The Pace of Change Is Accelerating

Staying on Top of Emerging Trends

The Widespread Use of Data and Analytics in Patient Care

November 4, 2015

1

Welcome

- This activity is made possible through a collaboration between the AMCP Foundation and Pfizer, Inc.
- The third in a series of 3 webinars
- Webinar protocol and housekeeping: submit your questions, which will be addressed at the end by our faculty

AMCP FOUNDATION

2

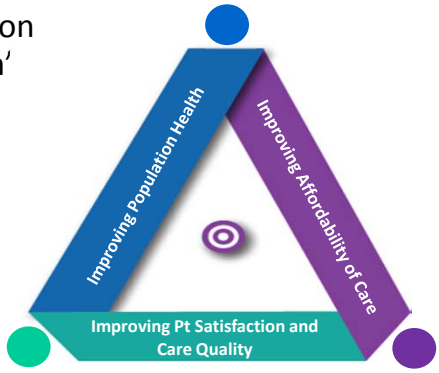
Pfizer

Faculty

- **Phil Schneider** *(moderator)*
  - Senior Consultant, Strategic Initiatives, Academy of Managed Care Pharmacy & Interim Executive Director, AMCP Foundation
- **Vitalii Doban, MBA**
  - Senior Director, Real World Data & Analytics, Pfizer, Inc.
- **Jeremy Nobel, MD, MPH**
  - Medical Director, Northeast Business Group on Health & Faculty, Center for Primary Care; Dept. of Global Health and Social Medicine at Harvard Medical School

Introduction

- Health care transformation driven by the "Triple Aim"
- Based on the results of a survey conducted by the AMCP Foundation, this Webinar will:
  - Help delineate today's most critical changes
  - Identify trends that are inter-related
  - Identify opportunities for pharmacists and pharmacy leaders to reshape their organizations to meet today's and tomorrow's challenges



Agenda

- **Study Background, Objectives, Research Methodology**
- Widespread Use of Data and Analytics in Patient Care
- Interoperability Requirements and Challenges
- The Role of Technology in Patient Engagement
- Impact on Health Care Delivery, Shifting of Financial Risk, Implications for Pharmaceutical Care
- Forcing Factors/Wildcards

Goals of the Research Initiative

Top **10** ***emerging trends*** *in US health care impacting* ***managed care pharmacy*** *in the next* **5** *years*

RESEARCH GOAL:

- Identify the top 10 emerging health care trends expected to have a significant impact on managed care pharmacy organizations in the next 5 years

ADDITIONAL STUDY OBJECTIVES:

- Provide real-world insights on key health policy priorities relevant to a set of broader health care stakeholders
- Develop a comprehensive reference resource for managed care provider organizations, health care payers, policy makers, and other stakeholders

Overview of Research Methodology

- Pulse of public opinion in secondary sources was combined with the insights of thought leaders, identifying the most important trends and thinking beyond the current evidence
  - Distilled summary of current evidence analyzed by an advisory panel
  - Ranking exercises and in-person workshop to reach group consensus

SECONDARY RESEARCH

- A targeted literature review gathered available information on emerging trends impacting managed care pharmacy

ADVISORY PANEL

- Advisory panel validated trends from the public domain, identified and prioritized the most important trends, and provided insight on implications across stakeholders

Advisory Panel for "Ahead of the Curve"

THOUGHT LEADER	PROFESSIONAL AFFILIATION
Joseph Biskupiak, PhD, MBA	Research Associate Professor & Associate Director, PORC at the University of Utah College of Pharmacy
Chris Dawe	Former Health Care Policy Advisor, the White House (National Economic Council)
Jeffrey Dunn, PharmD, MBA	Senior Vice President, VRx Pharmacy Services
Jeremy Nobel, MD, MPH	Medical Director, Northeast Business Group on Health (NEBGH); Faculty, Center for Primary Care, Harvard Medical School
Sandy Robinson, BA, MPA	Senior Vice President, Avalere Health
Rebecca Snead, RPh	Executive Vice President and CEO of the National Alliance of State Pharmacy Associations
Mark Snyder, MD	Specialist Leader, Deloitte Consulting
JoAnn Volk, MA	Research Professor and Project Director, Center on Health Insurance Reforms at Georgetown University Health Policy Institute
Mitzi Wasik, PharmD, BCPS	Director of Medicare Pharmacy Clinical Programs at Coventry Health Care, Inc./Aetna
Jed Weissberg, MD	Senior Fellow, the Institute for Clinical and Economic Review

