Monthly Campaign Webinar
November 10, 2016
• **Together 2 Goal® Updates**
  – Webinar Reminders
  – 2017 Webinar Topics
  – Goal Post Nov. Newsletter Highlights
  – Q3 2016 Data Reporting Reminder
  – National Day of Action Highlights

• **Conduct Practice-Based Screening**
  – John Cuddeback, MD, PhD, AMGA Analytics
  – Edward Gregg, PhD, Centers for Disease Control and Prevention

• **Q&A**
  – Use Q&A or chat feature
WEBINAR REMINDERS

• Webinar will be recorded today and available the week of November 14th
  – Together2Goal.org Website (Improve Patient Outcomes → Webinars)
  – Email distribution

• Participants are encouraged to ask questions using the “Chat” and “Q&A” functions on the right side of your screen
2017 WEBINAR TOPICS

• Seeking AMGA members to present on topics of interest, including:
  – How you incorporate the patient perspective (for instance, do you include patients or family members on committees?)
  – How you use innovative technology (such as mobile apps, Emmi, remote monitoring, etc.)

• To volunteer, please email together2goal@amga.org
Q3 2016 DATA REPORTING DEADLINE: DEC. 2

For data assistance, contact DataHelpForT2G@amga.org.
Upcoming Dates

- **November 14-17**: Institute for Quality Leadership
  - 11/14: Together 2 Goal® Pre-Conference Session (Interactive CORE Program)
  - 11/15: Quality Improvement Leadership Council Meeting
  - 11/16: Together 2 Goal® Peer-to-Peer Breakout Session

- **December 2**: Q3 2016 data due
- **December 22**: Q3 blinded, comparative reports sent to participating organizations
NATIONAL DAY OF ACTION HIGHLIGHTS
NATIONAL DAY OF ACTION HIGHLIGHTS

GREETINGS:

It is my pleasure to join with Premier Medical Associates and the commonwealth’s medical professionals, volunteers, and advocates to proclaim November 3, 2016, as National Day of Action.

Diabetes is one of the most pressing health issues we face - it affects one million adults in Pennsylvania and is the seventh leading cause of death in the commonwealth. By participating in the National Day of Action, Premier Medical Associates pledges to improve care for patients with diabetes in the Greater Pittsburgh area. I applaud this organization’s campaign to improve practice based screening abilities and increase earlier diagnoses to prevent the serious and life-threatening complications that diabetes may cause. The work of the staff and providers at Premier Medical Associates are key steps in improving health outcomes and the quality of life for people with or at risk for developing diabetes. I encourage all citizens to continue to raise awareness about this disease and the complications that it can cause, while providing support to those suffering from diabetes.

As Governor, and on behalf of all citizens of the Commonwealth of Pennsylvania, I am honored to support National Day of Action in the commonwealth. Please accept my best wishes for continued success in your mission.

TOM WOLF
Governor
November 3, 2016
Edward Gregg, PhD
Chief of the Epidemiology and Statistics Branch, Division of Diabetes Translation, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention

John Cuddeback, MD, PhD
Chief Medical Informatics Officer
AMGA Analytics
**Campaign Planks**

**Empower Patients**
- Build an Accountable Diabetes Team
- Integrate Emotional & Behavioral Support
- Refer to Diabetes Self-Management Education & Support Programs

**Improve Care Delivery**
- Conduct Practice-Based Screening
- Adopt Treatment Algorithm
- Measure HbA1c Every 3-6 months
- Assess & Address Risk of Cardiovascular Disease
- Contact Patients Not at Goal & with Therapy Change within 30 Days

**Leverage Information Technology**
- Use a Patient Registry
- Embed Point-of-Care Tools
- Publish Transparent Internal Reports
One-fourth of Americans who have Type 2 diabetes—and nearly twice that proportion among Asian and Hispanic Americans—are unaware they have it. Screening asymptomatic adults (practice-based case detection) is therefore an essential population health strategy.

According to the American Diabetes Association’s Standards of Care:

- All patients 45 years of age or older should be tested, with repeat testing every 3 years if the results are normal, every year for people who have prediabetes; and
- Testing should be considered in adults younger than 45 who are overweight (BMI ≥ 25, or ≥ 23 in Asian Americans) and have additional risk factors.

