

# Translating Big Data to Personalized Outreach

Innovation in Proactive Mental Health Management



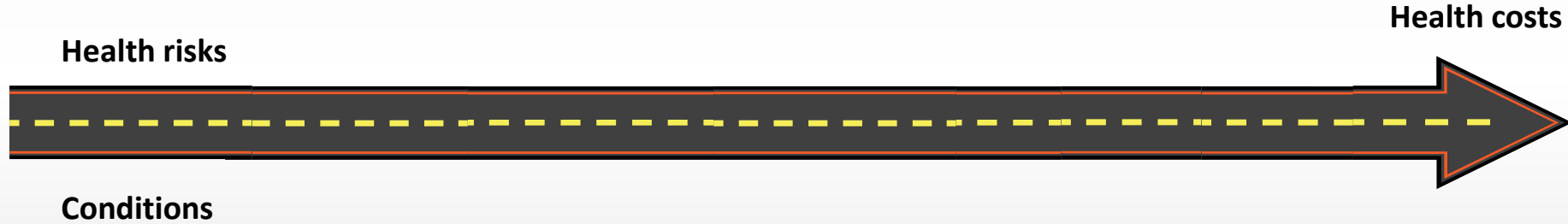
# Health, life and work are not separate issues



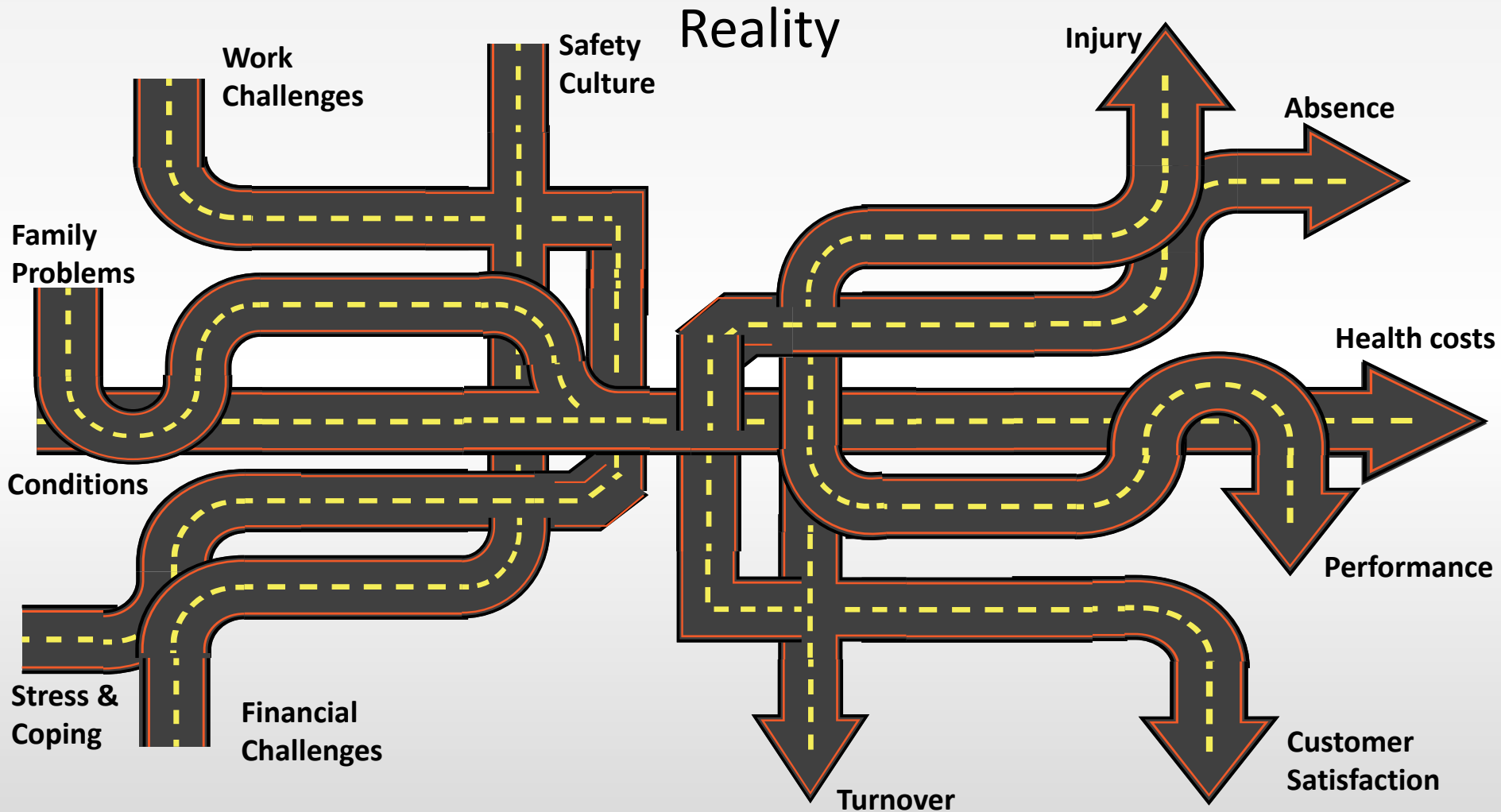
# Life comes at you



# Outcomes, oversimplified





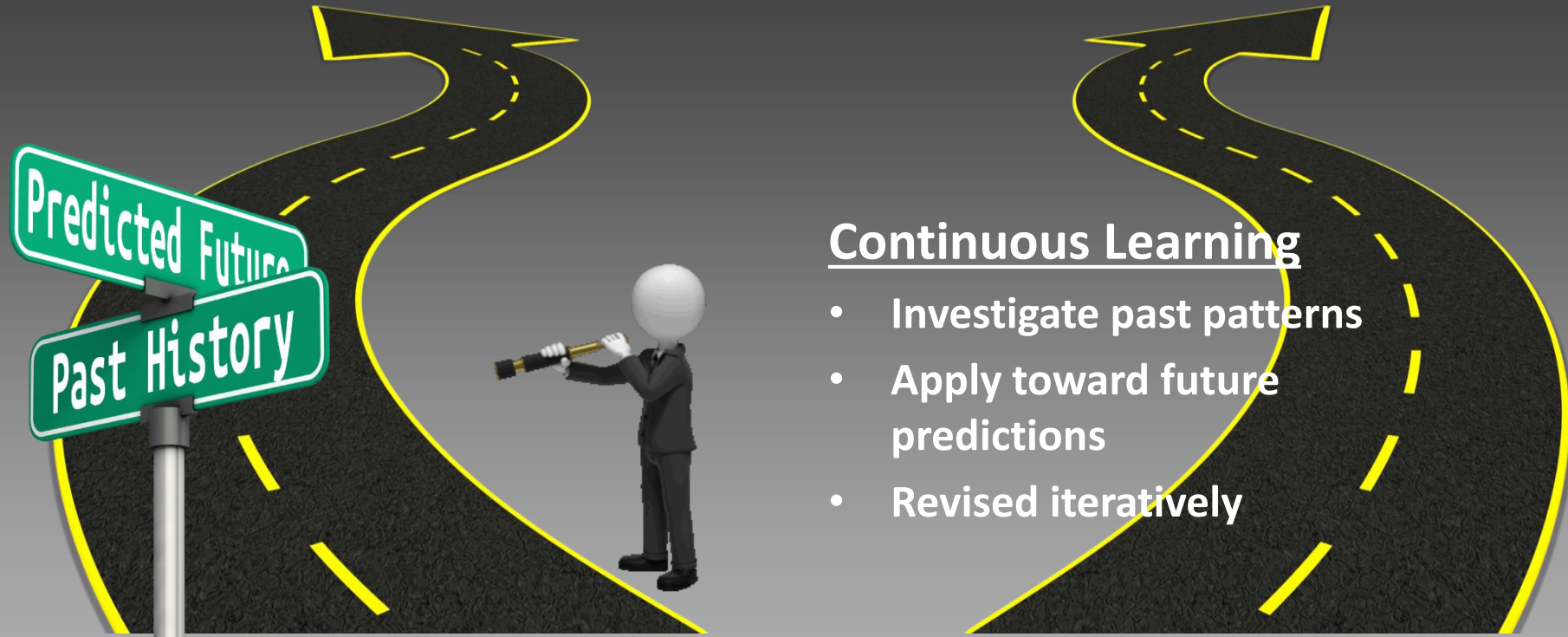


# Today's Presentation

1. Big Data: finding new populations with super-accuracy
2. Integrated outreach: maximizing engagement
3. Business Value for UPMC