Agenda

- Study Background, Objectives, Research Methodology
- **The Widespread Use of Data and Analytics in Patient Care**
- The Role of Technology in Patient Engagement
- Impact on Health Care Delivery, Shifting of Financial Risk, Implications for Pharmaceutical Care
- Forcing Factors/Wildcards

The Health IT System Comes of Age

The early history:	*More recently:*	*Today:*
Large health care databases have been mined for insights, even though the majority of the information collected (e.g., medical claims) was designed for financial management, not research.	Health Information Technology for Economic and Clinical Health (HITECH) program has accelerated the adoption of EHRs by providers and hospitals.	Entering an era where all health care information is captured electronically.

As of 2013, 48% of office physicians;
as of 2014, 97% of hospitals; and
as of 2014, 75% of oncologists
…adopted a basic or advanced EHR system in recent years

Sources: Sources: Hsaio CJ, Hing E 2014: http://www.cdc.gov/nchs/data/databriefs/db143.pdf; Charles D et al 2013: http://www.healthit.gov/sites/default/files/ oncdatabrief9final.pdf; American Society of Clinical Oncology 2014: J Oncol Pract 2014;10:119-142; Berger M, Doban V: http://www.researchgate.net/publication/260947762_Big_data_advanced_analytics_and_the_future_of_comparative_effectiveness_research

Data Sources Traditionally Used for Research

Administrative Claims Databases	Records of services billed and reimbursed between health care providers and payer organizations. Provides granular treatment and adherence data.
Surveys	Primarily for epidemiological information.
Medical Records	Can be electronic medical records or chart reviews. Used to reflect particular insights in patient management.
Cohort Studies	What most people would understand by the term "real-life" studies.
Pragmatic Clinical Trials	Simple experimental trials, however, where efforts are made to mimic a real-life situation as much as possible.
Registries	Analyzing all patients treated at a particular center for a particular condition on a continuous basis.

The medical-data industry is projected to surpass $10 billion by 2020, according to McKinsey & Co.

Emerging Sources of Health Care Data

- Sensors/Wearables
  - Activity tracking, Google smart contact lenses, ingestible sensors, etc.
- Search & Social Media
  - Patient engagement & education, safety surveillance
- Online Patient Communities
  - e.g. PatientsLikeMe.com
    - patient reported data
- Mobile Apps & Games (e.g. Apple Research Kit)
  - *30K+ medical apps on iTunes and Google Play*

Challenges:

Technology: Data volume, data integration, data streaming
Adoption: Patient adherence, utilization, technical literacy

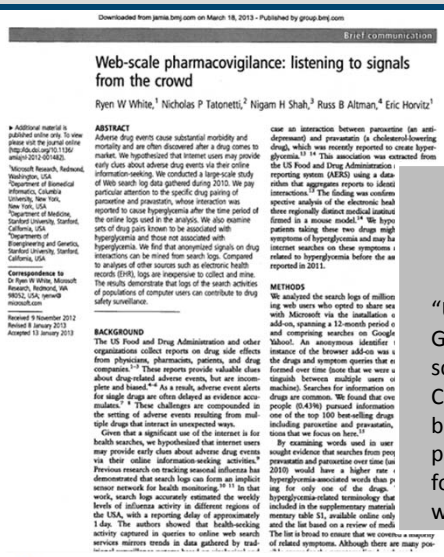
Enhancing Clinical Data in Oncology

- CancerLinQ™ - HIT platform sponsored by the American Society of Clinical Oncology (ASCO); gathered de-identified data from > 100,000 US patients with breast cancer to:
  - Create cancer data to overcome inconsistent data standards
  - Generate individualized guidance for any given patient based on evidence-based medicine
  - Explore real-world trends in patient characteristics, treatment patterns and outcomes
  - Provide feedback on physician performance
  - Help inform clinicians as to relative value of drug benefit, toxicity, and cost

IBM Watson Examples

- Memorial Sloan-Kettering trains IBM Watson to help doctors make better cancer treatment choices
  - Watson helps oncologists make the best treatment decisions for their individual patients based on latest research and evidence
  - IBM teams-up with Epic and dozens of hospitals in fight against cancer
- WellPoint has utilized Watson to perform UM functions more efficiently, effectively, and consistently
  - Performs UM on ~ 60% of outpt procedures and 12-14% of inpt procedures
  - Compares the appropriate medical policies and clinical guidelines to the provider request, and then forms an opinion about whether criteria were met.

