Helping Our Patients to Succeed:
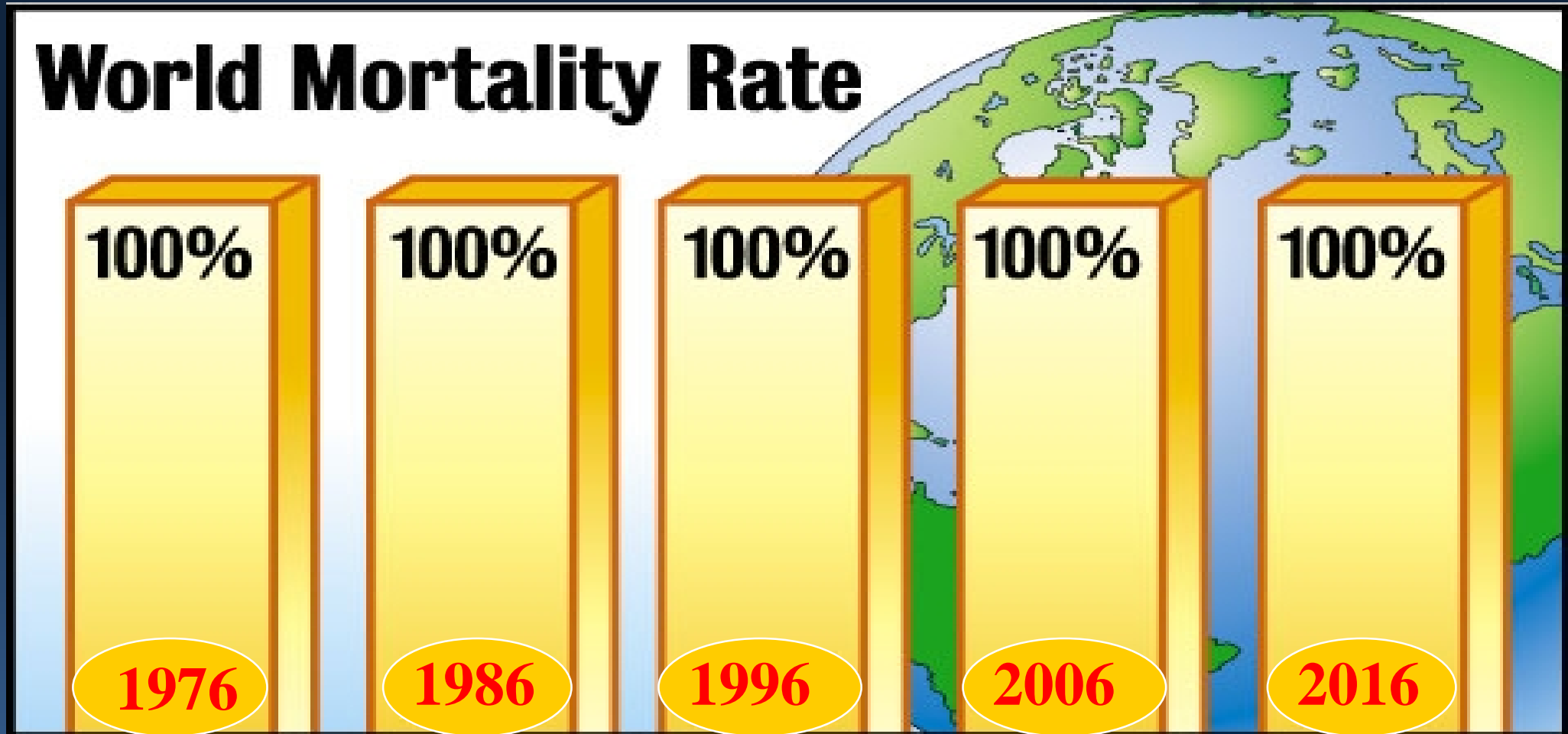## A Psychological Perspective on Type 2 Diabetes

William H. Polonsky, PhD, CDE

May 25, 2017

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

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

World Death Rate Holding Steady At 100 Percent

World Mortality Rate

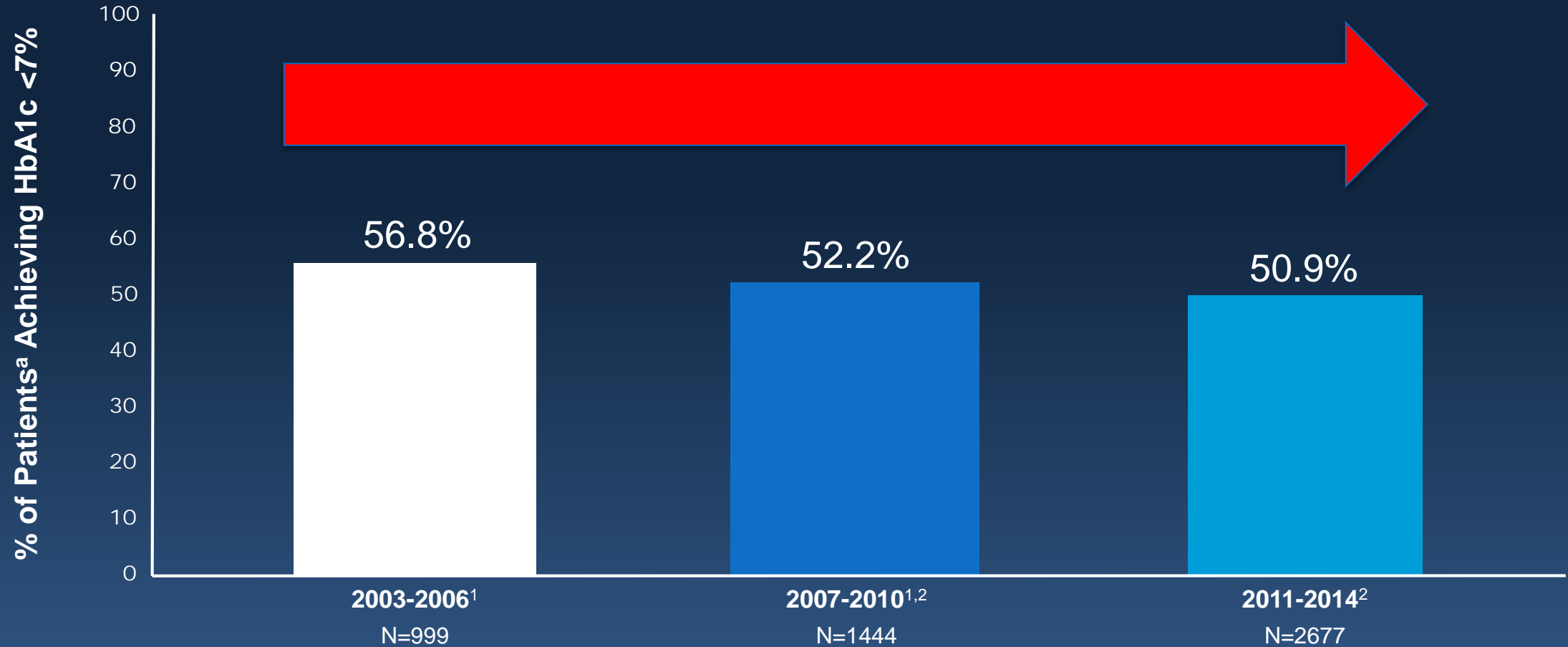| 100% | 100% | 100% | 100% | 100% |
| 1976 | 1986 | 1996 | 2006 | 2016 |

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

1. World mortality rates have worsened <u>A LOT</u>.
2. World mortality rates have worsened <u>somewhat</u>.
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4. World mortality rates have improved <u>somewhat</u>.
5. World mortality rates have improved <u>A LOT</u>.

Quiz #2: How Has Glycemic Control in T2D Changed Over the Past Decade?

1. Mean A1C has risen markedly.
2. Mean A1C hasn't really changed.
3. Mean A1C has dropped markedly.

GLYCEMIC CONTROL OVER THE LAST DECADE

% of Patients[a] Achieving HbA1c <7%

- 2003-2006[1] — 56.8% — N=999
- 2007-2010[1,2] — 52.2% — N=1444
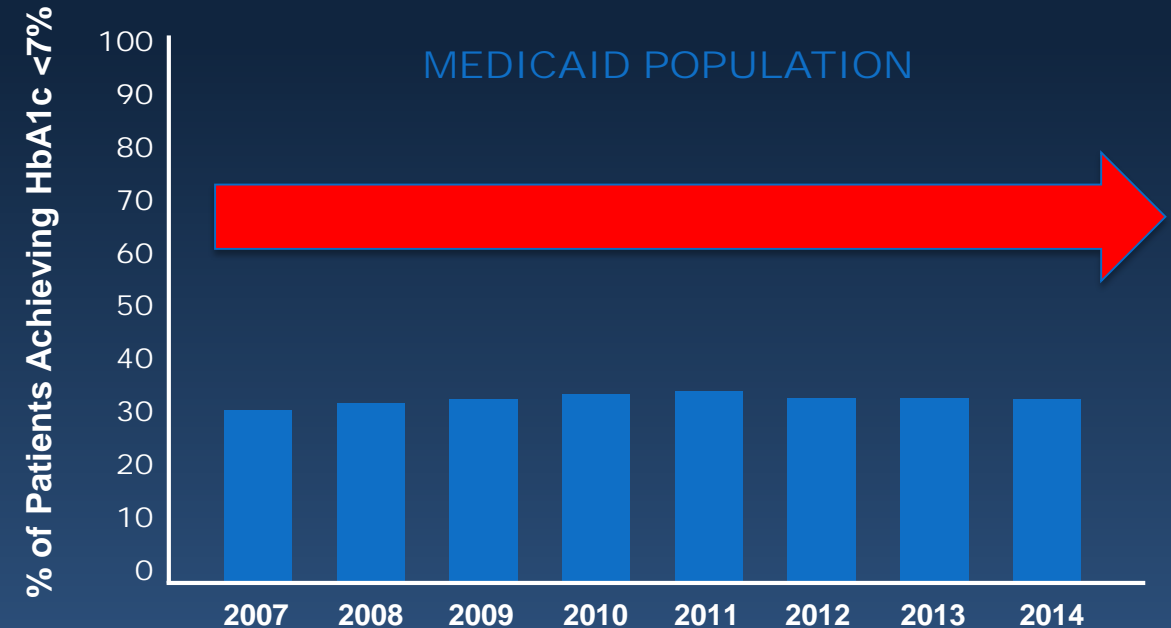- 2011-2014[2] — 50.9% — N=2677

NHANES Data

COMMERCIAL HMO AND MEDICAID POPULATIONS

HEDIS data from >1000 health plans covering >171 million lives (2014)

ONLY ~40% OF PATIENTS[a] ARE AT HbA1c <7%
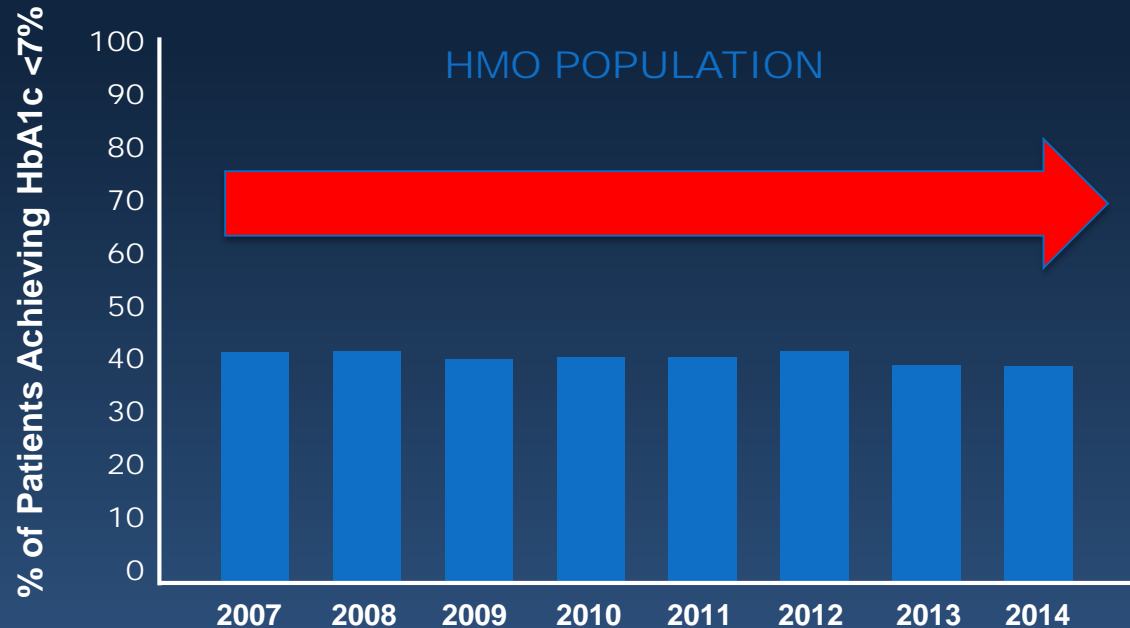
ONLY ~30% OF PATIENTS[a] ARE AT HbA1c <7%

HMO POPULATION

% of Patients Achieving HbA1c <7%

100 90 80 70 60 50 40 30 20 10 0

2007 2008 2009 2010 2011 2012 2013 2014

MEDICAID POPULATION

% of Patients Achieving HbA1c <7%

100 90 80 70 60 50 40 30 20 10 0

2007 2008 2009 2010 2011 2012 2013 2014

RATES OF VERY POOR GLYCEMIC CONTROL

HEDIS data from >1000 health plans covering >171 million lives

% OF DIABETIC PATIENTS WITH VERY POOR GLYCEMIC CONTROL (HbA1c >9%) IN THE US
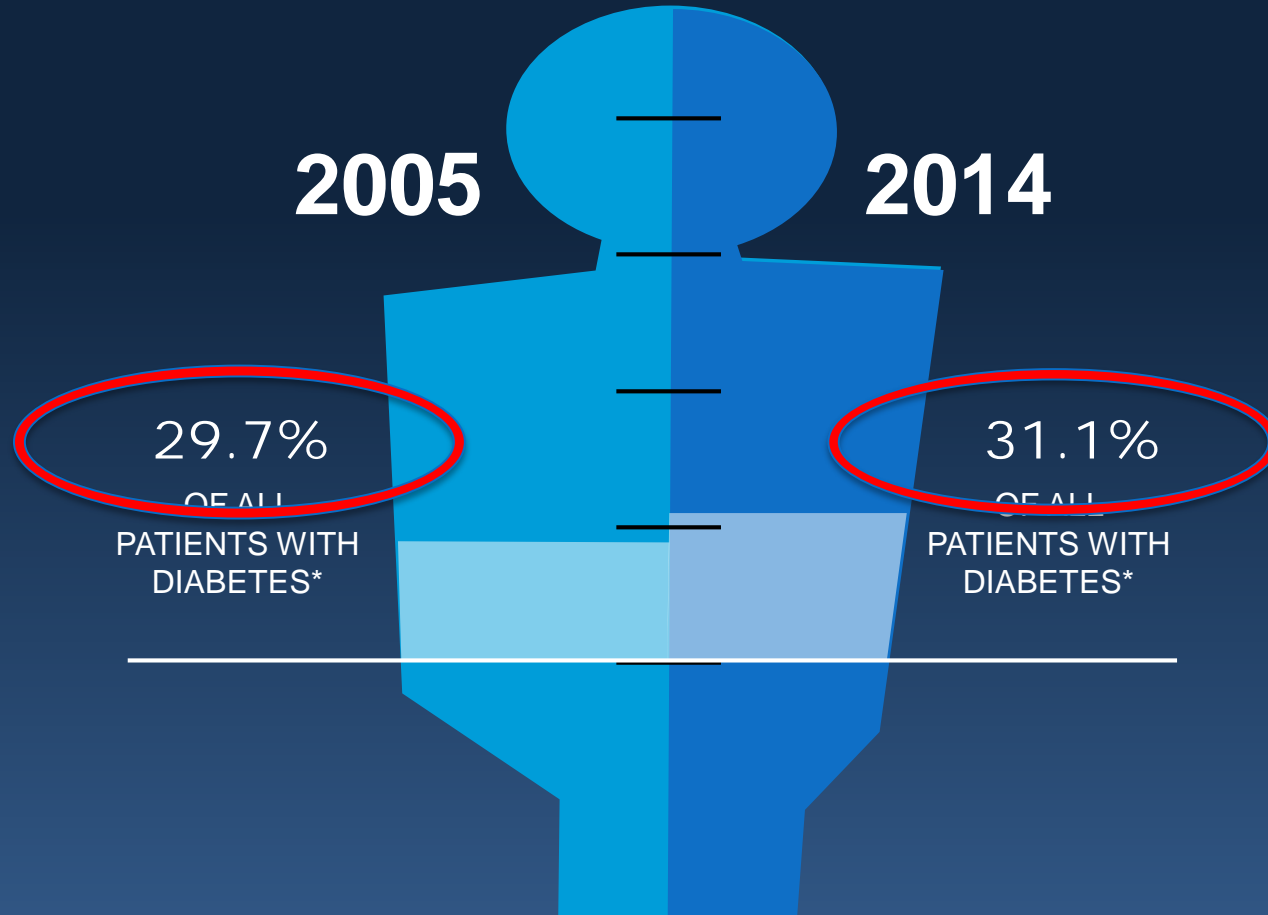
2005

29.7%
OF ALL
PATIENTS WITH
DIABETES*

2014

31.1%
OF ALL
PATIENTS WITH
DIABETES*

Quiz #2: How Has Glycemic Control in T2D Changed Over the Past Decade?

