

Healthcare Reform 2010 New Care Delivery and Business Models: How HIT Might Help

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AGENDA

The Current Environment

- Hi-Tech (ARRA)
- The Patient Protection and Care Affordability Act

New Payment and Care Delivery Models

- Accountable Care Organizations (ACOs)
- Patient Center Medical Home (PCMH)

IT Models to Support New Care Delivery Systems

HIT Considerations for 21st Century Care Delivery

- Cloud Computing
- Secure Computing
- Mobile Computing

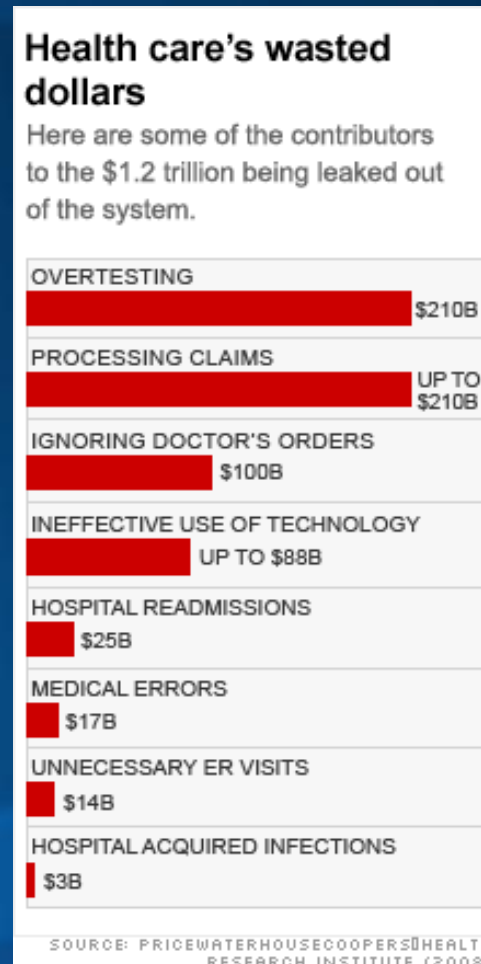


The Current Environment



Dollars Wasted and Savings Expected

Physician Service	3 B
Medicare Advantage	137 B
Home Health	40 B
Medicare DSH	22 B
Market basket Adj	157 B
Medicare part D	11 B
Medicare Part B	22 B
New payment models	13 B



1. Estimates by AMA April 7 2010

Hi-Tech Breach Notification

- **Mandatory penalties.** State AGs sue in civil court
 - Starting at \$100 per violation (\$25k/yr) going up to \$50,000 repeat violations w/ “willful Neglect” (\$1.5M/ yr)
- Projected PHI is essentially “**encrypted PHI**”
- Mandatory Reporting with 60 days and publication at HHS **Breach site for violations >500**

Breach Notifications Week of June 1

The screenshot shows the Health Information Privacy website. The main heading is "Breaches Affecting 500 or More Individuals". Below this, there is a list of breaches. The first breach is for "Oconee Physician Practices" in South Carolina, with approximately 653 individuals affected, dated 5/09/10, and the type of breach is "Theft". The location of the breached information is "Laptop". The second breach is for "VA North Texas Health Care System" in Texas, with approximately 4,083 individuals affected, dated 5/04/10, and the type of breach is "Improper Disposal". The location of the breached information is "Paper Records".

Entity	State	Approx. # of Individuals Affected	Date of Breach	Type of Breach	Location of Breached Information
Oconee Physician Practices	South Carolina	653	5/09/10	Theft	Laptop
VA North Texas Health Care System	Texas	4,083	5/04/10	Improper Disposal	Paper Records

<http://www.hhs.gov/ocr/privacy/hipaa/administrative/breachnotificationrule/postedbreaches.html>

Section 3025 – Hospital Readmissions

Beginning October 1, 2012, DRG payments to hospitals who have “excess” readmissions for certain conditions will be reduced.

The floor adjustment factor will be 99% for fiscal year 2013, 98% for 2014, and 97% for fiscal year 2015 and thereafter.

First three conditions to track

- AMI, heart failure and pneumonia.

October 1, 2014, the list expands

- COPD (chronic obstructive pulmonary disease),
- CABG (coronary artery bypass graft),
- PTCA (percutaneous transluminal coronary angioplasty),
- and other vascular conditions.

Medicaid Delivery Reform

Medical Homes and ACOs

Medicaid Health Home

- Effective January 1, 2011, states will have the option to amend their plans to permit Medicaid enrollees with at least two chronic conditions, to designate a provider as a health home.
- States who choose to amend their plans allowing for this option will receive a 90 percent FMAP for two years for payments made in provision of the health home (HR 3590, Sec. 2703).

Medicaid ACOs

- Establishes a demonstration project for bundled payments for acute care and post acute care under the Medicaid program.
- Allows large safety-net providers to alter their provider payment system from a fee-for-service structure to a capitated, global payment structure through a Medicaid Global Payment demonstration project.

Payment Riddle

Current payment methodologies do not align incentives

- Salary: under productivity
- Fee for Service (FFS): over use
- Capitation: under use
- P4P: focus on what you get paid for

New Payment and Care Delivery Models

Patient Centered Medical home (PCMH)

Accountable Care Organizations (ACOs)

General theme: Treat citizens in lowest cost settings appropriate to their needs and when possible keep them there

The Patient-Centered Medical Home (PCMH) is a Model of Health Care Delivery

The PCMH would be responsible for all of the patients' health care needs: acute care, chronic care, preventive services, and end of life care working with teams of health care professionals.

The PCMH would coordinate the care of its patients with specialists, lab/x-ray facilities, hospitals, home care agencies, and all other health care professionals on the patient care team.

The PCMH would use health information systems to provide data and reminder prompts such that all patients receive needed services.

NCQA PPC-PCMH: Included in the standards are 10 “must-pass” elements.

- 1.PPC-1A: Written standards for patient access and patient communication
- 2.PPC-1B: Use of data to show standards for patient access and communication are met
- 3.PPC-2D: Use of paper or electronic charting tools to organize clinical information
- 4.PPC-2E: Use of data to identify important diagnoses and conditions in practice
- 5.PPC-3A: Adoption and implementation of evidence-based guidelines for three chronic or important conditions
6. PPC-4B: Active support of patient self-management
7. PPC-6A: Systematic tracking of tests and follow up on test results
8. PPC-7A: Systematic tracking of critical referrals
9. PPC-8A: Measurement of clinical and/or service performance
- 10.PPC-8C: Performance reporting by physician or across the practice

To achieve Level 1 Recognition, practices must successfully comply with at least 5 of these elements. Achieving Level 2 or Level 3 depends on overall scoring and compliance with all 10 must pass elements: <http://www.ncqa.org/tabid/631/Default.aspx>

Accountable Care Organizations (ACOs)

(Sec. 3022)

- **Not later than January 1, 2012, the Secretary establishes a shared savings program that would reward ACOs**
 - **ACOs that meet quality-of-care targets and reduce costs are rewarded with a share of the savings**
- **ACOs include groups of health care providers**
 - **Physician groups, hospitals, nurse practitioners and physician assistants, and others**
- **ACOs need to**
 - **promote evidence-based medicine**
 - **patient engagement**
 - **report on quality and cost measures**
 - **coordinate care, such as through the use of Telehealth, remote patient monitoring, and other such enabling technologies**

ACOs and PCMH: ? Answer to payment Riddle

Possible Payment model

- PMPM capitation: 50% of expected costs
- Variable payment: 30% of expected costs
 - 5% P4P
 - 15% Improving outcomes (Pay for the Delta)
 - 10% patient satisfaction
- Shared Savings: 20% of expected costs
 - Minimum; zero if no savings
 - Maximum: up to 2x if savings achieved over expected

Note: expected costs are ratcheted down over time

VA Care Coordination / Home Telehealth (CCHT)

Comparisons made from one year prior to enrollment to 6 months post enrollment in remote patient monitoring program:

19.74% reduction in hospital admissions

25.31% reduction in bed days of care Patient

Acceptance high – only 10% declined remote monitoring

Patient satisfaction 86%

Average cost \$1,600 per patient per annum compared to \$13,121 for primary care and \$77,745 for nursing home care

Table 5. Reduction in Utilization by Condition Monitored (Single and Multiple Diagnoses)

CONDITION	NUMBER OF PATIENTS	% DECREASE IN UTILIZATION
Diabetes	8,954	20.4
Hypertension	7,447	30.3
Chronic heart failure	4,089	25.9
Chronic obstructive pulmonary disease	1,963	20.7
Posttraumatic stress disorder	129	45.1
Depression	337	56.4
Other mental health condition	653	40.9
Single condition	10,885	24.8
Multiple conditions	6,140	26.0

