Evidence-Based Hope: The Surprisingly Good News about Avoiding Diabetes Complications

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Quiz #1: How Has the Growing Diabetes Pandemic Affected World Mortality Rates?

1. World mortality rates have worsened A LOT.
2. World mortality rates have worsened somewhat.
3. World mortality rates have not changed.
4. World mortality rates have improved somewhat.
5. World mortality rates have improved A LOT.

World Mortality Rate

World Death Rate Holding Steady At 100 Percent

Bad News about T1D Survival

Livingstone et al, 2015
**Bad News about T1D Survival**

**Discussion**
This nationwide Swedish study of 33,915 patients with type 1 diabetes and 169,249 controls matched for age and sex shows that for patients with type 1 diabetes who had on-target glycemic control, the risk of death from cardiovascular causes were still more than twice the risk in the general population. For patients with diabetes who had very poor glycemic control, the risk of death from any cause and of death from cardiovascular causes were 5 and 10 times as high, respectively, as those in the general population. The excess...

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**Long-Term Complications in T2D**

Age-adjusted prevalence of chronic complications in 1524 Chinese T2Ds

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**Diabetes factoid #1:**

**Diabetes is the leading cause of kidney failure.**

Source: [www.diabetes.org](http://www.diabetes.org)

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**Disability-Free Years, Age ≥ 50 Years**

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**Blindness**

Diabetes is the leading cause of new cases of blindness among adults aged 20-74.

#WAFD13

MPH@GW
T1D Patients’ Perceptions of Complications Risk Over 20 Years (with Intensive Therapy)

- ESRD
- Amputation
- Nephropathy

Meltzer and Egleston, 2000

Feeling Hopeless about Diabetes

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>POPULATION</th>
<th>A MODERATE PROBLEM, OR WORSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>“I will end up with serious long-term complications, no matter what I do.”</td>
<td>254 T1Ds</td>
<td>70.5%</td>
</tr>
<tr>
<td></td>
<td>414 T1Ds</td>
<td>66.4%</td>
</tr>
<tr>
<td></td>
<td>268 T2Ds</td>
<td>74.3%</td>
</tr>
<tr>
<td></td>
<td>424 T2Ds</td>
<td>71.0%</td>
</tr>
</tbody>
</table>

The Key Contributor to Patient Disengagement: Lack of Worthwhileness

1. Emotional distress
2. Perceived benefits are nil
3. Perceived costs are too high
4. Unrealistic (or too vague) expectations
5. Environmental pressures

A Related Concept: Diabetes Fatalism

- Medication adherence
- Diabetes knowledge test
- General diet
- Exercise
- Blood sugar testing
- Foot care

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication adherence</td>
<td>0.027 (0.013; 0.039)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Diabetes knowledge test</td>
<td>-0.040 ( -0.083; 0.002)</td>
<td>.061</td>
</tr>
<tr>
<td>General diet</td>
<td>-0.060 ( -0.036; -0.085)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Exercise</td>
<td>-0.049 ( -0.025; -0.077)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Blood sugar testing</td>
<td>-0.056 ( -0.023; -0.088)</td>
<td>.001</td>
</tr>
<tr>
<td>Foot care</td>
<td>-0.014 ( -0.044; 0.015)</td>
<td>.243</td>
</tr>
</tbody>
</table>

P* = linear regression model test.
P* = linear regression model and depression.

Walker et al, 2012
The Key Belief

Diabetes is the leading cause of adult blindness, amputation, and kidney failure.

The Key Points of Our Presentation

Hopelessness

Apathy, disengagement

Poor self-management

Terrible outcomes

OUT

Susan G.

• 70 yrs. old, Type 1 for 66 years
• LDL - 88
• HDL - 78
• A1C – 6.8% to 7.3%
• One laser tx 15 years ago
• 1 severe hypo episode in last 15 years
• Profoundly worried that she is having or will have complications from diabetes
Maybe Health Care Providers, Too?