1. Mean A1C has risen markedly.
2. Mean A1C hasn't really changed.
3. Mean A1C has dropped markedly.

Quiz #3: 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**

The Key Behavioral Contributor to Glycemic Control?

ALL SELF-CARE BEHAVIORS + COVARIATES[a]

General Diet	Specific Diet	Exercise	SMBG	Medications
0.06	-0.04	-0.03	-0.002	-0.16

Quiz #3: 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**

MANY NEW T2D MEDICATION OPTIONS OVER THE LAST DECADE

Type 2 diabetes U.S. drug approvals: 2005-2015. Food and Drug Administration website.
https://www.accessdata.fda.gov/scripts/cder/drugsatfda/.

13
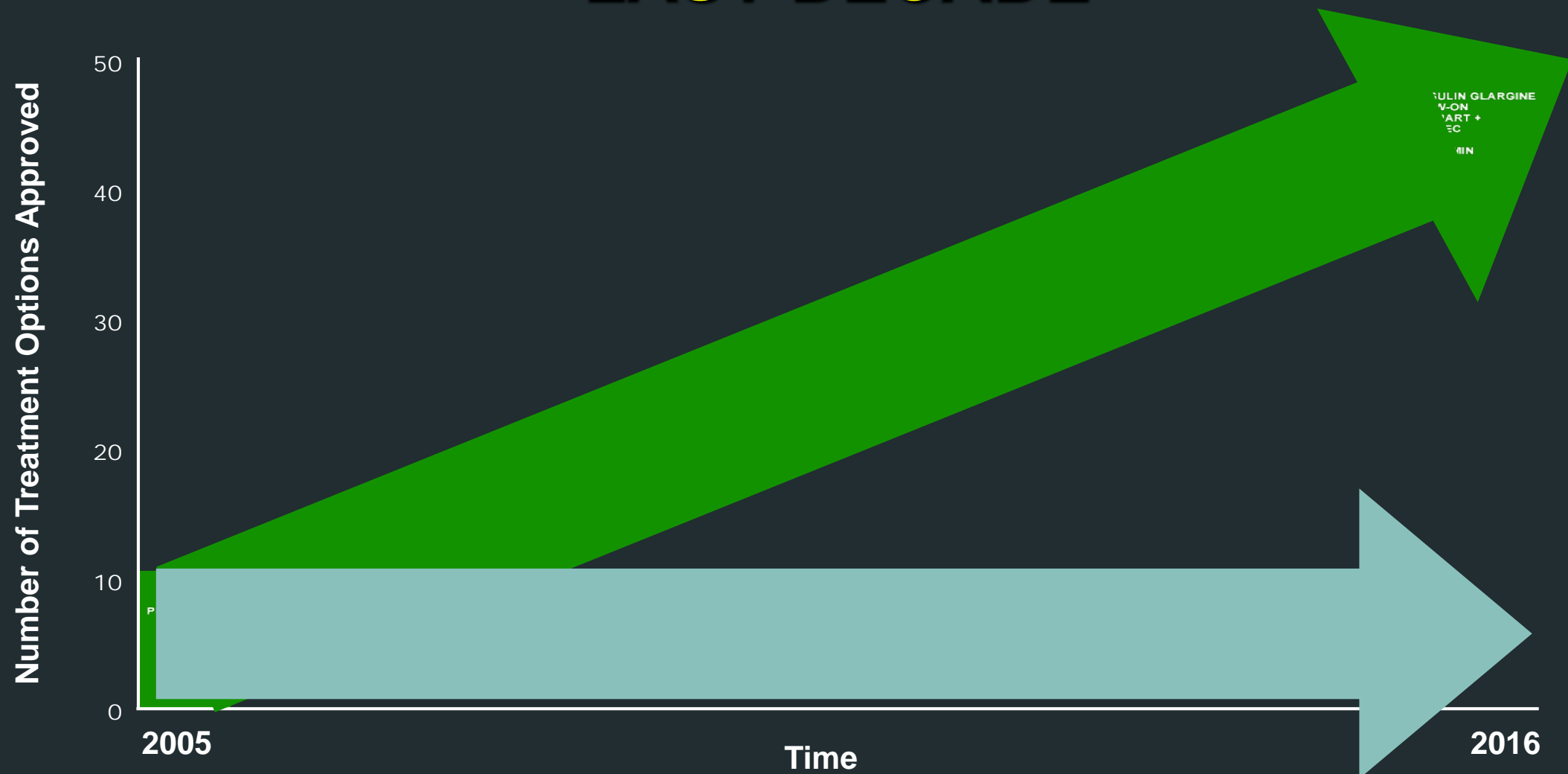
WHY AREN'T WE SEEING DRAMATIC IMPROVEMENTS?
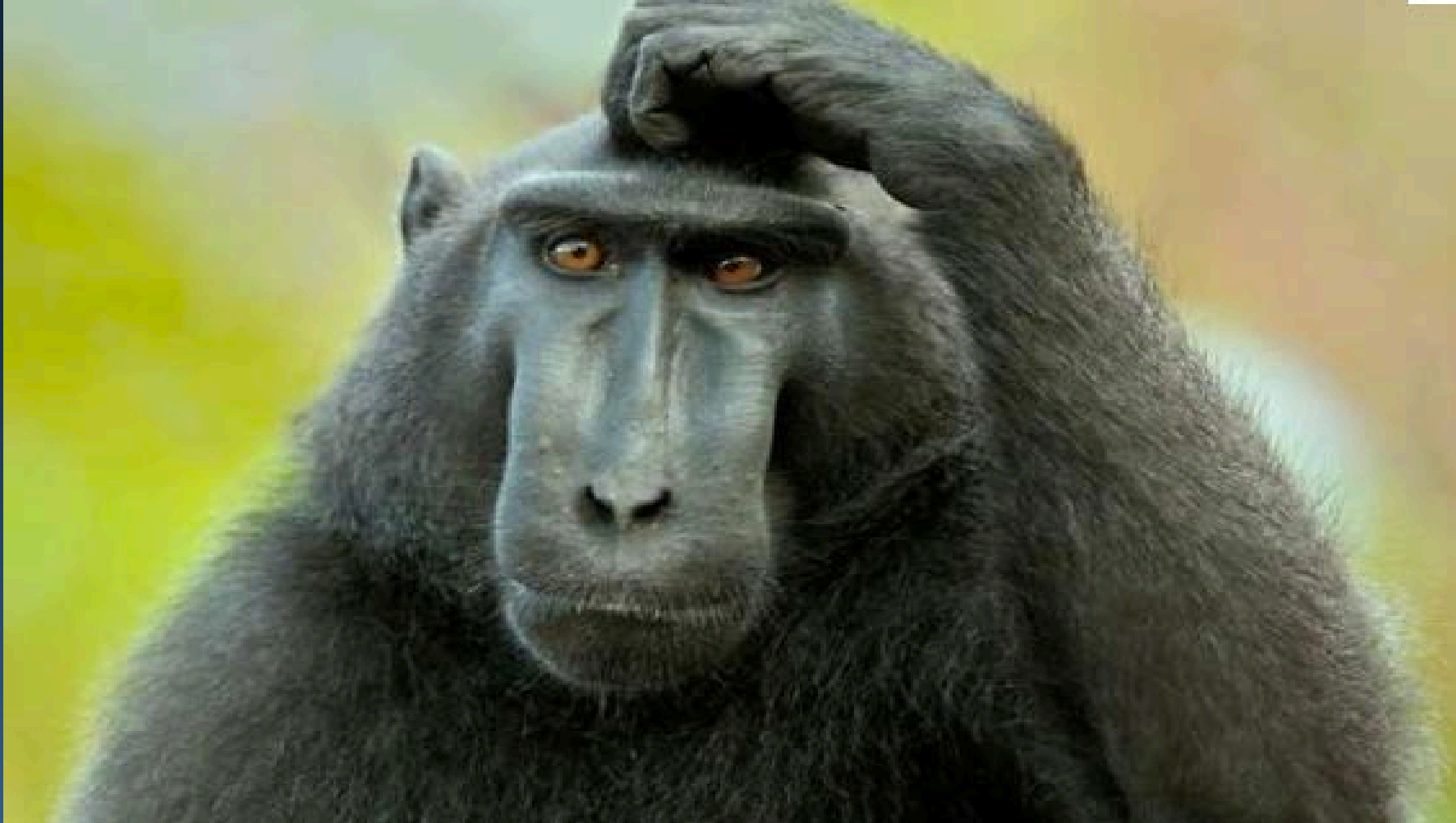
CLINICAL TRIAL RESULTS LOOK GOOD, BUT…

GLP-1 RA
(12 months)

Baseline HbA1c

N=2600
8.4%

N=221
8.3%

Change in HbA1c (%)

0

−0.2

−0.4 — −0.52%

−0.6

−0.8

−1.0 — GAP

−1.2 — −1.25%

−1.4

−1.6

DPP-4i
(12 months)

N=1889
7.8%

N=652
8.2%

Change in HbA1c (%)

0

−0.2

−0.4 — −0.51%

−0.6 — −0.68% — GAP

−0.8

−1.0

−1.2

−1.4

−1.6

■ **11 CLINICAL TRIALS**[a]   ■ **REAL WORLD**[b]
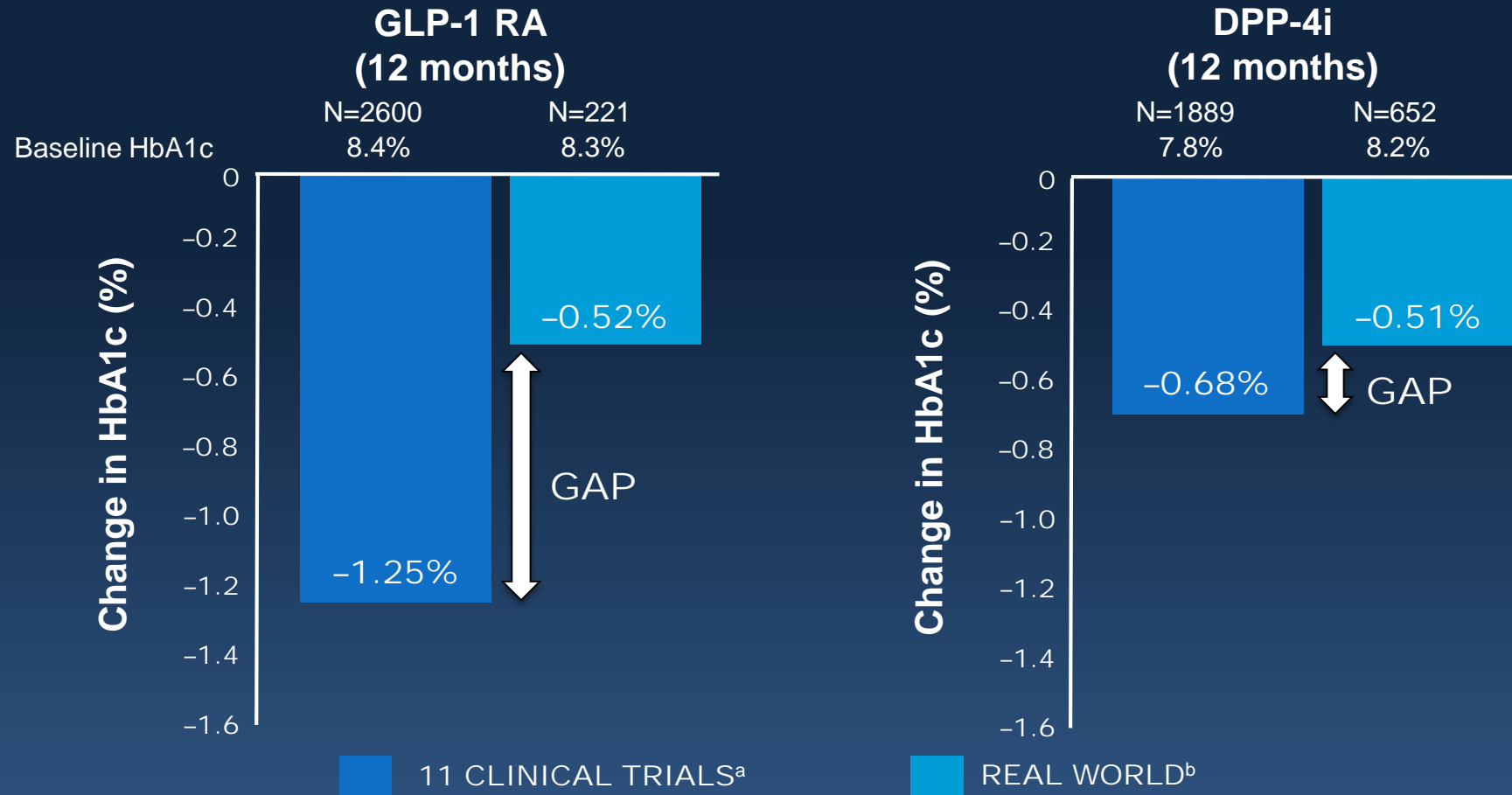
[a]Identified 11 pivotal randomized controlled trials with published change in HbA1c (7 GLP-1 RA [2600 patients] and 4 DPP-4i [1889 patients]).

[b]Optum/Humedica SmartFile database (2007-2014) was used (GLP-1 RA 221 patients; DPP-4i 652 patients). Change in HbA1c measured from drug initiation to 365±90 days later.