IT Models to Support New Care Delivery Systems



Start Care Coordination NOW: What it Takes

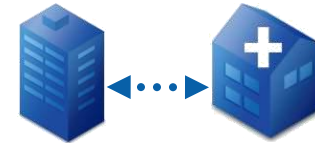
A Team Approach



Comprehensive Information



Data Exchange & Information Sharing

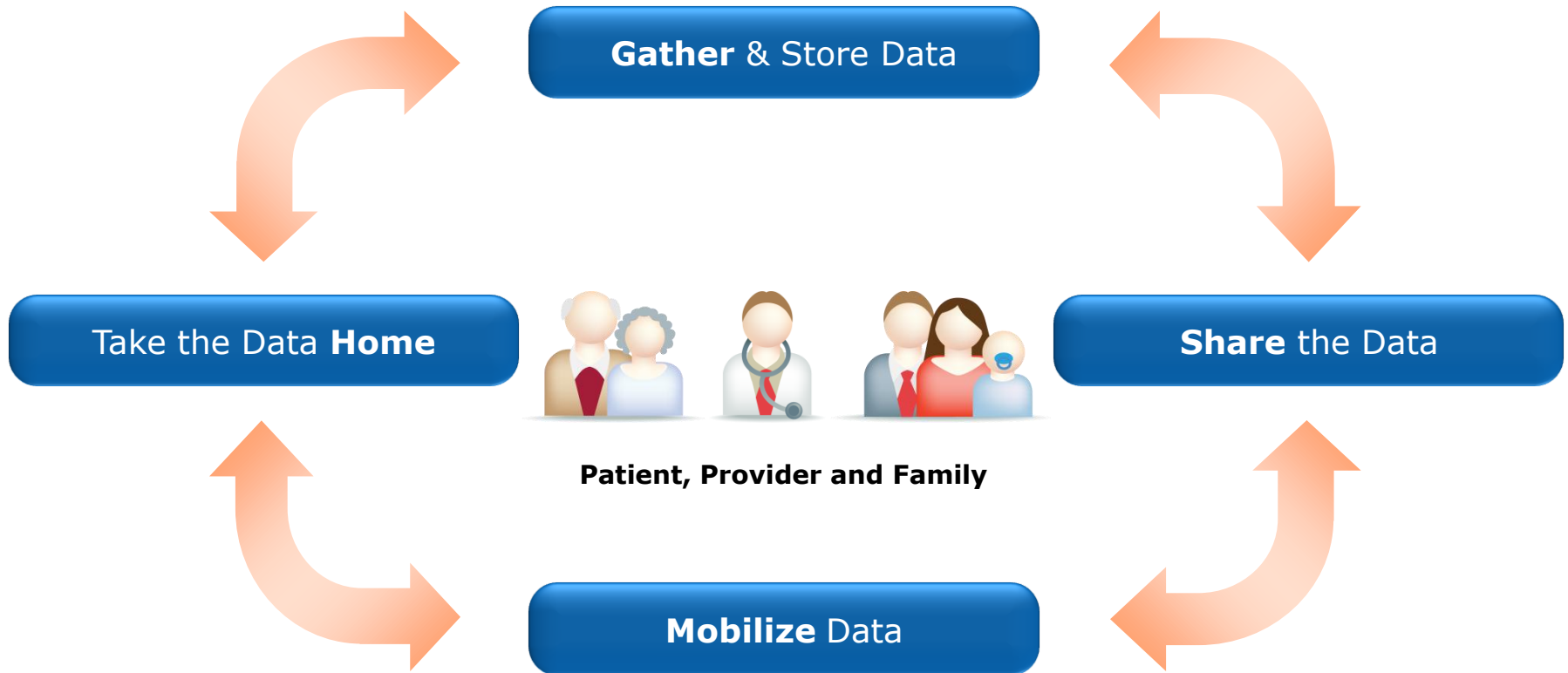


Data Access Everywhere



Reliable, Secure Infrastructure at a reasonable cost.

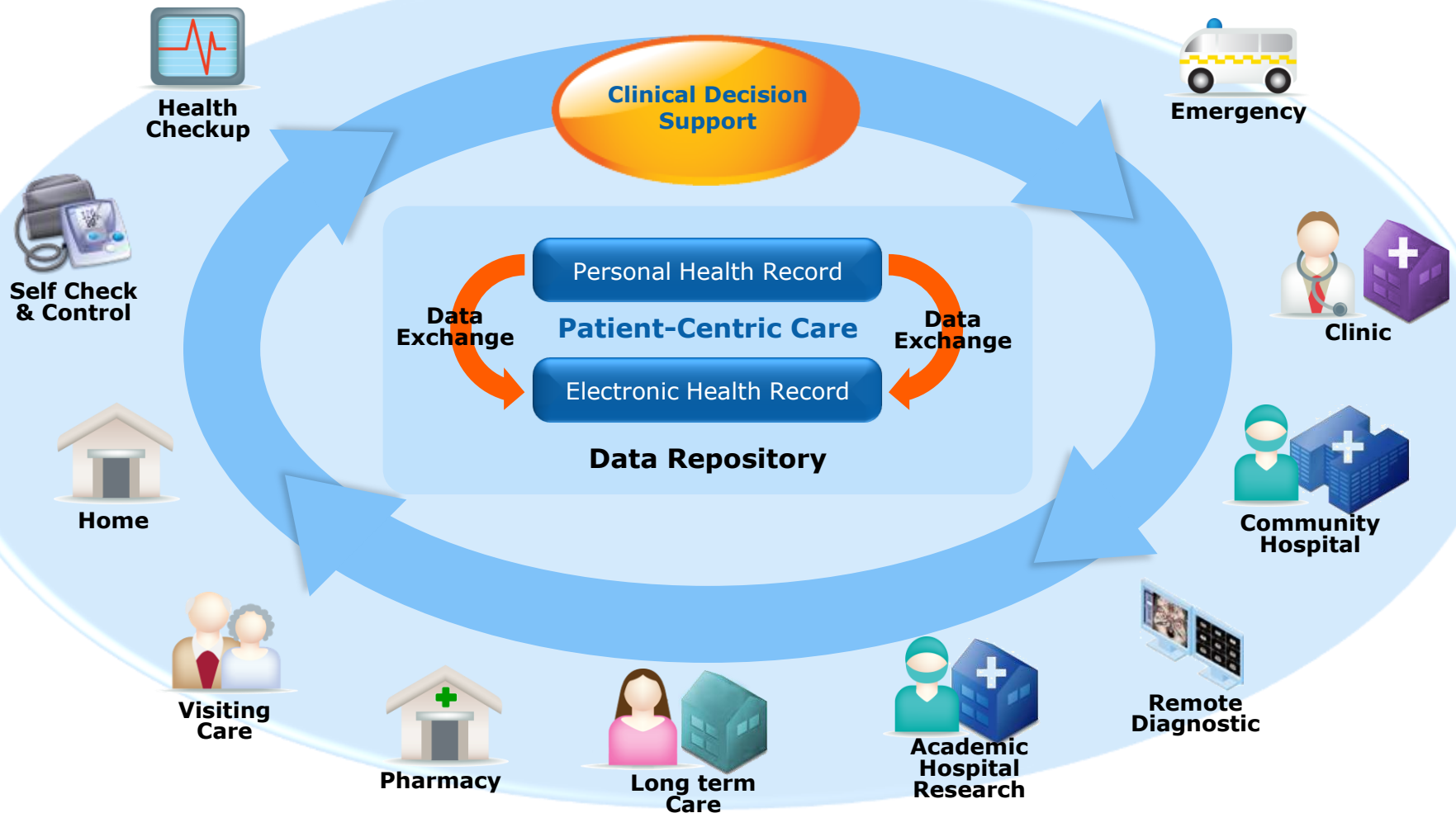
Data Flow to Support Care Coordination



Data Flow to Support Care Coordination



Our End-To-End Story: Care Coordination Across the Continuum



The ROI from an EMR: VA experience as analyzed by CITL

The gross value of the **VA's investments** in *VistA* applications was projected to be **\$7.16 billion**.

ROI: Cumulative reductions in unnecessary

- “Care attributable to **prevention of adverse drug event–related hospitalizations and outpatient visits** as a result of *VistA* was the largest source of benefit in our projections, with an estimated value of \$4.64 billion, or **65 percent** of total estimated value”.
- The cumulative value of **eliminated redundancies** accounted for \$1.92 billion, or **27 percent** of projected value.



