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Diabetes Alphabet Soup Part 1

Topics

- Today:
  - A1C, BP, Lipids, and Aspirin Goals
  - DDTP Clinical Resources
  - Trauma-Informed Diabetes Care
  - Ever-expanding science on diabetes risk factors
- Tomorrow:
  - Data: Prevalence, Audit, ESRD, GPRA
  - Diabetes in AI/AN Youth

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IHS Division of Diabetes

Changing Guidelines for A1C, Blood Pressure, LDL Cholesterol, and Aspirin

Guidelines have changed a lot in the last few years

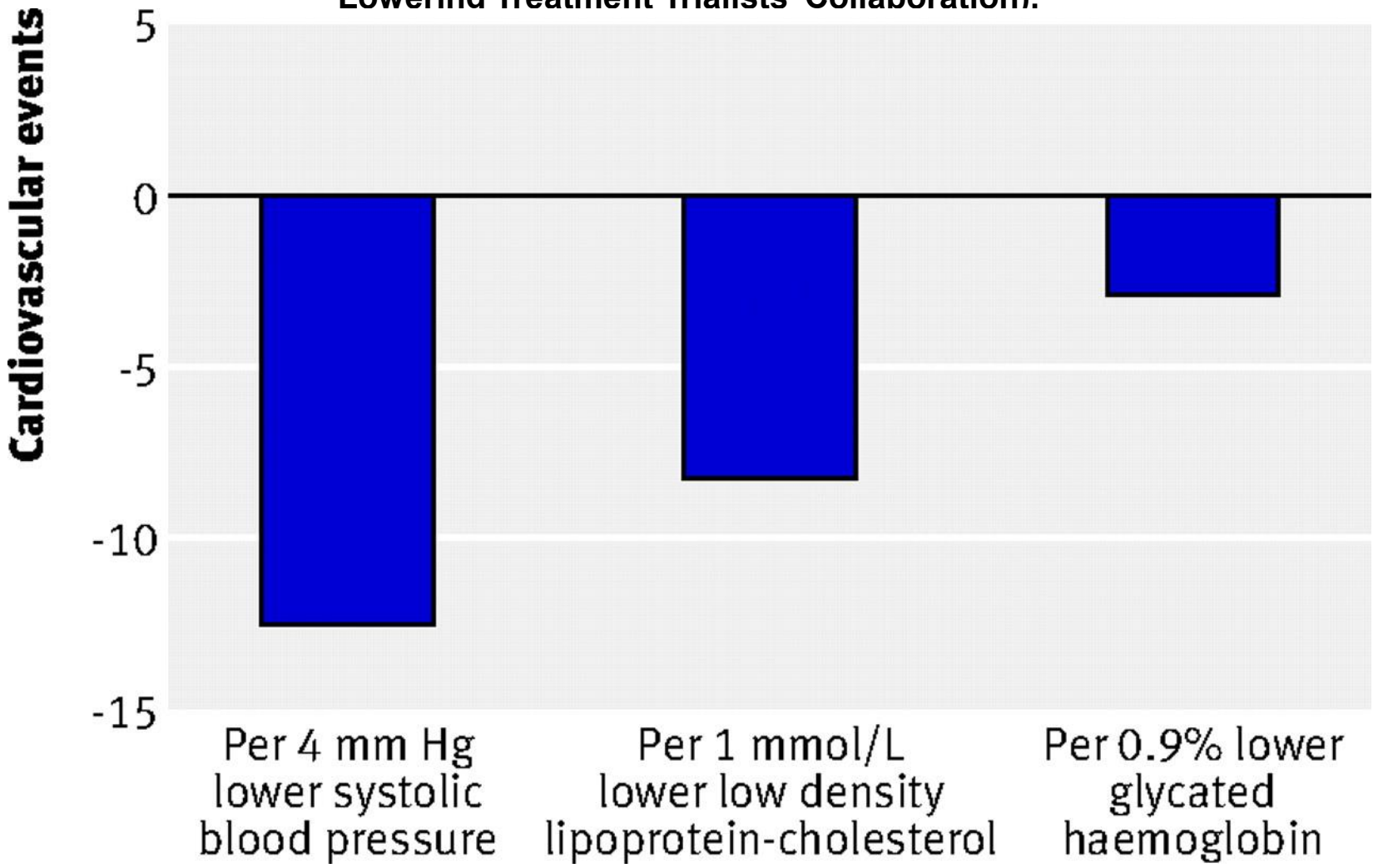
2007

- A1C <7%
- BP <130/80 mmHg
- LDL <100mg/dL
- Aspirin in pts >40 yrs old

2015

- A1C target should be ***individualized*** (<7%, <8%)
- BP <140/90
- Lipid Management:
  - Moderate- and High-Intensity Statin Therapy
- Antiplatelet agents
  - Yes in CVD
  - For rest, depends on CVD risk