# Big Data means bigger perspective



# Big Data means big picture

## All data sources

- Integrated at the individual level
- Automatically refreshed
- Current within 30 days
- Linked at the business-unit level
- Dedicated analysts
- Feedback loops for validation





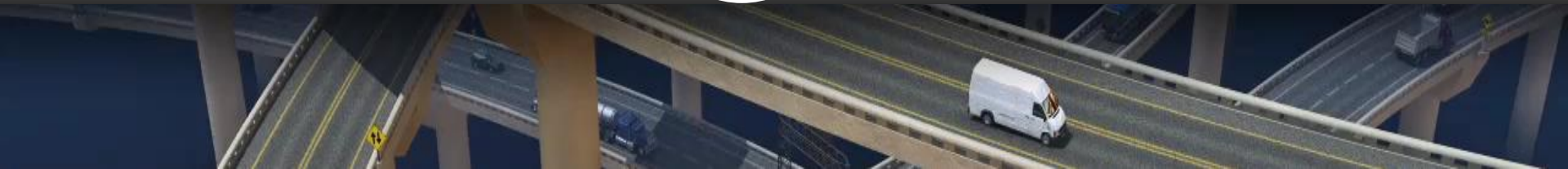
# Big Data transforms predictive capabilities

How do social  
determinants



How do job characteristics  
Influence medical  
utilization?

Influence absence  
and injury?



