

January 12, 2010



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## *Using and Securely Exchanging Health Records*

This presentation will begin at **2:00 pm ET**  
1 pm Central, 12 pm Mountain, 11 am Pacific

Please check that the volume on your computer is at the  
highest setting since we stream our presentation in Voice over IP (VoIP)

**NOTE:** You will not hear any sound until 2:00 pm



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### **AIIM Presents:** **Using and Securely Exchanging Health Records**

**Betsy Fanning – Director, AIIM Standards and  
Member Services**

**Steven Waldren, MD – American Academy of Family  
Physicians**

**Stasia Kahn, MD – Fox Prairie Medical Group**



## About AIIM

AIIM is the community that provides education, research, and best practices to help organizations find, control, and optimize their information. As a neutral and unbiased source of information, AIIM serves the needs of its members and the industry through the following activities:

- Market Education
- Peer Networking
- Professional Development
- Industry Advocacy

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## About AIIM Standards

AIIM Standards Program is the internationally recognized authority for developing and promoting market relevant enterprise content management best practices, standards, and guidelines that guide the industry and enable organizations to effectively use content. Our specific areas of interest include:

- Document Imaging
- File Formats – PDF, StratML
- Trusted Repositories
- Document Management

Learn more about AIIM Standards at <http://www.aiim.org/standards> and PDF Healthcare at <http://www.aiim.org/pdfh> or <http://www.informationzen.org/group/pdfhealthcare>

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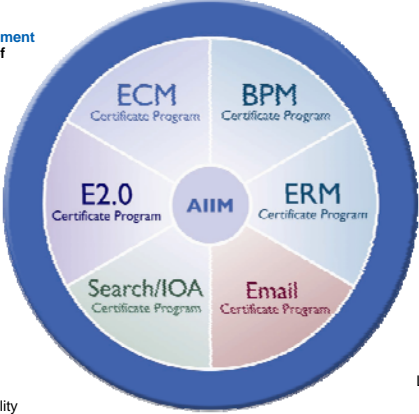


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**ECM**  
Enterprise Content Management  
Learn how to take control of your information assets.

**E2.0**  
Enterprise 2.0  
Learn best practices for using Web 2.0 technologies to improve collaboration across the enterprise.

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Visit the new AIIM portal at [aiim.org/healthcare](http://aiim.org/healthcare)

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The screenshot shows the AIIM Healthcare portal interface. It features a search bar at the top, navigation tabs for Home, Case Studies / White Papers, Research & Info, and Industry Research. The main content area displays several articles, including 'Intuitive Hospital System Automates Insurance Records Processing' and 'From Paper to Digital - Oregon Clinic Automates Medical Records'. There are also promotional banners for KOFAX and PDF/A2.

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## Questions?

In the questions pane on your screen,  
type your question in the white box  
and hit **“Send”** Button.

## Introducing our Speakers

**Steven Waldren, MD, MS**

**American Academy of Family Physicians**

**Stasia Kahn, MD**

**Fox Prairie Medical Group, IL**

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# PDF Healthcare

Steven E. Waldren, MD, MS

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## What is PDF Healthcare?

A “Best Practices Guide” describing attributes of the Portable Document Format (PDF) that facilitate the capture, exchange, preservation and protection of healthcare information

- Share data easily between healthcare institutions and providers
- Ease the transition into digital health records for information exchange and sharing
- Bridge the gap between healthcare providers and consumers



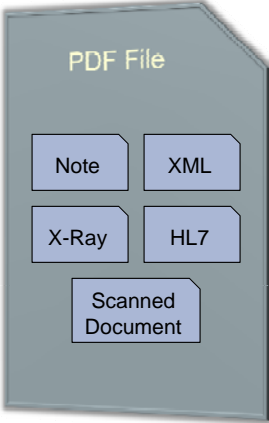
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## PDF Healthcare's Objective

**Objective**

Utilizing PDF features and functionality, the objective is to develop a secure, electronic container that can store and transmit relevant healthcare information, including but not limited to personal documents, clinical notes, lab reports, electronic forms, scanned images, photographs, digital X-rays, and ECGs, important for maintaining and improving one's health.