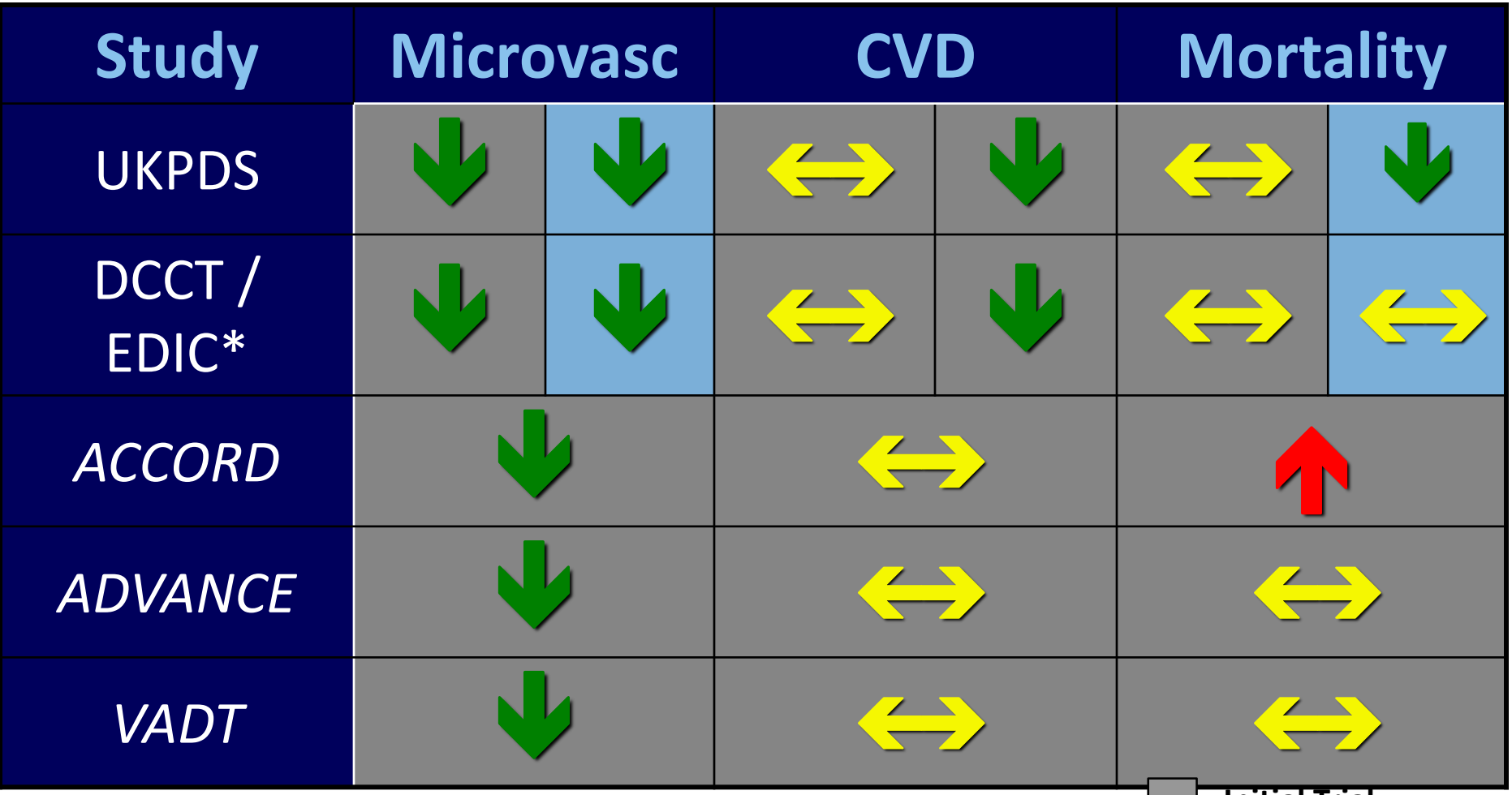
Absolute number of events prevented by different interventions per 1000 patient years of treatment (data taken from Cholesterol Treatment Trialists' Collaboration and Blood Pressure Lowering Treatment Trialists' Collaboration).



Preiss D , Ray K K BMJ 2011;343:bmj.d4243

A1C Targets

Impact of Intensive Therapy for Diabetes: Summary of Major Clinical Trials



Kendall DM, Bergenstal RM. © International Diabetes Center 2009

Initial Trial

Long Term Follow-up

* in T1DM

UK Prospective Diabetes Study (UKPDS) Group. *Lancet* 1998;352:854.
Holman RR et al. *N Engl J Med*. 2008;359:1577. DCCT Research Group. N Engl J Med 1993;329;977.
Nathan DM et al. *N Engl J Med*. 2005;353:2643. Gerstein HC et al. *N Engl J Med.* 2008;358:2545.
Patel A et al. N Engl J Med 2008;358:2560. Duckworth W et al. N Engl J Med 2009;360:129. (erratum: Moritz T. *N Engl J Med* 2009;361:1024)

Management of Hyperglycemia in Type 2 Diabetes: A Patient-Centered Approach

Position Statement of the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD)

American Diabetes Association.

