Reframing Innovation for Life Sciences Companies

A Presentation to the Twelfth Population Health and Care Coordination

Philadelphia
February 2012
Pharma 3.0 – The Third Place(s) for Healthcare

Progressions 2010
► “If”, “when” and “why”?
► Business model transformation, moving from products to services

Progressions 2011
► “What”, “so what” and “how”?
► Core capabilities and business processes

Progressions 2012
► “Where”, “when” and “how much”?
► Behavioral change of patients, business leaders and healthcare stakeholders
Agenda for today

Pharma 3.0 – The Third place(s) for Healthcare

Implications for Innovation for Life Sciences Industry

Getting to Pharma 3.0
Pharma 3.0
From pharma’s perspective

Drivers of change
- R&D productivity
- Patent cliff
- Globalization
- Demographics
- Pricing & reimbursement
- Health care reform
- Health IT
- Consumerism
- Value mining

Business Models

Pharma 1.0
Blockbuster drugs

Pharma 2.0
Diversified drug portfolios

Pharma 3.0
Healthy outcomes

Customer

Physician

Payor

Patient

From pharma’s perspective
Pharma 3.0
What is driving this shift?

Value mining
► Value-based P&R
► Comparative effectiveness
► Risk-sharing agreements

Making healthcare sustainable
► Healthcare reforms
► Increased pressure from payors

Health outcomes

Consumerism
► Health literacy
► Empowerment

Reducing resistance, encouraging adoption

Technologies
► Mobile health
► EHRs/PHRs
► Social media

Boosting efficiencies and sustainability
Major advances in health outcomes
Three waves

Improved hygiene
- Reduced infections
- Post-surgery survival rates

Breakthrough drugs and devices
- War on disease (polio, smallpox, cancer, HIV, malaria, etc.)
- Better health, longevity

Behavioral changes
- Payors, physicians, patients, companies
- Remove inefficiencies, boost outcomes
Increased burden of chronic disease

**Truth #1** Chronic diseases are the No. 1 cause of death and disability in the U.S.

**Truth #2** Treating patients with chronic diseases accounts for 75 percent of the nation's health care spending.

**Truth #3** Two-thirds of the increase in health care spending is due to increased prevalence of treated chronic disease.

**Truth #4** The doubling of obesity between 1987 and today accounts for 20 to 30 percent of the rise in health care spending.

**Truth #5** The vast majority of cases of chronic disease could be better prevented or managed.

**Truth #6** Many Americans are unaware of the extent to which chronic diseases could be better prevented or managed.

Sources: WHO and www.fightchronicdisease.org
The business model of healthcare is broken

Business Model Canvas

Key Partners
- Life sciences
- Payors
- Providers

Key Resources
- Speciality care
- Primary care
- Care Coordination
- Incentive alignment

Value Propositions
- Healthcare = Acute care

Key Activities
- Little prevention, little predisposition testing
- The value proposition does not address customer needs
- The system doesn't enable healthcare. Incentives are misaligned

Customer Relationships
- Physicians
- There is NO patient experience

Customer Segments
- Patients
- Population
- What about healthy people?

Channels
- Physicians
- Hospitals

New channels are emerging (e-clinics)

Cost Structure
- Cost +
- Costs are exploding

Revenue Streams
- HC insurance
- Out-of-pocket payments
- Govt support
- Funding is under pressure

The system doesn't enable healthcare. Incentives are misaligned.

The value proposition does not address customer needs.

There is NO patient experience.

New channels are emerging (e-clinics).

Funding is under pressure.

HC insurance

Out-of-pocket payments

Govt support

Cost +

Costs are exploding

The business model of key participants is broken.

The system doesn't enable healthcare. Incentives are misaligned.

The value proposition does not address customer needs.

There is NO patient experience.

New channels are emerging (e-clinics).

Funding is under pressure.
Enabling behavioral change
Disrupting the “value network”

Today’s value network is not aligned around outcomes.

Without a new VN, isolated changes will get subsumed by existing VN.

The outcomes ecosystem is not inevitable. Getting there requires coordinated action to align metrics, standards, incentives.

