The Big Data revolution
Opportunities for pharmaceutical players

McKinsey&Company
Introduction

Who we are

Peter Groves
Partner

• Partner in the healthcare practice and a leader in McKinsey’s Business Technology Office
• Expertise in technology enablement strategy and innovation
• Thought leader in payment innovation and advanced analytics in healthcare

Joe Chang
Engagement Manager

• Engagement Manager in pharmaceuticals and medical products practice
• Expertise in technology and analytics strategy, IT enablement
• Thought leader in advanced analytics implementation and healthcare value

The basis of our perspectives

Client work across sectors

Proprietary McKinsey research & reporting on Big Data

Sector-specific Real-World Data capability surveys

Collaboration with HHS/Health Data Initiative
Many industries have already been transformed by data; healthcare is at a tipping point.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Digitally nascent</th>
<th>On the adoption curve</th>
<th>New normal</th>
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<tbody>
<tr>
<td>Industries</td>
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<tr>
<td>Aerospace and Defense</td>
<td>• Aerospace and Defense</td>
<td>• Healthcare</td>
<td>• Media</td>
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<td>Automotive</td>
<td>• Automotive</td>
<td>• Pharmaceuticals</td>
<td>• Travel</td>
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<td>Chemicals</td>
<td>• Chemicals</td>
<td>• Consumer &amp; Packaged goods</td>
<td>• Entertainment</td>
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<td>Infrastructure</td>
<td>• Infrastructure</td>
<td>• High Tech</td>
<td>• Retail</td>
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<td>Oil and Gas</td>
<td>• Oil and Gas</td>
<td>• Telecom</td>
<td>• High-tech/IT</td>
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<tr>
<td>Healthcare</td>
<td></td>
<td>• Retail banking and insurance</td>
<td></td>
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<tr>
<td>Pharmaceuticals</td>
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<td>• Public sector</td>
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<td>Consumer &amp; Packaged</td>
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<td>Telecom</td>
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<td>Retail banking and</td>
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<td>insurance</td>
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<td>Public sector</td>
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Source: Expert interviews; McKinsey analysis
Data has helped transform several industries

- **Financial Services**
  - Regulators make data public at scale
  - Transaction data enables segmentation, evolution of highly targeted products

- **Food / agriculture**
  - Government and other players provide reporting and prediction data and services
  - Innovation (e.g., genetically modified seeds) bends cost curve and changes playing field
  - Granular POS data drives changes to merchandising, marketing

- **Retail / grocery**
  - Sophisticated machine-learning algorithms predict future purchases
Our clients in pharma/med devices see several opportunities across digital and big data....

“The opportunity for us in is integrating clinical and behavioral data to generate insights”

“There is opportunity in R&D—identifying the right sub-populations, the right patient in faster clinical trials”

“Device 2.0: low cost digital channels, imaging technologies, clinical research solutions, flexible sensors…”

“We need to focus on patient engagement and digital services - The next wave is mobile and e-commerce...?”

... however there is still some uncertainty

“We are at a transition point— the old channels still work and the new ones are yet unproven…”

Source: client interviews, 2013
… but have articulated some challenges that they still need to overcome

“We have very strong supporters in the management but they are not particularly digitally savvy”

“We have to learn to connect the dots – between the support and business functions, across the value chain”

“Being innovative is disruptive to our current state – we think we should focus on what we do best (which is what we’ve always done)”

“We are just starting to learn to navigate and experiment within the regulatory landscape.”

“It is imperative to educate the regulators with the help of our partners outside pharma – high tech, providers, payors …”

Source: client interviews, 2013
Today’s discussion framed around 3 questions

- What is Big Data, and are we there yet?
- What are the specific opportunities for Pharma players?
- What can your journey look like?
WHAT IS BIG DATA, AND ARE WE THERE YET?

We see data and analytics in the context of a “Digital Health” revolution

3 major trends...