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## Background

- **eHealthcare is a reality in today's environment**
- **PDF advantages in healthcare**
  - Long-standing success and adoption of PDF
  - PDF provides a secure and universal container for multiple data types regardless of data source or destination
  - PDF is platform- and system-neutral
  - PDF allows for interoperability and bi-directional information exchange
  - Selected records can be easily and quickly printed from PDF when necessary
- **PDF usage addressing specific industry needs include:**
  - PDF/A (Archiving), PDF/E (Engineering), PDF/UA (Universal Access), PDF/X (Printing)




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## Two PDFs of PDF Healthcare




PDF


**Static PDF**




PDF

**Dynamic PDF**  
XML Forms Architecture-Based PDF



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## Two PDFs of PDF Healthcare




PDF

**Static PDF**

Many Potential Uses in Healthcare:

- Scanned documents
- Secure other formats
- Embed multimedia
- Assure view-ability
- Archive



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## Using XFA Based PDF

```

<?xml version="1.0" encoding="UTF-8"?>
<ContinuityOfCareRecord xmlns:i="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:tas:org:ccr"
  xmlns="urn:tas:org:ccr">
  <CDRDocumentObjectID:632891751676125000 /><CDRDocumentObjectID>
  <Language>
    <Text>English</Text>
  </Language>
  <Version>V1.0</Version>
  <DateTime>
    <ExactDateTime>2006-07-22T14:26:10Z</ExactDateTime>
  </DateTime>
  <Patient>
    <ActorID>AA0001</ActorID>
  </Patient>
  <From>
    <ActorLink>
      <ActorID>AA0002</ActorID>
    </ActorLink>
    <ActorLink>
      <ActorID>AA0003</ActorID>
    </ActorLink>
    <ActorLink>
      <ActorID>AA0004</ActorID>
    </ActorLink>
  </From>
  <Purpose>
    <Description>
      <Text>Data Transfer</Text>
    </Description>
  </Purpose>
</ContinuityOfCareRecord>

```

XML Forms Architecture Based PDF

**Retains 100% Fidelity of Standard XML**

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## Uses of Dynamic PDF

### Embed DICOM

Health Data Explorer

Source: [www.desacc.com/products/hde/index.html](http://www.desacc.com/products/hde/index.html)

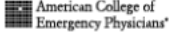


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## Uses of Dynamic PDF

### Populate Standard Forms

**Emergency Information Form for Children With Special Needs**


 American College of Emergency Physicians*	 American Academy of Pediatrics		<small>Date form completed by whom</small>	<small>Revised Revised</small>	<small>Initials Initials</small>
Name: Jane B Hernandez		Birth date: Jan 16, 1948		Nickname:	
Home Address: 758 Las Olas Dr. Fort Lauderdale FL 33011		Home/Work Phone: 999-555-9999			
Parent/Guardian:		Emergency Contact Names & Relationship:			
Signature/Consent*:		Jerry Smith Husband			
Primary Language:		Phone Number(s): 503-555-2222			
<b>Physicians:</b>					
Primary care physician:		Emergency Phone: 999-999-9999			
Dr. Peter Paul Primary		Fax:			

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## PDF Healthcare

A secure, portable, widely-useable,  
robust container  
for health information

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# Illinois PDF Healthcare Pilot

Stasia Kahn, MD



# Healthcare Data Exchange Pilots In Illinois

## Introduction

- **Lessons Learned: Referral Pilot**
- **Lessons Learned: EHR to PHR Pilot - The New Frontier**


## Who am I?



- Internist and Co-Founder of Fox Prairie Medical Group
- Vice President of Northern Illinois Physicians For Connectivity
- Lecturer, Medical Informatics Northwestern University Masters Degree Program
- A Physician that doesn't ask "What's In It For Me"


