



**Vietnam National Hospital of Pediatrics  
Remote Interactive Consultations and  
Epidemiology – RICE program**

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**Transforming Health  
Care in Vietnam**

*Joseph M Rosen, MD  
Hanoi – Vietnam, March 14th, 2007*



# Content of current presentation

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- General information of Vietnam
- Description of present HC system in Vietnam
- Description of the National Hospital of Paediatrics
- New Strategy for Healthcare Delivery in Vietnam
- Description of RICE Microsoft Project
- Network based Patient Centric System



**General Information  
of Vietnam that makes  
New Healthcare System  
Possible in the Future**



# Influencing factors to health care

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- Geography
- History
- Politics
- Economy
- Culture





# Vietnam Country



- Surface area: 329,600 km<sup>2</sup>
- Geographically  
Vietnam has three parts
  - South
  - Central, and
  - North
- Administrative division
  - 64 provinces/cities
  - 600 districts
  - 11,000 communes/towns



# Vietnam Country (cont.)



- **Population:** 80 millions
  - Children < 15 yrs: 30.1%
  - Growth rate : 1.7%
- **Ethnic groups**
  - Majority of people are the Vietnamese
  - The rest are minorities



**Description of present  
health care system in Vietnam  
Platform Based System  
Role of the Hospital and other  
facilities ( platforms)**

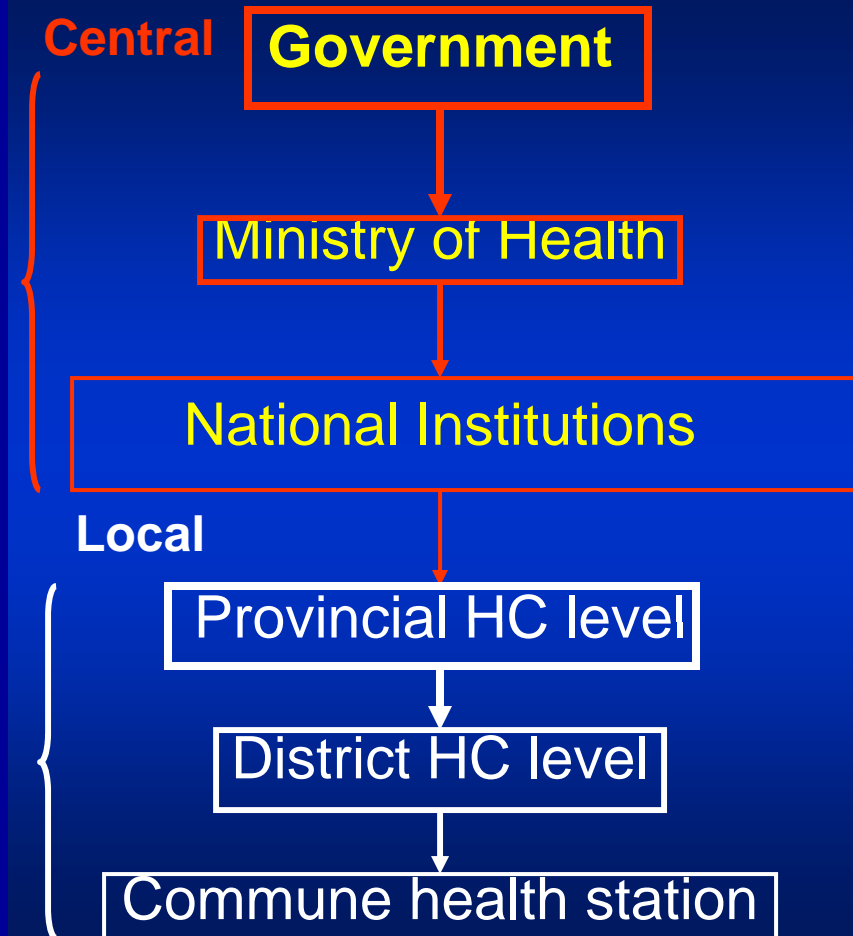


# Description of present HCS in Vietnam

## Health care platforms

### The same org. structure

- Basing on Adm. division
  - Central Health Care Level
  - Local Health Care Level
    - ✓ *Provincial/City*
    - ✓ *District/Town*
    - ✓ *Commune*
- Basing on economy sectors
  - Governmental health facilities
  - Private health facilities



