

An Open Source Journey for sharing medical records in a Safety Net world

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Demonstrating Open-Source Health Care Solutions 2009

WESP Consulting, LLC

Leveraging IT for Healthcare Improvement

- *Process Analysis*
- *Requirements Development*
- *Solutions Management*



An Open Source Journey for sharing medical records in a Safety Net world

- Who is Primary Care Coalition (PCC)?
- PCC's IT Journey
 - A novel approach to sharing
 - An expanded HIE model
 - Lessons Learned
- Thoughts on Healthcare IT and Open Source

Who is PCC?

Wealthy DC suburb of 930,000 residents, large growing immigrant population

112,000 uninsured adults (20% of adult population); 70,000 low income, uninsured adults

No academic health centers or public hospitals; 5 private community hospitals

Ten safety net clinics in the county:

Multi-cultural; Clinics independent 501(c)3; volunteer as well as staff providers

Free clinics; sliding scale; donations; 2 Federally Qualified Health Centers

Primary Care Coalition: Non-Profit (1993)

Led the development of **Montgomery Cares**, a coordinated/integrated system of care for low-income, uninsured, ethnically diverse residents. \$11M core funding provided by Montgomery County

Fifty employees/contractors with a healthcare programs focus:

- Administrator for Montgomery Cares

- Care For Kids program

- Project Access specialty care management

- Komen grant for breast cancer screening

- CareFirst (local Blue Cross) grant for Continuity of Care/Chronic Care

Small IT team, in support of PCC programs

Systems Integrator for the ten Safety Net clinics.

Who is PCC?

Proximity to DC has been a critical success factor

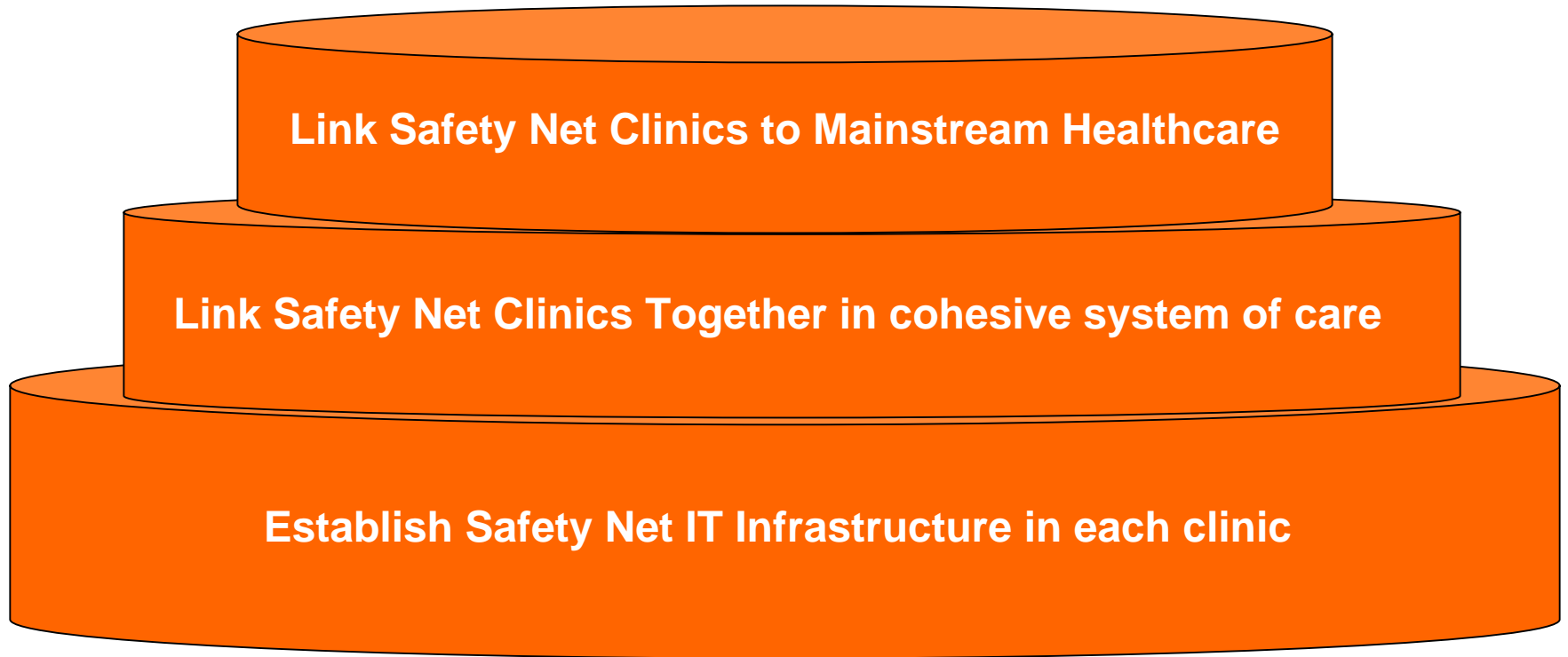
- Pool of talent:
 - CIO/Principal Investigator is a retired physician/CIO of NIH Clinical Hospital
 - Executive Director is a retired NIH Administrator, etc
- Concentration of healthcare industry activity/policy
 - Knowledge of federal funding opportunities
 - Participate in conferences, etc

Collaborator in the region – examples:

- Regional Primary Care Coalition
- Maryland Health Care Commission – Montgomery County Health Information Exchange assessment
- Institute for Healthcare Improvement (IHI)