**TIPS FOR EFFECTIVE SCREENING**

- Conduct screening in a practice-based setting, where patients can receive individualized treatment and support.
- Use hemoglobin A1c (HbA1c) for post-screening.
- Organizations should consider addressing policy, system, and environmental factors through community interventions to promote healthy lifestyles.
- Create care pathways for those newly diagnosed with Type 2 diabetes or pre-diabetes:
  - For people found to have Type 2 diabetes, therapy should be individualized.
  - For people who have “pre-diabetes” (HbA1c 5.7–6.4%, impaired fasting glucose, or impaired glucose tolerance), retesting should occur at least once a year.
  - Clinicians should provide full diagnostic disclosure that promotes shared decision-making. This may include creation of a “roadmap” for aggressive lifestyle interventions to prevent or delay the onset of overt Type 2 diabetes.
  - Consider referral to programs that meet the guidelines of the Centers for Disease Control and Prevention’s National Diabetes Prevention Program.
Progress and Challenges in Screening and Risk Stratification for Type 2 Diabetes Prevention

Edward W. Gregg, PhD
Division of Diabetes Translation
Centers for Disease Control and Prevention

Findings and conclusions in this presentation are those of the author and do not necessarily represent those of the Centers for Disease Control and Prevention
Outline

- Summary of recommendations and goals
- Recent analyses from Division of Diabetes Translation
- Quandaries and challenges
Diabetes Pyramid of Prevention

- **Moderate Risk**
- **Low Risk**
- **High Risk** (FPG100; Obesity; HTN, age)
- **Very High Risk** (IGT; A1c 5.7%; GDM)
- **Undiagnosed**

Prevent morbidity through optimal risk factor management and screening for complications.

Efficiently detect in clinical settings.

Reduce risk with structured programs in community settings.

Reduce risk with community programs, counseling and education.

Reduce risk by changing underlying risk factors (food, social, built environment) in communities.

Prevalence:
- ~25%
- ~13%
- 50%
### ADA Recommendations on Screening

**Table 2.2—Criteria for testing for diabetes or prediabetes in asymptomatic adults**

1. Testing should be considered in all adults who are overweight (BMI $\geq 25$ kg/m$^2$ or $\geq 23$ kg/m$^2$ in Asian Americans) and have additional risk factors:
   - physical inactivity
   - first-degree relative with diabetes
   - high-risk race/ethnicity (e.g., African American, Latino, Native American, Asian American, Pacific Islander)
   - women who delivered a baby weighing $>9$ lb or were diagnosed with GDM
   - hypertension ($\geq 140/90$ mmHg or on therapy for hypertension)
   - HDL cholesterol level $<35$ mg/dL (0.90 mmol/L) and/or a triglyceride level $>250$ mg/dL (2.82 mmol/L)
   - women with polycystic ovary syndrome
   - A1C $\geq 5.7\%$ (39 mmol/mol), IGT, or IFG on previous testing
   - other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans)
   - history of CVD

2. For all patients, testing should begin at age 45 years.

3. If results are normal, testing should be repeated at a minimum of 3-year intervals, with consideration of more frequent testing depending on initial results (e.g., those with prediabetes should be tested yearly) and risk status.

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American Diabetes Association, Standards of Medical Care in Diabetes – 2016
Population: Adults aged 40 to 70 years who are overweight or obese.

Recommendation: Screen for abnormal blood glucose as part of cardiovascular risk assessment in adults aged 40 - 70 y who are overweight or obese. Offer or refer patients with abnormal blood glucose to intensive behavioral counseling interventions to promote a healthful diet and PA.

Grade: B (high certainty of moderate benefit or moderate certainty that the net benefit is moderate to substantial.)

Rationale:
- Benefits on BP, glucose, lipid levels, obesity, PA, and for person with IGT, progression to diabetes.
- Minimal harm apart from short-term anxiety.
Screening and Diagnosis for Type 2 Diabetes and Pre-diabetes In the U.S.: General Principals and Concepts

- Screening/testing in clinical settings and established clinical/community partnerships, but not community-wide screening.

- 2-stage approaches that include risk assessment tools followed by diagnosis with glycemic tests.

- Screening testing for undiagnosed diabetes/prediabetes more cost-effective than either alone.

- Integrate with other recommended screening (e.g., lipid, BP).

- Need for refined risk stratification for primary prevention.
The National Diabetes Prevention Program: A Public-private partnership to scale the translated model of the DPP.

National Diabetes Prevention Program

COMPONENTS

Training: Increase Workforce
Train the workforce that can implement the program cost effectively.

Recognition Program: Assure Quality
Implement a recognition program that will:
- Assure quality.
- Lead to reimbursement.
- Allow CDC to develop a program registry.

Intervention Sites: Deliver Program
Develop intervention sites that will build infrastructure and provide the program.

Health Marketing: Support Program Uptake
Increase referrals to and use of the prevention program.