Carls GS et al. 76th ADA Scientific Sessions. June 10–14, 2016. Poster 117-LB.
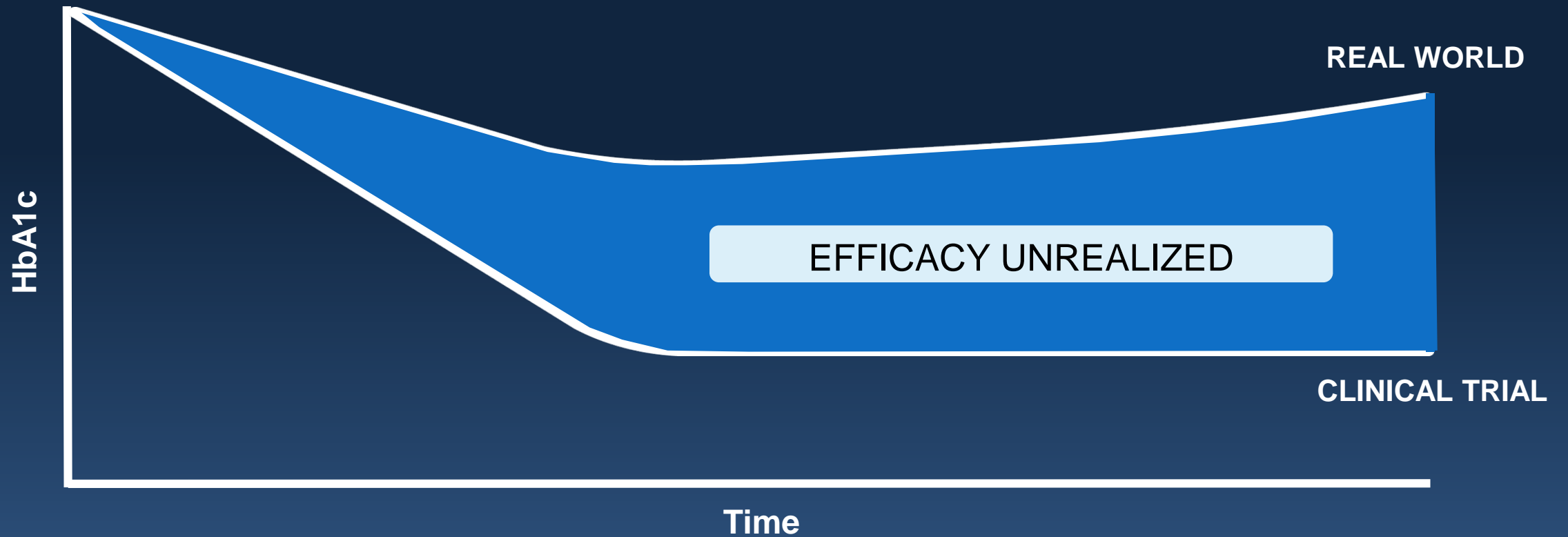
POOR ADHERENCE IS THE KEY
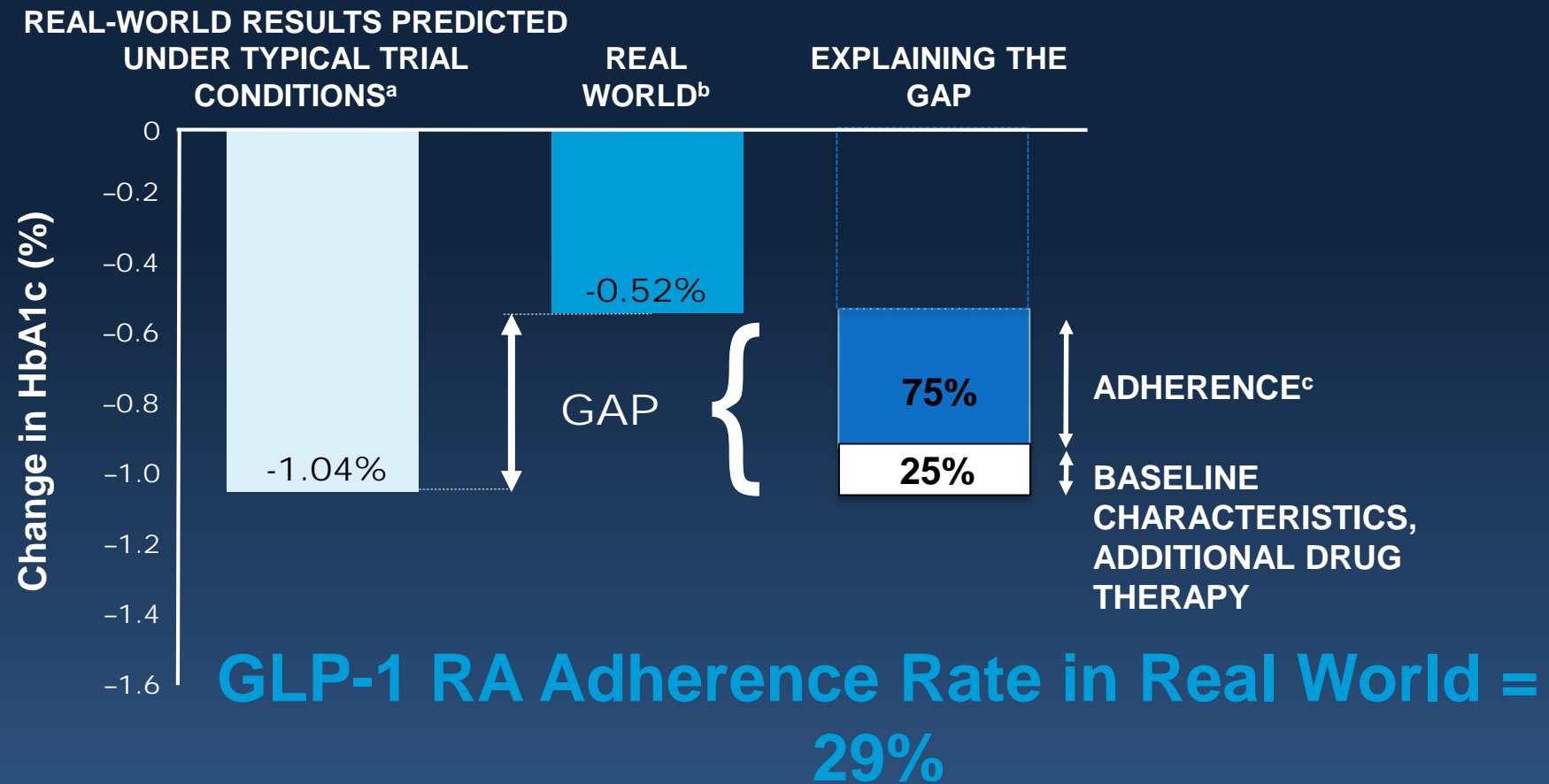
RCT, randomized clinical trial.

[a]Linear regression model fitted to estimate the change in HbA1c 1 year after initiating GLP-1 RA or DPP-4i based on baseline and treatment characteristics. [b]Optum/Humedica SmartFile database (2007-2014) was used (GLP-1 RA 221 patients; DPP-4i 652 patients). Change in HbA1c measured from drug initiation to 365±90 days later. [c]Medical adherence classified as poorly adherent if percentage of days covered (PDC) <80%.

Carls GS et al. 76th ADA Scientific Sessions. June 10–14, 2016. New Orleans, LA. Poster 117-LB.

ADHERENCE RATES FOR ORAL AGENTS ARE LESS THAN 50%

Adherent Patients at Follow-up (%)

Full Study Population
42.0% (1-year)
34.6% (2-year)
n=238,372;
n=134,444

DPP-4i
47.3% (1-year)
40.5% (2-year)
n=61,399;
n=31,073

SU
41.2% (1-year)
34.6% (2-year)
n=134,961;
n=75,499

TZD
36.7% (1-year)
27.9% (2-year)
n=42,012;
n=27,872

■ 1-YEAR FOLLOW-UP   □ 2-YEAR FOLLOW-UP
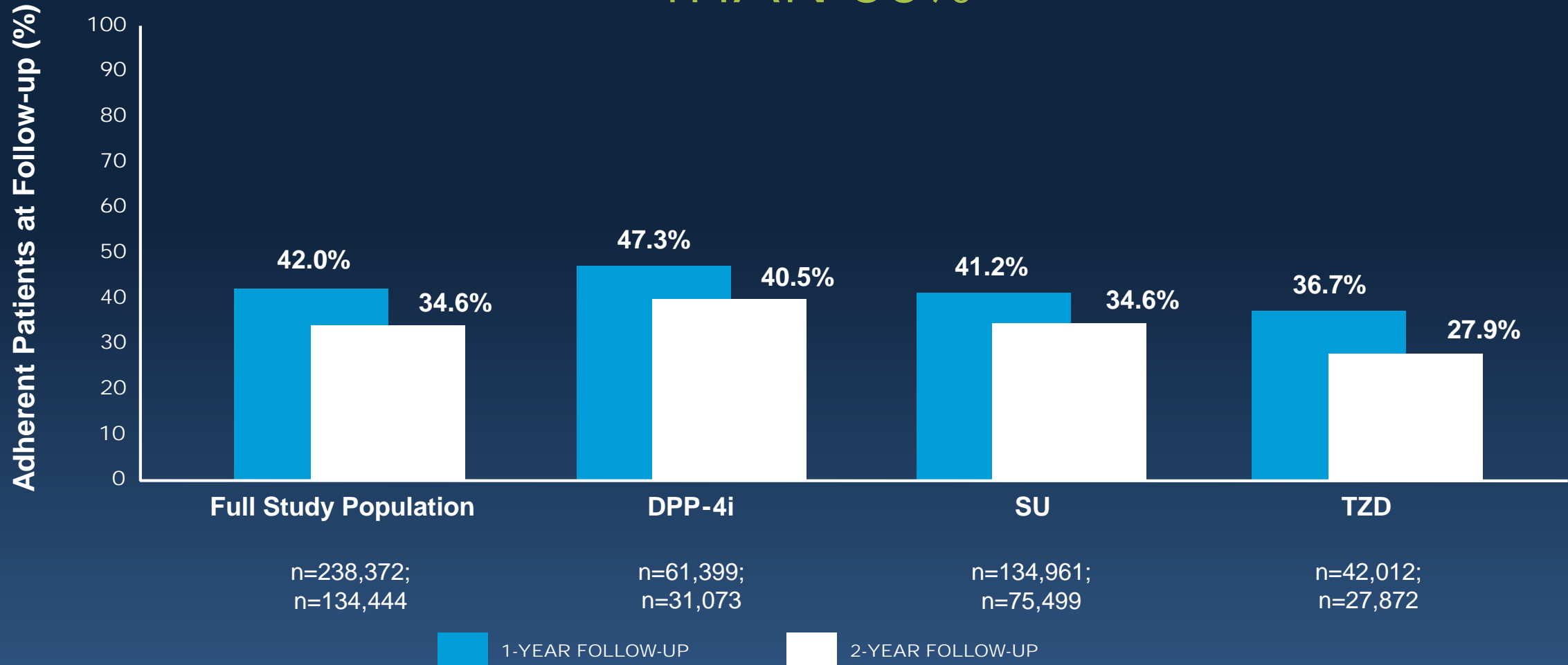
PDC, proportion of days covered; SU, sulfonylurea; TZD, thiazolidinedione.
A retrospective claims analysis of 238,372 patients with T2D with at least 1 prescription claim for a DPP-4i, SU, or TZD from January 1, 2009 to January 31, 2012. Adherence defined as PDC ≥0.8.
Farr AM et al. *Adv Ther*. 2014;31:1287-1305.

TRACKING NEW E-PRESCRIPTIONS FOR DIABETES MEDICATIONS

AMONG 75,589 INSURED PATIENTS IN THE FIRST YEAR OF A COMMUNITY-BASED E-PRESCRIBING INITIATIVE

31%

Never Filled

Filled

Fischer MA et al. *J Gen Intern Med*. 2010;25:284-290.
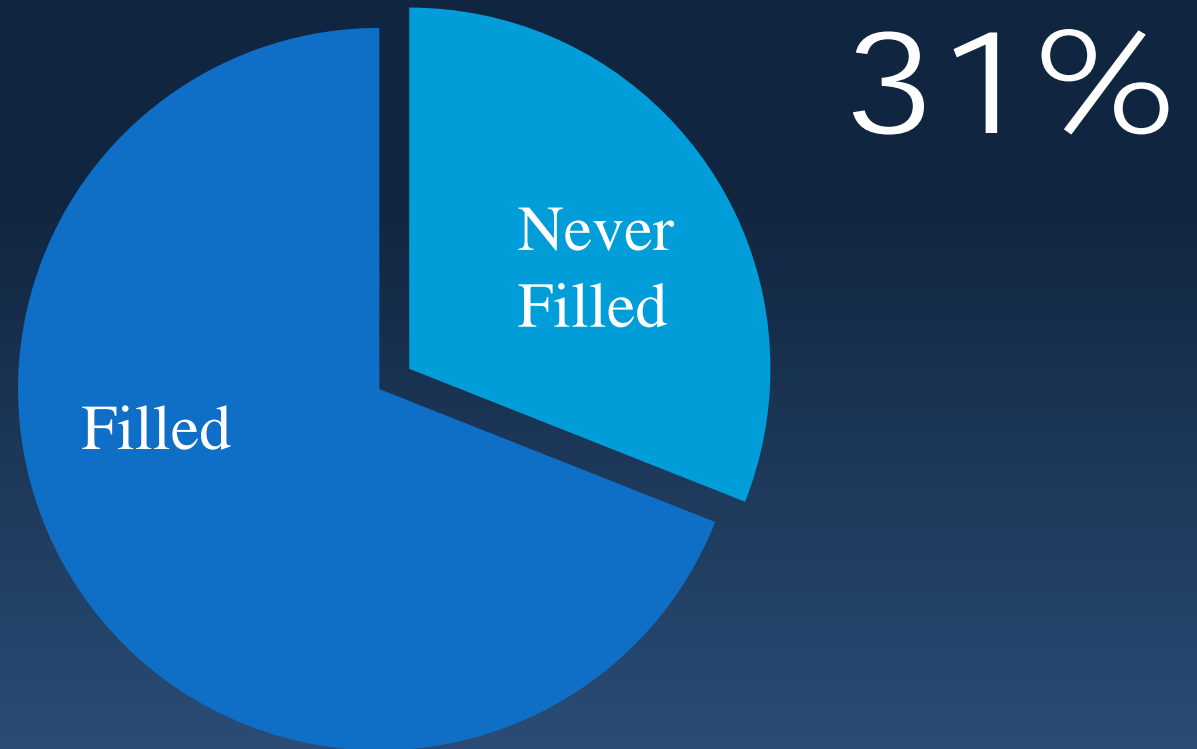
CLINICAL IMPACT OF POOR ADHERENCE

HOSPITALIZATION RISK INCREASES WITH HIGHER RATES OF POOR ADHERENCE[1,2]

Bar chart — Probability of Hospitalization, % (y-axis, 0 to 60) vs Adherence Level, % (x-axis):
- ≥80: 37%
- 60-79: 41%
- 40-59: 45%
- 20-39: 50%
- 0-19: 56%
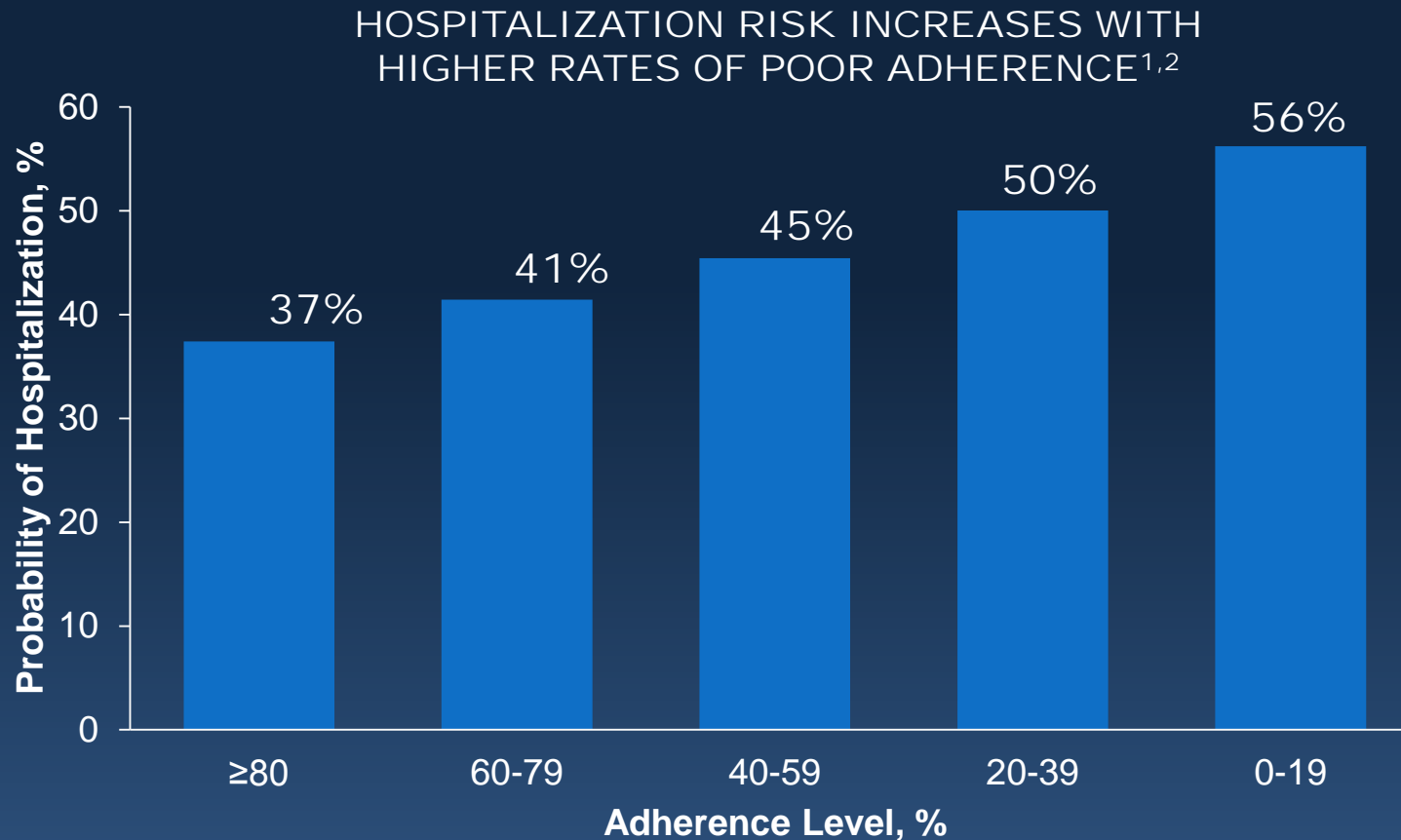
39% increased risk of all-cause mortality due to poor adherence to oral hypoglycemics[2]

Poor adherence defined as PDC <0.8

Data was provided by a large, Medicare supplemental (MarketScan) database from July 1, 2009 to June 30, 2014. There were 123,235 patients with T2D aged ≥65 who received glucose-lowering agents. Comparisons between adherent (defined as PDC ≥80%) and poorly adherent (PDC <80%) were all statistically significant at $P<0.001$.[1]

1. Boye KS et al. 76th ADA Scientific Sessions. June 10–14, 2016. Poster 1221-P. **2.** Ho PM et al. *Arch Intern Med.* 2006;166:1836-1841.

