E-nabling Disease Management through IT
The Next Generation of DM services

The Disease Management Colloquium Jefferson Medical College, Philadelphia, PA
June 27-30, 2004

Thomas G. Lundquist, MD, MMM

Executive Vice President & Chief Medical Officer

I-trax Health Management Solutions

Diabetes

In 2001, approximately 16.7 million adults in the US were thought to have diabetes.

- 90% are type 2 diabetes
- Estimated to grow to almost 22 million by 2025.
- At risk for neurological, peripheral vascular, cardiovascular, renal, and ophthalmic diseases
- Total & Direct costs estimated to be $132 billion
- Average is $10,900 per diabetic.

Mokdad, et al. Prevalence of obesity, diabetes, and obesity-related health risk factors, 2001. JAMA 2003; 289:76-79.

Hogan, et al. Economic costs of diabetes in the US in 2002. Diabetes Care 2003; 26:917-932.

Disease Progression Modeling: Diabetes
(with Provider Portal Example)

- Key risk factors (lipids, blood pressure and HbA1c) provide prediction of diabetes progression and associated budgetary impact
  - Neuropathy
  - Nephropathy
  - Retinopathy
  - Cardiovascular disease
- Case/disease management initiatives provide more intensive intervention for high-risk, future high cost employees
- Individuals predicted to be at high-risk of disease progression receive more intensive intervention from DM programs
- Developed in conjunction with Duke University

Duke Health

Stratification Report
Retinopathy

Physician: Jones, Dr. M.
Report: Retinopathy
Date Range: Since last transfer
From: 9/01/2002 To: 6/01/2003   Apply

Patient	None	NPDR1	NPDR2	NPDR3	PDR	Blind
Smith, John M.	PD	PD	3	54	30	2.3
Jones, Jane D.	17	30	26	20	5	1.2
Adams, Mark F.	6	16	23	39	13	0.8
Evans, Karen E.	7	18	24	36	12	0.7
Raven, Trisha T.	9	21	25	33	10	0.6

Retinopathy Over the Next 10 Years

Retinopathy
- No retinopathy 11%
- NPDR1 25%
- NPDR2 27%
- NPDR3 28%
- PDR 7%
- Blind 1.5%

Macular Edema
- No Me 87%
- Me 11%
- Blind 2%

Move the sliders to adjust the levels and see how the risk changes

HBA1C: 7.5 8 8.5 9 9.5 10 10.5 11 11.4 12 12.5

SBP: 105 112 119 126 133 140 147 154 161 168 175

Regular eye screening for PDR and ME
(if diagnosed, photocoagulation treatment)

Back   Next

Traditional Disease Management

- Coordinates interventions and communication for chronic conditions

- Disease specific

- Supports physicians ?

- Emphasizes prevention ?

- Uses evidenced-based guidelines

- Evaluates clinical, humanistic, and economic outcomes

Traditional Disease Management

- Fills gaps in communication and coordination of services ?

- Proactively determines "high risk members" and the "largest quality gaps" ?

- Does not second-guess decisions such as utilization management ?

- Proactively provides support and coordination to prevent disease complications before they happen ?

- Promotes self-management ?

"Widespread failings in chronic care management are a major national concern."

"Many of these failings stem from systemic problems rather than a lack of effort or intent by providers to deliver high quality care."

Anderson, G. Testimony before the Subcommittee on Health of the House Committee on Ways & Means, Hearing on Promoting Disease Management in Medicare, 16 April 2002

Frustrations with Traditional DM

- Payor-centric
- Focuses only on those patients already with disease
- Often patients enrolled in more than one program
- Leaves people behind
  - Only 4-6% of total population usually serviced
- Does not really emphasize prevention
- Graduation from programs leads to backslide
- Does not really engage the physicians
- High risk members = high cost members
- Corporations left unsatisfied

"The current health care delivery system is structured and financed to manage acute care episodes, not to manage and support individuals with progressive chronic disease."

Crossing the Quality Chasm:

A New Health System for the 21st Century

National Academy Press   2001

Lack of Coordination/Communication

- 18% of people with chronic conditions reported having duplicate tests and procedures
- 17% received conflicting information from providers
- Providers feel ill-prepared to manage chronically ill patients
- Providers reported that poor coordination of care led to poor outcomes.

Anderson G. Chronic Conditions: Making the Case for Ongoing Care. Partnership for Solutions & The Robert Wood Johnson Foundation.