Data-Mining Results in "Precognition"?



Downloaded from jamia.bmj.com on March 18, 2013 - Published by group.bmj.com

Brief communication

Web-scale pharmacovigilance: listening to signals from the crowd

Ryen W White,[1] Nicholas P Tatonetti,[2] Nigam H Shah,[3] Russ B Altman,[4] Eric Horvitz[1]

ABSTRACT

Adverse drug events cause substantial morbidity and mortality and are often discovered after a drug comes to market. We hypothesized that Internet users may provide early clues about adverse drug events via their online information-seeking. We conducted a large-scale study of Web search log data gathered during 2010. We pay particular attention to the specific drug pairing of paroxetine and pravastatin, whose interaction was reported to cause hyperglycemia after the time period of the online logs used in the analysis. We also examine sets of drug pairs known to be associated with hyperglycemia and those not associated with hyperglycemia. We find that anonymized signals on drug interactions can be mined from search logs. Compared to analyses of other sources such as electronic health records (EHR), logs are inexpensive to collect and mine. The results demonstrate that logs of the search activities of populations of computer users can contribute to drug safety surveillance.

BACKGROUND

The US Food and Drug Administration and other organizations collect reports on drug side effects from physicians, pharmacists, patients, and drug companies.[1–3] These reports provide valuable clues about drug-related adverse events, but are incomplete and biased.[4–6] As a result, adverse event alerts for single drugs are often delayed as evidence accumulates.[7 8] These challenges are compounded in the setting of adverse events resulting from multiple drugs that interact in unexpected ways.

Given that a significant use of the internet is for health searches, we hypothesized that internet users may provide early clues about adverse drug events via their online information-seeking activities.[9] Previous research on tracking seasonal influenza has demonstrated that search logs can form an implicit sensor network for health monitoring.[10 11] In that work, search logs accurately estimated the weekly levels of influenza activity in different regions of the USA, with a reporting delay of approximately 1 day. The authors showed that health-seeking activity captured in queries to online web search services mirrors trends in data gathered by traditional surveillance systems based on reporting by healthcare professionals.

case an interaction between paroxetine (an antidepressant) and pravastatin (a cholesterol-lowering drug), which was recently reported to create hyperglycemia.[12 13] This association was extracted from the US Food and Drug Administration's reporting system (AERS) using a data- rithm that aggregates reports to identi interactions.[14] The finding was confirm spective analysis of the electronic heal three regionally distinct medical institut firmed in a mouse model.[15] We hypo patients taking these two drugs migh symptoms of hyperglycemia and may ha internet searches on these symptoms related to hyperglycemia before the as reported in 2011.

METHODS

We analyzed the search logs of million ing web users who opted to share sea with Microsoft via the installation add-on, spanning a 12-month period and comprising searches on Google Yahoo!. An anonymous identifier instance of the browser add-on was the drugs and symptom queries that formed over time (note that we were u tinguish between multiple users machine). Searches for information on drugs are common. We found that ove people (0.43%) pursued information one of the top 100 best-selling drugs including paroxetine and pravastatin, tions that we focus on here.[15]

By examining words used in user sought evidence that searches from peo pravastatin and paroxetine over time (in 2010) would have a higher rate hyperglycemia-associated words than p ing for only one of the drugs. hyperglycemia-related terminology that included in the supplementary materials mentary table S1, available online only ated the list based on a review of medi The list is broad to ensure that we covered a majority of related symptoms. Although there are many pos-

► Additional material is published online only. To view please visit the journal online (http://dx.doi.org/10.1136/amiajnl-2012-001482).

[1]Microsoft Research, Redmond, Washington, USA
[2]Department of Biomedical Informatics, Columbia University, New York, New York, USA
[3]Department of Medicine, Stanford University, Stanford, California, USA
[4]Departments of Bioengineering and Genetics, Stanford University, Stanford, California, USA

Correspondence to
Dr Ryen W White, Microsoft Research, Redmond, WA 98052, USA; ryenw@microsoft.com

Received 9 November 2012
Revised 9 January 2013
Accepted 13 January 2013

The New York Times

March 6, 2013

Unreported Side Effects of Drugs Are Found Using Internet Search Data, Study Finds:

"Using data drawn from queries entered into Google, Microsoft, and Yahoo search engines, scientists at Microsoft, and Stanford and Columbia universities have for the first time been able to detect evidence of unreported prescription drug side effects before they were found by the Food and Drug Administration's warning system."