PCC's IT Journey – The Vision

Quality, Safety, and Efficiency benefits occur at each level



Health IT can help accelerate a “system of care” for the uninsured

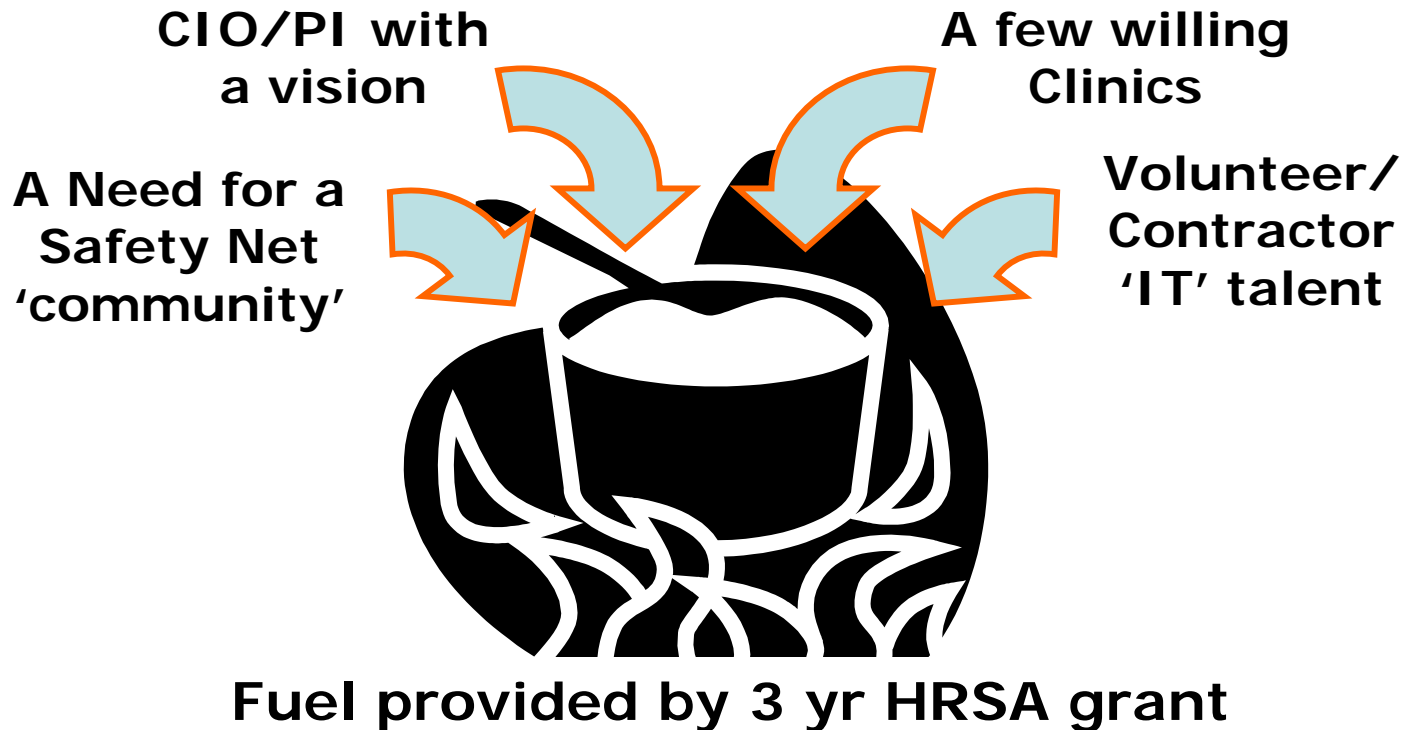
PCC's IT Journey

Technology Landscape in 2001...

- No market for EMR systems for safety net clinics
- Some unique characteristics and needs of safety net providers
- Most commercial systems had high up-front and maintenance costs
- Not many options for a system that could be shared across multiple, independent organizations
- Open Source technology had become a more stable, sophisticated option
- Clinics using Microsoft Access, limited IT support

No easy solutions available for PCC in 2001, so...

