

# Benefits of e-Health

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## Six Features of e-Health

1. Practitioners Can No More Rely on Memory Alone
  - Provide Access to Knowledge Bases
2. Health Information To Be Shared Among Authorized Persons
3. Continuity of Care
  - Patient Information Should be Available to Any Authorized Healthcare Professional
4. Patient Safety
5. Leveraged Skill and Knowledge
6. Changing Provider/Patient Relationship

# Electronic Communication

- Messaging (HL7, DICOM, Other EDI Systems)
  - US: 3 Billion Prescriptions on NCPDP standard
- Telemedicine
- Internet
- Mobile Health
  - Better ROI
  - New Opportunities (Integrating Photos)

# What Is ROI?

Tangible, Measurable Benefits Derived From a Technology Project

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1. Financial Gains or Savings
2. Increased Patient Satisfaction
3. Increased Practitioner and Employee Satisfaction
4. Reduction of Medical Errors (Should be #1)
5. General Higher Efficiency





# Annual Survey

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- Approx. 1500 Respondents on Annual Survey on Trends and Usage of EHRs
- What Are the Driving Forces?
- What Are The Barriers?
- Which Milestones to Take?

<http://www.medrecinst.com/resources/survey/survey02/index.shtml>

## Why EHRs?

Management/Administrative Motivations	Percent of Total Respondents	IT Mgrs and Analysts	Physicians & Nurses	Non-IT Management
The need to share comparable patient data among different sites within a multi-entity healthcare delivery system	75.70%	78.80%	68.90%	68.80%
The need to improve clinical documentation to support appropriate billing service levels	75.30%	72.70%	80.20%	74.00%
The requirement to contain or reduce healthcare delivery costs	66.30% 	69.10% 	59.90% 	72.70% 
The need to establish a more efficient and effective information infrastructure as a competitive advantage	64.30%	63.90%	57.50%	68.80%
The need to meet the requirements of legal, regulatory, or accreditation standards	60.40%	56.70%	62.30%	59.70%
The need to manage capitation contracts (global capitated contracts, specialty carve-outs, subcapitation for Medications, Hospitalization, etc.)	21.80%	20.90%	19.20%	26.00%
OTHER	3.50%	4.20%	6.00%	0.00%
Total Responses to this Question	733	330	167	77
Margin of Error	+/- 3.7%	+/- 5.5%	+/- 7.7%	+/- 11.4%

## Reasons for Implementing EHRs

Clinical Factors	TRENDS			
	1999	2000	2001	2002
Improve the ability to share patient record information among healthcare practitioners and professionals within the enterprise	73.0%	85.0%	83.0%	90.0%
Improve quality of care	72.0%	80.7%	83.0%	85.3%
Improve clinical processes or workflow efficiency	67.0%	81.0%	83.0%	83.8%
Improve clinical data capture	61.0%	68.0%	78.0%	82.6%
Reduce medical errors (improve patient safety)	n/a	n/a	n/a	81.9%
Provide access to patient records at remote locations	59.0%	71.0%	73.0%	70.9%
Facilitate clinical decision support	58.0%	66.0%	69.0%	70.4%
Improve employee/physician satisfaction	n/a	n/a	n/a	62.8%
Improve patient satisfaction	40.0%	54.0%	59.0%	60.2%
Improve efficiency via pre-visit health assessments and post-visit patient education	n/a	36.0%	38.0%	39.9%
Support and integrate patient healthcare information from Web-based personal health records	n/a	29.0%	28.0%	30.3%
Retain health plan membership	n/a	7.0%	9.0%	9.5%
OTHER	3.0%	1.0%	4.0%	0.3%
Total of Respondents for This Question		296	293	729
Margin of Error		+/- 5.8%	+/- 5.8%	+/- 3.7%

## Web-based Applications or Email Services

<b>All Market Segments</b>	<b>In Use Today</b>	<b>Planned for 1-4 Yrs</b>
Pre-visit Health Screenings, Evaluations, or Assessments	7.8%	37%
Remote Access to EHRs by clinicians	34.9%	35.5%
Patient Appointments and/or Admissions	25.3%	33.6%
Post-visit Patient Education	11.2%	33.5%
Email between patients and clinicians	18.2%	28.1%
Information about health conditions, diseases, wellness, or new developments in healthcare	25%	25%



## Web-based Applications or Email Services

<b>Solo/Small Market Segment</b>	<b>In Use Today</b>	<b>Planned for 1-4 Yrs</b>
Pre-visit Health Screenings, Evaluations, or Assessments	9.3%	46.5%
Post-visit Patient Education	12.8%	44.2%
Remote Access to EHRs by clinicians	24.4%	39.5%
Patient Appointments and/or Admissions	30.2%	37.2%
Email between patients and clinicians	36.0%	29.1%
Information about health conditions, diseases, wellness, or new developments in healthcare	31.4%	25.6%