EASD

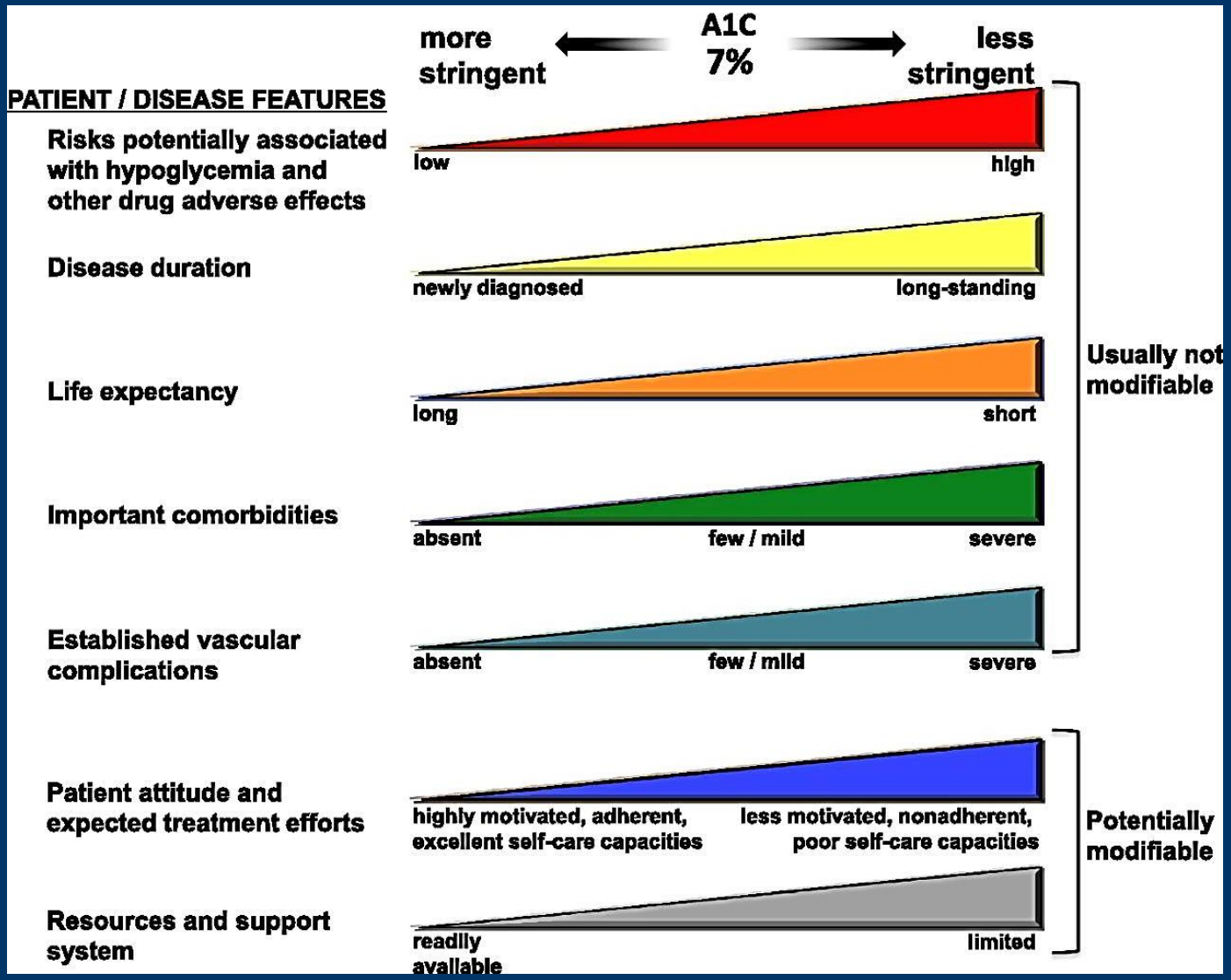
3. ANTI-HYPERGLYCEMIC THERAPY

- **Glycemic targets**
  - **HbA1c < 7.0%** (mean PG ~150-160 mg/dl [8.3-8.9 mmol/l])
  - Pre-prandial PG <130 mg/dl (7.2 mmol/l)
  - Post-prandial PG <180 mg/dl (10.0 mmol/l)
  - **Individualization** is key:
    - ➢ Tighter targets (6.0 - 6.5%) - younger, healthier
    - ➢ Looser targets (7.5 - 8.0%$^{+}$) - older, comorbidities, hypoglycemia prone, etc.
  - Avoidance of hypoglycemia

PG = plasma glucose

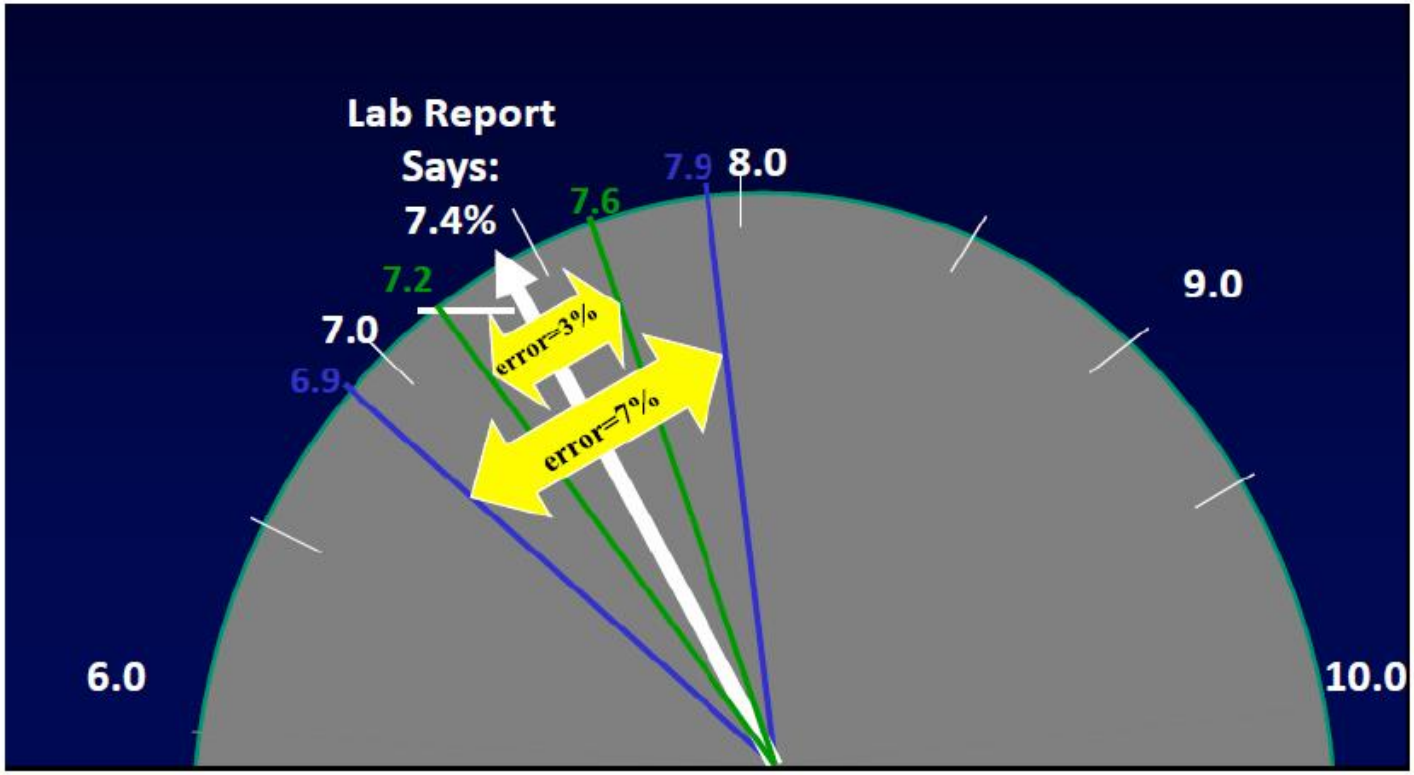
Diabetes Care, Diabetologia. 19 April 2012 [Epub ahead of print]

