

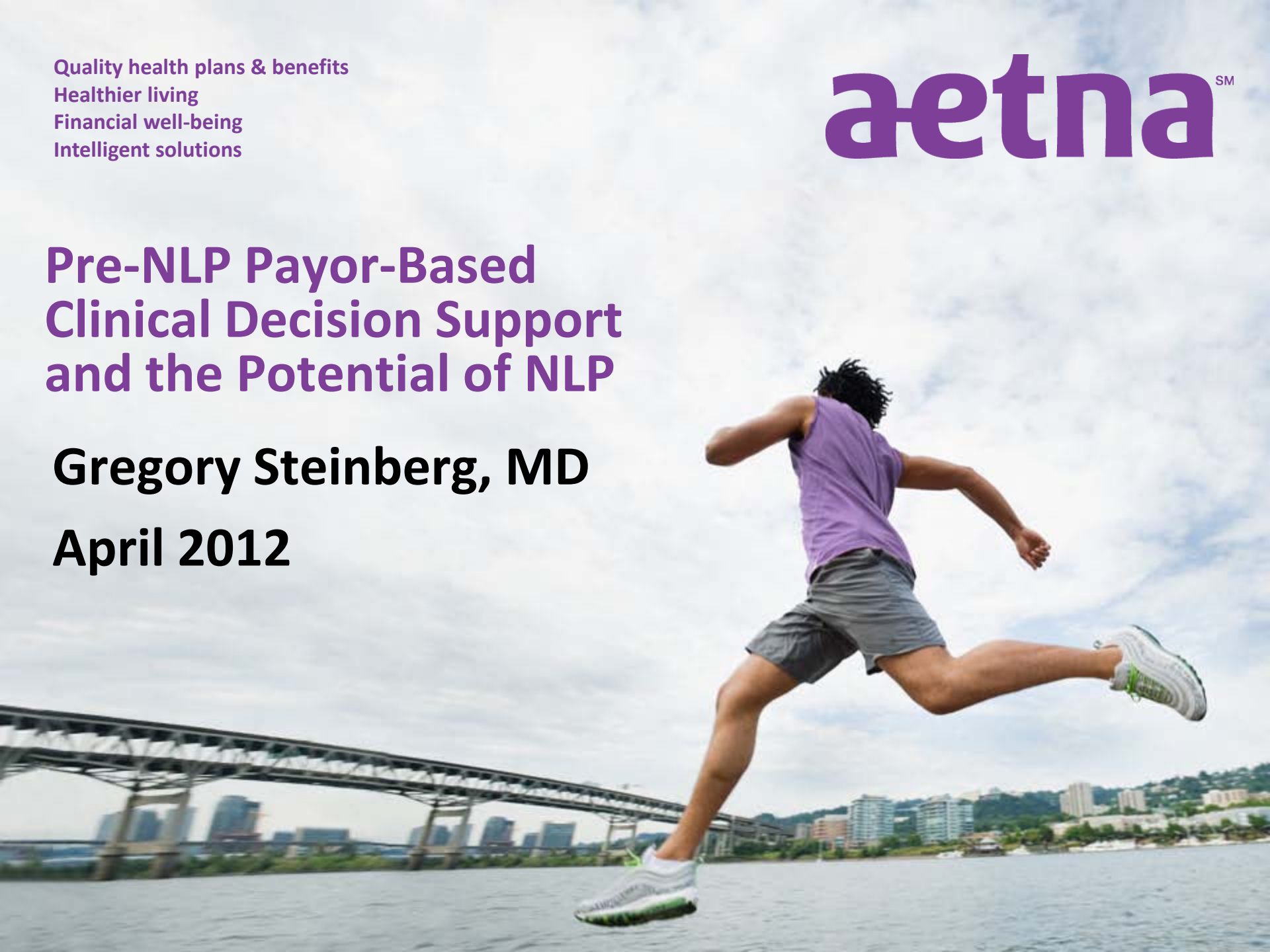
Quality health plans & benefits  
Healthier living  
Financial well-being  
Intelligent solutions