# Healthcare ICT Market

- \$45 Billion Annually
  - \$25 Billion US and \$20 All Other Countries

# Best EMR Installations

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- Boston Hospitals
- Kaiser Colorado
- Ambulatory Applications
- Home Health Care
- Other Niche Applications

# What Is Success?

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- No Clear Consensus
- Individualized to Organizational Culture
- Understanding Who Benefits from a Project

# Why Has ROI Been So Disappointing in Health IT?

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- 40 Years of Concept
- Generalities
- Standards
- Lack of Driving Motives for Stakeholders:
  - Physicians
  - Providers
  - Payers

# Concepts, Systems, and Components

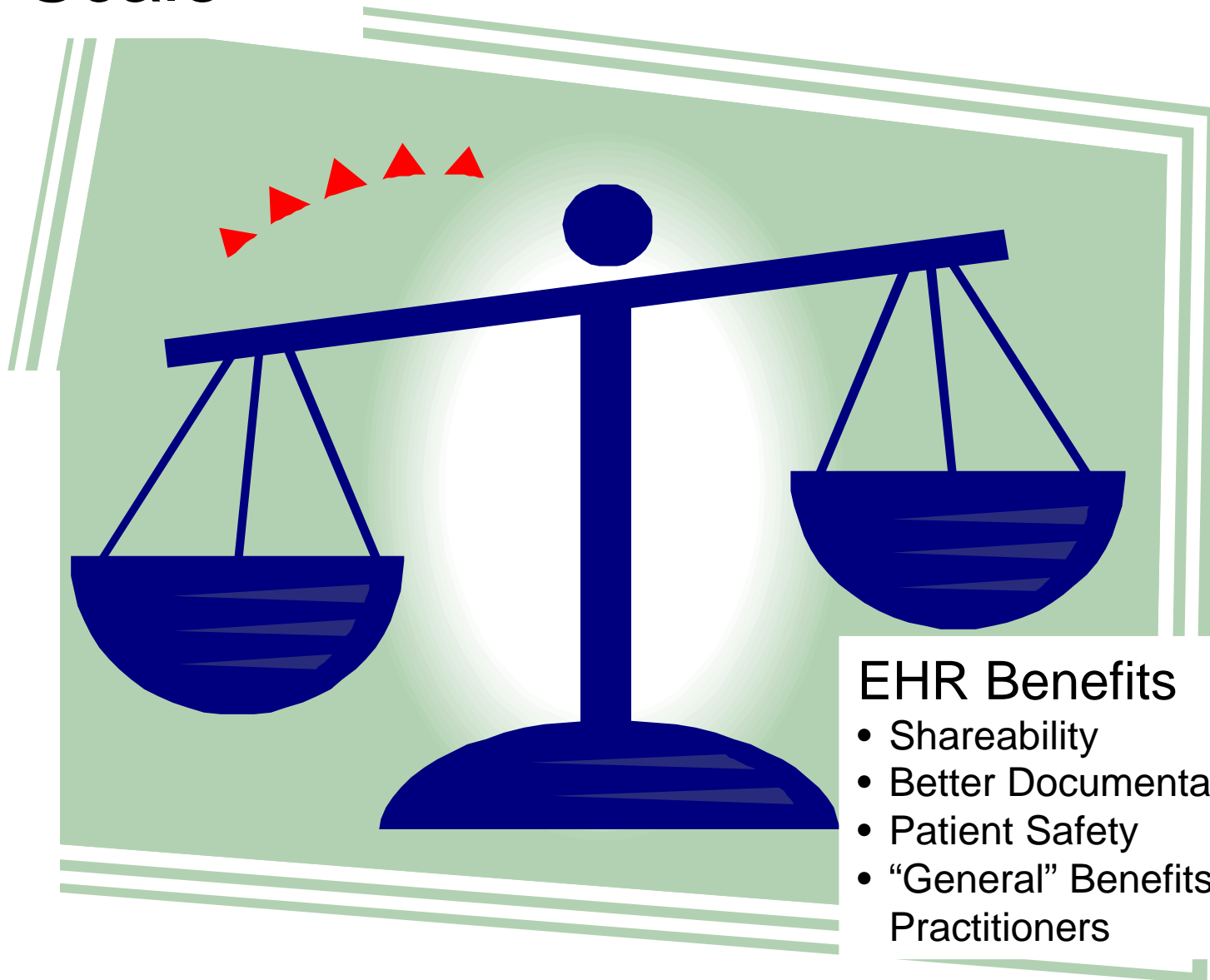
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- Where Can Financial Returns be Achieved?
  - Charge Capture, Coding, Patient Retention, Savings Through Efficiencies
- Proving the Reduction of Medical Errors
- Increase Patient Satisfaction:
  - Email
  - Patient Websites
  - Scheduling
  - System Integration

# EHR Scale

## Inertia

- Federal Government
- States
- Employers
- Providers
- Culture of Practitioners



## EHR Benefits

- Shareability
- Better Documentation
- Patient Safety
- “General” Benefits for Practitioners