Division of Diabetes Translation • http://www.cdc.gov/diabetes/prevention

The National Diabetes Prevention Program:

- Clinical-community partnership with delivery by lifestyle coaches in community settings.
- Diverse settings (YMCA, employers, community settings, virtual delivery)
- Train-the-trainer model by master trainers.
- 16-visit curriculum for small group counseling.
- Training, recognition and registry program by CDC to:
  - Train workforce
  - Ensure standards, quality, and credibility.
  - Drive reimbursement.
- Insurers and self-pays.
• 1007 CDC-recognized programs across 50 states/territories.
• >10,300 coaches (lay people; health professionals) trained.
• Serving 85,008 eligible participants.
• 39 commercial health plans providing some coverage for 2.4M
Key Challenges in US Roll-Out

- High Risk Population
  - Sustainable reimbursement structure.
  - Assuring high quality programs in communities.
  - Referral and engagement.
  - Risk stratification that ensures cost effectiveness.

- Whole populations
  - Determining food, behavioral, physical activity, social policies that work.
  - Effectiveness of broad reach, low-intensity programs.
  - Finding politically-acceptable, effective levers.
Issues and Challenges for Risk Stratification

- Lifestyle intervention most cost-effective among persons with high rate of progression and with insulin resistance.

- Different glycemic tests (FPG, A1c, OGTT) find different people (IFG; eA1c; IGT).
  - All predict progression to DM and CVD.
  - Only IGT population tested in prevention trials.
  - OGTT rarely used in practice (except for GDM).

- The ADA definition of pre-diabetes captures very large proportion of the population with heterogeneous risk.

- Refinement of risk stratification approaches and a multi-tiered approach to prevention is needed.
Recent Analyses and Implications
Prevalence of Pre-Diabetes among U.S. Adults, According to Different Definitions of Pre-Diabetes, NHANES 2005-2008

Prevalence

James et al., Diab Care, 2011
Incremental Cost-Effectiveness of Alternative A1c Cut Points (Compared to Neighboring Cutpoint)

Figure 3A - Cost per QALY Gained

Figure 3B - Cost per Case Prevented

Zhuo et al., 2012
Relationship of A1c (x-axis) and 10-year Diabetes Incidence (y-axis). Circle size represents the proportion of total diabetes cases over 10 years.

Adapted from Zhang et al., 2010; Zhuo et al., 2012; Gregg et al., 2013
Cost-effectiveness of the 2014 USPSTF recommendations for intensive behavioral counseling interventions for adults with cardiovascular risk factors

Presented at ADA Scientific Sessions, Lin et al., 2016
Cost-effectiveness of the 2014 USPSTF recommendations for intensive behavioral counseling interventions for adults with cardiovascular risk factors

Presented at ADA Scientific Sessions, Lin et al., 2016
Summary and conclusions

- Overall, the USPSTF recommended lifestyle intervention is **cost effective**
- The cost-effectiveness varies by risk factor status
  - *Cost saving* for obese persons with IFG and ≥ 1 other CVD risk factors.
  - *Cost effective* for persons with either obesity or IFG
  - *Not cost effective* for non-obese persons without IFG
- Intervention priority should be set based on risk status
Receipt of Glucose Testing among US adults, NHANES 2007-2012 (Bullard et al., PLOS One, 2015)

- Proportion meeting criteria for screening:
  - 73% (156 million) met ADA criteria

- 51% of eligible adults reported being tested in past 3 years.

- Eligible individuals not tested were more likely to be:
  - Lower educated
  - Poorer
  - Uninsured
  - Have no usual place of care
Summary

- Multi-tiered response to diabetes screening and prevention is essential.

- Current recommendations call for two-stage screening/testing approaches initiated in clinical settings.

- Screening and prevention of diabetes is cost-effective but will benefit from continued refinement of risk stratification approaches.
Practice-Based Screening for Diabetes
On-line resource for “staged” screening—begin by reviewing risk factors
• Ask. Screen. Know.™ (unbranded website, provided by Novo Nordisk)

Using EHR data to identify patients for screening—data from Optum™ One
• Typical proportions of patients eligible for screening
• Proportions who are currently being screened, and
• Yield from screening—patients with evidence for diabetes and prediabetes

First with A1c, then approximate figures for fasting plasma glucose and 2-hr GTT
• Ways to identify fasting glucose results in EHR data

Prioritizing patients with prediabetes for intervention
• More than 1,000 organizations offer NDPP programs, most at multiple sites
• Insurance coverage for intensive lifestyle programs—begins in 2018 for Medicare
• DPP study: heterogeneity of treatment effect
KNOW YOUR DIABETES RISK FACTORS

Health is your first wealth. Take the Diabetes Risk Factor Assessment today, talk to a health care professional about getting screened, and encourage your family and friends to do the same.