# **The National Hospital of Paediatrics (NHP)**

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**Introduction  
Hospital as Platform  
Versus Network**

## Central HC level



# Roles and responsibilities (cont.)

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- National institutions

- Curative work
- Preventive work
- Training & education
- Research activity
- Community HC activity
- International co-operation
- Financial management



# **Overview: Current Hospital**

# Recent Achievements

✿ New technological advances have been applied in NHP :

- Endoscopic surgery: Laparoscopic and Thoracoscopic surgery
- Gastroscopy
- Tracheobronchoscopy
- Open heart surgery
- Separation operations of conjoined twins
- Kidney transplants have been performed successfully
- First liver transplant in NHP

## New technological advances have been applied in NHP : (cont.)

- Hemodialysis.
- Cardiac intervention.
- Bio molecular laboratory.
- Genetics laboratory.
- Microsoft project – Digital Inclusion

**Current Difficulties and  
Challenges with Platform  
Hospital Based System**

- Overload situation
- The health care and treatment needs of children are increasing rapidly
- Limited budget, children under 6 years old: free of charge
- Limited space
- Infrastructure: + damaged  
+ old design

## **Strategic Opportunities for NHP**

**Shifting from a platform based  
hospital system to a network  
based health care system**

# Network Vision

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**Establish NHP as the 'Centre of Excellence'  
for Pediatric Services  
in Vietnam – Hub of the Network of Care**

# A new plan to develop the NHP

## From Hospital to Network

- Number of Beds : 900 plus Network of Care
- Budget for redevelopment : USD 100 million
- 5 phases (Four Physical and One Virtual Phase)
- Develop an Information Hub for Vietnam
- Provide Driving Force for Network based Care

# High Tech Building as the Hub of the Virtual Network



# RICE: Remote Interaction, Consultation and Epidemiology

Network Based Healthcare Delivery  
For Patient Centric Care

“Optimize care for the Patient and  
Minimize Cost to the Country”

Collaboration between NHP, Microsoft and the  
Thayer School of Engineering, Dartmouth College

Joseph Rosen, MD; Eliot Grigg; Shunhui Zhu



# RICE – Revolutionary Poem

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# Network Based Healthcare

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- Network maximized deliver care and minimized cost to provide this care
- Network approach allows patient to receive care as close to home as possible at highest level
- In some cases this is telemedicine and training with simulation to the rural clinic facility
- In other cases it allows faster transport of patient to the central hospital facility with information

# Overview

- Cellular-phone based electronic medical record
- Connecting doctors in rural areas to doctors in major cities
- Four parts:
  1. Electronic Chart
  2. Remote Consultation
  3. Epidemiology
  4. Medical Education



# The Big Questions

- How do we define Global Local healthcare?
- How to prepare for a global pandemic?
- How do we decrease the cost of care?
- How do we improve the quality of care?
- How do we move from hospital based system to a network based system?

# Understanding Local Culture

- National / Broad Culture
  - Working with local customs and belief systems
- Health Care Culture
  - Interfacing with health care system and practices



# The Problem(s)

- Lack of access to health care in rural areas
- High cost of patient transportation: financial and morbidity
- Emerging infectious diseases: SARS, Avian Flu
- Wired internet access limited and expensive to expand

# Cellular Infrastructure

- Ubiquitous (versus wired internet)
- Growing industry without health care investment
- Wireless (easily deployed)
- Devices relatively inexpensive and portable
- Existing cell phone familiarity and simplified interface (versus PCs)

# Electronic Medical Record

- Central server with database
- Simplified patient information
- Efficient data entry – eventually voice
- New data types

Patient: Active, Patient...  
Summ: Shakespeare, William  
56yo M  
CC: Fever with Rash  
Site: Thai Nguyen

BP	HR	R	T	SaO2
120/80	88	12	37.2	98%

History: 7.4, 14.2, 293, 1.2, 2.4, 42.1, 10.5, 9.2

Sensor: 145, 110, 16

Patient: Active, Patient...  
Summ: 15-NOV-06 @ 13:45

Notes	CBC	15-NOV
Rx	Chem-7	15-NOV
	UA	15-NOV
Labs	LFTs	15-NOV
Images	CBC	15-NOV
History	Chem-8	15-NOV
Sensor	Blood Cx	15-NOV