# Big Data is Now Possible

## Because

- Computing power
- Storage space
- Statistical Methods
- Open source

## Allows

- 800-1000 variables
- 45K people
- Automatically Updated (monthly)
- Short lags 1-10 days (Dx/Rx-30)
- Machine learning to optimize prediction

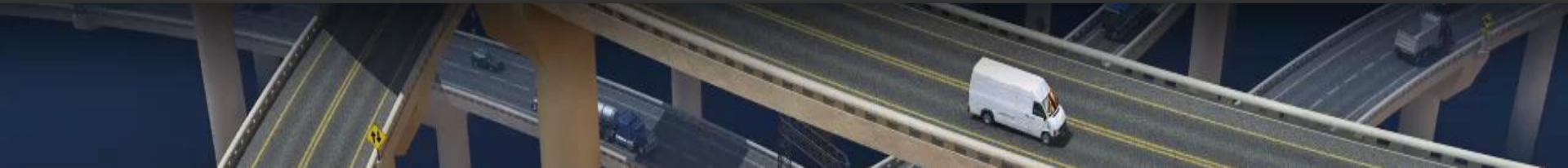


# As recently as five years ago



Statistical analysis methods and hardware couldn't/didn't:

- Process large numbers of variables
- Process variables that are related to each other
- Perform iterative analysis in a timely fashion
- Optimize and compare potential models
- Display results in a useful way
- Evolve continuously



Can we accurately predict who needs support?





# Recognizing the burden of mental health

- 94% of organizations say stress is an issue for employees
- CDC estimates costs of mental health (\$317B) greater than cost of all workplace injuries
- 200 million work days lost per year... (one million FTEs)

Mental Health and Substance Abuse: 2016 Survey, IFEBP



# Why focus on mental health?



## Mental Health Services

## Physical Health Services only



Percent of integrated cost by service	4.7%	95.3%
Percent of People	34%	66%
% of Integrated Total Costs	73%	26%
Additional Days Absent	6 days (700 FTEs)	



# Example: Predicting future events

**Question:** Can we predict who will have high stress, resulting in a new mental health claim?



**Approach:** Looking at people with no mental health claims for two years, which ones will have one in year three.  
(mood, anxiety, adjustment)



# Using traditional data sources

Add Longitudinal  
Change in HRA



Identifies 138  
79% accurate

Add recent HRA



Identifies 45  
67% accurate

Group Health Data



Identifies 12  
58% accurate





# Adding integrated data sources

**80% accurate: 325 confirmed cases**

FMLA	Short-term Disability	Workers Compensation	Add Human Resources
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Identifies 410



# Predictors are

We can predict new stress/mental health cases each year before they happen, with **high** accuracy.

Mostly anxiety, mood and adjustment issues. (treatable)

Predictors include:

- Changes in HRA responses
- Performance reviews
- Work settings
- Work scheduled
- New work injury
- Leave type and frequency
- Financial hardship
- Type of absence
- Recent job stress
- Repeat LOA
- Low work engagement





# Applying Integrated Services To Big Data

**Connecting people and services in real-time**

Andrew Yohe

What good is identifying new people  
If we can't reach them?