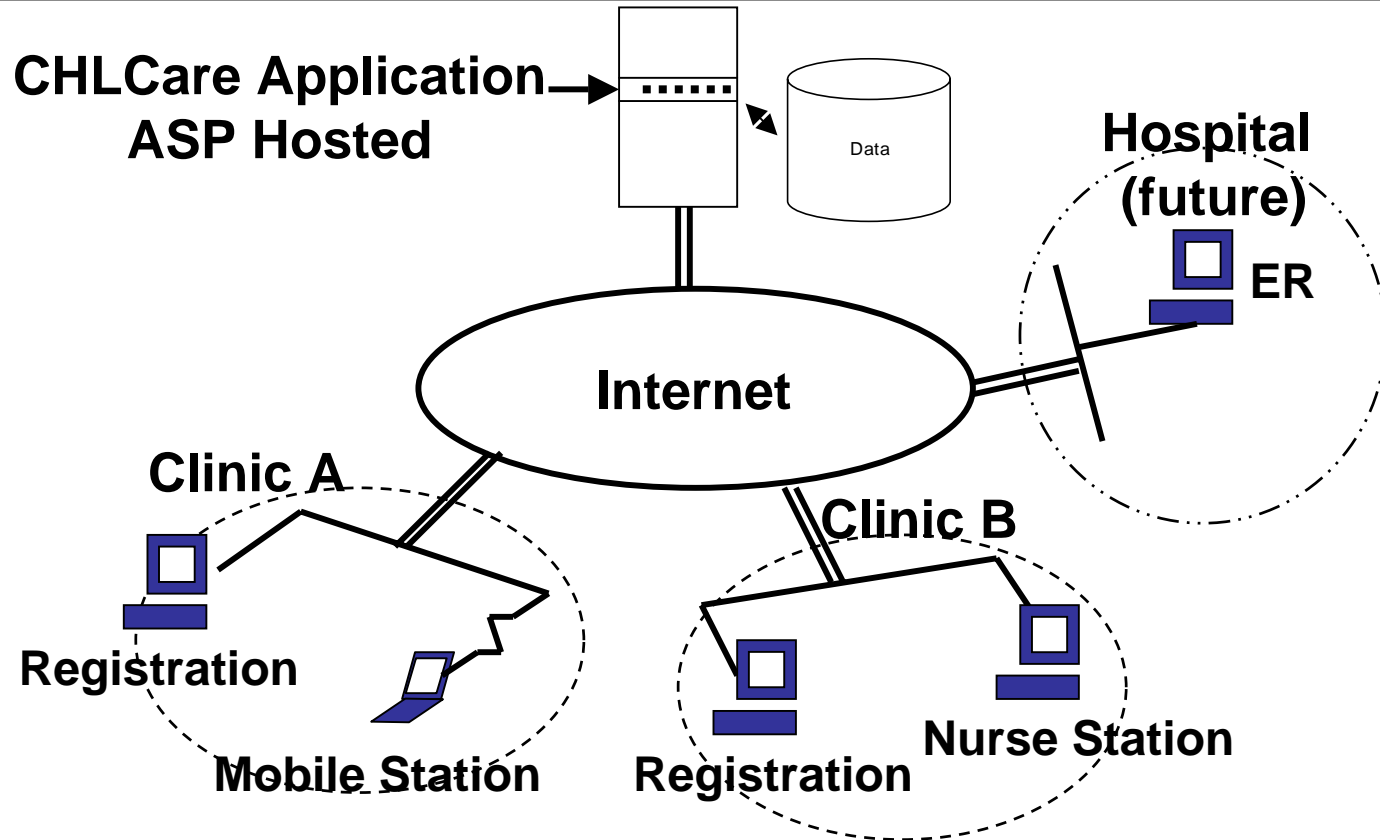
PCC's IT Journey



**A Custom Open Source EMR solution,
with the right mix of ingredients**

PCC's IT Journey: CHLCare – The Shared EMR

An Open Source, web-based, secure-access Application...



... with a single shared database for all clinics

PCC's IT Journey: CHLCare – The Shared EMR

2001 – 2002 A Learning Start

- PCC began clinic meetings
- PCC listened to clinic needs (MS Access systems, used for reporting/tracking but not to improve clinical treatment)
- Developed Open Source 'forms-driven' EMR (that's what clinics asked for!)
- First iteration – Clinics declared forms-approach not acceptable!

2002 – 2003 Second Attempt Successful

- PCC developed process maps for each clinic
- Re-defined EMR screens to fit processes
- Wrestled through the sharing agreements
 - Rules for clinic sharing
 - Rules for patient sharing
- Launched CHLCare (Community HealthLink) system
 - Converted first clinic's Access data – won over the clinic's Medical Director
 - Converted 5 additional county clinics within next 24 months

PCC's IT Journey: CHLCare – The Shared EMR

2004 – 2006 Outgrowing the initial software model

- Adding new features driven by clinic and PCC program needs:
 - Calendar tuned to Safety Nets with volunteer providers
 - Special Referral management
 - Financial transactions to help with cash drawer settlement
- Adding more clinics from Montgomery County and Northern Virginia
- But increasing CHLCare system stability problems
- A new AHRQ grant for health information exchange
 - Shift to a new HIE to provide the Many-to-Many interchange

2007 Conversion to ClearHealth infrastructure

- Converted existing CHLCare data
- Migrated CVDEMS registry data
- Forging an integrated EMR – Practice Management system

PCC's IT Journey: CHLCare – Objectives

- **Basic Electronic Medical Record capability**
- **Shared information across providers for a mobile patient population**
- **Ease of use**
- **Appointment management**
- **Reporting capability**
- **Referral Management**
- **Electronic receipt of laboratory results**
- **Position for regional linkage – hospitals, specialty providers**
- **Position for new clinical care tools – Chronic Disease Management, Continuity of Care, Decision Support**
- **Integrating Community Pharmacy point of service medication management**
- **Sharing medical data with “mainstream” providers**
- **Public Health and community care planning information**

Substantial progress on most fronts...

PCC's IT Journey: CHLCare – Where are we?

- 100,000 patient records
- 300,000 encounter records
 - 40,000 per year
 - All county resident encounters now with ICD9's and CPT's
- Management for three concurrent specialty referral programs
- Integrated ID Card's for county residents
- Financial Transactions with receipt, Daily reconciliation, etc
- Appointment Calendar with registrar tools
- Visit Planner for Care Team management
- Labs integrated from Quest

- Biggest accomplishment: Clinics are asking for more!

Substantial progress on most fronts...

PCC's IT Journey: CHLCare – Where are we?

Positives...