Approach to the Management of Hyperglycemia



ADA. 6. Glycemic Targets. Diabetes Care 2015;38(suppl 1):S37. Figure 6.1; adapted with permission from Inzucchi SE, et al. Diabetes Care, 2015;38:140-149

A1c Variability "Speedometer"



A1C Targets

- ***Individualize*** glucose targets—really!
  - Younger, healthier patients: aim for <7% (or *lower*)
    - Excellent glucose control achieved and maintained early in the course of diabetes has long-term benefits, including for CVD
  - Longer duration of diabetes, more co-morbidities and lots of meds already: liberalize glucose targets (ranges)
    - Think carefully about whether to add another medication (and which one) to lower glucose
    - Hypoglycemia causes "considerable morbidity and even mortality"

Diabetes Care 2013;36:1384-1395

- Focus more efforts on patients with A1Cs >9.0%
- Future EHRs: help with selecting, documenting target for each patient—VA already has a prototype

Blood Pressure

Blood Pressure: JNC 8 Panel

- 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults
  - Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8) *JAMA* 2014;311(5):507-520
- Very rigorous guideline development process
- Target for people with diabetes +/- CKD:

  <140/90
- Recommended medications:
  - Thiazide diuretic, ACEI/ARB, Calcium Channel Blocker
  - If CKD: start with ACEI or ARB
  - Big change: Beta blockers no longer recommended for first-line treatment of hypertension (different issue from CVD)

Recommendations: Hypertension/Blood Pressure Control

Goals

- People with diabetes and hypertension should be treated to a systolic blood pressure goal of <140 mmHg **A**
- Lower systolic targets, such as <130 mmHg, may be appropriate for certain individuals, such as younger patients, if it can be achieved without undue treatment burden **C**
- Patients with diabetes should be treated to a diastolic blood pressure <90 mmHg **A**
- Lower diastolic targets, such as <80 mmHg, may be appropriate for certain individuals, such as younger patients, if it can be achieved without undue treatment burden **B**

ADA. 8. Cardiovascular Disease and Risk Management. Diabetes Care 2015;38(suppl 1):S49

Blood Pressure Measurement

So easy to do (incorrectly)!

BP Measurement

- Measure BP at all routine visits
- Measuring BP in clinic:
  - Patient has rested for 5 minutes, is seated with feet on floor, arm supported at heart level
  - Cuff size should be appropriate for upper arm
  - Confirm elevated values on a different day

ADA 2015 Clinical Practice Recommendations

- Differences in BP Devices
  - Mercury, aneroid, electronic

Common Sources of BP Measurement Errors

- Incorrect cuff size
  - Use correct size for mid upper arm
  - Have all sizes of adult cuffs available where BPs measured
    - Small adult, Adult, Large adult, Adult thigh (for very large upper arms)
- Terminal digit bias
  - Significant tendency toward recording zeros
- Inadequate staff training and equipment maintenance
- Talking or listening to patient/colleague while taking BP
- BP cuff placed over clothing
- Smoking or caffeinated beverages within 30 min of BP
- Patient's back and/or arm unsupported
- Feet crossed or dangling

"Blood Pressure Measurement Toolkit: Improving Accuracy, Enhancing Care"

- Excellent booklet by the Wisconsin Heart Disease and Stroke Prevention Program, Wisconsin Dept. of Health Services
- Trains clinicians on proper BP measurement and even provides a PDSA framework for improving clinic processes

https://www.dhs.wisconsin.gov/publications/p0/p00623.pdf

BP Targets

- **<140/90:** target for (most) diabetes patients
  - Good BP control definitely reduces CVD, CKD risks
  - Balance need for good BP control with risk of problems
    - Hypotension, fatigue, polypharmacy issues are common
    - Use caution in patients who have symptoms at <140/90 and/or with meds needed to achieve it
      - Higher risk: Older, comorbidities, longer duration of DM, on lots of meds, autonomic neuropathy
      - Antihypertensive meds associated with falls/injuries in elderly *JAMA Intern Med* 2014;doi:10.1001/jamainternmed.2013.14764