## Why Implement PDF Healthcare for an Ambulatory HIE


- An ambulatory EMR is a data repository, which is a subset of a longitudinal health record
- Except in a completely closed healthcare system, a longitudinal EMR includes imported documents and images
- Imported data cannot be captured by the discrete data fields delineated by the CCR/CCD
- Consulting providers are used to dealing with narrative documents rather than summary data displayed by the CCR/CCD

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## CCR

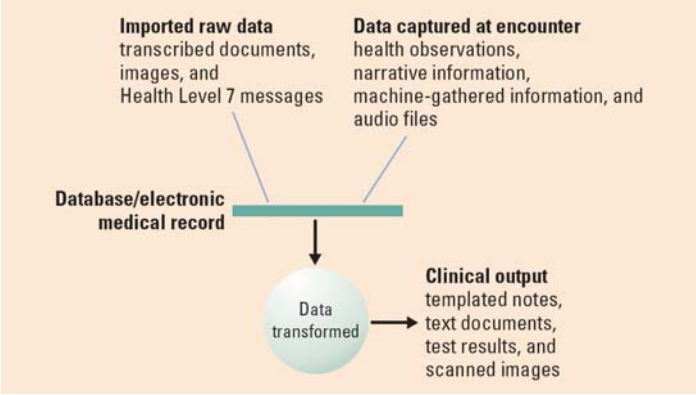
- The **Continuity of Care Record** is a health record standard specification developed jointly by ASTM International, the MMS, HIMSS, AAFP, AAP and other health informatics organizations.
- The CCR standard is a patient health summary standard. It is a way to create flexible documents that contain the most relevant and timely core health information about a patient, and to send these electronically from one caregiver to another.
- The CCR contains various sections creating a “snapshot” of a patient’s health data. The ASTM CCR standard is designed to permit easy creation by a physician using an electronic health record (EHR) system at the end of an encounter. Because it is expressed in the standard data interchange language known as XML, a CCR can potentially be created, read and interpreted by any EHR and EMR software application.



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## Overview of Data Flow Patterns in Ambulatory Healthcare Settings


**Raw data is transformed into clinical output during an in-person medical encounter**



```

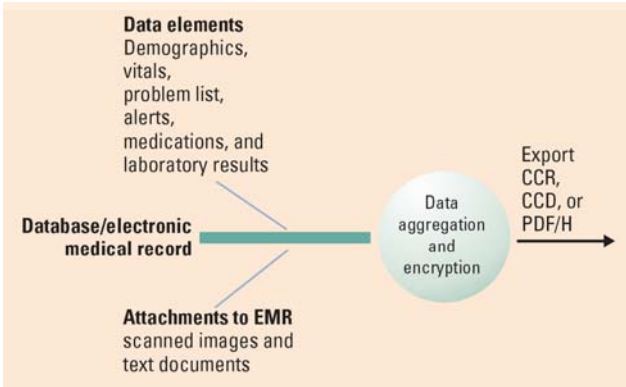
graph TD
    A[Imported raw data  
transcribed documents,  
images, and  
Health Level 7 messages] --> B[Database/electronic  
medical record]
    C[Data captured at encounter  
health observations,  
narrative information,  
machine-gathered information, and  
audio files] --> B
    B --> D((Data transformed))
    D --> E[Clinical output  
templated notes,  
text documents,  
test results, and  
scanned images]
          
```



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## Exporting Summary Care Information from an EMR

**Healthcare Delivery Organization creates and exports summary care information from an EMR**



**Data elements**  
Demographics, vitals, problem list, alerts, medications, and laboratory results

**Database/electronic medical record**

**Attachments to EMR**  
scanned images and text documents

**Data aggregation and encryption**


**Export CCR, CCD, or PDF/H**



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## Continuity of Care Record Pilot in Illinois

- June 8, 2005 ASTM CCR successfully balloted
- September 2005 - November 2007 CCRs exchanged with consulting providers
- February 2008 PDF Healthcare successfully balloted by ASTM and AIIM
- December 2007- April 2009 33 PDF Healthcare files exchanged successfully
- Receiving physicians were representatives of small, medium and large academic and private groups