Care Coordination Platform

- **Medicive®**

I-trax's database architecture supports overall Care Coordination Platform

- **Health-e-Coordinator™**

Web-based care management portal

- **MyFamilyMD™**

Private-labeled Consumer health management portal

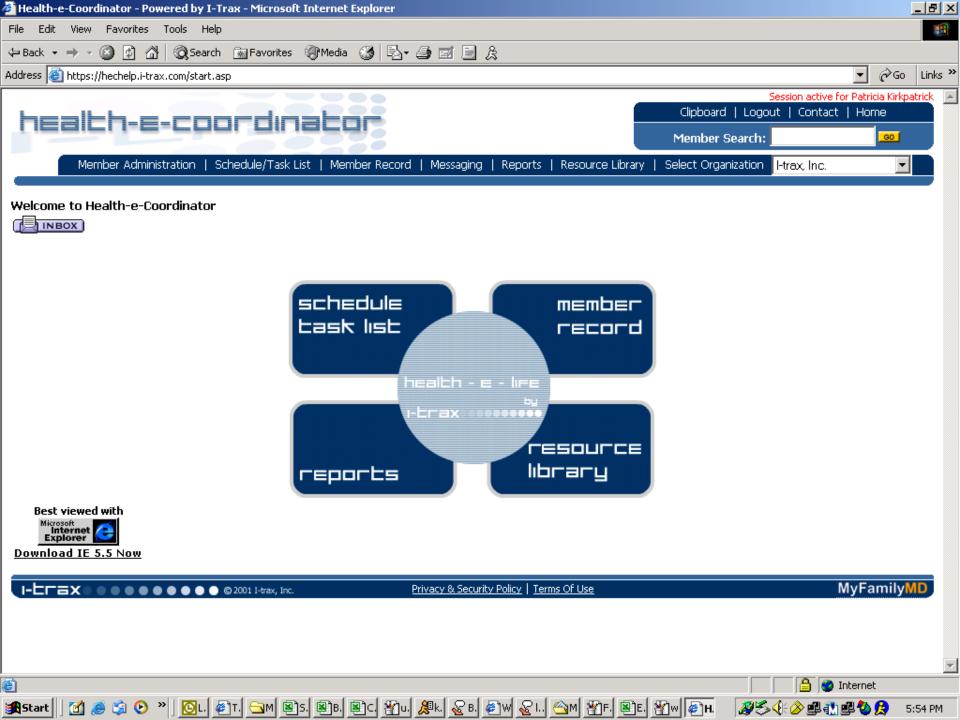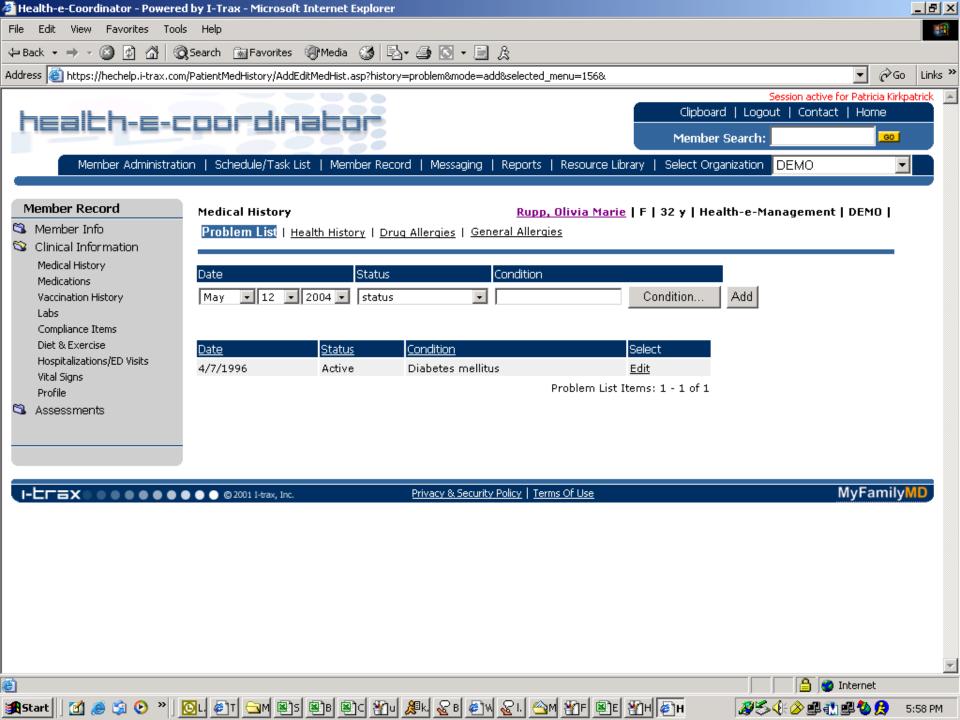-- Leverages Cooper Clinic/ WinningHabits Wellness content

- **CarePrime®**

Physician / Clinic health management portal w/ Secure Messaging

- **I-Talk™**

Interactive voice technology

Medicive® Database

"SimulCare"

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Member Administration | Schedule/Task List | Member Record | Messaging | Reports | Resource Library | Select Organization   I-trax, Inc.

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INBOX

schedule
task list

member
record

health - e - life
by
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reports

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health-e-coordinator

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Member Administration | Schedule/Task List | Member Record | Messaging | Reports | Resource Library | Select Organization   DEMO

Member Record

- Member Info
- Clinical Information
  - Medical History
  - Medications
  - Vaccination History
  - Labs
  - Compliance Items
  - Diet & Exercise
  - Hospitalizations/ED Visits
  - Vital Signs
  - Profile
- Assessments

Medical History   **Rupp, Olivia Marie** | F | 32 y | Health-e-Management | DEMO |

Problem List | Health History | Drug Allergies | General Allergies

Date	Status	Condition
May ▾ 12 ▾ 2004 ▾	status ▾	[ ] Condition... Add

Date	Status	Condition	Select
4/7/1996	Active	Diabetes mellitus	Edit

Problem List Items: 1 - 1 of 1

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Start   5:58 PM

health-e-coordinator

Add Member | Schedule/Task List | Member Record | Reports | Resource Library

Schedule/Task List

📁 Member Care Activities

   Today's Activities

   All Planned Activities

Today's Member Care Activities

General | Labs | To Be Enrolled

View the details of member care activities planned for today; view associated member care activities.

