

Using Patient Centered Technology to Enable Emergency Preparedness

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Summary

- What Information is Needed
- Current Model of Information Gathering and Retrieval
- The Issues
 - Privacy
 - Security
 - Accessibility and Portability
 - Interoperability
- Patient Centric Definition
 - Patient Centric Technology
- Applying This in Emergency Preparedness

Disclosure

- CMO and Principal
 - MediModules, Inc.

Emergency Preparedness

- The Emergency Responder needs three things:
 - Quick access to the medical information
 - Delivery of information by trained professionals
 - Up-to-date information

AHIMA: http://www.myphr.com/your_record/why_start.asp

What is the most vital information?

- Name
- Date of Birth
- Medications
- Allergies

- Other information that “would be nice” – beneficial but not required for emergency situations
 - Problem List (Diagnoses)
 - Blood Type
 - Next of Kin/Emergency Contact (Name and Contact)

-Rob Brouhard, Director of the Paramedic Training Program
California State University, Stanislaus (2006)

Current Methods of Gathering Information: Limitations



- Paper
 - Static – facility-centric
 - Often is not updated regularly



- Verbal
 - Asking the patient usually does not work
 - At least a 30% variance exists between what the physician prescribes and what the patient/family recalls (www.IHI.org)



- Electronic
 - Also usually facility-centric
 - Unable to be updated by multiple providers at different facilities

What goes into the Perfect System?

- Privacy
- Security
- Accessibility and Portability

- Additionally:
 - Interoperability

Privacy

The Commandment:

Thou shan't pry into others' PHI

➤ Definition:

- Privacy is based on the societal expectation that we are ethically bound to safeguard Personal Health Information (PHI)
- It is needed to maintain the patient-provider trust – any information given out must be authorized, either implicit or explicit
- HIPAA made this ethical requirement into law with the specific application to PHI

Examples are:

- Allow access only to other providers that are actively caring for the patient
- Electronic: maintaining a password that is not given out

Security

The Commandment:

Thou can't pry into others' PHI

➤ Definition:

- Protection of privacy and confidentiality through a collection of policies, procedures and safeguards
(Shortliffe, 2006)

➤ This is required whether the system is electronic or paper

➤ Examples are:

- Role-based access (nurse vs. provider)
- Websites: Secure Socket Layer (Encryption)

Security



- Method of storage can affect security
 - USB versus web-based Personal Health Records (PHR) were compared in terms of security
 - 5 of the major USB-based PHR's were tested – all were “hacked” to automatically access secure information on the physician’s computer and surreptitiously copy this data to the flash drive
 - Alternatively
 - The web-based PHR's were not able to be accessed in the same manner


(20 Feb 2007 Ann Int Med 146:4)

Accessibility and Portability

- System must be accessible from as many locations as possible
 - Paper: stored at one single location
 - Electronic: only a few have web-access – most at available only at the facility
- Other options is that the system travels with the patient
 - Can travel in the form of paper or “electronically”
 - MyMediList’s MediWallet
 - USB-based personal health record

Schematically

Personal Health Information



Privacy



Security

MyMediWallet™ (a service of MyMediList.com)

<u>RX MEDICATION</u>	<u>DOSE</u>	<u>FREQUENCY</u>
IBUPROFEN	50MG	Every six hours
WARFARIN	2MG	Once daily

MyMediWallet™ (a service of MyMediList.com)

My Allergies

<u>NAME</u>	<u>WHAT HAPPENS</u>
AMBIEN	Diarhea
ATIVAN	Rash
GNC 100	Fever

NON-Rx MEDICATION

<u>DOSE</u>	<u>FREQUENCY</u>
--	Once daily

My PROFILE
Testing, January
123 Any Street, --
12405, Acta, NY
PH: (516) 222 2222
Age : 97 Yrs.