Example: Quest Diagnostics' Foray into Big Data

- Quest's new Data Diagnostics tool to combine clinical, claims and lab data sets to offer providers real-time info about patients
- Provides a view of a person's disease progression, lab results, medication adherence, cardiac tests and other factors

FierceDiagnostics

NEWS TOPICS ANALYSIS

Topics: Partnering

Quest launches patient analytics tool for healthcare providers

September 30, 2015 | By Emily Wasserman

SHARE

Quest Diagnostics ($DGX) has been working hard to diversify its offerings, beefing up its presence in diagnostics as it delivers on plans for growth. In its latest move, the company is teaming up with health IT outfit Inovalon ($INOV) to roll out a cloud-based analytics platform for healthcare providers.

The companies' Data Diagnostics tool will combine clinical, claims and lab data sets to offer physicians, hospitals and other healthcare organizations information about patients in real time. Quest and Inovalon will kick off their 5-year exclusive deal during Q4 2015 and will split revenues evenly, Quest said in a statement. Neither side is revealing additional financial terms.

Quest Diagnostics CEO Stephen Rusckowski

Through Data Diagnostics, healthcare professionals can request information about patients through certain categories. For example, a Historical Data-Related Data Diagnostics category allows clinicians to look at an individual's disease progression, lab results, medication adherence, cardiac tests and other factors that could impact their health, the companies said in a statement. Organizations can also ask for custom reports on patients, potentially cutting down on costs by allowing doctors to rule out additional procedures or tests in point-of-care settings.

TOOLS

Comment

Print

Sign up for our FREE newsletter for more news like this sent to your inbox!

"This solution is a game-changer for healthcare," Quest CEO Steve Rusckowski said in a statement. "Our collaboration with Inovalon also

Source: http://www.fiercediagnostics.com/story/quest-launches-patient-analytics-tool-healthcare-providers/2015-09-30?utm_medium=nl&utm_source=internal

Key Challenges and Opportunities

CHALLENGES

- Fragmented patient data and limited interoperability at present;
- Legacy HIT systems often built to support billing and reimbursement, not patient care
- Slow pace of clinician adoption and of investment in resources to gain competency
- Need people trained in healthcare data analytics
- Patient privacy, regulatory hurdles and complexity of the overall environment
- Implications of errors in the shared medical record

OPPORTUNITIES

- Obtain more complete patient insights to better support care coordination & delivery
- Enable evidence-based and personalized medicine
- Facilitate population health management and patient engagement
- Design innovative reimbursement models
- Build disease models and understand disease etiology
- Improve product safety monitoring

Audience Participation

Q: In which areas does your organization utilize the data sources mentioned in this program (check all that apply)?

- ❑ Population health, care coordination & support
- ❑ Predicting clinical risk in patients with chronic diseases
- ❑ New product/reimbursement model development
- ❑ Comparative effectiveness research
- ❑ Adverse events and safety surveillance

Agenda

- Study Background, Objectives, Research Methodology
- The Widespread Use of Data and Analytics in Patient Care
- **The Role of Technology in Patient Engagement**
- Impact on Health Care Delivery, Shifting of Financial Risk, Implications for Pharmaceutical Care
- Forcing Factors/Wildcards

Role of Technology in Patient Engagement

- New technologies will empower patients and providers to enhance practices for managing and coordinating health care
- Widespread use of new technology tools require increased data transparency, patient education, and coordination of tools across the growing range of technology options
- Access to their own personalized care management tools promotes engagement in their care

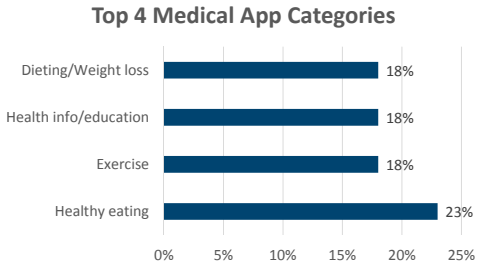
What Sets the Stage for New Approaches?