Take the Diabetes Risk Factor Assessment Today

More than 1 in 3 American adults are at-risk of diabetes

Many people who develop diabetes have 1 or more family members with the disease

African Americans are nearly twice as likely to develop diabetes as Caucasian Americans

askscreenknow.com
On-line resource for “staged” screening

- Begin by reviewing risk factors

Using EHR data to identify patients for screening—data from Optum™ One

- Typical proportions of patients eligible for screening
- Proportions who are currently being screened, and
- Yield from screening—patients with evidence for diabetes and prediabetes

First with A1c, then approximate figures for fasting plasma glucose and 2-hr GTT

- Ways to identify fasting glucose results in EHR data

Prioritizing patients with prediabetes for intervention

- More than 1,000 organizations offer NDPP programs, most at multiple sites
- Insurance coverage for intensive lifestyle programs—begins in 2018 for Medicare
- DPP study: heterogeneity of treatment effect
Optum One – Population Health Analytics

Aggregate data across the continuum

Clean, normalize and validate data

Transform data into insight

Make insights actionable

- Clinical claims & scheduling data
- Automated extraction
- Source system agnostic
- Person-centric MPI

Mapping

Validation

Normalization

- Predictive modeling
- Disease models
- Shared report library
- Benchmarking

Optum™ One
Intelligent health analytics platform

AMGA Shared Learning, Research and Translation
Users of Optum One among AMGA Members: “Instrumented Practices”

15% of AMGA members
25% of patients
Study Population

- Begin of Data (01/01/2010)
- EoD – 48 mo. (01/01/2012)
- EoD – 36 mo. (01/01/2013)
- EoD – 24 mo. (01/01/2014)
- EoD – 12 mo. (01/01/2015)
- End of data (12/31/2015)
Study Population

- Begining of Data (01/01/2010)
- EoD – 48 mo. (01/01/2012)
- EoD – 36 mo. (01/01/2013)
- EoD – 24 mo. (01/01/2014)
- EoD – 12 mo. (01/01/2015)
- ≥ 1 Office Visit
- End of data (12/31/2015)
Study Population

Begining of Data (01/01/2010)

≥ 3 Office Visits

≥ 1 Office Visit

EoD – 48 mo. (01/01/2012)
EoD – 36 mo. (01/01/2013)
EoD – 24 mo. (01/01/2014)
EoD – 12 mo. (01/01/2015)

≥ 1 Office Visit

End of data (12/31/2015)
Study Population

- No Prior Diabetes Diagnosis
- ≥ 3 Office Visits
- ≥ 1 Office Visit
- ≥ 1 Office Visit
- Begining of Data (01/01/2010)
- EoD – 48 mo. (01/01/2012)
- EoD – 36 mo. (01/01/2013)
- EoD – 24 mo. (01/01/2014)
- EoD – 12 mo. (01/01/2015)
- End of data (12/31/2015)
Study Population

- Begining of Data (01/01/2010)
- EoD – 48 mo. (01/01/2012)
- EoD – 36 mo. (01/01/2013)
- EoD – 24 mo. (01/01/2014)
- EoD – 12 mo. (01/01/2015)
- ≥ 1 Office Visit
- End of data (12/31/2015)
Study Population

EM visit (last 12 mo)

- No Visit 52.8%
- Yes Visit 47.2%

15.56M
Study Population

- Begining of Data (01/01/2010)
- ≥ 1 Office Visit
  - EoD – 48 mo. (01/01/2012)
  - EoD – 36 mo. (01/01/2013)
  - EoD – 24 mo. (01/01/2014)
  - EoD – 12 mo. (01/01/2015)
- End of data (12/31/2015)
Study Population

15.56M

EM visit (last 12 mo)

No Visit 52.8%
Yes Visit 47.2%

7.35M

EM visit (36-48 mo)

No Visit 51.2%
Yes Visit 48.8%
Study Population

- Begining of Data (01/01/2010)
  - EoD – 48 mo. (01/01/2012)
  - EoD – 36 mo. (01/01/2013)
  - EoD – 24 mo. (01/01/2014)
  - EoD – 12 mo. (01/01/2015)
- End of data (12/31/2015)

≥ 3 Office Visits

≥ 1 Office Visit
Study Population

EM visit (last 12 mo)
- No Visit 52.8%
- Yes Visit 47.2%

EM visit (36-48 mo)
- No Visit 51.2%
- Yes Visit 48.8%

Total Visits (0-48 mo)
- 22.5% 3–6 visits
- 36.1% 7–12 visits
- 19.6% 13–18 visits
- 9.4%
Study Population

- No Prior Diabetes Diagnosis
- Begin of Data (01/01/2010)
- ≥ 1 Office Visit
- EoD – 48 mo. (01/01/2012)
- EoD – 36 mo. (01/01/2013)
- EoD – 24 mo. (01/01/2014)
- EoD – 12 mo. (01/01/2015)
- ≥ 3 Office Visits
- ≥ 1 Office Visit
- End of Data (12/31/2015)
Study Population

