



The Business Value of Healthcare IT from the Hospital to the Home

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Agenda

- Intel Digital Health Group
- Business Value Model
 - Overview
 - Digital Hospital
 - Mobile Point Of Care
 - Telehealth
- Q&A

An Alternative Approach

Andy Grove

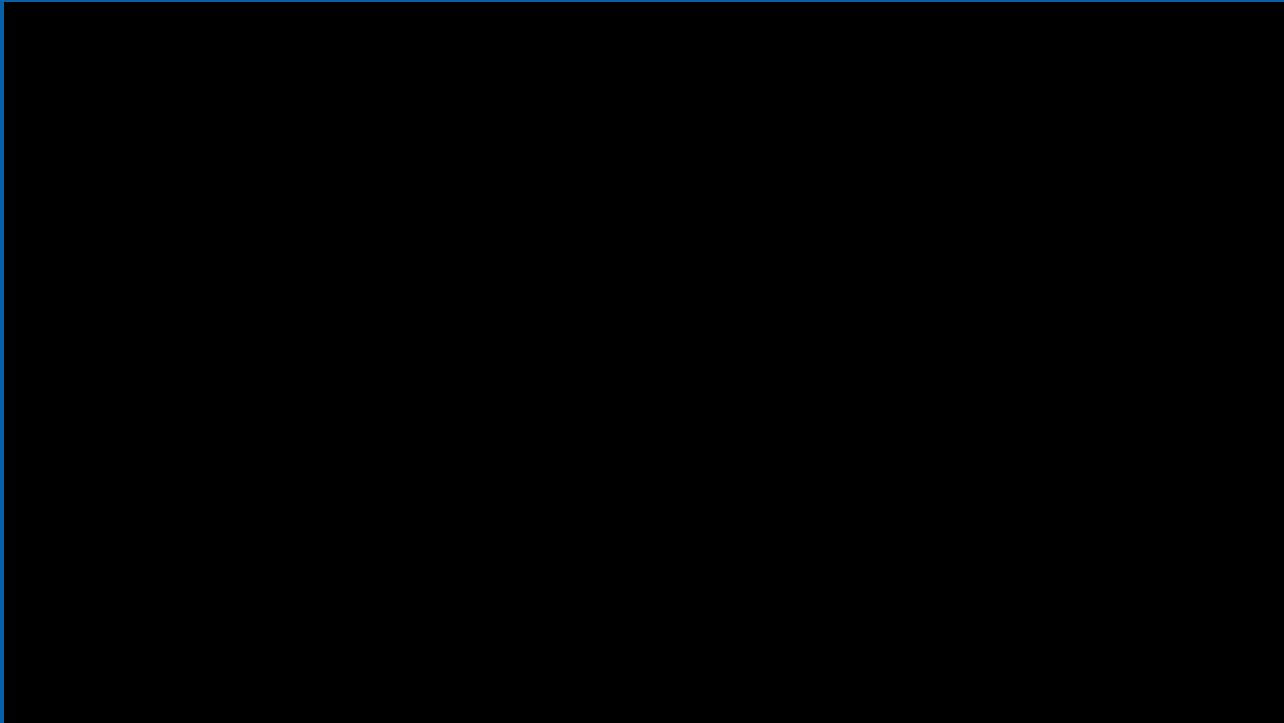
Intel co-founder



Andy Grove in an interview in Fortune described the health care situation as follows: *“Healthcare is the largest segment of the economy...and ... it is becoming too expensive to deliver. We're still living in the "mainframe" era of healthcare.... We can't, as a society, afford to devote any more of our economy to it ... What we need is ...the healthcare equivalent of the low cost PC”*