Patient Empowerment on the Rise

- More disease- and treatment-specific information at their fingertips
  - More informed choices as consumers
  - Influencing the spread of "health care everywhere"

86% of clinicians surveyed believe that mobile applications will be important in patient management within 5 yr

Source: http://www.pwc.com/en_US/us/ health-industries/top-health-industry-issues/assets/2015/HRI_TopHealthcareIssues2015_ChartPack.pdf



Source: Price Waterhouse Coopers HRI Clinician Workforce Survey, 2014

Providers Using Technology to Engage Patients

- Using mobile text messaging, E-mail communications, online chat programs
- Telemedicine for patient monitoring and care counseling
  - Reducing health-related work disruptions

Technology in Medication Management

- Survey of 21 specialty pharmacy providers found that almost two-thirds reported using smartphone and tablet apps to engage patients:
  - Communicate refill reminders or pharmacy order status
  - Send proactive messages with drug and dose reminders to improve adherence
  - Provide patient education on disease and treatment plans

Source: The 2013 Genentech Oncology Trend Report: Perspectives from Managed Care, Specialty Pharmacy Providers, Oncologists, Practice Managers, and Employers. Ed. 5.

Insurance Exchanges May Promote Consumerism

- Choosing among Exchange plans emphasizes comparison shopping on the Web
- Increasing financial risk for individuals helps encourage:
  - Greater engagement in plan choice
  - Greater participation in their own disease management/health choices

Key Challenges and Opportunities

Role of Technology in Patient Engagement

CHALLENGES

- Patient education to bridge the "digital divide," including health literacy and e-literacy (patient and provider); demographics will define technology usage
- Patients' willingness to pay for social, mobile, and cloud technologies to help manage their health
- Coordination of technologies, interoperability, privacy, and confidentiality

OPPORTUNITIES

- Improved patient health care decision-making
- Patient ownership over disease management
- The ability to connect with covered members in new ways for benefit and cost-sharing information, improving patient satisfaction

Audience Participation

Q: What most determines whether a person uses a health care app? (select one)

- ❑No cost to the individual
- ❑Use of gamification
- ❑Use for personal medical needs
- ❑Use for MD office appointments
- ❑Who provides or sponsors the app

Agenda

- Study Background, Objectives, Research Methodology
- The Widespread Use of Data and Analytics in Patient Care
- The Role of Technology in Patient Engagement
- **Impact on Health Care Delivery, Shifting of Financial Risk, Implications for Pharmaceutical Care**
- Forcing Factors/Wildcards

Impact on Health Care Delivery

WIDESPREAD USE OF DATA AND ANALYTICS

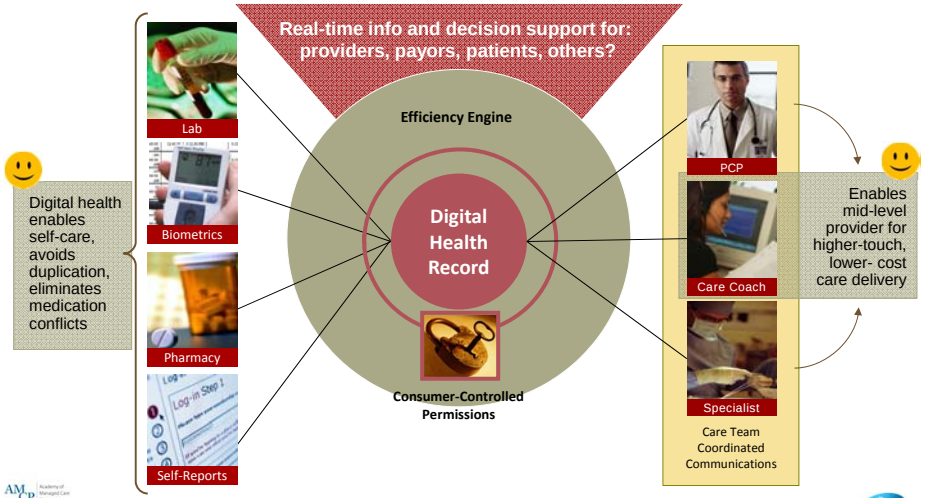
- Provider accountability, tied to payments, will increase
- Team-based coordination of care will be on the rise

ROLE OF TECHNOLOGY IN PATIENT ENGAGEMENT

- Increased use of data and technology, predictive modeling
- More emphasis on population health management
- Increased care coordination and efficiency

How It's Supposed to Work…

- Are we there yet? Not quite…but getting closer



Potential Gains in Efficiency and Quality Are Clear

Reducing...

resources required to achieve same or better outcome

- Elimination of duplicate diagnostic tests
- Streamlining of work-ups to exclude low-yield Dx tests
- Avoiding provider visits simply to "check in" and collect data

Substituting...

