision and removal of foreign body, subcutaneous tissues
10140	Incision and drainage of hematoma, seroma, or fluid collection
10180	Incision and drainage, complex, postoperative wound infection
11000	Debridement of extensive eczematous or infected skin
11010	Debridement including removal of foreign material associated w/ open fracture(s) and/or dislocation(s)
11011	Debridement including removal of foreign material associated w/ open fracture(s) and/or dislocation(s)
11012	Debridement including removal of foreign material associated w/ open fracture(s) and/or dislocation(s)
11050	Paring or curettment of benign hyperkeratotic skin lesion w/ or w/o chemical cauterization (such as verrucae or clavi) not extending through the stratum corneum (eg, callus or wart) w/ or w/o local anesthesia
11051	Paring or curettment of benign hyperkeratotic skin lesion w/ or w/o chemical cauterization (such as verrucae or clavi) not extending through the stratum corneum (eg, callus or wart) w/ or w/o local anesthesia
11052	Paring or curettment of benign hyperkeratotic skin lesion w/ or w/o chemical cauterization (such as verrucae or clavi) not extending through the stratum corneum (eg, callus or wart) w/ or w/o local anesthesia
11100	Biopsy of skin, subcutaneous tissue and/or mucous membrane (including simple closure), unless otherwise listed
11300	Shaving of epidermal or dermal lesion, single lesion, trunk, arms or legs

ICD10 Thesaurus - Windows Internet Explorer

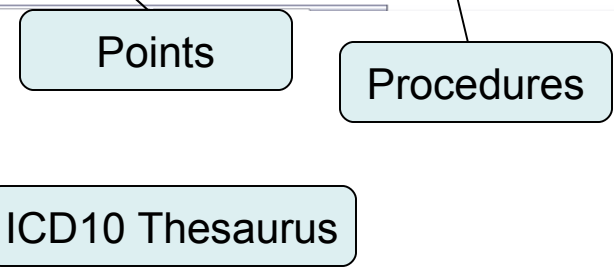
ICD10 Thesaurus

Osnabrück, Florian

ICD_10	Description
A02.2	Localized salmonella infections
A04.0	Enteropathogenic Escherichia coli infection
A04.1	Enterotoxigenic Escherichia coli infection
A04.2	Enteroinvasive Escherichia coli infection
A04.3	Enterohemorrhagic Escherichia coli infection
A04.4	Other intestinal Escherichia coli infections
A04.6	Enteritis due to Yersinia enterocolitica
A04.7	Enterocolitis due to Clostridium difficile
A05.1	Botulism
A06.2	Amebic nondysenteric colitis
A06.4	Amebic liver abscess
A07.1	Giardiasis [lambliaosis]
A19.-	Miliary tuberculosis
A19.0	Acute miliary tuberculosis of a single specified site
A19.1	Acute miliary tuberculosis of multiple sites
A19.2	Acute miliary tuberculosis, unspecified
A19.8	Other miliary tuberculosis
A19.9	Miliary tuberculosis, unspecified
A21.7	Generalized tularemia
A23.0	Brucellosis due to Brucella melitensis
A24.-	Glanders and melioidosis
A24.1	Acute and fulminating melioidosis

Procedures

Procedures i	Description	Category	Localization	Done by
10080	Incision and drainage of pilonidal cyst 2009-05-26 10:01:14	MP	<input type="checkbox"/>	Mollin INN



Why stop at OSS HIS?

- HL7 Message Hub/Gateway
- Consolidation of patient medical records
- Laboratory Information Management Systems
- Master Patient Index
- Enterprise Laboratory Results Management
- Clinic Management
- Etc etc etc

See us at the booth

ksc@sains.com.my

+60 82 234 342

+60 16 888 6640