SO WHAT TO DO?

EFFECTIVENESS OF CURRENT INTERVENTION STRATEGIES

"THERE IS NO SINGLE INTERVENTION STRATEGY,
OR PACKAGE OF STRATEGIES, THAT
HAS BEEN SHOWN TO BE EFFECTIVE
ACROSS ALL PATIENTS, CONDITIONS,
AND SETTINGS" [1-4]

1. Demonceau J et al. *Drugs.* 2013;73:545-562. **2.** Nieuwlaat R et al. *Cochrane Database Syst Rev.* 2014;11:1-730. **3.** Sapkota S et al. *PloS One.* 2015;10:1-17. **4.** World Health Organization 2003. http://apps.who.int/iris/bitstream/10665/42682/1/9241545992.pdf.

WHAT ARE WE MISSING?
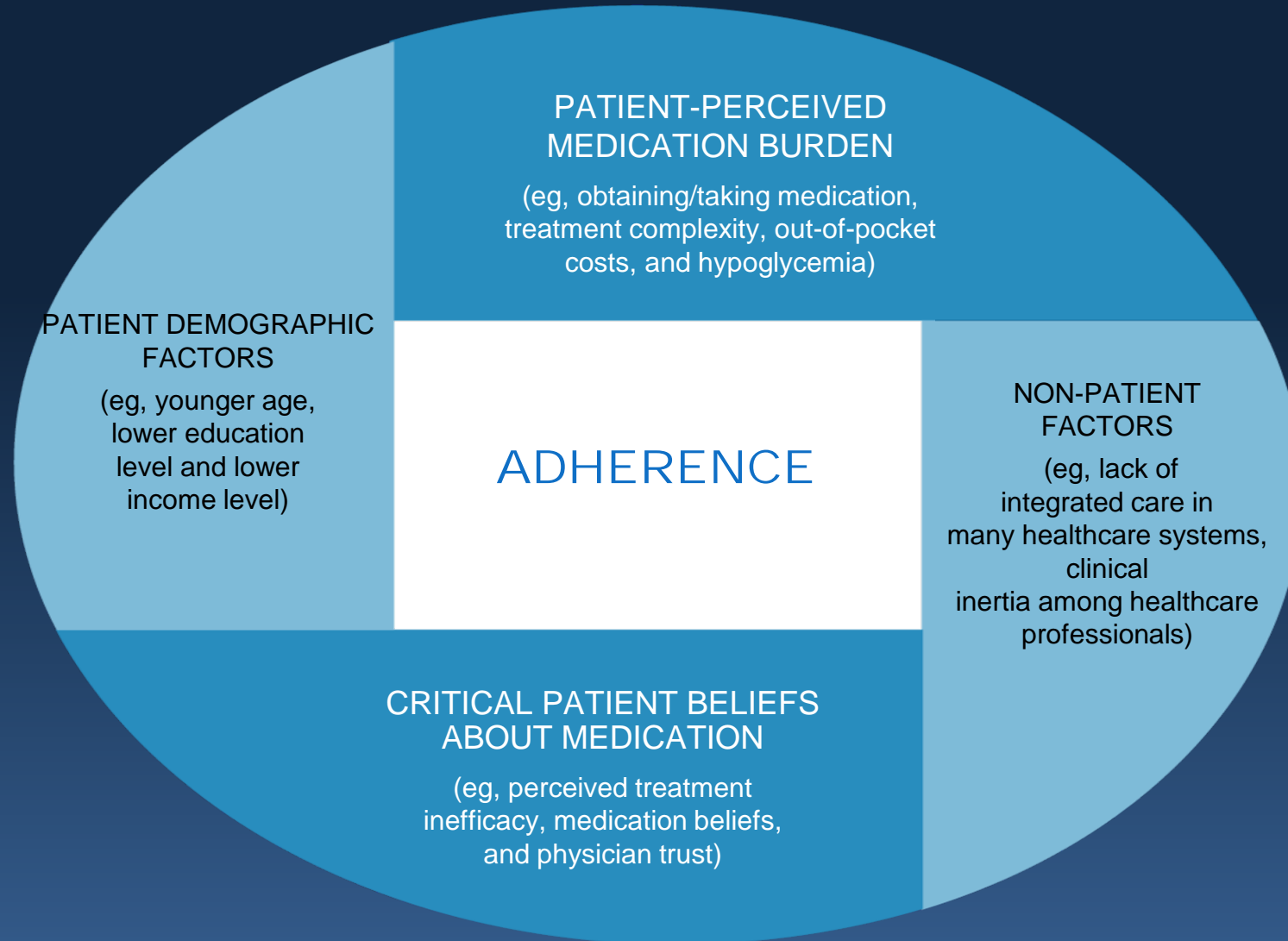
BMC
Health Services Research

RESEARCH ARTICLE

Open Access

Unintentional non-adherence to chronic prescription medications: How unintentional is it really?

Abhijit S Gadkari* and Colleen A McHorney

MAJOR CONTRIBUTORS

PATIENT-PERCEIVED MEDICATION BURDEN

(eg, obtaining/taking medication, treatment complexity, out-of-pocket costs, and hypoglycemia)

PATIENT DEMOGRAPHIC FACTORS

(eg, younger age, lower education level and lower income level)

ADHERENCE

NON-PATIENT FACTORS

(eg, lack of integrated care in many healthcare systems, clinical inertia among healthcare professionals)

CRITICAL PATIENT BELIEFS ABOUT MEDICATION

(eg, perceived treatment inefficacy, medication beliefs, and physician trust)

Polonsky WH, Henry RR. Poor medication adherence in type 2 diabetes: recognizing the scope of the problem and its key contributions. *Patient Prefer Adhere.* In press.

PERCEIVED TREATMENT INEFFICACY
Lack of tangible benefits contributes to discouragement and poor adherence[1,2]

1. Polonsky WH. *J Diabetes.* 2015;7:777-778. **2.** Polonsky WH, Skinner TC. *Clin Diabetes.* 2010;28(2):89-92.

COMPETING DEMANDS

HYPOGLYCEMIC EVENTS AND HYPOGLYCEMIC FEAR

Adherent Patients (%)

- No hypoglycemia n=266: 70%
- Mild hypoglycemia n=59: 56%
- Moderate/worse hypoglycemia n=80: 46%
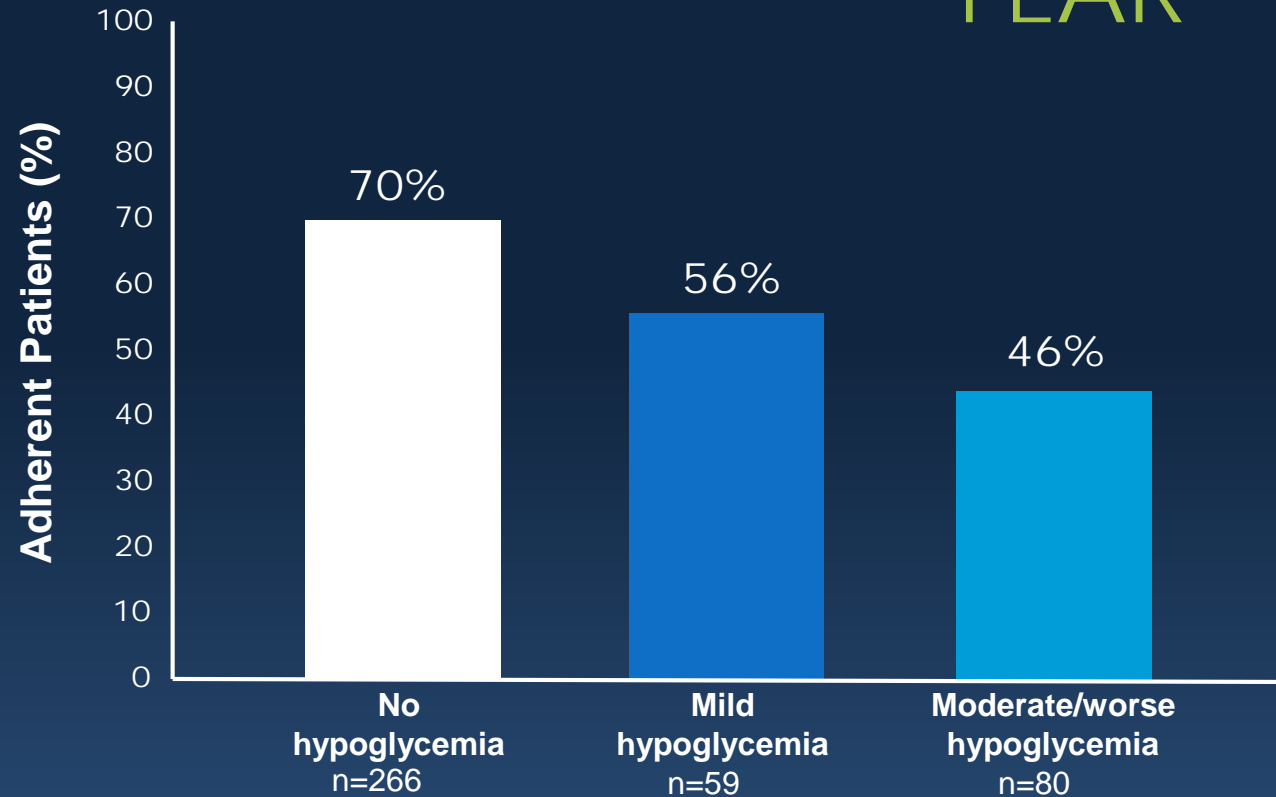
WHEN PATIENTS EXPERIENCE HYPOGLYCEMIA, FEAR OF A FUTURE EVENT CAN LEAD TO SKIPPING OR DISCONTINUING MEDICATION.[1,2]

Reprinted from *Patient Preference and Adherence*, volume 8, L. Walz et al, "Impact of symptomatic hypoglycemia on medication adherence, patient satisfaction with treatment, and glycemic control in patients with type 2 diabetes" pages 593-601, Copyright (2014), with permission from Dove Medical Press Ltd.

Cross-sectional study of T2D patients in Sweden treated with metformin and a sulfonylurea.
Adherence was determined using a self-report adherence and barriers questionnaire.[3]
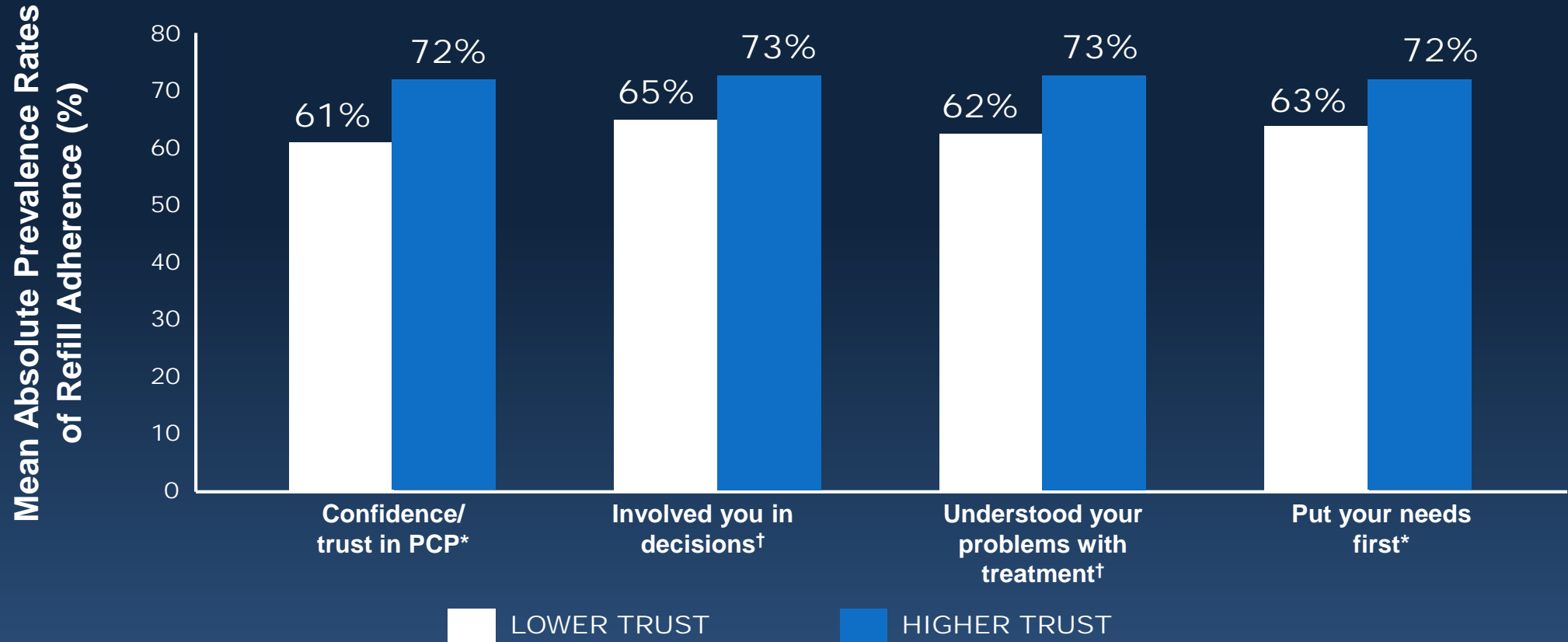
1. Hajós TRS et al. *Diabetes Care.* 2014;37:102-108. **2.** Gonder-Frederick LA et al. *Diabet Med.* 2013;30:603-609. **3.** Walz L et al. *Patient Prefer Adhere.* 2014;8:593-601.

CO-PAYS AND ORAL MEDICATIONS
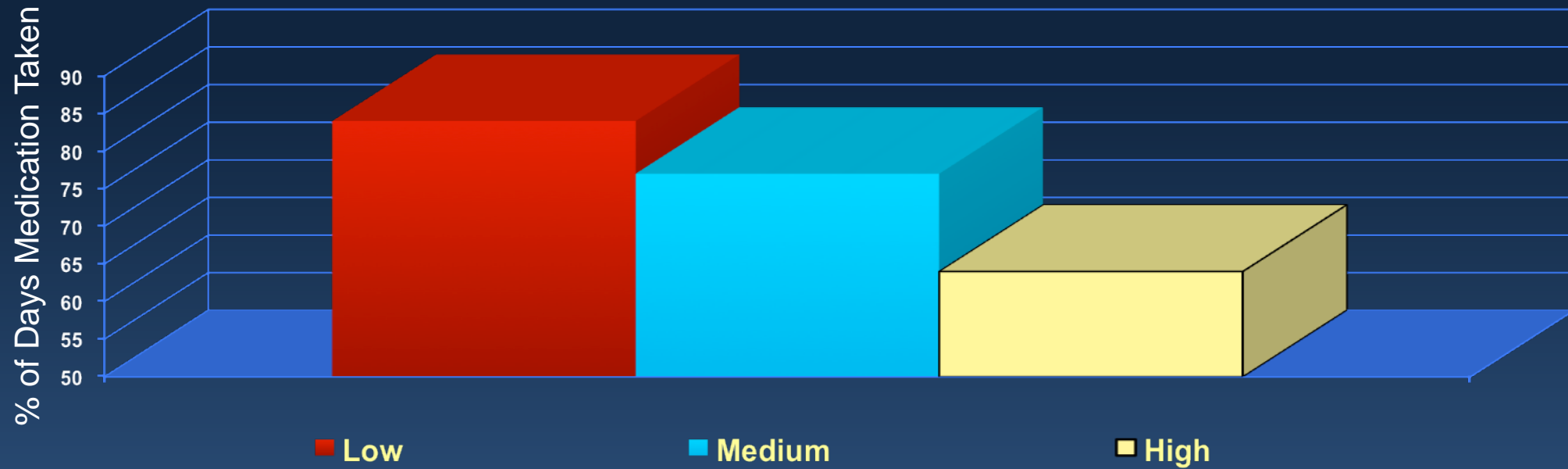
Colombi AM, et al. *J Occup Environ Med.* 2008;50:535-541

LACK OF PHYSICIAN TRUST

Differences in prevalence of poor refill adherence for any cardiometabolic medication in a cohort of 9377 patients with diabetes. Respondents were classified as poorly adherent when they had no medication supply for >20% of the observation time.

*Trust is defined using 2 items from the Trust in Physicians Scale (TIPS) modified to match the 4-point Consumer Assessment of Healthcare Providers and Systems (CAHPS) scale options during the preceding 12 months. †Shared decision-making was determined using 2 items from the Interpersonal Processes of Care (IPC) instrument during the preceding 12 months.