- **EM visit (last 12 mo)**
  - No Visit: 52.8%
  - Yes Visit: 47.2%

- **EM visit (36-48 mo)**
  - No Visit: 51.2%
  - Yes Visit: 48.8%

- **Total Visits (0-48 mo)**
  - 3-6 visits: 22.5%
  - 7-12 visits: 36.1%
  - 13-18 visits: 19.6%
  - No DM Dx: 9.4%

- **Year of First DM Dx**
  - 2010: 5.7%
  - 2011: 5.4%
  - 2012: 5.4%
  - 2013 - 2015: 80.9%
Study Population

- **EM visit (last 12 mo)**
  - No Visit: 52.8%
  - Yes Visit: 47.2%
  - Total: 15.56M

- **EM visit (36-48 mo)**
  - No Visit: 51.2%
  - Yes Visit: 48.8%
  - Total: 7.35M

- **Total Visits (0-48 mo)**
  - 3–6 visits: 22.5%
  - 7–12 visits: 36.1%
  - 13–18 visits: 19.6%
  - Total: 3.59M

- **Year of First DM Dx**
  - No DM Dx: 80.9%
  - Total: 3.53M

- **Study Population**
  - Total: 2.99M
  - Total: 100.0%
Who is Eligible for Screening?

Table 2.2—Criteria for testing for diabetes or prediabetes in asymptomatic adults

1. Testing should be considered in all adults who are overweight (BMI ≥25 kg/m² or ≥23 kg/m² in Asian Americans) and have additional risk factors:
   - physical inactivity
   - first-degree relative with diabetes
   - high-risk race/ethnicity (e.g., African American, Latino, Native American, Asian American, Pacific Islander)
   - women who delivered a baby weighing >9 lb or were diagnosed with GDM
   - hypertension (≥140/90 mmHg or on therapy for hypertension)
   - HDL cholesterol level <35 mg/dL (0.90 mmol/L) and/or a triglyceride level >250 mg/dL (2.82 mmol/L)
   - women with polycystic ovary syndrome
   - A1C ≥5.7% (39 mmol/mol), IGT, or IFG on previous testing
   - other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans)
   - history of CVD

2. For all patients, testing should begin at age 45 years.

3. If results are normal, testing should be repeated at a minimum of 3-year intervals, with consideration of more frequent testing depending on initial results (e.g., those with prediabetes should be tested yearly) and risk status.

American Diabetes Association, Standards of Medical Care in Diabetes – 2016
Who is Eligible for Screening?

Age Range

- 75 – 89
  - 12%

- 65 – 74
  - 17%

- 45 – 64
  - 40%

- 18 – 44
  - 30%

2.99M
Who is Eligible for Screening?

- Normal Weight: 20%
- Overweight: 28%
- Obese 1: 21%
- Obese 2 (and 3): 26%

Total: 900K
Who is Eligible for Screening?

- **No Risk Factors**: 41%
- **1 RF**: 33%
- **2 RF**: 17%
- **DM Risk (Age < 45)**

Total: 900K
### Who is Eligible for Screening?

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Available Data</th>
<th>% of Study Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical inactivity</td>
<td>self reported exercise status</td>
<td>18.1%</td>
</tr>
<tr>
<td>First-degree relative with diabetes</td>
<td>diagnosis (V180)</td>
<td>3.3%</td>
</tr>
<tr>
<td>High-risk race/ethnicity</td>
<td>self reported race/ethnicity</td>
<td>16.5%</td>
</tr>
<tr>
<td>Women who delivered a baby weighing &gt; 9 lb or were diagnosed with gestational diabetes</td>
<td>diagnosis (V1221, 648.8)</td>
<td>2.8%</td>
</tr>
<tr>
<td>Hypertension (or on therapy for hypertension)</td>
<td>diagnosis, BP, Rx</td>
<td>31.5%</td>
</tr>
<tr>
<td>HDL cholesterol level &lt; 35 mg/dL and/or a triglyceride level &gt; 250 mg/dL</td>
<td>lab results</td>
<td>11.9%</td>
</tr>
<tr>
<td>Women with polycystic ovary syndrome</td>
<td>diagnosis, BP (140/90), Rx</td>
<td>2.8%</td>
</tr>
<tr>
<td>Past A1C ≥ 5.7%</td>
<td>lab results</td>
<td>1.0%</td>
</tr>
<tr>
<td>Other clinical conditions associated with insulin resistance</td>
<td>diagnosis, BMI (acanthosis nigricans, severe obesity)</td>
<td>8.4%</td>
</tr>
<tr>
<td>History of CVD</td>
<td>evidence of CAD (Dx, Rx)</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

### Risk Factors Distribution

- **No Risk Factors**: 41%
- **33%**
Who is Eligible for Screening?