Developed by
MediModules, Inc
www.medimodules.com
Card Printed on Feb 17 2007

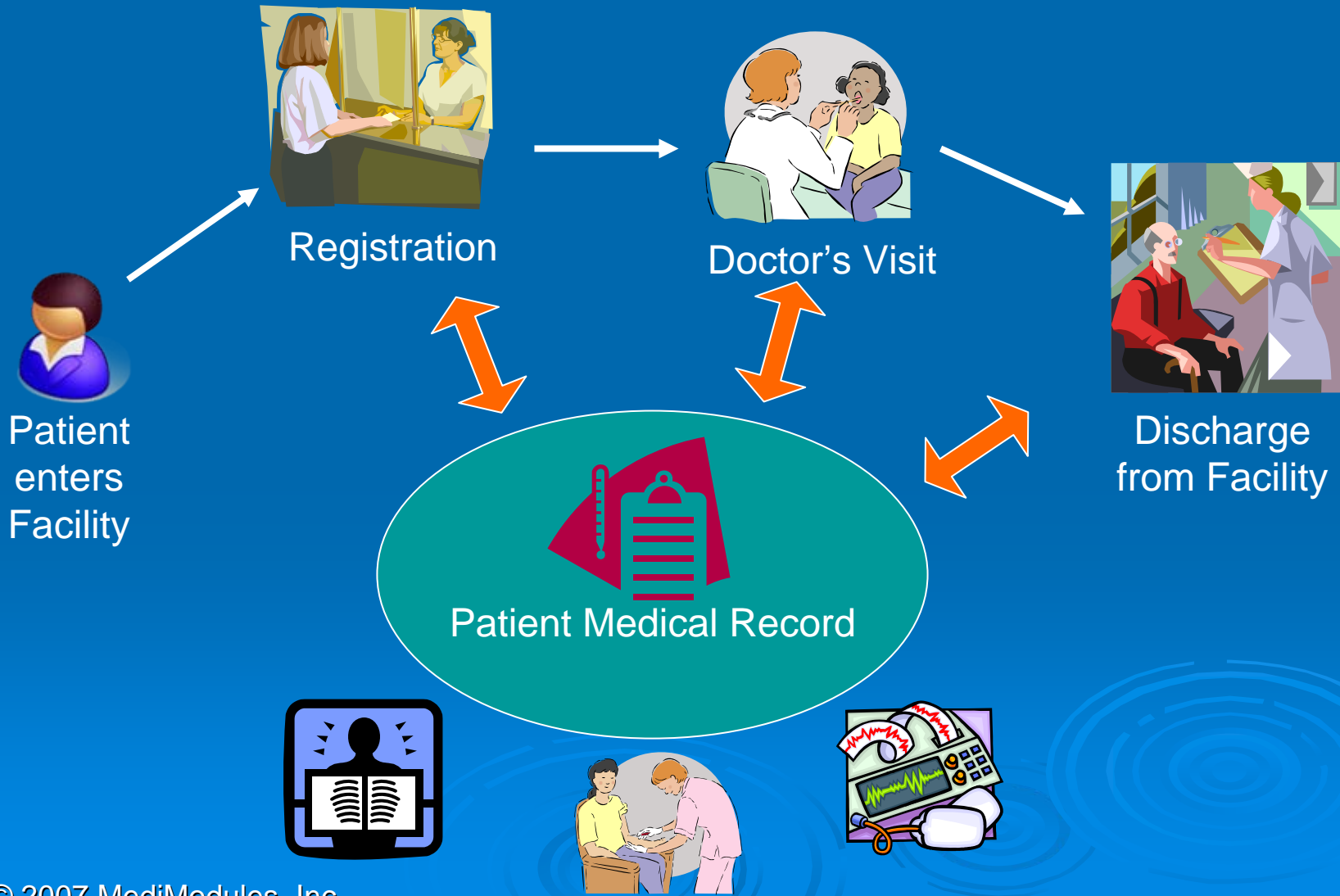


Accessibility and Portability

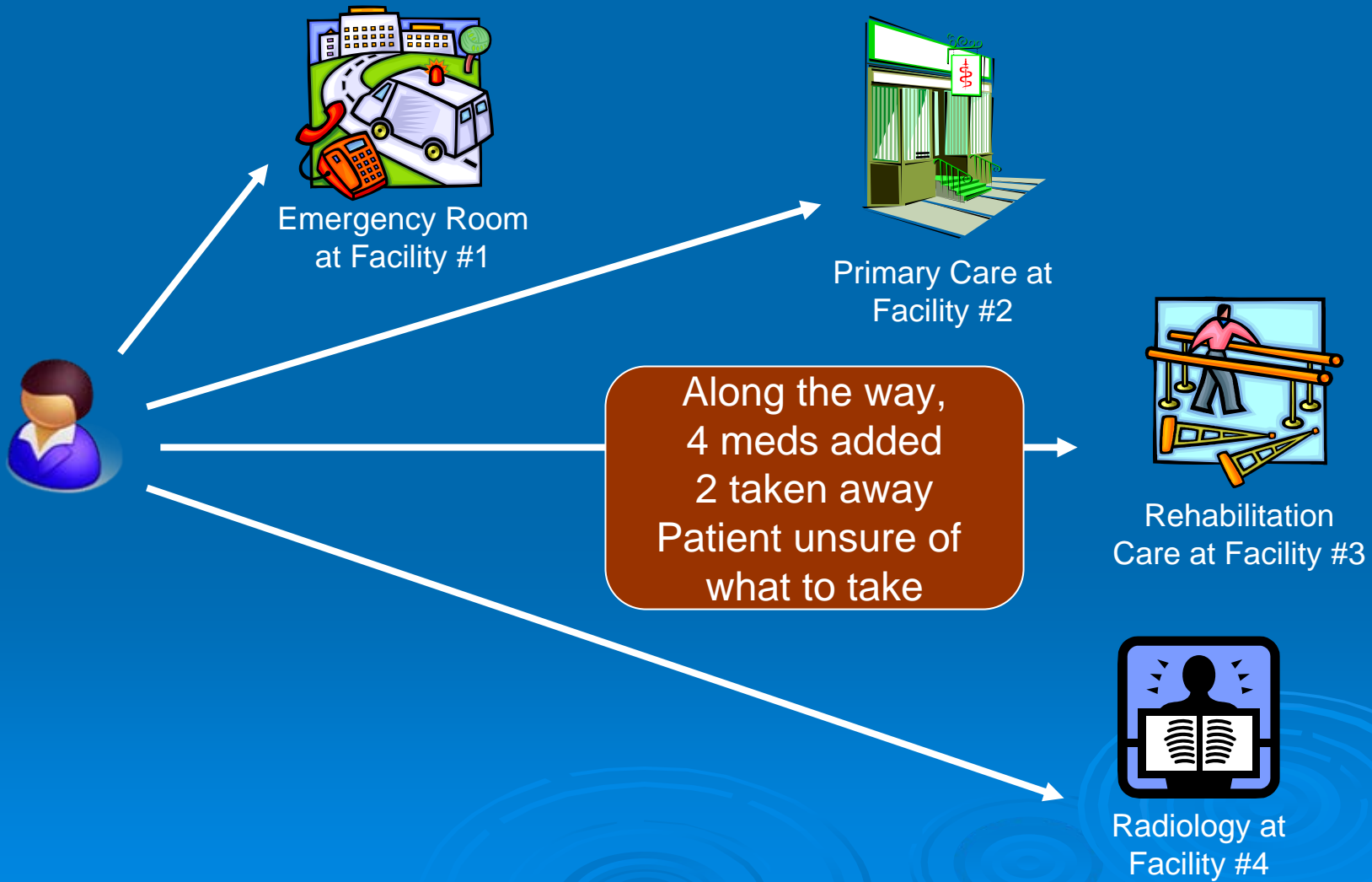
Interoperability

- In the most functional of systems, the information should interact seamlessly with the other systems
- Currently, standards are in existence to help that to happen:
 - General: XML and HL7
 - Pictures/Radiology: DICOM
 - E-Prescribing: NCPDP

