Technologies That Improve Medication and Care Plan Adherence

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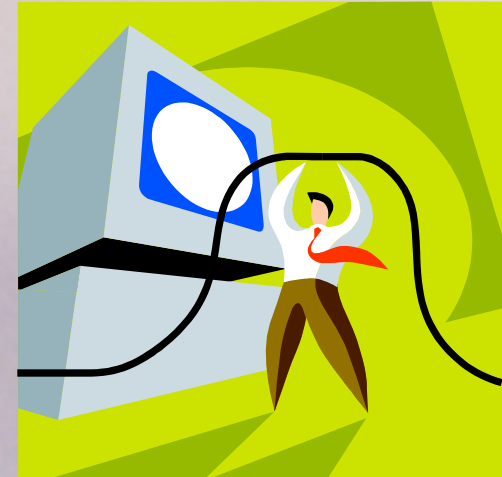## XLHealth

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Technology: A Diverse Set of Tools to Accelerate Process Improvement

Two Major Categories:

Administrative
- Financial
- Billing
- Scheduling

Clinical
- EMR
- E-prescribing
- Remote patient monitoring

Dozens more and growing every year!

Developing and Implementing Programs to Improve Medication and Care Plan Adherence

The challenge is to simultaneously improve the **efficiency** and **effectiveness** of care management and medication adherence programs…..

Efficiency can be significantly improved by deploying better new _technologies_…

Effectiveness is improved by deploying better clinical and care management _knowledge_… that is imbedded in a technology

Developing and Implementing Programs to Improve Medication and Care Plan Adherence

- Business processes that monitor and <u>improve patient adherence</u> to medication and care plans are of high value to DM programs, providers, and patients

- Technologies exist that <u>leverage nursing personnel</u>, and deploy and monitor medication and care management knowledge

- These technologies enable rapid, targeted patient interventions to improve health outcomes and reduce ER visits, hospitalizations, and nursing home admissions

Product Categories for Medication and Care Plan Technologies

- Integrated Diary/Physiologic Monitoring Systems (Remote Patient Monitoring)

- Web-based Solutions

- IVRS Telehealth Systems

- Medication Adherence Tools and Systems

Remote Patient Monitoring

Monitor chronically ill patients' adherence to medication and care plans

Monitor physiologic functioning

Prevent hospital admissions

Data transmitted via phone line

Cost decreasing ($50/month)

Center of Excellence Tool

Gaining acceptance by Homecare agencies to reduce traditional visits

Used selectively by DM firms and programs

We Have the Technology, but...

Barriers:

Cost per patient (falling)

Patient selection

Ease of Use for patients

Ease of Use for Care Managers

What gets reported?

ROI compared to telephonic monitoring

Product Category – Integrated Diary/Physiologic Monitoring Systems - iMetrikus

Condition Monitoring Modules

iMetrikus MediCompass: Biometric Device Interfaces

Diabetes Management

Blood Glucose Monitors:
- Accu-Chek ™ Active
- Accu-Chek™ Advantage
- Accu-Chek ™ Compact
- Accu-Chek ™ Complete
- Ascensia® Breeze™
- Ascensia® Contour™
- Ascensia Elite XL®
- Bayer Glucometer ® DEX
- Bayer Glucometer ® DEX2
- Bayer Glucometer ® Elite XL
- BD Logic ™
- BD Paradigm Link ™
- In Duo ™
- One Touch® Basic
- One Touch ® II
- One Touch ® Profile
- One Touch ® Ultra
- One Touch ® UltraSmart
- One Touch ® Sure Step
- Precision Q-I-D ®
- Precision XTRA™
- Prestige Smart System™
- TrueTrack Smart System ™
- TheraSense FreeStyle ®

Insulin Pumps:

D-TRON Plus

Respiratory Management

Digital Spirometry:

AirWatch

Cardiac Management

Blood Pressure Cuffs:
A&D LifeSource UA-767PC (Arm)
OMRON HEM-637 (Wrist)
OMRON HEM-705CP (Arm)

Digital Scales:
A&D LifeSource UC-321PL*

Lipid Testing:

CardioChek PA*
(cholesterol, triglycerides, glucose, & ketones)

iMetrikus MediCompass Connect

National Telehealth Value Study Using Home Health Diary/Physiologic Monitoring Systems

- 1027 home health care Medicare patients in 6 month study

- Results:
  - 5.56 fewer skilled nursing visits, with visit decrease of over 50% in several agencies
  - Skilled nursing caseload increased by 8 on average
  - Decreased ER visits and hospitalizations
  - Revenue increase of $128,000 per nurse per year
  - Cost savings of $64,800 per year
  - ROI of 6.14 at composite of 32 sites (Assumptions: skilled nursing visit fully burdened @$100, skilled nurse visits dropped from 15.76 to 13.18, caseloads increased from 19 to 27, HHRG of $2000, LOS = 8 episodes/year, equipment cost of $75/month for 30 monitors per nurse)