BMI Cat (Age < 45):
- Normal Weight 20%
- Overweight 28%
- Obese 1 21%
- Obese 2 (and 3) 26%

DM Risk (Age < 45):
- No Risk Factors 41%
- 1 RF 33%
- 2 RF 17%
Who is Eligible for Screening?

- **Obese 2 (and 3)**
  - 26%

- **Obese 1**
  - 21%

- **Overweight**
  - 28%

- **Normal Weight**
  - 20%

- **No Risk Factors**
  - 41%

- **2 RF**
  - 17%

- **1 RF**
  - 33%

- **BMI/DM Risk (Age < 45)**
  - 49.9% BMI Risk/DM RF

- **BMI Risk/No DM RF**
  - 25.4%

- **No BMI Risk/DM RF**
  - 15.8% No BMI Risk/No DM RF
Who is Eligible for Screening?

- **2.99M**
  - Age Range:
    - 75 – 89: 12%
    - 65 – 74: 17%
    - 45 – 64: 40%
    - 18 – 44: 30%
  - BMI Cat (Age < 45):
    - Obese 2 (and 3): 26%
    - Obese 1: 21%
    - Overweight: 28%
    - Normal Weight: 20%
  - DM Risk (Age < 45):
    - 1 RF: 33%
    - 2 RF: 17%
  - BMI/DM Risk (Age < 45):
    - 49.9% BMI Risk/DM RF
    - 25.4% BMI Risk/No DM RF
    - 15.8% No BMI Risk/No DM RF
Who is Eligible for Screening?

- **Age Range**:
  - 75 – 89: 12%
  - 65 – 74: 17%
  - 45 – 64: 40%
  - 18 – 44: 30%

- **BMI Cat (Age < 45)**:
  - Obese 2 (and 3): 26%
  - Obese 1: 21%
  - Overweight: 28%
  - Normal Weight: 20%

- **DM Risk (Age < 45)**:
  - No Risk Factors: 41%
  - 1 RF: 33%
  - 2 RF: 17%

- **BMI/DM Risk (Age < 45)**:
  - 49.9% BMI Risk/DM RF
  - 25.4% BMI Risk/No DM RF
  - 15.8% No BMI Risk/DM RF
  - 15.1% No BMI Risk/No DM RF

- **Screening (ADA)**:
  - Eligible for Screening: 84.9%
  - Not Eligible: 15.1%
Topics

On-line resource for “staged” screening

• Begin by reviewing risk factors

Using EHR data to identify patients for screening—data from Optum™ One

• Typical proportions of patients eligible for screening
• Proportions who are currently being screened, and
• Yield from screening—patients with evidence for diabetes and prediabetes

First with A1c, then approximate figures for fasting plasma glucose and 2-hr GTT

• Ways to identify fasting glucose results in EHR data

Prioritizing patients with prediabetes for intervention

• More than 1,000 organizations offer NDPP programs, most at multiple sites
• Insurance coverage for intensive lifestyle programs—begins in 2018 for Medicare
• DPP study: heterogeneity of treatment effect
Are Patients Being Screened?

**Important Note**

The next few slides reflect screening using A1c only, so they significantly under-estimate current screening rates.

We then explore plasma glucose results identified as fasting in the EHR, although only a few organizations have a large number of such results. But many glucose tests are drawn on the same day as lipid panels, which are almost always done fasting. Taking the lowest value among the glucose results on days when a lipid panel was done, the distribution is similar to that of results identified as fasting glucose—slightly lower, in fact. So it is probably correct to assume that those values were drawn fasting, just not clearly identified as such when reported in the EHR.

Optum labels glucose results as fasting only when they are clearly identified as fasting in the EHR. Overall, there are about 10 times as many results that were *probably* drawn fasting, along with a lipid panel.
Are Patients Being Screened? *(HbA1c only)*

<table>
<thead>
<tr>
<th># of A1c Measurements</th>
<th>A1c Last 12 months</th>
<th>A1c Last 24 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>12.6%</td>
<td>10.9%</td>
</tr>
<tr>
<td>1</td>
<td>82.5%</td>
<td>80.2%</td>
</tr>
<tr>
<td>2</td>
<td>3.7%</td>
<td>4.7%</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5+</td>
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Are Patients Being Screened? (HbA1c only)

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<th>A1c Last 12 months</th>
<th>A1c Last 24 months</th>
<th>A1c Last 36 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>82.5%</td>
<td>80.2%</td>
<td>76.1%</td>
</tr>
<tr>
<td>1</td>
<td>12.6%</td>
<td>10.9%</td>
<td>12.0%</td>
</tr>
<tr>
<td>2</td>
<td>3.7%</td>
<td>4.7%</td>
<td>5.1%</td>
</tr>
<tr>
<td>3+</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Are Patients Being Screened? *(HbA1c only)*