Quantified movement
- sensors, social

Torrents of digital data
- Genomic, clinical, claims

Information & analytics
- predictive modeling, network mapping, AI, visualization

... creating value in the following ways

Decision support
- R&D, sales and marketing

Connectivity
- customers, colleagues, stakeholders

Innovation
- products, services, business models

Automation
- replace labor with technology

We see data and analytics in the context of a “Digital Health” revolution
What do we mean by ‘Big Data’? 

**WHAT IS BIG DATA, AND ARE WE THERE YET?**

**Diverse**
Semi- and un-structured data types

**Voluminous**
Massive, multi-petabyte data sets

**Timely**
Fast-moving, perpetually current data capture and transmission

**Adaptive**
Fuels analytics that are self-learning and improve with scale

**Distributed**
Sourced from inside and outside the organization

**Big Data**
**What do we mean by “Big” in healthcare?**

<table>
<thead>
<tr>
<th>Imagine …</th>
<th>With …</th>
<th>That costs …</th>
<th>With data equivalent to …</th>
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</thead>
<tbody>
<tr>
<td>… a clinical trial</td>
<td>100-300 patients</td>
<td>10-50m USD to complete</td>
<td>A library floor of books (50 Gigabytes)</td>
</tr>
<tr>
<td>… a leading vendor (e.g., IMS, Cegedim)</td>
<td>50-100m patients covered</td>
<td>up to 1m USD for complex studies</td>
<td>More data than in all US academic research libraries (10-20 Petabytes)</td>
</tr>
<tr>
<td>… all the data stored across US medical centers</td>
<td>Cover 300m+ patients</td>
<td>?</td>
<td>All the words ever spoken by human beings (1-2 Exabytes)</td>
</tr>
</tbody>
</table>
We have been facing a number of headwinds to real data “liquidity”...

**Misaligned incentives**
- Volume-driven fee for service model
- 3rd party payment mutes the demand for change

**Fragmented information silos**
- Complexity in sharing/integrating diverse data
- Fear of penalty – risk of more downside in data than opportunity

**Technology underinvestment**
- Uncertain returns on large-scale HIT implementations
- Clinical data still not machine-readable

**Resistance to behavior change**
- Tradition of physician judgment over protocols
- Privacy concerns resulting from stringent regulations
**WHAT IS BIG DATA, AND ARE WE THERE YET?**

... But multiple forces are creating a tipping point in US health care

<table>
<thead>
<tr>
<th>Government Catalyzing market change</th>
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</thead>
<tbody>
<tr>
<td>• Push for data transparency</td>
</tr>
<tr>
<td>• Government enabling private sector to create <strong>interoperable standards</strong> e.g., Big Data Initiative</td>
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<table>
<thead>
<tr>
<th>Demand for better data</th>
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<tbody>
<tr>
<td>• <strong>Cost pressure</strong> given reform, economic climate, payment innovation (CMS expects a ~5% decline)</td>
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<tr>
<td>• <strong>First movers showing impact</strong>; risk of being “beaten to the punch”</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Supply of new data sets at scale</th>
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<tbody>
<tr>
<td>• Clinical data becoming “liquid” through <strong>EMRs</strong> and <strong>information exchanges</strong></td>
</tr>
<tr>
<td>• <strong>Non-healthcare consumer data</strong> is increasingly aggregated and accessible</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Technical capability</th>
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<tbody>
<tr>
<td>• Advances in the ability to <strong>manage diverse data sets</strong> while ensuring patient privacy</td>
</tr>
<tr>
<td>• <strong>Analytical tools</strong> at front-lines</td>
</tr>
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</table>
New ways to capture health care value in a data-enabled world

**The old drivers**

- **Benefit plan designs** that drive cost-sharing and set care limits
- **Medical management techniques** that pit payors vs. providers
- **Unit price discounts** based on contracting, negotiating leverage

**The new drivers**

- **Patient-oriented segmentation** based on care needs, responses
- **Tighter payor-provider collaboration** to identify the highest-impact care, tradeoffs
- **Payment for value** and rewards for superior performance by even lesser-known providers
### What is Big Data, and are we there yet?