Retinopathy Outcomes in the DCCT

Quiz #2: What Do the DCCT Results Tell Us?
1. Improved BG control led to a **dramatic** reduction in the risk of severe vision loss.
2. Improved BG control led to a **moderate** reduction in the risk of severe vision loss.
3. Improved BG control had **no impact** on the risk of severe vision loss.
4. Improved BG control **increased** the risk of severe vision loss.

3-step Progression in ETDRS Interim Scale

Provider Worries vs. Patient Worries
• Sustained 3-step retinopathy progression
• Development of proliferative retinopathy
• Vision loss

What Worries Providers is Not Necessarily What Worries Patients
DCCT/EDIC Visual Loss - 2009

- Vision < 20/200 in either eye
- Conventional group – 1/730 (1/1 from diabetes)
- Intensive group – 4/711 (1/4 from diabetes)

The Key Points of Our Presentation

Hopelessness

Apathy, disengagement

Poor self-management

Terrible outcomes

The Key Points of Our Presentation

Hope, not Hopelessness

Engagement

Improved self-management

Better clinical outcomes

The Good News

1. Overall, things are getting better.

Life Expectancy in T1D

Miller et al, 2013
### CVD Mortality Rates in Diabetes: Curious Findings

<table>
<thead>
<tr>
<th>Study</th>
<th>Expected</th>
<th>Rosiglitazone</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>RECORD (n=4,447)</td>
<td>11.0</td>
<td>2.8</td>
<td>2.8</td>
</tr>
<tr>
<td>ACCORD (n=10,251)</td>
<td>50</td>
<td>14</td>
<td>11</td>
</tr>
</tbody>
</table>

**Home et al., 2009**

### SANDS Study

“As the effectiveness of therapy improves and new treatment strategies are widely applied, it is becoming more difficult to conduct a trial in which adequate numbers of clinical end points are achievable in a reasonable length of time for individuals without CVD at baseline.”

**Gerstein et al., 2008**

### 20th Century Risk Engines in the 21st Century

- **UKPDS — EPIC NL & EPIC Potsdam**
  - Overestimation of the risk (224% and 112%)

- **UKPDS — ADVANCE study**
  - Overestimation of risk for CHD by 198%

- **Framingham — ADVANCE study**
  - Overestimation of CVD by 202%
  - Overestimation of CHD by 289%

**Diabetologia, 2010;53:821**

### AHA/ACC risk calculator

![AHA/ACC risk calculator](image_url)
**The Good News**

1. Overall, things are getting better.
2. And with good care...

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**T1D Complications After 30+ Years**

- **1978**:
  - Severe vision loss: 40%
  - Amputation: 10%
  - Nephropathy: 20%
  - Fatal MI's: 10%

- **2009**:
  - Severe vision loss: 10%
  - Amputation: 5%
  - Nephropathy: 5%
  - Fatal MI's: 5%

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**In Summary**

“Historical reports of frequencies of serious complications in T1D patients are clearly outdated because no one would realistically follow what was then the standard of care with respect to glycemic control. ... rates of complications with ‘intensive’ treatment, or what would now be considered the standard of care, are substantially lower than in the past. This is indeed good news that should be openly shared with the newly diagnosed patient to help alleviate fears that may accompany the diagnosis...”

Nichols, 2009

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**Facts & Fictions**

- **Q.** Diabetes is the leading cause of adult blindness, amputation, and kidney failure. True or false?
- **A.** False. To a large extent, it is poorly controlled diabetes that is the leading cause of adult blindness, amputation and kidney failure.

Well-controlled diabetes is the leading cause of... **NOTHING!**

Liew et al, 2014

“A marked change has occurred in the relative importance of these main causes of blindness certifications since the last major analysis in 1999–2000, with diabetic retinopathy/maculopathy now no longer the leading cause of blindness in working age adults.”

Liew et al, 2014

**Facts & Fictions**

Q. Diabetes is the leading cause of adult blindness, amputation, and kidney failure. True or false?

A. False. To a large extent, it is poorly controlled diabetes that is the leading cause of adult blindness, amputation and kidney failure.