Due Date	Phone #	Activity	Member	Select
7/29/2003	610-333-9283	Diabetes Level III 1st Routine Follow-up Encounter	Regan, Michael	View All
6/26/2003	610-333-9283	A1c	Regan, Michael	View All
6/26/2003	610-333-9283	Cholesterol	Regan, Michael	View All
6/26/2003	610-333-9283	Blood Pressure	Regan, Michael	View All

Planned Activities : 1 - 4 of 4

CAREPRIME

Health Record | Immunization | Messaging | Reports | Preferences

Navigation Bar

- Patient Info
  - Patient Snapshot
  - General
  - Insurance
  - Contact
  - Allergies
  - Emergency Contact
  - Medications
  - Lab Tests
  - Diagnostic Tests
  - Questionnaire History
- Patient Admin
- Patient Reports
- Medical History
- Vaccination History

Patient Info: Patient SnapShot

Regan, Michael | M | 56 y

General

Name: Michael Regan	**Phone:** 610-333-9283
Sex: M	**Email:** Not Available
Age: 56 y	**Address:** 555 S. 60th Reading, PA 19601 USA
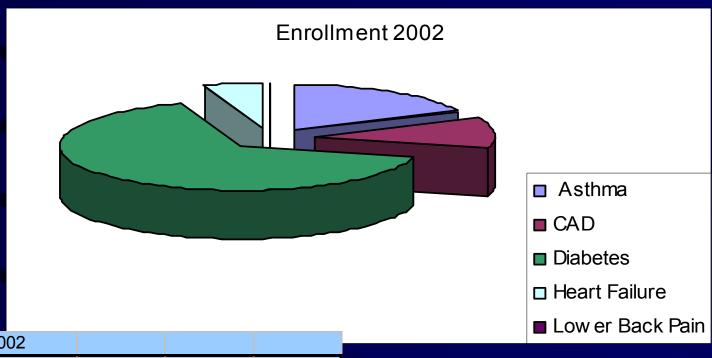
Allergies (combined)

Date	Allergy
6/24/2003	AP Cat Hair
6/24/2003	Codeine

Medical Conditions (Provider Entered/Confirmed)

Date	Severity	Condition
6/24/2003 5:21:54 PM	Active	Arteriosclerotic Heart Disease
6/24/2003 5:19:43 PM	Active	Hypertension (benign)
6/24/2003 5:18:54 PM	Active	Diabetes Mellitus
6/24/2003 5:20:46 PM	AssumedInactive	Conjunctivitis (chronic allergic)

Current Medications

Start Date	Medication	Dosage	Frequency	Recorded
1/1/2002 5:47:23 AM	Centrum Singles-Vitamin C	1 tablet	1 time a day	Consumer
9/1/2001	Claritin	1 tablet	As needed	diagnosis
6/1/2001	Glucophage	1 tablet	2 times a day	diagnosis
1/1/2002	Hyzaar	1 tablet	1 time a day	diagnosis
1/1/2002	Verapamil Hydrochloride	1 tablet	2 times a day	diagnosis
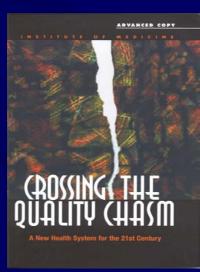
Health-e-Life Program - enrollment statistics

Enrollment 2002

Legend:
- Asthma
- CAD
- Diabetes
- Heart Failure
- Lower Back Pain

Enrollment 2002			
Disease	Enrollment	Declined	Percent
Asthma	7,996	639	92.6
CAD	5,024	244	95.37
Diabetes	29,165	2,245	92.85
Heart Failure	2,365	308	88.48
Lower Back Pain	34	2	94.44
Total	44,584	3,438	92.3%

Frustrations in Healthcare

- Costs are rising again
- Overall cost trend lines are rising at 13-14% again
- Many misunderstandings of what disease management is and can do
- Utilization management only took us so far
- Communication Connectivity is lacking
- Scalability often cannot be achieved
- Resource allocation is often limited
- What about the other 94%?

ADVANCED COPY

INSTITUTE OF MEDICINE

CROSSING THE QUALITY CHASM

A New Health System for the 21st Century

Technology as a Change Agent

- 3rd Generation Interactive Voice Recognition (IVR) – outreach & intake
- Web-based outreach & intake
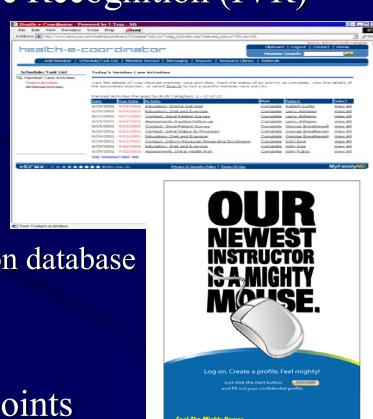- Care coordination tools
  - Evidence-based medicine
  - Decision support technology
  - Patient-based medical information database
- Personalized health records
- Personalized care plans
- Dramatically increased touch points

Technology as a Change Agent – Personal Health Management

- Personalized health records
  - Claims data (medical information from all providers)
  - Pharmacy data
  - Clinical Laboratory Data
  - Personal Medical & Pharmaceutical History
  - Health & Wellness Engagement Record
  - Physician Care Plans
  - Case Management Care Plans
  - Evidence-based Guidelines Resources
- Dramatically improved information sharing