Source: The New Republic
The Third Place(s) for Healthcare
Shifting epicenter of healthcare delivery

Accountable Care
Medical Homes
Bundled payments
Chronic disease management
Health IT
Value based purchasing
What are the assets stakeholders can leverage?

- **Payors**
  - Financing
  - Risk sharing

- **Medical Technology Co.**
  - Remote care

- **Telecom Co.**
  - Diagnostics
  - Connectivity
  - Counseling
  - Drugs
  - Efficacy insights

- **Employers**
  - Behavioral change

- **Pharmacies Co.**

- **Life sciences**

- **Retailers Co.**
  - Access

- **Food Co.**

- **Providers**
  - Nutrition
  - Functional Foods

- **Information companies**
  - Medical expertise

- **Families & friends**
  - Social support

- **Social media Co**
  - Community engagement

- **HIT Co.**
  - Patient data

- **Providers**

- **Self-managed patient**
  - Health literacy
  - Medical expertise

- **Treatment**
  - Nursing care

- **Prevention**
  - Behavioral change

- **Diagnostics**
  - Efficacy insights

- **Connectivity**
  - Telehealth

- **Access**
  - Functional Foods

- **Health literacy**
  - Health education

- **Behavioral change**
  - Nutrition education

- **Nutrition**
  - Functional Foods

- **Risk sharing**
  - Remote care

- **Remote care**
  - Telehealth

- **Financing**
  - Nursing care
The ecosystem advances

Pharma companies: 78% increase in number of 3.0 initiatives

Non-pharma companies: outpacing pharma with >$20b committed to date

Selected investments:

- $2.8b Samsung: Electronic health equipment
- $0.5b Nestle: Health and wellness products for diabetes, obesity, etc.
- $2.5b Pepsico: Drinks/snacks inspired by Traditional Chinese Medicine
- $6.0b GE: Health innovation initiative (improve care for more people at lower cost)
- $0.8b TELUS: Social network for Canadian patients to manage health

► Smartphones lead the way
► Moving beyond diabetes into broad spectrum of disease states
► More holistic approaches to improving outcomes
Apps for patients

Sources: www.apple.com
The ecosystem advances
Non-traditional players – Health as the new green

Ford Motor Company and WellDoc® Announce Unique Research Collaboration to Help Patients Manage their Health on the Road 18 May 2011

Groundbreaking integration aims to bring mHealth services to the automotive industry to help improve chronic disease management outcomes and reduce healthcare costs.

The new TOTO Intelligence Toilet is a sure thing when it comes to monitoring your health. 07 September 2010

- Measure body weight
- Checks your urine, BMI, body temperature and blood sugar level
- Data extracted, graphed and displayed at a wall monitor or PC
The Third Place in Healthcare will redefine the system and the business models of the key players

Serving patients’ unmet needs and improving network-based adherence…

- Engaging patients and caregivers
- Focus on preventative care
- Improving healthcare access
- Optimizing healthcare delivery

Incentives to drive change

- Enhanced diagnoses
- Improved prognosis
- Increase effectiveness and efficacy of treatment
- Reducing relapse or worsening of condition
- Containing mortality rates

…..closes the final link in providing Personalized, Preventative Healthcare
The Third place(s) for Healthcare
Shifting epicenter of healthcare delivery

1) Patients: self-management
- Physician
- Hospital
- Payor
- Treatment
- Diagnosis
- Prevention
- Health management
- Pre-disposition testing

Changing Behaviors

2) Industry: business models
- Business Model Canvas
  - Key Partners
  - Key Activities
  - Value Propositions
  - Customer Relationships
  - Channels
  - Customer Segments
- Potential business and technology partners
- What key activities?
- What's the value proposition to the market? Today? In the future?
- Who are the customers?

