Integrating Today's Health Information Technology into Health Professional Education

Andre Kushniruk, Elizabeth Borycki
University of Victoria

Aviv Shachak
University of Toronto

Kendall Ho
University of British Columbia

University of Victoria

Background: School Of Health Information Science, U. of Victoria

- Since 1981 a "holistic" approach to teaching health informatics:
  - Health information Science: "the field that deals with information processing (including computers) and communication in health care practice, education and research"
- Over 800 graduates, 150 current undergraduate students, 100 grad students all with focus in health informatics
  - Interdisciplinary approach
- Needed way to bring electronic health record experience to these students
  - Idea has extended across BC (and for medical, nursing and health informatics)

University of Victoria

Current Situation in Health Professional Education in Canada

- Health professional students do not typically see EHR (and related technologies such as clinical decision support) in their academic training programs
- EHR is not integrated into medical, nursing and other allied health professional curricula
- Graduates in many programs are likely to have not seen (i.e. had hands-on exposure to) EHR by time of graduation
  - Consequently will not understand advantages, disadvantages, and how to use EHR to improve practice

University of Victoria

How Can We Integrate Health Information Technology into Education ?

- Increase integration by:
  - exposing students and practitioners to hands-on access, through integrated and easy access to working systems
  - Enabling students, practitioners and managers to distinguish between systems and see how they can be used in their practice and educational settings
  - Increasing understanding of use of systems, decision-making knowledge

- This will results in:
  - Reduced financial and human resources burden on universities, colleges and regional health authorities for e-health application education and training

University of Victoria

A Continuum for Considering Integration of EHRs into Health Professional Education

Loose Coupling **Tight Coupling**

Demonstration of EHRs prior to class time

Laboratory or assignments involving EHR (outside of lectures/class)

Access to patient cases discussed in class through EHR only

Full integration into labs, lectures and testing of students

University of Victoria

Initial Approach

- Development of a web portal that allows students and practitioners:
  - To remotely access and **interact with** open source EHR software (from anywhere and anytime)
  - To obtain the latest information about EHRs and actually try them out in **their** educational or clinical practice settings
  - To learn about the use of the EHR
    - Educational modules focused around EHR and related e-health applications

University of Victoria

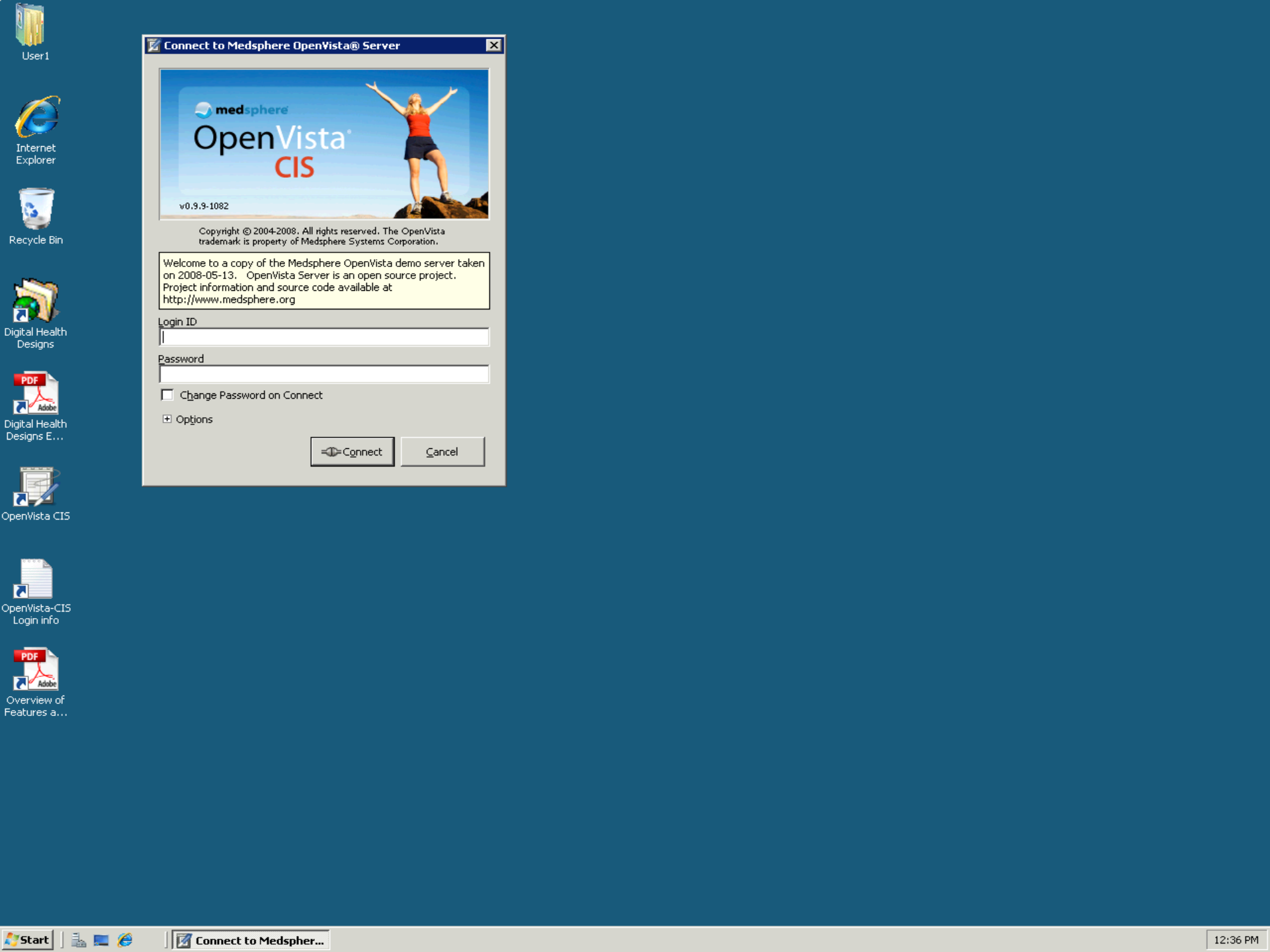
Electronic Health Records / Electronic Medical Records / Personal Health Records