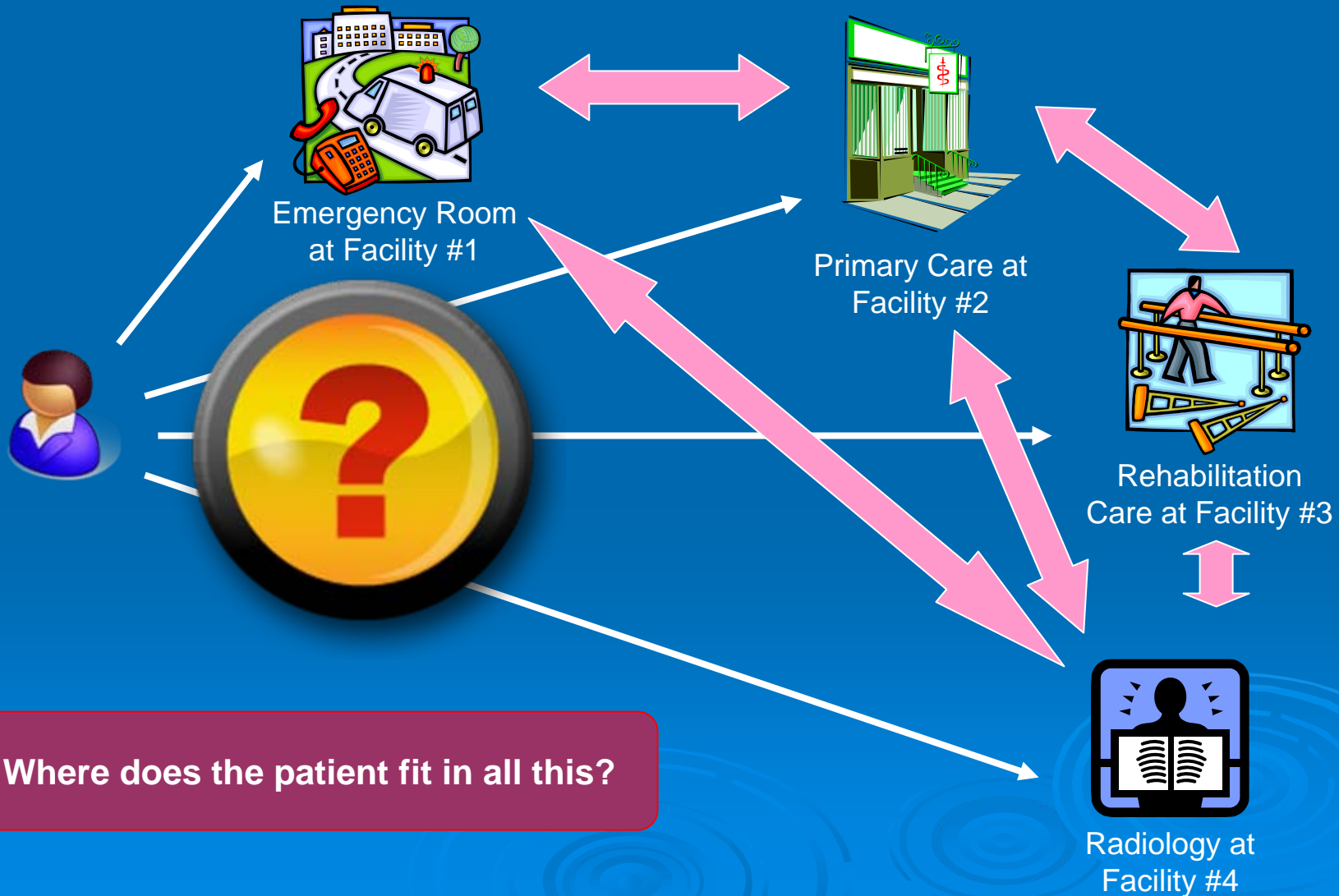
The Ideal Path of the Patient



The True Path of a Patient



Interoperability



Patient-Centric: Definition

- Shortliffe's Biomedical Informatics (3rd Ed)
 - No definition of "Patient-centric"
- We must look to the literature, government and industry to come up with a definition