*National Telehealth Value Study, Remington Report May/June, July/August 2006

Remote Patient Monitoring - Summary

Many vendors – the technologies are becoming a commodity, though still relatively expensive

Key barrier to broader usage is cost and ROI for diseases other than severe heart failure

Differentiators will be in the "software" that creates behavioral change in patients and displays the data for care managers

Web-based Solutions: Problems With Web Content

Turned Off

Why some consumers turn away from a health information site.

Site was too commercial
47%

Couldn't determine the source of the information
42%

Couldn't determine when information was last updated
37%

Site lacked endorsement of a trusted independent organization
30%

Site appeared sloppy or unprofessional
29%

Site contained information they knew to be wrong
26%

Information disagreed with own doctor's advice
20%

Source: Pew Charitable Trust

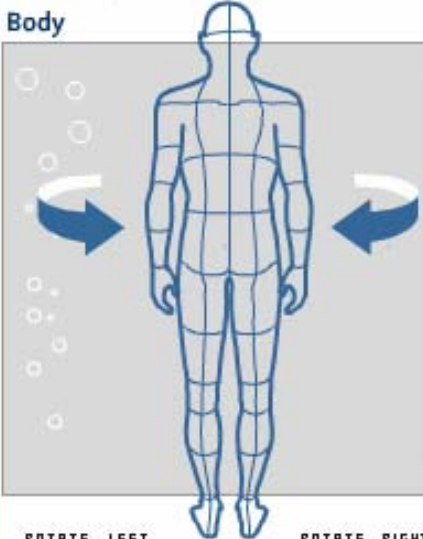# Product Category – Web-based Solutions - WorldDoc

WorldD⊙c

Personal Evaluation System

personal
evaluation
system

medical
library

health helpers

pharmacy

my cyberfile

help

step 1   step 2   **step 3**   step 4   _((Answer questions to create a profile))_

Answer the following questions so we can determine possible causes of your symptom:

Did you fall or have trauma to the ankle?
- ⊙ Yes
- ○ No

When you press your thumb along the back of the achilles tendon, is it painful? 📷
- ○ Yes
- ⊙ No

Where is most of your pain in your ankle?
- ⊙ On the outside of the ankle
- ○ On the back of the ankle
- ○ On the inside of the ankle

Push on the area of pain. Is it tender?
- ⊙ Yes
- ○ No

WorldDoc

Personal Evaluation System

- personal evaluation system
- medical library
- health helpers
- pharmacy
- my cyberfile
- help

| step 1 | step 2 | step 3 | step 4 | _((Review the results of your profile)) |

Profile:
You indicated Ankle Pain (not from Recent Injury).

This is not a substitute for a medical evaluation by a licensed physician. Your profile suggests the following possibilities. Click on the possibilities and read the explanation and treatment options. We hope this helps you with your health decisions.

Possibilities:

Name	Severity Level
BROKEN ANKLE	🔴 severe
SPRAIN	🟢 mild
ACHILLES TENDON TEAR (RUPTURE)	🔴 severe