3) System: collective impact
- Common agenda
- Shared measurement system
- Mutually reinforcing activities
- Continuous communication
- Backbone support organization
- Collective impact
Business model development
Mapping the value pathway

**Intervention opportunities**
- Education
- Awareness programs
- Annual checkup at offices and schools
- Use of IT to assess diabetes risk
- Peer-to-peer exchange of experience
- Sense of community
- Financial support
- Emerging markets (awareness)

**Value leakages**
- Lack of awareness and literacy
- Social stigma of disease
- Psychological issues
- Cost burden
- Neglect
- Addiction

**Intervention opportunities**
- Reminders
- Guidance on managing side effects
- Innovative drugs (smart insulins)
- Innovative DDD
- Regular dietary/exercise coaching
- Innovative monitoring (non- or minimally invasive)
- Continuous glucose monitoring
- Platform for concordance between HCP, patient and health plan

**Population**

**Value leakages**
- Lack of coordinated care
- Discontinuity with specialists
- Reduction of quality of life
- Complexity of disease, comorbidities
- Lack of insurance and burden of out-of-pocket costs
- Impaired family dynamics

**Intervention opportunities**
- Integrated diabetes management through cohesive groups
- Education on co-morbidities and their management
- Data management platforms/software
- EMRs
- Counseling, emotional support from support group
- Access schemes
- R&D collaborations to develop novel therapies/devices

**Population at risk 350m worldwide**

**Value leakages**
- Undiagnosed diabetes is often higher than 50%
- Risk confirmed

**Pre-diabetes**
- Lifestyle management
- Drug treatment
- Blood pressure monitoring

**Diabetic patient**
- Management of hypertension

**Glycemic control**

**First-line treatment (OAD)**
- Lifestyle management
- Regular glucose monitoring

**Second-line treatment (OAD+ basal insulin)**
- Regular glucose monitoring

**Third-line treatment (insulin analogs)**
- Regular glucose monitoring

**Uncontrolled diabetes**

**Screening and glycemic test**
- Population
- Diagnosis

- Non-adherence to:
  1. Drug treatment
  2. Lifestyle management
  3. Self-monitoring
  4. Physician visits

- Burden of complex treatment
- Pain of injections
- Lack of motivation
- Pricking pain
- Burden of frequent monitoring, data management
- Lack of time and motivation

- Population
- Screen
- Diagnosis

- Risk confirmed

- Long-term complication management

- Diabetes
- Nephropathy
- Neuropathy
- Vascular disease

- Dystopia management
- Lipid profiling
- CVD (Heart disease)

- Nephropathy management
- Nephropathy screening

- Pain management
- Nephropathy screening

- Eye care management
- Retinal screening program

- Diabetic patient
- Management of hypertension

- Glycemic control

- First-line treatment (OAD)
- Second-line treatment (OAD+ basal insulin)
- Third-line treatment (insulin analogs)
Pharma 3.0
Enhanced core competencies to enable health outcomes

- Manage patient outcomes
- Expand access
- Meet unmet medical needs
- Connecting information
- Radically collaborative innovation
- Multiple business models

Self-managed patient

Pharma 1.0 and 2.0

- R&D
- Manufacturing
- Regulatory
- M&S

Drugs and efficacy insights
Connecting information
Connect

Big data
- R&D functions but also from external relationships becoming increasingly data rich
- Exponential increase in the quantity of data being created

The internet of things
- Connected and context-aware technologies
- Generation of real time data

Closed gardens
- Data increasingly been aggregated in closed, proprietary systems
- Need to negotiate access to, collect and analyze different kinds of data in various forms

New capabilities
- To track, store and analyze data
- To develop insight-enabled interventions at key points in the cycle of care

Aggregators
- To aggregated data using common language and turn data into insights

Building solutions
- To develop insightful solutions from data

Information strategy
- As a new approach to IT
- IT will be about informing and driving 3.0 strategy
Radical collaboration
Collaborate

New business models
► …require a different approach to innovation
► No single entity will have the full complement of skills, expertise and insights to develop innovative outcomes-based business models

A broken system
► Innovation will need to be disruptive
► A focus on outcomes is providing a catalyst for disruptive innovation
► Assets are in place, need to combine them

Rigorous process for R&D
► Pharma will develop large portfolios of business model experiments

New approaches to IP
► Pharma will need to learn to contribute assets and IP into new models that they do not entirely control

Community engagement
► A key driver of success will be the ability to engage with customers and developers in fundamentally different ways.
► Open partnering and open innovative process, crowdsourcing
Multiple business models
Operate