# The Scale Is Tipping

- Federal Government
  - Consolidated Health Initiative (CHI)
  - Federal Legislation
  - Employers
  - NCVHS NHII Proposals
- States: Florida and Others
- Providers – ROI
- Employers
- Business Community
- Physician Community
  - Change of Culture





Order Entry

Lots of Pressure to Create it

Reduction of Medical Errors

Mobile Health Care

EHR

**Many Organizations Working Are Making it Priority**  
Standards Organizations  
HL7  
CHI  
ISO TC 215  
EHI  
IHE  
ASTM  
HIMSS  
OTHERS  
Various Countries

- **No Consensus on Definitions**
- **No Common Vision**
- **Uncertainty About Benefits to Practitioners and Providers**
- **Complete Lack of Standards**
- **What is Success?**

Charge Capture Applications

HIPAA – Control over Systems

MEDIA



DICOM

SNOMED

ADA

CEN  
TC 251

NCPDP

HL7

Healthcare  
Informatics  
Standards  
Developers

ISO TC 215

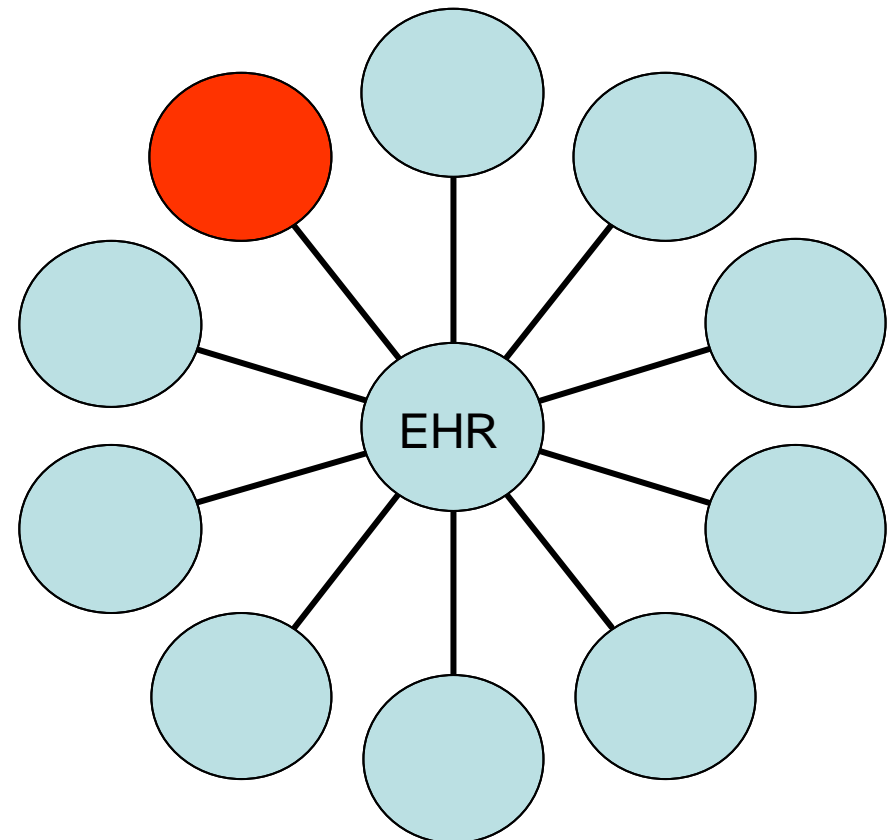
ASTM E31

ASC X12N/EDIFACT

IEEE

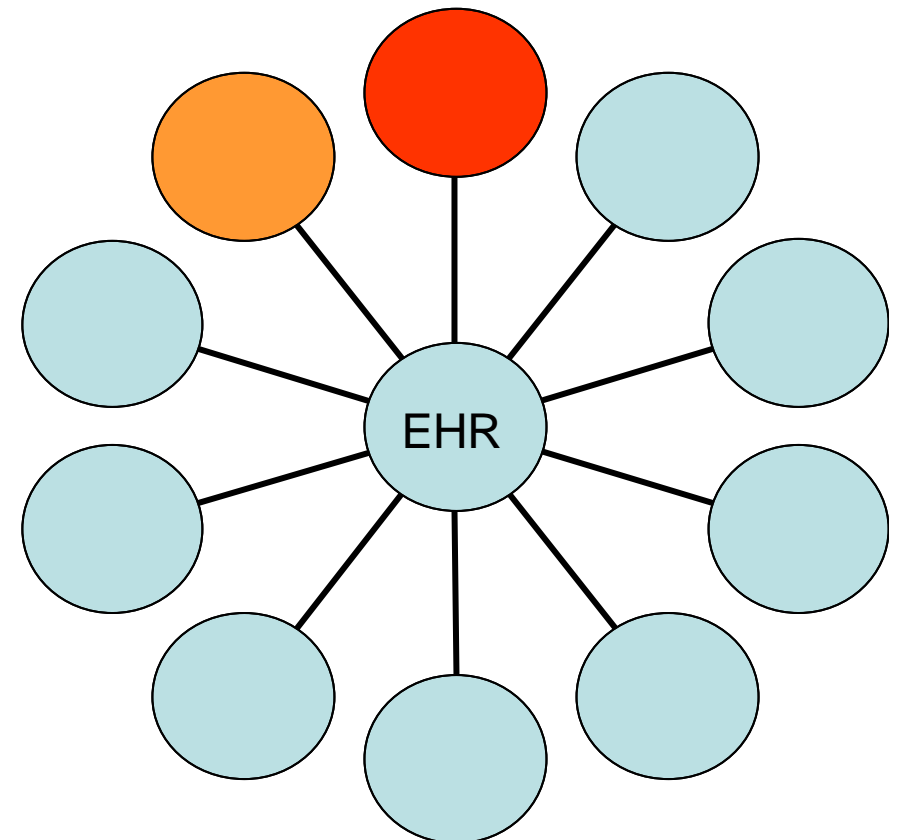
# 1. Information Content

- Inconsistencies
- Different Cultural Aspects
- No Standards



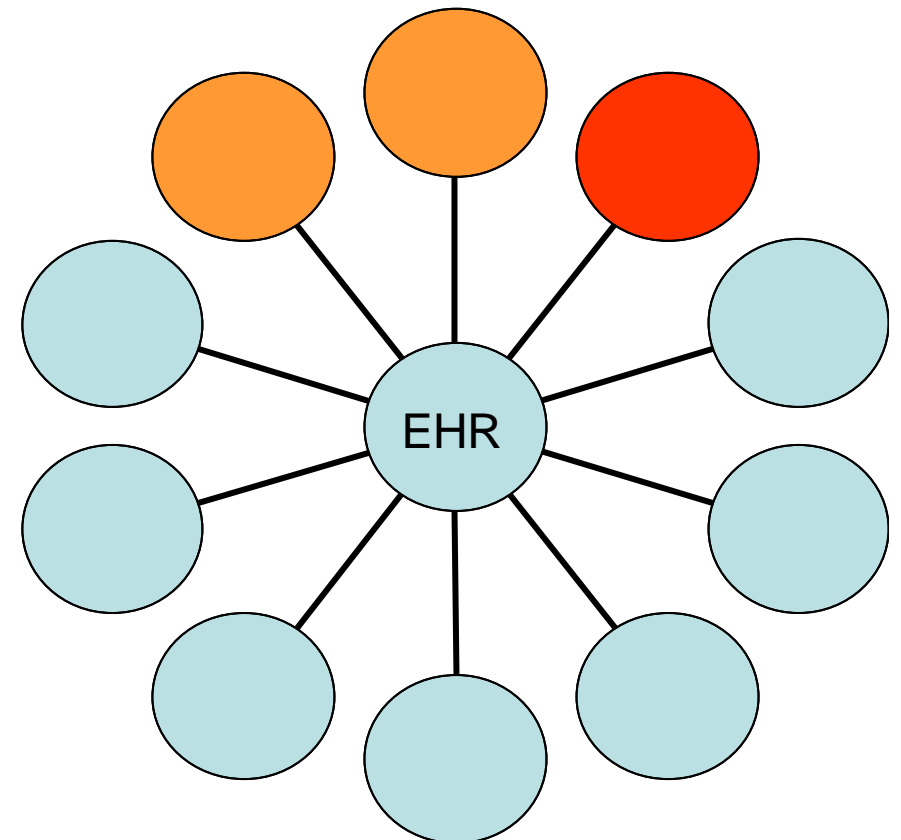
## 2. Information Capture

- How to get information into the computer?
- How to get Physicians to use computers in the exam room?
- Complex issues