Patient: Active, Patient...  
Summ: Chest X-Ray  
4-NOV-06@22:30  
Dyspnea

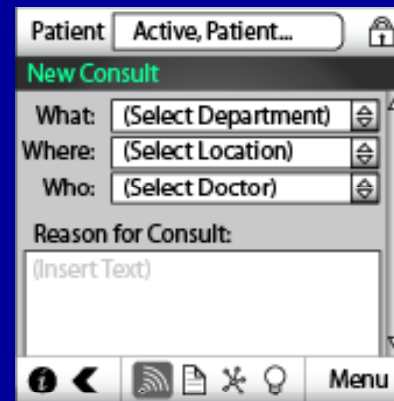
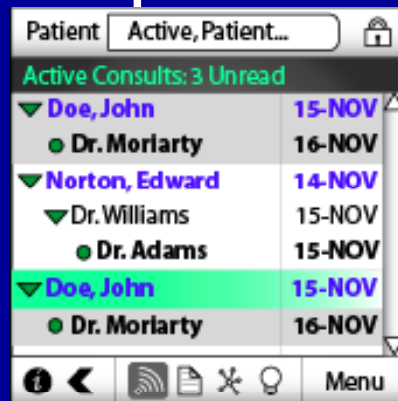
Images: Photo Face  
4-NOV-06@22:30  
Cleft Lip

History: Photo Left Arm  
4-NOV-06@22:30  
Urticaria

(Old Interface)