<table>
<thead>
<tr>
<th>A1c Last 12 months</th>
<th>A1c Last 24 months</th>
<th>A1c Last 36 months</th>
<th>A1c Last 48 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>82.5%</td>
<td>80.2%</td>
<td>76.1%</td>
<td>72.5%</td>
</tr>
<tr>
<td>12.6%</td>
<td>10.9%</td>
<td>12.0%</td>
<td>13.1%</td>
</tr>
<tr>
<td>3.7%</td>
<td>4.7%</td>
<td>5.1%</td>
<td>5.6%</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

# of A1c Measurements

- 0
- 1
- 2
- 3
- 4
- 5+
Are Patients Being Screened? *(HbA1c only)*

- **2.54M**
- **76.1%**
- **12.0%**
- **5.1%**

---

**Individual AMGA Member Organizations**

- **0**
- **1**
- **2**
- **3**
- **4**
- **5+**

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HbA1c Results: Evidence of DM or Pre-DM

Individual AMGA Member Organizations

<table>
<thead>
<tr>
<th>% of Patients</th>
<th>&lt; 5.7</th>
<th>5.7 – 6.49</th>
<th>≥ 6.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>39.2%</td>
<td>44.5%</td>
<td>16.3%</td>
</tr>
<tr>
<td>90%</td>
<td>78%</td>
<td>38%</td>
<td>18%</td>
</tr>
<tr>
<td>80%</td>
<td>75%</td>
<td>35%</td>
<td>15%</td>
</tr>
<tr>
<td>70%</td>
<td>72%</td>
<td>32%</td>
<td>13%</td>
</tr>
<tr>
<td>60%</td>
<td>69%</td>
<td>29%</td>
<td>11%</td>
</tr>
<tr>
<td>50%</td>
<td>66%</td>
<td>26%</td>
<td>9%</td>
</tr>
<tr>
<td>40%</td>
<td>63%</td>
<td>23%</td>
<td>7%</td>
</tr>
<tr>
<td>30%</td>
<td>60%</td>
<td>20%</td>
<td>5%</td>
</tr>
<tr>
<td>20%</td>
<td>57%</td>
<td>17%</td>
<td>3%</td>
</tr>
<tr>
<td>10%</td>
<td>54%</td>
<td>14%</td>
<td>2%</td>
</tr>
<tr>
<td>0%</td>
<td>51%</td>
<td>11%</td>
<td>1%</td>
</tr>
</tbody>
</table>

686K

# of Patients

All Groups (A1c 36 mo)

<table>
<thead>
<tr>
<th>% of Patients</th>
<th>&lt; 5.7</th>
<th>5.7 – 6.49</th>
<th>≥ 6.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>39.2%</td>
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<td>90%</td>
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<td>10%</td>
<td>54%</td>
<td>14%</td>
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</tr>
<tr>
<td>0%</td>
<td>51%</td>
<td>11%</td>
<td>1%</td>
</tr>
</tbody>
</table>
A1c ≥ 6.5% – How Many Have a Diagnosis?

All Groups (A1c 36 mo)

No Dx 29.5%

2015 18.3%

2014 21.5%

2013 30.7%

Individual AMGA Member Organizations

% of Patients

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

# of Patients

0K 5K 10K 15K
## Differences by Age *(HbA1c only)*

<table>
<thead>
<tr>
<th>Age</th>
<th>All Groups</th>
<th>Age: 18-44</th>
<th>All Groups</th>
<th>Age: 45-89</th>
<th>All Groups</th>
<th>Age: 18-44</th>
<th>All Groups</th>
<th>Age: 45-89</th>
<th>All Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>≥ 6.5</td>
<td>≥ 6.5</td>
<td>No Dx</td>
<td>No Dx</td>
<td>2015</td>
<td>2014</td>
<td>2013</td>
<td>2013</td>
</tr>
<tr>
<td>Age: 18-44</td>
<td></td>
<td>11.5%</td>
<td>17.2%</td>
<td>22.8%</td>
<td>30.3%</td>
<td>23.3%</td>
<td>24.7%</td>
<td>29.1%</td>
<td>30.9%</td>
</tr>
<tr>
<td>Age: 45-89</td>
<td></td>
<td>59.1%</td>
<td>47.4%</td>
<td>12.2%</td>
<td>17.6%</td>
<td>2015</td>
<td>2014</td>
<td>2013</td>
<td>2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.70 – 6.49</td>
<td>5.70 – 6.49</td>
<td>11.9%</td>
<td>5.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt; 5.7</td>
<td>&lt; 5.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
On-line resource for “staged” screening