Remote Patient Monitoring
Call Center



Affiliated Specialists
Radiology, Neurology



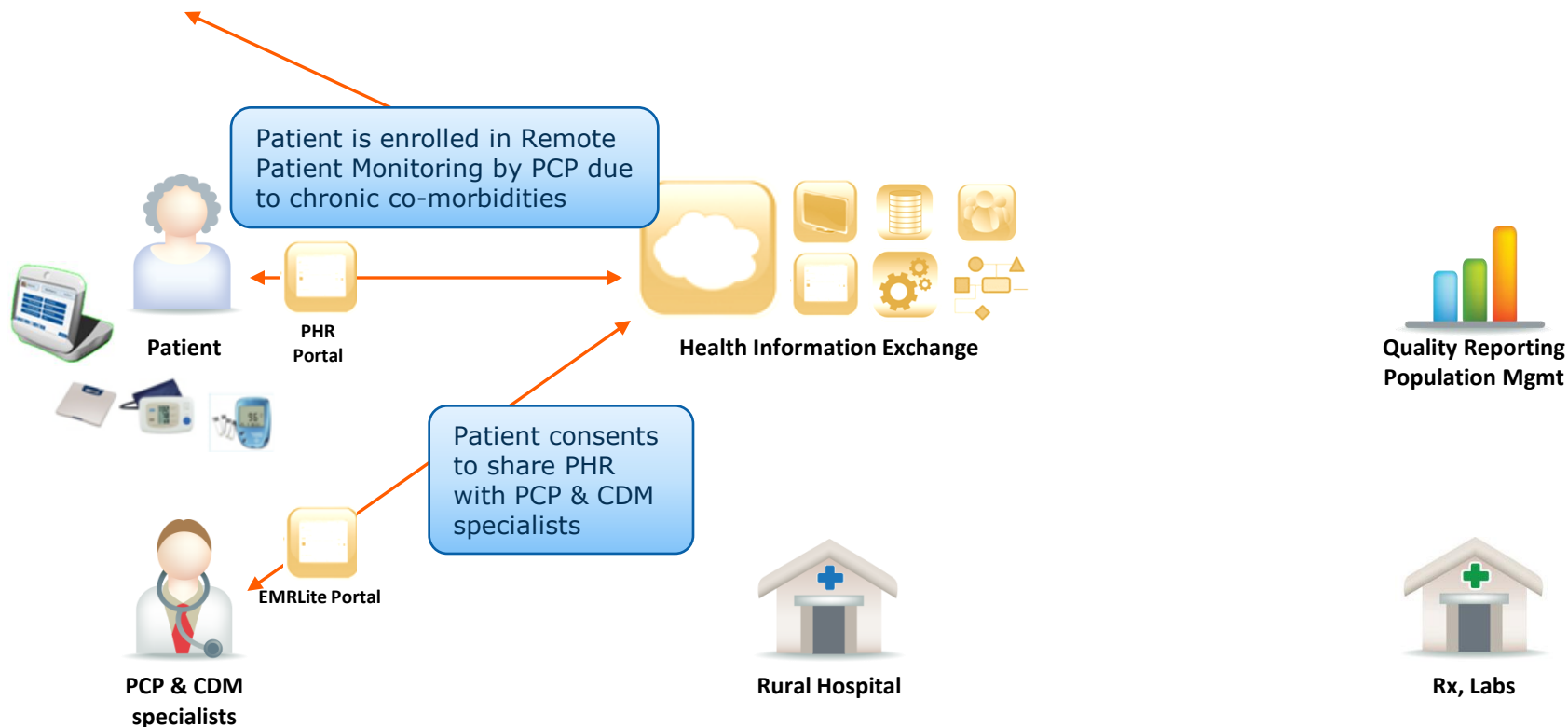
Urban
Hospital



System
Administrator



Claims
Adjudication



1 Gather & Store Data

2 Share the Data

3 Mobilize the Data

4 Take the Data Home

Digital Health Group





**Remote Patient Monitoring
Call Center**



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**Urban
Hospital**

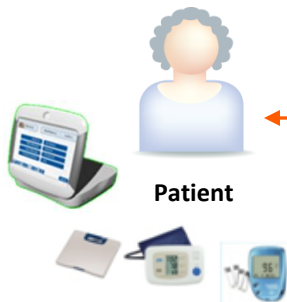


**System
Administrator**



**Claims
Adjudication**

Call center nurse reviews patient medical condition, vitals signs, and trending.



Patient



**PHR
Portal**

Patient encounters are pushed programmatically to PHR; accessible by patient and patient's clinicians



Health Information Exchange



**PCP & CDM
specialists**



EMRLite Portal

Cardiologist notes change in medication, adjusts coordinated care plan accordingly.



Rural Hospital



Rx, Labs

- 1 Gather & Store Data
- 2 Share the Data
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Digital Health Group





**Remote Patient Monitoring
Call Center**



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**Urban
Hospital**



**System
Administrator**



**Claims
Adjudication**

Technicians can remotely manage Patient and Clinician nodes via remote management interface

Patient eligibility verification, claims adjudication, quality reporting all occur according to set policies



Health Information Exchange



**Quality Reporting
Population Mgmt**

PCP prescribes changes in medication via e-prescription interface. Potential drug interactions are checked automatically.



Patient



**PHR
Portal**



EMRLite Portal



**PCP & CDM
specialists**



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**Remote Patient Monitoring
Call Center**



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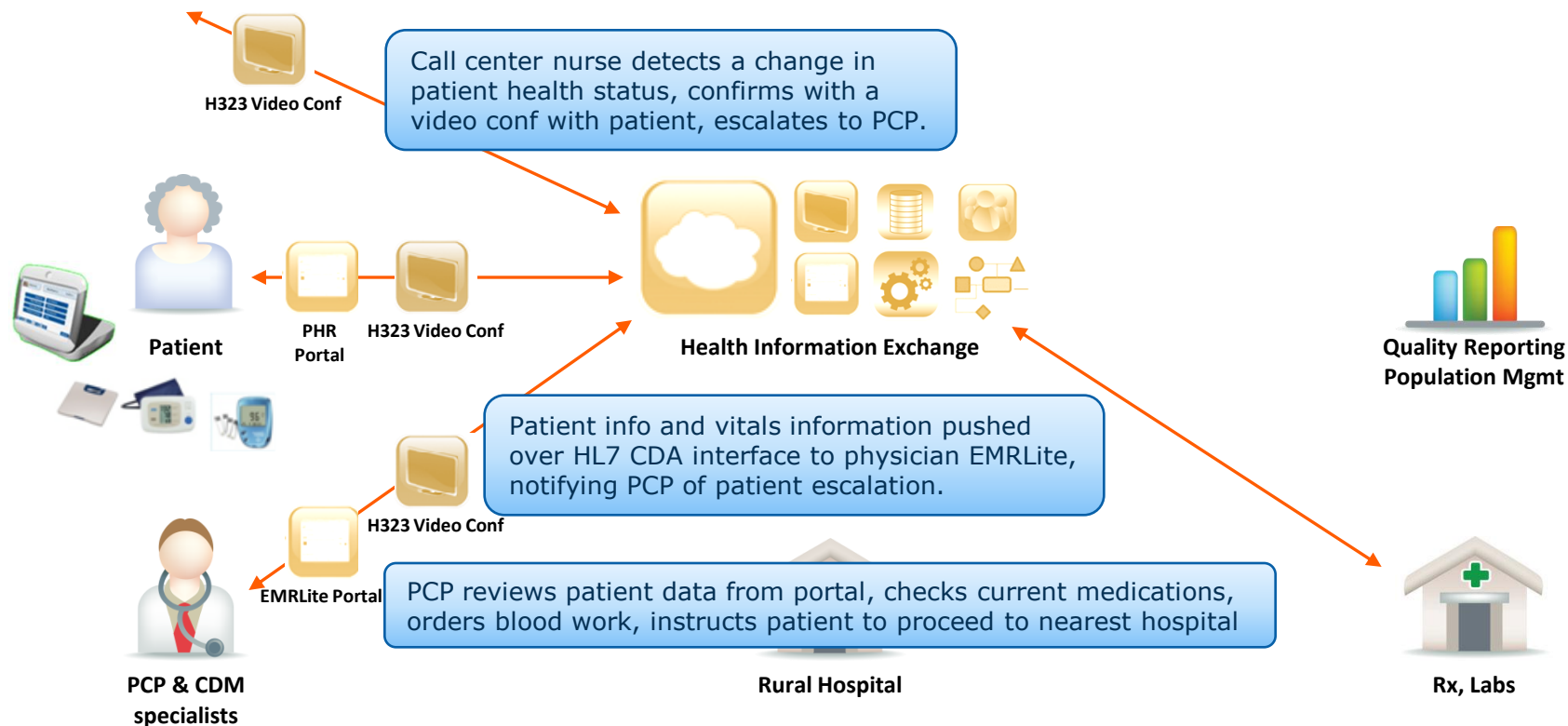
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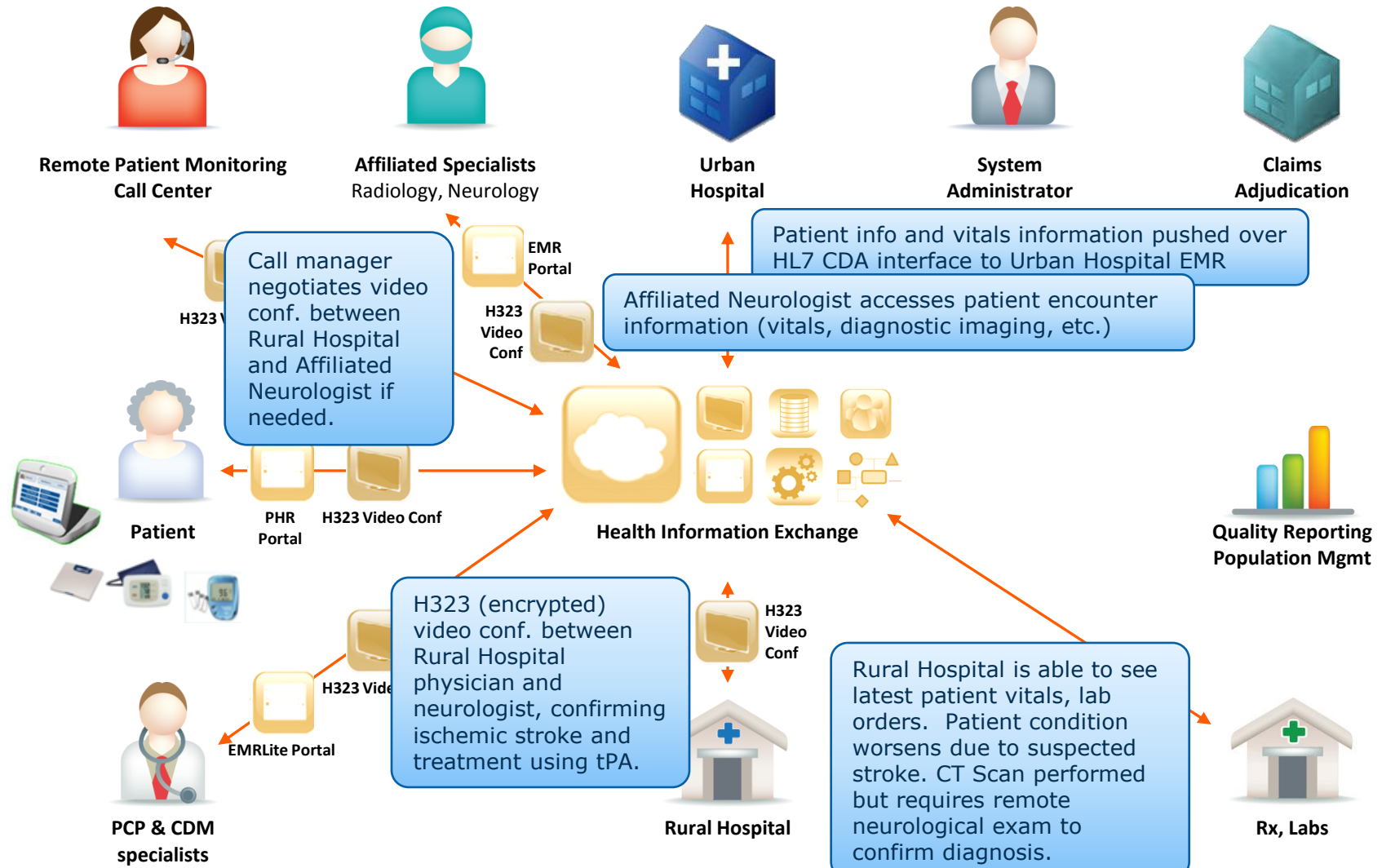
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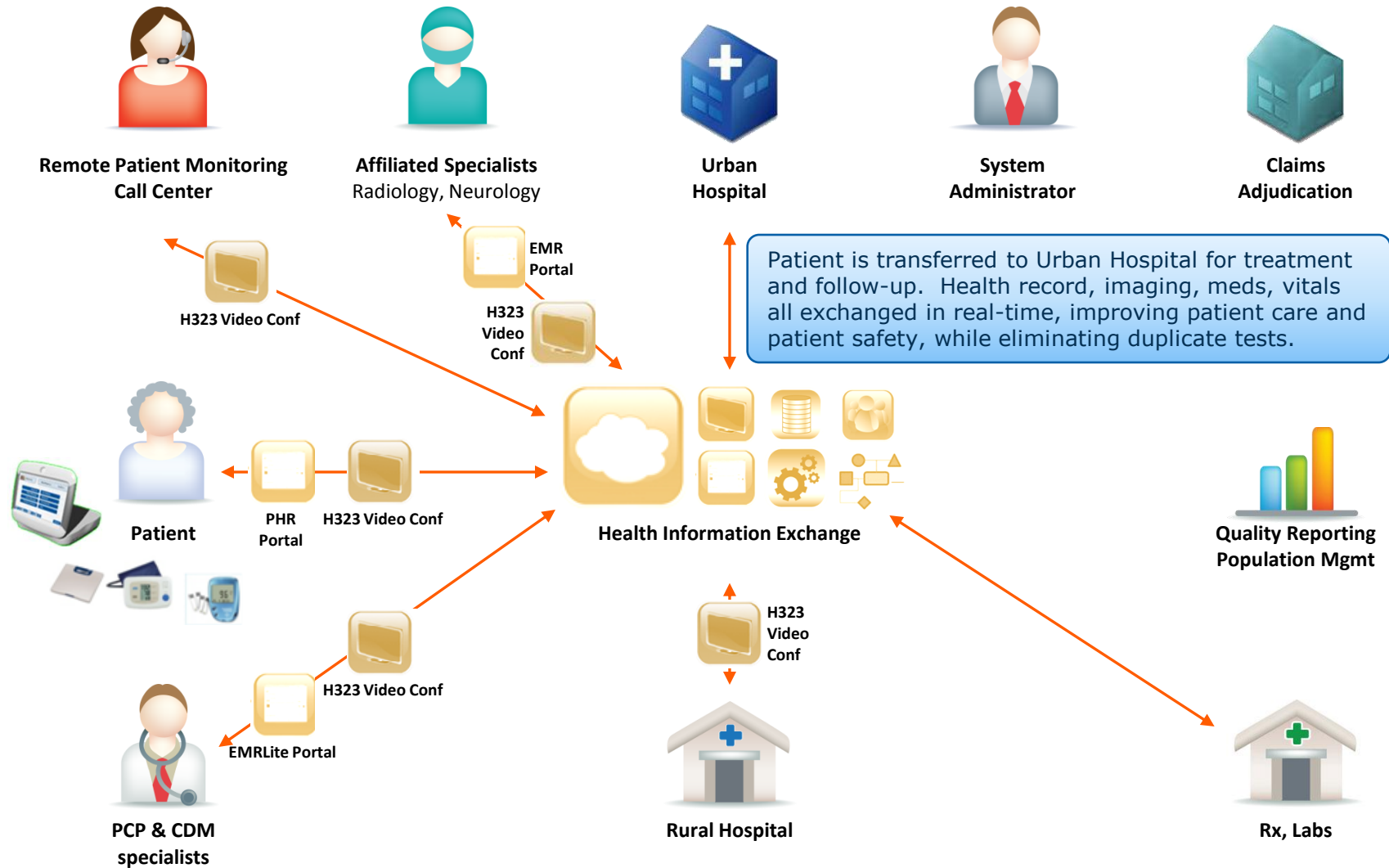
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Digital Health Group