**aetna**<sup>SM</sup>

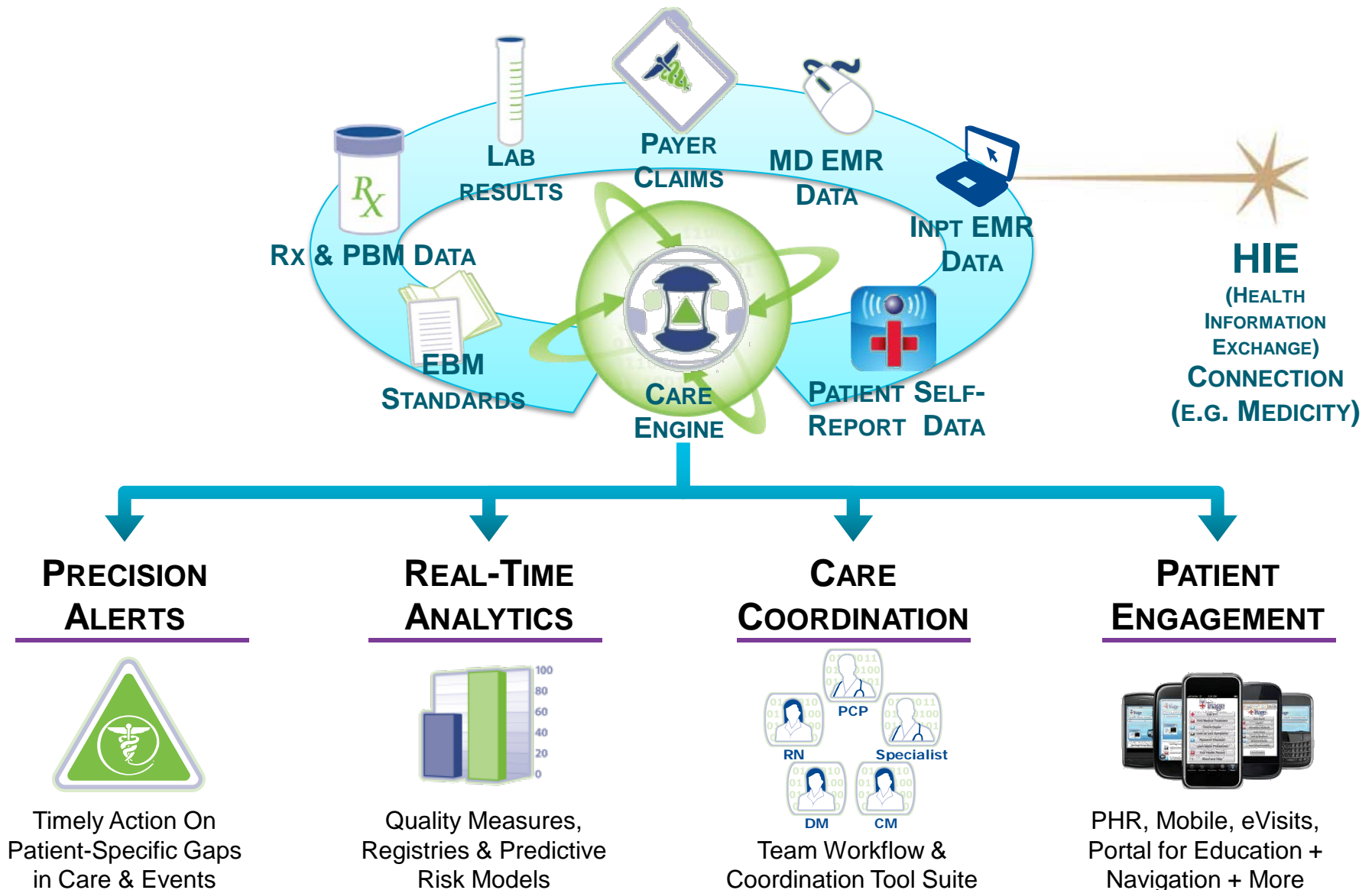
# Pre-NLP Payor-Based Clinical Decision Support and the Potential of NLP