Ratanawongsa N et al. *JAMA Intern Med.* 2013;173:210-218.

MEDICATION BELIEFS

Perceived worthwhileness: Does the patient believe the benefits of the medication outweigh the costs?

PERCEIVED BENEFITS

- **Rarely apparent**
- **HCP may state that long-term risks are reduced**

PERCEIVED COSTS

- **Adverse effects**
- **Concerns about long-term adverse effects**
- **Represents "sickness"**

Polonsky WH. *J Diabetes*. 2015;7:777-778.

MEDICATION BELIEFS

ROY

Takes 2 oral medications for T2D and basal insulin; his last HbA1c was 6.8%

WHO IS DOING BETTER WITH HIS DIABETES?

SAM

Doesn't take any medications for T2D; his last HbA1c was 9.1%

ROY. How healthy you are, and your risk of complications, is not determined by how much medication you take.
It is your metabolic results that matter.
Even if you are not taking pills or insulin, high blood sugars will likely lead to future problems.

Polonsky WH. *J Diabetes*. 2015;7:777-778.

WHY DO PATIENTS FEEL THIS WAY?

- Threatening patients with medication
  - *"If you can't make some positive changes, then we'll have no choice but to put you on more medication, and perhaps even start insulin."*
- Underlying messages
  - More medication, and especially insulin, should be avoided at all costs
  - You have failed
  - You are to be punished

SO WHAT TO DO?

1. **Ask correctly**

   o *"Any problems taking those medications?"*

   vs.

   o *"What's one thing about taking your medications that's been challenging?"*

SO WHAT TO DO?

1. **Ask correctly**
2. **Forgetfulness**
   - o **"Aside from forgetting, what else is tough about taking your meds?"**
   - o **Anchoring strategies**

Anchoring Medication to Daily Events
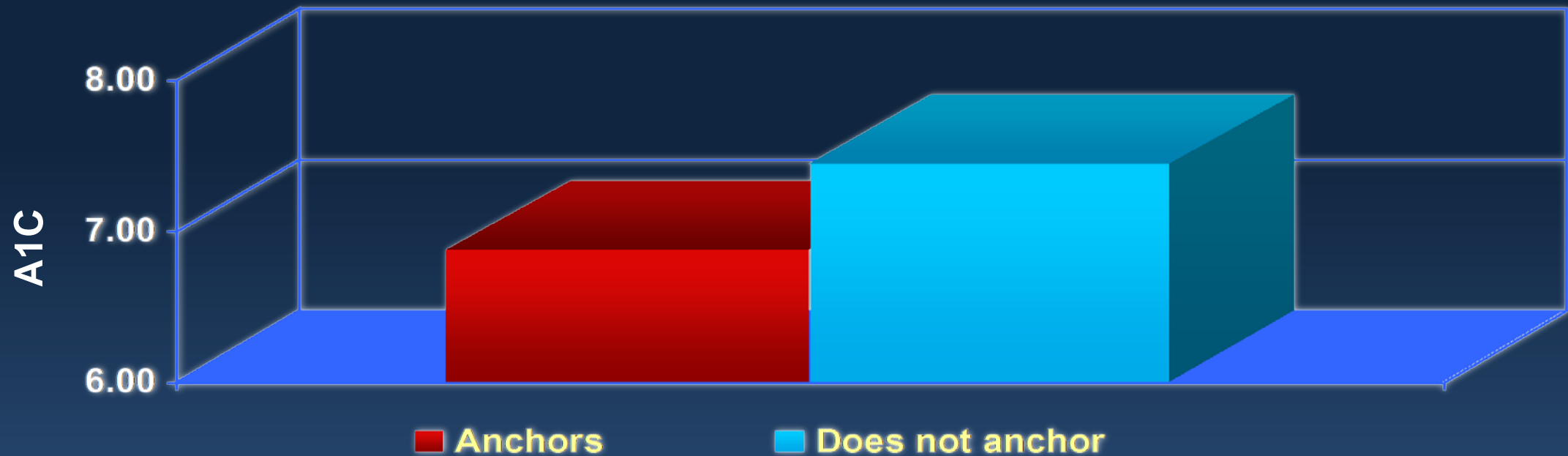
"A daily event (a meal, TV show, bedtime, brushing my teeth) reminds me."

Littenberg B, et al. *BMC Fam Prac*. 2006;7:1.

SO WHAT TO DO?

1. Ask correctly
2. Forgetfulness
3. Treatment complexity
   o Simplify if possible
   o Provide additional details as needed

SO WHAT TO DO?

1. Ask correctly
2. Forgetfulness
3. Treatment complexity
4. Provide hope
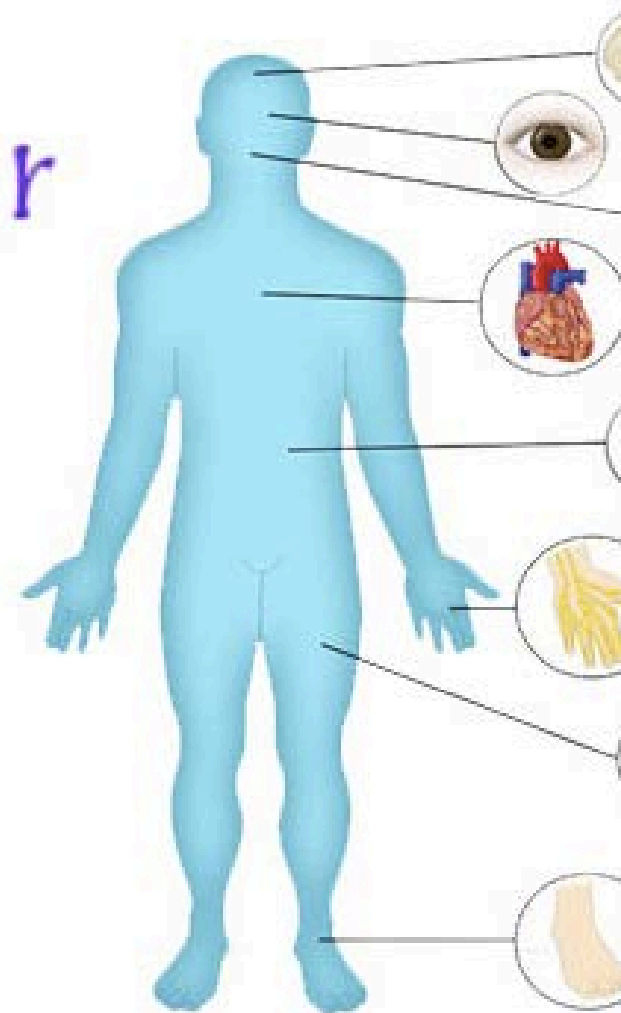
Bad News about T1D Survival

Figure. Percentage Surviving by Age Among Those With Type 1 Diabetes Compared With the General Population Without Type 1 Diabetes

Livingstone et al, 2015
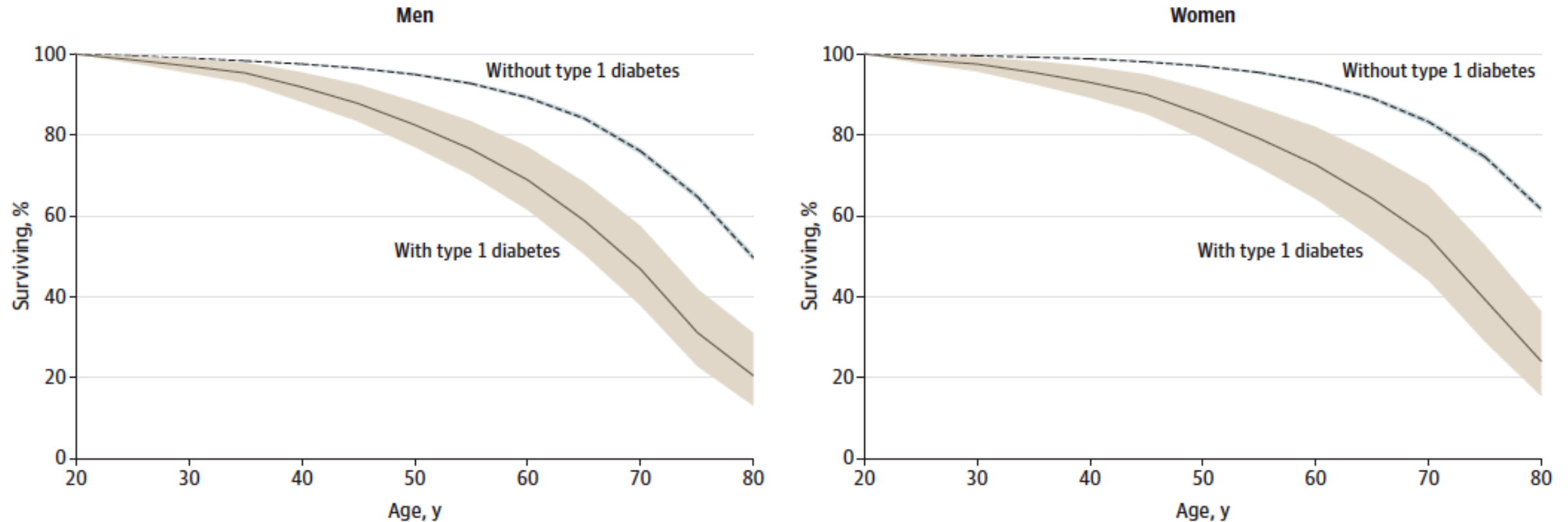
Bad News about T1D Survival

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 any cause and the risk of death from cardiovascular causes were still more than twice the risks in the general population. For patients with diabetes who had very poor glycemic control, the risks of death from any cause and of death from cardiovascular causes were 8 and 10 times as high, respectively, as those in the general population. The excess

Lind et al, 2014

Disability-Free Years, Age ≥ 50 Years
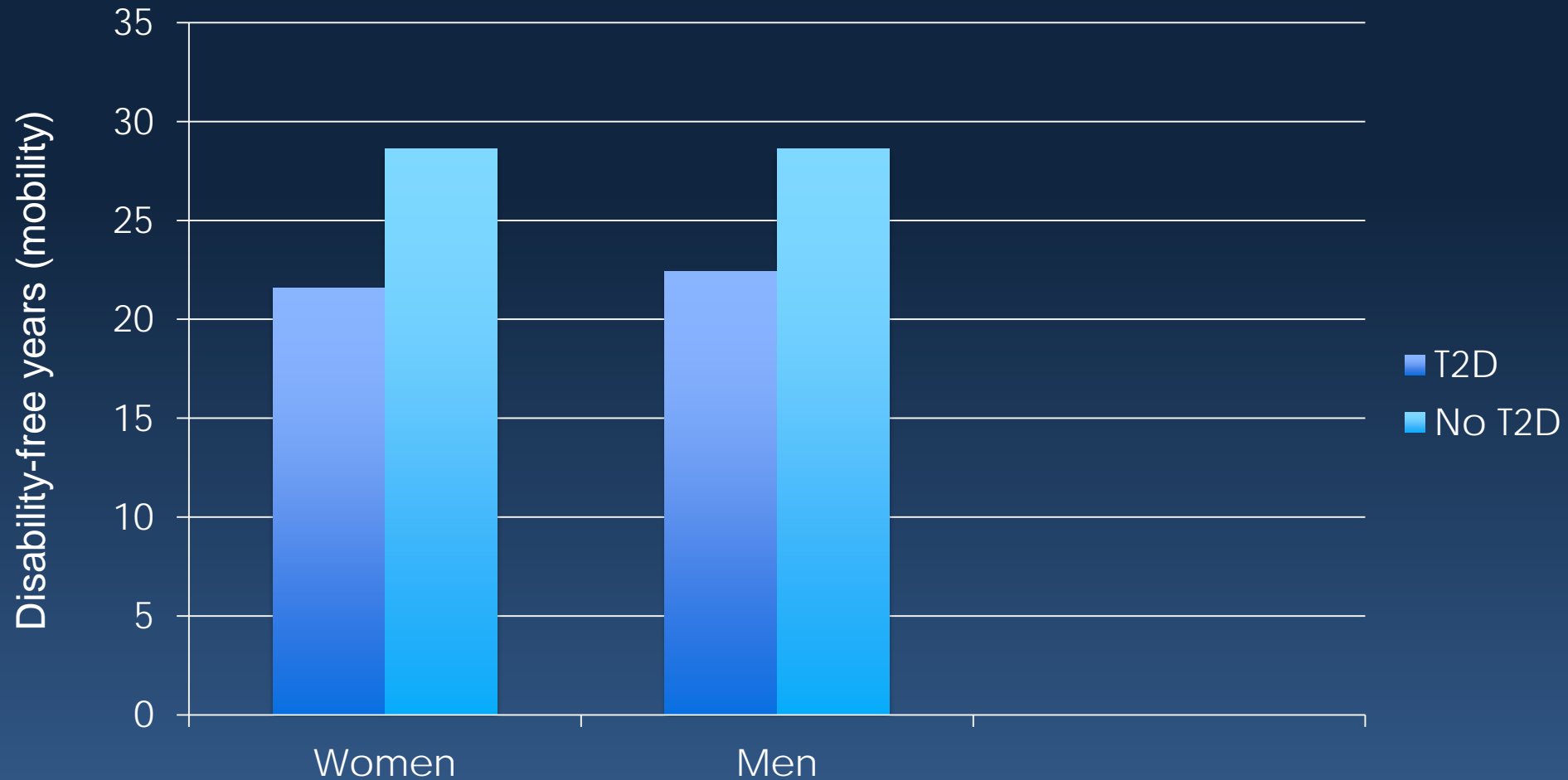
Bardenheier et al, 2016

T1D Patients' Perceptions of Complications Risk Over 20 Years (with Intensive Therapy)

Meltzer and Egleston, 2000
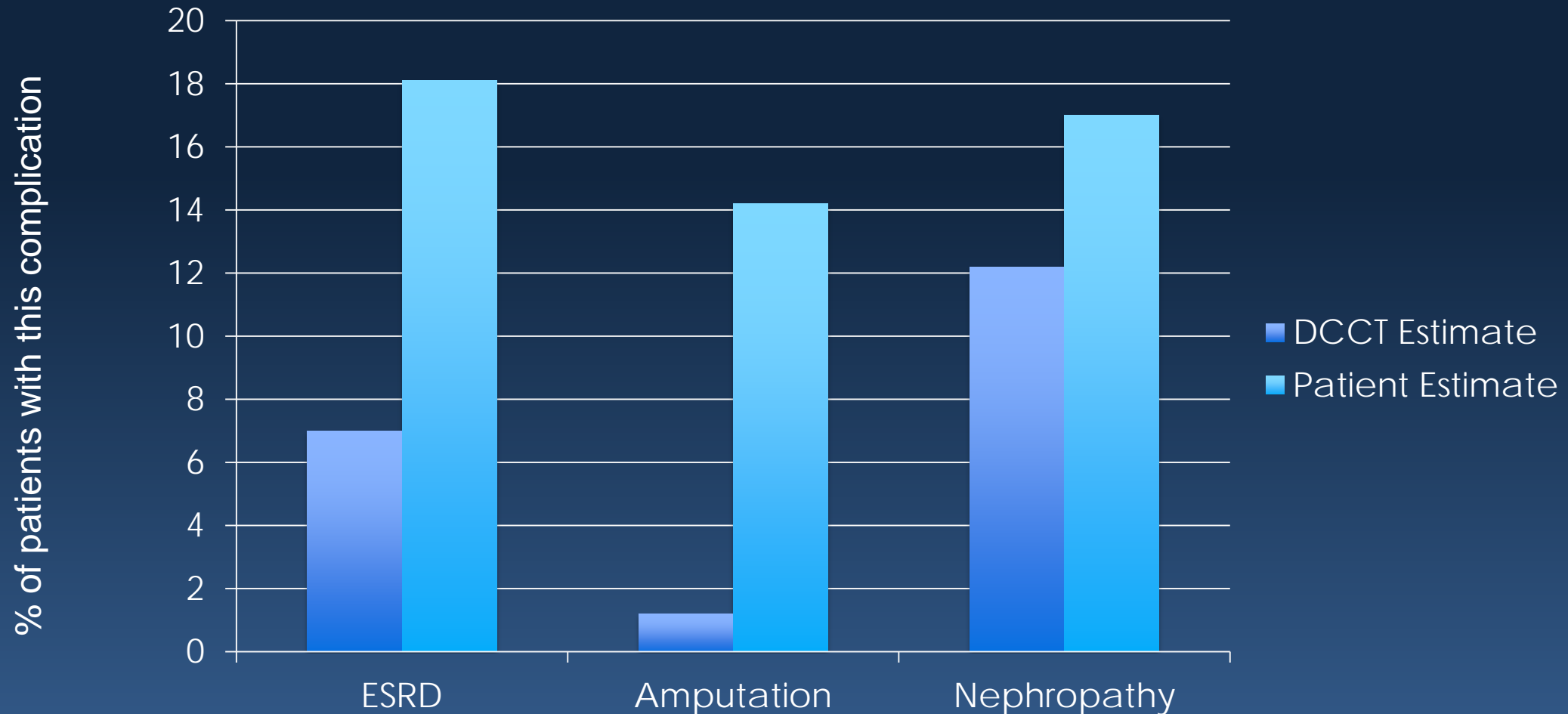
Feeling Hopeless about Diabetes