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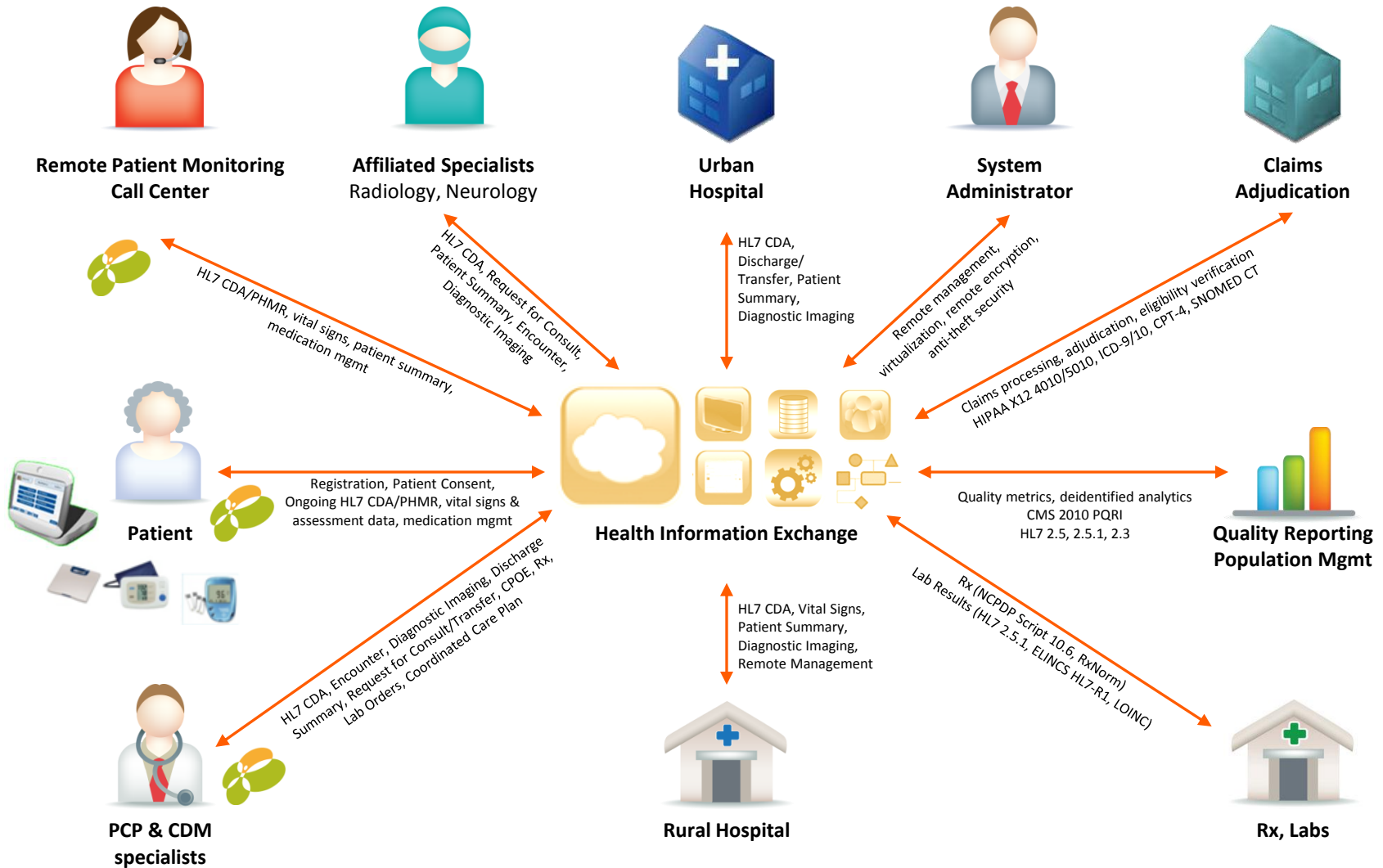
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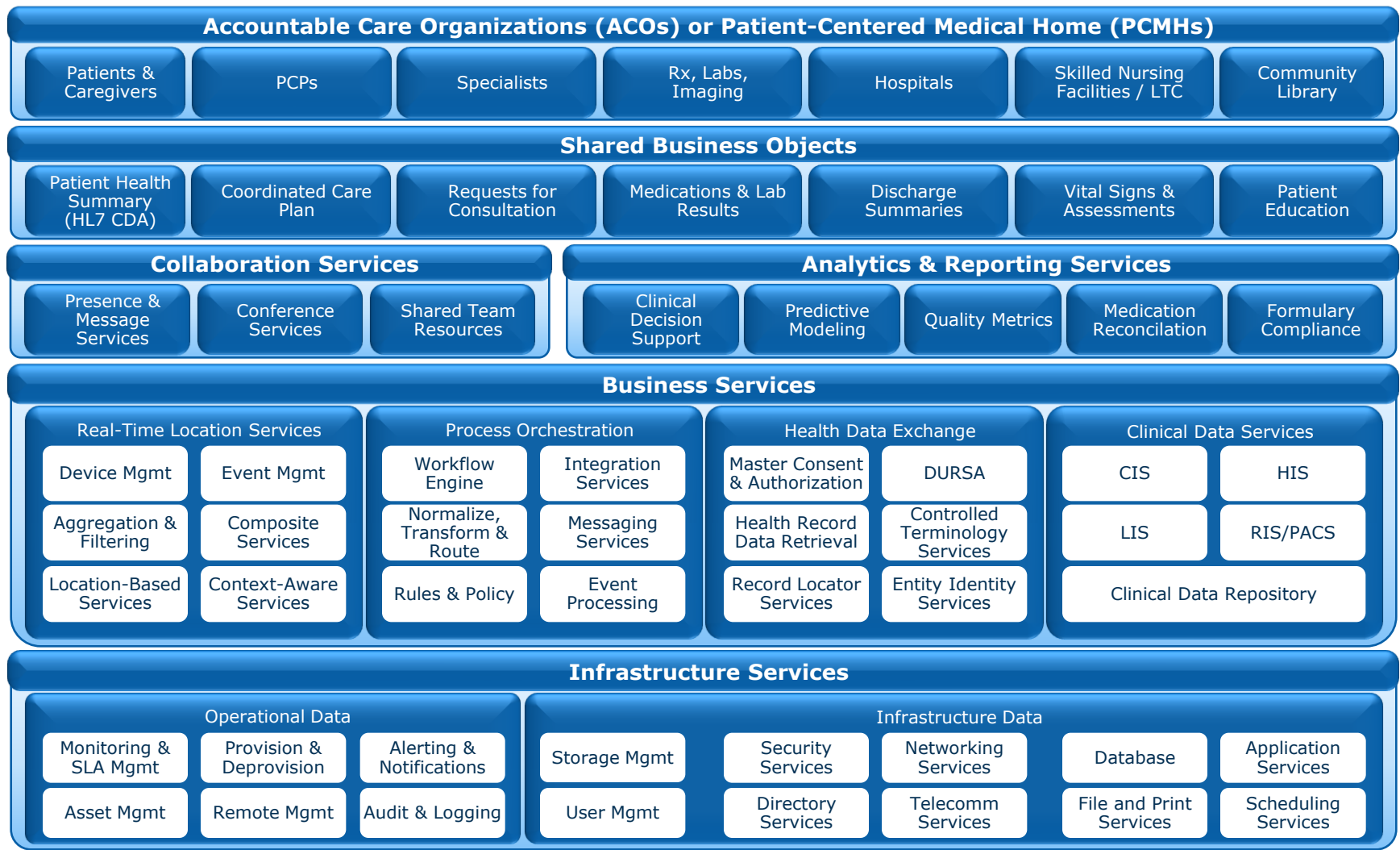
Digital Health Group





