Innovations in Delivery for Simple Acute Care

Ateev Mehrotra MD
Idea of disruptive innovation

- Innovation typically comes from outsiders
- Begin by providing simpler services
- Lower costs using new technology or employees with lower salaries
## Typical “Menu” at a Retail Clinic

<table>
<thead>
<tr>
<th>Common Illnesses</th>
<th>Wellness &amp; Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Allergies (ages 6+)</strong></td>
<td><strong>Camp Physicals</strong></td>
</tr>
<tr>
<td><strong>Bladder Infections (females, ages 12-65)</strong></td>
<td><strong>Health Screening Package</strong></td>
</tr>
<tr>
<td><strong>Bronchitis (ages 10-65)</strong></td>
<td><strong>Cholesterol Screening</strong></td>
</tr>
<tr>
<td><strong>Ear Infections</strong></td>
<td><strong>Diabetes Screening</strong></td>
</tr>
<tr>
<td><strong>Pink Eye &amp; Styes</strong></td>
<td><strong>Hypertension Screening</strong></td>
</tr>
<tr>
<td><strong>Sinus Infections (ages 5+)</strong></td>
<td><strong>Obesity Screening</strong></td>
</tr>
<tr>
<td><strong>Strep Throat (additional lab charges may apply)</strong></td>
<td><strong>Smoking Cessation</strong></td>
</tr>
<tr>
<td><strong>Swimmer’s Ear</strong></td>
<td>- Initial Visit</td>
</tr>
<tr>
<td></td>
<td>- Follow Up Visits</td>
</tr>
<tr>
<td></td>
<td><strong>Additional Services</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Ear Wax Removal</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Flu Diagnosis (ages 10-65)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Mononucleosis</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Pregnancy Testing</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Suture Removal</strong></td>
</tr>
<tr>
<td></td>
<td><strong>TB Testing</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Price</th>
<th>Price</th>
<th>Price</th>
<th>Price</th>
<th>Price</th>
<th>Price</th>
<th>Price</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$29</td>
<td>$29</td>
<td>$29</td>
</tr>
<tr>
<td>$69</td>
<td>$39</td>
<td>$39</td>
<td>$29</td>
<td>$29</td>
<td>$29</td>
<td>$29</td>
<td>$29</td>
</tr>
<tr>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$29</td>
<td>$29</td>
<td>$29</td>
</tr>
<tr>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$29</td>
<td>$29</td>
<td>$29</td>
</tr>
<tr>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$29</td>
<td>$29</td>
<td>$29</td>
</tr>
<tr>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$29</td>
<td>$29</td>
<td>$29</td>
</tr>
<tr>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$29</td>
<td>$29</td>
<td>$29</td>
</tr>
<tr>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$29</td>
<td>$29</td>
<td>$29</td>
</tr>
<tr>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td>$29</td>
<td>$29</td>
<td>$29</td>
</tr>
</tbody>
</table>

*MinuteClinic Website*
Under the weather?
Get fast, online medical help.
Symptom Checkers

healthychildren.org
Powered by pediatricians. Trusted by parents. from the American Academy of Pediatrics

freemd
your virtual doctor

WebMD symptom checker

isabel
the symptom checker

NHS choices

symcat.com
symptoms to solutions
Growth

- More than 10 million retail clinic visits per year
  - MinuteClinic just under 1000 sites
- Estimated 1 million direct-to-consumer telemedicine visits per year
  - Teladoc alone 300 thousand visits per year
- Symptom checkers used over 100 million times per year
  - iTriage 50 million uses per year
Drivers

- Societal shift on what is a reasonable wait
- Too difficult to see usual provider
- Automation and guidelines
- Increased out-of-pocket costs for patients

Mehrotra, JAMA, 2013
Percentage of Covered Workers Enrolled in a Plan with a General Annual Deductible of $1,000 or More for Single Coverage, By Firm Size, 2006-2013

* Estimate is statistically different from estimate for the previous year shown (p<.05).

NOTE: These estimates include workers enrolled in HDHP/SOs and other plan types. Average general annual health plan deductibles for PPOs, POS plans, and HDHP/SOs are for in-network services.