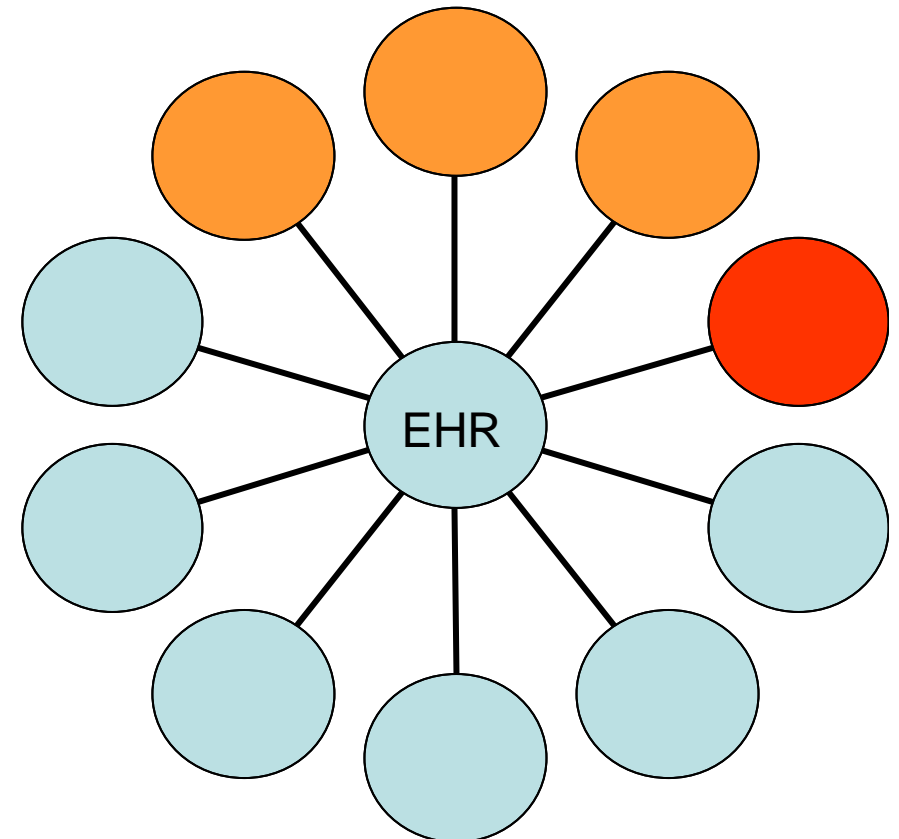
## 3. Information Representation

- Inconsistent Meaning of Text
- Different Code Sets
- Lack of standards
- Clinical Code sets:
  - SNOMED



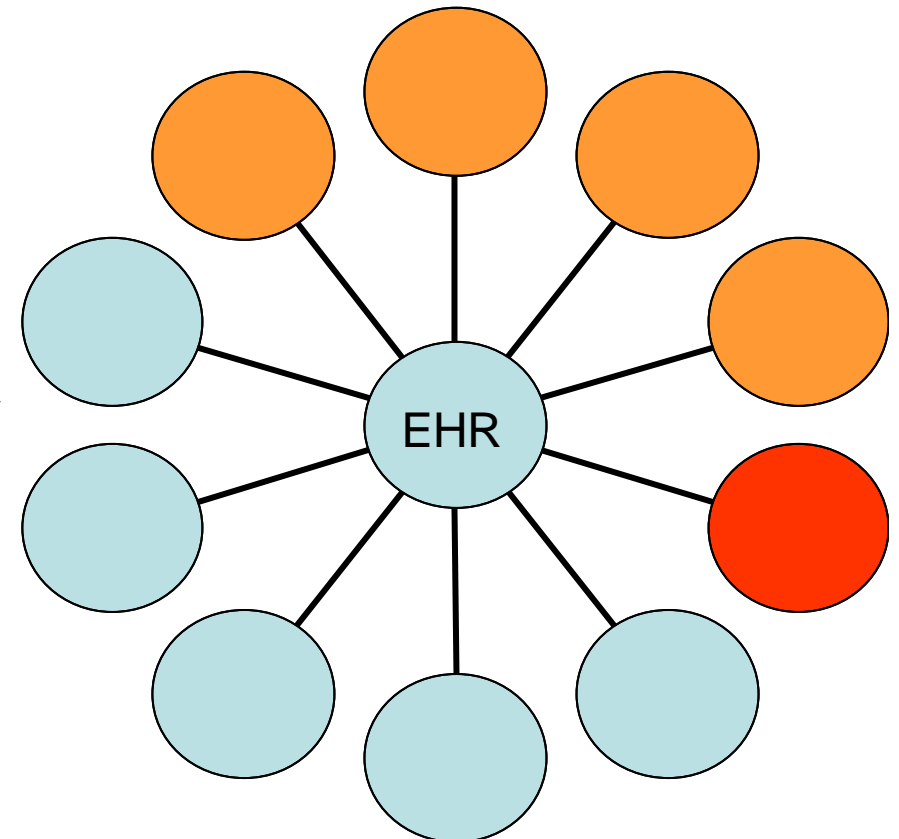
## 4. Data Models and Operational Conformity

- In order to achieve interoperability, a standardized model must be applied to as well as a standardized data model
- Current competing models are RIM, FAM, GEHR (OpenEHR), etc.