Patient-Centric: Definition

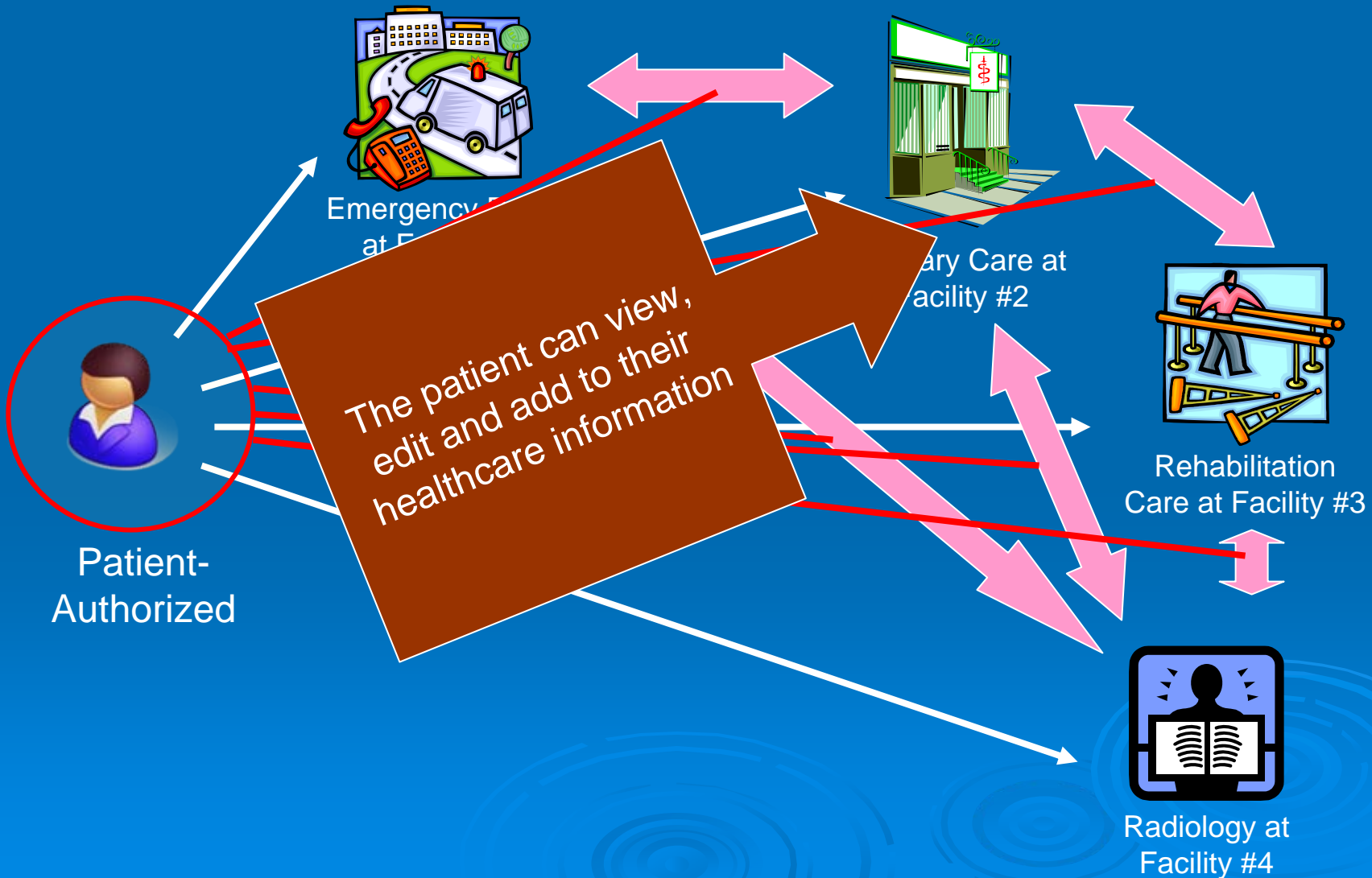
- IOM (www.iom.edu):
 - "care that is respectful of and responsive to individual patient preferences, needs, and values"
- AHRQ (www.ahrq.gov):
 - "patients become active participants in their own care and receive services designed to focus on their individual needs and preferences, in addition to advice and counsel from health professionals."
- AAFP (www.aafp.org):
 - "treating patients as partners, involving them in planning their health care and encouraging them to take responsibility for their own health."

Applying this in the digital world:

IBM (Health IT Summit, 2006):

"the ultimate [electronic] patient-centric care – [patient accessed] personalized medicine through information-based medicine."

Interoperability in the Patient Centric Model



Patient Centric: Is it Important to the Patient?

➤ Markle Foundation (2006):

- Survey of 1,000 Americans
 - Over 95% of respondents said that doctors and individuals should have access to **all** of an individual's medical records.
 - 66% wanted to have access to their own records electronically.
- Interestingly
 - 80 percent were concerned about identity theft and fraud and that their information could be used without their permission
 - About 75 percent said they felt that the government should help establish privacy and confidentiality standards for electronic health information.