**Big Data is changing the paradigm; these are the new value pathways**

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Right Living</strong></td>
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<td><strong>Right Care</strong></td>
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<tr>
<td><strong>Right Provider</strong></td>
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<td><strong>Right Value</strong></td>
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<tr>
<td><strong>Right Innovation</strong></td>
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</table>

**Ecosystem feedback loop**
**WHAT IS BIG DATA, AND ARE WE THERE YET?**

**Significant EBITDA impact across the value chain in pharma/devices**

Percent, Estimated annual EBITDA impact in ~5-7 years

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Potential EBITDA impact</th>
<th>Example levers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research &amp; development</td>
<td>~3-8%</td>
<td>Develop better products leveraging large datasets; transform clinical trials</td>
</tr>
<tr>
<td>Real-world evidence</td>
<td>~3-5%</td>
<td>Demonstrate comparative effectiveness, health economics to improve formulary positioning and grow sales</td>
</tr>
<tr>
<td>Product safety</td>
<td>~3-5%</td>
<td>Manage safety risk and avoid legal/remediation costs</td>
</tr>
<tr>
<td>Digital services</td>
<td>~3-5%</td>
<td>Deliver better outcomes and value through services for patients, clinicians and payors</td>
</tr>
<tr>
<td>Customer engagement</td>
<td>~2-5%</td>
<td>Increase use of digital channels to drive sales growth and improve ROI; grow sales through e-commerce</td>
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<tr>
<td>Agile supply chain</td>
<td>~1-2%</td>
<td>Optimize network, warehousing and transportation through end-to-end visibility and integrated automation</td>
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<tr>
<td><strong>Total</strong></td>
<td>~15-30%</td>
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</tbody>
</table>

What is Big Data, and are we there yet?

The data itself is not perfect, but does not need to hold back progress.

Is data available in time and is access grated for the analyses?

Can data be regarded as true and credible and is the data set complete?

Is there a clear responsibility for the data?

Is the data relevant for the planned analysis, do we get the data integrated and do we get it fast enough?

Is data throughout the system consistent and can we interpret it?

Data available for particular analysis

Data in right format and representation

Usable data

Correct data

Applicable data

Data suitable for analysis

Data suitable but workarounds/corrections needed

Data governance

Total data
Today’s discussion framed around 3 questions

What is Big Data, and are we there yet?

What are the specific opportunities for Pharma players?

What can your journey look like?
WHAT ARE THE SPECIFIC OPPORTUNITIES FOR PHARMACEUTICAL PLAYERS?

Consider the Patient/Caregiver CareFlow

- Senses something may be wrong/possible medical need
- Gathers information
- Seeks professional help
- Assessed by doctor, learns diagnosis
- Seeks to understand disease and treatment
- Initiates treatment/fills prescription
- Experiences initial treatment benefits/side effects
- Abandons treatment
- Visits doctor for checkup
- Decides to seek alternative treatment/advice
- Seeks to understand disease and treatment
- Condition changes or stabilizes, new conditions emerge
- Cured
- Refills prescription/is adherent to care protocol
WHAT ARE THE SPECIFIC OPPORTUNITIES FOR PHARMACEUTICAL PLAYERS?

Consider the Provider CareFlow

1. Patient presents, information gathered
2. Monitors progress
3. Follows up with patient
4. Runs diagnostic tests
5. Makes diagnosis
6. Researches potential issues
7. Prescribes therapy and coverage
8. Alternate therapy suggested based on coverage
9. Patient chooses what to do
10. Prescription filled or therapy delivered
11. Prescribes a treatment and explains or refers
12. Peer-to-peer discussion
13. Independent research
14. Direct experiences
15. Formal training

Providers’ knowledge estate

Formal training
Researches therapies and coverage
Monitors progress
Prescribes a treatment and explains or refers
Patient chooses what to do
Alternate therapy suggested based on coverage
Patient presents, information gathered
Follows up with patient
Runs diagnostic tests
Makes diagnosis
Researches potential issues
Direct experiences
Peer-to-peer discussion
Independent research

Patient care

WHAT ARE THE SPECIFIC OPPORTUNITIES FOR PHARMACEUTICAL PLAYERS?
WHAT ARE THE SPECIFIC OPPORTUNITIES FOR PHARMACEUTICAL PLAYERS?