Detailed estimates for Insured Procedure

**Procedure:** MRI - Back (outpatient)

**Procedure Description:** Magnetic resonance imaging of the spinal canal, without contrast material.

**Procedure Code:** 72148

**Insurance Plan:** Anthem - NH - Health Maintenance Organization (HMO)

**Within:** 20 Miles of Nashua, NH (03060)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DERRY IMAGING CENTER</td>
<td>$268</td>
<td>$0</td>
<td>$268</td>
<td>VERY</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NH NEUROSPINE INSTITUTE</td>
<td>$268</td>
<td>$0</td>
<td>$268</td>
<td>VERY</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CATHOLIC MEDICAL CENTER</td>
<td>$1,429</td>
<td>$0</td>
<td>$1,429</td>
<td>MED</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PARKLAND MEDICAL CENTER</td>
<td>$1,601</td>
<td>$0</td>
<td>$1,601</td>
<td>LOW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOUTHERN NH MEDICAL CENTER</td>
<td>$1,705</td>
<td>$0</td>
<td>$1,705</td>
<td>MED</td>
</tr>
</tbody>
</table>
How these options fit the Disruptive Innovation Model

• Offer affordability, convenience, and simplicity to previously neglected markets
• Lower cost through less expensive providers, cutting overhead, automation
• Markets too small and low-margin for incumbents to pursue or aggressively defend

Do they improve value?
<table>
<thead>
<tr>
<th>Issue</th>
<th>Potential benefits</th>
<th>Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality</td>
<td>• Strict guideline based care, thus ensuring quality</td>
<td>• Deliver poor quality services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Overprescribe antibiotics</td>
</tr>
<tr>
<td>Access</td>
<td>• Improve access for all patients</td>
<td>• Undermine patient-doctor relationships</td>
</tr>
<tr>
<td></td>
<td>• New safety-net provider</td>
<td>• Decrease use of preventive care</td>
</tr>
<tr>
<td>Costs</td>
<td>• Decrease ED visits</td>
<td>• Increase costs due to unnecessary follow-up</td>
</tr>
<tr>
<td></td>
<td>• Decrease overall costs</td>
<td></td>
</tr>
</tbody>
</table>
Ongoing Debate

- Quality
- Access
Quality of Care in Retail Clinics is the Same or Better as Found in Other Settings

Mehrotra et al., Annals of Internal Medicine, 2009
More Recent Work on Antibiotic Prescribing Rates

Mehrotra et al, Am Jo Managed Care, 2015
eVisits - Antibiotic Prescribing

Oral antibiotic prescribed day of visit or subsequent 2 days (allow for culture results)

P<0.001

Mehrotra et al, JAMA IM, 2012
Teladoc - Antibiotic Prescribing

Uscher-Pines et al, JAMA IM, 2015
Teladoc Physicians Less Likely to Order Tests

Testing for pharyngitis: Teladoc Office Visits vs. Testing for back pain: Teladoc Office Visits

P<0.001

Uscher-Pines et al, JAMA IM, 2015
Summary on Quality

• Compared to in-person physician office visits quality similar, but not always
• Variation across providers
• Issue of under-testing
• No quantum leap forward
Ongoing Debate

• Quality
• Access
Few retail clinic patients report having a primary care physician
Few retail clinics in underserved areas

- 13% of clinics in Health Professional Shortage Areas (HPSAs) compared to 21% of population

*Rudavsky, Mehrotra, JABFM, 2010*
Do Teladoc users live in underserved communities?