Technology as a Change Agent – Health Database Management

- Centralized patient-centric database
    - Portable
    - Secure
- Multiple user interfaces
    - Patient portal
    - Clinician portal
    - Care Coordinator portal (Nurse, Case Managers,etc)
    - Management reporting tools
- Enabling Communication Connectivity
    - Secure messaging between <u>all</u> constituents
    - Real time data transfer & event review by <u>all</u> constituents

Technology as a Change Agent - Disease Management

- Personalized care plans
- Care coordination tools
  - Resource Library
  - Full service fulfillment center
  - Person specific task generation and reminders
  - Physician care plan incorporation
- Dramatically increased touch points
  - Personalized messaging and reminders
  - 24/7/365 nurse & mentor access
  - Virtual trainers
  - Virtual coaches

Asthma

- Nearly a quarter of working asthmatics changed their job or duties because of their condition.

- Another quarter reported missing at least one partial or complete work day in the last four weeks because of their asthma.

- One fifth rated their effectiveness on the job as less that or equal to 90% in the last four weeks

Blanc, et al.   The work impact of asthma and rhinitis: findings from a population-based survey. J Clin Epidemiol 2001; 54:610-618.
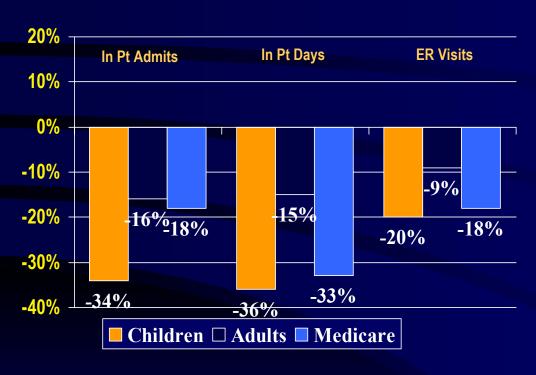
Asthma
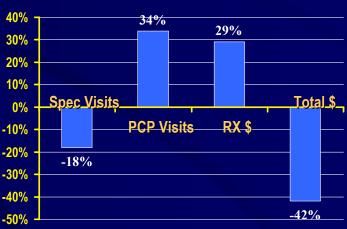
- Among full time working parents of children with asthma:
  - 39% of parents whose children awakened one to three times a month, and
  - 69% of parents whose children awakened four to seven times a month
  - Missed at least one day of work that month.

Diette et al. Nocturnal asthma in children affects school attendance, school performance, and parents' work attendance. Arch Pediatr Adolesc Med 2000; 154:923-928

Health-e-Management Outcomes

Asthma

Bar chart showing Asthma outcomes with categories In Pt Admits, In Pt Days, ER Visits by Children, Adults, Medicare:
- In Pt Admits: Children −34%, Medicare −18%
- In Pt Days: Children −36%, Medicare −33%
- ER Visits: −16%, −15%, −20%, −9%, −18%

Legend: Children, Adults, Medicare

Second chart:
- Spec Visits −18%
- PCP Visits 34%
- RX $ 29%
- Total $ −42%
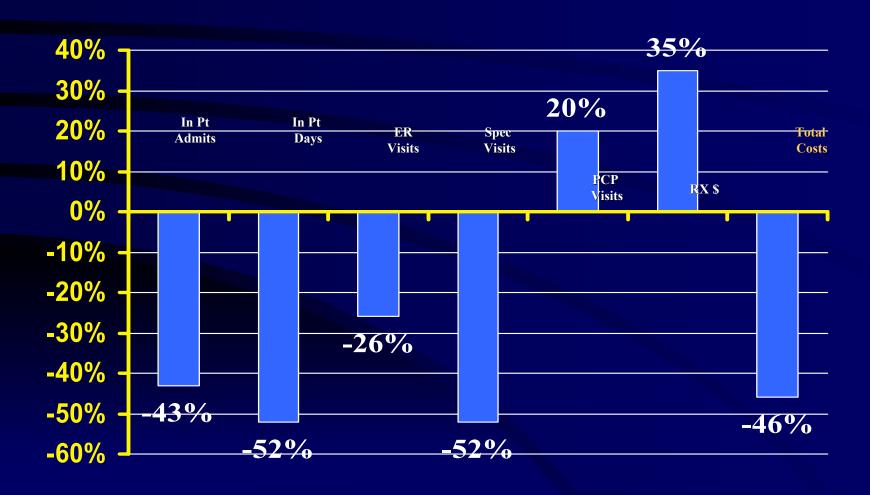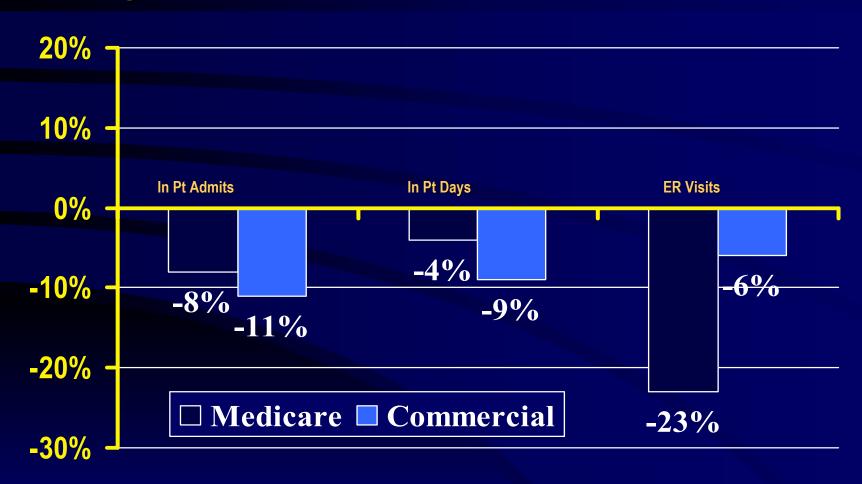
Health-e-Management Outcomes