Deriving differential insight from voluminous data sets requires a deliberate shaping of “the question”

- **Prediction/Simulation**
  - What will happen?

- **Evaluation**
  - Why did it happen?

- **Data mining**
  - How did it happen?

- **Monitoring**
  - What is happening now?

- **Reporting**
  - What happened?
### What are the Specific Opportunities for Pharmaceutical Players?

#### Many use cases important to pharma apply to other stakeholders, too

<table>
<thead>
<tr>
<th>Pharma</th>
<th>Govt1/Employer</th>
<th>Payor</th>
<th>Provider</th>
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<tbody>
<tr>
<td>Characterize disease and patient pop.</td>
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<td>Under-treatment</td>
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<td>Patient adherence with treatment/disease mgmt</td>
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<td>Develop intervention/therapy</td>
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<td>Trial design</td>
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<td>Trial predictive modeling</td>
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<td>Patient recruitment</td>
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<td>New indication/Phase IV design</td>
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<tr>
<td>Assess intervention/therapy in use</td>
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<td>Pharmacovigilance/Drug safety</td>
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<td>Comparative product effectiveness</td>
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<td>Health economics</td>
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<tr>
<td>Target products and services</td>
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<td>Closed loop marketing</td>
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<tr>
<td>Epidemiology and treatment practices</td>
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<td>Risk-based product pricing</td>
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<tr>
<td>Manage quality and efficiency of delivery</td>
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<tr>
<td>Benefit design</td>
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<td>Provider selection</td>
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<td>Predictive modeling of utilization</td>
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<td>Formulary design</td>
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<td>Forecasting/budgeting</td>
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<td>Error prevention</td>
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<tr>
<td>Care optimization</td>
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</table>

1. Government category includes FDA and CMS

Source: McKinsey analysis
WHAT ARE THE SPECIFIC OPPORTUNITIES FOR PHARMACEUTICAL PLAYERS?

Unlocking the full potential of big data in Pharma R&D can create significant value across the ecosystem.

**Clinical trial productivity**
- Smaller/faster trials
- Improved trial planning, operations, and monitoring
- Faster/better recruitment
- More effective go or no-go

**Improved patient outcomes**
- Improved safety oversight
- Live tracking enabling more consistent patient adherence and compliance
- Tailored dosing for individuals

**Better research**
- Optimized R&D spend based on predictive modeling
- Targeted investments based on disease pattern analysis
- Personalized medicine
- Insights for new indications
WHAT ARE THE SPECIFIC OPPORTUNITIES FOR PHARMACEUTICAL PLAYERS?

Companies and government agencies are already experimenting with emerging technologies to tap into various R&D data pools …

However, larger opportunity remains to make an integrated big data play and realize true potential of the opportunity.
**WHAT ARE THE SPECIFIC OPPORTUNITIES FOR PHARMACEUTICAL PLAYERS?**

**Payor detail: examples**

Payors are exploring deeper opportunities to understand, predict and influence patient behaviors and reduce variation in cost / outcomes

**High value opportunities for payors**

- **Understanding and influencing patient behavior**
  - Integrate data from *mobile monitoring devices* (e.g., scales)
  - Deter *prescription non-compliance* and provide direct provider feedback
  - *Segment patients* based on expected impact of potential interventions

- **Understanding and influencing efficient care delivery**
  - Work with hospitals to implement *admission-discharge notifications*, and access to electronic patient record
  - Deploy data-enabled *referral tools to all providers* (e.g., quality, patient assessment, cost)
  - Partner with manufacturers to encourage innovative approaches to drive value to the system

- **Matching cost and value**
  - Design new payment models tailored to local market needs, based on payor claims data
  - Evaluate and pay providers based on performance
### WHAT ARE THE SPECIFIC OPPORTUNITIES FOR PHARMACEUTICAL PLAYERS?