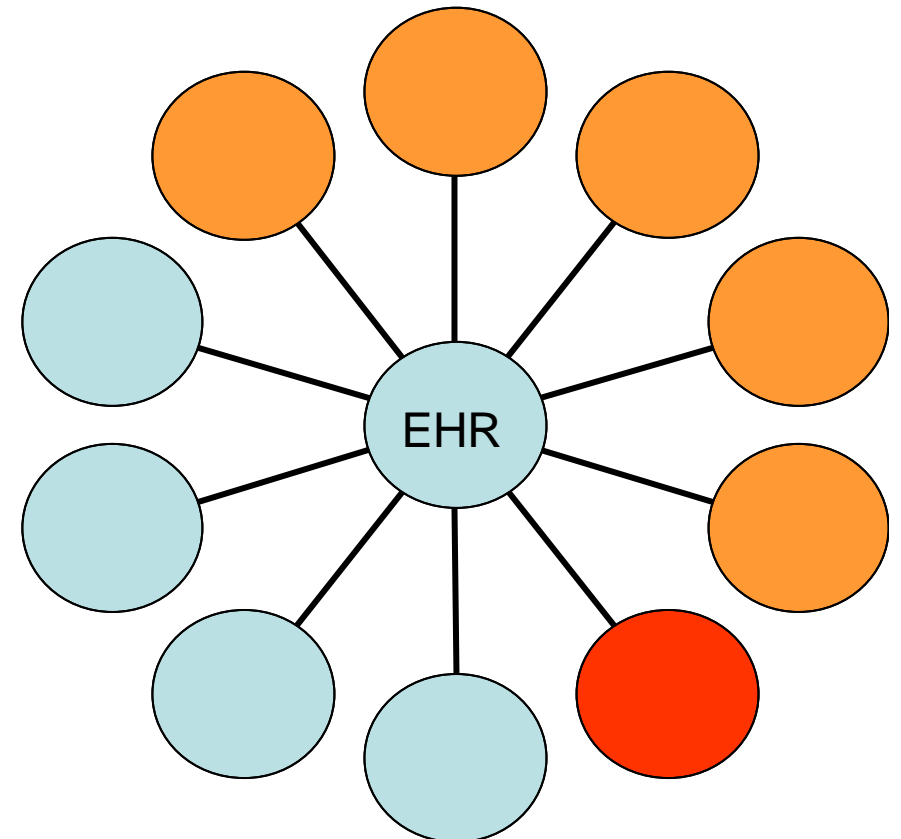
## 5. Clinical Practice

- Integrating Guidelines and Protocols
- Accessing Information on the Internet
  - Overcoming Issues of Reliability



## 6. Decision Support

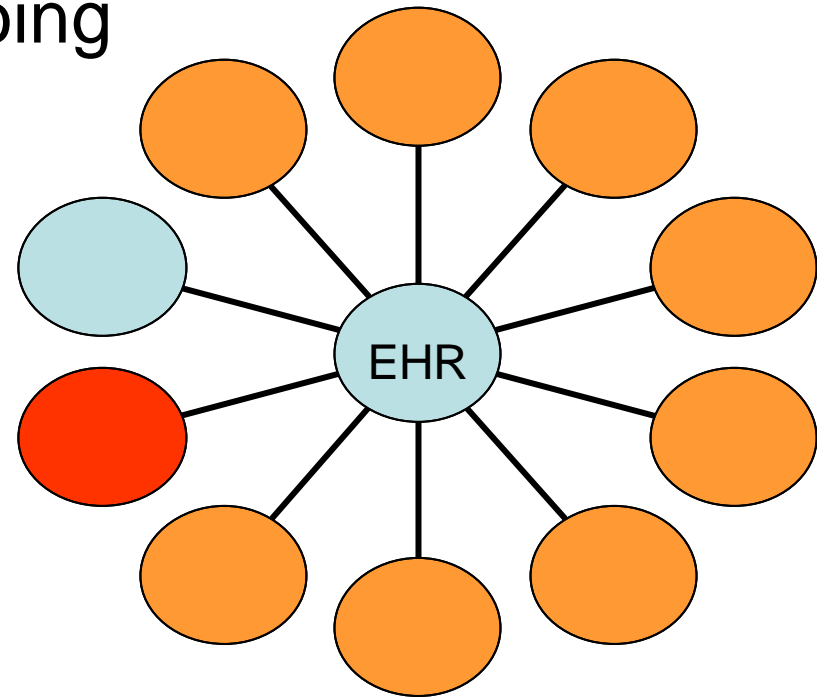
- Standardized Decision Support
  - Admission Systems
  - Eligibility
  - Diagnostic Support
  - Order Entry and Test Results
  - Etc.





## 7. Technical Interoperability

- Which interoperability system is going to succeed in health care?
  - OSI
  - Microsoft
  - CORBAmed
  - GEHR/OpenEHR
  - HL7
  - Generic Internet: XML with Ontology



## Impediments to an EPR

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- ◆ **Lack of interoperability due to:**
  - **Optionality within standards (HL7 Z fields)**
  - **Lack of single standardized implementation guides**
  - **Limited conformance testing**
  - **Limited use of clinically specific codes and vocabularies**

# The Race for Interoperability

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- OSI Level
- Microsoft
- Object Management Group (CORBAmed)
- DICOM/RSNA: EHI
- HL7
- ASTM E31
- New Organizations