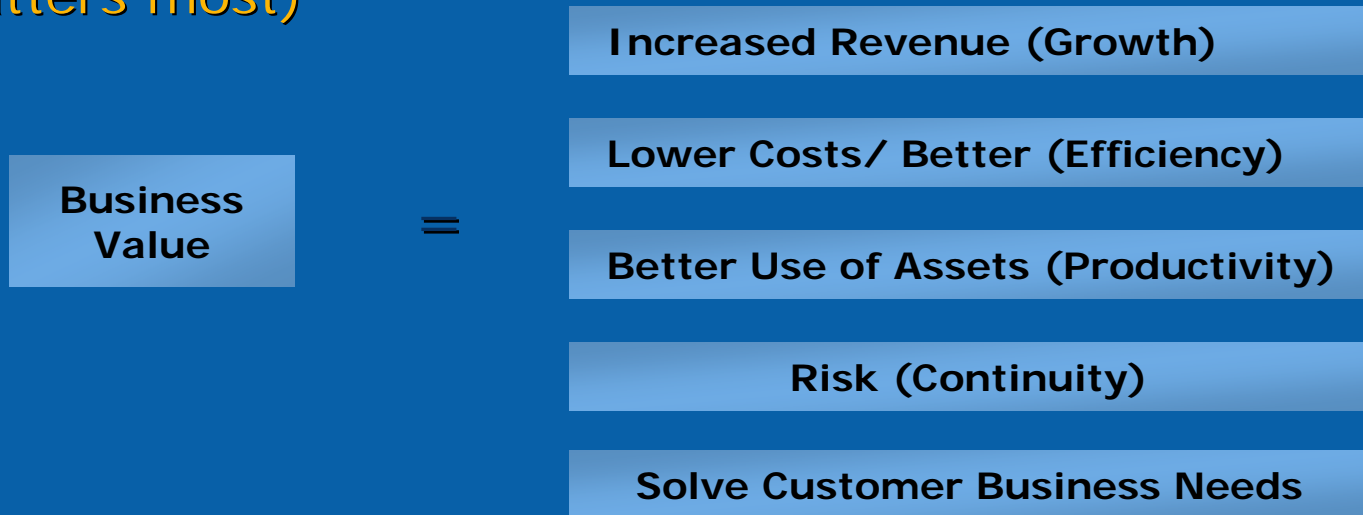
Intel Digital Health Strategy





Defining IT Business Value

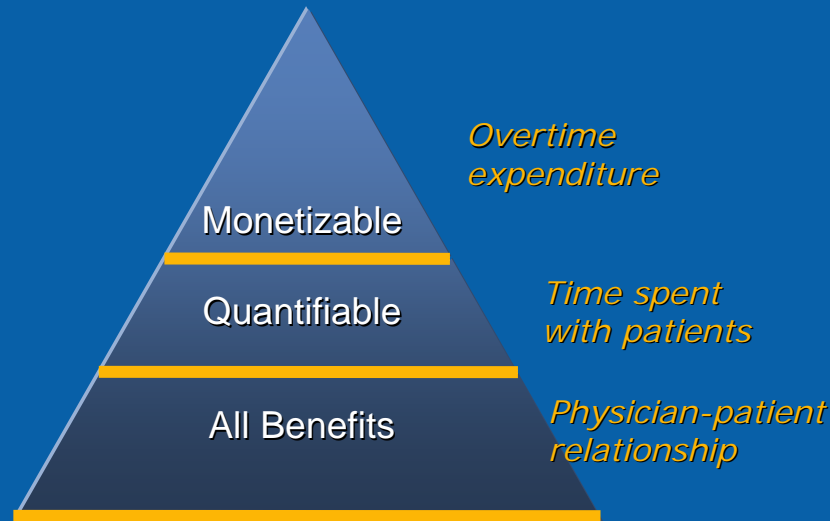
- Business Value is the benefit in monetary terms that results from IT products or services
 - It is the contribution IT makes to helping a an organization achieve their strategic objectives (what matters most)



- There is no such thing as an IT investment, there are only IT enabled "business" investments

Industry-Tested Approach to Identifying Business Value

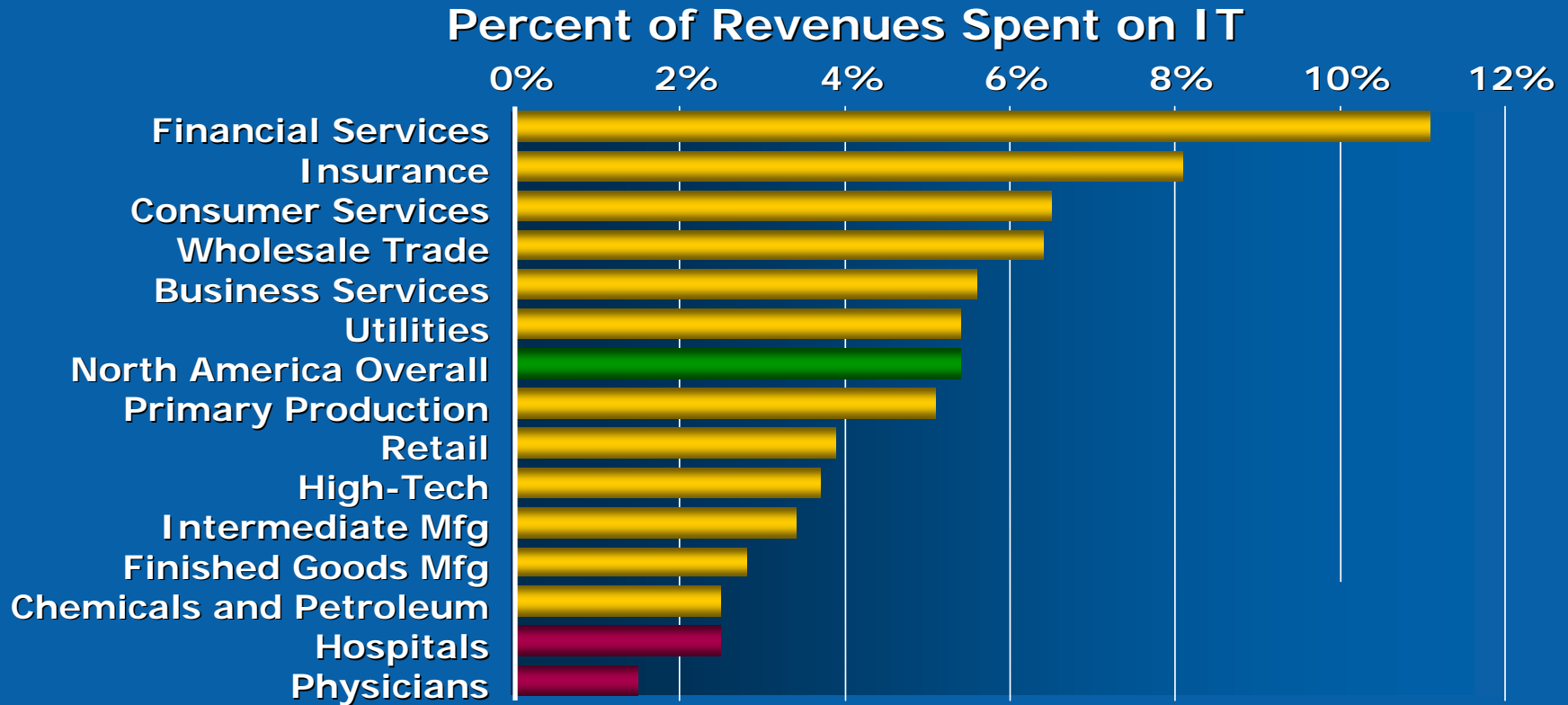
- Business Value: Improved ability to achieve strategic business objectives
- Improve quality of care, patient safety, staff productivity, revenue, costs...



*Not all benefits are quantifiable.
Not all quantifiable benefits are monetizable.*

Business Value Model focuses on monetizable benefits.

Healthcare's Low IT Adoption Rate



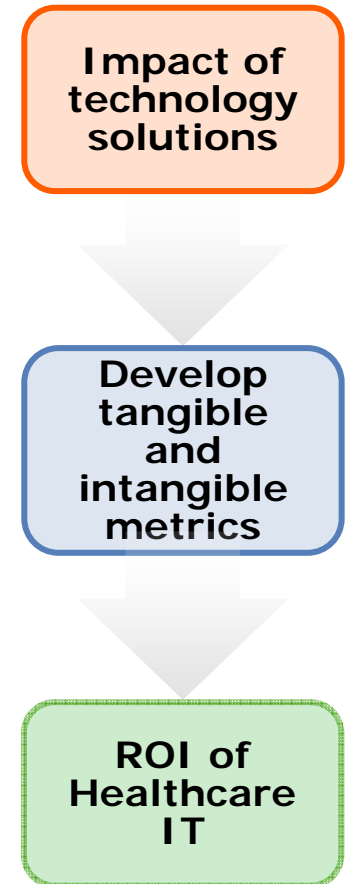
Why?