**Provider detail: examples**

Current incentive structure has their attention more focused on transactional and operational improvements

### High value opportunities for payors

**Transactional analytics**
- Payor yield
- Self-pay impact
- Cash collection
- Overall charges
- Cost reduction
- Reimbursement (including new payment models)

**Operational analytics**
- Labor – structural factors, policies and workforce practices
- PSM – drug & supply choice, vendor management, price optimization
- Patient throughput
- OR, ED and floors utilization and protocols

**Clinical analytics**
- Referral management and effective communication
- Laboratory, imaging/radiology and drug and blood utilization
- Clinical pathways
- Clinical quality / variability

*NOT EXHAUSTIVE*
**WHAT ARE THE SPECIFIC OPPORTUNITIES FOR PHARMACEUTICAL PLAYERS?**

**Spotlight:** payment innovation models are gaining traction and may indirectly change the way payors and providers consider pharma trend

<table>
<thead>
<tr>
<th>Population-based</th>
<th>Basis of payment</th>
<th>Most common application</th>
<th>Most applicable to initiatives targeting…</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Total health, quality of healthcare, and total cost of a population of patients over time</td>
<td>• Patient centered medical homes (PCMH)</td>
<td>• Encouraging primary prevention for healthy consumers and care for chronically ill, e.g.,</td>
</tr>
<tr>
<td></td>
<td>• Achieving a specific patient objective at including all associated upstream and downstream care and cost</td>
<td>• Retrospective Episode Based Payment (REBP)</td>
<td>• Obesity support for otherwise healthy person</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Management of congestive heart failure</td>
</tr>
</tbody>
</table>

- Acute procedures (e.g., hip or knee replacement)
- Perinatal
- Acute outpatient care (e.g., asthma exacerbation)
- Most inpatient stays including post-acute care, readmissions
- Some behavior health
- Some cancers
Payment reform must incorporate both population-based and episode-based models to comprehensively address sources of value.

**WHAT ARE THE SPECIFIC OPPORTUNITIES FOR PHARMACEUTICAL PLAYERS?**

**Detail: Payment innovation (1/5)**

Sources of value realized through payment reform

<table>
<thead>
<tr>
<th>Root causes of inefficiency, poor clinical outcomes and patient experiences</th>
<th>Primary prevention and early detection</th>
<th>Choice of tests, treatment, and setting of care</th>
<th>Efficient and effective delivery of each clinical encounter</th>
<th>Care coordination and treatment adherence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral health risks (e.g., smoking, poor diet, sedentary lifestyle, etc.)</td>
<td>Overuse or misuse of diagnostics</td>
<td>Medical errors</td>
<td>Poor treatment compliance</td>
<td></td>
</tr>
<tr>
<td>Delayed detection contributing to increased severity and preventable complications</td>
<td>Use of medically unnecessary care</td>
<td>Clinicians practicing below top of license</td>
<td>Missed follow-up care leading to preventable complications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use of higher-cost setting of care where not indicated</td>
<td>High fixed costs due to excess capacity</td>
<td>Ineffective transitions of care</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>High fixed costs due to sub-scale</td>
<td>Misaligned treatment guidance among providers</td>
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<td></td>
<td></td>
<td>Use of branded drugs instead of generic equivalents</td>
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<td></td>
<td></td>
<td>Use of medical devices ill-matched to patient needs</td>
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</tbody>
</table>

Payment reform must incorporate both population-based and episode-based models to comprehensively address sources of value.
WHAT ARE THE SPECIFIC OPPORTUNITIES FOR PHARMACEUTICAL PLAYERS?

Detail: Payment innovation (2/5)

How retrospective episodes work for patients and providers

1. Providers deliver care as today (performance period)

   - **Patients** seek care and select providers as they do today

2. Providers submit claims as they do today

3. Payers reimburse for all services as they do today

4. Calculate incentive payments based on outcomes after performance period (e.g., 12 months)

   - Review claims from the performance period to identify a ‘Quarterback’ for each episode

5. Payers calculate **average cost per episode** for each Quarterback

   - Compare average costs to predetermined ‘commendable’ and ‘acceptable’ levels

6. Providers will:

   - **Share savings**: If avg. costs below commendable levels and quality targets met
   - **Pay part of excess cost**: If avg costs are above acceptable level
   - **See no change in pay**: If average costs are between commendable and acceptable levels

NCPPO
National Conference of Pharmaceutical Organizations

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WHAT ARE THE SPECIFIC OPPORTUNITIES FOR PHARMACEUTICAL PLAYERS?