Well-controlled diabetes is the leading cause of... **NOTHING!**

**T1D Mortality Rates**

DCCT/EDIC, 2016
**Table 1—DCCT/EDIC deaths and death rates by cohort, and sex, with SMRs relative to the U.S.**

<table>
<thead>
<tr>
<th>Group</th>
<th>Observed/expected*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total (n = 1,441)</td>
<td>125/114</td>
</tr>
<tr>
<td>Intensive (n = 711)</td>
<td>51/58</td>
</tr>
<tr>
<td>Conventional (n = 730)</td>
<td>74/56</td>
</tr>
</tbody>
</table>

DCCT/EDIC, 2016

**Normal Microalbumin = No Increase in Mortality**

- FinnDiane study – Type 1 DM, 22 years
- Casale Monferrato – Type 2 DM, 11 years
- Pittsburgh EDC Study – Type 1 DM, 28 years

Diabetologia (2007) 50:941–945

**The Impact of Statin Use in T2D: The 4S Study**

![Graph showing Impact of Statin Use in T2D: The 4S Study](image)

**Why is the Good News So Unknown?**

Perhaps it is downplayed or goes unnoticed because:
- We worry that patients will become disengaged if the element of fear is removed.
- Perhaps the bad news is important for the diabetes industry, diabetes charities and (some) HCPs.
- People typically receive their information from common news sources, not from careful reviews of journal articles.

**How Do We Use These Data to Enhance Patient Engagement?**

**Life Expectancy in a Large Cohort of Type 2 Diabetes Patients Treated in Primary Care (ZODIAC-10)**

**Conclusions:** “This study shows a normal life expectancy in a cohort of subjects with type 2 diabetes patients in primary care when compared to the general population.”
The Wrong Way

Mrs. Briscoe
- Age 45, dental hygienist, T2D 10 yrs
- Single mother, four children; lives with sister and her two kids
- Angry and frustrated about having diabetes; often just ignores it
- On maximum doses of 3 oral meds; not sure they are working
- A1C is 9.3%, which worries her
- BP, LDL and renal tests: All fine.
- Believes complications are inevitable; mom died of complications 18 months ago

Quiz #3: Key Obstacle to Address?
A. Depression
B. No perceived urgency
C. Diabetes fatalism
D. “Life is in the way”
E. Negative beliefs about diabetes medications

Four Key Steps for Effective Intervention
1. Gather the patient’s perspective
   - “How do you think will affect you over the years?”
   - If you are concerned that some harm may occur, what do you think you can do about that, if anything?
2. Acknowledge their realistic (and unrealistic) concerns
   - “With an A1C of 9.3%, you are indeed at risk; terrible complications can and do occur.”
3. Talk about the good news
   - “But terrible complications do not have to happen. With good care, odds are good you can live a long and healthy life with diabetes.”
Diabetes & Your Health

“To live a long and healthy life, develop a chronic disease and take care of it.”
- Sir William Osler

A1C: Not as Important as We Thought

• Explains only 10.6% of the retinopathy risk in the DCCT
• “…other factors may presumably explain the remaining 89% of the variance in risk among subjects independent of A1C”

Four Key Steps for Effective Intervention

1. Gather the patient’s perspective
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3. Talk about the good news
4. Review what action, if any, is needed
   • Our goal: helping you to get your numbers to a safe place
   • The “Bang For Your Buck” approach

Which Biomarkers Have the Biggest Impact?

Quiz #3: How Much Does A1C Account for Diabetes Complications?
1. A lot! (accounts for more than 75% of the variance)
2. A fair amount (accounts for 40 – 75% of the variance)
3. Some (accounts for 15% - 40% of the variance)
4. Not much (accounts for less than 15% of the variance)

Quiz #4: From a Behavioral Perspective, What is Likely to be The Biggest Bang For Your Buck?
1. Increasing physical activity
2. Make positive dietary changes
3. More frequent blood glucose monitoring
4. Taking the appropriate medications

Quiz #3: How Much Does A1C Account for Diabetes Complications?

Quiz #4: From a Behavioral Perspective, What is Likely to be The Biggest Bang For Your Buck?
For Mrs. Briscoe: What Key Action to Recommend?