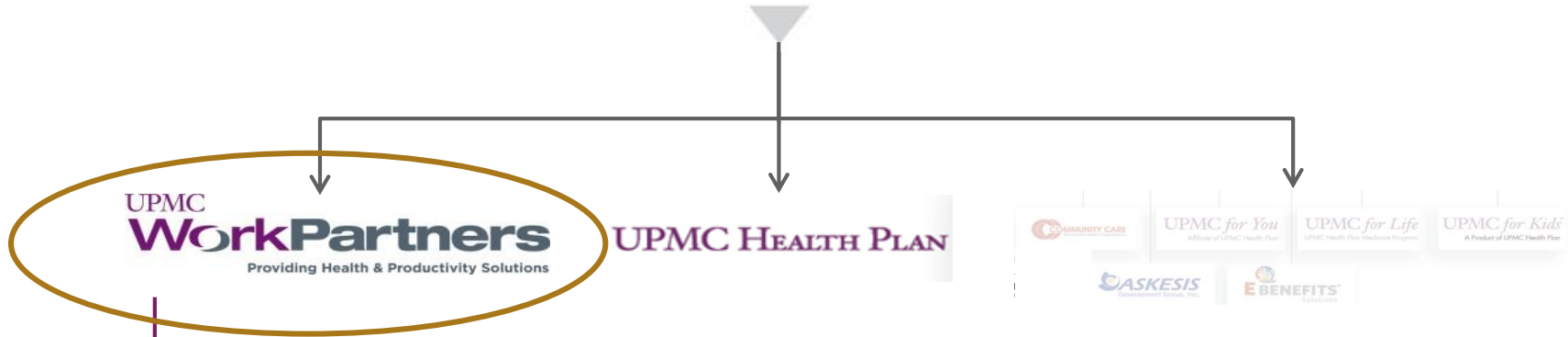




# Who Is WorkPartners?



## UPMC Insurance Services Division



### LifeSolutions

*EAP & Health  
Management Solutions*

### Absence Management

*Leave & STD Services*

### Workers' Compensation

*TPA & Fully Insured*

### On-site Services

*Employee Health &  
Acute Care Clinics*

# Building Crosswalks to Improve Engagement Support

**Improve**  
**Manage**  
**Maintain**



# Take advantage of scheduled “stops”



Existing wellness programs



Integrated Clinic Visits



WC/STD/Leave

Multiple Opportunities for Repeat Engagement

Over 40,000

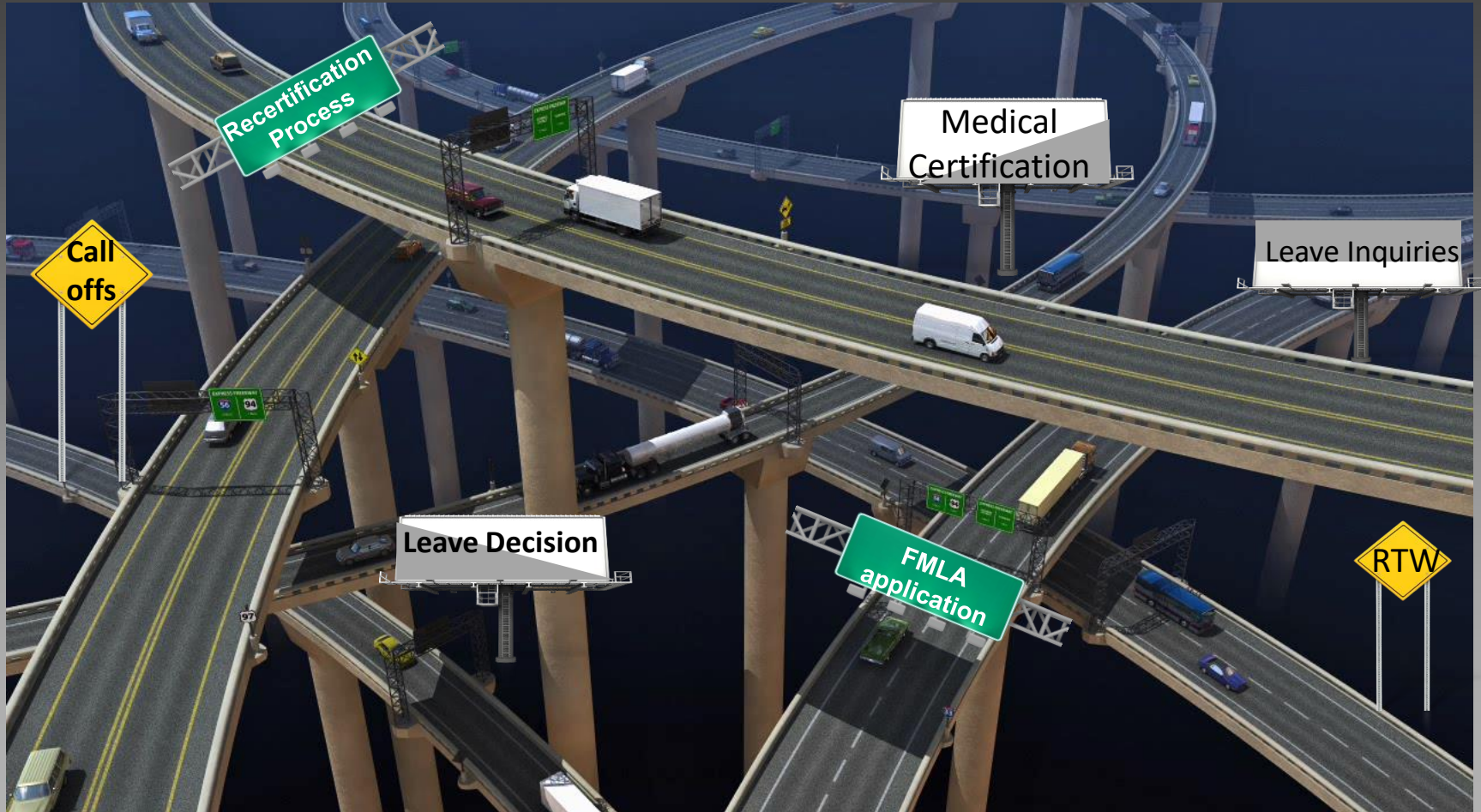