<table>
<thead>
<tr>
<th>Location Characteristics</th>
<th>Teladoc User</th>
<th>Non-Teladoc Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPSA (%)</td>
<td>23</td>
<td>20</td>
</tr>
<tr>
<td>Rural (%)</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Travel Time</th>
<th>Teladoc User</th>
<th>Non-Teladoc Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nearest PCP (in minutes)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Time to nearest hospital (in minutes)</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Time to nearest UCC (in minutes)</td>
<td>16</td>
<td>13</td>
</tr>
</tbody>
</table>
Summary on Access

- Innovations attract different patient population not “plugged in” with a practice
- Often no PCP relationship to disrupt
- But not clear these innovations improve access to underserved communities
Acknowledgements

- **Colleagues**
  - Judy Lave
  - Beth McGlynn
  - John Adams
  - Rena Rudavsky
  - Hangsheng Liu
  - Julie Lai
  - Lori Uscher-Pines
  - Jeffrey Linder
  - Scott Beach
  - Adams Dudley
  - Claude Setodji
  - Robin Weinick
  - Rachel Burns
  - Maggie Wang
  - Craig Pollack
  - Scott Ashwood
  - Marty Gaynor
  - Kristin Ray
  - Courtney Gidengil
  - Hannah Semigran

- **Funding by NIH, California Health Care Foundation, Robert Wood Johnson Foundation**

- **Questions:** mehrotra@hcp.med.harvard.edu
Virtual visits instead of in-person physician visits

EXHIBIT 2
In-Person And Virtual Patient-Physician Visits, Kaiser Permanente Northern California, 2008-13

- Office visits
- Virtual visits (telephone and secure e-mail)
Ongoing Debate

- Quality
- Access & PCP relationships
- Costs
Significant Per Episode Cost Savings at Retail Clinics

Mehrotra et al., Annals of Internal Medicine, 2009
No Notable Difference in Prescription Costs
More than 100 Million Minor Acute Problem Visits to Physicians and Emergency Rooms

Top 10 Conditions/Services at Retail Clinic Visits

Millions of Visits per Year

- ED
- MD Office

Mehrotra et al., Health Affairs, 2008
Weinick et al., Health Affairs, 2010
Do Retail Clinics Save Money?
Depends on Impact on Overall Utilization

• Substitution
  – Visiting retail clinic instead of physician or ED
  – No change in overall utilization

• New Utilization
  – Visiting retail clinic instead of staying home
  – Increase in overall utilization
Overall Utilization Increases

Innovations may drive up health care spending

• In medicine when something becomes easier, more convenient we use it more

• Net impact:
  – Fraction of visits that replace in-person visits vs. new utilization
  – Relative savings compared to in-person
  – Downstream costs deterred
Innovation Paradigm

• Much of discussion has been innovation vs. typical care

• Less focus on care modality as a whole and more focus on
  – Which provider
  – Clinical condition
Do not assume quality will be equal or superior to in-person visits

• Relatively little known

• Potential pitfalls
  – Poor oversight
  – No “boots on the ground”
Summary thoughts
Improve access, but not necessarily for “underserved” populations

- Innovations have focused on improving convenience and likely save time
- Pull in patients into system
- Not necessarily underserved communities
Symptom Checkers

healthychildren.org
Powered by pediatricians. Trusted by parents. from the American Academy of Pediatrics

freemd
your virtual doctor

Esagil

WebMD symptom checker

Content Provided by
Harvard Health Publications
HARVARD MEDICAL SCHOOL

isabel
the symptom checker

NHS choices

Symcat.com
symptoms to solutions
Audit study using Standardized Patient Vignettes

- Emergent care required (15)
  - For example. Appendicitis, asthma attack, heart attack, meningitis, pneumonia, stroke

- Non-emergent care reasonable (15)
  - For example. Acute otitis media, acute sinusitis, influenza mononucleosis, UTI, vertigo

- Self-care is sufficient (15)
  - For example. Acute bronchitis, allergic rhinitis, viral conjunctivitis, constipation, viral URI
Overall diagnostic accuracy

- Top 1: 33%
- Top 3: 52%
- Top 20: 60%
Appropriate triage advice

Overall Emergent Non-emergent Self-care

80%*
55%*
34%*

* P < 0.001
Do Retail Clinics Undermine PCP Relationships?

- First Contact Care
- Continuity
- Prevention
- Chronic Illness Care
Impact on PCP Continuity: 8% Fewer Patients Have a PCP Visit

Reid et al. JGIM, 2012
Impact on Preventive Care:
No Negative Impact on Breast Cancer Screening

Reid et al. JGIM, 2012
Importance of improving access

**Video on time costs of health care**