Diabetes

A bar chart showing the following outcomes:

Category	Value
In Pt Admits	-43%
In Pt Days	-52%
ER Visits	-26%
Spec Visits	-52%
PCP Visits	20%
RX $	35%
Total Costs	-46%

Health-e-Management Outcomes

Congestive Heart Failure

Chart showing percentage changes for Congestive Heart Failure outcomes:

Category	Medicare	Commercial
In Pt Admits	-8%	-11%
In Pt Days	-4%	-9%
ER Visits	-23%	-6%

Legend: ☐ Medicare ☐ Commercial

Y-axis: 20%, 10%, 0%, -10%, -20%, -30%

Technology as a Change Agent - Health & Wellness
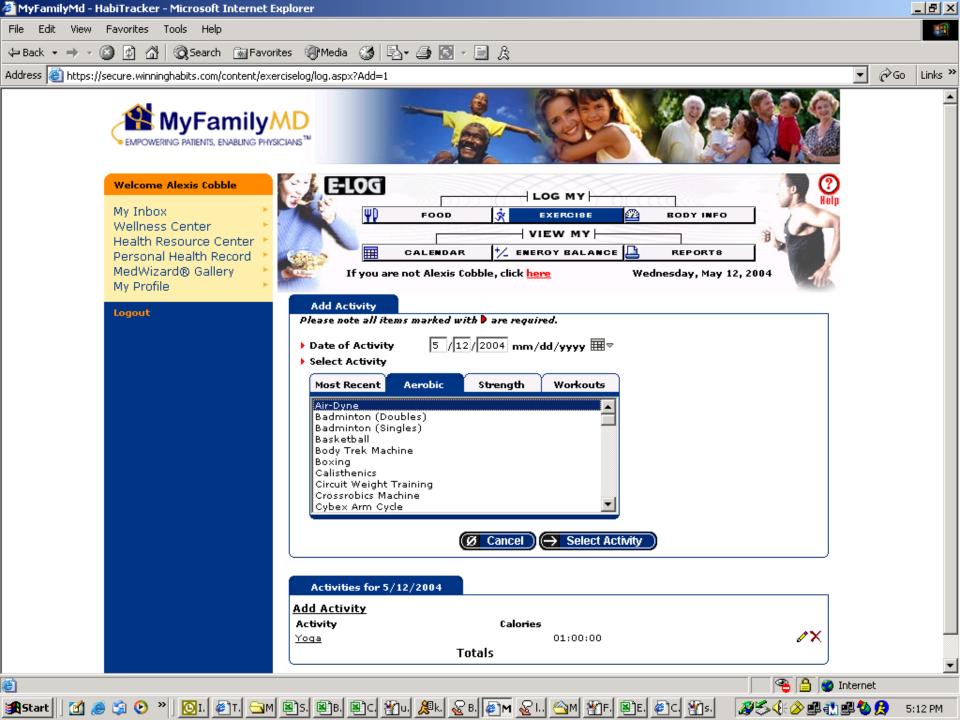
- Diet & Nutrition
- Exercise
- Medication Management
- Adverse Habit Management
- OTC Management
- Medication Error
- Depression/Mental Health Assessment
- Absenteeism Management
- Family Leave Interaction & Support
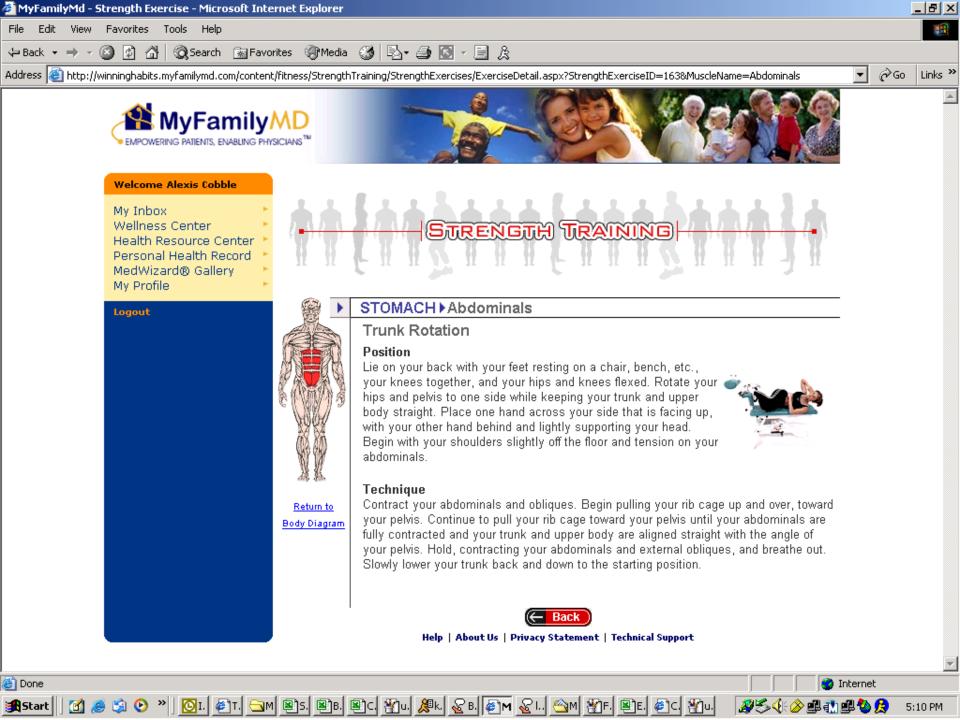
Technology as a Change Agent – Health & Wellness Management