STATEMENT	POPULATION	A MODERATE PROBLEM, OR WORSE
"I will end up with serious long-term complications, no matter what I do."	254 T1Ds	70.5%
	414 T1Ds	66.4%
	268 T2Ds	74.3%
	424 T2Ds	71.0%

The Good News

1. Overall, things are getting better.

Life Expectancy in T1D

Miller et al, 2013
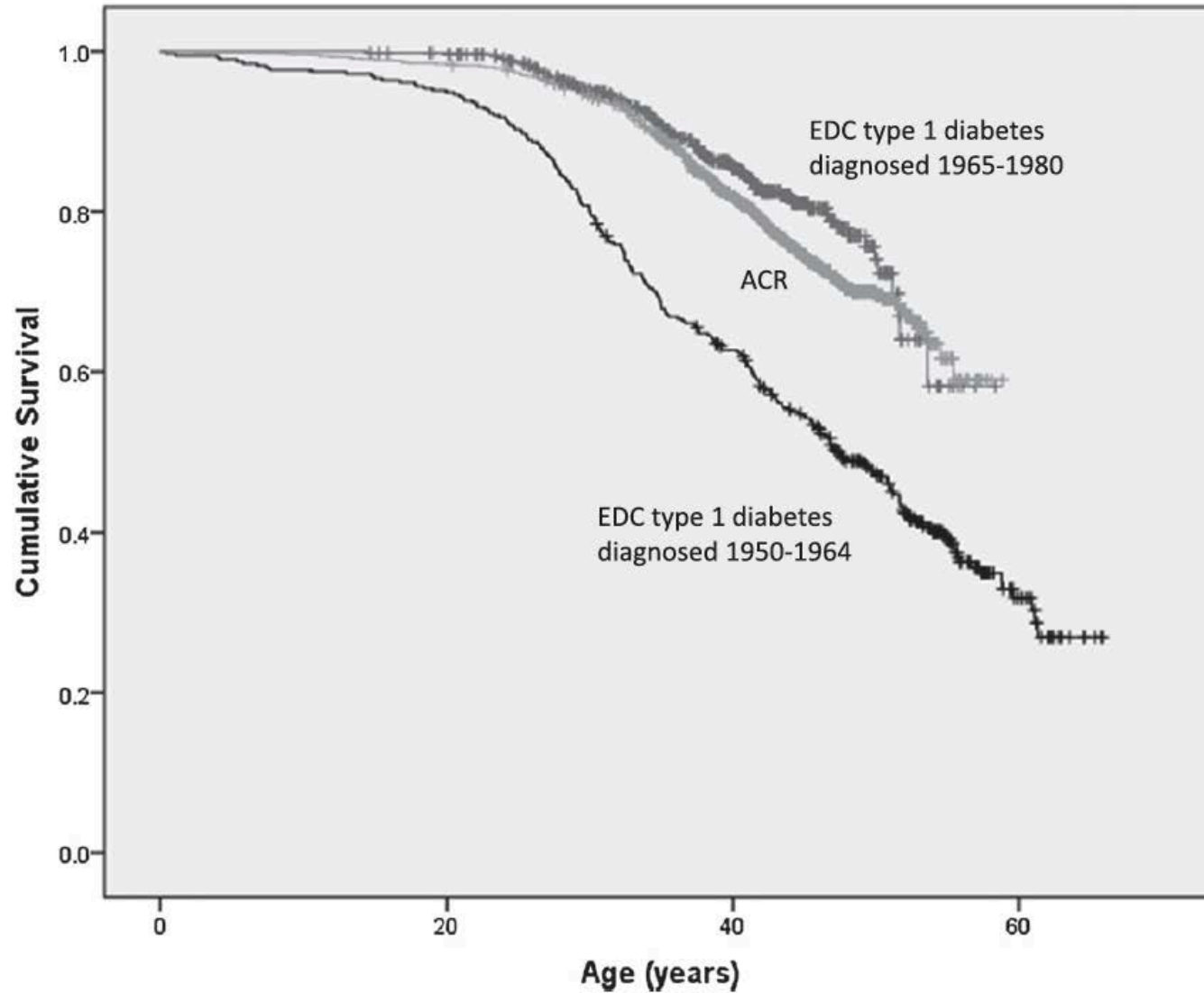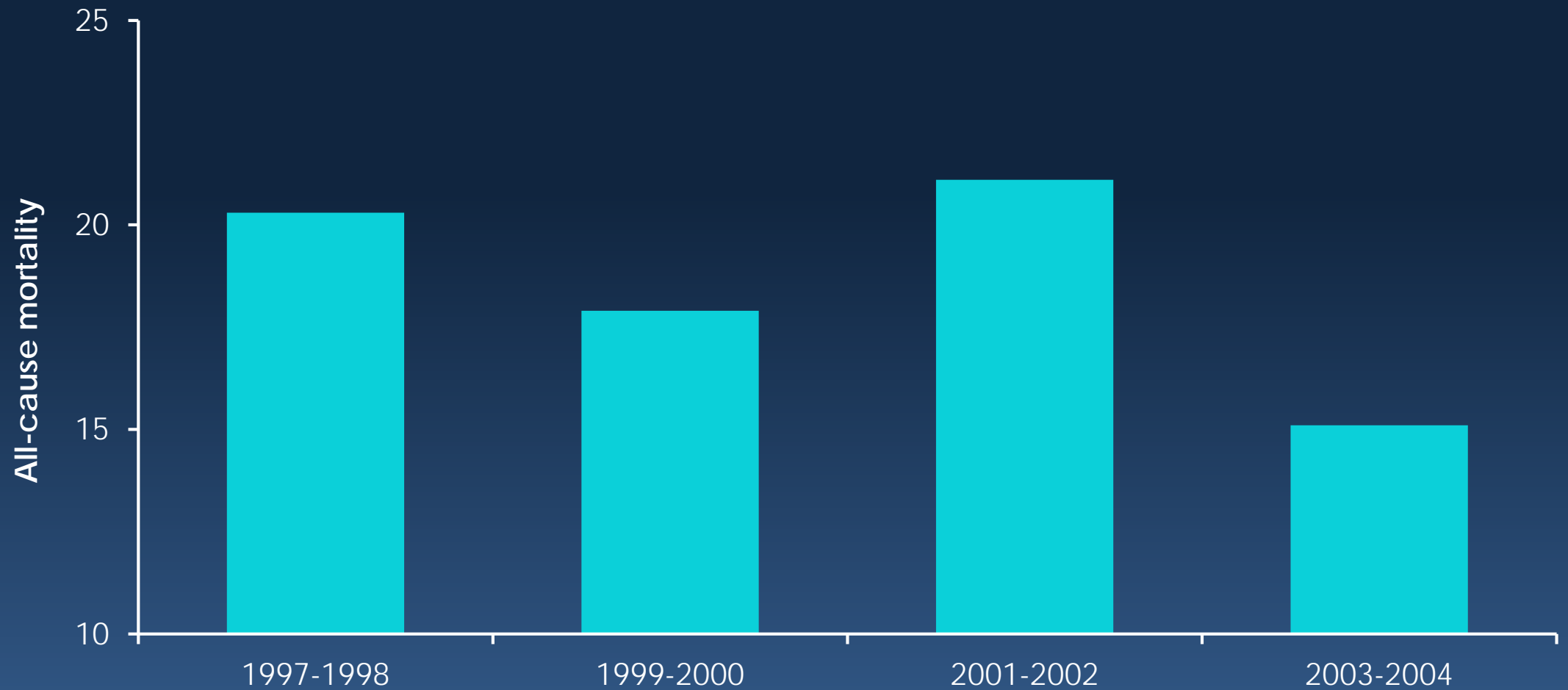
Long-Term Diabetes Complications, 1990 - 2010

Gregg et al, 2014
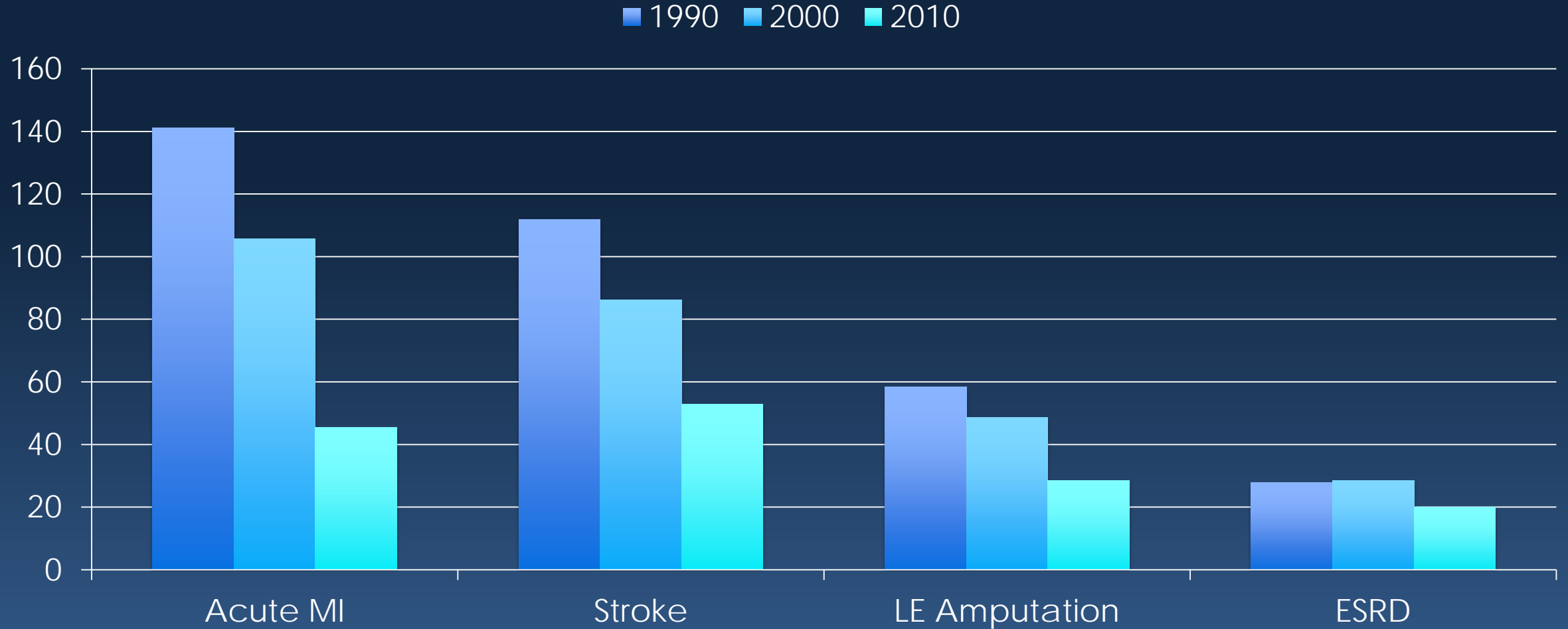
LEA Rates in Scotland, 2004- 2008

Incidence (1000 of DM population)

3.5
3
2.5
2
1.5
1

2004 2005 2006 2007 2008

Kennon et al, 2012
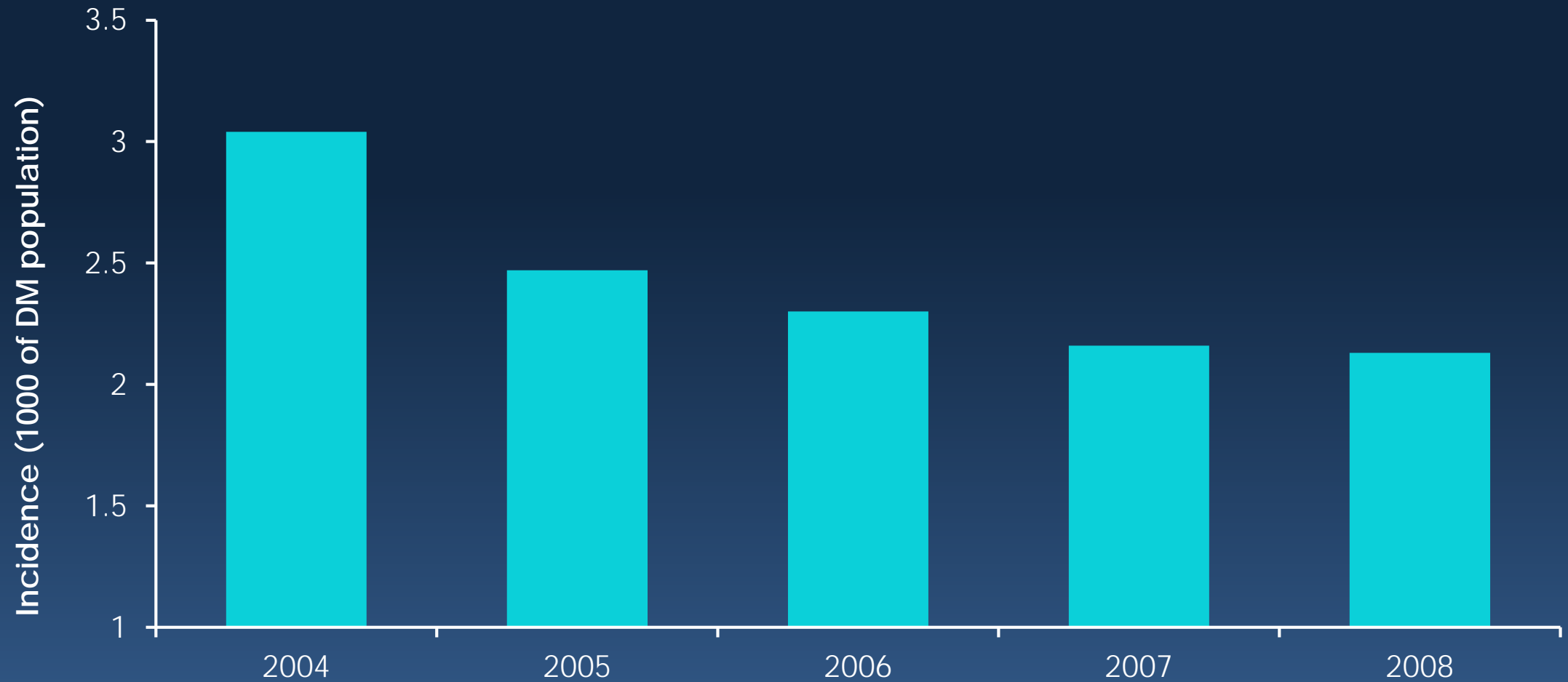
CVD Mortality Rates in Diabetes: Curious Findings

RECORD (n=4,447 T2Ds)	Expected
Cardiovascular Event Rate (%)	11.0

Home et al, 2009

CVD Mortality Rates in Diabetes: Curious Findings

RECORD (n=4,447 T2Ds)	Expected	Actual: Rosiglitazone	Actual: Control
Cardiovascular Event Rate (%)	11.0	2.8	2.8

Home et al, 2009

CVD Mortality Rates in Diabetes: Curious Findings

RECORD (n=4,447)	Expected	Actual: Rosiglitazone	Actual: Control
Cardiovascular Event Rate (%)	11.0	2.8	2.8

ACCORD (n=10,251)	Expected
Event Rate Deaths/1,000 pts/year	50

Home et al, 2009

CVD Mortality Rates in Diabetes: Curious Findings

RECORD (n=4,447)	Expected	Actual: Rosiglitazone	Actual: Control
Cardiovascular Event Rate (%)	11.0	2.8	2.8

ACCORD (n=10,251)	Expected	Actual: Intensive	Actual: Control
Event Rate Deaths/1,000 pts/year	50	14	11

Home et al, 2009; Gerstein et al, 2008

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."