- Clinics are becoming more eager to move to real-time data entry
- Functionality requests are coming in fast
- Clinics are using data for improving clinical outcomes and operational efficiencies; clear evidence of a more quantitative approach
- Clinic staff and volunteers are increasingly knowledgeable about EMRs
- More and better information for County Public Health planning
- Some evidence that shared information supports a system of care for low income uninsured patients
- Strengthens clinics in seeking grant and contract support for clinical quality improvement interventions
- Allows safety net specific features not in commercial systems
- Facilitates innovative care models: Chronic care model; planned care; Triple Aim; care team

PCC's IT Journey: CHLCare – Where are we?

Negatives...

- Increased functionality = increased complexity and training
- Volunteer user base makes training more difficult and expensive
- Full EMR (paperless) is difficult to achieve
- Open Source EMRs have increased in number and capability but are typically discrete “silos” rather than integrated, modular frameworks
- Lacking CCHIT certification

Key question...

- Can PCC maintain its pace for innovation within a certified IT environment?

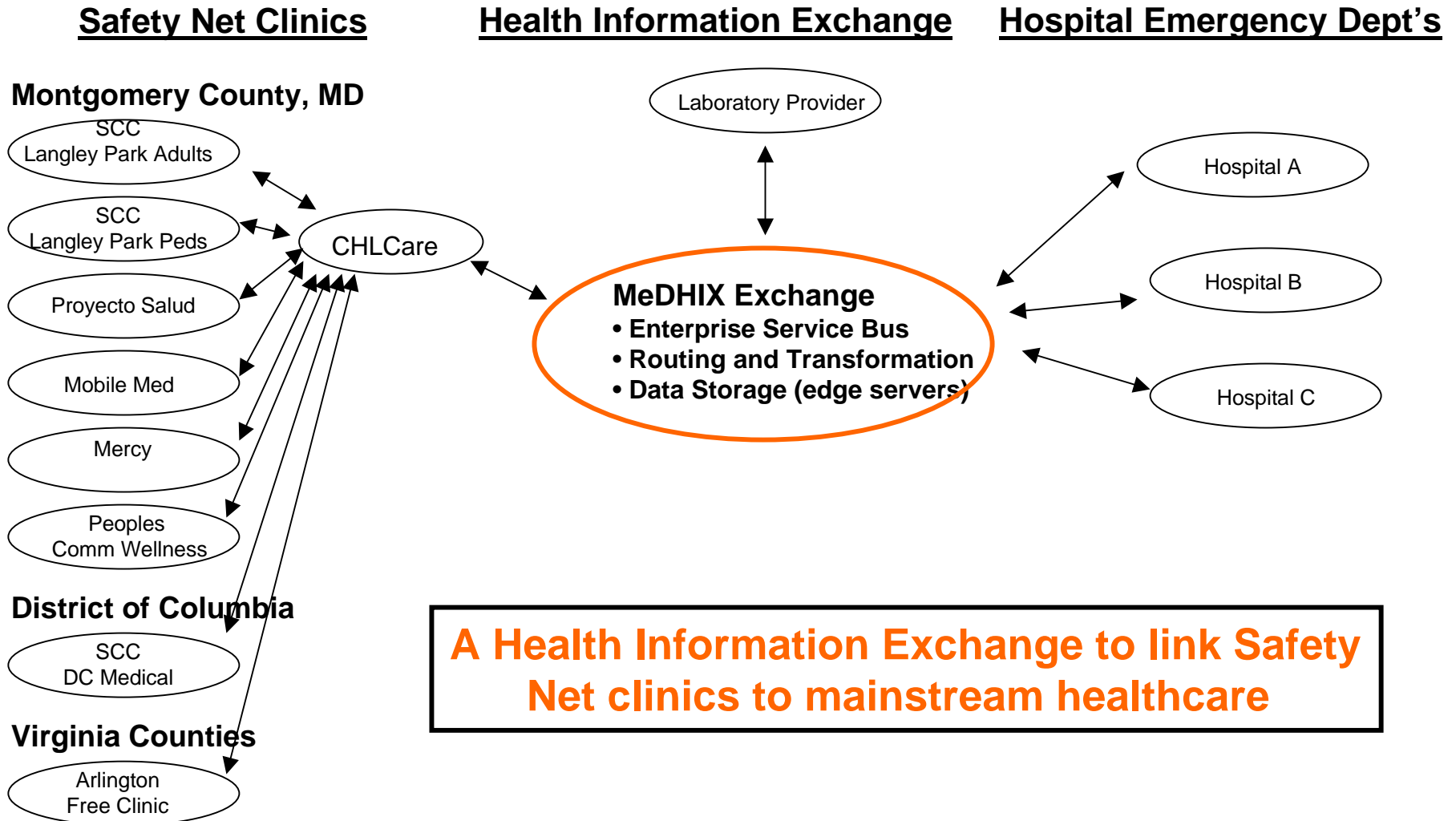
PCC's IT Journey: MeDHIX – an HIE +

MeDHIX – Metro DC Health Information Exchange

- 2004 PCC awarded a one year Regional Health Information Exchange planning grant from the Agency for Healthcare Research and Quality.
- 2005 Awarded a three year implementation grant to design and build a Safety Net Regional Health Information Exchange
- Coordinated architecture with CHLCare shared EMR
 - MeDHIX assumed the role of the Many-to-Many switch, positioned to link with other EMR's as well as CHLCare
 - Patient summary clinical database (EHR?) to facilitate responsive delivery; permits a future linkage for a Personal Health Record, hence the “+”.

