Disruptive Innovators.  
Who Will Affect Healthcare Delivery?

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What is “Disruptive Innovation”? 
1. Disruption as Destruction

The opening up of new markets, foreign or domestic, and the organizational development from the craft shop and factory... illustrate the same process of industrial mutation—if I may use that biological term—that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism. It is what capitalism consists in and what every capitalist concern has got to live in. . . .

Joseph A. Schumpeter: *Capitalism, Socialism and Democracy* (New York: Harper, 1975) [orig. pub. 1942], pp. 82-85

Ich (I or the thesis) + Nicht-Ich (not-I or the antithesis) → Synthesis

Johann Gottlieb Fichte (1762-1814) *Die Bestimmung des Menschen* (Erstausgabe, 1800)

Dialectical Materialism- applying experiential factors, not just thought.
For examples: *Das Kapital* (Marx) 1867 and *Dialektik der Natur* (Engels) 1883
2. Disruption as Innovation

Clay Christensen and colleagues describe “disruptive innovation” as: “a process whereby a smaller company with fewer resources is able to successfully challenge established incumbent businesses. Specifically, as incumbents focus on improving their products and services for their most demanding (and usually most profitable) customers, they exceed the needs of some segments and ignore the needs of others. Entrants that prove disruptive begin by successfully targeting those overlooked segments, gaining a foothold by delivering more suitable functionality—frequently at a lower price. Incumbents, chasing higher profitability in more-demanding segments, tend not to respond vigorously. Entrants then move upmarket, delivering the performance that incumbents’ mainstream customers require, while preserving the advantages that drove their early success. When mainstream customers start adopting the entrants’ offerings in volume, disruption has occurred.”

3. Disruption as Replacement (New completely replaces old)
4. Disruption as a Value Proposition (Resetting Equilibrium)
How can we use it to define a disruptive innovation in healthcare?
Boehringer Wins FDA Approval for First Warfarin Rival
By Naomi Kresge and Catherine Larkin - Oct 20, 2010
Boehringer Ingelheim GmbH won U.S. approval to sell Pradaxa, beating drugmakers including Bayer AG and Johnson & Johnson to the market with the first rival to the half-century-old blood thinner warfarin. The Food and Drug Administration cleared the drug for patients with an irregular heartbeat that may raise the risk of a stroke, the agency said yesterday in a statement.
Pfizer Inc., Bristol-Myers Squibb Co., Bayer and J&J were racing Boehringer, the world’s biggest family-owned drugmaker, to win U.S. approval for a warfarin replacement, a market Bayer has said may reach $12 billion to $15 billion a year. Pradaxa sales may reach $4 billion a year by 2020, according to an estimate from Jack Scannell, a London-based analyst for Sanford C. Bernstein Ltd.

Example 1. Drugs

Bayer, J&J's blood pill shows mass-market promise
Sun, Oct 31 2010 By Ludwig Burger FRANKFURT (Reuters) –

...the Xarelto pill was as good as the established warfarin pill at reducing the risk of strokes due to a form of irregular heartbeat that is common among the elderly...

...patients on Xarelto ran a risk of bleeding that was comparable to those on warfarin...

Bayer has said it is eyeing more than 2 billion euros ($2.78 billion) in annual sales from Xarelto in a market worth an estimated $12 billion to $15 billion in total

In total, at least eight companies are racing to launch new oral anti-coagulants to replace warfarin, a problematic 65-year-old medicine originally developed as rat poison.
Warfarin inhibits the vitamin K-dependent synthesis of biologically active forms of the calcium-dependent clotting factors II, VII, IX, and X as well as the regulatory factors protein C, protein S, and protein Z.

By the end of 2013, as much as 50% of warfarin use could be replaced by new oral anticoagulants - Medco 2011 Drug Trend Report

In 2013, these drugs accounted for 70% of the atrial fibrillation market. - Atrial Fibrillation – Global Drug Forecast and Market Analysis to 2023 © GlobalData.
Example 2. Devices

A special **non-invasive pressure-sensing ultrasound probe**... can measure the extent of the damage and enable **doctors to map disease progression and determine treatment**, said Dr. David M. Kwartowitz, assistant professor of bioengineering at Clemson....

While emerging science suggests that physical therapy alone may be enough for some patients, postponing surgery, which requires four to six months of limited activity, may impact shoulder function, he said. The probe improves the ability to get the information that helps make the determination, he said. Orthopedic surgeon Dr. Richard Hawkins, co-founder of the Steadman Hawkins Clinic, said the **probe should be helpful in determining whether an injury can be repaired**.

“This device allows us to analyze the tissue characteristics of the rotator cuff,” he said. “And if it has a lot of degeneration, it might not be as reparable as if it had stronger tissue characteristics.”

Physicians use conventional ultrasound now to see rotator cuff injuries, but the probe in development should provide more accuracy....

And while costly MRI imaging is also used now to visualize rotator cuff injuries, he said, the probe, while offering similar images, is another tool that would be much less expensive and could be done in the office setting.

The researchers say the device could cut costs by as much as 70 percent.

Cardiologists who used a handheld ultrasound were more likely to make an accurate diagnosis of patients with common cardiovascular abnormalities than colleagues who relied on a physical exam, for an estimated savings of $63 per patient. Handheld ultrasound’s ability to rule out abnormalities also likely would reduce downstream testing...

Cardiologists and other practicing physicians may resist using handheld ultrasound for several perceived reasons: the need for training; concerns that it takes more time; distrust in its accuracy; lack of financial incentives; and the potential loss of downstream revenue from echocardiograms, among others.

Example 4. Organizational Change: Telemedicine

A key attraction of this type of telehealth for health plans and employers is the potential savings involved in replacing physician office and emergency department visits with less expensive virtual visits. However, increased convenience may tap into unmet demand for health care, and new utilization may increase overall health care spending. We used commercial claims data on over 300,000 patients from three years (2011–13) to explore patterns of utilization and spending for acute respiratory illnesses. We estimated that 12 percent of direct-to-consumer telehealth visits replaced visits to other providers, and 88 percent represented new utilization. Net annual spending on acute respiratory illness increased $45 per telehealth user. Direct-to-consumer telehealth may increase access by making care more convenient for certain patients, but it may also increase utilization and health care spending.

Example 5. A totally successful disruption
Adoption requirements for value-added disruption

• Maximizes profit by minimizing expense and/or

• Becomes the evidence-based state of the art

• Must also be accepted by key stakeholders (Consider who will oppose the disruption)
Some Disruptive Innovations on the Horizon
(Some are already here)

• Vaccines for prevention and treatment, e.g., Universal flu vaccine and cancer treatments
• 3-D printing of body parts, e.g., joints and organs
  [https://www.youtube.com/watch?time_continue=129&v=t5UsRDS-wqI](https://www.youtube.com/watch?time_continue=129&v=t5UsRDS-wqI)
• “Liquid biopsies” for cancer screening
• “Wearables”
• Organizational entry into other sectors, e.g., CivicaRx and ProvideGx
• AI: Artificial or Augmented Intelligence
• Genetically-guided therapies including epigenetic manipulation
• Expansion of capitated payments and other risk-based payments
• Selling personal data, which will require...
• Interoperable information systems, which will require...
• Verifiable security and privacy of personal and organizational data.
For further information:

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