- 1 Gather & Store Data
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Health Information Network Solution Architecture





Cloud Computing



Cloud Computing Business Drivers

Business Benefits

High-Level IT Strategies and Goals

Efficiency

- Accelerate virtualization to create a **multiple tenant** environment
- Deploy new, retire old servers to improve energy efficiency
- Drive higher utilization via **resource pools** and consolidation

Agility

- Improve provisioning time from days to hours
- Automate workflows to enable consistency, agility and **elasticity**
- Opportunistic use of public cloud services, when applicable

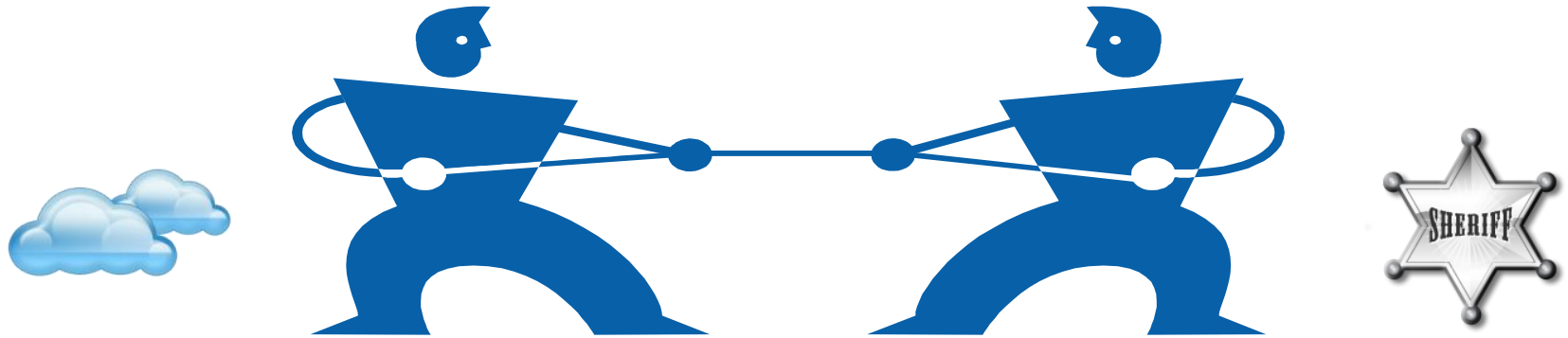
Availability

- Deliver high availability for all workloads, regardless of location
- Protect Intel IP, data and differentiated business processes
- Provide secure, **broad network access** on authenticated devices

Services

- **On demand, self-service portal** to streamline business processes
- Establish **measured services** for VM utilization, health and usage
- Apply actual application consumption for IT capacity management

Security in the Enterprise Cloud



Cloud / Virtualization

- Higher Utilization
- Fast Provisioning
- Flexibility
- Consolidation
- Multi-Tenancy

Security

- Cost of Downtime / Data Loss
- Risk of Company Image
- Concentration of Assets
- Compliance, Regulatory

Cloud Deployment requires Balancing Security Tensions

Security in the Cloud

Security Needs



Virtualization Benefits

Cloud and virtualization have inherent security requirements

- Abstraction of physical hardware
- Multi-tenancy movement implicitly require audit and security

"Google cloud told to encrypt itself"
R in RSA wants s in https"

—The Register

"Webhost hack wipes out data for 100,000 sites"
Vaserv suspects zero-day virtualization vuln"

—The Register

"IT ops, security pros at odds over virtualization risks"
IT pros upbeat about virtualization, whereas security experts harbor doubts about the security role the hypervisor can play"

—IDG News Service

Cloud Services and Virtualization Break Many Traditional Perimeter-oriented Security Techniques

Considering Cloud Deployment Today

"Private Clouds"



Virtual Private and Hybrid clouds



Cloud Brokers

"Public Clouds"



Deployed behind firewall for an organization's internal use

Best for:

- Security
- Compliance and Governance
- Interoperability

Example: ERP, business intelligence

Services via public internet, multi-tenant

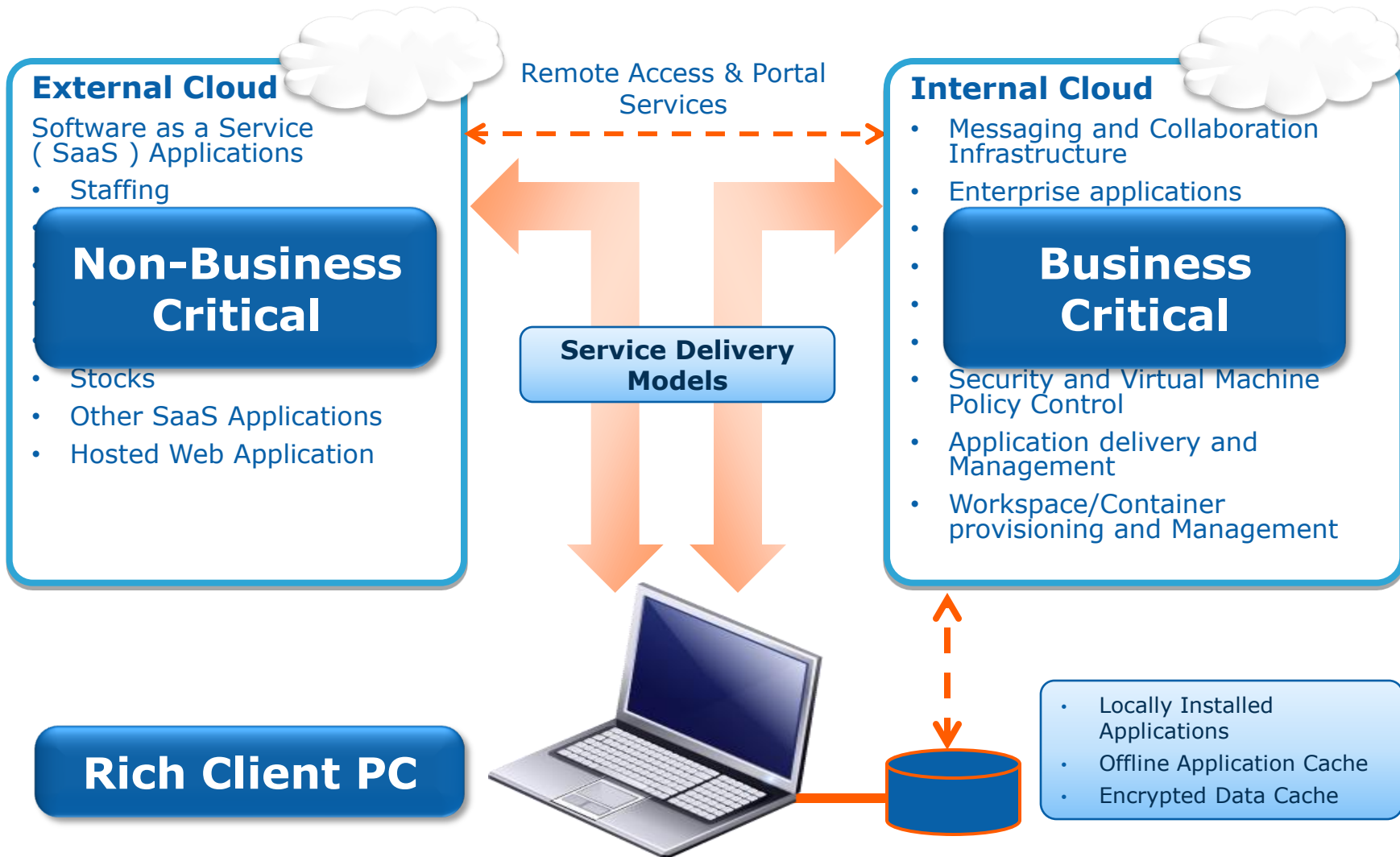
Best for:

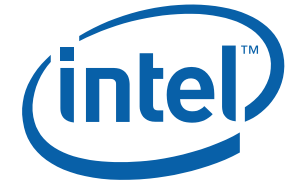
- Rapid Deployment
- Reduced Capital Expenditure
- External vendor expertise

Example: batch jobs, HR apps

Intel IT Strategy: develop private clouds while adopting selective best of breed public cloud services

Choosing the Right Deployment Balance

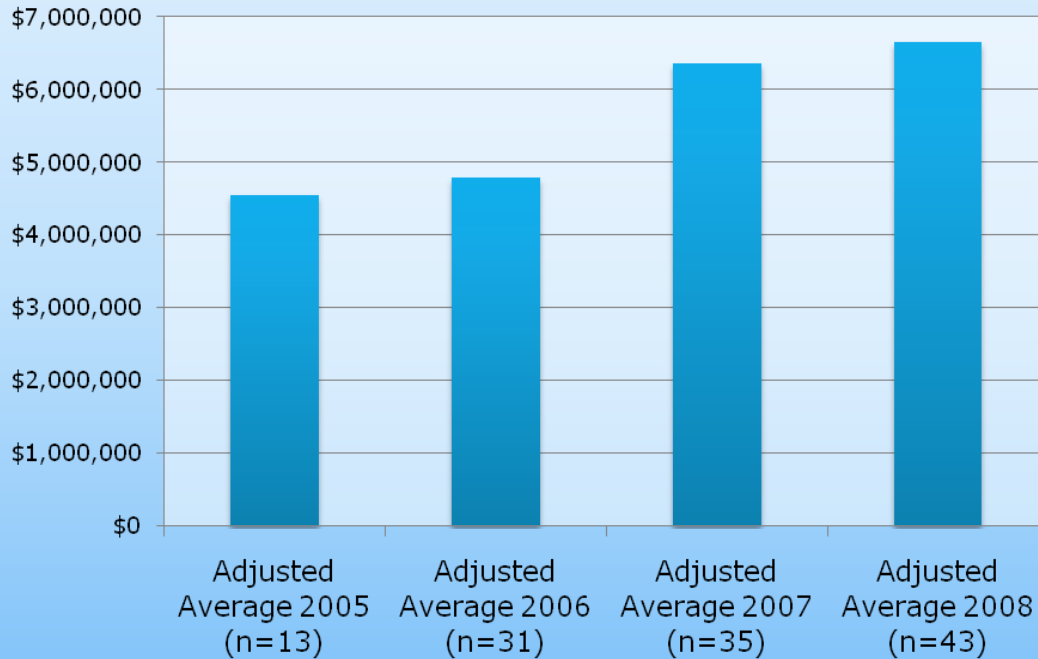




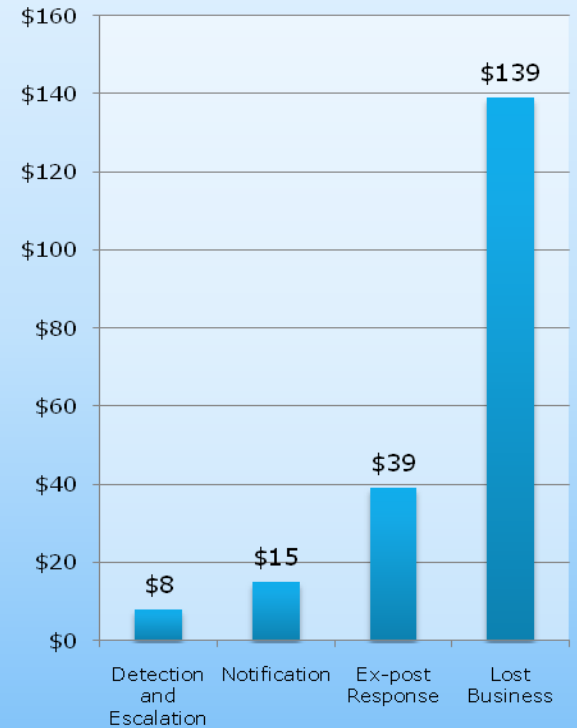
Secure Computing

Breaches Cost the Enterprise

Average Organizational Costs of a Data Breach, 2005-2008



Average Cost of Data Breach on a Per Victim Basis (2008)



**Risks are Growing, Costs are Increasing
Prevention the Best Solution**

HHS publishes online list of patient data breaches

Office for Civil Rights publicizes 64 recent health care data breaches involving 500 or more patients

By [Alice Lipowicz](#) Apr 19, 2010

- The Health and Human Services Department has started publishing an [online list](#) of more than 60 recent breaches of private patient health care data and intends to share the data for research and investigation.
- Under the economic stimulus law, HHS got authority to publish breach incidents that affect 500 or more persons. Covered entities, including physicians, hospitals and other health care providers, are required to report breaches of unsecured protected health information to the department in 60 days.
- HHS' Office for Civil Rights in recent weeks began publicizing on its Web site data breaches that affect more than 500 people, dating from July 2009 to March 2010.
- As of today the Web site lists 64 breach incidents. The largest breach is that of Blue Cross Blue Shield of Tennessee, where theft of hard drives affected data from more than 500,000 patients in October 2009. Most of the incidents involve theft or unauthorized access to laptop computers or other devices, **but some involve hacking and scamming.**

New Security Features with Intel® Xeon® Processor 5600

Advanced Encryption Standard New Instructions (AES-NI¹¹)

ORACLE
Microsoft
McAfee



Enables broad usage of encryption throughout the enterprise

Ready for Today

Intel® Trusted Execution Technology (TXT)

VMware
Parallels
HyTrust



Prevents the insertion of malicious software prior to VMM launch

Prepared for Tomorrow

Intel® TXT and Intel® AES-NI¹¹ Help Make Data Centers More Secure

HIPAA and Intel® vPro® Processor Technology

HIPAA Standard	HIPAA Specification Description	Benefits of Activating Intel® vPro® Processor Technology in your Enterprise
Security Awareness and Training HIPAA Section 164.308(a)(5)	Guard against, detect, and report malicious software	Minimize Security Vulnerabilities <ul style="list-style-type: none"> Proactively push software security updates, even when the PC is off or the OS is inoperable Monitor network traffic for malicious network behavior, isolate issues, and report incidents to a centralized management system
Security Incident Procedures HIPAA Section 164.308(a)(6)	Identify, respond and report suspected or known security incidents and outcomes	
Contingency Plan HIPAA Section 164.308(a)(7)	Restore loss of data	Remotely Enforce Compliance <ul style="list-style-type: none"> Provision PCs down-the-wire for quicker system restoration to access tools and data Automatically restore security and management agents and settings remotely to resolve non-compliance issues Remotely conduct asset inventory and assess the health of PC hardware and software from a centralized management console
Device and Media Controls HIPAA Section 164.310(d)(1)	Monitor removal of EPHI from electronic media for re-use	
Audit Controls HIPAA Section 164.312(b)	Monitor activity of information systems containing EPHI	
Access Control HIPAA Section 164.312(a)(1)	Encrypt and Decrypt EPHI	Helps Protect Data <ul style="list-style-type: none"> Encrypt and decrypt EPHI for storage and transmission without affecting end user productivity
Transmission Security HIPAA Section 164.312(e)(1)	Encrypt EPHI during transmission	

EPHI = Electronic Patient Health Information

Beyond Malicious Attacks, PC and Data Theft is ...