# OMA Overview

Not standardized by  
OMG; Scope is  
Single application or  
vendor

Business Objects  
Healthcare  
Finance  
Telecommunication

Compound Docs  
Object Linking  
Help Facilities  
Desktop Mgmt

Application  
Objects

Vertical  
CORBA Facilities

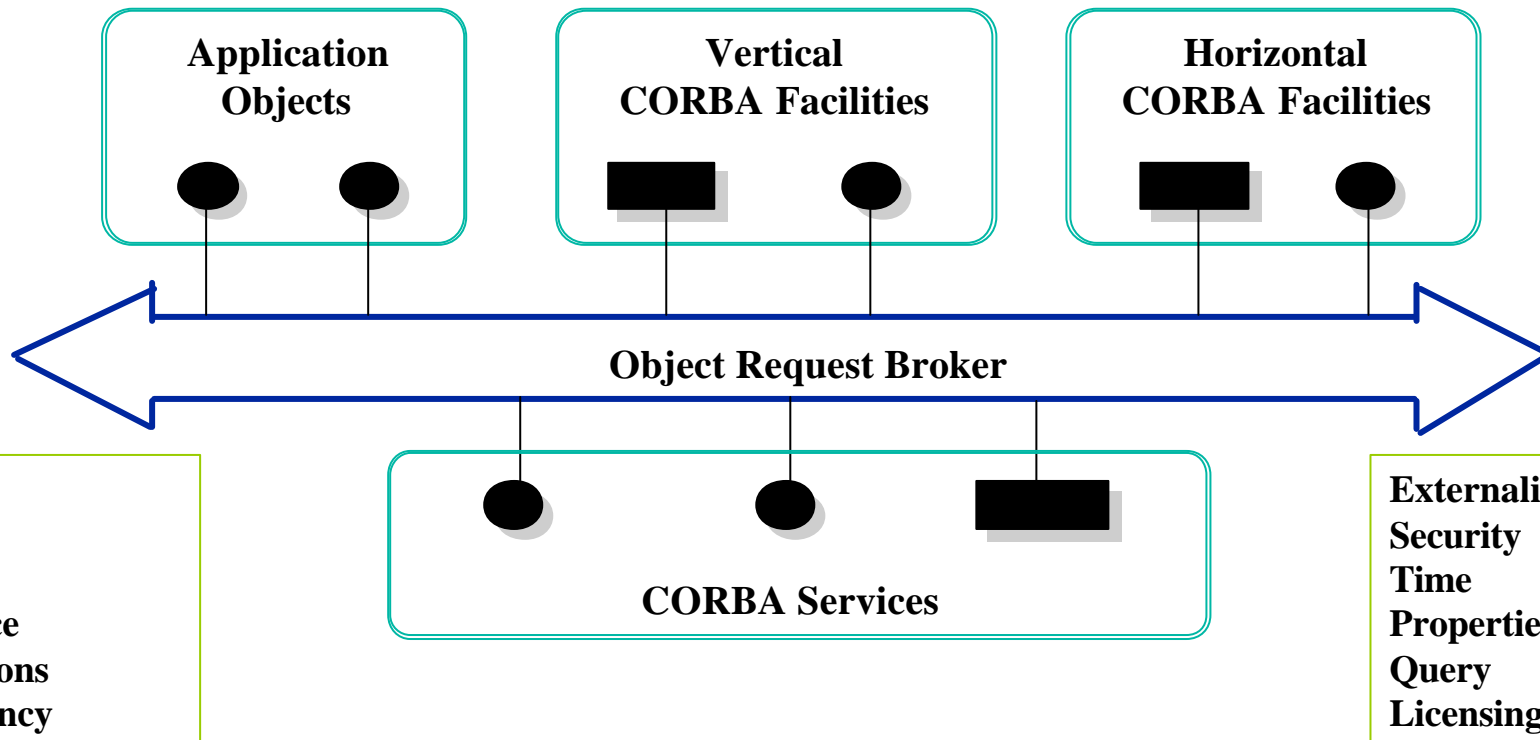
Horizontal  
CORBA Facilities

Object Request Broker

Lifecycle  
Events  
Naming  
Persistence  
Transactions  
Concurrency

CORBA Services

Externalization  
Security  
Time  
Properties  
Query  
Licensing





# HL7

HL7 Reference Information Model (RIM)  
(Religion)

## **HL7 Clinical Documentation Architecture (CDA)**

- Level 1: Headers
- Level 2: Body (Type of Document)
- Level 3: DTDs

HL7 Terminology Efforts

HL 7 Version 3.0 Messaging Based on Trigger-Events

## Finally: Peter Waegemann's Observations

1. Understanding and Definitions on e-Health Space
  - e-Health or m-Health?
2. Understanding of Current Standards Efforts
3. Do We Needs Another Standards Effort?
  - Yes for Wireless Healthcare System
  - No for general e-Health