**Gregory Steinberg, MD**

**April 2012**



# CDS Enables Actionable Population Care



# CDS Finds Individualized Opportunities for Health Care Improvement & Risk Reduction

## Collect Patient Data



## Compare to Evidence-Based Medicine



## Identify Risks & Communicate Gaps in Care



# Basic Clinical Decision Support Helps at Some Steps

**Diagnose & Evaluate**

**Prevent & Monitor for Complications**

**Manage Disease & Complications**

**Medication Safety**



*BMI > 25 & Age > 40, need diabetes test*



*Need A1c blood test*



*Need Eye Exam*



*Need Routine Vaccine*



*Drug interactions*

**Much of clinical decision support is fairly basic today.**


# Advanced CDS Helps at Every Step of Care


## Diagnose & Evaluate


## Prevent & Monitor for Complications

## Manage Disease & Complications

## Medication Safety

 BMI>25 & Age >40, need diabetes test

 High random blood sugar, need test

 Gestational diabetes, need diabetes test

 Metabolic syndrome, need treatment

 Need A1c blood test


 Need Eye Exam

 Need Foot Exam


 Need LDL cholesterol blood test


 Need Vaccines for Influenza, Pneumonia

 Need kidney damage urine protein test

 Need kidney function blood test

 Need Peripheral Artery Disease Test

 High A1c, no meds, need metformin

 High A1c, on meds, need to intensify

 Very high A1c, need insulin

 LDL >100, no meds, need statin therapy


 LDL still high, on meds, need intensify


 Kidney damage, need ACE inhibitor / ARB


 Hypertension, need ACE inhibitor/ARB

 Age>40, need aspirin

 Metformin danger conditions, need tests

 Glitazones, liver damage, tests needed

 Drugs that worsen blood sugar levels

 Statins – liver, muscle damage warning

 Pramlintide – danger with gastroparesis

 ACE inhibitor/ARB side effects (e.g. potassium)