• Begin by reviewing risk factors

Using EHR data to identify patients for screening—data from Optum™ One

• Typical proportions of patients eligible for screening
• Proportions who are currently being screened, and
• Yield from screening—patients with evidence for diabetes and prediabetes

First with A1c, then approximate figures for fasting plasma glucose and 2-hr GTT

• Ways to identify fasting glucose results in EHR data

Prioritizing patients with prediabetes for intervention

• More than 1,000 organizations offer NDPP programs, most at multiple sites
• Insurance coverage for intensive lifestyle programs—begins in 2018 for Medicare
• DPP study: heterogeneity of treatment effect
# Measures of Glycemic Control

<table>
<thead>
<tr>
<th>Test</th>
<th>Prediabetes</th>
<th>Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c</td>
<td>5.7 – 6.4%</td>
<td>≥ 6.5%</td>
</tr>
<tr>
<td>Fasting Plasma Glucose (FPG)</td>
<td>100 – 125 mg/dL</td>
<td>≥ 126 mg/dL</td>
</tr>
<tr>
<td>2-hr PG in 75-g Oral Glucose Tolerance Test*</td>
<td>140 – 199 mg/dL</td>
<td>≥ 200 mg/dL</td>
</tr>
<tr>
<td>Random Plasma Glucose</td>
<td></td>
<td>≥ 200 mg/dL w/ classic symptoms</td>
</tr>
</tbody>
</table>

* Across provider organizations, the oral glucose tolerance test is used almost exclusively in patients who are pregnant, presumably to identify gestational diabetes. These patients are not included in Together 2 Goal.®
Max A1c (during 2015)

883,000 patients with HbA1c drawn during 2015 and no Dx of diabetes prior to 1/1/2015
Max Fasting Plasma Glucose

262,000 patients with lab result identified as fasting plasma glucose drawn during 2015 and no Dx of diabetes prior to 1/1/2015
Max “Random” Glucose Drawn with Lipid Panel

2.52 million patients with “random” glucose drawn on same day as lipid panel during 2015 and no Dx of diabetes prior to 1/1/2015.
Max A1c vs. Max FPG

<table>
<thead>
<tr>
<th>HbA1c (%)</th>
<th>Fasting Plasma Glucose (mg/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4 - 5.6</td>
<td>4.4 - 5.6</td>
</tr>
<tr>
<td>5.7 - 6.4</td>
<td>5.7 - 6.4</td>
</tr>
<tr>
<td>6.5 - 7.1</td>
<td>6.5 - 7.1</td>
</tr>
<tr>
<td>7.2 - 7.9</td>
<td>7.2 - 7.9</td>
</tr>
<tr>
<td>8.0 - 8.8</td>
<td>8.0 - 8.8</td>
</tr>
<tr>
<td>8.9 - 9.0</td>
<td>8.9 - 9.0</td>
</tr>
</tbody>
</table>

- **Normal**: 38.9%
- **Pre-diabetes**: 44.0%
- **Diabetes**: 17.1%

47,000 patients with both HbA1c and fasting glucose (identified as such) during 2015 and no Dx of diabetes prior to 1/1/2015
Max A1c vs. Max FPG

HbA1c (%)

Plasma Glucose (mg/dL)

47,000 patients with both HbA1c and fasting glucose (identified as such) during 2015 and no Dx of diabetes prior to 1/1/2015
Are Patients Being Screened?

- Estimated Add’l. Screening: FPG + “Random” Glu Drawn w/ Lipids
  - 2.54M
  - 76.1%
  - 12.0%
  - 5.1%

# of A1c Measurements:
- 0
- 1
- 2
- 3
- 4
- 5+

Individual AMGA Member Organizations:

- % of Patients by # of A1c Measurements
- All Groups (A1c 36 mo)
- 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
- 0 1 2 3 4 5+
Topics

On-line resource for “staged” screening
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Heterogeneity of Treatment Effect

- Reanalysis of data from randomized trials—subsets of patient populations
  - PCORI-funded
  - Tufts, University of Michigan, Veterans Health Administration

- Diabetes Prevention Program Study (DPP)
  - 3,234 adults with “pre-diabetes”
    - Impaired fasting glucose, impaired glucose tolerance
    - BMI ≥ 24 (or ≥ 22 in Asians)
  - Conducted 1996–2001, stopped one year early
  - Two interventions reduced the risk of progression to overt diabetes
    - 14.2% for intensive lifestyle intervention
    - 7.1% for metformin 850 mg/d

Heterogeneity of Treatment Effect: Diabetes Prevention Program Study

Intensive Lifestyle Intervention

Metformin

Lowest-risk quartile – 15% of patients have HbA1c > 6.0%
Highest-risk quartile – 25% of patients have HbA1c < 6.0%

http://www.pcori.org/research-in-action/moving-beyond-averages
Topics

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