- **Business value** of HIT investments not well understood
- IT capital competes with clinical technologies
- IT perceived as expensive and difficult to implement
- Cultural resistance



Measuring Business Value: Value Dials

Value Dial	Measures	Metrics (Key Performance Indicator)
Financial	Revenue Enhancement	Covered Lives / Membership
		Employer Satisfaction
		# of Accounts
		New Product Revenue
	Medical Cost Reduction	Hospitalisation Rate
		Emergency Room Visit Rate
		Length of Stay (in Hospital)
		Medical Loss Ratio (MLR)
		Rx, Dx & Lab Costs
	Administrative Cost Reduction	Clinical Staff Productivity
		Administrative Cost / Revenue Ratio
		Avg. Time to Process Claim
Clinical	Quality of Care	Employee Retention Rate
		Mortality Rate
		Adherence to Guidelines
		Vital Signs / Test Results Improvement Rate
		Medication Compliance Rate
		Health Improvement Rate
Satisfaction	Member Satisfaction	Member Satisfaction Rate
		Member Retention Rate
	Provider Satisfaction	Provider Satisfaction Rate
Regulatory	Regulatory Compliance	DIN-ISO, EFQM, KTQ, Procum-Cert, etc



Measuring Business Value: Process

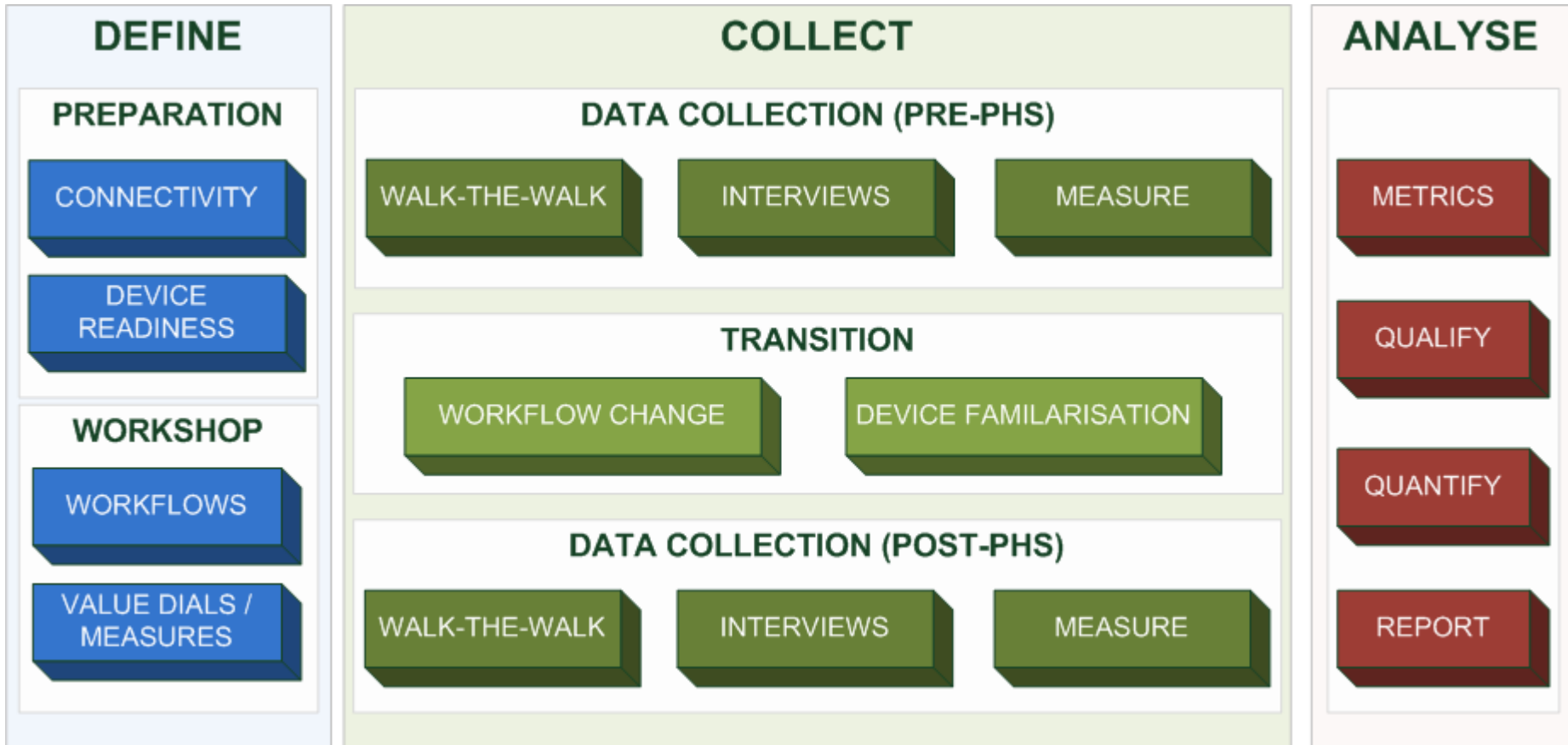
The Process of Measuring

Key Measurement Tasks:

- Document metrics plan (i.e., define value dials)
- Perform baseline measurement
- Implement the IT solution
- Perform post-implementation measurement
- Analyse results and determine business value



Measuring Business Value - Process



Digital Hospital Value Model

Intel HIT Economic Model

ROI Summary

Value Dials

Choose a Value Dial to see the IT investment impact.

Low Medium High

Patient Safety



Quality of Care



Patient Satisfaction



Staff Productivity



Revenue Enhancement



Cost Optimization



Staff Productivity

Value Measurement	Impact	Technology	Case Studies
Avg. physician visits per day	25/day	mobile/EMR	view
Physician time waiting for film proces or location	5-80 min/day		view
Annual lost revs searching for record per physician	\$380k	EMR	view
Retrieving surgery notes - admin staff time	10 min/visit	mobile/EMR	view
Annual transcription cost per provider	\$9.60k	EMR	view
Maintenance of paper charts/yr	\$8.00	EMR/p. mgt	view
Paper forms expense	\$10k per mon.		view

Choose IT investments below to explore their impact on the healthcare value dials

Basic IT

Billing System or Hospital Admin.