Detail: Payment innovation (3/5)

For providers, risk adjusted average cost of the total patient population they serve is what matters – NOT the cost of each episode.

Risk-adjusted costs for one type of episode in a year for a single example provider

- Cost per episode
- Average

Individual episodes

Risk-adjusted average cost per episode for the provider

- Average cost of the episode
- Provider

National Conference of Pharmaceutical Organizations
WHAT ARE THE SPECIFIC OPPORTUNITIES FOR PHARMACEUTICAL PLAYERS?

Detail: Payment innovation (4/5)

Analytical implementation of episode-based payment raises important issues

Individual providers, in order from highest to lowest average cost

Issues to consider:

- Fairness/methodology
- Transparency and “pressure” on performance
- Change management and capability development
- Management of unintended consequences
- Trajectory to impact
WHAT ARE THE SPECIFIC OPPORTUNITIES FOR PHARMACEUTICAL PLAYERS?

Detail: Payment innovation (5/5)

Transparency and feedback is crucial to making payment reform work

Providers reports should give transparency to:

- **Summary**
  - Overview: # episodes, included / excluded
  - Average cost of care compared to other providers
  - Quality summary
  - Cost summary
  - Key utilization statistics

- **Performance summary**
  - Data for all episodes the provider is considered the ‘Quarterback’
  - Includes gain sharing and risk sharing eligibility

- **Quality detail**: Detail benchmarks for quality metrics across all providers

- **Cost detail**: Breakdown of episode cost by care category
  - Benchmarks against commendable providers

- **Episode detail**: Cost detail by care category for each individual episode a provider treats
Today’s discussion framed around 3 questions

What is Big Data, and are we there yet?

What are the specific opportunities for Pharma players?

What can your journey look like?
We see 5 core components of an effective advanced analytics capability:

1. Clear vision & roadmap
2. Data, IT, and analytic approaches
3. Integration into business processes & workflows
4. Skills & enabling organization
5. Culture & mindset

WHAT CAN YOUR JOURNEY LOOK LIKE?
Successful organizations have deployed a range of approaches to fulfill the 5 components of developing an effective advanced analytics capability (1/5)

1. Clear vision & roadmap
   - Create a holistic view of where insight from analytics will have greatest impact (e.g., clinical operations, population health management)

2. Data, IT, and analytic approaches

3. Integration into business processes & workflows
   - Take business-value driven approach and demonstrate clear linkage to ‘use cases’

4. Skills & enabling organization

5. Culture & mindset

WHAT CAN YOUR JOURNEY LOOK LIKE?

National Conference of Pharmaceutical Organizations
Successful organizations have deployed a range of approaches to fulfill the 5 components of developing an effective advanced analytics capability (2/5)

1. Clear vision & roadmap
2. Data, IT, and analytic approaches
3. Integration into business processes & workflows
4. Skills & enabling organization
5. Culture & mindset

- Define and prioritize information assets/domains
- Develop comprehensive governance model to address data ownership, advanced analytics capabilities and IT architecture tradeoffs
- Reuse, replace and reinvent IT assets opportunistically
- Use a “pilot-driven” approach to realize value incrementally
- Establish process for continued innovation

WHAT CAN YOUR JOURNEY LOOK LIKE?

NCPO
National Conference of Pharmaceutical Organizations
Successful organizations have deployed a range of approaches to fulfill the 5 components of developing an effective advanced analytics capability (3/5)

WHAT CAN YOUR JOURNEY LOOK LIKE?

1. Clear vision & roadmap
2. Data, IT, and analytic approaches
3. Integration into business processes & workflows
4. Skills & enabling organization
5. Culture & mindset

- Integrate use of advanced analytics into current workflow and processes
- Develop effective tools and interfaces to limit disruption and drive broad usage
WHAT CAN YOUR JOURNEY LOOK LIKE?