2005 Next Step: an Open Source HIE

PCC's IT Journey: MeDHIX – an HIE +



PCC's IT Journey: MeDHIX – an HIE +

MeDHIX – Great IT goals:

- Share safety net clinic data with hospital emergency departments to improve care at the ED for the PCC population
- Enable hospitals to effectively refer back to the clinics for follow-up care
- Position for electronic ED Discharge Summary to clinics for care continuity

ED-MC Connect Program brought the broader healthcare need:

- A 2008/2009 IHI Triple Aim prototype project
- Building the processes which require the MeDHIX infrastructure

MeDHIX progress to date:

- Picture ID (linked through CHLCare) for identification of uninsured
- eChart: patient's medical record synopsis available at the ED – first hospital in test now as part of ED-MC Connect
- Interchange with Quest (in production)
- Built on a service architecture

PCC's IT Journey: MeDHIX – an HIE +

MeDHIX – Critical features:

- Sensitive Data Management
- Printer friendly version of eChart to permit fast acceptance
- ‘Break the Glass’ emergency capacity to view records of patients who have not enabled information sharing

MeDHIX – has put PCC ‘in the game’:

- Experience base for Maryland HIE studies
- Enabled PCC to bid to CMS ED Diversion grant, others

PCC's IT Journey: MeDHIX – an HIE +

MONTGOMERY CARES/Community HealthLink
Medical Home: Happy Care
301-222-3333 Issue Date: 4/23/07

Leta Robison Kajut
111 Test
Apt 11
Silver Spring MD 20910

Metro DC Health Information Exchange
MemberID: 11111 Female 1990-11-01 0

Not a Legal ID nor Proof of Health Insurance

eChart - Metro DC Health Information Exchange
Patient eChart
Logged-in as: Kajut, Leta
Logout

Patient Lab

Name: Basic MeDHIX Health System: Community HealthLink
DOB: 02/20/1980 (28) Female Primary Language: Arabic
Phone: 703 222 2232 Medical Home: PCC MRN: 97483

Sensitive Data associated with Mental Health, Drug Abuse, etc may not be displayed