Basic wired infrastructure

Traditional client terminal systems

Paper-based systems

Infrastructure

Electronic process automation

(HIS, CIS, Financials)

Secure access to traditional backend (terminal services)

Automation "Siloes" (lab, ward, pharmacy, etc.)

Automation

Mobile point of care

Electronic Medical Records (EMR)

Computerized Physician Order Entry (CPOE)

Image Mgt. & Integration (RIS / PACS / HIS)

Integration

Full digital integration of solutions & data using SOA

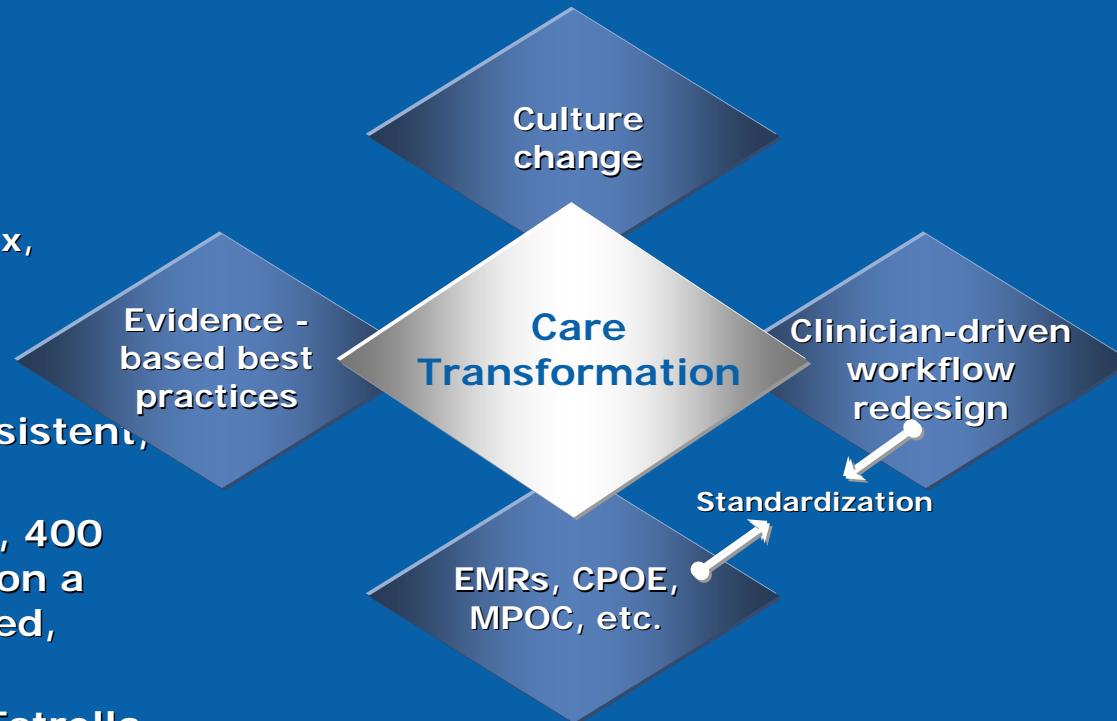
Asset / patient tracking (RFID)

VoIP / location based services

Evidence-based medicine

Investing in Healthcare IT: Banner Health

- One of largest US nonprofit healthcare systems
 - US \$3.3B
 - 20 hospitals, 7 states
 - Based in fast-growing Phoenix, Arizona
 - 3,065 licensed acute hospital beds
 - 187,588 annual admissions
- Franchised approach for consistent, high-quality care
- 300 clinicians across system, 400 process improvements built on a foundation of standards-based, interoperable HIT
- First deployment at Banner Estrella Medical Center, opened January 2005



Comprehensive, clinician-driven initiative to improve care



Measuring the Impact: Monetized Business Value at Banner Estrella

- Collaborated with Intel & Cerner to use the Intel Business Value Model
- Analysis was conservative
- 10 key indicators produced about **\$1.6M** annual savings to Banner Estrella's EBITDA (excluding ALOS impact)
- Annual benefits of approximately **\$2.6M** including ALOS impact
- Highest Press-Gainey scores in Banner Health's 20-hospital network
- Further benefits expected as BEMC matures and Banner implements Care Transformation at all 20 hospitals

Best Practices

Holistic approach

Strong leadership at all levels

Patient-focused, clinician driven initiative

Interoperable, standards-based solutions on scalable Intel® platforms

Information at the point of care – wireless facility, 1.8 PCs/patient

Banner Estrella Quantitative Benefits

Areas of Study	Effect ($\Delta\%$) Case mix adjusted
Average length of stay (ALOS) reduction	- 7.1%
Overtime reduction	- 5.3%
Pharmacy cost reduction	- 17.8 %
Forms elimination	- 41.6 %
Document storage cost reduction	- 95.6 %
Adverse drug event (ADE) reduction	- 84.3 %
Medical-related claims avoidance	- 71.8 %
Days in A/R reduction	- 2.2 %
Nursing staff turnover	- 15.8 %
Reduced ED left without treatment (LWOTs)	- 1.8 %

Using the Intel HIT economic model to measure bottom-line impacts

Qualitative Benefits

CMO: "Patients start healing sooner. They experience higher quality care and fewer errors."

MD: "When treatment guidelines change, we can embed them into the system and change our practices quickly."

Director of Pharmacy: "Pharmacists can make a more valuable contribution."

Director of Nursing: "Nurses can develop a better plan of care and intervene more effectively for the patient."

RN: "Nurses have time to develop more empathy with the patient."

Chief of Staff: "It gives me a level of comfort in the care I provide that I didn't have before."

MD: "We've removed delays that are inherent in a paper system."

CMO: "It has become a selling point for us."

RN: "I would never go back to a paper-based hospital."

Mobile Point of Care Value Model

Going Mobile at the Point of Care (MPOC): What is it?

Mobile Point of Care
(MPOC)



Workflow Solution = **SUM** of the parts, not any part in isolation

Why Mobility Matters?