A multiplicity of business models
- Diverse new value propositions
- Heterogeneous customer base
- Diverse and new channels
- Emerging enabling technologies
- A need to experiment

A shift to solutions
- Allowing to unbundle knowledge from product
- With models incorporating services and customer insights

A rigorous and systematic approach
- Use commercial trials to develop and experiment around new offerings

Manage a portfolio of partners
- Investing in long-term potential of some relationships, partner around specific challenges, bring together complementary skills and needs

Manage performance
- ...of developing and scaled initiatives
- Function as a value added private equity firm
Building Pharma 3.0
Six business processes

Pharma 3.0

Connecting information
- Extracting value out of large volumes of data from diverse, unfamiliar sources

Radical collaboration
- Innovative collaborations with non-traditional partners to co-create value for each other and the ecosystem

Multiple business models
- Building and managing a portfolio of innovation models

Business model development: systematically experimenting with new models
Community engagement: engaging to add personalized value and build trust
Information strategy: empowering IT to guide 3.0 strategy
Performance management: measuring and communicating 3.0 value drivers
Capital strategy: adapting the capital agenda for Pharma 3.0 initiatives
Governance, risk and controls: embracing (and managing) risk in 3.0 initiatives

Three core competencies for success in Pharma 3.0
Business processes that should be created or enhanced
Business model development
A systematic, scalable process

Not business development by another name

► BMD does not exist in pharma today
► Systematic, scalable processes for:
  ► Wide-scale experimentation
  ► Identifying winners, failing fast
  ► Scaling up and commercializing
► Requires different skills, incentives and mindsets

Skills, incentives and mindsets

► Appropriate incentives
► Knowledge of:
  ► Multiple health care systems
  ► New technologies
  ► Regulatory/legal aspects
► Customer centricity
► Strategic and financial rigor

A systematic, scalable process:

► Map the value pathway
► Identify value leakages
► Envision solutions and partners
► Determine strategic fit
► Conduct commercial trials; scale up
► Ongoing performance management
<table>
<thead>
<tr>
<th>Key Partners</th>
<th>Key Activities</th>
<th>Value Propositions</th>
<th>Customer Relationships</th>
<th>Customer Segments</th>
<th>Day</th>
<th>Month</th>
<th>Year</th>
</tr>
</thead>
</table>
| Potential business and technology partners | What key activities? | **What is the value proposition to the market?**
  Today? In the future? | What existing relationships can be leveraged? | Who are the customers? |               |       |      |
| Key Resources | What resources? |                         |                        |                   |               |       |      |
| Cost Structure | |                         |                        |                   |               |       |      |
| Revenue Streams | |                         |                        |                   |               |       |      |

- What type of revenue streams?
- What are the start-up and operating cost drivers?
- How big is this market?
- Who are the customers?
- What channels?
- What is the value proposition to the market?
- What existing relationships can be leveraged?
- Today? In the future?
- What key activities?
- What resources?
Nudged patient behavior

Communicate clearly!

Processing information
Providing a feedback loop, actionable information based on personalized data
- Personalized to circumstances
- Made relevant
- Informing choices and trade-offs

Resisting temptation
Enabling actions-taking while in cold states to help guide behaviors when in hot states
- Technologies to manage behaviors in hot states
- Social networks feedback and reinforcement.
- Contracts to lock in behaviors

Account for preferences!

Empowering

Learn from behavioral economics

Experiment and be flexible

Use new technologies and social media
Implications on R&D value chain
The R&D value chain is shifting from sequential to lifelong and patient-centric.
Semantic networks

**Care delivery**
- **Provider**
  - Regulator-endorsed algorithm for product
  - Provides basis for further decision-support services
- **Payors / regulators / govt**
  - Payors mine patient information
  - They design RFPs for future therapies
  - Pharma companies bid for discovery and development contracts (supplier)
- **Empowered patient**
  - Patients control their own health records
  - Advanced decision support tools help them design treatment directly
  - Patients associations design insurance schemes and treatment RFPs

