ACOs and Chronic Disease: Outcomes-Driven Initiatives to Manage Population Health

Diabetes Impact

May 1st 2014

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Montefiore Medical Center, the University Hospital for Albert Einstein College of Medicine
Bronx, New York
Diabetes epidemic – a tsunami

CASE

• 38 y/o Hispanic with T2DM + HTN diagnosed at age 18
• Fragmented care, never engaged in her disease, non-adherent to medical appointments or advise
• I was asked to see her upon hospital discharge
• Mother of 3, unemployed, on Medicare and Medicaid
• 6 years before left foot infection > BKA amputation
• Kidney failure > dialysis > kidney transplant
• Unsuccessful kidney transplantation > dialysis past 2 years
• CVA resulting in vision loss in her right eye
• Last hospitalization for a MI > CABG X 4
Diabetes epidemic – a tsunami

CASE -COST

• MEDICAL
  – Osteomyelitis
  – BKA
  – Dialysis
  – Kidney Transplant
  – Stroke
  – MI
  – CABG
  – Other hospitalizations

• SOCIAL
  – Unemployed
  – Care for her Children (housing and food stamps)
  – Medicaid > Medicare because of disabilities
Diabetes epidemic—a tsunami

CASE -COST

- MEDICAL EXPENSES
  - Osteomyelitis
  - BKA $91,106
  - Dialysis $82,285 per year
  - Kidney Transplant $262,000
  - Stroke
  - MI
  - CABG $90,000 to >$150,000
  - Other hospitalizations

TOTAL MEDICAL COST FOR THIS 38 YER OLD LADY > 1 MILLION
Early and Aggressive Management of Type 2 Diabetes

Joel Zonszein, MD

*I declare no conflict of interest for this presentation*

Disclosure - Speaker’s Bureau or Advisory Board:

- Novo nordisk
- Takeda Pharmaceuticals North America, Inc
- Merck/Schering-Plough Pharmaceuticals
- Sanofi
- Boehringer Ingelheim
- Eli Lilly

*I thank our patients - ultimately the ones to benefit*
Diabetes is not a rare disease...

- 26 million — 8.3% of the US population
  - The Bronx - 14.6%  
  - April 25, 2013

- Projected to increase from 1:10 to 3:10 by 2050
  - ↑Incidence among American youth - younger, and younger
  - ↑GDM 10%

- Diabetes “discriminates vulnerable populations”
  - More: diabetes > complications > hospitalizations
Treating diabetes is complex...

• **Early diagnosis** 1/3 not diagnosed
• **Early treatment** - those diagnosed are often not treated or undertreated

• **Treatment consist of:**
  – Education + TLC’s
  – **A** A1c < 7% less than 45%
  – **B** Blood pressure <130/80 mmHg 50%
  – **C** LDL-cholesterol < 100 mg/dl 66%
  – **ALL** Glucose + BP + cholesterol 10%

Meeting ABC goals in diabetes 1988–2010

<table>
<thead>
<tr>
<th>Medication</th>
<th>Route</th>
<th>Hypoglycemia</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulins → Basal, Bolus, Mixed and Afrezza</td>
<td>Parenteral inhaled</td>
<td>YES</td>
<td>↑</td>
</tr>
<tr>
<td>Sulfonylureas → 1&lt;sup&gt;st&lt;/sup&gt; and 2&lt;sup&gt;nd&lt;/sup&gt; generation</td>
<td>Oral</td>
<td>YES</td>
<td>↑</td>
</tr>
<tr>
<td>Glinides -nateglinide, rapeglinide</td>
<td>Oral</td>
<td>YES</td>
<td>↑</td>
</tr>
<tr>
<td>Biguanides -metformin</td>
<td>Oral</td>
<td>NO</td>
<td>↔</td>
</tr>
<tr>
<td>Alpha-glycosidase inhibitors</td>
<td>Oral</td>
<td>NO</td>
<td>↔</td>
</tr>
<tr>
<td>acarbose, miglitol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiazolidinedione (s) –pioglitazone</td>
<td>Oral</td>
<td>NO</td>
<td>↑↑</td>
</tr>
<tr>
<td>Incretinomimetics: DPP-IV inhibitors – sitagliptin, saxagliptin, linagliptin</td>
<td>Oral</td>
<td>NO</td>
<td>↔</td>
</tr>
<tr>
<td>Incretinomimetics: GLP-1 analogues</td>
<td>Parenteral</td>
<td>NO</td>
<td>↓↓</td>
</tr>
<tr>
<td>exenatide, liraglutide, exanatide ER, albiglutide</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amylin analogue pramlintide</td>
<td>Parenteral</td>
<td>NO/YES</td>
<td>↓↓</td>
</tr>
<tr>
<td>Bile Acid Sequestrant -colesevelam</td>
<td>Oral</td>
<td>NO</td>
<td>↔</td>
</tr>
<tr>
<td>Dopamine agonists bromocriptine</td>
<td>Oral</td>
<td>NO</td>
<td>↓</td>
</tr>
<tr>
<td>SGLT-2 inhibitors</td>
<td>Oral</td>
<td>NO</td>
<td>↓↓</td>
</tr>
<tr>
<td>canagliflozin, dapagliflozin (empagliflozin)</td>
<td></td>
<td></td>
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</tbody>
</table>
Diabetes is a “targeted disease” - ACA