- Targeted Wellness & Health Management
- Online tools
  - Virtual coaches
  - Virtual Mentors
  - Daily personalized health content
  - Streaming video health & fitness content
  - Streaming video healthy habits & healthy eating content
- Personalized Care & Goal Attainment Plans Dramatically improved information sharing
- Outbound Certified Health Mentors & Coaches
- Incentive Plan Tracking & Coordination with Benefits

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Today's News
- Crunch Your Way to a Tighter Midsection
- Don't Forget Your Rewards of Exercise
- Cross Training For Fun And Fitness
- Don't Be A Sore Loser

Fitness Tip of the Day
Take time to stretch calf muscles before and after exercise; or just stretch calves several times ...

Fitness Watch
- What's Hot/What's Not
- Equipment Best Bets
- Sports Medicine

Sport Specific Training
- Baseball/Softball
- Basketball
- Biking
- Football
- Golf
- Running
- Soccer/Rugby
- Swimming
- Tennis/Racquet Sports
- Volleyball

To view an episode, click on a title below.

COOPER|TV

Video Fitness Tips
Week of 5/9 to 5/15

Sun	Specific warm-ups
Mon	Cycling efficiency
Tue	Advice to swimmers
Wed	Bend at the hip
Thu	Work the wrists
Fri	Stand tall
Sat	The Safest Exercise

Resource Library
Search our archives for additional info.

Go

Exercise Log
- Exercise Logging System

Strength Training
- Training Tips
- Virtual Trainer
- FAQ's

Aerobic Training
- Training Tips
- Target Heart Rate
- Individual Activities
- Group Training
- FAQ's

Flexibility
- Training Tips
- FAQ's

Fitness Assessments
- Before You Begin
- Heart Rates
- Body Composition
- Cardiovascular Test
- Strength Test
- Flexibility Test
- Basal Metabolic Rate

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E-LOG

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🍴 FOOD   🏃 EXERCISE   🎛 BODY INFO

⎯ VIEW MY ⎯
▦ CALENDAR   +⁄‒ ENERGY BALANCE   🖨 REPORTS

❓ Help

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Add Activity

Please note all items marked with ▸ are required.

▸ **Date of Activity**   5 / 12 / 2004 mm/dd/yyyy ▦ ▽
▸ **Select Activity**

| Most Recent | **Aerobic** | Strength | Workouts |

Air-Dyne
Badminton (Doubles)
Badminton (Singles)
Basketball
Body Trek Machine
Boxing
Calisthenics
Circuit Weight Training
Crossrobics Machine
Cybex Arm Cycle

⊘ **Cancel**   → **Select Activity**

Activities for 5/12/2004

Add Activity

Activity	Calories		
Yoga	01:00:00		✏ ✗
Totals			

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STROENGTH TRAINING

Return to
Body Diagram

STOMACH ▶ Abdominals

Trunk Rotation

Position

Lie on your back with your feet resting on a chair, bench, etc., your knees together, and your hips and knees flexed. Rotate your hips and pelvis to one side while keeping your trunk and upper body straight. Place one hand across your side that is facing up, with your other hand behind and lightly supporting your head. Begin with your shoulders slightly off the floor and tension on your abdominals.

Technique

Contract your abdominals and obliques. Begin pulling your rib cage up and over, toward your pelvis. Continue to pull your rib cage toward your pelvis until your abdominals are fully contracted and your trunk and upper body are aligned straight with the angle of your pelvis. Hold, contracting your abdominals and external obliques, and breathe out. Slowly lower your trunk back and down to the starting position.

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Background

- Company is 83% male, average age of 48, working in production settings
- Initial data collected in 1999 prior to launch of wellness program
- Wellness program begun in January 2000
- Second set of data collected in Fall 2003

Total Participants and Those with 5+ Risk Factors

Life-style Risk Factors
Percentage of Employees At Risk

Blood Pressure & Cholesterol Changes
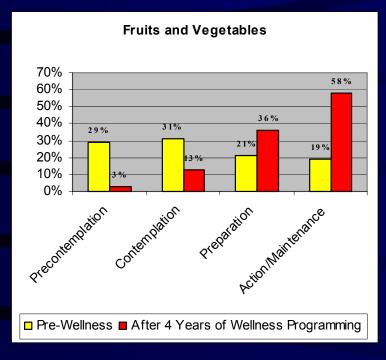
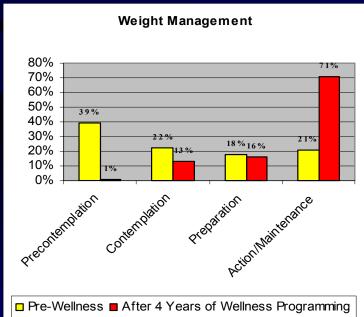- Percent of employees with hypertension dropped from 20 to 10 percent (approximately 600 people)