lower resource-intensive option in either prevention, diagnosis, or treatment

- *People* (e.g. mid-level providers, pharmacists, health coaches, "efficient" provider networks)
- *Place* (e.g. shift to home or lower cost ambulatory setting)
- *Product* (e.g. shift to generic Rx)

Avoiding...

complications, adverse reactions, or sub-therapeutic treatment improves both quality and efficiency

- Medical regimen adherence
- Early detection or avoidance of ADEs or side-effects
- Reduction of ED and hospital use

Shifting of Financial Risk

WIDESPREAD USE OF DATA AND ANALYTICS

- May improve management of risk for providers
- Better use of predictive modeling for payers

ROLE OF TECHNOLOGY IN PATIENT ENGAGEMENT

- New sources of data for population health
- Financial risk may drive patient engagement, more use of technology
- Use of incentives for better utilization of technology

Implications for Pharmaceutical Care

WIDESPREAD USE OF DATA AND ANALYTICS

- Potential for improved use of effective but costly pharmaceuticals for the right patient at the right time
- Prediction of adverse events in patient subpopulations
- Opportunities in public health
- Opportunities for better chronic disease care

ROLE OF TECHNOLOGY IN PATIENT ENGAGEMENT

- Potential for improving adherence through smartphone apps/reminders
- Patient education about drug therapy
- Opportunities for patient-reported data to assess therapy's effectiveness, real-world evidence

Agenda

- Study Background, Objectives, Research Methodology
- The Widespread Use of Data and Analytics in Patient Care
- The Role of Technology in Patient Engagement
- Impact on Health Care Delivery, Shifting of Financial Risk, Implications for Pharmaceutical Care
- **Forcing Factors/Wildcards**

Forcing Factors and Wildcards: What to Track and Monitor

FORCING FACTORS

- Legal/regulatory factors that influence trends
  - HITECH and other legislation that encourage HIT use, affect interoperability
  - Federal government "meaningful use" program continuing implementation
- Market-related factors that influence trends
  - Pace of health plan and health system "convergence" and consolidation
  - Growing number of significant CMS "pay-for-performance" models being replicated by commercial payers

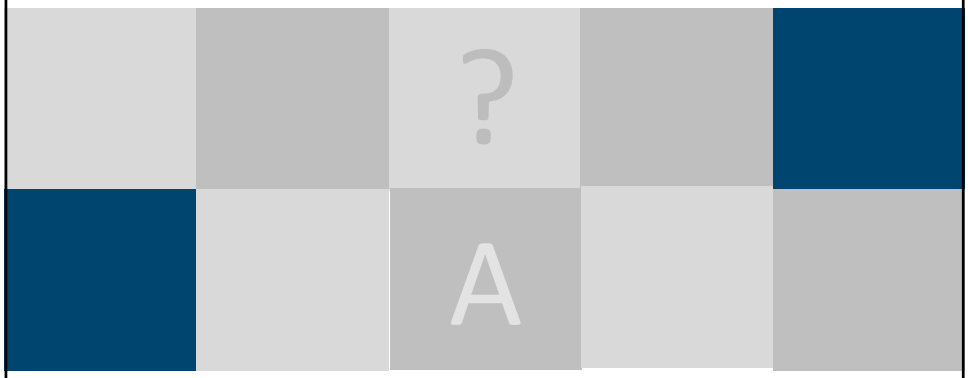
WILDCARDS

- Surprising breakthroughs in wearable patient technology
- Potentially harmful data breaches at any point in the health delivery system
- If cost-containment efforts fail, will a move to single payer be next?
  - Will that further integrate data collection and reporting?

Overview of Top 10 Trends

1. Migration from Fee-for-Service to New Payment Models
2. Consolidation of Health Care Stakeholders
3. Widespread Use of Data and Analytics in Patient Care
4. Spending and Utilization for Specialty Pharmaceuticals
5. Medicaid Expansion due to Health Care Reform
6. Migration to Value-Oriented Health Care Marketplaces
7. Growth and Performance of Accountable Care Organizations
8. Role of Technology in Patient Engagement
9. Increasing Patient Cost Sharing
10. Health Care Everywhere

Q & A



Please visit http://www.amcp.org/foundationwebinars/ to view recent AMCP Foundation webinars that addressed the other Top 10 Trends.

Also, see http://www.amcp.org/amcp-foundation/Resources/trends/ for the full *Ahead of the Curve* monograph.

To contact the presenters: **Vitalii Doban, MBA** (vitalii.doban@pfizer.com)
Jeremy Nobel, MD, MPH (jnobel@nebgh.org)