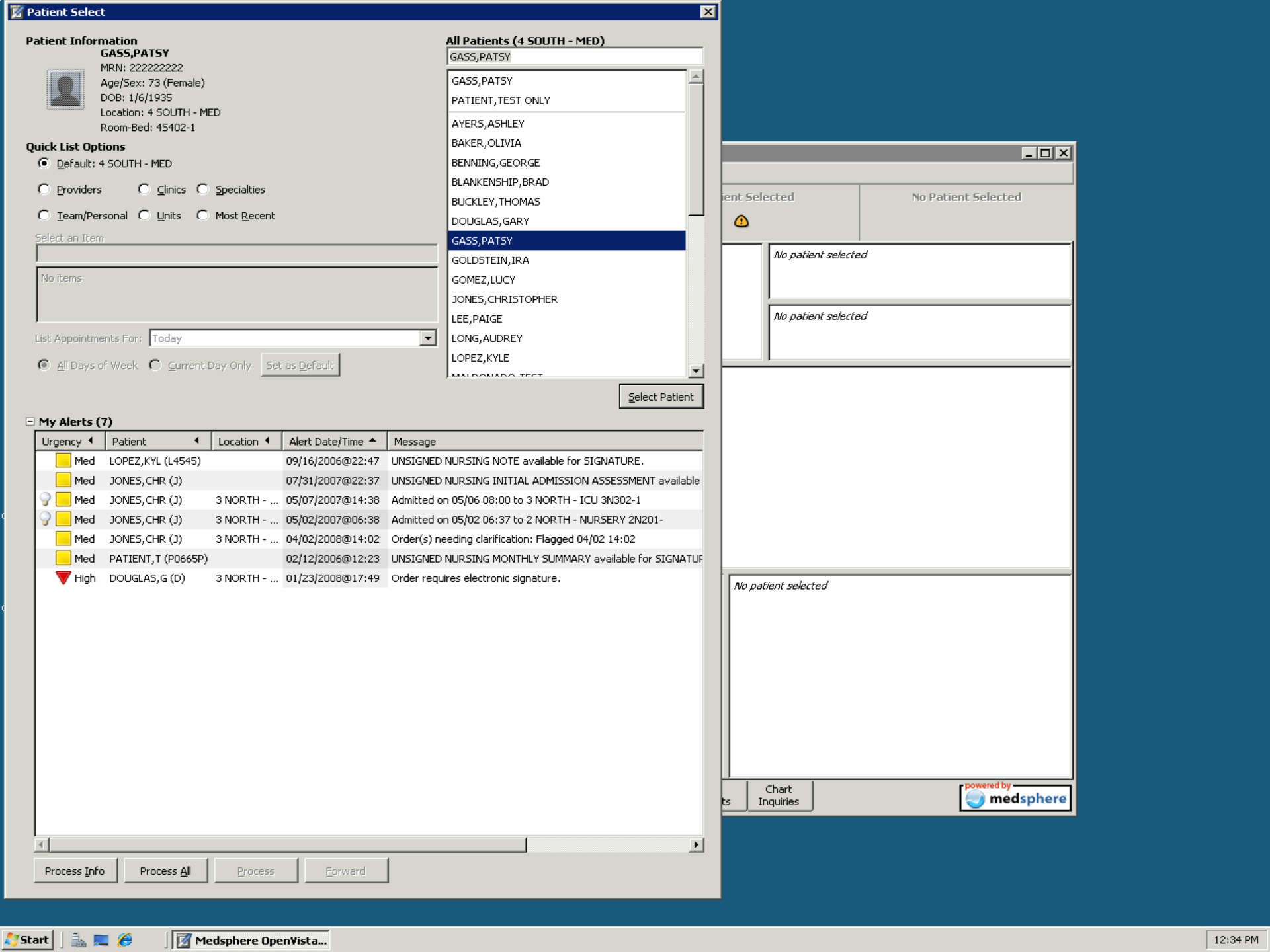
- Digital Health Designs EMR & OpenVista – CIS
- POND - Pediatric Oncology Networked Database
- OSCAR McMaster