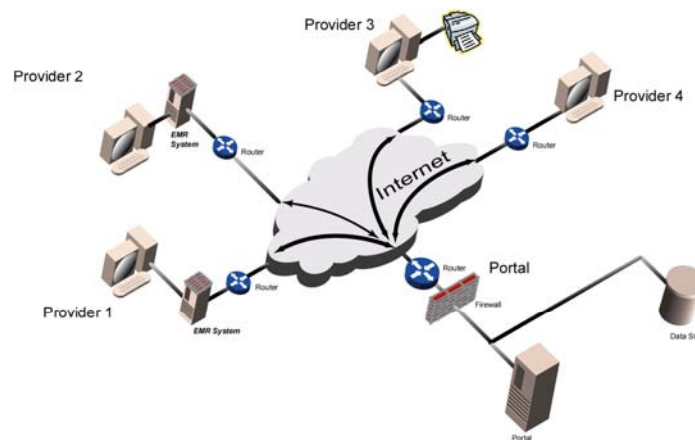
## PDF Healthcare Provider Pilot Summary

### Feedback:

- 33 PDF Healthcare and 1 CCR uploaded to the portal
- Couple of Misconnects – PDF Healthcare not accessed by consulting provider
- 3 imported directly into EMR
- Many viewed online by the provider
- Multiple providers printed the document themselves

### Key findings:

- Those providers who were working in a digital office were interested in being able to download the PDF Healthcare into their system
- One provider who was paper-based was interested in saving the file to an office computer



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Navigation: Home | Tools | Patient | [Data: CCR]

File | Edit | Default | View | Tools | Utilities | Settings | Help

For Prairie Medical Group PC | Prairie MO, Stacia

To generate a new CCR click on the button below. To view an existing CCR click on the blue item on the table to the right.

Generate New CCR

CCR's Generated

Date	Type	From	To
12/02/2008	3:00PM	af@prc14056-48ac-02	
12/02/2007	8:46AM	16485674-8905-47ac-02	
12/01/2007	8:10AM	af@prc14056-48ac-02	

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The Healthcare Information Revolution

**Problem List**

Onset Date	Code	Description
<input type="checkbox"/>	S12004	400 Hypertension Yes
<input checked="" type="checkbox"/>	S12004	399 Hypertension Yes
<input checked="" type="checkbox"/>	S12004	245 Diabetic Yes
<input checked="" type="checkbox"/>	S12004	245 Diabetic Yes
<input checked="" type="checkbox"/>	S12004	205 Asthma Yes

**Allergies**

Onset Date	Allergy	Reaction	
<input checked="" type="checkbox"/>	S124003	SEVOPROXICIN	rash
<input checked="" type="checkbox"/>	S124003	DEXTROROTHRAMETER	rash
<input type="checkbox"/>		Non-steroidal Medication	Constipation
<input type="checkbox"/>		Penicillin; Cephalosporins; Carbapenems; Amoxicillin	Hives/Skin Rash
<input type="checkbox"/>		Penicillin; Cephalosporins; Carbapenems; Amoxicillin	Hives/Skin Rash

**Medications**

Ex Date	Name	Sig	
<input checked="" type="checkbox"/>	S7004	ACTHAGONIN	

**Lab Test**

Col. Date	Test Name	
<input checked="" type="checkbox"/>	S124000	AST/ALT
<input checked="" type="checkbox"/>	S70000	CAC
<input type="checkbox"/>	S70000	CAC
<input checked="" type="checkbox"/>	402000	Smeg
<input checked="" type="checkbox"/>	402000	Urinalysis

**Encounter List**

Date	Physician	Location
<input checked="" type="checkbox"/>	8002007 24743 AM	Stacia Kaba MD - For Prairie Medical Group PC
<input type="checkbox"/>	8002007 42724 AM	Stacia Kaba MD - For Prairie Medical Group PC

**Discussion List**

Date	Physician	
<input checked="" type="checkbox"/>	8002007 24743 AM	Henry Jin
<input type="checkbox"/>	1072007 40146 AM	Conradie An
<input type="checkbox"/>	402000 301142 AM	Urinalysis
<input type="checkbox"/>	402000 301142 AM	Urinal
<input type="checkbox"/>	402000 301142 AM	Urinalysis