Patient-Centric: Models

➤ Some models

• Viewing the information

- patients having access to information but no ability to edit, no communication

Group Health, Incorporated

www.myGHI.com

• Storing the information (web-based)

- Patient controlled access to the information, acts as a storage portal for various aspects of medical care

LifeSensor

www.LifeSensor.com

• Interactive Patient and Provider

- Information is under the patient's control, but the provider can access and update the information with 2-way communication

Medem, Inc.

www.ihealthrecord.org

MediModules, Inc.

www.mymedilist.org

Example: myGHI



Key points:

- offers an ability to view all claims related information
- No editing of health related information allowed

Example: myGHI

Welcome | Our Plans | Health & Wellness | Find a Doctor | Customer Service | myGHI

You are here: [GHI Home](#) | [Members](#) | [myGHI](#) | [Benefits](#) | [Medical](#) Printer friendly | Text Size **T****T****T**

- myGHI Home
- Claims
- Benefits**
 - Medical/Hospital ▶
 - Pharmacy
- Who's Covered?
- Pre-Certification
- Request ID Card
- Update Profile
- Message Center
- Health Tools
- Forms and Downloads
- News and Features
- Member Resources
- Tour myGHI for Members

Benefits

Plan Overview

Medical: RX PLAN EXPRESS SCRIPTS INC.
Category 252

Pharmacy: Covered Through Express Scripts
[Click here](#) for general pharmacy information.

Dependent Child Coverage:
Dependent children are covered until age 19.
College age students - until 23.

Major Medical Deductible Requirement:

Contract	Amount	Amount

The following links provide information about your Express Scripts pharmacy coverage:

- [Benefit Details](#)
- [Prescription History](#)
- [Munish Family](#)

Message Contact to Plan

Prescription Information

Medical: MEDICAL HMO PLAN
Category 252

Hospital: HOSPITAL HMO PLAN

Benefits Summary

▶ **Financials**

Requirement	Comments	In Network	Out of Network
Individual Deductible			\$200
Family Deductible			\$500

▶ **Wellness Care**

Example: ihealthrecord

➤ What is ihealthrecord?

- The iHealth Record is a secure and confidential, interactive personal record of a patient's medical history. The patient can create, manage and share (with authorized physicians) the personal health information.
- Providers cannot add to the content but recently, they have started using secure messaging and online consultation

Example: ihealthrecord

The screenshot displays the iHealthRecord patient portal interface. At the top, there is a navigation bar with links for 'Back to Clinician's Site', 'Physician finder', 'Account', 'Help', and 'Logout'. Below this, a secondary navigation bar includes 'Home', 'Message Inbox', 'Education Programs', 'My Health Record' (highlighted), and 'My Clinicians'. A patient's profile picture is visible in the top left corner. The main content area is titled 'Identification' and contains a form for entering patient information. The form includes fields for Patient Race, Primary Language, Patient Height, Patient Weight, Patient Eye Color, Patient Blood Type, Patient Marital Status, and Patient's Number of Children. There is also a 'Comments' section with a text area for additional information. Navigation buttons for 'Previous', 'Save and Continue', and 'Skip' are located at the top and bottom of the form. A sidebar on the left lists various health record categories such as 'Health Record', 'Basic Information', 'Medications', 'Allergies', and 'Additional Information'.

Key points:

- offers the ability to enter all of your health related information with patient controlled access
- Full editing of data allowed by patient
- Has some connectivity with the provider, but not full access

Example: ihealthrecord

The screenshot displays the ihealthrecord website interface. At the top, there is a navigation bar with links for "Back to Clinician's Site", "Physician finder", "Account", "Help", and "Logout". Below this is a secondary navigation bar with "Home", "Message Inbox", "Education Programs", "My Health Record" (highlighted), and "My Clinicians".

The main content area is titled "Conditions and Medical History" and includes a "Print/View Record / Wallet Card | Help" link. A text block explains that the list below shows conditions and medical history diagnoses entered in the Personal Health Record, with instructions to click on condition names for details or to "View/Edit".

Below the text are navigation buttons for "Previous" and "Next". A table lists conditions and medical history items:


Condition/Medical History	View/Edit X Remove
ADHD	
Depression	
Heart Condition	View/Edit X Remove
Hepatitis	View/Edit X Remove

Annotations with pink boxes and arrows point to various parts of the interface:

- "Medical Problem List" points to the "ADHD" and "Depression" entries in the table.
- "Procedure History" points to the "Heart Condition" entry in the table.
- "Document Storage" points to the "Legal Documents" and "Access Privileges" items in the left sidebar.
- "Access Privileges" points to the "Access Privileges" item in the left sidebar.

At the bottom, there is a footer with "Powered by Medem" logo, "Contact Medem" link, and "Copyright © 2004 Medem, Inc. All Rights Reserved." (Updated 2/2003).