Successful organizations have deployed a range of approaches to fulfill the 5 components of developing an effective advanced analytics capability (4/5)

1. Clear vision & roadmap
2. Data, IT, and analytic approaches
3. Integration into business processes & workflows
4. Skills & enabling organization
5. Culture & mindset

- Definition of the right roles and securing the right talent
- Organizational model that facilitates the delivery of analytic insights across the organization
- Thoughtful articulation of partnerships (e.g. data) and outsourcing strategy
Successful organizations have deployed a range of approaches to fulfill the 5 components of developing an effective advanced analytics capability (5/5)

WHAT CAN YOUR JOURNEY LOOK LIKE?

1. Clear vision & roadmap
2. Data, IT, and analytic approaches
3. Integration into business processes & workflows
4. Skills & enabling organization
5. Culture & mindset

- **Strong commitment** from senior management to an analytically driven strategy
- **Mindset and actions** to adopt analytics into daily decision-making
- **Clear articulation of how and when** analytics should inform decision making
- **Alignment of incentives** with performance metrics
WHAT CAN YOUR JOURNEY LOOK LIKE?

We see a short list of industry imperatives to accelerate the revolution

<table>
<thead>
<tr>
<th>Bold moves for the industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Make your data available to the people and organizations that can use it to drive value</td>
</tr>
<tr>
<td>2. Establish common ground for data governance, usability, and defining what constitutes evidence</td>
</tr>
<tr>
<td>3. Shift the collective mindset around patient data to “share, with protections,” vs. “protect”</td>
</tr>
<tr>
<td>4. Invest in the capabilities of the players sharing and working with the data</td>
</tr>
</tbody>
</table>
We think the leaders will need to prioritize specific action

**Payors**

1. Start building new data analytics engines to better leverage the data you already have
2. Isolate what drives best performance in influencing the cost of care, and partner with providers and manufacturers to implement those practices more broadly
3. Re-evaluate internal workflows to ensure data-driven decision-making and enhance data capture

**Pharma & devices**

1. **Follow through on re-orientation around payor and customer value**, collaborating with payors and integrating value into R&D decision-making
2. **Ensure a clear line of sight into safety and efficacy of your products and competitor products**
3. **Collaborate for breakthrough science**, both with payors and providers, as well as with peer manufacturers in your TAs

**Providers**

1. Establish clear data governance and develop an effective ‘informatics talent’ strategy
2. Ensure seamless access to patient data and connectivity across care venues, modalities
3. Ensure appropriate integration consistency across key data elements that drive the greatest value
4. Orient around quality and outcomes-based protocols to drive patient care
**WHAT CAN YOUR JOURNEY LOOK LIKE?**

We see four key organizational enablers

<table>
<thead>
<tr>
<th>Vision &amp; Strategic Direction</th>
<th>Talent</th>
<th>Org and Governance</th>
<th>Culture of Renewal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Translating digital aspirations into resource allocation</td>
<td>Attracting and retaining pharma/healthcare relevant digital skills</td>
<td>Development of guidelines given compliance and legal uncertainty</td>
<td>Making ‘willingness to fail’ work in a highly regulated, risk-averse environment</td>
</tr>
<tr>
<td>Balancing internal ownership of vision and strategy vs. agency recommendations</td>
<td>Reluctance to staff up given uncertainties around demand and adoption</td>
<td>Need for rapid content generation cycles given speed of change</td>
<td></td>
</tr>
</tbody>
</table>
How some leading pharma-companies have started their Big Data journeys

- Top level commitment to initiative
- Centralizing function to build scale – typically within R&D but could be in Commercial
- Data partnerships with major health plans, PBMs, regulators, other players in ecosystem
- Joint analytic efforts with health plans to determine efficacy and outcomes - the devil you know is better than the one you don't
- Specific measures of economic impact for making go/no go decisions on phase 3 and 4
- Capability building – tools, talent/health economist & medical informaticists, buy vs. build decisions
- Change management programs to educate and convert organization – TA heads, researchers, senior management
Follow ups

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