Over 150,000

Over 60,000



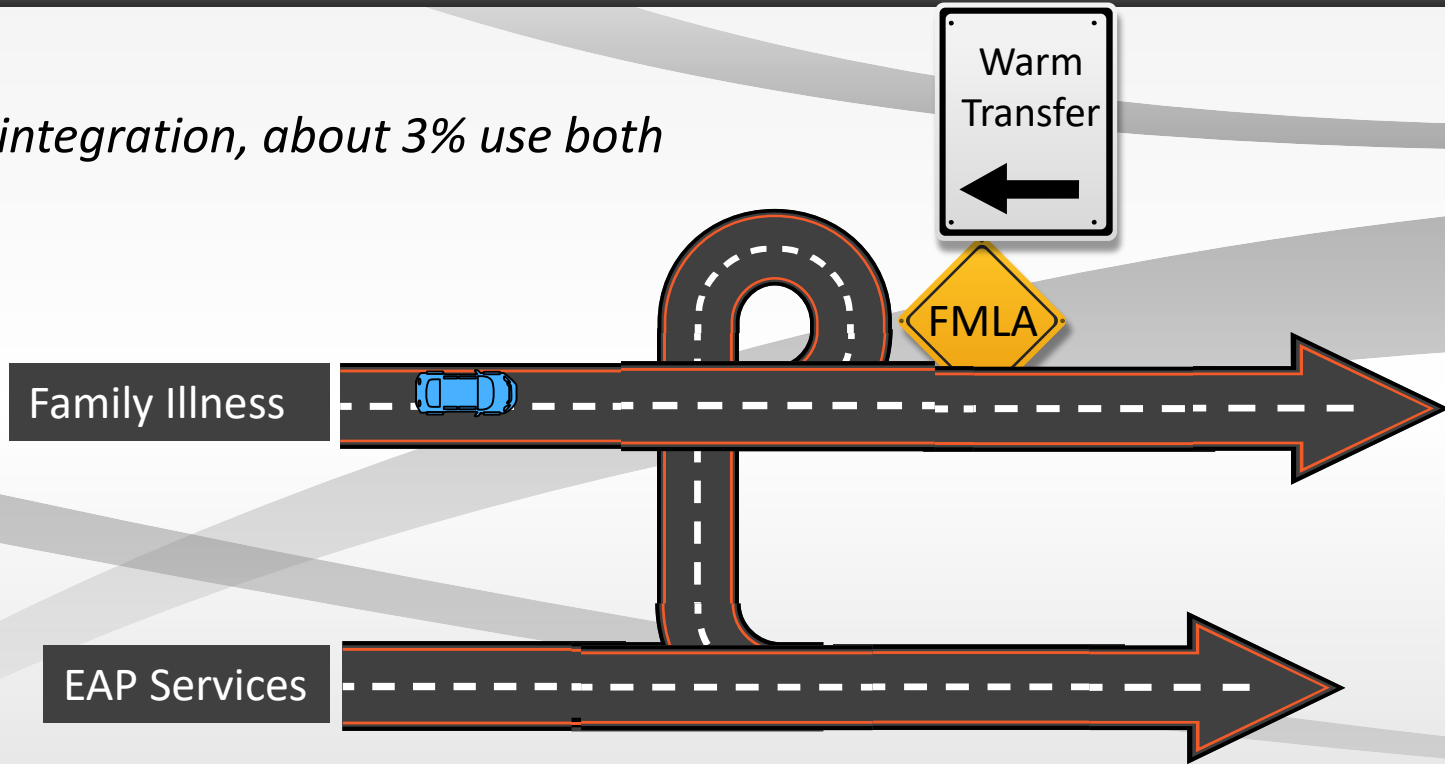


# Multiple engagement opportunities - Leave



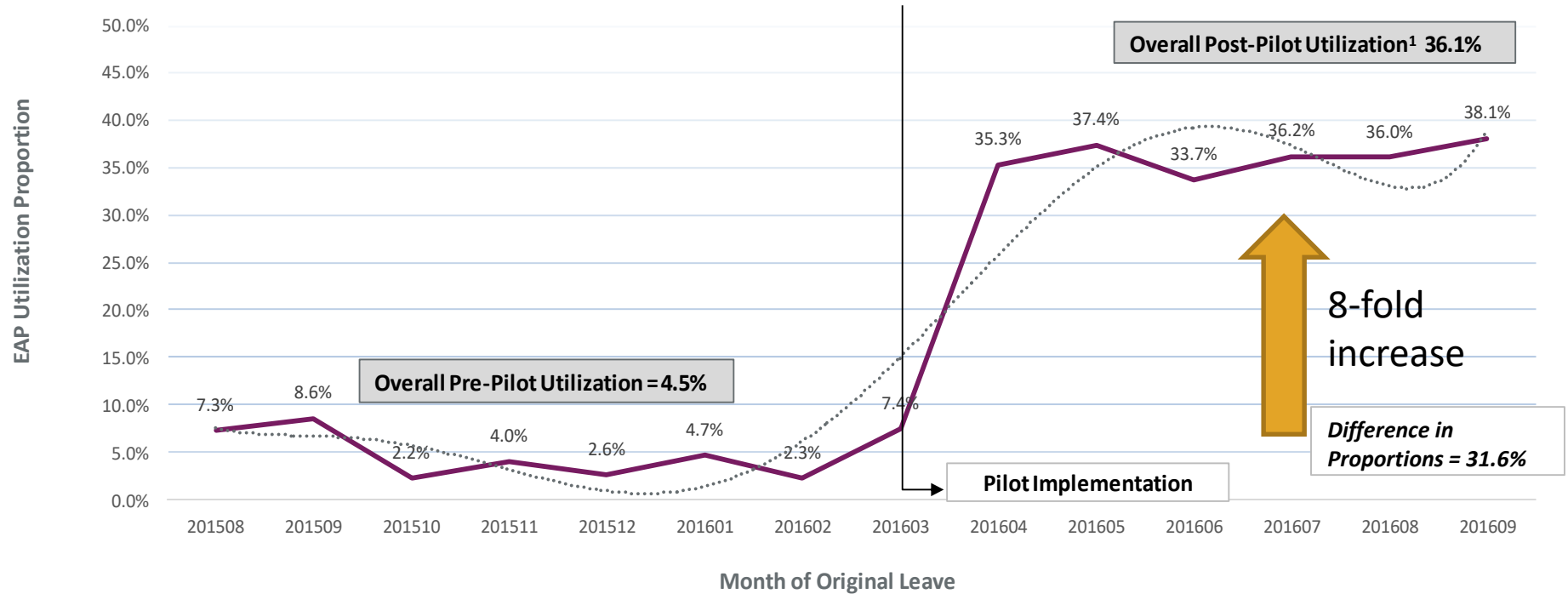
# Real-time Hand-offs Work

*Without integration, about 3% use both*



# Example #1: FML to EAP Active Hand-off Pilot

EAP Utilization for FMLA Reasons - Parent, Partner/Spouse or Child



# Example #2: Prescription (Rx) for Wellness

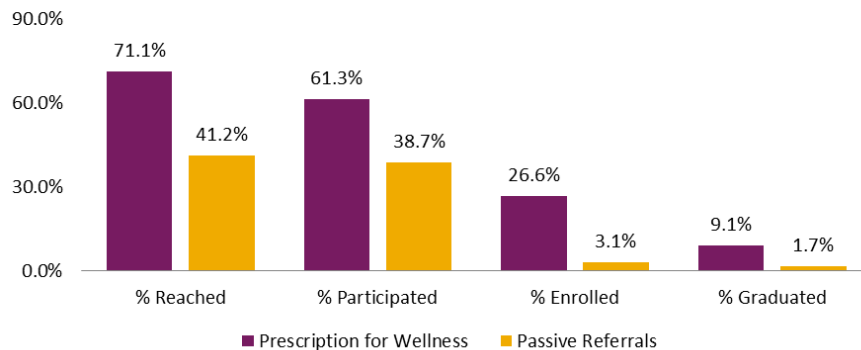
## Why Prescribe Healthy Behaviors? The Power of the White Coat



- The clinician/patient conversation is very potent in promoting positive behavior change outcomes.