Example: LifeSensor



The screenshot displays the LifeSensor web application interface. The main content area is titled 'Lab Reports' and shows a 'Test Results' table. An orange callout box with the text 'Instant & Accurate Information' is overlaid on the right side of the screenshot.

Analyte	Value	Unit
Creatine	0.90	mg/dl
Uric Acid	6.00	mg/dl
Calcium	9.60	mg/dl
Magnesium	2.09	g/dl
Cholesterol	215.0	mg/dl

This is a full scale fee-based PHR that is similar in capability to ihealthrecord.org

➤ Key Points

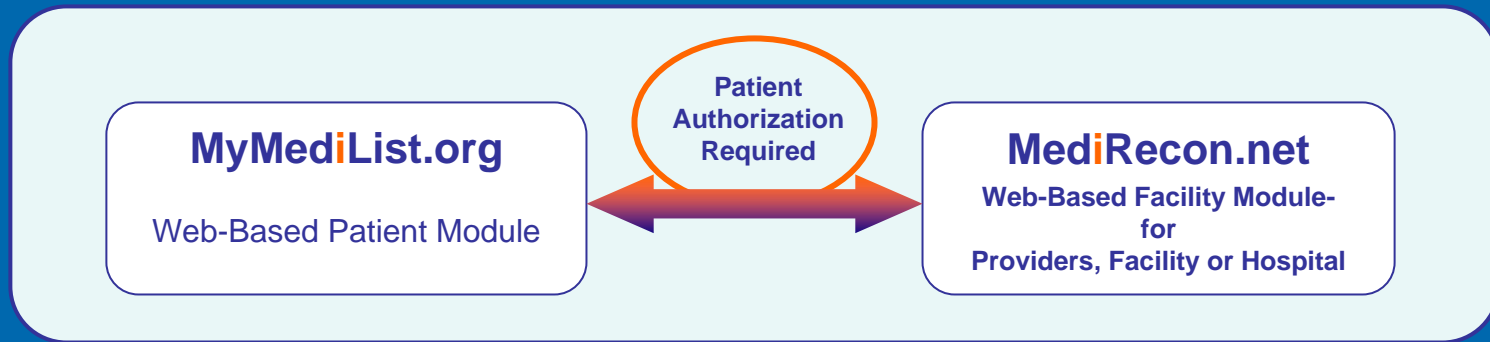
- Personal Access Codes

- Allow the provider to view information
- NO editing of the data by the provider
- In an emergency, by using this code, you can grant access to your “emergency” information to the Emergency Responder

➤ Internet-based updating

- Connect to ancillary systems such as labs

Example: MyMediList



➤ Key Points

- **Patient Centric Model**
 - Allows the patient and the provider to access the medication and allergy data (problem list in upcoming version)
 - All access is explicitly patient authorized
 - Has extensive auditing of access as well as print reports
- **Connects to the Provider**
 - Using web-based seamless connectivity to the provider, both can update the information, thus ensuring a more recent list

Example: MyMediList

123 Any Street
Sioux City, IA, 51105

Age: 57 YRS.
Gender: Female

Account last updated
on 05-03-07 By Demo, S

FAQ's Sign Out

Print: - Select -

Home Profile Allergies Rx Meds Non - Rx Meds Connect to MD

Currently listed Medication Allergies for you :

MEDICATION	ALLERGIC REACTION	CREATED/ MODIFIED DATE	
FOSINOPRIL	Swollen Lips	04-23-07	View/Edit Remove

Currently listed Food or Substance Allergies for you : None

Currently listed Rx Medications for you :

MEDICATION	STRENGTH	FREQUENCY	CREATED/ MODIFIED DATE	CURRENTLY TAKING	
ZITHOMAX 250MG TABLET	250 MG	Once daily	04-30-07	No	View/Edit Remove
LUNESTA 1MG TAB	1 MG	Once daily at bed time	04-30-07	Yes	View/Edit Remove
ATENOLOL	50 MG	Once daily	04-30-07	Yes	View/Edit Remove

Allergies

Demographics

Medication Information

Example: MyMediList

- If web-access is not available then paper print reports are available

The image shows a paper printout of a MyMediList card, titled "MyMediWallet™ (a service of MyMediList.com)". The card is divided into several sections:

- RX MEDICATION**: A table listing medications, doses, and frequencies.
- NON-Rx MEDICATION**: A table listing non-prescription medications, doses, and frequencies.
- My Allergies**: A table listing allergens and the reactions they cause.
- My PROFILE**: Personal information including name, address, phone number, and age.
- Footer**: Information about the developer, MediModules, Inc., and the date the card was printed.