Frequent

- **2M laptops/year** are reported as **stolen** and **97% are never found**¹⁴
- **12,000 laptops per week** are **lost** or go missing at the airports¹⁵
- Since 2005, **46 breaches of protected health information (PHI)** representing **nearly 80M records** (76 Million from a VA breach).¹⁸

Costly

- **Average cost of a lost healthcare laptop was \$43,547** (not including data breach cost)¹⁶
- Average cost of a **data breach** for a health-care organization was **\$282 per customer record**¹⁷
- **HIPAA violations run \$100 - \$50,000 per violation** with an annual **maximum of \$1.5 million**



Survey: Healthcare organizations' security not up to HITECH standards¹⁸

Attempted hacker attacks in healthcare on the rise¹⁸

Smart Security Without Sacrificing Manageability:

Hardware-Based Security for PC and Data

Help Protect PCs from theft with Intel® Anti-Theft Technology¹³

- Disable access to data encryption keys and PC at hardware-level when PC is lost or stolen
- Via local PC triggers or remote IT issued “poison pill”
- Simple, remote reactivation upon PC recovery

**Supported by
Leading Software
Vendors:**

Absolute Software*,
McAfee*,
PGP*,
Wave*,
WinMagic Data Security*



Allina Hospitals & Clinics in US

- Customer Profile/Challenge
 - Headquartered in Minneapolis, Minnesota, **Allina Hospitals & Clinics (Allina) is an organization of 11 hospitals.**
 - **Allina has an extensive fleet of 3,800 mobile PCs** which put information at the caregiver's fingertips
 - **Allina has experienced a sharp increase in laptop theft** -- including an **incident that required public disclosure** of breached patient health information
- Solution
 - **Allina looked to Computrace with Intel AT for a high-tech solution for managing the systems and protecting against data breaches.**
- Comment from the Manager of Desktop Technology at Allina on Computrace + Intel AT
 - "If a computer is lost or stolen, Computrace with Intel AT is a lifeline. If we are concerned about the information on a laptop, we use Computrace to remotely delete the data. Even if the machine is out of reach, we can still 'brick' the system through a local timer. This is a very effective tool for protecting confidential data and reducing risk."



intel[®]
Health

Secure Mobile Computing

The need for Security in Mobile Computing: Data Theft

Frequent

- **2M laptops/year** are reported as **stolen** and **97% are never found**¹⁴
- **12,000 laptops per week** are **lost** or go missing at the airports¹⁵
- **Since 2005**, more than **263 million personal records have been exposed**²⁰

Costly

- The average **cost of a lost laptop is \$49,246**²¹

Often from the inside

- **70%** of all reported security **breaches** were **due to insiders**²²



Imagine if a laptop with hundreds or thousands of patient records is stolen

The need for Rich Client Computing in Mobile Healthcare Environments

- **Local data access**

- In environments where bandwidth is limited and always on access is not guaranteed; local data access needed to compute continuously and provide 24x7 patient care (*"What do you do when the network goes down?"*)

- **Large data set applications where latency matters** (aka: some apps run better locally)

- Image Intensive Applications (manipulating PACs images)
- Alternative data entry modalities
 - Voice:
 - Command and control
 - Authentication
 - Voice to txt
 - Handwriting recognition

- **Multi-tasking:** Running multimedia and txt apps simultaneously

- When it becomes important to Videoconference, look up both txt and image data simultaneously, and run CDSS you needs lots of MIPS

Common MPOC Project Opportunities: *Overcome Operational Bottlenecks in any Setting*



What is the Best Device For My Needs?



	Mobile Clinical Assistant	Tablet PC's	Laptop's	Fixed PC's
Mobility	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vital sign, I & O entry	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medication Administration	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Template data-entry	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Free-format text data-entry	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Large diagnostic images	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Data Inquiry	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Manageability	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>



MPOC Solutions: Greater Quality of Care, Improved Access, Optimized Workflow

- Reduce errors and delays by automating routine data collection and eliminating manual entry processes.
- Helps support fact-based decision making
- Enhance collaboration among the entire healthcare team both inside and outside the hospital.

“We expect mobility, along with **innovative applications**, to become the key driver in enabling clinicians to use technology to improve patient care.”

— *Wang Tao, Director of Information Center, Tian Tan Hospital*

“I think wireless mobility is very important. It’s the next step that we should be doing. **I can access it on my computer, my laptop from home, or wherever I am.** It makes time from the onset of a rhythm problem to delivering care to the patient so much shorter.”

— *Tracy Stevens, MD, Cardiologist, St. Luke’s Medical American Heart Institute*

Summary

- Three pain points coming
 - Falling Reimbursement; Enhanced Security requirements; Excess Readmissions Rule
- Alternative care delivery models to help mitigate above
 - PCMH and ACO
 - Global capitation, quality metrics, and gain sharing
- Health Information technologies that can assist with care delivery transformation
 - Cloud Computing
 - Secure computing
 - Secure Mobile Computing

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Legal Disclaimers

1. Estimates by AMA April 7 2010
2. HiTech Act, Division A Title XII, Subtitle D Part 1 Sections 13401-11
3. The Patient Protection and Affordable Care Act (HR 3590 enrolled: Sec 3025)
4. Patient Protection and Affordability Care Act 2010
5. Patient Centered Primary Care Collaborative 2008 www.pcpcc.net
6. Patient Protection and Affordability Care Act 2010; Sec 3022
7. Reference: TELEMEDICINE and e-HEALTH. DEC 2008; VOL.14(10):1118-1126
8. The Value From Investments In Health Information Technology At The U.S. Department Of Veterans Affairs HEALTH AFFAIRS 29, NO. 4 (2010): 629–638
9. Ponemon Institute - 2008 Annual Study: Cost of a Data Breach . February 2009
10. <http://fcw.com/articles/2010/04/19/hhs-publishing-online-list-of-patient-data-breaches.aspx>
11. AES-NI is a set of instructions that consolidates mathematical operations used in the Advanced Encryption Standard (AES) algorithm. Enabling AES-NI requires a computer system with an AES-NI-enabled processor as well as non-Intel software to execute the instructions in the correct sequence. AES-NI is available on Intel® Core™ i5-600 Desktop Processor Series, Intel® Core™ i7-600 Mobile Processor Series, and Intel® Core™ i5-500 Mobile Processor Series. For further availability of AES-NI enabled processors or systems, check with your reseller or system manufacturer. For more information, see http://softwarecommunity.intel.com/isn/downloads/intelavx/AES-Instructions-Set_WP.pdf.
12. Intel® Active Management Technology requires the platform to have an Intel® AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. With regards to notebooks, Intel AMT may not be available or certain capabilities may be limited over a host OS-based VPN or when connecting wirelessly, on battery power, sleeping, hibernating or powered off. For more information, see <http://www.intel.com/technology/manage/iamt>
13. Intel® Core™ vPro™ processor family includes Intel® Anti-Theft Technology—PC Protection (Intel® AT). No computer system can provide absolute security under all conditions. Intel® Anti-Theft Technology (Intel® AT) requires the computer system to have an Intel® AT-enabled chipset, BIOS, firmware release, software and an Intel AT-capable Service Provider/ISV application and service subscription. Certain functionality may not be offered by some ISVs or service providers and may not be available in all countries.

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14. Processor, May19,2006
15. Ponemon Institute 2008
16. The Cost of a Lost Laptop, Ponemon Institute, April 2009, Sponsored by Intel Corporation
17. Fourth Annual US Cost of Data Breach Study, Ponemon Institute, January 2009, Sponsored by PGP Corp
18. healthcareitnews.com
19. Requires full disk encryption software and/or hardware enabled for this usage of Intel® vPro™ technology
20. Privacy Rights Clearinghouse, Sep, 2009
21. Ponemon Institute April 2009
22. CNET News.com, January 2005, from Ponemon Institute Survey (163 F1000 companies)
23. Systems using Client Initiated Remote Access require wired LAN connectivity and may not be available in public hot spots or “click to accept” locations. For more information on CIRA go to: <http://www.intel.com/products/centrino2/vpro/>

BACKUP

Legal Disclaimers

1. “Using Total Cost of Ownership to Determine Optimal PC Refresh Lifecycles”, Wipro Technologies, March 2009 (www.wipro.com/industryresearch). Based on a survey of 106 firms in North America and Europe representing 15 different industries and projections based on a Model Company developed by Wipro Technologies. Computer system price data updated November 2009. Actual results may vary based on the number of use-cases implemented and may not be representative of results that individual businesses may realize. For additional implementation examples refer to Intel Case Studies available at <http://communities.intel.com/openport/docs/DOC-1494>.
 - The new PC year 1 costs represent support costs associated with the PC. The year 4 costs include both support costs as well as out of warranty repair costs. The values for both support and out of warranty repair costs were calculated by Wipro as an average of the costs reported by the 106 companies interviewed for the Wipro Technologies paper.
 - Notebook year 1 (new PC) support costs = \$716.
 - Desktop year 1 (new PC) support costs = \$433.
 - Notebook year 4 support + out of warranty repair costs = \$1136 + \$348 = \$1484 which is \$768 higher than new PC (\$768 = \$1484 - \$716).
 - Desktop year 4 support + out of warranty repair costs = \$688 + \$120 = \$808 which is \$375 higher than new PC (\$375 = \$808 - \$433).
2. Activated features include Intel® Active Management Technology. Intel® Core™ vPro™ processor family includes Intel® Active Management Technology (Intel® AMT). Intel AMT requires the computer system to have an Intel AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. Setup requires configuration by the purchaser and may require scripting with the management console or further integration into existing security frameworks to enable certain functionality. It may also require modifications of implementation of new business processes.
3. Intel® Core™ vPro™ processor family includes Intel® Anti-Theft Technology—PC Protection (Intel® AT). No computer system can provide absolute security under all conditions. Intel® Anti-Theft Technology (Intel® AT) requires the computer system to have an Intel® AT-enabled chipset, BIOS, firmware release, software and an Intel AT-capable Service Provider/ISV application and service subscription. The detection (triggers), response (actions), and recovery mechanisms only work after the Intel® AT functionality has been activated and configured. Certain functionality may not be offered by some ISVs or service providers and may not be available in all countries. Intel assumes no liability for lost or stolen data and/or systems or any other damages resulting thereof.
4. “Using Total Cost of Ownership to Determine Optimal PC Refresh Lifecycles”, Wipro Technologies, November 2009 (www.wipro.com/industryresearch). Based on a survey of 106 firms in North America and Europe representing 15 different industries and projections based on a Model Company developed by Wipro Technologies. Computer system price data updated November 2009. Actual results may vary based on the number of use-cases implemented and may not be representative of results that individual businesses may realize. For additional implementation examples refer to Intel Case Studies available at <http://communities.intel.com/openport/docs/DOC-1494>.”
5. J. Gold Associates Research Report. <http://ipip.intel.com/gp/7409/jgold-keeping-notebooks-past-prime/>
6. Source: Intel. Actual time saved depends on network traffic conditions, the amount of user data migrated, and applications, drivers, or policies downloaded during the migration process. Data collected by Intel on various desktop and mobile PCs migrated to Windows 7 under various conditions.
 - MMS demo showing remote, wireless Windows 7 upgrade on Win XP laptops: <http://www.vimeo.com/4430604>.
 - A shortened video is also available on SMCR at: [Brad Anderson 2009 Keynote Demo](#)
7. Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM) and, for some uses, certain computer system software enabled for it. Functionality, performance, or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