- A Rx denotes an expectation for follow-up and “filling” the order.
- Promotes patient action to initiate.

Engagement **2x-10x** greater than “usual care” identification and referral routes

Engagement Rate Comparisons





# Sounds Simple.... It's not

## Key Components

Process flows

Live flags in records

Timely identification

Counselor training

Ongoing evaluation





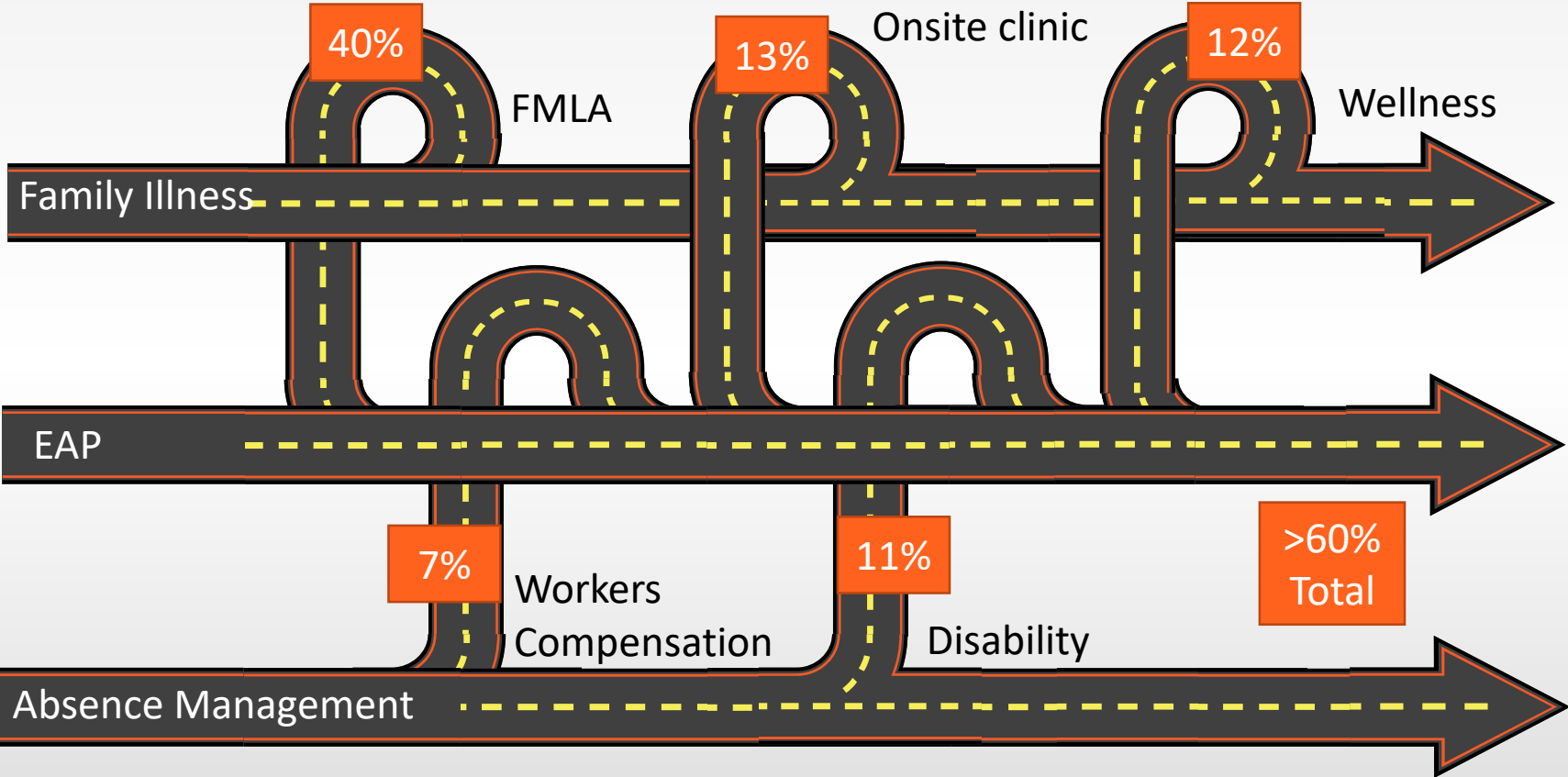
# High Stress- Mental Health

## Of the 325 people identified

- Contact in the **12 months** prior or after: **75%**
- Contact in the **6 months** prior or after: **65%**
- Contact in the **3 month** prior or after: **52%**