Callout boxes with arrows point to the following sections:

- Allergies**: Points to the "My Allergies" table.
- Medication Information**: Points to the "RX MEDICATION" and "NON-Rx MEDICATION" tables.
- Demographics**: Points to the "My PROFILE" section.
- Date of Card Printing**: Points to the footer text "Card Printed on Feb 17 2007".

<u>RX MEDICATION</u>	<u>DOSE</u>	<u>FREQUENCY</u>
IBUPROFEN	50MG	Every six hours
WARFARIN	2MG	Once daily

<u>NON-Rx MEDICATION</u>	<u>DOSE</u>	<u>FREQUENCY</u>
GINKO	--	Once daily

<u>My Allergies</u>	
<u>NAME</u>	<u>WHAT HAPPENS</u>
AMBIEN	Diarrhea
ATTIVAN	Rash
GNC 100	Fever

My PROFILE
Testing, January
123 Any Street, --
12405, Acra, NY
PH: (518) 222 2222
Age : 97 Yrs.

Developed by
MediModules, Inc
www.medimodules.com
Card Printed on Feb 17 2007

Applying this in Emergency Preparedness

- The Emergency Responder needs three things:
 - Quick access to the medical information
 - Delivery of information by trained professionals
 - Up-to-date information

AHIMA: http://www.myphr.com/your_record/why_start.asp

Applying this in Emergency Preparedness

➤ Quick access

- **Excerpt** (*HealthDay News*, 4/26/07):
 - [... **paper medical records** are heavy, and most are stored in a basement or ground floor of a building. "All the records **were easily sitting in foul-smelling water for three weeks**," he said. "They're all lost."
 - Dr. Brooks remembers seeing **refugees** from New Orleans who **did not know what type of cancer they had** or what kind of treatment they had received.
 - [Her hospital]..started developing an electronic records system 15 years ago and, as a result, **information for all 300,000 of its patients was accessible after the storm.**

Quick Access

- Extensive requirements for access will hinder treatment
- Access needs to be quick and easy
 - Patient granted access, such as by a PIN code
 - Patient provided via web-access
 - Patient shows the information to the provider who then gets the access via the web
- This process must occur with both privacy and security in mind

Trained Professionals

- Trained professionals are often available in such time of crisis
 - Volunteer organizations
 - American Red Cross
 - Government
 - FEMA, State-based
- However, the system must be able to handle this access
 - Role-based access
 - Easily setup access

Up-To-Date Information

➤ Not assessed

- Harris Interactive (July, 2006)

- 1,100 adults: 7 percent of U.S. adults use online personal health records
- Most believe that this was a self selected group, as Harris conducts only online polls

- Access via provider is only as good as the last visit
- Access via patient is only as good as when they remembered to last update the information

➤ This will occur best in the format of a patient and provider controlled system

Conclusion

- Patient-centric technology is becoming increasingly popular
- Ensuring access of vital information to the right people at the right time is a key in the Emergency Response cycle
- Numerous systems exist, each with their own benefits
- Privacy and security cannot be foregone in this process
- The key is to ensure the best possible care for the patient

References

- Shortliffe, E. Biomedical Informatics: Computer Applications in Health Care and Biomedicine (Springer: New York 2006)
- Wight A. and Sitting. D. *Security Threat Posed by USB-Based Personal Health Records* **Ann Int Med** 146:4 314-215 2007
- AHRQ
 - www.ahrq.gov
- Institute for Healthcare Improvement
 - www.ihl.org
- Markle Foundation
 - www.markle.org
- American Health Information Management Association (AHIMA)
 - www.ahima.org
- Harris Interactive
 - www.harrisinteractive.com

Links

Information on Personal Health/Medication Records

<http://www.nlm.nih.gov/medlineplus/personalmedicalrecords.html>

Research various personal health records (unbiased)

http://www.myphr.com/resources/phr_search.asp

Privacy and Security

http://www.hhs.gov/ocr/hipaa/consumer_summary.pdf (patient)

<http://www.hhs.gov/news/facts/privacy.html> (provider)

Emergency Preparedness and Personal Health Records

<http://www.amia.org/inside/releases/2006/ahima-amiaphrstatement.pdf>