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8. (Cross Client) Cross client claim based on lowest performance data number when comparing desktop and mobile benchmarks. Configurations and performance test as follows: (Mobile) Comparing pre-production Intel® Core™ i5-520M processor based laptops to theoretical installed base of Intel® Core™2 Duo processor T5500. Laptop system configurations: Intel® Core™ i5-520M (3 MB Cache, 2.4 GHz), with Intel® Turbo Boost Technology and Intel® Hyper-Threading Technology on pre-production Intel® Ixex Peak HM55, Dual-channel Micron* 4 GB (2x2 GB) DDR3-1066 7-7-7-20 with Intel® Graphics Media Accelerator HD graphics, Hitachi* 320 GB HDD, Intel® Matrix Storage Manager 8.9.0.1023 (BIOS, Intel® INF and Graphics: pre-production, Imoncompliant with VRD 11.1 requirements) Microsoft* Windows* 7 Ultimate 64-bit RTM. Intel® Core™2 Duo processor T5500 (2 MB Cache, 1.66 GHz, 667MHz FSB) in Lenovo* Thinkpad* T60 laptop, Mobile Intel® 945GM Express Chipset, Micron* PC5300 DDR2 667 2x1 GB 5-5-5-15 memory, Intel® GMA 950 graphics 224 MB Dynamic video memory technology, Hitachi* Travelstar* HTS721010G9SA00 SATA 100 GB 7200RPM HDD, BIOS Lenovo* 79ETD7WW 2.17 with default settings, Microsoft* Windows* Vista Ultimate. Business productivity claims based on SYSmark* 2007 preview is BAPCo's latest version of the mainstream office productivity and Internet content creation benchmark tool used to characterize the performance of the business client. SYSmark 2007 preview features user-driven workloads and usage models developed by application experts. Multitasking claims based on financial calculations workload consisting of advanced spreadsheet calculation measured using Microsoft* Excel* Monte Carlo Simulation plus Virus Scan. Security workload consists of Winzip*12 decompressing an encrypted archive containing 200 photos, 125 of which are 10MP photos and 75 which are 6MP photos. The photos are in jpeg format. The total size of all the photos is about 830 MB. (Desktop) Comparing pre-production Intel® Core™ i5-650 processor based desktops to theoretical installed base of Intel® Core™2 Duo Processor E6400 with comparable frequency. Desktop configurations: pre-production Intel® Core™ i5-650 processor (4MB Cache, 3.20 GHz) on pre-production Intel® Ixex Peak P55, Dual-channel DS Micron* 4 GB (2x2 GB) DDR3-1333 9-9-9-24 with Intel® Graphics Media Accelerator HD graphics @ 900 MHz, Seagate* 1TB HDD, Intel® Matrix Storage Manager 8.9.1023 (BIOS, Intel® INF and Graphics: pre-production, Imoncompliant with VRD 11.1 requirements), Microsoft* Windows* 7 Ultimate 64-bit RTM Intel® Core™2 Duo Processor E6400 (2M Cache, 2.13 GHz, 1066 MHz FSB) on Intel® DQ45CB, Dual channel DS Micron* 2 GB (2x1 GB) DDR2-800 5-5-5-18 with Integrated Intel® GMA 3000 onboard graphics subsystem, Seagate* 320 GB HDD, (BIOS:0059, Intel® Chipset INF: 8.4.0.1016, Graphics: 7.14.10.1329), Microsoft* Windows* 7 Ultimate 64-bit RTM, Microsoft* Windows* Vista Ultimate 32-bit. Business productivity and energy claims based on SYSmark* 2007 preview is BAPCo's latest version of the mainstream office productivity and Internet content creation benchmark tool used to characterize the performance of the business client. SYSmark 2007 preview features user-driven workloads and usage models developed by application experts. Multitasking claims based on financial calculations workload consists of advanced spreadsheet calculation measured using Microsoft* Excel* Monte Carlo Simulation plus Virus Scan. Security workload consists of Winzip*14 decompressing an encrypted archive containing 200 photos, 125 of which are 10 MP photos and 75 which are 6 MP photos. The photos are in jpeg format. The total size of all the photos is about 830 MB.
10. KVM Remote Control (Keyboard Video Mouse) is only available with dual-core Intel® Core™ i5 vPro™ processors and i7 vPro™ processors with active integrated graphics. Discrete graphics are not supported.
11. "Using Total Cost of Ownership to Determine Optimal PC Refresh Lifecycles," Wipro Technologies, March 2009 (<http://www.wipro.com/resource-center/wipro-council-for-industry-research/research-perspectives.htm>). Based on a survey of 106
- firms in North America and Europe representing 15 different industries and projections based on a Model Company developed by Wipro Technologies. Actual results may vary based on the number of use-cases implemented and may not be representative of results that individual businesses may realize. For additional implementation examples refer to Intel Case Studies available at <http://communities.intel.com/docs/DOC-1494>.
 - PCs older than 3 years show a marked increase in the number of security incidents.
 - In year 4, PCs experience a 53% increase in the number of security incidents compared to PCs in year 1.
 - In year 5 they experience an 87% increase, while those that are 6 years and older experience a 120% increase in the number of security incidents.
12. Source: Processor, May19,2006
13. Source: Privacy Rights Clearinghouse, Sep, 2009
14. Source: Ponemon Institute April 2009
15. Source: Ponemon Institute 2008
16. Source: CNET News.com, January 2005, from Ponemon Institute Survey (163 F1000 companies)
17. Requires full disk encryption software and/or hardware enabled for this usage of Intel® vPro™ technology

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18. Case studies based on organizations with at least 7800 PCs. Actual results may vary based on the number of use-cases implemented and may not be representative of results that individual businesses may realize. For additional implementation examples refer to Intel Case Studies available at <http://communities.intel.com/openport/docs/DOC-1494>.
22. Forrester Consulting: Increased Productivity By Providing Notebooks Beyond The Road Warriors
http://governmentsecurity.bitpipe.com/detail/RES/1239220213_575.html
23. Telework in Montana State Government <http://www.leg.mt.gov/content/Publications/Audit/Report/06SP-05.pdf>
24. How Come Distributed Work is Still the Next Big Thing? http://www.thefutureofwork.net/assets/WP-20061-Distributed_Work_Next_Big_Thing.pdf
25. Forrester: The Total Economic Impact™ of Increasing Enterprise Notebook Adoption
http://www.cisointelalliance.com/_files/pdf/Intel%20Workplace%20Mobility%20Study%20-%20TEI%20Report.pdf
26. Source: IT@Intel whitepaper, Enterprise-wide Deployment of Notebook PCs with Solid-State Drives.
http://download.intel.com/it/pdf/Enterprise-wide_Deployment_of_Notebook_PCs_with_Solid-State_Drives.pdf
27. Hyper-Threading Technology requires a computer system with a processor supporting HT Technology and an HT Technology enabled chipset, BIOS, and operating system. Performance will vary depending on the specific hardware and software you use.
28. Intel® Turbo Boost Technology available on the Intel® Core™ i7 processor and the Intel® Core™ i5 processor only. Intel® Turbo Boost Technology requires a PC with a processor with Intel Turbo Boost Technology capability. Intel Turbo Boost Technology performance varies depending on hardware, software, and overall system configuration. Check with your PC manufacturer on whether your system delivers Intel Turbo Boost Technology. For more information, see <http://www.intel.com/technology/turboboost>.
29. Systems using Client Initiated Remote Access require wired LAN connectivity and may not be available in public hot spots or “click to accept” locations.
30. “AES-NI is a set of instructions that consolidates mathematical operations used in the Advanced Encryption Standard (AES) algorithm. Enabling AES-NI requires a computer system with an AES-NI-enabled processor as well as non-Intel software to execute the instructions in the correct sequence. AES-NI is available on Intel® Core™ i5-600 Desktop Processor Series, Intel® Core™ i7-600 Mobile Processor Series, and Intel® Core™ i5-500 Mobile Processor Series. For further availability of AES-NI enabled processors or systems, check with your reseller or system manufacturer. For more information, see http://softwarecommunity.intel.com/isn/downloads/intelavx/AES-Instructions-Set_WP.pdf.
31. <http://www.healthcareitnews.com/blog/privacy-security-personal-health-information>
32. The Cost of a Lost Laptop, Ponemon Insitute, April 2009, Sponsored by Intel Corporation
<http://www.ponemon.org/local/upload/fckjail/generalcontent/18/file/Cost%20of%20a%20Lost%20Laptop%20White%20Paper%20Final%203.pdf>
33. Fourth Annual US Cost of Data Breach Study, Ponemon Institute, January 2009, Sponsored by PGP Corp,
<http://www.ponemon.org/local/upload/fckjail/generalcontent/18/file/2008-2009%20US%20Cost%20of%20Data%20Breach%20Report%20Final.pdf>
34. <http://www.healthcareitnews.com/news/survey-healthcare-organizations-security-not-hitech-standards>
35. <http://www.healthcareitnews.com/news/attempted-hacker-attacks-healthcare-rise>
36. <http://www.healthcareitnews.com/news/connecticut-ag-sues-health-net-over-security-breach>