Health Records Technology in BC

- Physician Information Technology Office (PITO)
- EMR Toolkit
- BCHealthGuide Online
- EHRchitect.com

School of Health Information Science
University of Victoria


User1
Internet Explorer
Recycle Bin
Digital Health Designs
Digital Health Designs E...
OpenVista CIS
OpenVista-CIS Login info
Overview of Features a...
Connect to Medsphere OpenVista® Server
medsphere
OpenVista
CIS
v0.9.9-1082
Copyright © 2004-2008. All rights reserved. The OpenVista trademark is property of Medsphere Systems Corporation.
Welcome to a copy of the Medsphere OpenVista demo server taken on 2008-05-13. OpenVista Server is an open source project. Project information and source code available at http://www.medsphere.org
Login ID
Password
Change Password on Connect
Options
Connect
Cancel
Start
Connect to Medspher...
12:36 PM


Patient Select
Patient Information
GASS,PATSY
MRN: 222222222
Age/Sex: 73 (Female)
DOB: 1/6/1935
Location: 4 SOUTH - MED
Room-Bed: 4S402-1
Quick List Options
Default: 4 SOUTH - MED
Providers
Clinics
Specialties
Team/Personal
Units
Most Recent
Select an Item
No items
List Appointments For:
Today
All Days of Week
Current Day Only
Set as Default
All Patients (4 SOUTH - MED)
GASS,PATSY
GASS,PATSY
PATIENT,TEST ONLY
AYERS,ASHLEY
BAKER,OLIVIA
BENNING,GEORGE
BLANKENSHIP,BRAD
BUCKLEY,THOMAS
DOUGLAS,GARY
GASS,PATSY
GOLDSTEIN,IRA
GOMEZ,LUCY
JONES,CHRISTOPHER
LEE,PAIGE
LONG,AUDREY
LOPEZ,KYLE
Select Patient
My Alerts (7)
Urgency
Patient
Location
Alert Date/Time
Message
Med LOPEZ,KYL (L4545) 09/16/2006@22:47 UNSIGNED NURSING NOTE available for SIGNATURE.
Med JONES,CHR (J) 07/31/2007@22:37 UNSIGNED NURSING INITIAL ADMISSION ASSESSMENT available
Med JONES,CHR (J) 3 NORTH - ... 05/07/2007@14:38 Admitted on 05/06 08:00 to 3 NORTH - ICU 3N302-1
Med JONES,CHR (J) 3 NORTH - ... 05/02/2007@06:38 Admitted on 05/02 06:37 to 2 NORTH - NURSERY 2N201-
Med JONES,CHR (J) 3 NORTH - ... 04/02/2008@14:02 Order(s) needing clarification: Flagged 04/02 14:02
Med PATIENT,T (P0665P) 02/12/2006@12:23 UNSIGNED NURSING MONTHLY SUMMARY available for SIGNATUF
High DOUGLAS,G (D) 3 NORTH - ... 01/23/2008@17:49 Order requires electronic signature.
Process Info
Process All
Process
Forward
ient Selected
No Patient Selected
No patient selected
No patient selected
No patient selected
Chart Inquiries
powered by medsphere
Start
Medsphere OpenVista...
12:34 PM