Lipid Management

2013 ACC/AHA Guideline on the Treatment of Blood Cholesterol to Reduce Atherosclerotic Cardiovascular Risk in Adults

J Am Coll Cardiol

E-pub: November 12, 2013

ACC/AHA Cholesterol Guidelines

- ATP IV panel's work in conjunction with ACC/AHA
- Guideline highlights (it's all about statins!)
  - No longer recommended to treat to LDL targets
  - Treat w/moderate or high-intensity statin therapy:
    - Clinical CVD: high-intensity if <75 y/o, moderate if older
    - LDL ≥190mg/dL: high-intensity
    - DM pts 40-75 y/o with LDL 70-189 mg/dL but no known CVD: moderate—high-intensity if 10-yr CVD risk ≥7.5%
    - Other pts with 10-yr CVD risk ≥7.5%: moderate or high

ACC/AHA Cholesterol Guidelines

- Statin dosing:
  - **High-intensity**: atorvastatin 40-80 mg, rosuvastatin 20-40 mg
  - **Moderate-intensity**: atorvastatin 10-20 mg, rosuvastatin 5-10 mg, simvastatin 20-40 mg, pravastatin 40-80 mg
- What do we do with the patients who can't tolerate statins: at high/moderate dose, low dose, or at all?
  - Try different statin (esp. if sx with simvastatin), start at low dose/titrate up slowly
  - Use of non-statin lipid agents only if high risk patient can't tolerate sufficient statin dose +/- therapeutic response

Recommendations for Statin Treatment in People with Diabetes (4)

Age	Risk factors	Recommended statin dose*	Monitoring with lipid panel
<40 years	None	None	Annually or as needed to monitor for adherence
	CVD risk factor(s)**	Moderate or high	
	Overt CVD***	High	
40–75 years	None	Moderate	As needed to monitor adherence
	CVD risk factors	High	
	Overt CVD	High	
>75 years	None	Moderate	As needed to monitor adherence
	CVD risk factors	Moderate or high	
	Overt CVD	High	

* In addition to lifestyle therapy.

** CVD risk factors include LDL cholesterol ≥100 mg/dL (2.6 mmol/L), high blood pressure, smoking, and overweight and obesity.

*** Overt CVD includes those with previous cardiovascular events or acute coronary syndromes.

ADA. 8. Cardiovascular Disease and Risk Management. Diabetes Care 2015;38(suppl 1):S52, Table 8.1

Recommendations: Dyslipidemia/Lipid Management (6)

Treatment recommendations and goals

- Combination therapy has been shown not to provide additional cardiovascular benefit above statin therapy alone and is not generally recommended **A**
- Statin therapy is contraindicated in pregnancy **B**

ADA. 8. Cardiovascular Disease and Risk Management. Diabetes Care 2015;38(suppl 1):S52

Antiplatelet Therapy

Recommendations: Antiplatelet Agents (1)

- Use aspirin therapy (75–162 mg/day)
  - Secondary prevention strategy in those with diabetes with a history of CVD **A**
- Consider aspirin therapy (75–162 mg/day) **C**
  - As a primary prevention strategy in those with type 1 or type 2 diabetes at increased cardiovascular risk (10-year risk >10%)
  - Includes most men >50 years of age or women >60 years of age who have at least one additional major risk factor
    - Family history of CVD
    - Hypertension
    - Smoking
    - Dyslipidemia
    - Albuminuria

ADA. 8. Cardiovascular Disease and Risk Management. Diabetes Care 2015;38(suppl 1):S54

Resources From the IHS Division of Diabetes

www.diabetes.ihs.gov

DDTP Website: www.diabetes.ihs.gov

At no cost to I/T/U sites/clinicians:

- Diabetes Treatment Algorithms
- Standards of Care
- Online Catalog
  - Diabetes educational materials
- CME/CE Training
  - Live: “Advancements in Diabetes” monthly webinars
  - Online: Recorded trainings, new one added monthly

www.diabetes.ihs.gov – Home Page

Division of Diabetes Treatment and Prevention
Leading the effort to treat and prevent diabetes in American Indians and Alaska Natives

Thursday, April 12, 2012

HOME
ABOUT US
PROGRAMS
- SDPI
- Model Diabetes Programs
- IDEP

PEOPLE
- DDTP
- ADCs
- TLDC

LEARN Hubs
- CKD
- Foot Care
- Glucose Management
- Physical Activity

TRAINING
- Web-Based
- AADE Partnership
- External Trainings
- Conferences

RESOURCES
- Audit
- Fact Sheets
- Instant Downloads
- Mobile Video Podcasts
- Online Catalog
- Patient Education Materials
- Podcasts
- Provider Resources

TOOLS
- Best Practices
- Clinical Guidelines
- Curricula
- DM Treatment Algorithms
- Quick Guide Cards

SITE MAP

Tools – Clinical Guidelines Update

Standards of Care: Type 2 Diabetes – Revised edition has new and enhanced sections about diabetes in youth, women of childbearing age and caring for patients with multiple comorbid conditions. Expanded tools and provider resources, plus better navigation.