Over the next 12 months



# Summary

Real-time, integrated referrals:

- Just as important as accurate prediction
- Leverages existing integrated service delivery
- Significantly increases in engagement



# Big Data Business Value to

**UPMC** LIFE  
CHANGING  
MEDICINE

Michael Parkinson, M.D.

# Let's Talk About Engagement



75% Behaviors, 30% Waste –  
What Are We Trying to Do?

*"Give it to me straight, Doc. How long do I have to ignore your advice?"*





# About UPMC

UPMC HEALTH  
SERVICES DIVISION

UPMC  
ENTERPRISES

UPMC INSURANCE  
SERVICES DIVISION

UPMC INTERNATIONAL

*Highly integrated  
system with an  
academic medical  
center hub that is  
closely affiliated with  
the University of  
Pittsburgh*

## **UPMC Health Services Division has:**

- More than 20 academic, community, and regional hospitals with more than 5,000 licensed beds
- More than 500 clinical locations in western Pennsylvania
- More than 70 inpatient, outpatient & long-term care facilities for rehabilitation services
- More than 3.9 million outpatients visits

## **UPMC Insurance Services Division has:**

- More than 2.9 million members in FY16
- \$7 billion in top line revenue
- 33% market share across all covered lives in western Pennsylvania
- The largest behavioral health insurance provider in Pennsylvania



# Our Mission & Vision

## Mission

UPMC's mission is to **serve our community** by providing outstanding **patient care** and to shape tomorrow's health system through clinical and technological innovation, research, and education.

## Vision

UPMC will **lead the transformation of health care**.

- Putting our patients, health plan members, employees, and community **at the center** of everything we do and creating a model that ensures that **every patient gets the right care, in the right way, at the right time**, every time.
- **Harnessing our integrated capabilities** to deliver both superb state-of-the-art care to our patients and high value to our stakeholders
- Employing our partnership with the University of Pittsburgh to **advance the understanding of disease**, its prevention, treatment and cure.
- **Serving the underserved** and disadvantaged, and advancing excellence and innovation throughout health care.
- Fueling the **development of new businesses** globally that are consistent with our mission as an ongoing catalyst and driver of **economic development** for the benefit of the residents of the region.



# Healthy Workforce Definition\*

## HEALTHY

Demonstrating **optimal health status** as defined by positive health behaviors; minimal modifiable risk factors; and minimal illnesses, diseases, and injuries

## PRODUCTIVE

Functioning to produce the **maximum contribution** to achievement of personal goals and the organizational mission

## READY

Possessing an **ability to respond to changing demands** given the increasing pace and unpredictable nature of work

## RESILIENT

Adjusting to setbacks, increased demands, or unusual challenges by **bouncing back to optimal “well-being” and performance** without incurring severe functional decrement

*\*IOM: Integrating Employee Health: A Report for NASA 2007*



# It's more than health

To deliver on our mission  
We need employees who are:

**Healthy**  
**Productive**  
**Ready**  
**Resilient**



# Our Challenge: Growing Healthier and More Productive Employees and Businesses



Health Measure	Pittsburgh Ranking vs. 14 Similar U.S. Economic Regions	
Diabetes	19%	13th
Fatal Heart Attacks	25.3%	12th
Obesity	36.6%	10th





# Hospital Employees: Sicker and Higher Cost

## A study of healthcare employees found:

- Hospital employees have 10% higher healthcare costs
- Hospital employees & families have 13% higher healthcare costs
- Hospital employees & families have 8.6% more illness
- Hospital workers & families had fewer physician office visits, yet were 22% more likely to visit the ER
- The average annual cost of healthcare for hospital employees was \$4,662 exceeding the general employee population by \$538