Everyone and everything moves

- Patients
- Staff
- Equipment



Resource location is Mission Critical

- Cost
- Quality
- Access



Workflow increasingly dependent on I.T.

- Practice Guidelines
- Clinical Decision Support
- Task/Change-based Systems

Problem

Everything moves in a healthcare environment yet most computers don't



Solution

MPOC frees up workflows from physical boundaries



Outcome

Clinicians more effective, efficient, spend more time with patients



Usage Models Drive Design of MPOC Solution

"Walk Around"

'Grab & Go' Patient-2-Patient



"Wheel Around"

Room-2-Room



"Walk and Dock"

Patient Care & Office
Usage Model



MPOC - Salford Royal

- Engagement
- Assess / Map Concerns
 - Identified Value Dials
 - Defined KPIs
- Pre-Pilot Analysis
 - Map workflows
 - Data collection
- Pilot
 - Introduce IT solution
 - Collect data
- Results
 - Analysis
 - White Paper

Value Dials	Key Performance Indicators
Quality of Care	Reduced length of stay
	Reduced risk of infection
	Compressed order lifecycle
Patient Satisfaction	Improvements in patient satisfaction
Staff Productivity	Productivity improvements (time savings)
	Efficiency
Cost of Care	Reduced lab work
	Reduced materials

- **Basis for Salford Royal decision-making**

Item	IT Costs GBP		Maintenance		
	Cost	Initial Investment	Year 1	Year 2	Year 3
MCA	£1,365.99	£13,660	£4,553	£4,553	£4,553
Docking Station	£185.00	£1,850	£617	£617	£617
Add'l Battery	£86.00	£430	£143	£143	£143
Mini-Printers	£619.00	£6,190	£2,063	£2,063	£2,063
Total Cost		£22,130	£7,377	£7,377	£7,377
Benefit			£47,727	£47,727	£47,727
Net Benefit		-£22,130	£40,351	£40,351	£40,351
Project NPV 15% discount		£70,000			

MPOC VM – Workflow Optimization

MPOC – Workflow Optimization	Pre-Preparation		Preparation		On-Ward	
	Task	Time	Task	Time	Task	Time
	Print Labels / Requisition Forms		Work Distribution		White board Check	
	Sort Labels / Requisition Forms		Trolley Preparation	15	Take bloods	10
Work Allocation	30			Ward Completion		
Pre-Preparation Time: Mins		Preparation Time: Mins		On-Ward Time: Mins		
1 X Work Allocation	<u>30</u>	10 X Trolley Preparation	<u>150</u>	180 X Take Bloods	<u>1800</u>	
					Total Time:	1980 33hrs

MPOC Workflow Optimization can

- Reduce number of phlebotomists (by 2)
- Increase the number of draws by 27-33% (50-60 draws)
- Improve capacity management and timeliness of blood draws

Telehealth Value Model

Disruptive Demography



- Double # of seniors by 2025, boomer effect in long term care
- 2/3rd of workforce caregiving part time
- Shortage of care professionals

Disruptive Economy



- Healthcare costs rise to 20% of GDP or \$4T in 8 years
- Lack of pensions, insurance, savings
- Globalization of markets

Disruptive Technology



- Wearable, wireless sensor networks
- Web 2.0 personal software/services
- Powerful, affordable microprocessors