Product Category
Web-based Solutions – Motiva
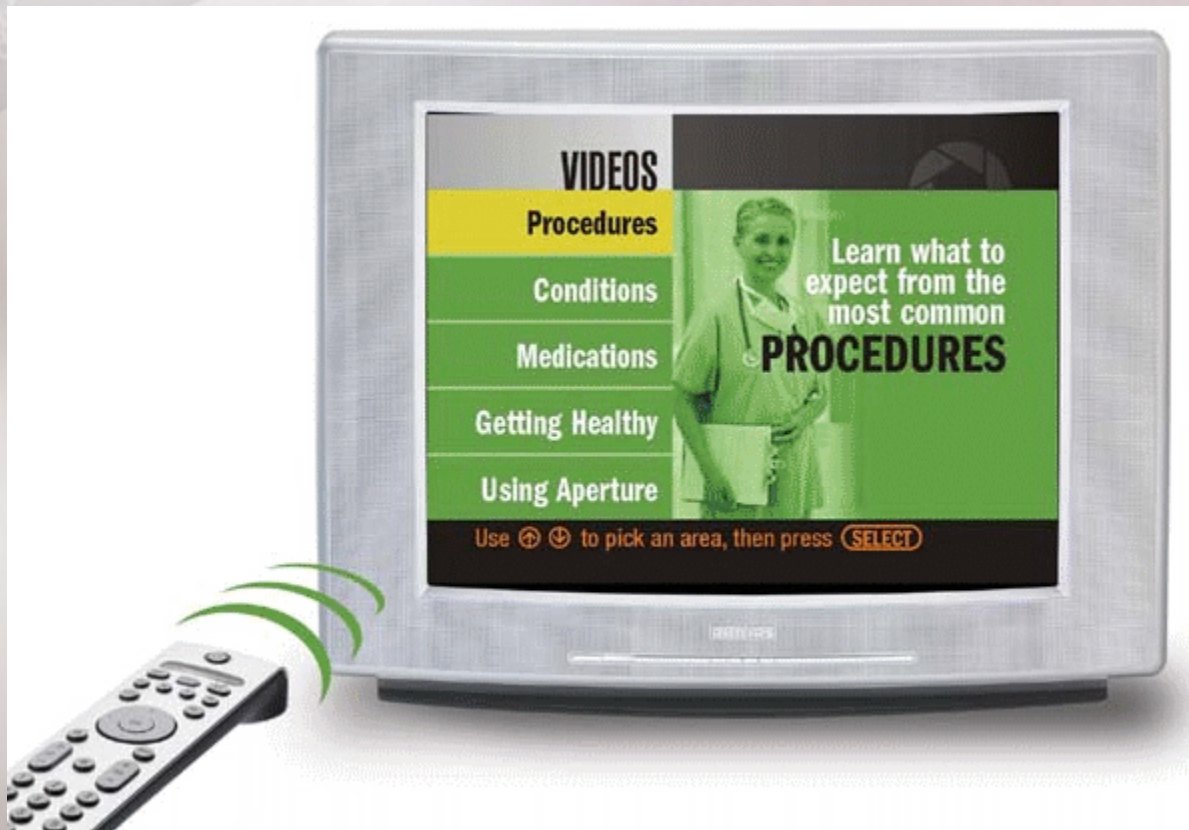
Product Category – IVRS Telehealth Systems

TeleWatch

Development was a joint project between:

- JHU- School of Medicine, Division of Cardiology
- JHU- Applied Physics Laboratory

Goals of the telemedicine system:

- Easy to use
- Inexpensive
- Employ widely available technology

Clinically superior

- Complex algorithms detect worrisome trends
- Nurse alerted for quick intervention

Eliza …

▶ Phone-based speech enabled outreach designed to inspire behavior change

▶ Understands what you say and responds accordingly – over the phone

▶ Provides focused and actionable feedback

▶ Senior programs include

　✦ Welcome outreach

　✦ Health Risk Assessments

　✦ Quality of Life surveys

　✦ Age-appropriate reminders- colon cancer screening, mammograms, flu…

▶ Seniors just might be the most receptive of all!