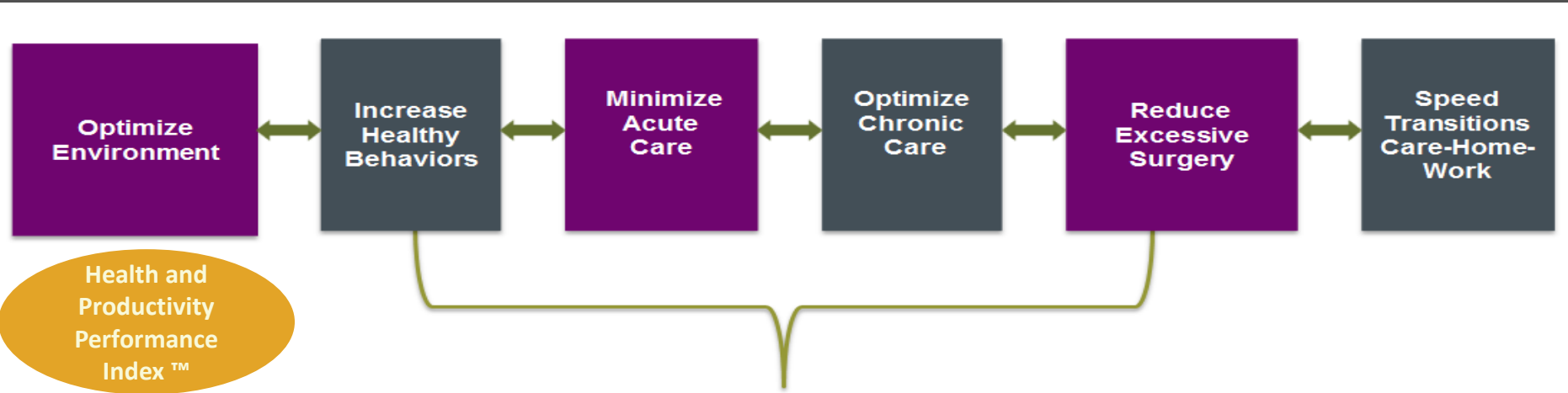


(Source: CHICAGO | Monday Sept 12, 2011 12:25am EDT (Reuters))



# Employer Health & Productivity Road Map™\*

*“Understand, Improve, and Partner With Your Doctor”*



**Incentivized Health Management Program or Consumer-Directed Health Plan**

\*Parkinson MD. Employer Health and Productivity Roadmap™ Strategy, JOEM 55 (12) Supp Dec 2013.

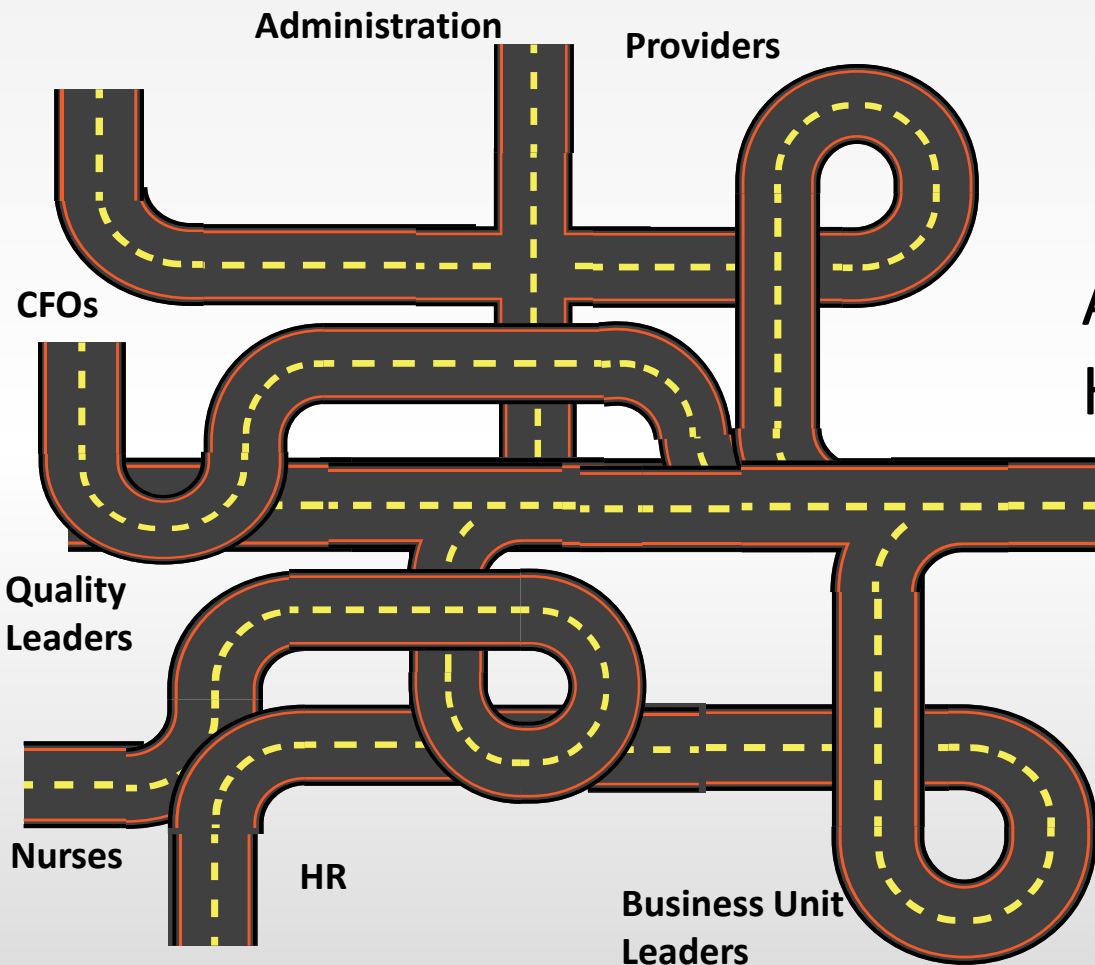


# Collaboration

## Big Data also means **Big Cooperation**

- Data owners come from all aspects of the business.
- And buy-in at the top is key.





All Roads Lead to Better  
Health and Performance

**Data integration** provides a new **map** for all the stakeholders to **merge and collaborate** for more **effective and earlier** interventions for our most valuable resources...**Employees and their families!**