Primary Data Rx History Immunizations

Allergies - Listing records 1 - 1 of 1

Allergy
NKA

Problem List - Listing records 1 - 1 of 1

Problem List
Hypertension

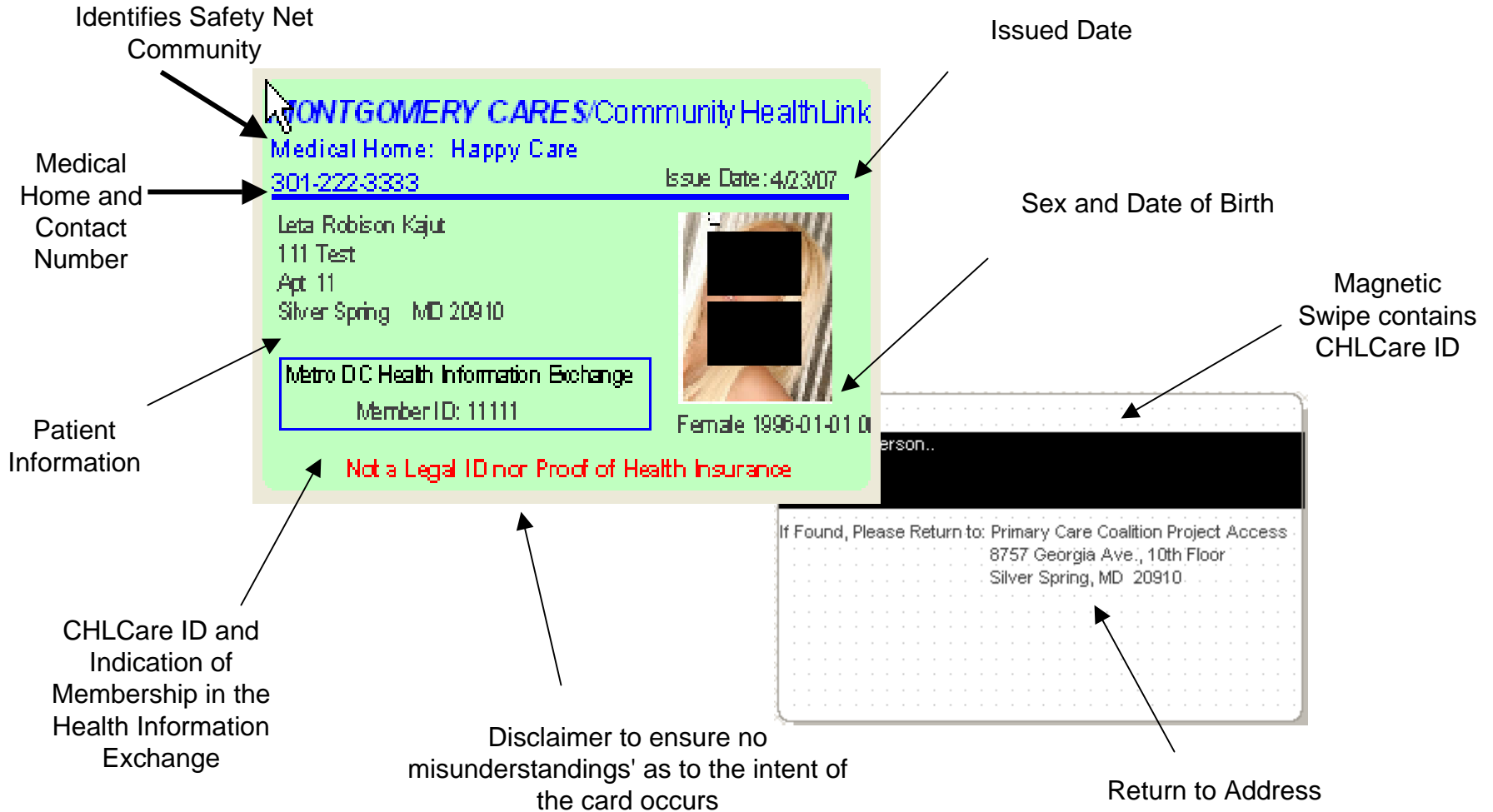
Printer Friendly

Dose	Schedule	Issue Date
1 mg	One Daily	03/03/08
10 mg	One Daily	09/16/07

...sociative and somatoform disorders, 414.9 Chronic ischemic heart disease, ... sociative and somatoform disorders



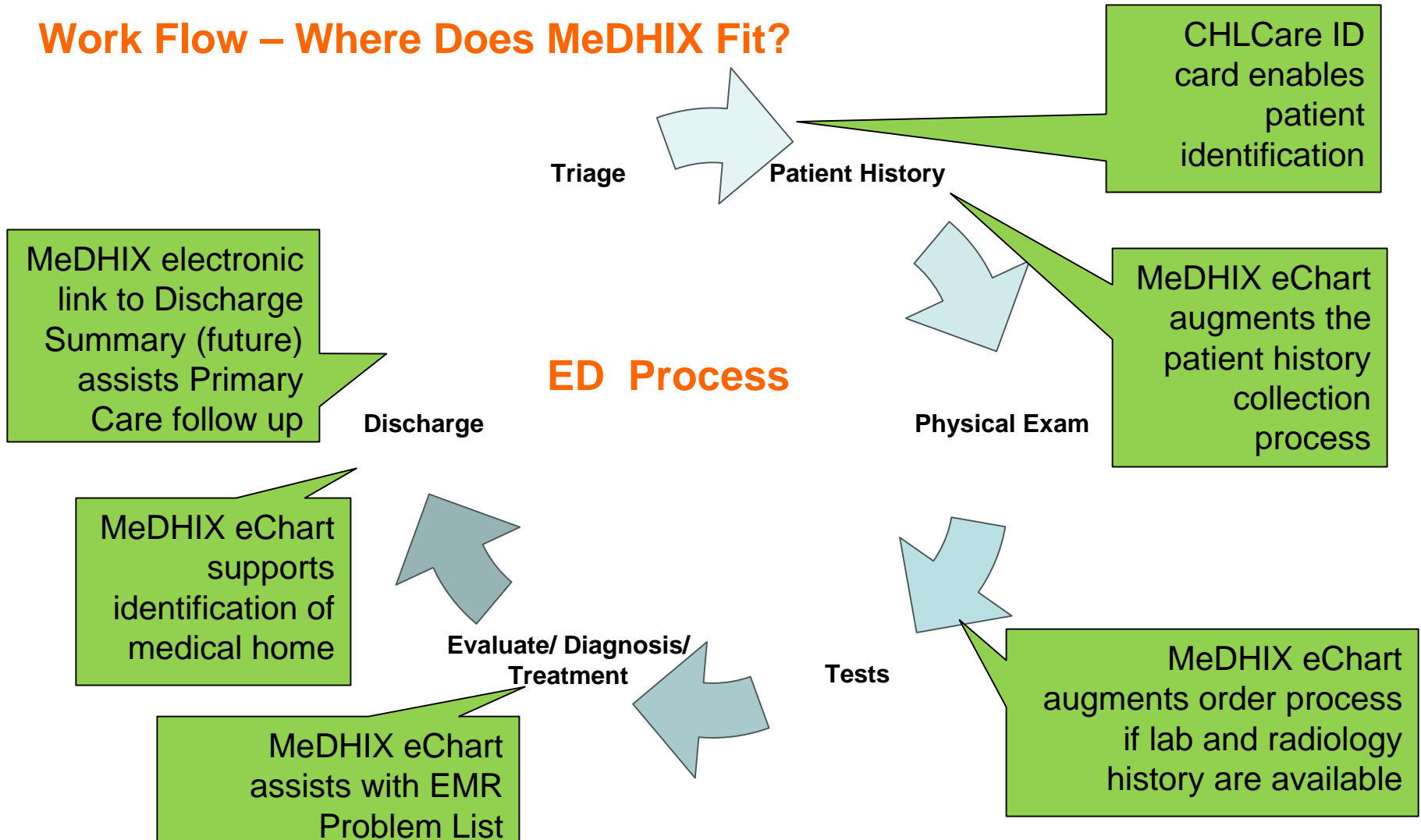
PCC's IT Journey: MeDHIX – an HIE +



ID Card Design

PCC's IT Journey: MeDHIX – an HIE +

Work Flow – Where Does MeDHIX Fit?