Medsphere OpenVista® CIS [DEMO] - Connected as DEMO (USER,PHYSICIAN)

File Edit View Actions Options Tools Help

LOPEZ,KYLE
Age/Sex: 7 (Male)
MRN: 233124545

Wt: 21.772 kg
Ht: 110 cm
BMI/BSA: 18.0 (0.82)

PEDS 4A101-2
Provider: USER,PHYSICIAN
Admit Dx: seizure

Admitted: 11/7/2006 11:39:47 AM
Acct #:

Postings:
Alerts:

Care Team
Admitting MD: MURPHY,JESSICA
Attending MD: MURPHY,JESSICA

New Note... Edit Delete

Default: Last 100 Signed Notes

Date	Title
12/20/2006	GROUP NOTE
12/20/2006	MH GROUP NOTE
10/20/2006	PHYSICAL THERAPY
8/16/2006	PEDI CARDIOLOGY F
8/16/2006	NURSING ASSESSME
8/16/2006	PEDI PROGRESS NO
8/16/2006	NURSING ASSESSME
8/15/2006	NURSING ASSESSME
8/15/2006	PEDI NEUROLOGY PI
8/15/2006	PEDI PROGRESS NO
8/15/2006	PEDI CARDIOLOGY F
8/17/2006	Addendum to PEDI C
8/15/2006	EEG REPORT
8/15/2006	NURSING ASSESSME
8/15/2006	PEDI CARDIOLOGY (
8/15/2006	NURSING ASSESSME
8/14/2006	NURSING NOTE
8/14/2006	NURSING NOTE
8/14/2006	PEDI NEUROLOGY C
8/14/2006	PEDI ADMIT NOTE
8/14/2006	NURSING INITIAL AI
6/14/2006	PEDI NEUROLOGY C

Templates

Adm: 8/14/2006 EEG REPORT, 4A -PEDIATRICS, GOLDSTEIN,JACOB (8/15/2006 9:00 AM)

```
       TITLE: EEG REPORT
DATE OF NOTE: AUG 15,2006@09:00      ENTRY DATE: AUG 15,2006@09:53:44
      AUTHOR: GOLDSTEIN,JACOB      EXP COSIGNER:
     URGENCY:                            STATUS: COMPLETED


Reason for Study: Seizure disorder, incr

Medication: phenobarbital 80 mg po dialy


 METHODOLOGY Topographic EEG Methodology
 placed according to the International 1
 a standardized 19 channel (Lexicor syst
 montage was obtained with linked earlob
 10 Kohms was required at all sites prio
 signals were fed directly to a quantita
 they were digitized at a rate at or abo
 band-pass filtered between 1 and 30 Hz
 analysis.
    The client was seated in a comfortab
 3.5 meters in front of a video monitor
 ottoman in front of the seat. A series
 approximately 3 minutes, was administer
 eyes open, 3) reading for comprehension
 difficulty. Digitized data were subject
```