**Image List**

Date	Category	Name	
<input checked="" type="checkbox"/>	S120000 120800 AM	Lab/Experiments	DIG
<input checked="" type="checkbox"/>	S120000 120800 AM	Lab/Experiments	vet shg
<input type="checkbox"/>	S120000 120800 AM	Publicize	DIG
<input type="checkbox"/>	S120000 120800 AM	Publicize	vet shg
<input type="checkbox"/>	S120000 120800 AM	Lab/Experiments	DIG

Include Family History:   
 Include Social History:   
 Include Latest Vital Signs:   
 Include Advance Directives:   
 To: Text Doctor  
 Type: Consulting Provider  
 CCR Purpose: Reason for Consult

Generate

Ready | For Prairie Medical Group PC | ADPR006 | 06/12/2008

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Navigation: Home | Tools | Patient | [Data: CCR]

File | Edit | Default | View | Tools | Utilities | Settings | Help

For Prairie Medical Group PC | Prairie MO, Stacia

**Medications**

Ex Date	Name	Sig	
<input checked="" type="checkbox"/>	S7004	ACTHAGONIN	

**Lab Test**

Col. Date	Test Name	
<input checked="" type="checkbox"/>	S124000	AST/ALT
<input checked="" type="checkbox"/>	S70000	CAC
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<input checked="" type="checkbox"/>	S120000 120800 AM	Lab/Experiments	vet shg
<input type="checkbox"/>	S120000 120800 AM	Publicize	DIG
<input type="checkbox"/>	S120000 120800 AM	Publicize	vet shg
<input type="checkbox"/>	S120000 120800 AM	Lab/Experiments	DIG

Include Family History:   
 Include Social History:   
 Include Latest Vital Signs:   
 Include Advance Directives:   
 To: Text Doctor  
 Type: Consulting Provider  
 CCR Purpose: Reason for Consult

Generate

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**Medications**

Medication	Date	Form	Strength	Quantity	SIG	Indications	Instruction	Refills	Source
ASTHMOFMCN	Prescription Date: Mar 07, 2005	PACKET	10	1			Do not substitute	0	
ASTHMOFMCN	Prescription Date: Mar 07, 2005	PACKET	10	1			Do not substitute	0	

**Immunizations**

Code	Vaccine	Date	Brand Name	Lot #	Exp. Date	Route	Site	Source

**Vital Signs**

Vital Sign	Date	Result

**Encounters**

Type	Date	Location	Practitioner	Description	HPI	Source
Physician Office Visit	Encounter Date: Oct 31, 2007	Fox Prairie Medical Group PC		Office Visit		

**Social History**

Type	Date	Code	Description	Status	Source

**Family History**

Type	Date	Code	Description	Relationship(s)	Status	Source

**Results**

Test	Date	Code	Description	Relationship(s)	Status	Source
FTIBR	Assessment Time: Nov 24, 2003 - 08:08 PM UTC-08:00					
FTIBR	Assessment Time: Nov 24, 2003 - 08:08 PM UTC-08:00					
Shp	Assessment Time: Apr 08, 2003 - 09:50 PM UTC-08:00					

**Insurance**

Type	Date	Identification Numbers	Payment Provider	Subscriber	Source

Comments: This patient will be seeing you for special consult on May 26th, 2008.