The Good News

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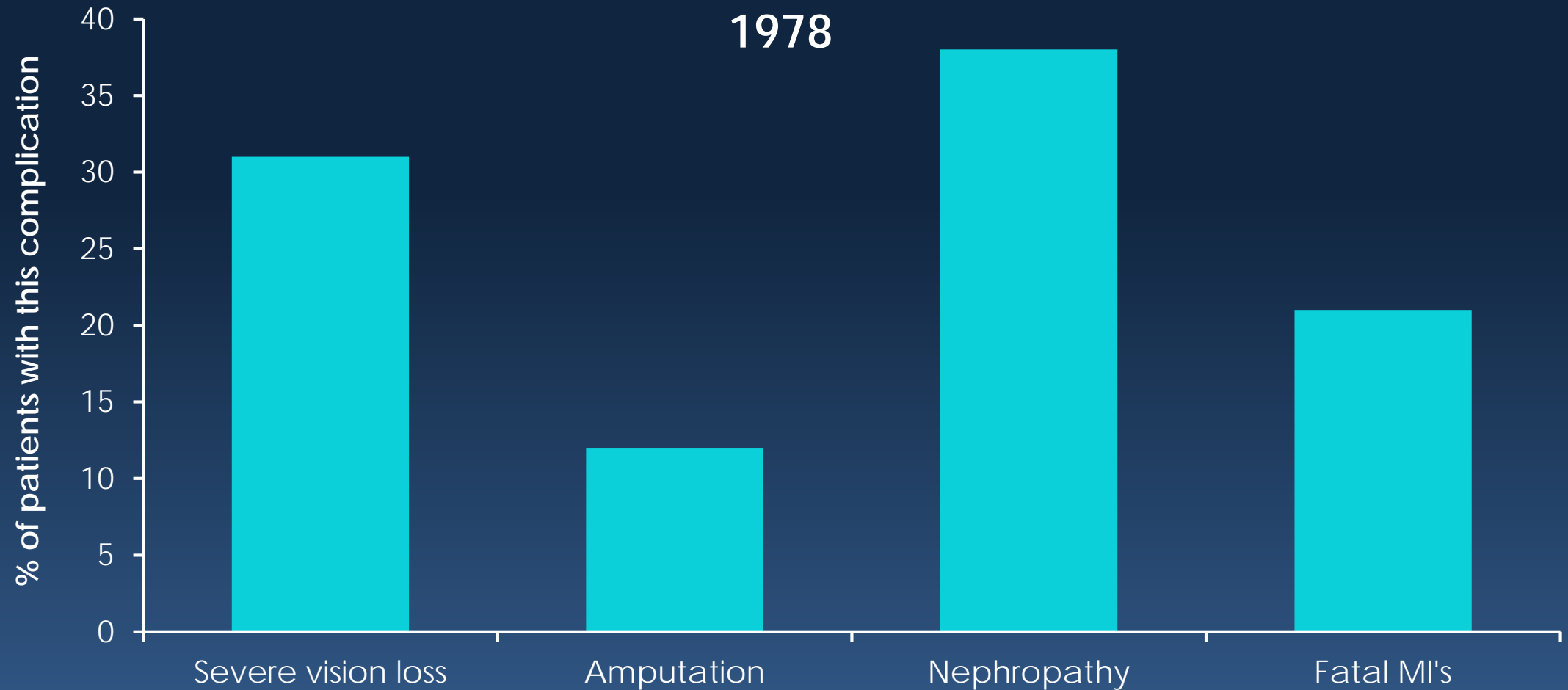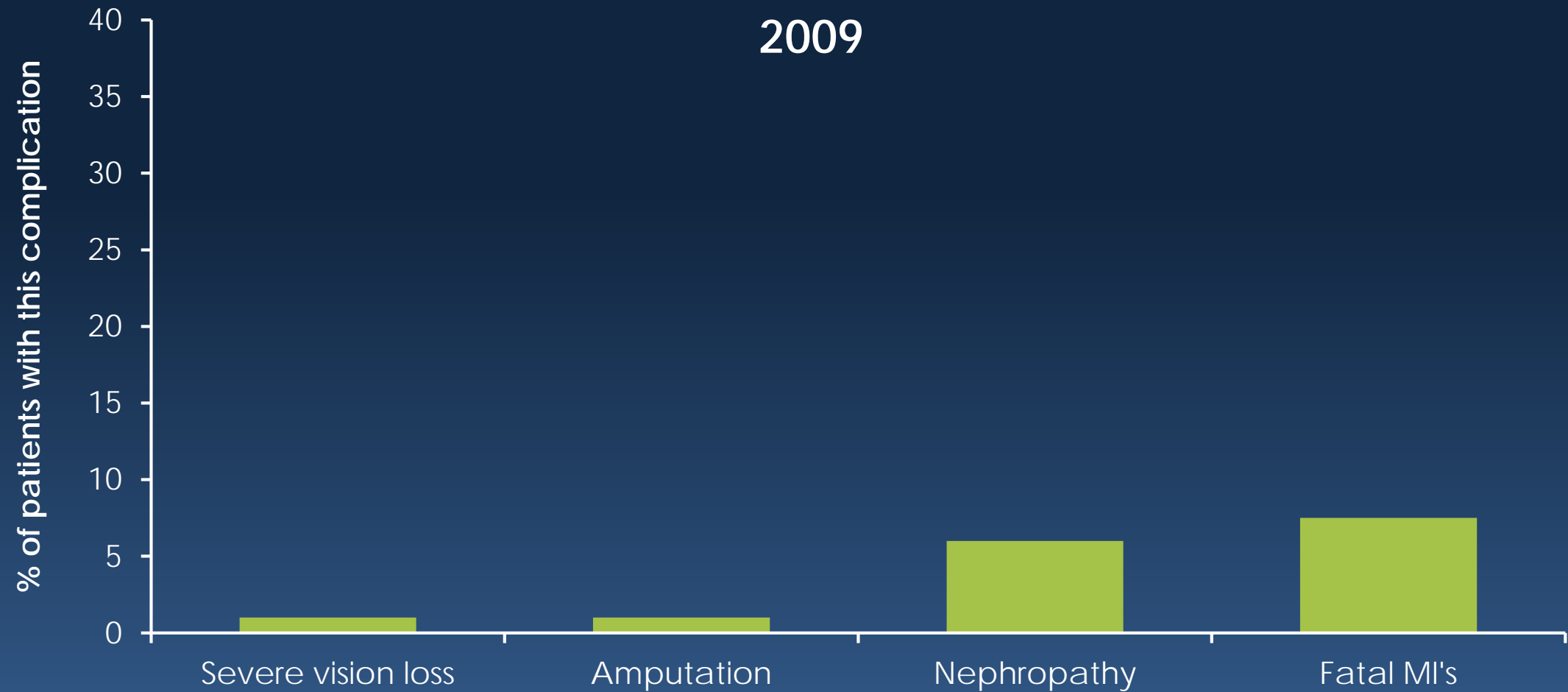
In Summary

"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

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!

Fact Check

This doesn't mean: good care will **guarantee** that you will not develop complications

This does mean: with good care, **odds are good** you can live a long, healthy life with diabetes

We Even Put it on Mugs!
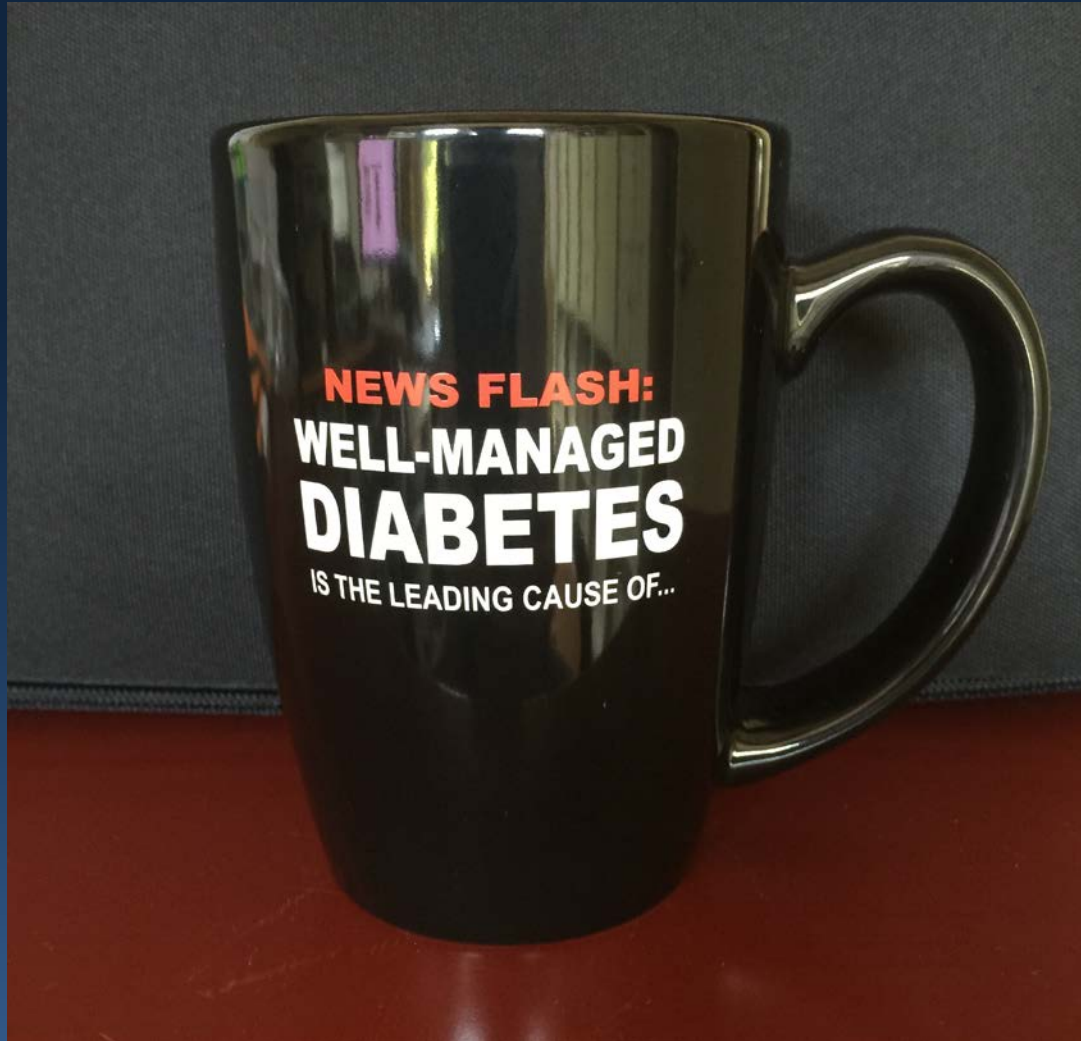
T1D Mortality Rates

Table 1—DCCT/EDIC deaths and death rates by DCCT intensive versus conventional therapy group, primary versus secondary cohort, and sex, with SMRs relative to the U.S. population, along with RMRs comparing two SMRs

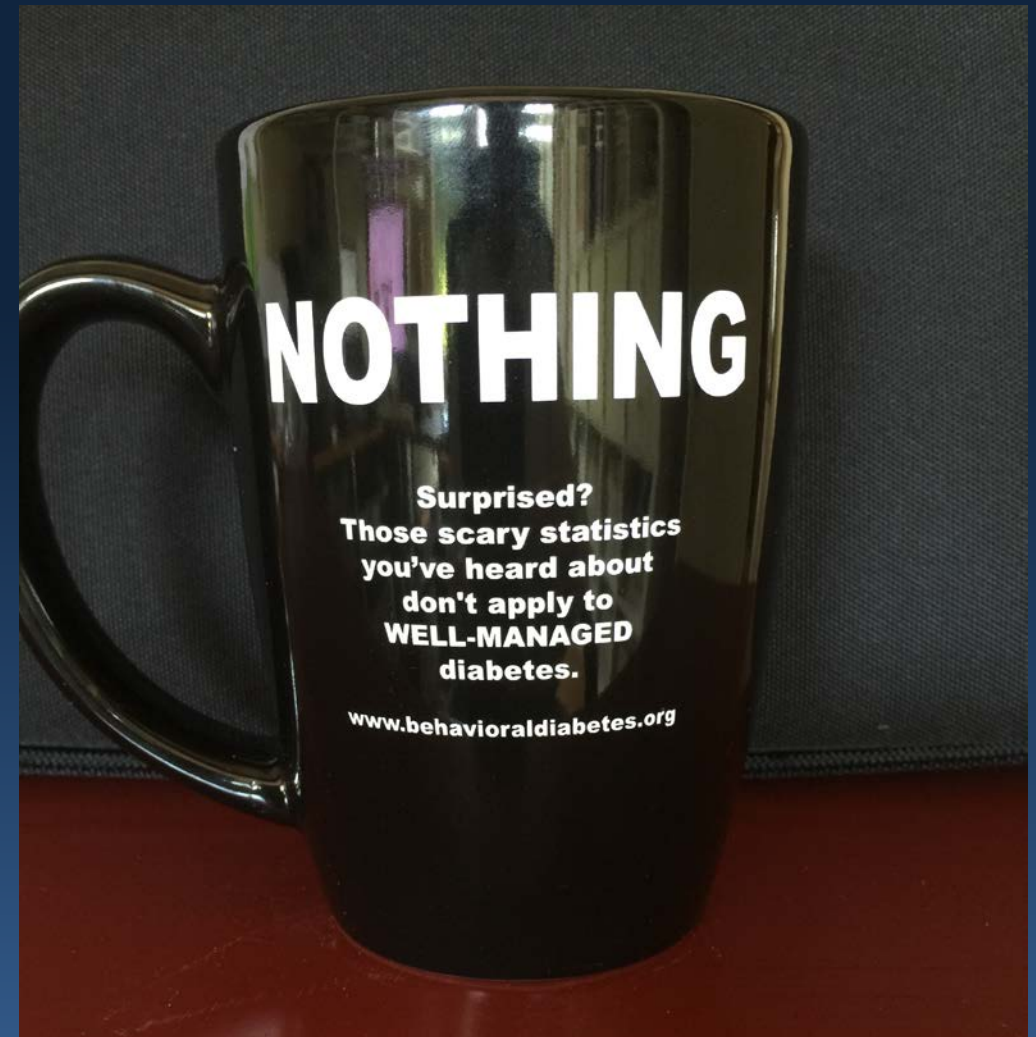|	Observed/expected*	Rate (95% CI)†	SMR (95% CI)‡	RMR (95% CI)§	P
Total (n = 1,441)	125/114	320 (269, 380)	1.09 (0.92, 1.30)		
Intensive (n = 711)	51/58	263 (200, 345)	0.88 (0.67, 1.16)	1.49 (1.04, 2.14)	0.028
Conventional (n = 730)	74/56	376 (301, 470)	1.31 (1.05, 1.65)		
Primary (n = 726)	61/54	315 (247, 404)	1.13 (0.88, 1.45)	0.95 (0.67, 1.35)	0.76
Secondary (n = 715)	64/60	324 (255, 412)	1.07 (0.83, 1.36)		
Females (n = 680)	47/39	252 (190, 333)	1.19 (0.90, 1.59)	0.87 (0.61, 1.26)	0.464
Males (n = 761)	78/75	382 (307, 475)	1.04 (0.83, 1.30)		
Treatment group by sex				Conventional vs. Intensive	
Females					
Intensive	21/21	220 (145, 335)	0.99 (0.64, 1.51)	1.46 (0.82, 2.59)	0.201
Conventional	26/18	284 (195, 415)	1.44 (0.98, 2.11)		
Males					
Intensive	30/37	304 (213, 434)	0.82 (0.57, 1.18)	1.54 (0.97, 2.43)	0.066
Conventional	48/38	456 (346, 600)	1.26 (0.95, 1.66)		
Treatment group by study cohort				Conventional vs. Intensive	
Primary					
Intensive	27/26	291 (200,422)	1.03 (0.70, 1.51)	1.17 (0.71, 1.95)	0.538
Conventional	34/28	338 (244,470)	1.21 (0.87, 1.69)		
Secondary					
Intensive	24/32	237 (160,353)	0.75 (0.50, 1.13)	1.88 (1.13, 3.12)	0.015
Conventional	40/28	415 (307,562)	1.42 (1.04, 1.93)		

*Number of deaths. †Rate per 100,000 PY with 95% CI from a Poisson regression model with robust information sandwich standard errors. ‡Expected number of deaths from the 2013 U.S. population life table for every year of age in the cohort and the SMR. §RMR obtained from an unadjusted Poisson model, each with 95% CI and P value (two sided).

DCCT/EDIC, 2016

T1D Mortality Rates

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

	Observed/expected*
Total (n = 1,441)	125/114
Intensive (n = 711)	51/58
Conventional (n = 730)	74/56

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

Helen L. Lutgers[1], Esther G. Gerrits[2]*, Wim J. Sluiter[3], Lielith J. Ubink-Veltmaat[4], Gijs W. D. Landman[2], Thera P. Links[3,5], Reinold O. B. Gans[1,5], Andries J. Smit[1,5], Henk J. G. Bilo[1,2,5]

1 Department of Internal Medicine, University Medical Center Groningen, Groningen, the Netherlands, 2 Diabetes Center, Isala Clinics, Zwolle, the Netherlands, 3 Department of Endocrinology, University Medical Center Groningen, Groningen, the Netherlands, 4 Family practice't Veen, Hattem, the Netherlands, 5 Department of Medicine, University of Groningen, Groningen, the Netherlands

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."*

Diabetes & Your Health

"To live a long and healthy life, develop a chronic disease and take care of it."