MeDHIX – Excerpts from a 2008 PCC presentation

- A valuable self-examination by PCC of the lessons learned in implementing MeDHIX
- Thanks to the very talented staff in the PCC Center for Community Based Health Informatics
 - Leta Kajut, Director, Health Information Exchange Technology
 - Tom Lewis, CIO PCC

MeDHIX Year 2: Proof of Principle Meets Reality

- MPI probabilistic match algorithm inadequate for safety net patients
- NHIN prototypes informative but not definitive national model or comprehensive standards
- One set of safety net clinics not ready for HIE; focus was on EHR selection and adoption, a multi-year project

MeDHIX Year 2: Proof of Principle Meets Reality

- Community hospitals added new prerequisites for safety net providers for patient identification and HIPAA protection
- New project to issue photo IDs to safety net patients
 - Meets hospital need for positive patient identification
 - Facilitate and authenticate exchange of protected health information
- Recurrent legal issues, costs, and lack of consensus concerning patient privacy and access to PHI
 - New organizations raise previously resolved issues
 - New members of existing organizations revisit old issues
 - Delays implementation
 - Fear, unwillingness, or excuse not to participate
 - Unnecessarily high legal expenses

MeDHIX Year 2: Proof of Principle Meets Reality

- Interest of participants in HIE waxes and wanes
 - Other institutional priorities, IT and non-IT related
 - Near term needs trump longer term, more hypothetical projects
- Stark exemption unintended consequences
 - Shifted hospital focus away from regional HIE
 - Opportunity to tie physicians to a hospital through EHR subsidy
 - Limited resources and competitive pressures undercut HIE
- Hospital trust relationships
 - Larger competitor institutions not trusted as HIE operator
 - Unrelated litigation affected HIE collaboration among hospitals

MeDHIX Year 2: Proof of Principle Meets Reality

- Population-stratified perceived benefits of HIE
 - Widely held view that HIE for safety net patients will lead to better quality care and cost reductions. Shared view of hospitals and safety net clinics. (cost/benefit analysis perceived as positive)
 - No clear consensus that similar HIE benefits will accrue to insured patients who have strong ties to their personal physicians, smaller numbers of providers, better provider communication of health information, and established HIE methods.
 - Risk to privacy perceived as outweighing benefits for cost and quality for insured patients. (risk/benefit analysis not always positive; disclosure may place patients or the hospital at risk)
- Closely held clinical information still seen as a competitive advantage by some providers

MeDHIX Year 2: Proof of Principle Meets Reality

- HIE data sharing boundaries
 - Comfortable sharing data already being shared
 - Reluctant to share data not already being shared
 - Preference for role as silent partner in day to day HIE
 - Do not want responsibility for managing database inquiries
 - Will not permit direct access to their databases
 - Vendor contractual constraints
 - Firewall management and security concerns and costs
 - Unwilling to incur added support costs for HIE without clear benefits
 - Willing to incur at most small implementation costs.
- Probabilistic matching of patients not accepted
 - “Don’t show me data that might not be for this patient”
 - “I don’t have time to sort out “possible matches”

MeDHIX Year 2: Proof of Principle Meets Reality

- Clinical data sharing observations
 - Safety nets and ERs may differ from other providers
 - “Complete” record not necessarily the best
 - “eChart synopsis most useful
 - Name of clinic providing care
 - Patient demographics
 - Encounter history, problem list
 - Allergies, meds, recent labs, if available
 - 1 – 2 pages maximum; too much information a deterrent to use
 - Discharge summaries of high value to safety net clinics
 - Images less useful initially, especially in safety net clinics
- Printable eChart most useful in some ER settings
 - Ease of integration with ER workflow
 - Legal concerns of non-repudiation: “what did you know and when did you know it?”

MeDHIX Year 2: Proof of Principle Meets Reality

- Comprehensive, complex solutions
 - May be favored by large institutions
 - Unnecessary and inhibiting in smaller settings
 - Costly in \$, time, and support
 - High end graphics work station (thick client)
 - Multiple security patches; too much support expertise
 - Too much space required
 - Most data not needed; too much time to learn
- Different providers value clinical data differently
- Ease of use vs. complex privacy constraints
 - Multiple jurisdictions with conflicting requirements
 - Need to document compliance and exceptions easily

MeDHIX Year 3: Problem Resolution for ER Project

- Picture ID Card developed/deployed to safety net patients
 - Addresses concerns identified earlier
 - Well received by patients and clinics
 - Implementation challenges with largely volunteer clinic staff
- Open source HIE enterprise service bus architecture tested
- Quest laboratory <-> safety net clinic result link deployed
- eChart content, design, testing complete
- Community hospital ER <-> safety net clinic collaboration defined

Understanding Legal Constraints

MeDHIX does not display sensitive data initially

- Integrates a process for accessing sensitive data
 - Opt in vs. opt out
 - Mental health, substance abuse, HIV data
- Document successive levels of patient permission
 - To access sensitive data
 - Hospital policy override (“break the glass”)

Understanding Legal Constraints

The electronic record is probably not a complete historic depiction of the medical record.

Data provided may not represent the complete patient history. Confirm all information with the patient and solicit additional information.