- Common disease - 23 million Americans
- Quintessential chronic disease
- Efficacious interventions poorly implemented
- High cost $174 billion in 2007
  - Complications, unemployment, disabilities and a social burden
- Health disparities
- Mostly managed by PCP’s
What are we doing at Montefiore?
PROGRAMS AT EINS:
- DRTC
- HCOE
- The Bronx Center to Reduce and Eliminate Ethnic and Racial Health Disparities (Bronx CREED)
- Collaboration with the DOH, and others

PROGRAMS AT MONTEFIORE:
- Montefiore Clinical Diabetes Center
- Montefiore’s Care Management Organization (MONTE CMO)
- Diabetes Center of Excellence (NYSDOH Grant)
- Wellness programs

Diabetes Disease Management Program (DDMP)
>15 years a “de facto” model for (ACO)

Community engagement
Montefiore Medical Center, the University Hospital for Albert Einstein College of Medicine

25 FTE’s dedicated to diabetes (17 CDE’s) + Diabetes Champions

PROGRAMS AT MONTEFIORE

• Montefiore Clinical Diabetes Center:
  – ADULT: 4 RN’s, 2 RD’s, 2 MD’s (7CDE’s)
  – PEDIATRICS: 2 RN’s 2 RD’s (3 CDE’s)
• OBSTETRICS: 2 RN’s 1 RD (2 CDE’s)
• CMO/ACO:
  – 7 RNs (5 CDE’s) in MMG 11 offices
  – One telephonic RN (CDE) at Yonkers
  – 2 FTE Pharm D’s dedicated to Diabetes
Montefiore Community Initiatives

Substance Abuse
- Bronx BREATHERES Cessation Center
- Managed Addiction Treatment Services
- Medical Stabilization – Detox Program

Mobile Primary Care
- Mobile Dental Van
- Vaccine Administration
- House Calls Program
- Cancer Screenings

Obesity
- CHAM JAM: Child Program
- B’N Fit: Teen Program
- Bronx on the Move!
- Tour de Bronx Bicycling Event

Nutrition
- Weekly Farmer’s Market
- Green Carts
- Healthy Bodega Initiative
- Healthy Kids program
ACOs and Chronic Disease: Outcomes-Driven Initiatives to Manage Population Health

Diabetes Impact

• ACOs managing chronic diseases – outcomes
• Role of pharmaceuticals and devices
• Tools, programs, and services biopharma and device companies that can help improving outcomes or reducing cost for ACOs.
ACA – Novel health care delivery systems

DIABETES IMPACT (DDMP)

• Developed at Montefiore ~15 years ago
  – D. Stein, M. Alderman and J. Zonszein

• Tailored to prevention and treatment of CVD in T2DM (integrated with PCP)

• Two tiers:
  – Early diabetes no complications (DSME)
  – Late diabetes + complications (Case managers using a one-to-one approach “carte blanche”)

ACA – Novel health care delivery systems
DIABETES IMPACT (DDMP)