1 2 3 4 5 6

Go To Guidelines

Provider Resources

Clinical Tools
- Diabetes Treatment Algorithms
- Quick Guide 'How To' Cards
- Diabetes LEARN

Clinical Guidelines
- Standards of Care and Clinical Practice Recommendations [PDF - 540KB]
  - Summary Table of Recommendations [PDF - 145KB]
  - Additional Tools and Resources [PDF - 260KB]
  - Bibliography [PDF - 245KB]

All CME Trainings
- Diabetes Foot Care
- Preventing Amputations in Diabetes
- Obstructive Sleep Apnea and Diabetes
- Diabetes Standards of Care and Treatment Targets
- Managing CKD
- Screening and Monitoring CKD
- CKD Nutrition

SDPI Spotlight

Community-Directed Programs
Application Information – Information and resources for **FY 2012** Continuation Application.

Reporting Requirements
FY 2011 Annual Progress Report - Templates and Resources.

FY 2012 Mid-Year Progress Report – Information and resources.

Open period for reporting for Cycle 2 begins May 1st!

Training Opportunities – Online seminars specific to grant requirements.

Mark your calendars now for upcoming SDPI Required Trainings:
July 11, 2012 @ 1 PM MDT
October 10, 2012 @ 1 PM MDT

Optional SDPI Training Series
Tipping the Motivational Balance for Change! Darryl Tonemah, PhD

Diabetes Prevention & Healthy Heart Initiatives
Information.

What's New

Advancements in Diabetes Seminars
Session information – CME/CE Series

Upcoming Sessions:

May 23, 2012 @ 1 PM MDT
Individualizing Diabetes Targets: One Size Does Not Fit All
Ann Bullock, MD

The IHS Diabetes Care and Outcomes Audit 2012
The WebAudit is now open and the RPMS/DMS patch is available.

2011 Best Practice Addendum
[PDF - 232KB] – Provides the most current information on the Required Key Measures along with examples of ways to obtain the measures.

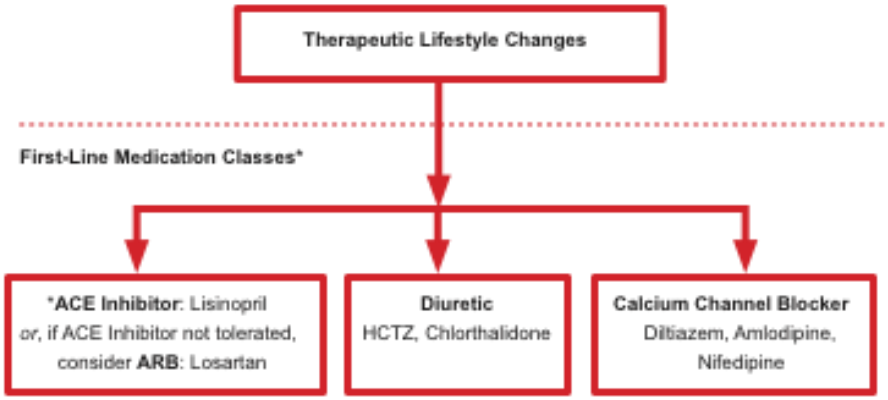
Diabetes Foot Care Hub – April is Foot Care Awareness Month, great time to update your knowledge and skills for diabetes foot care treatment and prevention.

Division of Diabetes Treatment and Prevention | Phone: (505) 248-4182 | Fax: (505) 248-4188 | diabetesprogram@ihs.gov

IHS Hypertension Management Algorithm

- Available on the IHS Division of Diabetes website: www.diabetes.ihs.gov, specific page:
  - http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsDTTreatmentAlgorithm
  - Also available on mobile devices
- Includes hypertension treatment approach based on JNC 8 Panel recommendations
  - Medications, dosing reference
    - IHS Core Formulary meds and a few others commonly prescribed

Hypertension Management



**consider ACE Inhibitor or ARB as intial medication for patients with Chronic Kidney Disease*
Do not use an ACE Inhibitor and ARB together in the same patient.

If BP not at goal in one month, consider titrating dose up and/or adding medication from a different class above. Utilize these 3 classes before considering addtional medication classes.

Consider Additional Medication Classes

If BP not at goal or unable to tolerate the first-line medication classes above, consider adding medications from additional drug classes. Base selection on individual patient indications.

Beta Blocker	Alpha Blocker
Metoprolol, Atenolol	Prazosin, Doxazosin

Treat BP to targets as tolerated:

Systolic BP target < 140**

Diastolic BP target < 90

** Individualize BP targets and medication therapy. Patients who are older and/or have significant comorbid conditions and cannot tolerate BP < 140/90, may require higher BP targets to prevent adverse effects (e.g. hypotension, fatigue, diziness). For example, consider systolic BP target < 150 in patients ≥ 60 years.