eliza

Product Category: Medication Adherence Tools and Systems

Average Reported Rate Of Non-Adherence Is 43%
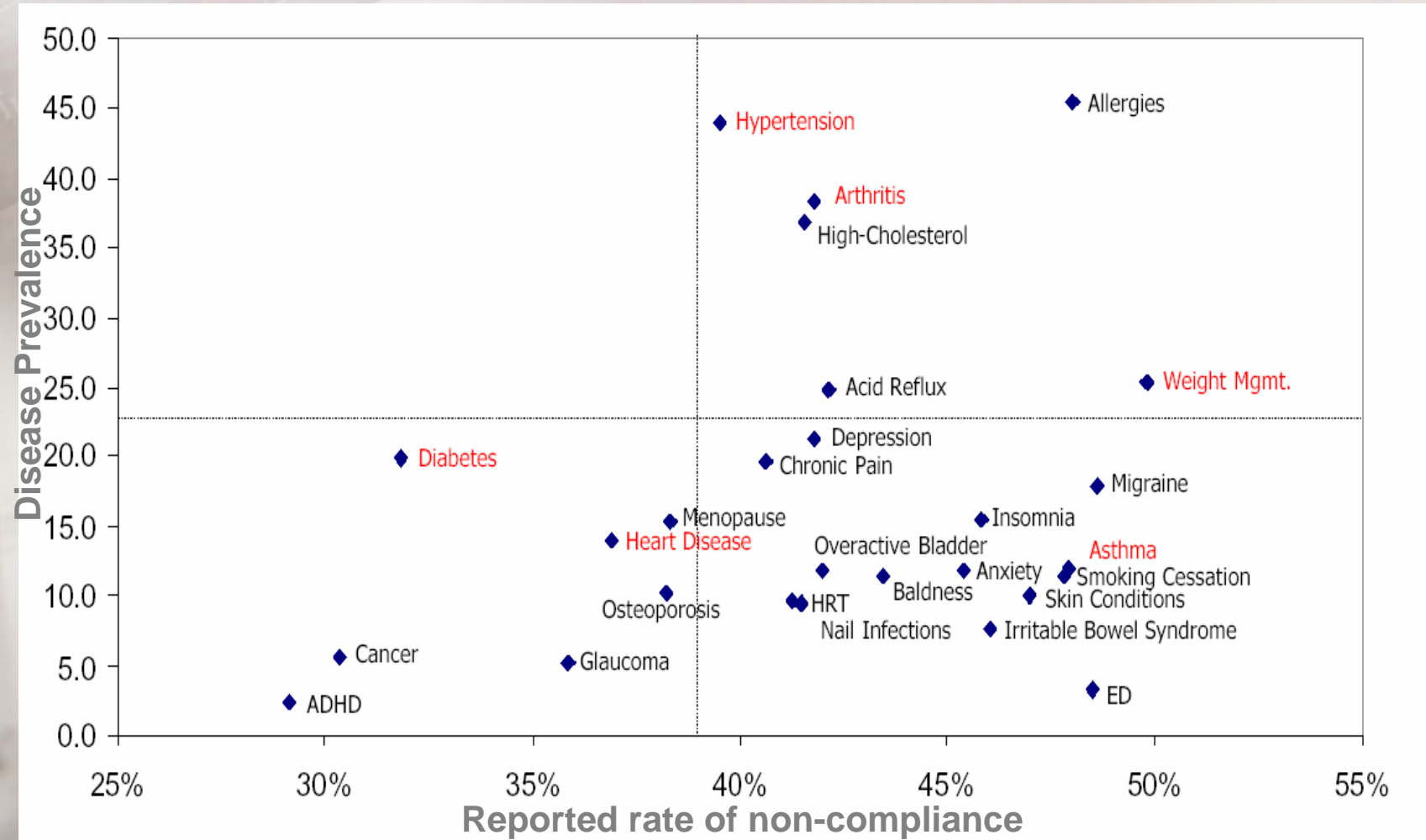
What's At Stake? - Medication Non-Adherence Drives Up Healthcare Costs

Failure to take medication as prescribed:

- Causes **10%** of total hospital admissions

- Causes **33%** of CHF hospital admissions

- Causes **75%** of Schizophrenia admissions

- Causes **68%** of NNRTI resistant/mutated HIV virus

- Results in **$100 billion/year** in unnecessary hospital costs

- Causes **22%** of nursing home admissions

- Costs the U.S. economy **$300 billion/year**

(N Engl. J Med 8/4/05, National Pharmaceutical Council, Archives of Internal Medicine, NCPIE, American Public Health Association, AIDS 2006 20:223-232)

The Medication Adherence Solution

Product Category - Medication Adherence Tools and Systems

Audio Reminders

Voice Reminders

Medication and Care Plan
  Tracking Devices

Integrated Dispensing
  Systems

RFID-enabled

Landline/Wireless

Patient Challenges:

- Too many medications at home

- Old medications not destroyed

- New prescriptions received: new dose, different medication, generic vs brand labeling

- Inconsistent communication between multiple providers: pharmacies, PCP, Hospitalist, Specialist

- Which pill is which?
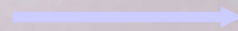
Please Help!!!!

"What medication do I take?"

"What did the doctor say?"

"What is the correct dose?"

"What is the correct time?"

"What do each of these medications do?"

"Why are they important?"

"Why do I need them, I feel better"?"