- Age 45, dental hygienist, T2D 10 yrs
- Single mother, four children; lives with sister and her two kids
- Angry and frustrated about having diabetes; often just ignores it
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4. Review what action, if any, is needed
   - Our goal: helping you to get your numbers to a safe place
   - The "Bang For Your Buck" approach
   - And maybe you are already doing well enough!

Beware of Promoting Unnecessary Diabetes Self-Management!

Remember Susan G?

- 70 yrs. old, Type 1 for 66 years
- LDL - 88
- HDL - 78
- A1C – 6.8% to 7.3%
- One laser tx 15 years ago
- 1 severe hypo episode in last 15 years
- Profoundly worried that she is having or will have complications from diabetes

Marilyn M.

- 59 yrs. old, Type 1 for 44 years
- BP – 118/68
- LDL – 72, HDL - 76
- A1C – 8.2% to 8.6%
- Normal albuminuria
- Background retinopathy
- Rare mild hypoglycemia
- Wakes up every morning concerned and deeply discouraged about her A1C

Quiz #5: What Do You Suggest to Marilyn?

1. Recommend that she begin psychotherapy and/or an antidepressant trial
2. Congratulate her; encourage her to continue doing what she is doing and let her know she can stop worrying.
3. Encourage her to begin pump therapy as a means to achieve tighter glycemic control (A1C < 7.0%)
4. Suggest that she begin seeing her endocrinologist and CDE at a much more frequent interval.
Marilyn M

Our advice should be:
“Relax, congratulations, don’t worry.”
Why? Because her risk for future complications is very, very low.

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Four Key Steps for Effective Intervention
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3. Talk about the good news
4. Review what action, if any, is needed
   - Our goal: helping you to get your numbers to a safe place
   - The “Bang For Your Buck” approach
   - Be reassuring if you are already doing well enough!

Take-Home Messages

Complications Are Decreasing, Mortality Rates are Dropping
And With Good Care…

And For Some Patients, “Good Care” May Be Less Onerous Than You think….

Dr. Bernie Lown

• “It is the goal for every physician that when your patients leave, they feel more confident and comforted than when they arrived.”
• “Hope without action is hopeless.”

Thank You!

Coming this month:
Grassrootsdiabetes.org
HealthAnalytics.io
Mark K

- 47 yrs. old, Type 2 for 5 yrs.
- BP – 142/86
- LDL - 155
- HDL - 32
- A1C – Always > 8%, now 8.4%
- On metformin and a BP pill
  - By the way, he stopped taking his BP pill

Our approach should be:

Provide hope: “You are in an excellent position to avoid major complications from your diabetes”

Discuss what people like him have been able to do to move their BP and LDL into a safer range.

Let him choose a next action, but guide it toward BP, lipid control.

Individualized Risk Strategy

Let’s compare Don and Dan

- Both 51 yrs. old, Type 2 for 7 yrs.
- BP – 144/82
- LDL - 145
- HDL - 36
- A1C – 7.8% to 8.2%
- Background retinopathy
  - Don is doing a lot. Dan isn’t
Individualized Risk Strategy
Let's compare Don and Dan

- Both 51 yrs. old, Type 2 for 7 yrs.
- BP – 144/82
- LDL - 145
- HDL - 36
- A1C – 7.8% to 8.2%
- Background retinopathy

- But two different treatment profiles
  - Don is doing a lot. Dan isn't

How Do We Talk About Risk?

- Use our various pieces of “evidence”
- Assess the risk for the person with diabetes
- Urge to action, reassure, or both

MOST IMPORTANTLY!

- Determine the areas that would bring greatest benefit
- Of these areas, which is the most likely to be successfully addressed by this person, at this time

Populations vs Individuals

What is the Purpose of Discussing Risk?

- To scare people?
  - But this rarely ever works
  - Although they can scare themselves
- Because of major short-term impacts?
  - This isn't like many cancers
  - Diabetes risks are almost never in the short term
    - Hypoglycemia is the exception
- To invoke action
  - and sometimes to reassure