Patients referred by PCP’s participating in the Montefiore PROMISED – DSME workshops 2013

<table>
<thead>
<tr>
<th></th>
<th>A1C</th>
<th>LDL-cholesterol</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHANES 2007-2010 (% at goal)</td>
<td>&lt;7%</td>
<td>&lt;100</td>
</tr>
<tr>
<td>CMO patients attending DSEME (% at goal)</td>
<td>52.2%</td>
<td>56.8%</td>
</tr>
<tr>
<td>Before DSME &gt; within a year after DSME</td>
<td>43% &gt; 53.0%</td>
<td>53.0% &gt; 67.0%</td>
</tr>
</tbody>
</table>
### ACA – Novel health care delivery systems

**DIABETES IMPACT (DDMP) \( n=4305 \)**

<table>
<thead>
<tr>
<th>Screening measure</th>
<th>Baseline</th>
<th>Outcome</th>
<th>( p ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c (annual)</td>
<td>84.9%</td>
<td>91.7%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HbA1c (biannual)</td>
<td>48.9%</td>
<td>71.2%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>LDL</td>
<td>78.6%</td>
<td>83.8%</td>
<td>0.001</td>
</tr>
<tr>
<td>Smoking status</td>
<td>26.2%</td>
<td>55.6%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Depression (PHQ-2)</td>
<td>17.4%</td>
<td>48.3%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Flu Vaccine</td>
<td>14.2%</td>
<td>47.8%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Outcome</th>
<th>( p ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c (mean %)</td>
<td>8.5</td>
<td>7.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>% with HbA1c &lt; 7%</td>
<td>27.1</td>
<td>46.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>% with HbA1c &gt; 9%</td>
<td>29.3</td>
<td>13.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>LDL (mean mg/dL)</td>
<td>110.1</td>
<td>102.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>% with LDL &lt; 100</td>
<td>45.1</td>
<td>50.9</td>
<td>0.005</td>
</tr>
</tbody>
</table>

Montefiore ACO
PY1 Financial Results

MONTEFIORE IS “NUMERO UNO”

Among 32 Pioneer ACO in financial performance

Savings = $23 million

~7% below benchmark

$14 million of savings for Medicare

Centers for Medicare and Medicaid Services (CMS)
Stephen Rosenthal and Henry Chung, M.D
PY 1: Inpatient Admissions decreased 10.4%

Source: CMMI PY1 Pioneer ACO Data Analysis
PY 1: Inpatient Admissions for Diabetes decreased 45.7%

Source: CMMI PY1 Pioneer ACO Data Analysis
# At Risk Population
## Quality Performance 2013

<table>
<thead>
<tr>
<th>ACO #</th>
<th>Description of Measure</th>
<th>Average National ACO Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>Diabetes Mellitus: Hemoglobin A1c Poor Control in Diabetes Mellitus. (*P)</td>
<td>25.94%</td>
</tr>
<tr>
<td>28</td>
<td>Hypertension (HTN): Controlling High Blood Pressure. (P)</td>
<td>63.24%</td>
</tr>
<tr>
<td>29</td>
<td>Ischemic Vascular Disease (IVD): Complete Lipid Panel and LDL Control (&lt;100 mg/dL). (P)</td>
<td>52.03%</td>
</tr>
<tr>
<td>30</td>
<td>Ischemic Vascular Disease (IVD): Use of Aspirin or Another Antithrombotic. (P)</td>
<td>72.61%</td>
</tr>
<tr>
<td>31</td>
<td>Heart Failure: Beta-Blockers for Left Ventricular Systolic Dysfunction. (R)</td>
<td>79.65%</td>
</tr>
<tr>
<td></td>
<td>Diabetes Composite - All or Nothing Scoring</td>
<td>31.09%</td>
</tr>
<tr>
<td></td>
<td>Coronary Artery Disease (CAD) Composite - All or Nothing Scoring</td>
<td>61.67%</td>
</tr>
</tbody>
</table>
There’s No Place Like a “Medical Home”

- Patient Engagement
- Safety and Quality
- Treatment of Patient as a “Whole”
- Comprehensive and Coordinated Care
- Enhanced Access
- Physician Directed Practice
- Payment for Added Value
ACA – Novel health care delivery systems
DIABETES IMPACT