MD.2

MD.2

Dispensing Button is designed for seniors' special needs. Easy to see and feel, it is conveniently oversized and requires only a gentle push for one-button dispensing.
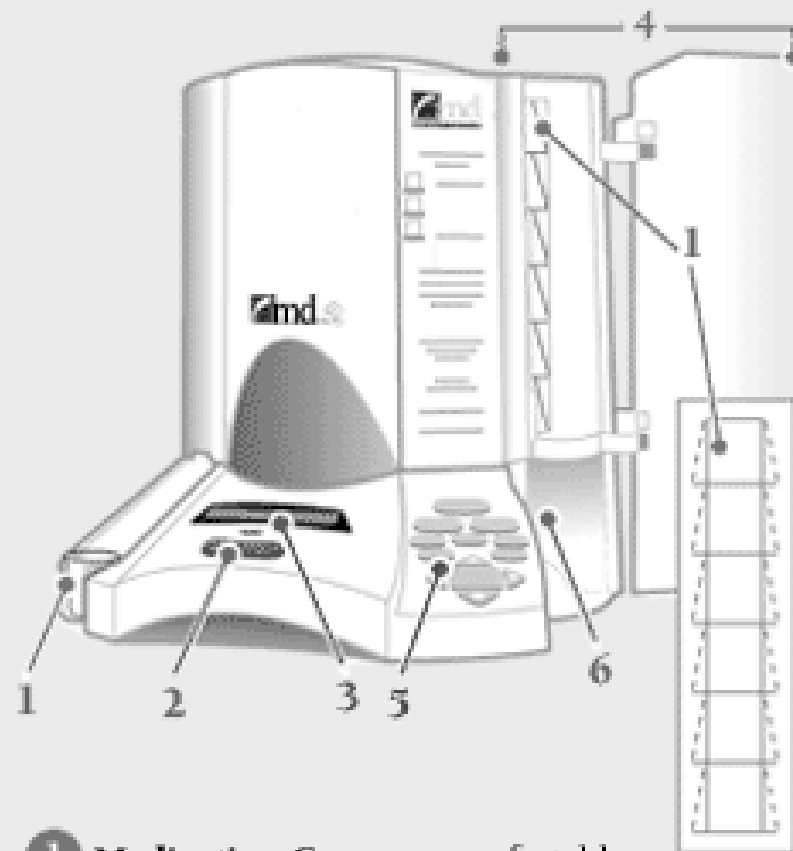
Medication Reminders. Each dose is announced by a loud, clear voice and tone (adjustable volume), a text message, and a flashing red light. Special instructions such as "Take with food" can also be announced.

Locking Storage Compartment. MD.2 can be pre-loaded with a maximum of 60 medication cups. The locking compartment keeps medications safe and in order.

Keypad, designed for easy setup, is located in the locking medication compartment to prevent accidental changes or tampering.

Battery Backup system provides alternate power for up to 18 hours.

Medication Cups are comfortable to hold and have secure lids to prevent spills. Each reusable cup can hold 20-25 pills and supplements. As many as six cups/doses can be delivered per day.

Med-eMonitor ...

System Overview
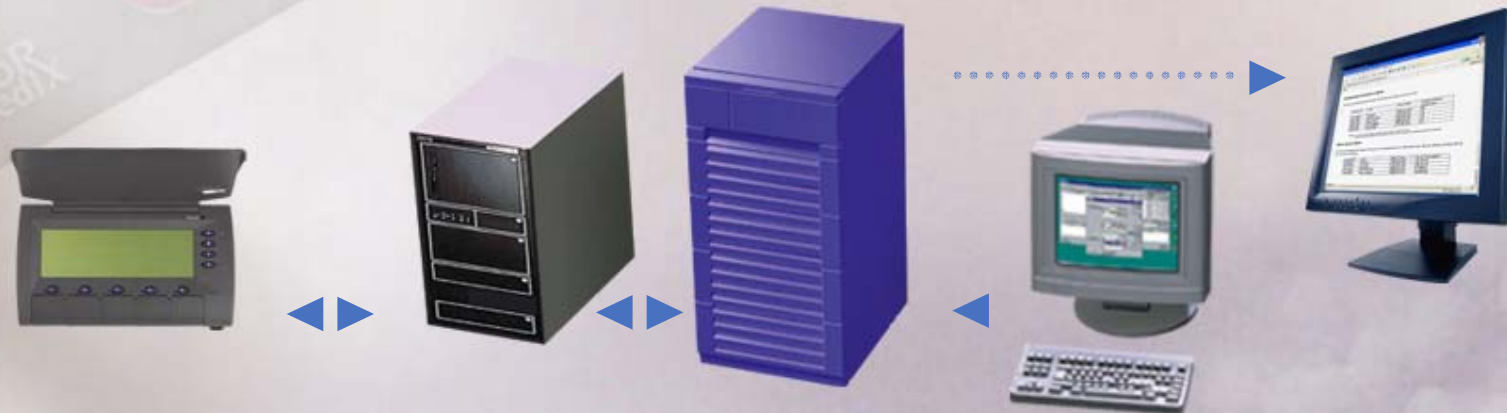
Med-eMonitor ———————————————— Med-eXpert————

Patient device organizes and delivers drugs and real-time information. Prompts and records medication and care plan adherence

The Medication Adherence Solution

Two-way communication over patient's standard phone line

Web-enabled real-time care plan selection for each patient by care manager

Web-enabled reports to care manager and/or loved ones by: e-mail, text message, pager, and fax if missed meds or decline in health

Reporting – Participant Level

Medication Compliance by Drug

Aspirin 81 mg oral tablet	Pseudoephedrine Hydrochloride 30 mg	Glucophage XR 500 mg	Psyllium 85% powder for reconstitution	Legend
94% Compliance	94% Compliance	100% Compliance	93% Compliance	Taken / Unscheduled / Missed

Weight Trend

30 Day Weight Trend

Lbs.