# Remote Consultation

- Doctor or nurse in rural area enters patient data into system
- Doctor at NHP consults and replies with medical opinion



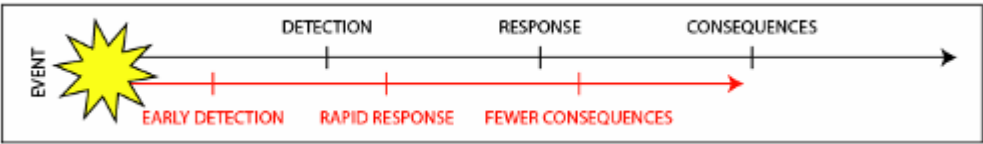
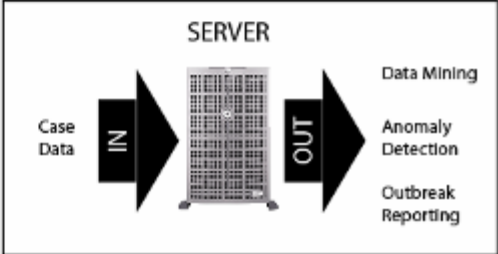
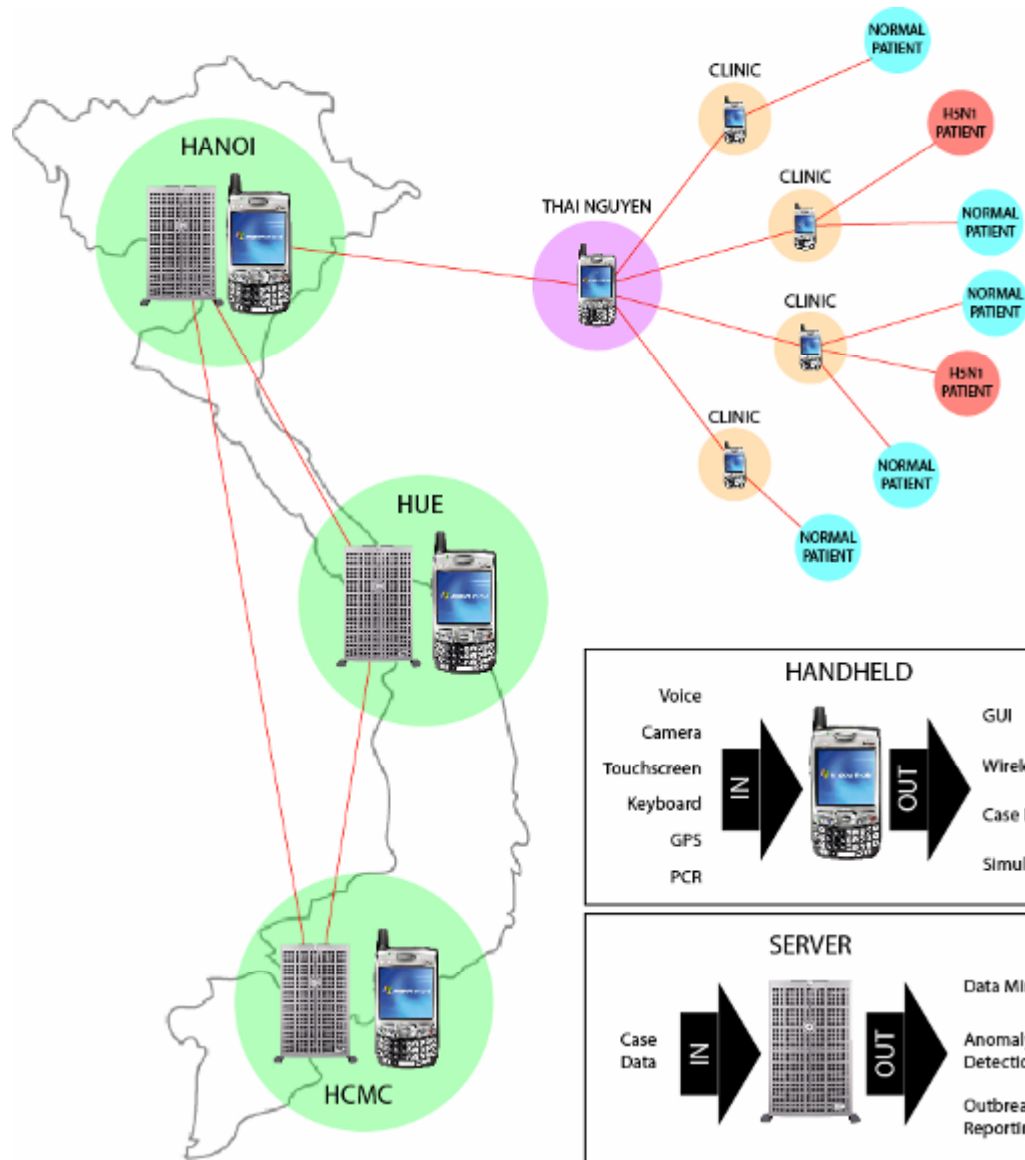
(Old Interface)