ACE Inhibitors (ACEI)/Angiotensin Receptor Blocker (ARBs) First line medication choice for patients with Chronic Kidney Disease Can cause ↑ K^+, ↑ creatinine; cough (with ACEI), rarely angioedema. Do not use an ACEI and an ARB at the same time.	
Lisinopril (Prinivil®, Zestril®)	Start 2.5-5mg daily; usually 20-40mg daily; max 80mg daily
Losartan (Cozaar®)	Start 25-50mg daily; max 100mg daily. Consider if unable to tolerate ACEI
Diuretics	
HCTZ	Start 12.5mg daily; usually 25-50mg daily; Can ↓ K^+ Higher doses may be used for other indications (e.g. edema)
Chlorthalidone	Start 12.5mg daily; usually 25-50mg daily; Can ↓ K^+ Higher doses may be used for other indications (e.g. edema)
Calcium Channel Blockers	
Amlodipine (Norvasc®)	Start 2.5-5mg daily; usually 5-10mg daily. Consider in patients with angina or CHF
Diltiazem (Cardizem®)	*Note*: multiple formulations exist: Immediate Release (TID-QID), SR/Sustained Release (BID), CD/Controlled Delivery (daily), and LA/Long Acting (daily) Consult your local formulary to assure appropriate selection and dosing For diltiazem CD start 180-240mg daily; usually 240-360mg daily; max 480mg daily
Nifedipine XL (Adalat®/ Procardia®)	Start 30mg daily; usually 30-90mg daily; max dose120mg daily Caution edema, CHF, and MI
Beta Blockers Don't use if bradycardia or 2nd/3rd degree block. Caution in severe CHF, asthma, or renal dysfunction.	
Atenolol (Tenormin®)	Start 25-50mg daily in 1-2 divided doses; usually 50-100mg/day Eliminated renally (caution Renal Failure)
Metoprolol (Lopressor®)	Start 50-100mg daily in 1-2 divided doses; usually 100-200mg/day. Max 450mg daily *XR formulation dosed once daily.* Eliminated hepatically (caution in Liver Failure)
Propranolol (Inderal®)	Start Long Acting 80mg daily or Immediate release 40mg BID; usually 120-240mg daily; max 640mg daily
Carvedilol (Coreg®) (Immediate Release Dosing)	Start 6.25mg BID; usually12.5-25mg BID. *CR formulation dosed once daily.* Also indicated for heart failure (start at 3.125mg BID)
Alpha Blockers	
Doxazosin (Cardura®)	Start 1mg immediate release at bedtime; Max dose 16mg daily Titrate up slowly; Can cause dizziness, drowsiness, and weakness
Prazosin (Minipress®)	Start 1mg PO BID-TID (first dose at bedtime); Max dose 15mg daily Titrate up slowly; Can cause dizziness, drowsiness, and weakness
Central Acting	
Clonidine (Catapres®)	Start 0.1mg BID (first dose at bedtime); usually 0.1-0.3mg BID; max 1.2mg BID Titrate up slowly; Can cause sedation/dizziness/weakness; Do not stop abruptly

Drugs in *italics* are **not** on the IHS National Core Formulary

Note: This is not a complete prescribing reference. This algorithm is not intended for treatment selection in children or in women who are or could become pregnant; some antihypertensive medications can cause fetal damage.

Ref: JNC 8 Panel; http://jama.jamanetwork.com/article.aspx?articleid=1791497.

ADA 2015 Clinical Practice Recommendations; http://care.diabetesjournals.org/content/38/Supplement_1.

Smart Phone Instructions

- Access internet address on your iPhone Safari tab and go to **diabetes.ihs.gov**
- Click on **Provider Mobile Site**
- Disclaimer screen - Click **Continue**
- Provider resources page – click arrow to **Treatment Algorithms**
- Click on **Hypertension**
- **Hypertension treatment guidelines (algorithm) page appears**
- Roll to the bottom of this screen and click on the **Icon to Add to Home Screen** (tap the box with an upward arrow)
- Click on the “**Add to Home Screen**” .

Android device instructions

- Access the Browser and type in www.diabetes.ihs.gov
- In Orange side bar, click **Clinical Resources**
- Under the red bar **Clinical Tools**, Click on **Diabetes Treatment Algorithms**
- In upper right corner, click on the **smartphone image** (Access Mobile Versions)
- Click on **Hypertension bar**
- Roll down and Click on lower right **3 bullet points**
- Click on "**Add to Home Screen**"

IHS Diabetes Listserv

- DDTP recently inherited the Diabetes Listserv
- Intended for I/T/U clinicians
  - Different from DDTP's SDPI grantee and Audit email lists
- Sign up on the IHS Listserv page
- You'll receive email announcements on:
  - Upcoming trainings
    - Advancements in Diabetes and other CME/CE webinars
    - NDEP, VA, and other trainings
  - New diabetes materials/trainings on DDTP website
  - Coming soon: DDTP working with NIH librarian to provide brief summaries/links to new diabetes and AI/AN literature

Trauma-Informed Diabetes Care

"As human beings we belong to an extremely resilient species. Since time immemorial we have rebounded from our relentless wars, countless disasters (both natural and man-made), and the violence and betrayal in our own lives. But traumatic experiences do leave traces, whether on a large scale (on our histories and cultures) or close to home, on our families, with dark secrets being imperceptibly passed down through generations. They also leave traces on our minds and emotions, on our capacity for joy and intimacy, and even on our biology and immune systems."

The Body Keeps the Score: Brain, Mind, and Bocy in the Healing of Trauma, p. 1

Bessel van der Kolk, 2014

Trauma-informed care: reflected in the shift from "What's *wrong* with you?" to "What *happened* to you?"

The Integration of Trauma-Informed Care in the Family Partner Program, Issues Brief, Massachusetts Dept. of Mental Health, Children's Behavioral Health Research and Training Center, 2012

How would we re-think our care if we know that many people are dealing with trauma?

How do we reduce the likelihood that health care itself will trigger trauma responses in patients?

"Trauma-informed services are those in which service delivery is influenced by an understanding of the impact of interpersonal violence and victimization on an individual's life and development. To provide trauma-informed services, all staff of an organization, from the receptionist to the direct care workers to the board of directors, must understand how violence impacts the lives of the people being served, so that every interaction is consistent with the recovery process and reduces the possibility of retraumatization."