220 218 216 214 212 210 208 206 204 202 200

7   14   21   28 1   7 8

Target Levels 200-220 Lbs.   Daily Average Levels
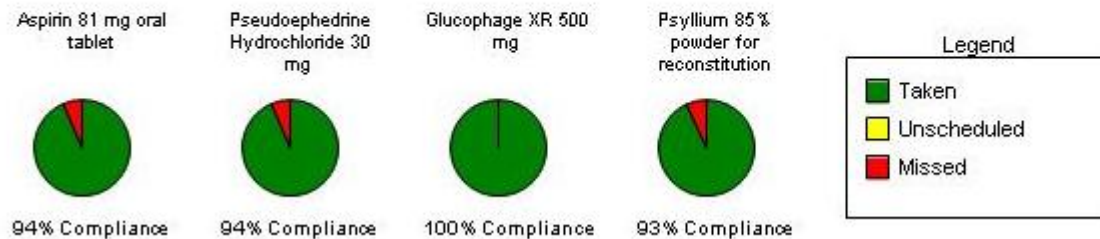
The Medication Adherence Solution

ADT/XLHealth/InforMedix Paradigm
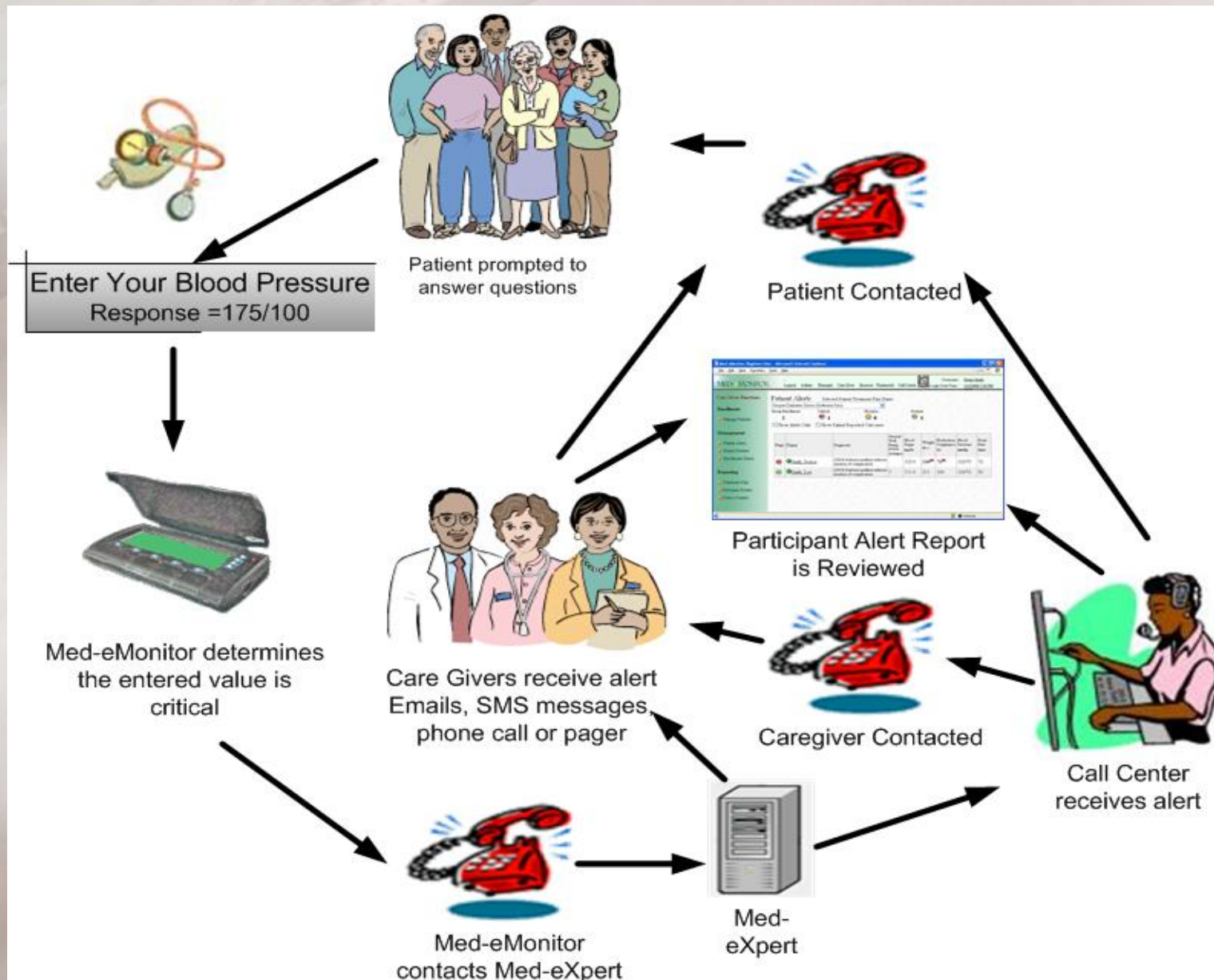
Medicare Health Support - Tennessee

