Medtronic Diabetes:
Who We Are, What We Do and Where are We Going

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Past-President, Endocrine Society
Colonel (ret) U.S. Army Medical Corps

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Medtronic: Global Medical Technology Leader

- Number of employees: 85,000+
- Number of countries operating in: 160+
- Number of patients: 500,000+
- Number of patents: 53,000+
- Research and development spend: $2B
- Charitable contributions: $80M

Information reflects Medtronic fiscal year 2014 data and Covidien fiscal year 2014 data.
Diabetes Care Solutions

Serving 500,000+ patients worldwide

- Insulin Pumps
- Continuous Glucose Monitoring
- Connected Care
- Data Management

Care Management
Diabetes Care Solutions

“Artificial Pancreas” Closed Loop

Insulin Pump

Continuous Glucose Monitor
Winning the Race to Closed Loop

**MiniMed 530G**
Threshold Suspend

- Stops insulin delivery when glucose levels fall below set threshold

**MiniMed 640G**
SmartGuard

- Stops insulin delivery when glucose levels are predicted to fall below set threshold

**Hybrid Closed Loop**

- Starts & stops insulin based on actual & predicted values

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**Clinical Path:** *Continue pursuit of artificial pancreas*

**Consumer Path:** *Innovate around comfort, ease and cost across all segments*
Personal and Professional Continuous Glucose Monitoring

Personal CGM

Guardian® CGM System

Professional CGM

iPro®2
Personal and Professional Continuous Glucose Monitoring

**Personal CGM**
- Guardian® CGM System

**Professional CGM**
- iPro®2
Looking Beyond A1C and BG Meter Readings

CGM Reveals Insights Beyond BGs and A1C

- BG Meter Readings
- Continuous Glucose Sensor Readings

**A1C: 7.5**

<table>
<thead>
<tr>
<th>Time of Day</th>
<th>Glucose (mg/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midnight</td>
<td>90</td>
</tr>
<tr>
<td>3AM</td>
<td>120</td>
</tr>
<tr>
<td>6AM</td>
<td>150</td>
</tr>
<tr>
<td>9AM</td>
<td>180</td>
</tr>
<tr>
<td>12PM</td>
<td>210</td>
</tr>
<tr>
<td>3PM</td>
<td>240</td>
</tr>
<tr>
<td>6PM</td>
<td>270</td>
</tr>
<tr>
<td>9PM</td>
<td>300</td>
</tr>
<tr>
<td>Midnight</td>
<td>330</td>
</tr>
</tbody>
</table>

- Meter Avg: 100 SD: 40
- SG Avg: 154 SD: 102
(2001) Kaufman Study
Professional CGM Captures Excursions Missed by BG Meters

**Study Design**
- Study Duration: 6 months
- N: 47 pediatrics with type 1 Diabetes (A1C > 8.6\% ± 1.6), intensive insulin therapy
- 3-day Professional CGM evaluation and BG Meter Readings
- Compared highs and lows identified with CGM versus BG

**Outcome**

<table>
<thead>
<tr>
<th></th>
<th>Professional CGM</th>
<th>BG Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Excursions Identified</td>
<td>191</td>
<td>42</td>
</tr>
<tr>
<td>Night-time Excursions Identified</td>
<td>72</td>
<td>10</td>
</tr>
</tbody>
</table>

Professional CGM revealed up to 7x more night-time excursions than BG meters

Clinicians used CGM data to adjust and optimize therapy

Professional CGM Helped Guide Bolus/Basal Therapy Modifications

Clinician Directed Change

- Basal or Long-acting Insulin
- Bolus or Rapid-acting Insulin
- Hypo treatment
- Correction Algorithm for Dawn Phenomenon
- for High Fat Meals
- for High Glycemic Foods

Personal and Professional Continuous Glucose Monitoring

Personal CGM

Guardian® CGM System

Professional CGM

iPro®2
Personal Continuous Glucose Monitoring in Type 1 DM

**Period 1:**
- Median Glucose (min, max) = 200 mg/dl (42, 350)
- Mean Glucose ± Stdev = 200 ± 69 mg/dl

**Period 2:**
- Median Glucose (min, max) = 176 mg/dl (54, 334)
- Mean Glucose ± Stdev = 178 ± 57 mg/dl

**Period 3:**
- Median Glucose (min, max) = 148 mg/dl (60, 264)
- Mean Glucose ± Stdev = 150 ± 42

Personal Continuous Glucose Monitoring in Type 2 DM

Driving Technology Breakthroughs

Yesterday

1st insulin pump
502

1st pro CGM
522/722

1st real-time CGM
2006

2003

Today

MiniMed 530G
1st system to automatically suspend insulin in U.S.

2013

MiniMed 620G
New pump platform in Japan

2014

MiniMed 640G
SmartGuard technology

2015

Tomorrow

Hybrid closed-loop system
Artificial pancreas
CGM for Type 2 in Primary Care

This slide contains future products/technologies that are not available for commercial distribution...
The Medicare CGM Access Act of 2015, HR 1427

**Creates Medicare Access for CGM**
- Stand-alone, SAP, APDS
- Covers medically appropriate populations

**Establish Appropriate payment mechanism for CGM**
- Pathway for future technology (APDS)

**Senate and House Bills**
- H.R. 1427 Reps. Tom Reed, Diana DeGette, and Ed Whitfield
- S. 804 Senators Susan Collins and Jeanne Shaheen
Thanks for Your Attention