# Epidemiology

- Sensor network
  - Doctors
  - Hardware
  - Patients
- Data Mining
  - Able to detect an emerging infectious disease before clinical suspicion

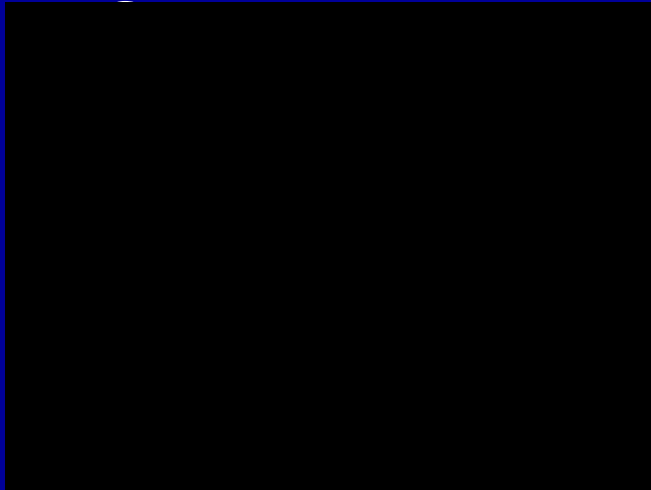


(Old Interface)

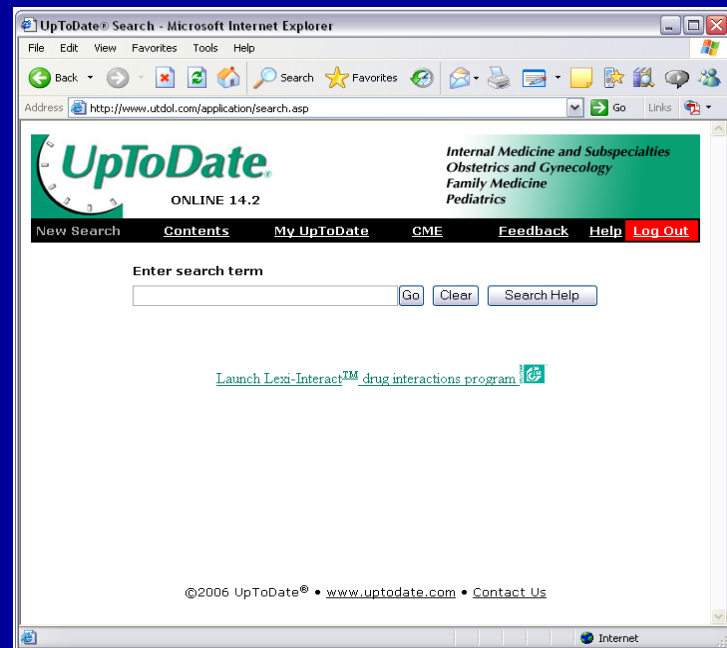


# Medical Knowledge

- Internet Web Sites
- Medical Journals

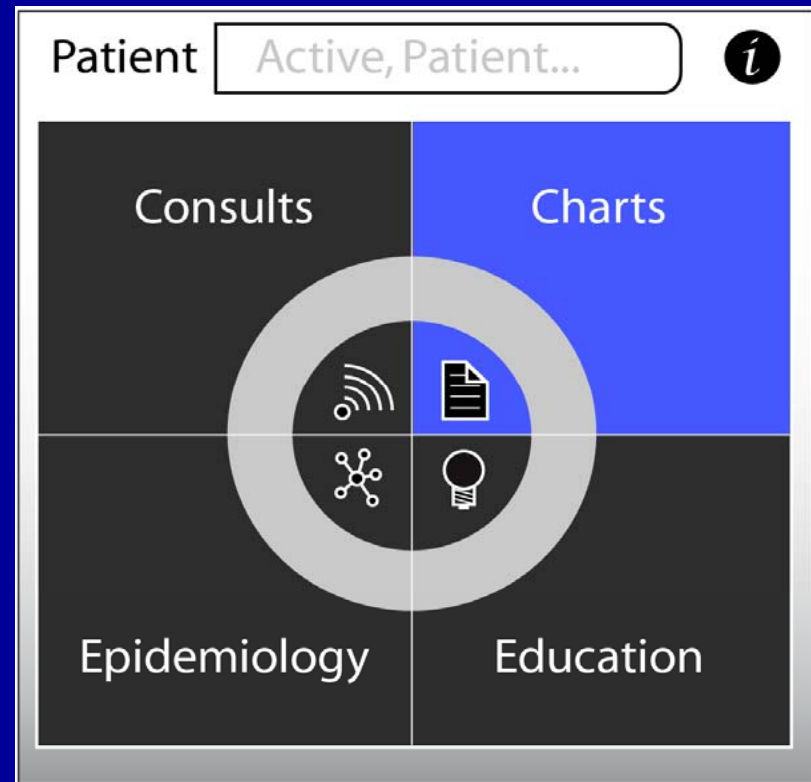


Simulation Video



# Design Principles

- Simplicity
- Reliability
- Speed
- Remote Updates
- User interface is currently being redesigned with the latest software tools



(New Interface)

# Accessories

- Now
  - GPS
  - Camera
- Future
  - PCR: rapid identification of infectious diseases
  - Patient ID: barcode, RFID
  - Simulation: procedure training
  - Ultrasound
  - Haptics (eventually)

# Sustainability

- Ease of use: time spent versus reward
- Purchasing hardware and phone plans: \$\$\$
- Tech support / software updates
- Business Model: physician compensation for remote consultation

# The Future

- Integration with Hospital Information Systems
- Patient Access to Medical Information
- Disaster Mode
- Videoconferencing (requires bandwidth)
- Accessories: PCR / Ultrasound
- Interface: Text-to-Speech, Speech Recognition, Mini-Projectors
- Simulation: procedure training
- Decision-support for Physician Extenders

# The Big Picture

- Information Therapy: giving the patient and family control of their own data
- Redefining the Hippocratic Oath for the 21<sup>st</sup> century
- Balancing therapy and technology
- Moving from a superhighway to an information highway for health care



# Enjoy the peace





# RICE – Salsa Party and Dinner

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