**New models
of care forced
to emerge**

Technologies to Facilitate Disease Management

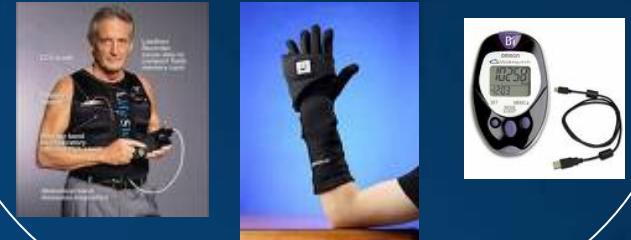
Monitors



Telephone



Smart Devices



Video Conferencing



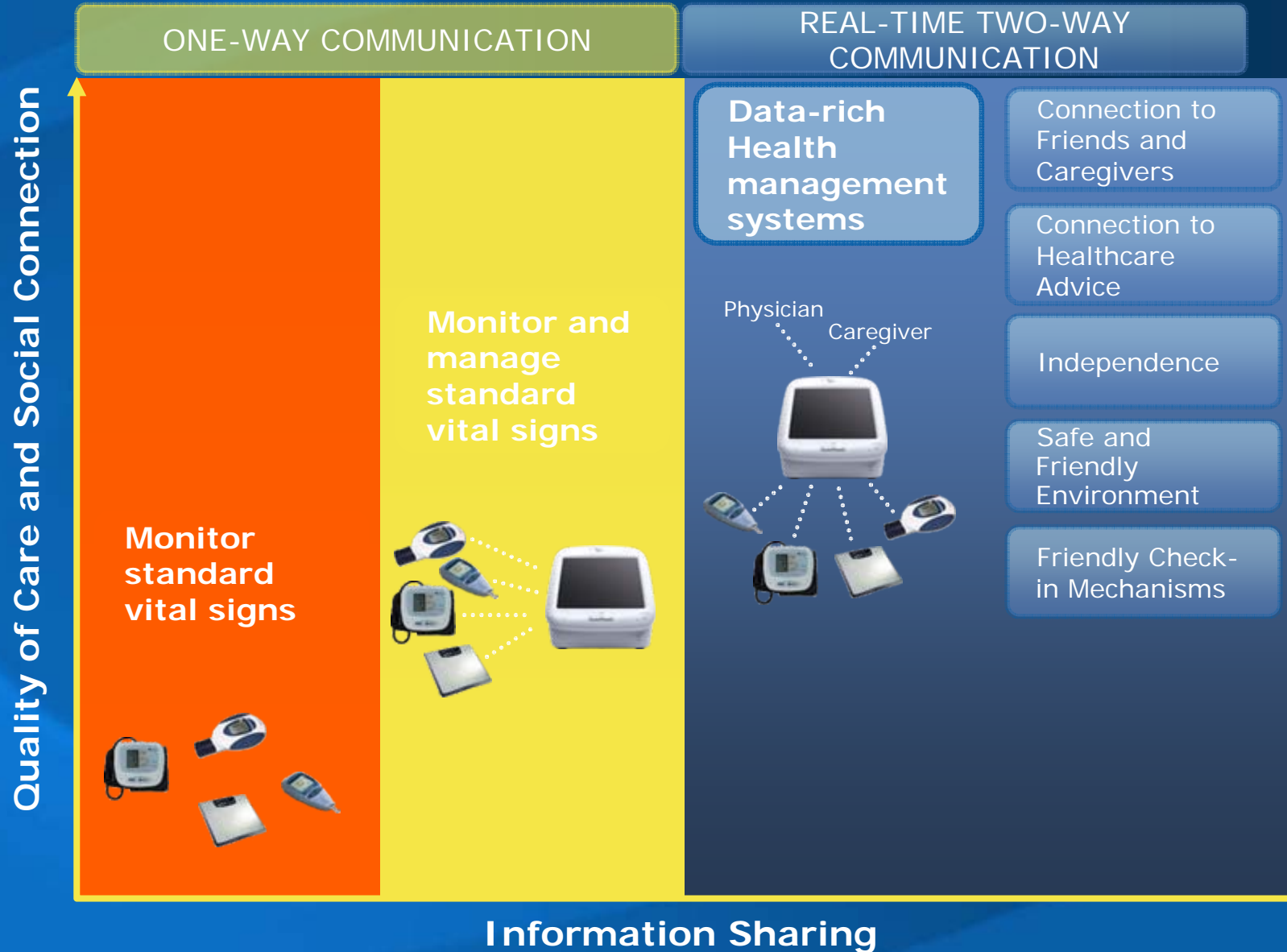