• PCMH
  – Evaluation between 2007-2010 in provision of PCMH modest changes
  – Not better care and patient or family experiences
  – Wide variations in design and evaluation
  – Evolution - more research needed

Bojadzievski T, Gabbay RA. DIABETES CARE, 2011;34
ACA – Novel health care delivery systems
DIABETES IMPACT - Summary

- PCMH “concept evolving”
- Education (DSME)
  - Self empowerment and motivational adherence
  - Working in team with the PCP
- Treatment: TLC + MEDS (ABC’S)
  - Better access to the “right medications”
- Avoiding ED and or Hospitalizations
- Integration and continuity of care
ACOs and Chronic Disease: Outcomes-Driven Initiatives to Manage Population Health

**Diabetes Impact**

- ACOs managing chronic diseases – outcomes
- Role of pharmaceuticals and devices
- Tools, programs, and services biopharma and device companies that can help improving outcomes or reducing cost for ACOs.
Outcomes-Driven Initiatives - Population Health

- **Avoid a Culture Clash** – Cultural competence
- *Promotores de la salud, Navigators, Educators*
  - Peer Mentors (ongoing grant*)
    - 8 mentors with T2DM
    - Mentees n=100
      - Age 63
      - NHB 19%, Hispanics 17%, White 4%
      - A1c 10.1

* Ashwin Patel, MD, PhD, InquisitHealth
The use of medical information exchanged from one site to another via electronic communications to improve a patient’s clinical health status

- two-way video
- email
- smart phones
- wireless tools
- other telecommunication technology
Telemedicine: Outcomes-Driven Initiatives

- Telephonic motivation
- TextMed Programs
- Telephonic CBG management
- WellDoc™ Mobile Diabetes Management* -behavioral mobile coaching (improve A1c)

*Diabetes Care 34:1934–1942, 2011
9% of Mississippians have diabetes
$2.7 billion annual cost = 3% of the state's economy

Republican Gov. Phil Bryant and the University of Mississippi + three private partners implemented a telemedicine plan for low-income residents
Goals: “keep the disease in check” and “avoid hospitalizations”

The bill requires private insurers, Medicaid and state employee plans to reimburse medical providers for services
The project is free for the poor uninsured participants

USA Today April 18, 2014
Telehealth solutions InscrybeMD® Telehealth Tablet App., Electronic House Call™ and InscrybeMD®
Outcomes-Driven Initiatives - Population Health

- Transplants:
  - Pancreas
  - Kidney Pancreas
  - Islet Cell transplants

- Insulin pumps
- CGSM devices
- Closed-Loop System or ARTIFICIAL PANCREAS
Traditional Insulin Pump Components

- Body
- Insulin reservoir
- Tubing
- Insertion catheter
- Battery compartment
Advances in Pump Technology

- Tubeless
- Disposable pump

Tubing-free system with integrated reservoir, infusion set, and inserter
Continuous Monitoring Systems
Overlay of several days of glucose values demonstrating the need to change insulin therapy for carbohydrate coverage at dinner based on postprandial elevations above target.
Glycated Hemoglobin in All Patients

Connectivity - Future
Summary of Insulin Pump Therapy

• Use will continue to increase
• Insulin dosing easier and more accurate
• Can result in improved glycemic control and reduced hypoglycemia
• Accurate CGM + insulin pump in a closed-loop system may....

• PUMP COST:
  – $5,000 to $7,000
  – $2,500 per year for pump supplies

• SENSOR COST
  – $307 to $2,500

CGM = continuous glucose monitor
ACOs and Chronic Disease: Outcomes-Driven Initiatives to Manage Population Health

Diabetes Impact - Summary

• Common chronic disease
• Efficacious interventions - poorly implemented – "too much too late"
• EBM supports aggressive disease prevention
• Team work and patient centered management:
  – Education + TLC + Proper medications
• Technology - T1DM and T2DM
ACA

Health Care for all
Prevention
New health care delivery
Better clinical outcomes
Savings?

WE HAVE AN OPPORTUNITY!
THANK YOU!