 Oral contraceptives – danger with diabetes

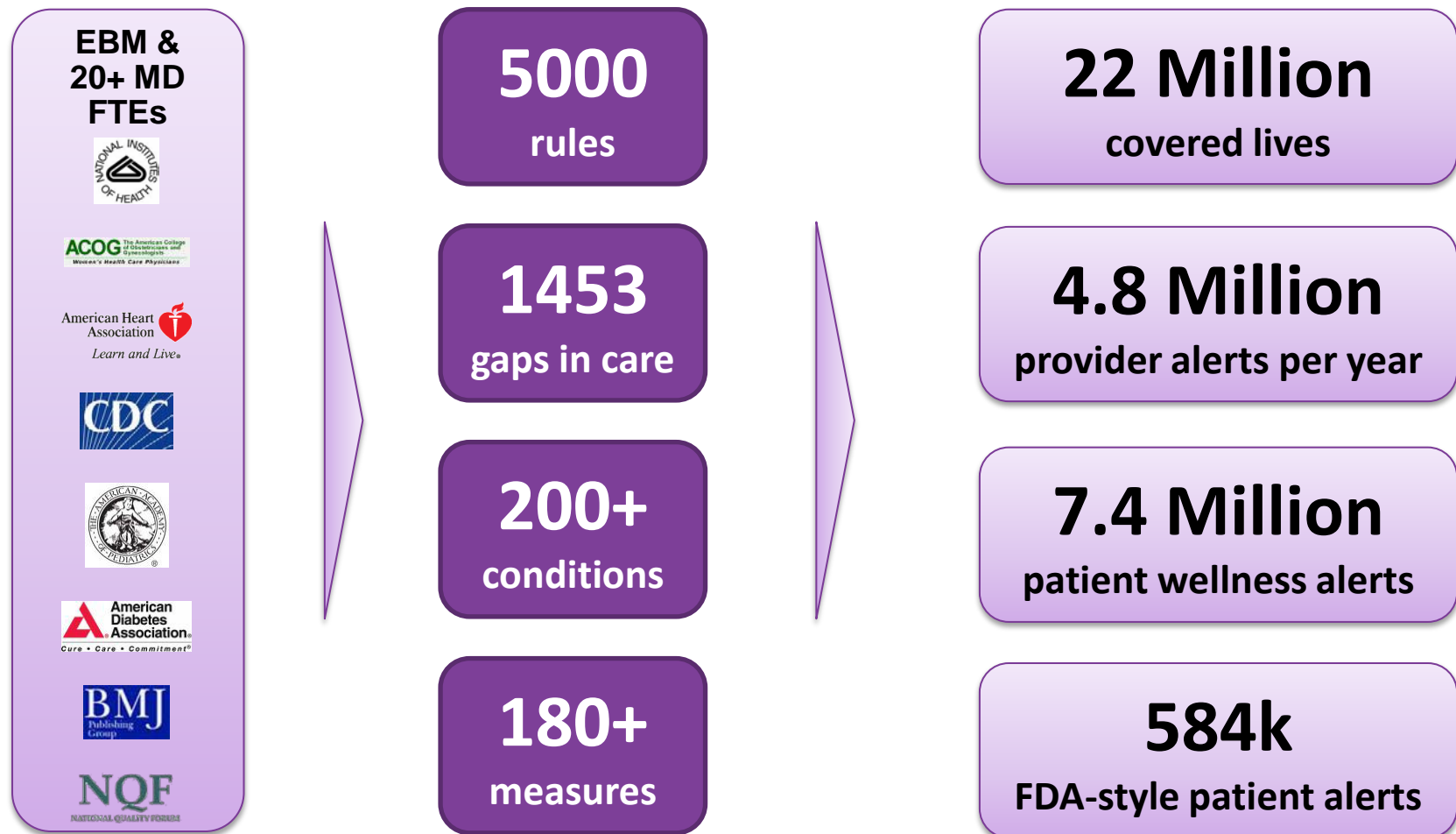
 Aspirin & ulcer risk, need ulcer protection

These are real alerts that cover the spectrum for just one disease.

CareEngine CDS library covers 200+ conditions.

# National-Scale Claims-based CDS Alerting

## 2011 STATISTICS



**Note: claims-based CDS = 91% concordance with EMR “validity” (AMIA Annu Symp Proc. 2008 Nov 6:1171); HIE data will improve true-positive rate**

# Lessons Learned from CDS Work and areas where NLP may help



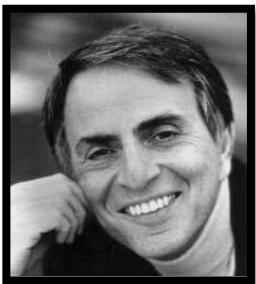
## Current 'real world' data is structured but noisy

- Diagnosis claims often inaccurate due to coding errors and 'rule outs'
- Rule coding logic can mitigate this
- Claims lag is an issue especially for ICD & CPT data.



## Sensitivity vs Specificity

- Patient-specific alerts need to be ↑specific and ↓sensitive : MDs hate false positive alerts! Also concern for potential alert fatigue.
- CDS rules address with 'tight' inclusionary & exclusionary logic
- Population-based quality measures need to be ↓specific and ↑sensitive particularly for measure numerators



## “ Absence of Evidence does not equal Evidence of Absence” (Carl Sagan)

- Current CE/CDS uses insurance and Rx eligibility as evidence of absence (i.e. 'we would have seen it in the data')for errors of omission
- This can lead to false positive alerts



# Published Studies of CDS Demonstrate Real Quality Improvement & Cost Savings



## Original Study

**MEDICAL ERRORS:** 46/1000  
potentially serious medical errors were identified

**HOSPITALIZATIONS:** 8.4% fewer hospitalizations

**PAID CLAIMS:** \$8.07 PMPM lower across the study population



## Follow-Up Study

**CHARGES:** Average PMPM charges (vs. paid claims) in the treatment group **were reduced by \$21.92 (6.1%)** vs. control group