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**SEVACRE**  
The Clinical Knowledge Portal


Organization: User: Test Doctor  
Sunday, May 18, 2008

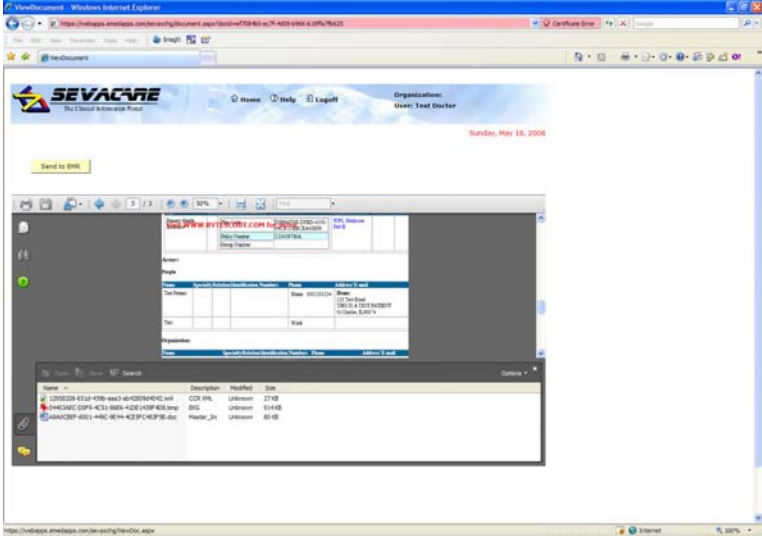
Send By	Patient	Description	Type	Practitioner	Timestamp	View
Kahn MD, Stevia	Test F Patient	This patient will be seeing you for special consult on May 26th, 2008.	PDN	Fox Prairie Medical Group	5/18/2008 9:17:31 AM	View
Kahn MD, Stevia	Patient Test	Meeting again	PDN	Fox Prairie Medical Group	5/18/2008 7:52:13 PM	View
Kahn MD, Stevia	Patient Test	Meeting	PDN	Fox Prairie Medical Group	5/18/2008 7:47:51 PM	View
Kahn MD, Stevia	Patient Test	Update Progress notes for Test Patient.	PDN	Fox Prairie Medical Group	5/18/2008 2:09:13 PM	View
Kahn MD, Stevia	New Test	Test updated	PDN	Fox Prairie Medical Group	5/18/2008 2:03:27 PM	View
Kahn MD, Stevia	Test F Patient	Patient is going to see you next week	PDN	Fox Prairie Medical Group	3/3/2008 3:04:49 PM	View
Kahn MD, Stevia	Patient Test	Meeting	CCR	Fox Prairie Medical Group	12/1/2007 9:08:53 AM	View
Kahn MD, Stevia	Patient Test	Meeting from remote machine	CCR	Fox Prairie Medical Group	12/30/2007 12:25:22 PM	View
Test F Patient	Test F Patient	it is going to see you next week	CCR		10/26/2007 11:48:34 AM	View
Kahn MD Stevia	Patient Test	TEST CCR	CCR		3/5/2007 8:47:42 AM	View
Kahn MD Stevia	Patient Test	THIS IS A TEST CCR	CCR		3/5/2007 8:27:13 AM	View
Kahn MD Stevia	Patient Test	This is a test CCR	CCR		2/4/2007 1:24:28 PM	View
Test F Patient	Test F Patient	going to see the patient next week	CCR		8/28/2006 4:25:12 PM	View
Test F Patient	Test F Patient	Patient is seeing you next week	CCR		8/28/2006 4:26:15 PM	View
Test F Patient	Test F Patient	This patient is going to be seeing you next week	CCR		8/10/2006 1:21:27 PM	View

Page 1 of 1


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## Reasons to Celebrate

- Physicians will use email to communicate with their peers
- Physicians are receptive to trying new technology
- Information can be presented to consulting physicians in an electronic format at the point of care
- The CCR and the PDF Healthcare format can be implemented successfully in an EMR without EMR vendor support

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## Obstacles and Challenges

- Email notification was blocked to one provider on two separate instances – first one was sent successfully

**Solution:**



- Implement a return receipt for notification emails or a decision support feature
- Notifies the sender that the PDF Healthcare or CCR has not been viewed by the recipient within a specified period of time

- One PDF Healthcare was created successfully in the EMR but notification email was delayed due to an attachment being scanned into EMR in a non-standard format

**Solution:**


- Added data field on the PDF Healthcare Generator indicating that a selected image was scanned into the EMR

- Human error
  - The wrong provider was sent email notification (Oops!)