- Percent of employees with uncontrolled diabetes dropped from 14 to 11 percent (approximately 180 people)
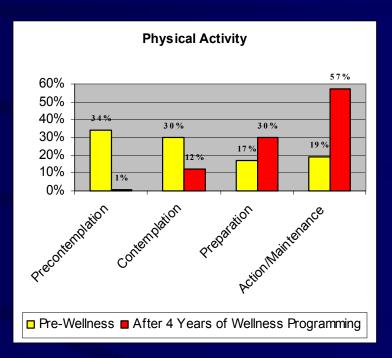
Blood Pressure & Cholesterol Changes

- Based on annual cost of treatment data from the American Heart Association, estimated recurring annual savings for control of high blood pressure equals **$1,110,600.**
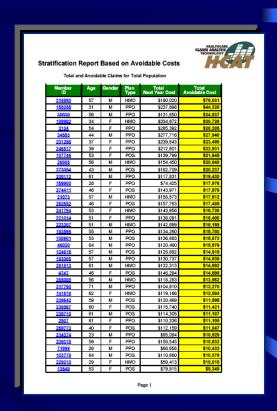
- Based on annual cost of treatment data from the American Diabetes Association, estimated recurring annual savings for control of diabetes equals **$1,922,940.**

Fruits and Vegetables

- Precontemplation: Pre-Wellness 29%, After 4 Years 3%
- Contemplation: Pre-Wellness 31%, After 4 Years 13%
- Preparation: Pre-Wellness 21%, After 4 Years 36%
- Action/Maintenance: Pre-Wellness 19%, After 4 Years 58%

□ Pre-Wellness ■ After 4 Years of Wellness Programming

Physical Activity

- Precontemplation: Pre-Wellness 34%, After 4 Years 1%
- Contemplation: Pre-Wellness 30%, After 4 Years 12%
- Preparation: Pre-Wellness 17%, After 4 Years 30%
- Action/Maintenance: Pre-Wellness 19%, After 4 Years 57%

□ Pre-Wellness ■ After 4 Years of Wellness Programming

Weight Management

- Precontemplation: Pre-Wellness 39%, After 4 Years 1%
- Contemplation: Pre-Wellness 22%, After 4 Years 13%
- Preparation: Pre-Wellness 18%, After 4 Years 16%
- Action/Maintenance: Pre-Wellness 21%, After 4 Years 71%

□ Pre-Wellness ■ After 4 Years of Wellness Programming

Technology as a Change Agent – Productivity Management

- Targeted Occupational Health Management
  - Personalized care plans
  - 24/7/365 nurse call & rehab support

- Targeted Absence Management
  - STD, LTD, FMLA

- Online tools
  - Virtual PT & exercise coaching
  - Single point of entry for injury reporting
  - Single point of entry for sick day reporting
  - Management reports

- Care coordination tools
  - Person specific task generation and reminders
  - Physician care plan incorporation

Weight Management

Chart with percentages by stage:
- Precontemplation: 39% (Pre-Wellness), 1% (After 4 Years of Wellness Programming)
- Contemplation: 22% (Pre-Wellness), 13% (After)
- Preparation: 18% (Pre-Wellness), 16% (After)
- Action/Maintenance: 21% (Pre-Wellness), 71% (After)

Legend: ☐ Pre-Wellness ☐ After 4 Years of Wellness Programming

Is a New Philosophy Needed?

- Population Health Management
  - Not just Population Health Pricing
  - "Population Health Management on a Targeted Population"
- Benefit strategy
- Avoidability vs. High cost
- Health-e-Valuation^{SM} versus traditional Health Risk Assessments
- Incentives aligned to drive participation
- Internal Marketing & Corporate Campaign managed
- Performance Metrics provide accountability

Population Health Management
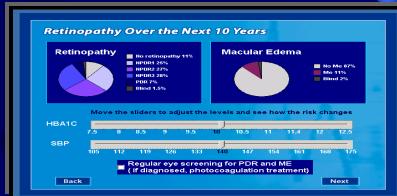
- No one is left behind – 100% of population managed actively
- Long-term Strategy

Non-enrolled employees
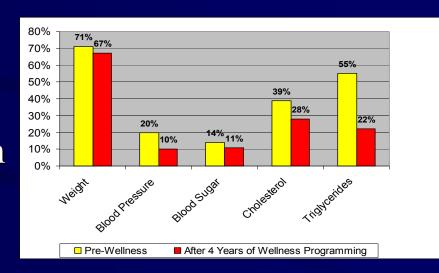
Enrolled & dependents global & remote care coordination
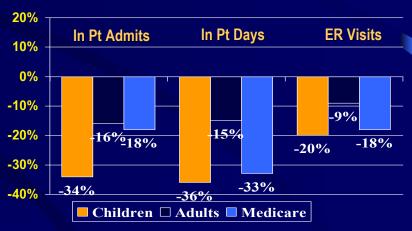
Enrolled & dependents onsite care delivery & coordination