IVR



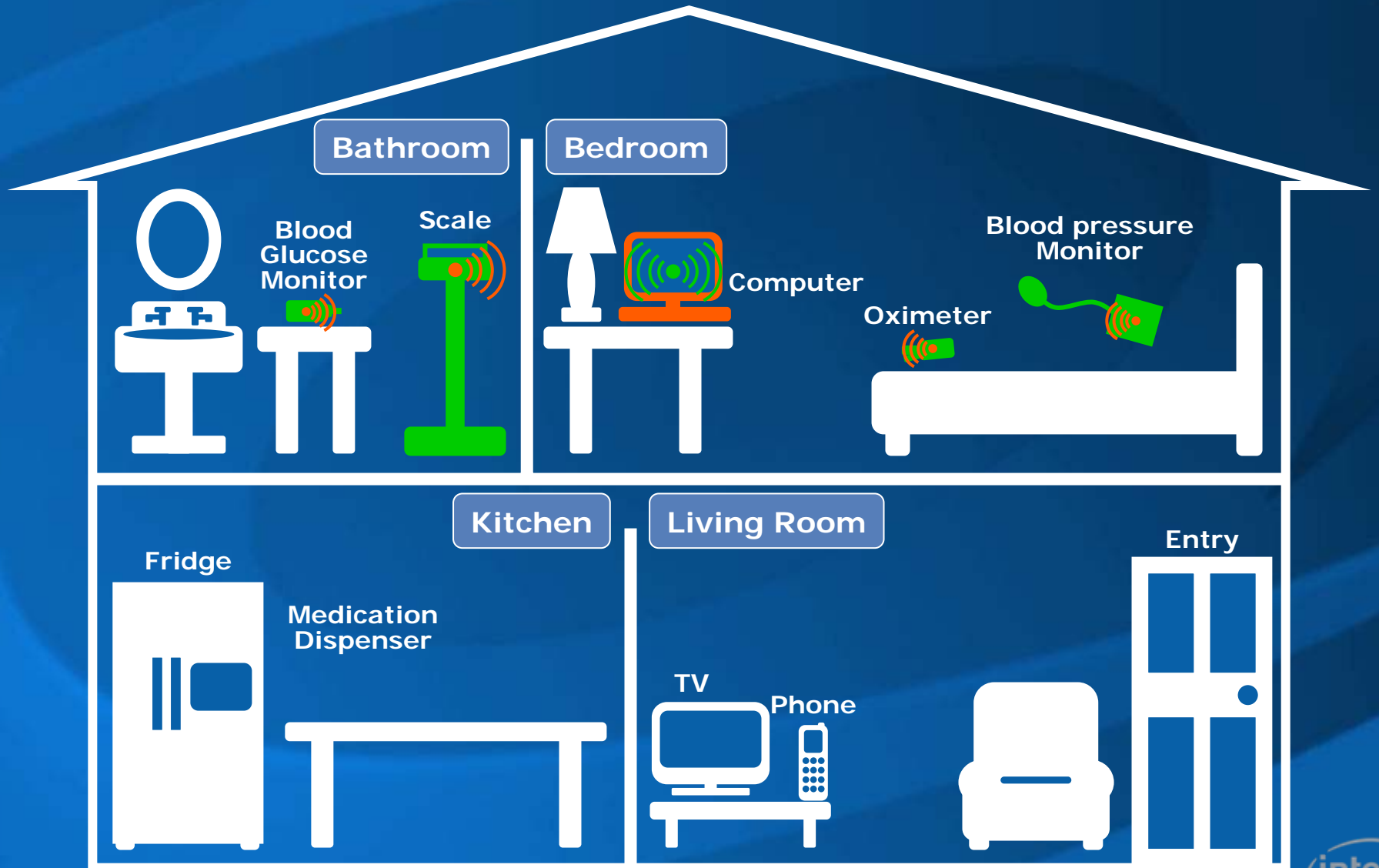
Messaging



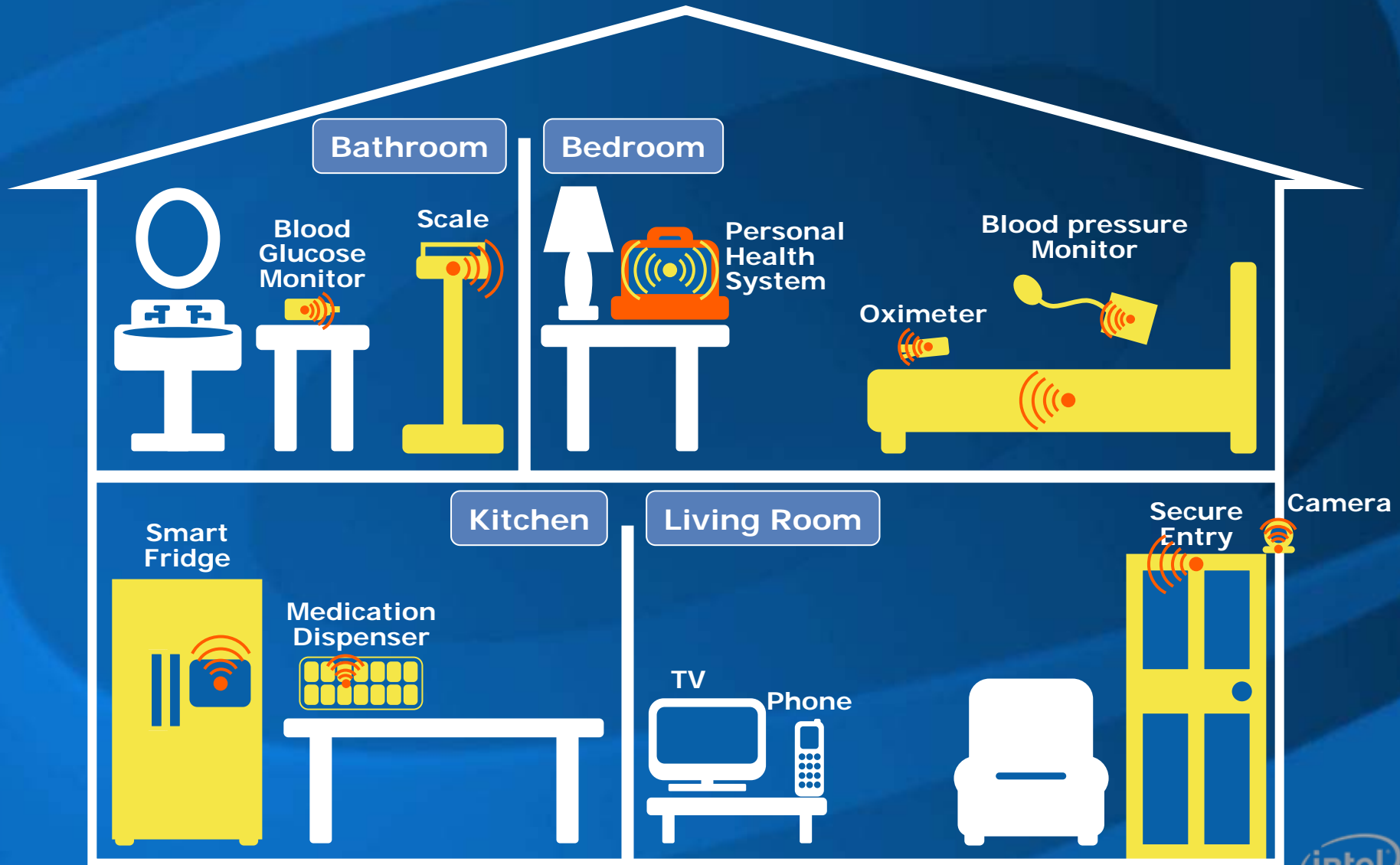
Evolution of Remote Patient Monitoring



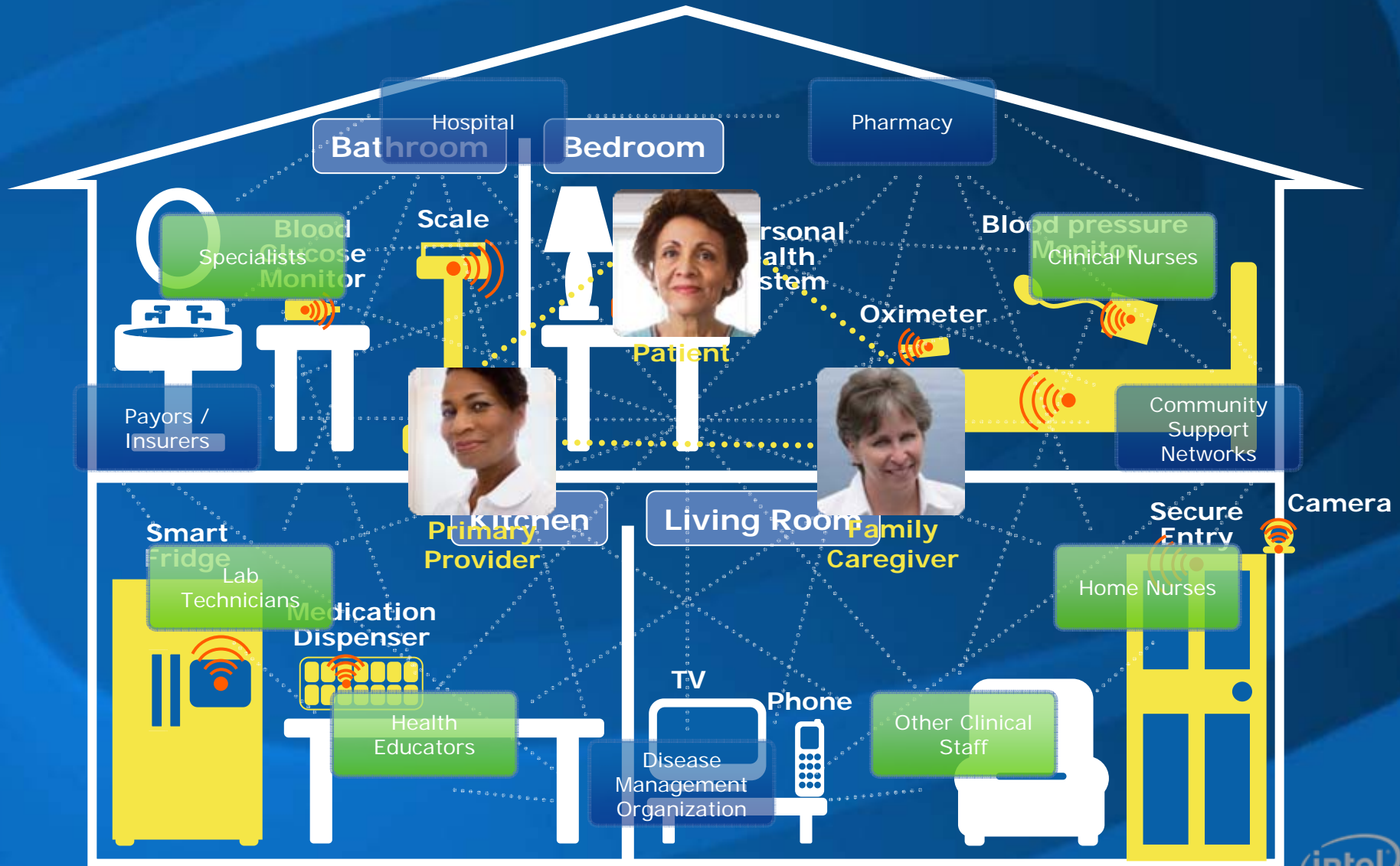
Home with Basic Remote Patient Monitoring