- Sir William Osler

SO WHAT TO DO?

1. Ask correctly
2. Forgetfulness
3. Treatment complexity
4. Provide hope
5. Patient-provider trust
   - Listen, listen, listen

Conversation Elements

Factor 1
Encouraging

Factor 2
Collaborative

Factor 3
Discouraging

Factor 4
Recommending Other Resources

Positive
(β = +1.690)

Positive
(β = +0.436)

Negative
(β = -1.242)

No Impact
(β = 0.093)

Quality of patient–physician communication at diagnosis

Positive
(β = -0.367)

Positive
(β = -0.412)

Positive
(β = +0.391)

Positive
(β = +1.093)

Positive
(β = +0.880)

Positive
(β = +0.702)

Positive
(β = +0.910)

How emotionally distressed are they with their diabetes?
Emotional DDS

How distressed by the regimen are they with their diabetes?
Regimen-related DDS

How well do they feel?
WHO-5

Do they follow a healthy diet?
SDSCA General Diet Score

Do they eat healthier foods?
SDSCA Specific Diet Score

Do they exercise frequently?
SDSCA Exercise Score

Do they takes their meds as directed?
SDSCA Medication Score

Polonsky et al, 2017

Conversation Elements

Encouraging

- *"Told me that with good care and effort, odds are good that I can live a long, healthy life with DM"*
- *"Told me a lot can be done to control my DM"*

Collaborative

- *"Helped to make a treatment plan that I could do in my daily life"*
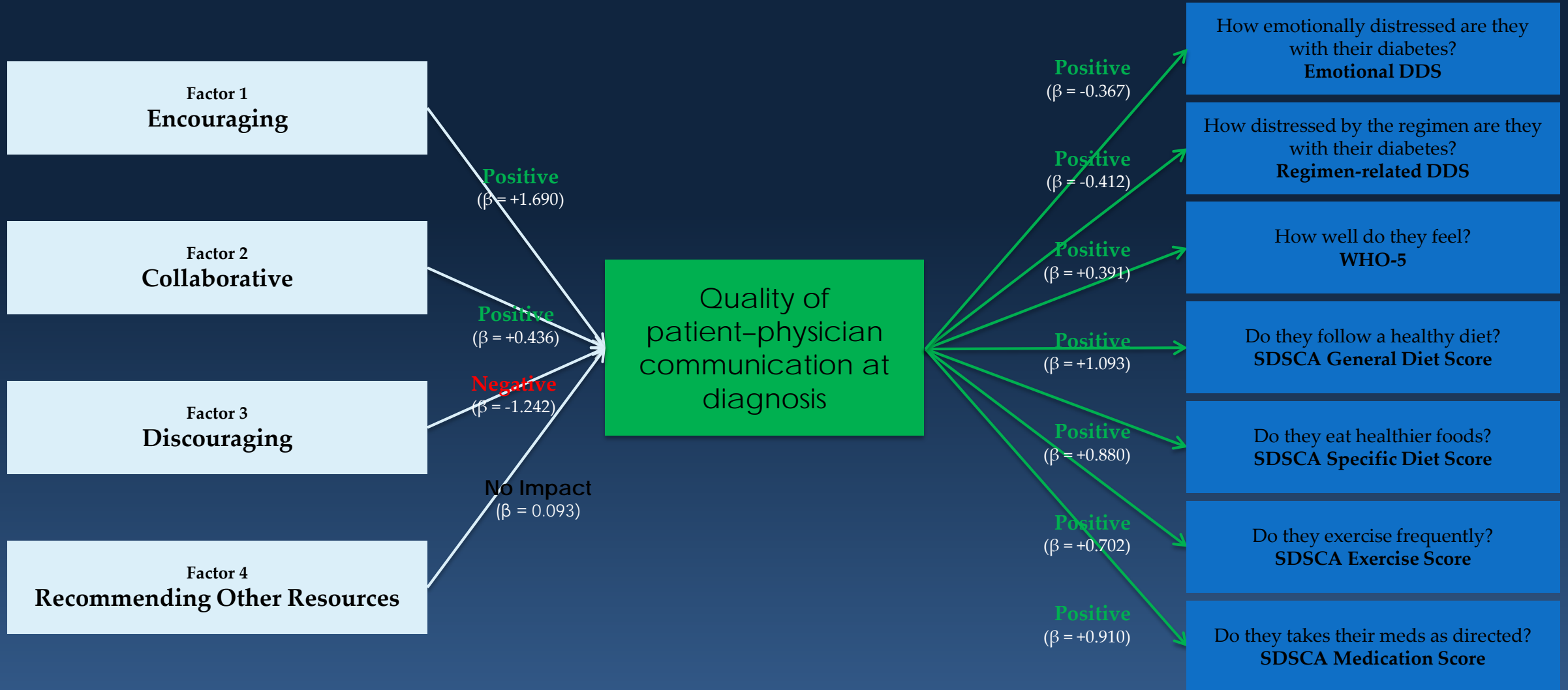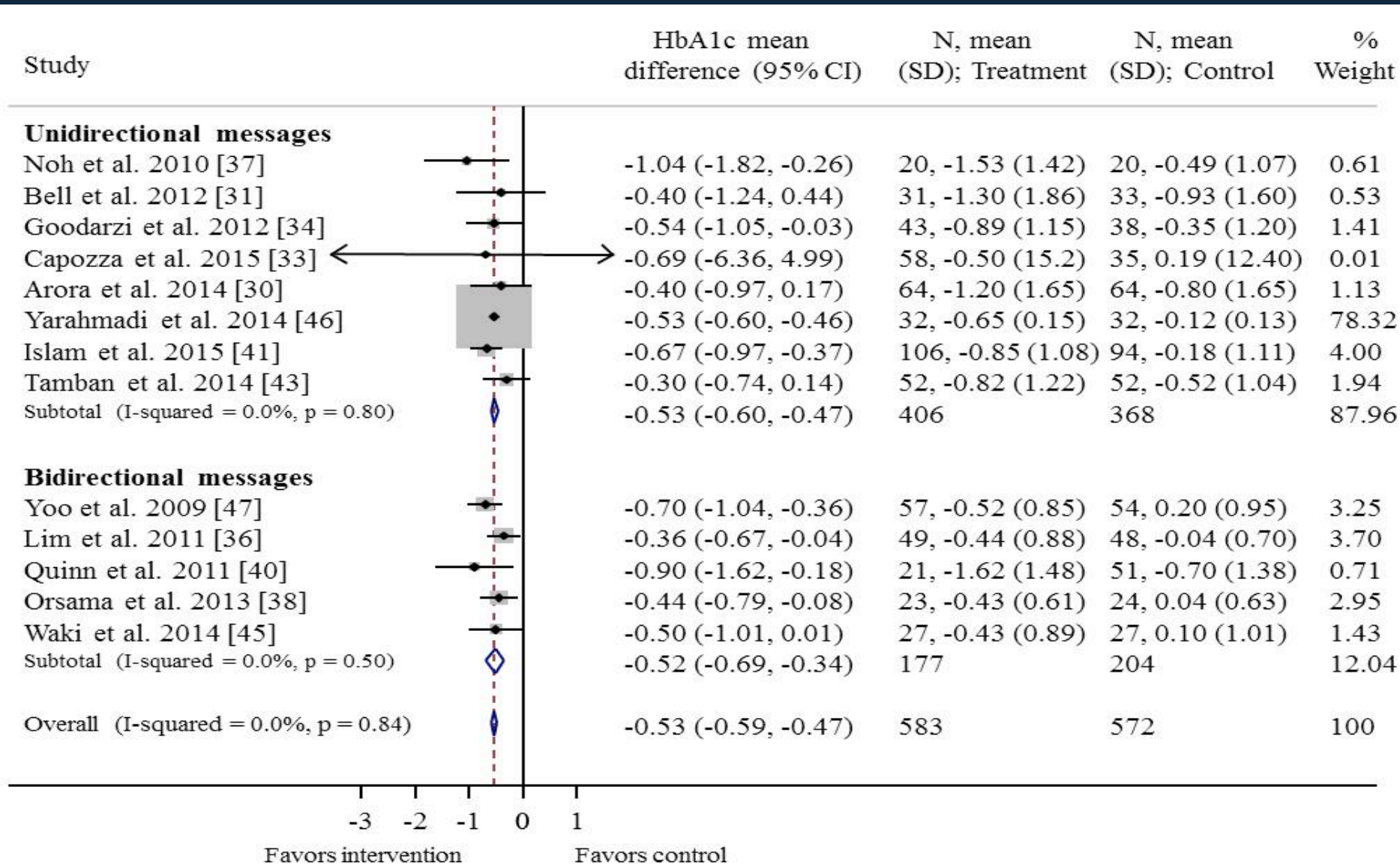- *"Helped to plan ahead so I could take care of my DM even in hard times"*

Polonsky et al, 2017

SO WHAT TO DO?

1. Ask correctly
2. Forgetfulness
3. Treatment complexity
4. Provide hope
5. Patient-provider trust
6. **Stay in touch**

The Value of Ongoing Contact

Study	HbA1c mean difference (95% CI)	N, mean (SD); Treatment	N, mean (SD); Control	% Weight
Unidirectional messages				
Noh et al. 2010 [37]	-1.04 (-1.82, -0.26)	20, -1.53 (1.42)	20, -0.49 (1.07)	0.61
Bell et al. 2012 [31]	-0.40 (-1.24, 0.44)	31, -1.30 (1.86)	33, -0.93 (1.60)	0.53
Goodarzi et al. 2012 [34]	-0.54 (-1.05, -0.03)	43, -0.89 (1.15)	38, -0.35 (1.20)	1.41
Capozza et al. 2015 [33]	-0.69 (-6.36, 4.99)	58, -0.50 (15.2)	35, 0.19 (12.40)	0.01
Arora et al. 2014 [30]	-0.40 (-0.97, 0.17)	64, -1.20 (1.65)	64, -0.80 (1.65)	1.13
Yarahmadi et al. 2014 [46]	-0.53 (-0.60, -0.46)	32, -0.65 (0.15)	32, -0.12 (0.13)	78.32
Islam et al. 2015 [41]	-0.67 (-0.97, -0.37)	106, -0.85 (1.08)	94, -0.18 (1.11)	4.00
Tamban et al. 2014 [43]	-0.30 (-0.74, 0.14)	52, -0.82 (1.22)	52, -0.52 (1.04)	1.94
Subtotal (I-squared = 0.0%, p = 0.80)	-0.53 (-0.60, -0.47)	406	368	87.96
Bidirectional messages				
Yoo et al. 2009 [47]	-0.70 (-1.04, -0.36)	57, -0.52 (0.85)	54, 0.20 (0.95)	3.25
Lim et al. 2011 [36]	-0.36 (-0.67, -0.04)	49, -0.44 (0.88)	48, -0.04 (0.70)	3.70
Quinn et al. 2011 [40]	-0.90 (-1.62, -0.18)	21, -1.62 (1.48)	51, -0.70 (1.38)	0.71
Orsama et al. 2013 [38]	-0.44 (-0.79, -0.08)	23, -0.43 (0.61)	24, 0.04 (0.63)	2.95
Waki et al. 2014 [45]	-0.50 (-1.01, 0.01)	27, -0.43 (0.89)	27, 0.10 (1.01)	1.43
Subtotal (I-squared = 0.0%, p = 0.50)	-0.52 (-0.69, -0.34)	177	204	12.04
Overall (I-squared = 0.0%, p = 0.84)	-0.53 (-0.59, -0.47)	583	572	100

-3 -2 -1 0 1

Favors intervention   Favors control

Arambepola et al, 2016

SO WHAT TO DO?

1. Ask correctly
2. Forgetfulness
3. Treatment complexity
4. Provide hope
5. Patient-provider trust
6. Stay in touch
7. Talk about medication beliefs

Challenging Harmful Beliefs

- **Out-of-control diabetes can harm you, even if you feel okay**
- **Treatment should not be delayed**

Back on Track Feedback			Name: *Molly B.*	
Tests	Usual Goals	Your Results	FID #:	
	Your score should be		SAFE: At or better than goal	NOT SAFE: Not yet at goal
A1C	7.0% or less	8.7%		x
Blood Pressure	130/80	125/75	x	
Lipids	100 or less	116		x

Challenging Harmful Beliefs

- **Out-of-control diabetes can harm you, even if you feel okay**

- **Treatment should not be delayed**

- **Discuss the critical "medication secrets"**

Four Medication "Secrets"

1. Taking your meds is one of the most powerful things you can do to positively affect your health

2. Your meds are working even if you can't feel it

3. Needing more medication isn't your fault

4. More medication doesn't mean you are sicker, less medication doesn't mean you are healthier
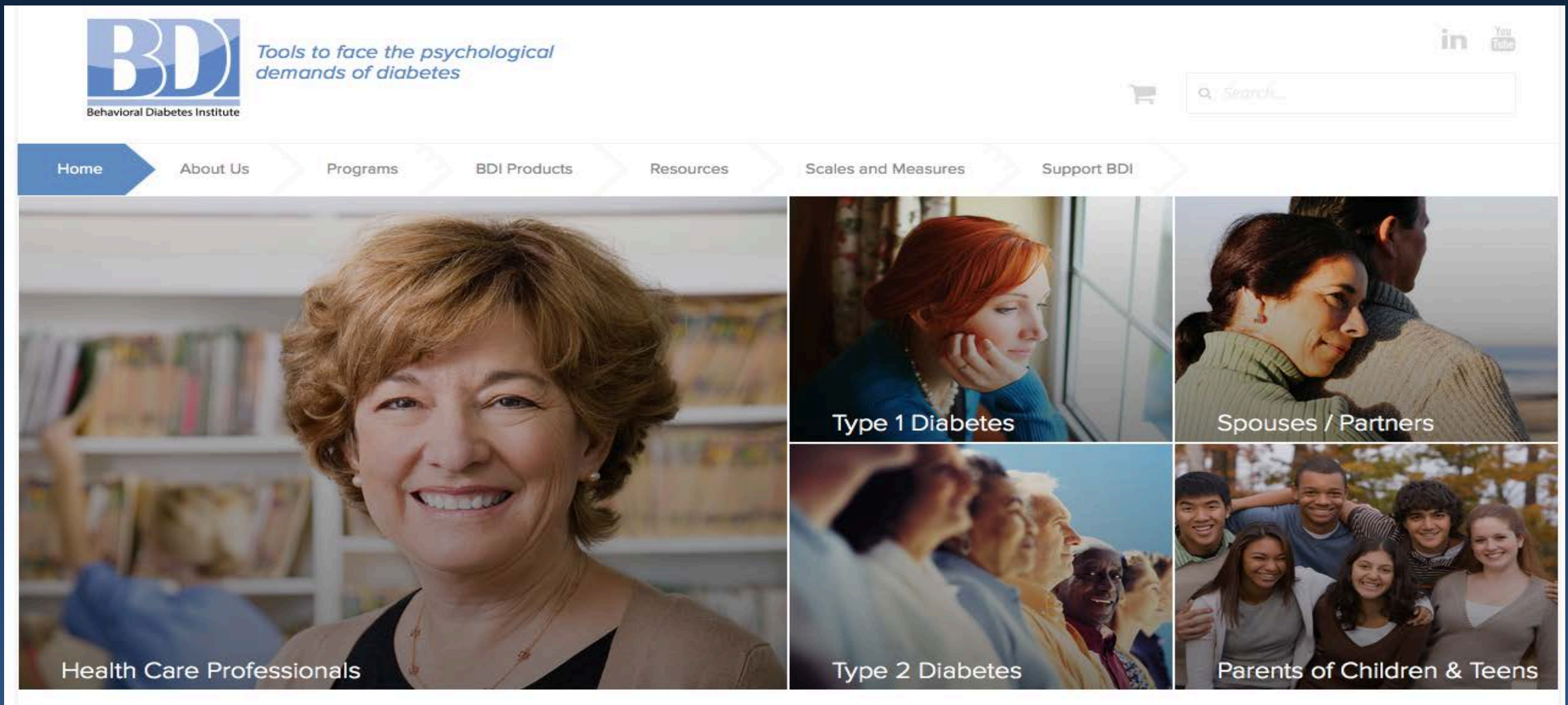
PROS | CONS

Take-Home Messages

1. Ask correctly
2. Forgetfulness
3. Treatment complexity
4. Provide hope
5. Patient-provider trust
6. Stay in touch
7. Talk about medication beliefs

One Step at a Time

Thanks for Listening

www.behavioraldiabetes.org