Prompt and record adherence to medications

Prompt and record glucose levels

Prompt and record systolic, diastolic BP

Reminders about proper care per ADA guidelines

- Meal plan
- Schedule eye exam
- Check feet for cracks or sores and use temperature probe
- Check Lipid levels
- Schedule doctor visit for HgA1C blood test

Reminder to schedule end of protocol clinic visit

The Medication Adherence Solution

Medicare Health Support - Tennessee

Reminder to wear protective shoes

Questionnaires

- Prodromal signs of stroke
- Change in medications
- Hospitalizations
- ER Visits
- Depression inventory
- Patient Satisfaction Survey

The Medication Adherence Solution

Consumer Monitoring by excelleRx

InforMedix

Alerts

Respond

excelleRx Care Manager/Pharmacist

Notify and Connect

Physician

Family Members

Pharmacy

Emergency Service

Enroll Patients   Medication Management Risk Assessment
Set up devices   Respond to Exceptions Reports
Monitor Patients   Notify pharmacy regarding refills
Update Care Plan   Instruct on device usage
Counsel Patients   Optimize medication regimens

The Medication Adherence Solution

Research Results

"Improved Medication adherence from a baseline of 52% (prior to using device) to over 94% (after 3-months usage)"(1)

"The Med-eMonitor System provided for compliance enhancement with medications and protocols, ease of central evaluation by treating professionals, additional education, and reduced on-site evaluation in chronic schizophrenics."(2)

"Patients in the compliance device group had a 94% medication compliance rate, and a 96% compliance rate with entering daily weight and blood pressure data into the device. QOL improved significantly from baseline to 3-months follow-up (ANOVA, p=0.006)" (3)

"Average medication adherence rates increased from a baseline of 40% to over 92%, HbA1c levels dropped an average of 18.7% after 3 months patient use (p<.002)" (4)
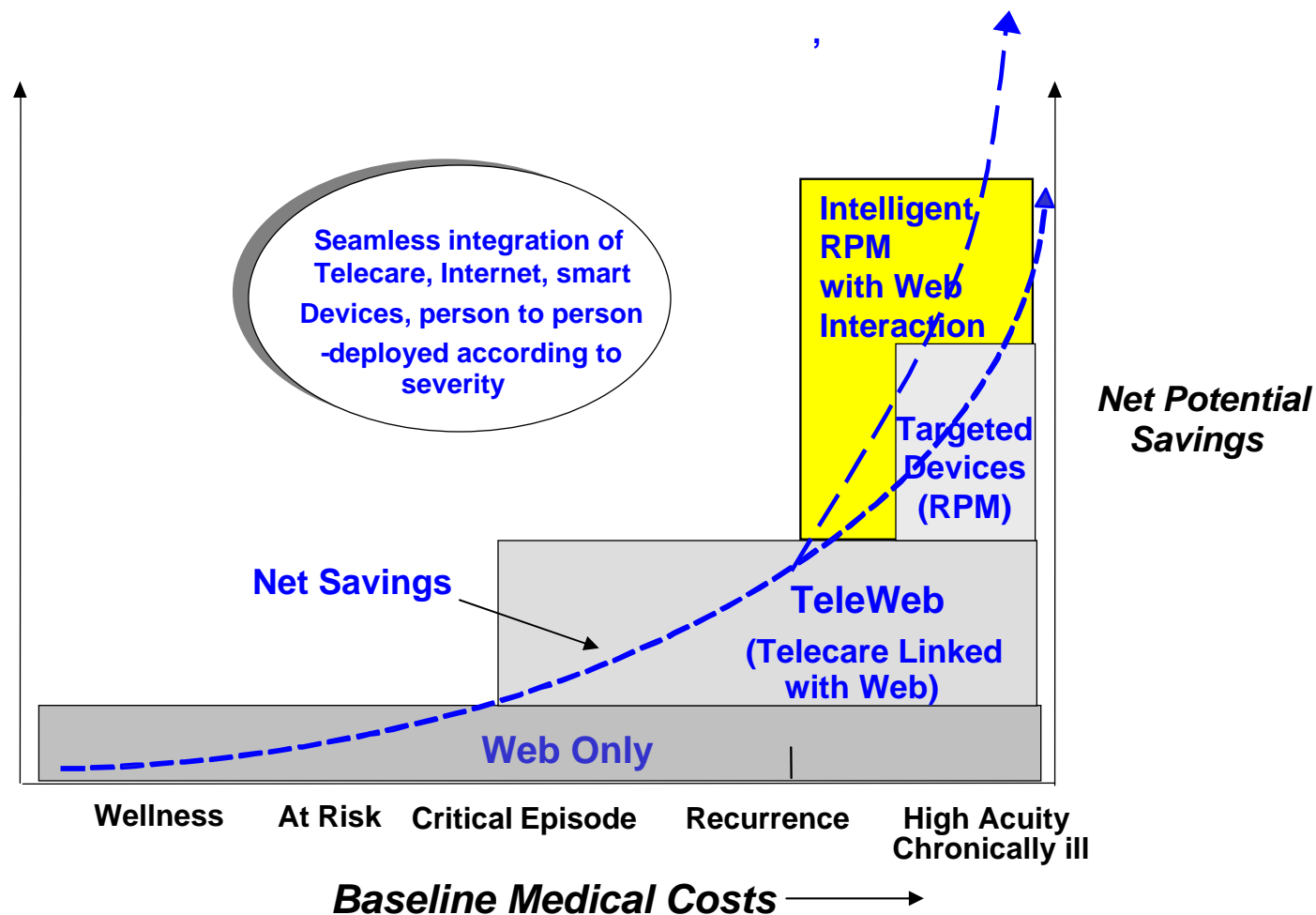
(1) "The Med-eMonitor™ for improving adherence to oral medication in schizophrenia" Bendle S, Velligan DI, et.al: Schizophrenia Bulletin, 31(2): 519, 2005