**HOSPITALIZATION:** 95% of savings was due to decreases in inpatient charges and associated professional charges

**CAUSALITY:** After the study, both groups received CareEngine services, and differences between the groups disappeared



# ACOs Shift Provider Focus to Population Health Management

	Traditional FFS		Accountable Care
<b>Focus</b>	Procedure	→	Individual
<b>Accountability</b>	Episode	→	Population
<b>Organization</b>	Physician or hospital	→	Integrated delivery network
<b>Incentives</b>	Volume x Unit Price	→	Population x Value
<b>IT Systems</b>	<ul style="list-style-type: none"> <li>• Charge capture</li> <li>• Billing</li> <li>• Throughput</li> </ul>	→	<ul style="list-style-type: none"> <li>• Connectivity</li> <li>• EHRs / PHR</li> <li>• Care Coordination</li> <li>• Population Mgmt (Plan Svcs)</li> <li>• Risk Management</li> <li>• Business Intelligence (Analysis &amp; Reporting)</li> </ul>
<b>Metrics of Success</b>	<ul style="list-style-type: none"> <li>• Volume</li> <li>• Reimbursement</li> </ul>	→	<ul style="list-style-type: none"> <li>• Clinical Quality &amp; Outcomes</li> <li>• Total Cost</li> <li>• Satisfaction</li> <li>• Value created</li> </ul>

# Accountable Care Solutions (ACS) Vision

- Clinical Data Integration
- Secure Data Exchange

- Leading consumer mobile app
- Symptom-to-Provider pathway
- Navigation, access, appointments, registration

- Intelligent provider interface
- Cloud-based application store
- Rapid / viral distribution

- Risk management
- Health plan services
- Network and member management
- Distribution

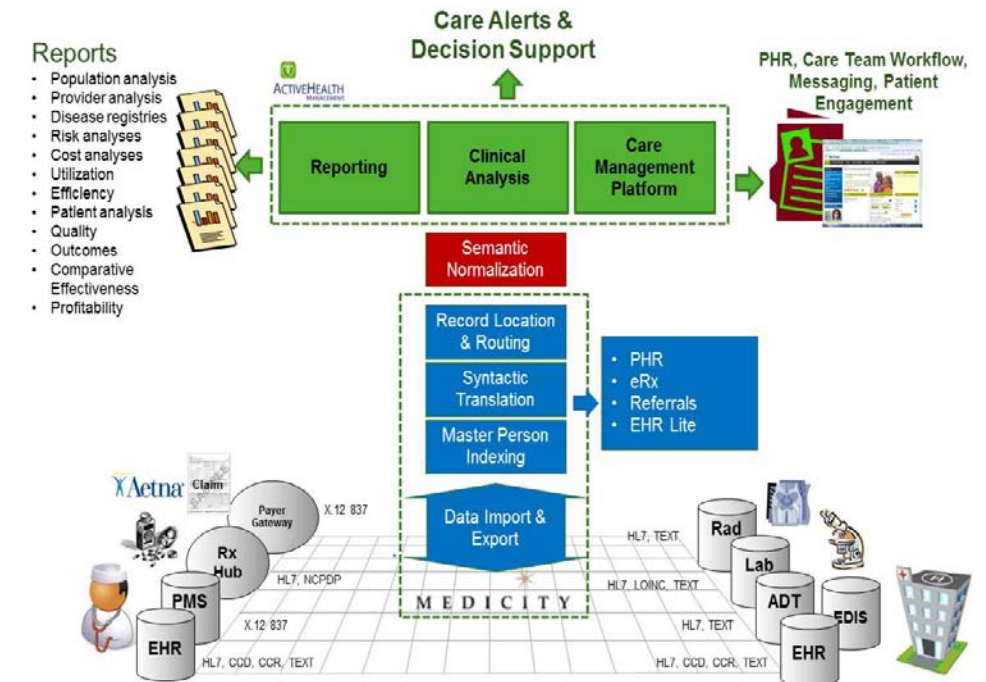
- Population-based clinical intelligence, decision support, disease registries and alerts
- Care Management, communication and workflow technology
- Personal Health Record