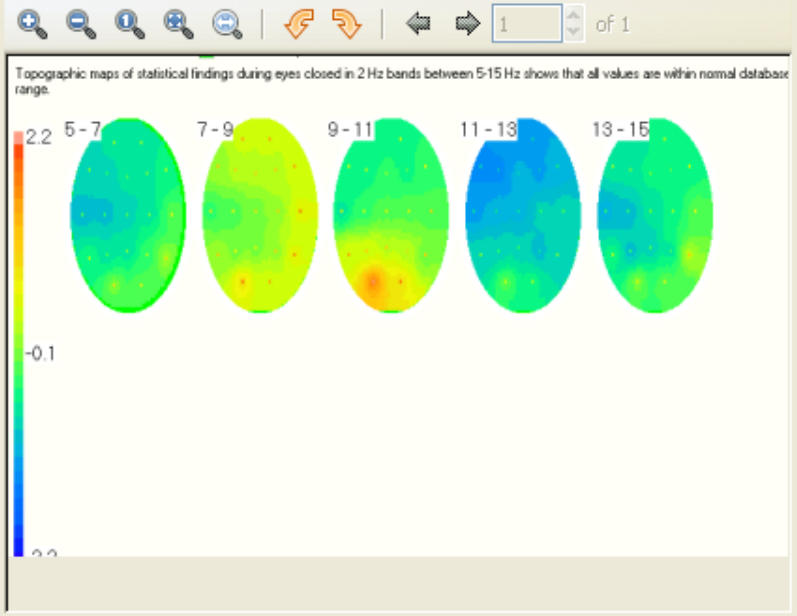
Encounter

Images

8/15/2006 8/15/2006 8/15/2006

EEG REPORT

EEG REPORT
Captured on 8/15/2006



Close

Patient Summary | Problem List | Medications | Orders | Clinical Notes | Consults/ Procedures | Discharge Summary | Vital Signs | Lab Results | Chart Inquiries

powered by medsphere

start Medsphere OpenVist... EEG REPORT shortcuts 5:17 PM

Example of Tight Coupling – Medical Education

- Used in pilot with all 4th year medical students in a one week period (over 240 students and faculty) – Island Medical Program, UBC main campus and UNBC (collaborators: Kendall Ho, B. Armstrong)
- Medical cases previously accessed on paper made accessible using the EHR to students during an educational module
- Allowed medical students to experience EHR first hand
- Integrated simultaneous lecture discussion of EHR with hand-on experience

University of Victoria

Example of Loose Coupling – Nursing Education

- Extended use of portal to education of nursing students in Canada
- 150 nursing students in course on “New Trends in Nursing” given remote access over the portal to OpenVista two weeks before face-to-face discussion
- Students were asked to consider what impact of EHR will be on their practice (and explore features of OpenVista)
- All brought together for a 3 hour group discussion with professors and group facilitators

University of Victoria

Further Work – Integration of EHRs into Testing of Medical Students

- From pilot work with UBC (Kendall Ho), students indicated testing for OSCEs is a prime motivator
- Examined OSCE (Objective Structured Clinical Examinations) used for evaluating medical student skills
- Conducted focus groups with key stakeholders
- Developed storyboards for integrating EHRs into the OSCEs

University of Victoria

Further Examples of Integration – Health Informatics Education

- Hands-on module added to third year and fourth year undergraduate health informatics program (on EHRs and Decision Support)

- Pre and post test of self rating of basic health informatics competencies
  - Several HI competencies improved significantly following hands-on work with the EHR

- Analysis of student information needs as well
  - Need to integrate learning about the EHR throughout the undergraduate curriculum
  - Need to work with a range of EHRs and decision support tools
  - Interest in integrating mobile apps into curriculum
  - Need for hands-on project where students would develop an EHR

University of Victoria

Current Work: Integration of Educational EHRs with Educational Simulations

- A wide range of educational simulations have been developed for teaching health professionals about clinical diagnoses, treatment and decision making
- However, many of these systems do not get used past their piloting phase
  - As they are often stand alone with their own interfaces and do not fit into clinical practice

- To address this current work is on integrating educational EHRs with educational simulations
  - Linking in the simulations within the EHR (work with U. of T. – Aviv Shachak)

University of Victoria

Future Directions and Conclusion

- Re-establishment of Educational EHR portal
- Open source system deployment
- Pedagogical considerations – using the integration continuum (from loose to tight coupling)
- Collaboration across British Columbia nursing, medical and health informatics schools
- Requirements gathering for integration into educational EHR underway

- Best way to teach about technology is to have students exposed to it in real-life or simulations – experimentation in doing this needed

University of Victoria

For Further Information

- Andre Kushniruk, Director School of Health Information Science, University of Victoria
- andrek@uvic.ca

University of Victoria