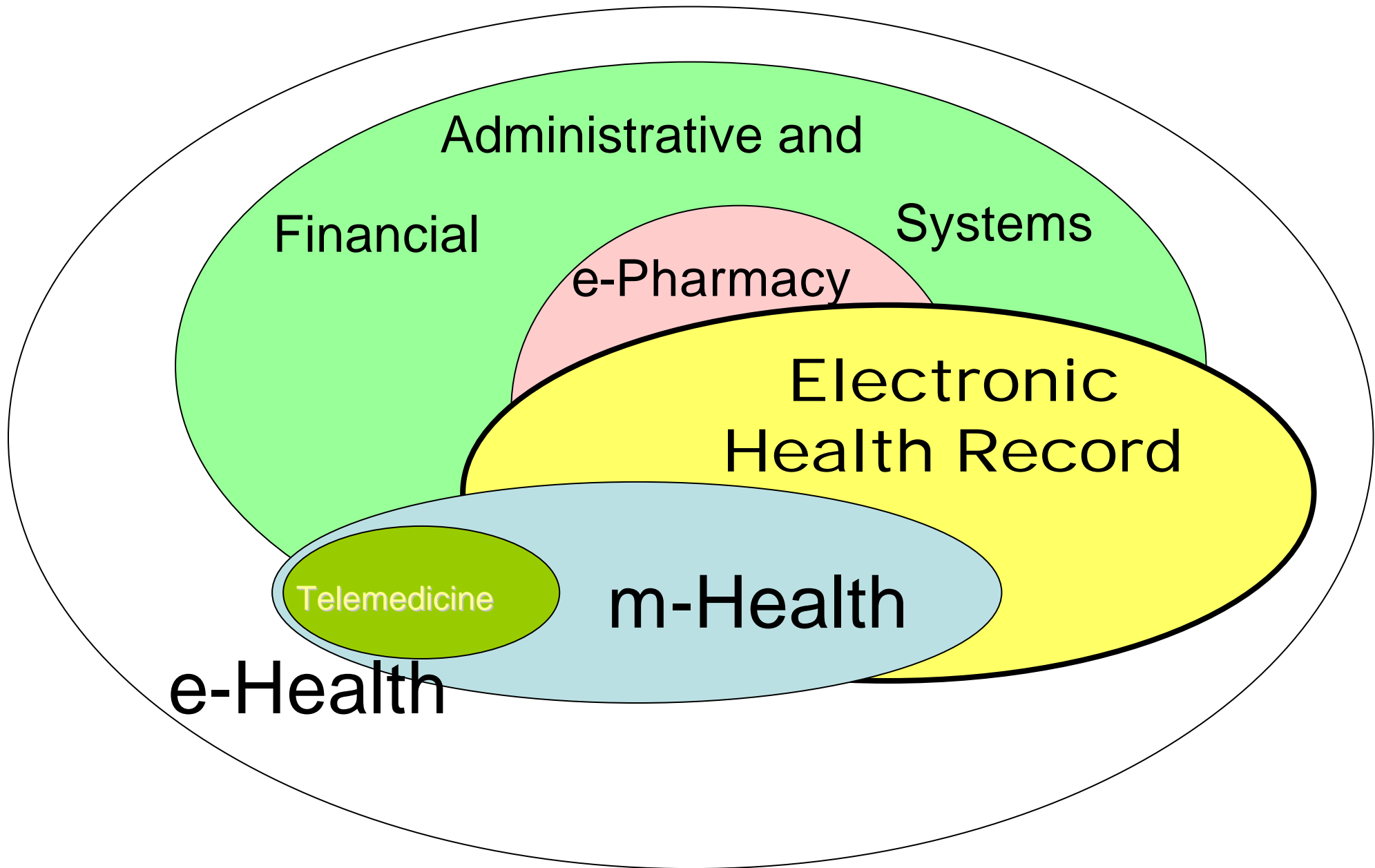
## Opportunity

- Mobile Healthcare Alliance
  - Only international not-for-profit organization in mobile health
  - Addressing hurdles and standards
  - Promoting the advantages of point-of-care computing in health care
- [www.mohca.org](http://www.mohca.org)



# Current Working Groups in MoHCA

1. Definitions and Strategies (WG1)
2. EMC (WG2)
3. Security with Wireless Devices (WG3)
4. Application Standards (WG4)
5. Systems Integration (New)
6. User Issues (New)





Thank You

A large, 3D, metallic-textured 'Thank You' message is displayed diagonally across the upper half of the slide. The letters are thick and have a brushed metal appearance. A horizontal orange line is positioned above the text, starting from the left edge and extending across the width of the slide.

Attend:

**TEHRE 2003:**

London, UK December 2-3, 2003

**Survey on Electronic Health Record Usage and Trends**

<http://www.medrecinst.com/resources/survey2002/index.shtml>

**www.medrecinst.com**

Copies of these slides may be obtained by emailing [peterw@medrecinst.com](mailto:peterw@medrecinst.com)