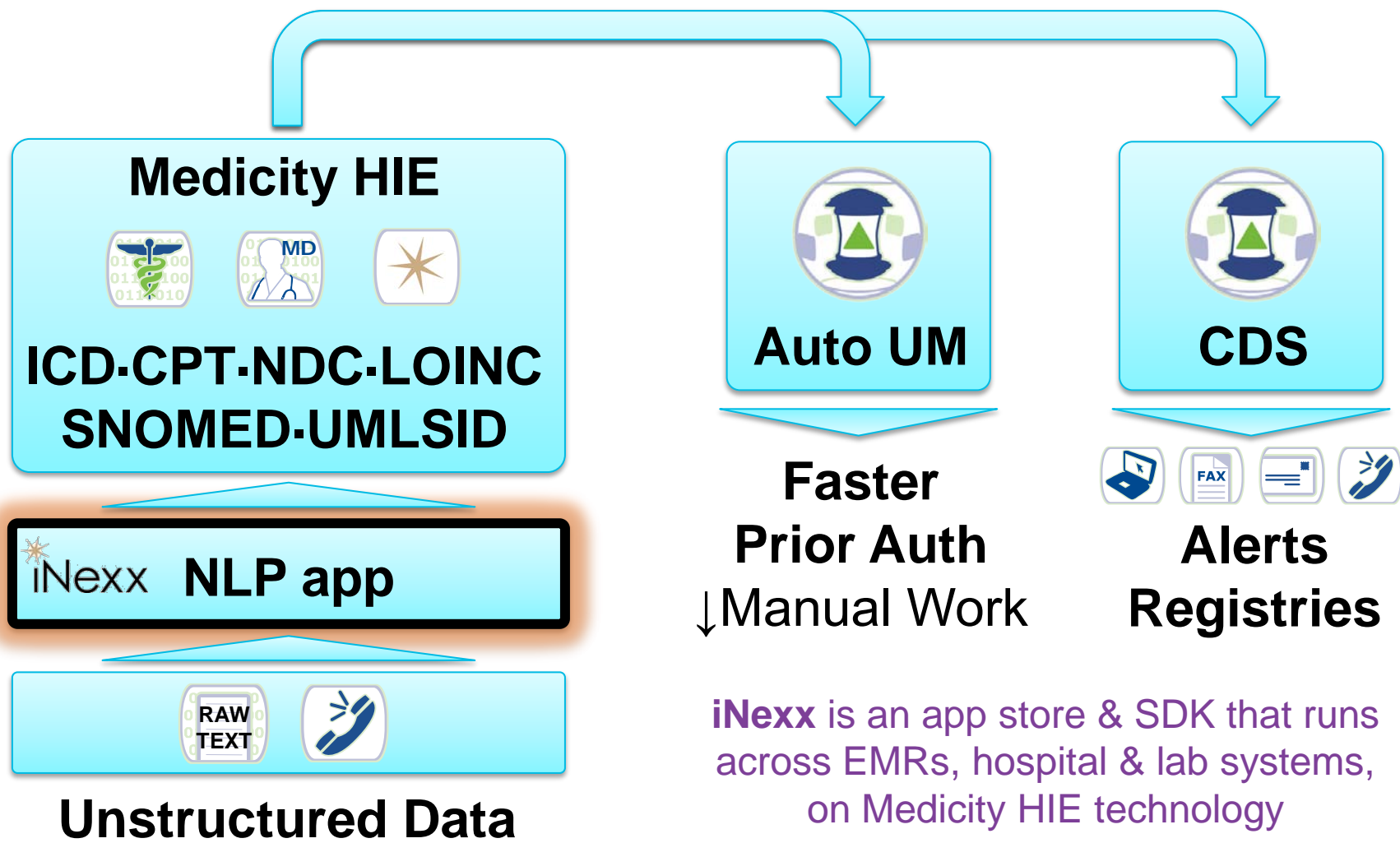
# Aetna ACS Technology Overview

**Goal: develop and deploy a technology solution dedicated to ACOs and integrated across multiple platforms**

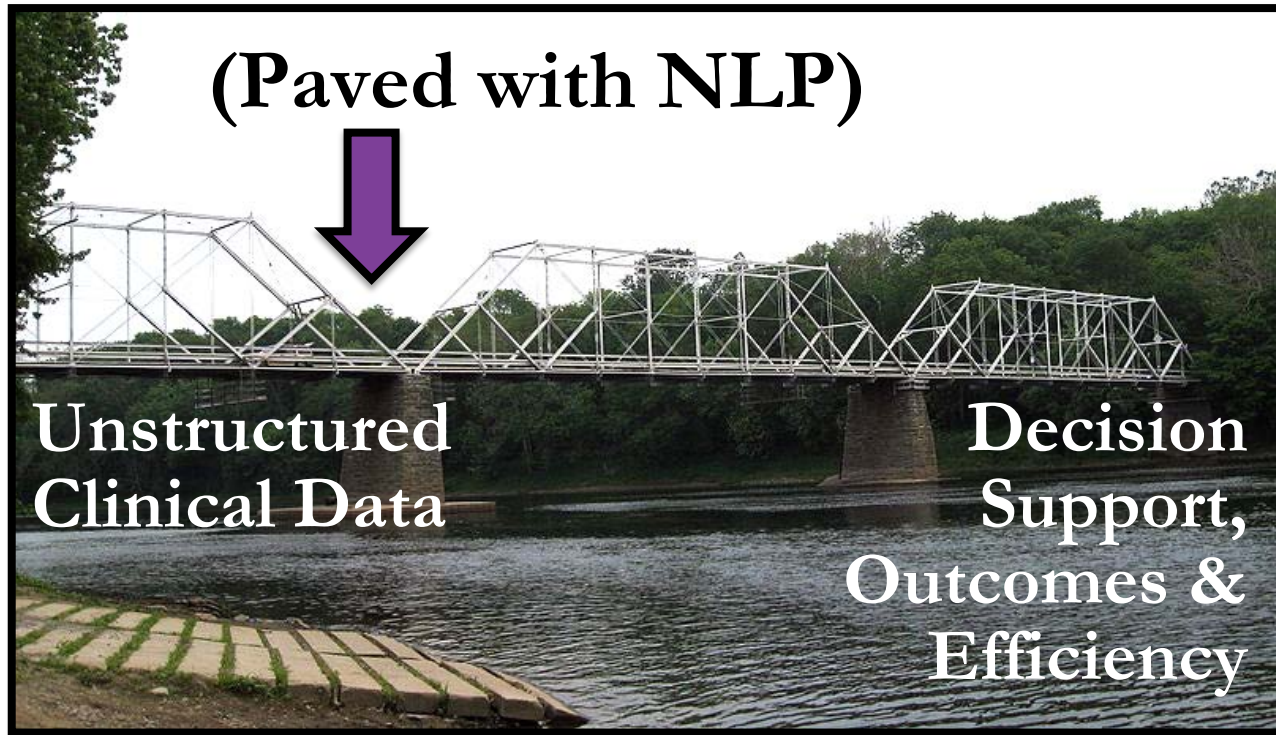
- ▶ Deploy **integrated technology stack** specifically designed to manage ACO **clinical & financial** operational needs
  - Integrate ActiveHealth, Medicity, CentriHealth, iTriage into turn-key, easily deployable solution that can be on-premise if required
  - Leverage ActiveHealth quality algorithm development process, add efficiency algorithms
  - Develop automated care management processes
- ▶ Create new integrated clinical and claims **data warehouse** for ACO **performance management**, population based **reporting**, and clinical **quality** and **outcomes** measurements
- ▶ Create 5 **Pioneer labs** which develop incremental intellectual property which reside on technology stack



# Potential for NLP in Aetna & ACO World



# Thank you.



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