(2) "Feasibility of Using the Med-eMonitor System in Monitoring and Enhancing Research Protocol Compliance and Health Status in Schizophrenia," Ruskin, PE, Van Der Wende,J, et.al.: Drug Information Journal, 37 (281-289), 2003

(3) "Pilot Study of a Web-Based Compliance Monitoring Device For Patients with Congestive Heart Failure," Artinian,N, Harden,J,et.al., Heart & Lung, 2003: 32, 226-233

(4) "Remote Monitoring and Management of Rural Diabetic Patients Using a Web-based Medication Adherence/ePRO Monitoring Device" Farberow, B, Disease Management Congress, 2005,

Technology and Disease Management

Seamless integration of Telecare, Internet, smart Devices, person to person -deployed according to severity

Intelligent RPM with Web Interaction

Targeted Devices (RPM)

Net Potential Savings

Net Savings

TeleWeb (Telecare Linked with Web)

Web Only

Wellness | At Risk | Critical Episode | Recurrence | High Acuity Chronically ill

Baseline Medical Costs ⟶

Population – Breakdown by Presence of Chronic Disease

Product Categories – Disease Management in a "Plug and Play Environment"

Low Intensity Monitoring

- **Low intensity patient** - newly diagnosed patient with Type II Diabetes
- **Population Management Services**
  - Specialty Disease Management Services
  - Call center services
- **Web-based solution**
- **IVRS patient monitoring**
  - Medication adherence prompting and monitoring
  - Simple patient-reported outcomes monitoring
  - Simple patient behavioral prompting and monitoring
  - Outbound exceptions reporting of patient non-adherence
  - Secure, Web-enabled communications
- **Daily patient monitoring by exceptions reports**

Product Categories – Disease Management in a "Plug and Play Environment

High Intensity Monitoring

- **High Intensity Patient** - complex diabetic patient, multiple co-morbidities, history of multiple hospitalizations - average annual costs in excess of $50,000.
- **High Intensity Program**
  - Clinical Nurse Practitioner or RN in the home/community
  - True MD Integration
  - On site Case management
  - Imbedded Care Guidelines
  - Caregiver support line
  - Addresses Depression and Isolation
- **Remote Patient Monitoring, Medication Adherence Systems, Web-based Solutions**
  - Medication adherence prompting and monitoring
  - Patient-reported outcomes monitoring
  - Patient behavioral prompting and monitoring
  - Direct-to-Patient medical education
  - Physiologic monitoring
  - Personal Emergency Response (PERS) monitoring
  - Outbound exceptions reporting of patient decline and safety concerns
  - Secure, Web-enabled communications
- **Daily patient monitoring by exceptions reports**