## Process Lessons Learned & Recommendations

- **When possible:**
  - Call the receiving physician or a designated employee ahead of time
  - Alert them that a PDF Healthcare document is on its way
- **When referring to an institution that screens patients prior to making appointments, it may be difficult to find a physician willing to view the PDF Healthcare**
- **Confirm the provider who is seeing the patient**
- **Beware that SPAM filters may block the notification emails**
- **When possible:**
  - Make a call after the email notification has been sent
  - This can ensure that the data needed at the point of care is available



## Technology Lessons Learned

- **Receiving providers may not have a complete view of the rendered CCR**
  - Solution: Change the margins of the style sheet
- **Standard style sheet with multiple discrete lab results proved to be confusing to the recipients**
  - Solution: Modify CCR style sheet to better group the results
- **EMR PDF viewers have varying ability to view attachments to the PDF**
  - Providers saving the PDF in their EMR need to save attachments separately if viewer will not allow access

## Provider Feedback

- Incorporate a Narrative Note explaining the purpose of the referral
- Attach the most recent Office Encounter
- Be more concise to avoid excessive scrolling
- Simplify the procedure to access the PDF Healthcare
- Attach MRI Image
- Limit Administrative Burden on Provider



## Limiting Administrative Burden

- **For practice groups where a physician(s) prefers not to view PDF Healthcare directly,**
  - Identify an employee responsible for accepting the email notification
  - Print or import the file into the EMR
- **Use a generic consulting provider field for an entire practice**
- **Disadvantage to either approach is that the physician no longer chooses what to import from the PDF package**



## EHR to PHR Pilot: The New Frontier

### Fox Prairie Medical Group / HealthString Data Exchange Pilot


- Fox Prairie Medical Group, Emedapps, HealthString, LLC and Northwestern Institutional Review Board agreed to work together in pilot project designed to allow data sharing between physicians and patients
- Summary data presented to patients using a secure, electronic format and existing standards

## Vision



- Electronic health data export and import
- Care provider selects data to export from EHR to patient's PHR creating a Continuity of Care Record
- Patient reviews CCR and selects data to import into PHR
- Initial exchange: EHR to PHR
- Long term goal: PHR to EHR exchange

## Challenges

- Unique patient identifiers vary from EHR to PHR
- Data export and import must be secure
- Patients select data elements they wish to import into their PHR
- CCR and PHR use alternate nomenclature for medications, problems/conditions, allergies, lab work and test results

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## Physician/Patient Benefits





- PHR extends EHR adding nurse coaches and behavioral modification tools
- Improved Care Coordination
- Access to real time data from patient
- Better educated patients
- Patient controlled data
- Caregivers and providers are better informed



**==**


**BETTER CARE & HEALTHIER PATIENTS  
SHARED OWNERSHIP IN OUTCOMES**



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- An integrated PHR will benefit the patient by giving them the **most up-to-date, accurate Emergency Information Card** that can be life-saving in the event of an emergency.
- Medications, Health Conditions, Allergies are updated each time data are sent from physician and imported into the patient's PHR.

	
<b>Member ID</b>	01-WIH-17424
<b>Name</b>	John Smith
<b>D.O.B.</b>	08/13/1964
<b>Contact 1</b>	May Flowers, 312-123-4567
<b>Contact 2</b>	April Showers, 312-123-4567
<b>Physician</b>	ANDREW SMITH
<b>Blood Type</b>	O Negative
<b>Health Conditions</b>	High Blood pressure
<b>Medications</b>	Pravachol, Aspirin
<b>Allergies</b>	Sulphur containing medications, Bees
<b>Other Info.</b>	See back of card
	1-312-546-3669



## Summary

- Secure Digital Health Information Exchange between Healthcare Providers is possible using Existing Standards
- Secure Exchange of Summary Data between EHR and PHR is possible
- **PHR can be modified to allow patient to view, select, and import discrete data elements and attachments from a provider generated summary document in the PDF Healthcare format**

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**Follow-up:**

**February 2010**  
PDF Forms Supporting the Clinical  
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