Population Health Management

- Stratification on <u>avoidability</u> for entire population
  - "Healthy"
  - Unknowns
  - Patients with known disease & demand management needs

- Claims data AND Medical History, Family History, Clinical Data, and Lifestyle Choices
- Behavioral Modification
- Health and Wellness
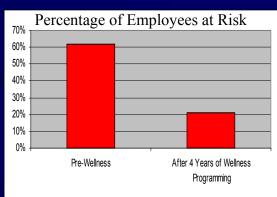- Pharmacy interaction

Population Health Management

- Health and Wellness
- Demand Management
- Absenteeism/Presenteeism
- Disease Management
- End-of-Life Management
- Productivity Management
- Occupational Health
- Corporate Health
- Performance Metrics

Pre-Wellness ■ After 4 Years of Wellness Programming

	Weight	Blood Pressure	Blood Sugar	Cholesterol	Triglycerides
Pre-Wellness	71%	20%	14%	39%	55%
After 4 Years	67%	10%	11%	28%	22%

	In Pt Admits	In Pt Days	ER Visits
Children	-34%	-36%	-20%
Adults	-16%	-15%	-9%
Medicare	-18%	-33%	-18%

■ Children ■ Adults ■ Medicare

Population Health Management

- *"Treating people, not diseases"*™
- The right resources at the right time
- Self-Help resources and tools
- Education, Counseling, Mentoring
- Patient Enrollment <u>AND</u> Participation
- Clinical Interaction & Support
- Physician Engagement
- Coordination with Case Management
- Coordination with Utilization Management
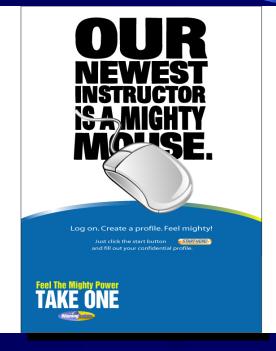- Benefit Design Strategy

Percentage of Employees at Risk

Benefit Design Strategy

- Incentives for Healthy Behaviors
- Incentives for Active Wellness Activities
- Incentives for Active Prevention Activities
- Incentives for Active Disease Management
- Sharing the health care cost trend line reductions
- Reducing the employee contribution
- No participation, no health care benefits ???

Personalized Corporate Campaign

- Internal Marketing and Communications Plan tied to Specific Corporate Culture
  - Communications Vehicles
  - Competitions/ Challenges
  - Medical Director/ Senior Management "Push"
  - On-Going Program Visibility
  - Integrated Benefit Design Incentives
- "Private-Labeled" Health & Wellness Program

www.MyHoustonian.com

The Houstonian Fitness Challenge, May 2003

It's easy. Just login, record your exercise and win.

1. Login to www.MyHoustonian.com
2. Click on Exercise Log
3. Create a Profile
4. Start logging

Do it. Log it. Win it!

ABWay.net

OUR NEWEST INSTRUCTOR IS A MIGHTY MOUSE.

Log on. Create a profile. Feel mighty!

Feel The Mighty Power TAKE ONE

According to WHO…

"The only way to cope with that level of prevalence and effectively treat people with chronic conditions is to transform healthcare."

"That means moving away from a system that focuses on episodic care in response to acute illness toward a system that is proactive and emphasizes health across a lifetime."

"Do not quench your inspiration and your imagination;
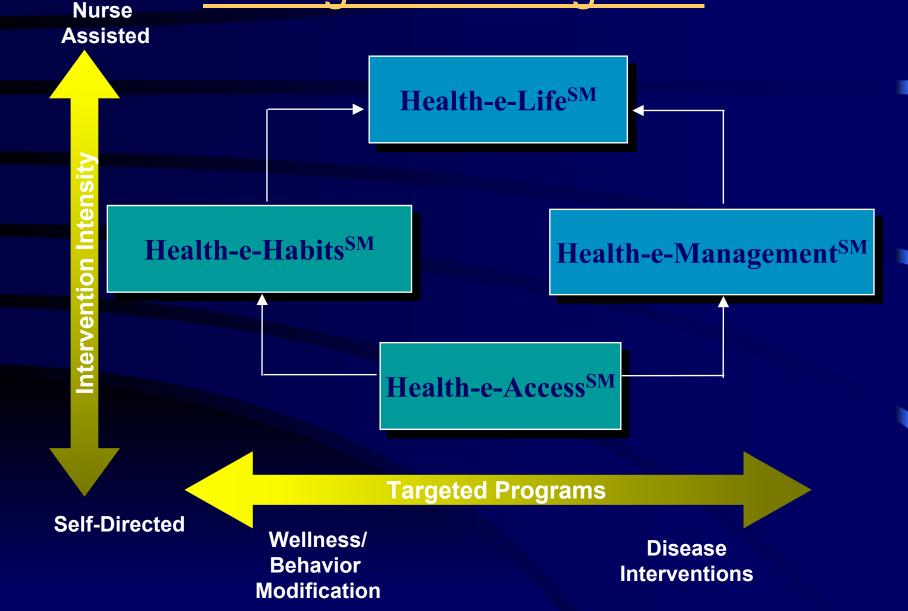*Do not become the slave of your model."*

Vincent Van Gogh

The Population Health and Productivity Company

"Fundamentally Changing the Way Healthcare is Delivered"

I-trax Personalized Health Management Programs

MyNurseLine Outcomes