Home of Tomorrow



Home Connected to the Community



Tools: Personal Health Value Model

Intel Personal Health Value Model Tool



Choose a View Below

Summary View Detail View

Choose a Value Dial Below

Member Satisfaction

Provider Satisfaction

Regulatory Compliance

Revenue Enhancement

Medical Cost Reduction

Administrative Cost Reduction

Quality of Care

Key Performance Indicators

Impact

Case Details

Case Studies, Source & Author

Key Performance Indicators	Impact	Case Details	Case Studies, Source & Author
+ Hospitalization Rate	63% reduction during one year.	Multiple Diseases; A study of	Dis Manage, view
- Emergency Room Visit Rate	40% reduction during one year.	Multiple Diseases; A study of telecare by the VHA.	Dis Manage, Meyer view
	66% reduction year over year.	Multiple Diseases; A study of programs that enhanced elder chronic care through technology and care coordination at the VHA.	Telemed J E Health, Kobb view
	26% reduction during 6 month post compared to 6 month pre-study.	CHF, Diabetes, COPD; A study of how telecare reduces healthcare costs.	Telemed J E Health, Noel view
	37% reduction during 8-12 month with RPM, then sustained 43% post monitoring period.	CHF; A study of clinical, financial and behavioral outcomes of remote patient monitoring by Thomas Jefferson University.	Dis Manage, Hudson view
	34% reduction year over year.	Diabetes; Trial comparing cost and benefits before and after with indigent border residents of Laredo, Texas.	Diabetes Tech Ther, Cherry view

Thursday, 16 October 2008

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Tools: Telehealth ROI Estimator

Telehealth ROI Estimator*

User Inputs/Assumptions

Home Care

Average Length of Episode (Days)

Telehealth Home Care Reimbursement Mix

Case Rate

Visit Rate

Total

Data

Number of Full-Time Home Care Nurses

Home Care Nurse Compensation

Hours Worked Per Day by Home Care Nurse

Cost of a Home Visit

Case Rate Payment Per Episode

Visit Rate Payment Per Visit

Monthly Telehealth Equipment Reimbursement

Home Visits Per Episode Without Telehealth

Home Visits Per Episode With Telehealth

Length of Home Visit Including Travel (Minutes)

Time Spent Managing Patient Remotely (Minutes)

Home Care Nurse Patient Case Load

Home Care Nurse Patient Case Load With Telehealth

Telehealth Solution Costs

Solution Cost

Utilization Assumptions With Telehealth

Remote Patient Monitoring Device

Unit Cost

Optional Extended Warranty on Unit

Peripherals

Weight Scale

Blood Pressure Monitor

Blood Glucose Meter

Pulse Oximeter

Peak Flow Meter

Cumulative Impact

Non-Cumulative Impact

Year 1 Costs

Benefits

Details

	Year 1	Year 2	
Costs			
Costs	\$299	\$219	
Cumulative Costs	\$299	\$519	
Independent Home Care Benefits			
Gross Benefit	\$141	\$155	
Benefit	\$70	\$155	
Cumulative Benefit	\$70	\$226	
Hospital with Home Care Benefits			
Gross Benefit	\$262	\$311	
Benefit	\$141	\$311	
Cumulative Benefit	\$141	\$452	
Independent Home Care & Hospital with Home Care Benefits			
Benefit	\$212	\$466	
Cumulative Benefit	\$212	\$679	
Success & Growth			
Annual Growth (%)	10%	10%	
Success Factor (%)	50%	100%	
Default Peripheral Usage			
Peripherals	Cost Estimate	CHF	
Weight Scale	\$138	X	
Blood Pressure Monitor	\$116	X	
Blood Glucose Meter	\$165		
Pulse Oximeter	\$275	X	
Peak Flow Meter	\$28		
*Cost estimates are provided as guidance only.			
Default Acute Measures			
Metric	Without Telehealth	With Telehealth	Without Telehealth
Initial LOS	5.5	5.0	5.5
60-day readmission rate	25%	15%	20%
LOS of 60-day readmissions	6.0	4.8	6.0
60-day Emergency Room visit rate	15%	9%	15%

Telehealth ROI Estimator

Select a Chart Option:

Cumulative Impact Non-Cumulative Impact Year 1 Costs and Benefits Details

Year 1 Costs

- Other Initial Investments
- Other Annual Ongoing Expenses
- Support Services
- Peripherals
- Remote Patient Monitoring Device

Benefits

- Case Rate Home Care
- Visit Rate Home Care
- Initial LOS
- 60 Day Readmissions
- ER Visit Rate
- Revenue Enhancement

Select a Disease State:

Congestive Heart Failure Chronic Obstructive Pulmonary Disease Diabetes Multiple

User Inputs

Home Care	Value
Telehealth Home Care Reimbursement Mix	
Case Rate	50%
Visit Rate	50%
Total	100%
Data	
Number of Full-Time Home Care Nurses	2
Are you Reimbursed for Telehealth Equipment?	<input type="radio"/> Yes <input checked="" type="radio"/> No
Home Visits Per Episode Without Telehealth	

Information and Background (i)

Reset Default Values (↶)

Save Values for Later (↓)

Load Saved Values (↑)

Print Report (🖨)

Switch to Advanced View (↔)

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Mouse Over Variables for Description

Scroll for More Variables

Questions?

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