**Supply chain**
- **Pharmacies**
  - Massive amount of patient disease and medication related data
  - Therapeutic resource centers
  - Comparative effectiveness data
  - Theranostics and supporting economic information
- **AMCs (academic medical centers)**
  - Bioinformatics Research – Linking diseases to genomics information
- **R&D**
  - Pharmas/Biotechs
    - Development of biomarkers
    - More effective drugs sooner
    - Collaborative networks for drug discovery and development
### Selected revenue models

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Examples</th>
<th>Success factors</th>
<th>Patient-centric opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data monetization</td>
<td>► Provide discounted/free services ► Extract value from customer data</td>
<td>► Zynga ► Facebook ► Safeway (loyalty cards)</td>
<td>► Platform for collecting customer data ► Data mining skills ► Trust from customers</td>
<td>► Disease networks: Give patients free care, capture value from lifelong data</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>► Social media: Free access, monetize discussion thread data ► Smartphone apps</td>
</tr>
<tr>
<td>“Freemium”</td>
<td>► Provide basic offering for free ► Charge a premium for advanced or special features</td>
<td>► Skype (free Skype-to-Skype calls, charge for other calls)</td>
<td>► Customer expectations of free access ► Ability to easily add or subtract features</td>
<td>► Smartphone apps: Limited features for free versions, charge for full versions.</td>
</tr>
<tr>
<td>Subscription/membership</td>
<td>► Give customers access for a specific time period in exchange for a flat subscription fee</td>
<td>► Netflix ► Costco</td>
<td>► Low marginal costs ► Variability in customer usage over time</td>
<td>► Capitated models: Companies agree to receive a flat payment per patient for a certain period.</td>
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<tr>
<td></td>
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<td></td>
<td>► Behavioral incentive programs: Patients or employers pay monthly fee for behavior modification programs.</td>
</tr>
<tr>
<td>Market exchange</td>
<td>► Connect multiple buyers and sellers ► Create transparency ► Revenue from commissions, transaction fees, etc.</td>
<td>► eBay ► Priceline ► Yelp ► Groupon</td>
<td>► Inefficient markets</td>
<td>► Transparency enablers: Websites with info on quality and prices ( ► Online clearinghouses: e.g., for providers to sell excess capacity</td>
</tr>
</tbody>
</table>
Getting to 3.0
Disrupt and engage

Revisit incentives and metrics
- Health outcomes based incentives
- Standards and metrics to measure health outcomes
- Economic value for externalities to set price signals
- Baseline to compare interventions

Develop Standards
- Regulatory
- Value mining
- Interoperability of data

Evolve Cultures and mindset
- Trust
- Incentives to encourage openness, transparency and impartiality
- Science is first

Engage the ecosystem

Articulating strength
- Knowledge about the products
- Understanding of cycle of care
- Expertise in clinical trials
- Knowledge of disease states
- Familiarity with regulatory
- Familiarity with payers

Addressing conflicts of interest
- Investing in long-term potential of some relationships, partner around specific challenges, bring together complementary skills and needs

Take action to build trust
- Committing to act in ways that demonstrate new approaches and mindsets for co-creating value with partners
- Realign internal incentives and processes
Getting to 3.0
Change models

Lead

Guide

Monitor

Learning

Task force
Encourage and monitor the creation of R&D and pilot projects

Small HQ team
Build outcomes based business models, influence and guide business units to encourage them having targeted initiatives

Business Unit
Create targets, drive new innovations, deliver results and communicating success on value creation

Build goals, objectives, incentives and scorecard to motivate and measure performance

Build outcomes focused scorecard

Monitor of progress of pilots with view to harness results over time to construct value proposition for system-wide change

Supervisory

Driving

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Innovation for Life Sciences Companies – a Virtual Circle

Clinical Transformation
- Real world data informs activities
- Increased focus on “pills+” that help prevention, chronic disease self management

Healthcare Delivery Transformation
- Achieving B2C - Patient-physician connectivity and multi-channel information pipelines
- Improved multi-sourced data and predictive
- Articulated Self Management pillar of health systems

Commercial transformation
- Providing product and services in nontraditional settings
- Building new business models that create life long relationship with customers and improve outcomes
- Organize around patient populations, e.g. women’s health
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