~~Mental Health, Drug Abuse and HIV data is not included in eChart as per the following statutes:~~

Virginia: 12.1-127.1; 32.1-36., 27.2-400; District of Columbia: DC Code 7-1201, DC-Code 7-12-2, DC-Code 7-1203;

Maryland: Md Code Ann Health Gen 18-338.1, 4-307

Do Not Re-Disclose information as per Virginia Statute 12.1-127.1.03(A)

Understanding Legal Constraints

Mental Health, Drug Abuse, HIV not displayed

Sensitive Data Management

Logged-in as: Kajut, Leta

eChart - Metro DC Health Information Exchange

Logout ▼

Patient eChart

Patient Lab

Name: Basic MeDHIX	Health System: Community HealthLink	MRN: 97483
DOB: 02/20/1980 (28) Female	Primary Language: Arabic	
Phone: 703 222 2232	Medical Home: PCC	

Sensitive Data associated with Mental Health, Drug Abuse and HIV are not displayed

Authorize Sensitive

Primary Data Rx History Immunizations

Printer Friendly

Understanding Legal Constraints Authorization and Consent Recording

Sensitive Data Management

Logged-in as: Kajut, Leta

eChart - Metro DC Health Information Exchange

Logout ▾

Patient eChart

Name: Basic MeDHIX	Health System: Community HealthLink	MRN: 97483
DOB: 02/20/1980 (Age: 28) Female	Primary Language: Arabic	
Phone: 703 222 2232	Medical Home: PCC	

Statement of Authorization to View Sensitive Data

The user understands viewing Mental Health, HIV or Drug Rehabilitation data is restricted by state and federal law. Through the action of authorizing the display of Mental Health, HIV or Drug Rehabilitation data the user indicates patient authorization and the associated documentation is entered into the patient's record. If the patient has not or can not provide authorization, the user indicates the situation meets criteria for emergency access with the intent to protect the patient or third parties from substantial risk of imminent and serious physical injury and that this information is essential to the patient treatment and/or assessment processes.

Mental Health Drug Abuse HIV

User confirms all required documentation processes for patient Authorization are met

User declares the situation meets the criteria for emergency access to protect the patient or third parties from imminent serious physical harm.

Cancel Enter

Understanding Legal Constraints

Patient has chosen not to share data

Logged-in as: Kajut, Leta

eChart - Metro DC Health Information Exchange

Logout ▼

Select a Patient eChart

Please select a patient using the Medical Record Number (MRN) and Health System

Medical Record Number

Health System

Search

Patient Name: Restrict MeDHIX Sex: Male DOB: 10/26/1952 (Age: 55)

Enter

[Short Term Authorization](#)

PATIENT HAS OPTED OUT OF SHARING DATA ELECTRONICALLY

Data provided may not represent the complete patient history. Confirm all information with the patient and collect additional information.

Stakeholder Observations on the Value of HIE

- When it is integrated into day-to-day business processes
 - Not an easy or inexpensive task
 - Requires considerable staff time and sophistication
- When it becomes a standard mechanism for multi-provider communication and care coordination
- When data affecting a treatment decision is made available that would not have been known using traditional methods
- Value propositions for one organization do not always equate to value for another
- The “grand vision” must be coupled to a practical ROI

Some Final Thoughts about Elephants

- A critical mass of clinical data essential for successful HIE
 - A special challenge for safety net clinics (staff, \$\$)
 - Limited safety net EHR data -> little or value to hospital or consultants
 - No return of discharge summaries or consultant notes -> no value to safety net clinics
- Shifting from opt-in to opt-out if legally sound, but is uncomfortable for many organizations
- The greatest benefits of HIE are likely to come from both individual and system wide practice re-design, not from HIE itself.

Regional Health Information Technology Activities

Too Many RHIOs?

- National Capital Area RHIO (DC RHIO)
- Pediatric Regional Health Information Network
- DC Medicaid Transformation Grant
- INOVA EHR activities and regional implications
- Northern Virginia RHIO
- NOVA Scripts Central
- DC Primary Care Association EHR Project

Too Many RHIOs?

- Maryland Governor's HIT Advisory Committee Report
- Maryland Citizen-Centric Health Information Exchange
- Maryland statewide HIE plan
- PCC AHRQ funded MeDHIX project
- Maryland Community Health Centers EHR plans
- PCC Montgomery County EHR Assessment Activities

Thoughts on Healthcare IT

My personal views....

Aside from the insurance and integrated healthcare delivery organizations:

- Healthcare is predominantly a massive cottage industry (not a compliment!)
- Quality is near impossible for consumers to assess
- Separate provider entities act independently (or worse)
- Smaller enterprises often lack IT vision/direction

Dis-aggregation of costs and benefits will continue to cause disincentives for System Level improvement;

- EMR's and Health Information Exchange are collateral casualties
- Payors lack the skills and ability to act as system integrators, take on the dis-function caused by industry fragmentation
- Systemic improvement will be incredibly difficult

Any wonder why Healthcare is the last frontier for leveraging IT for improvement?

And here comes the federal government to help solve this Gordian knot!

Thoughts on Healthcare IT

My personal views....

The value of Open Source EMR's applications:

- + Shift in value proposition (to pay for current value received)
- + Ability for anyone to innovate (we can't afford to lose this)
- + Ability to build from scratch, using OS infrastructure, tools
- Lack of modularity / defined API's across OS commercial EMR's
- Certification for those who innovate/branch/roll their own

Looks like the OS jump to application level has built more silos

- Is anyone attempting to address this?

Thoughts on Healthcare IT

My personal views..

So, would PCC go the Open Source / Innovate route if they had to do it over again?

- I'd think so, since the alternatives still aren't innovative for our population
- the OS EMR options are much better (than in 2001)
- Any way to avoid silo-ing?

Should others go the same route?

- Depends....
- Pushing IT, without a clear system level healthcare driver, is fraught with danger!
- Think Use Cases and Workflow assessment – Process Improvements
- Start with a System Level view (goals, metrics, processes) and develop the business case
- Keep an eye on Washington, DC