J Community Psychology 2005:33(4);461-477

Trauma and Health Care

- Everyone loves going for medical care…
  - AI/AN children often were lined up for immunizations, dental work through school without parent present
- Lack of clinic appt availability at many Indian health sites
  - Patients sometimes have to come as walk-ins, may not get in that day—disempowering, frustrating
    - Patients often wait til problems arise, so harder to treat and may get lectured on how they should have come in sooner
- Medical and dental care can easily trigger trauma response
  - Interaction with authority figures and unequal power systems
  - Dental care: vulnerable position, uncomfortable/painful, invasive, patient can't talk during procedure, may feel suffocated
  - Experiences of family members (esp. if witnessed) affect patients
    - e.g., going to hospital, starting insulin

Trauma-informed Care

- During the exam/procedure
  - Encourage patient to do what helps them feel comfortable
    - Have a support person with them +/- holding their hand
    - Listen to music, wear their coat, keep the x-ray apron on
    - Negotiate the angle of the exam table/dental chair, whether door/curtain is open, closed, or ajar
  - Talk to pt while they are clothed/sitting up, explain procedure, show tools to be used; tell them what you're doing and why
  - State clearly that the patient is in control and can take a break or stop exam/procedure at any point (and then honor this…)
- Make the *relationship* with patient the primary goal, not just meeting a particular requirement
  - Positive interactions with authority figures like providers contribute to healing from trauma—the converse is also true, especially for kids

Trauma-informed Diabetes Care

- How would we set up our clinics if we assumed that most patients are dealing with trauma?
  - Make appointment process as easy as possible
  - Peaceful, cheerful diabetes clinic environment
    - Lighting: warm vs. harsh/fluorescent; furniture comfortable
    - Consider what is on walls, magazines in waiting room
    - Signs: positive, not negative (e.g. if pt late to clinic)
  - Staff who are calm, kind and give straight-forward directions and explanations—we all *think* we do this…
  - Caring, supportive, nonjudgmental clinical/educational care
    - Diabetes is associated with trauma for many people: "bad news"
    - We have often blamed people for their diabetes control, behaviors
    - Food insecurity: be sure people have access to nourishing foods
  - Encourage questions, ask about and validate patient's concerns

Trauma-informed Diabetes Care

- Find out what's going on in their lives, how their kids are doing, etc.—and then listen to their responses
- Find out if they're taking their meds at the dosages you think they're taking (esp. insulin), without judgment
  - Ask about hypoglycemia, hypotension, med side effects
    - Which may be why they're not taking their meds as scheduled
- Pay more attention to them than to computer
- Be careful not to use jargon, keep decision questions clear/straightforward
- Find something to praise/appreciate, thank them for coming to see you

Perhaps most of all…

- Recognize that we have our own wounds to heal that impact our ability to interact with patients the way we want to—it's about changing **us**

- What are ways we can heal ourselves?
  - How can we avoid having our own traumas triggered by our patients?
    - How can we be aware of when this happens anyway and avoid taking it out on them?
  - How can we support our co-workers in this? How to be "mirrors" for each other?

How do we see our patients and ourselves?

- **Old Model**: Stereotyping, paternal
  - Patients are a bit lazy and must be reminded, motivated, coaxed, and even guilted/threatened into following our good medical advice (and not messing up our GPRA numbers!).
- **New Model**: Relationships, partnering
  - Given the context of their past and current life circumstances, patients are doing the best they can—clinicians can be important educators, counselors, cheerleaders, and non-judgmental supports to patients on their life journeys.

Walk through your clinic as if you were someone dealing with a lot of trauma. See what can be changed–it doesn't cost much to change the lighting, the posters on the wall, some clinic processes, the kindness we show.

Resources

- SAMHSA
  - National Center for Trauma-Informed Care

    www.samhsa.gov/nctic
  - Concept of Trauma and Guidance for a Trauma-Informed Approach. SAMHSA, July 2014

- Western Massachusetts Training Consortium

  www.wmtcinfo.org
  - Great pamphlet for providers available free on web:

  "Trauma Survivors in Medical and Dental Settings: Why Is This Important to Doctors and Dentists"

A short discussion of the emerging science around diabetes risk factors

“Understanding the Origins of Diabetes”

“Despite the emphasis on Western lifestyle as contributing to NCD risk, attempts to address the problem through modifying behavior in adults have met with limited success, indicating that such interventions occur too late in life to reduce risk substantially. Attention is now focused on ways in which early developmental factors contribute to later NCD risk, offering a new approach to how NCDs, such as diabetes, are inherited. …Aspects of the early developmental environment, reflected in the diet, behavior, and lifestyle of the mother and …father, play an important role, acting on the developing fetus through epigenetic processes that appear to contribute to risk via links to adiposity.”

JAMA 2014;311:575-576

- Inverse association between gestational age and elevated insulin levels at birth and in early childhood

JAMA 2014:311:587-596

Emerging science on DM risk factors

- In utero and early life stress/nutrition
  - Leg length in adulthood (marker of early life deprivation) independently assoc with lower insulin sensitivity

    Diabetes Care 2013;36:3599-3606
  - Lower insulin sensitivity ***predicts*** decline in physical activity in peripubertal Hispanic and African American girls

    Diabetes Care 2013;36:3739-3745
- Diet quality associated with weight gain even if calories restricted
  - Overeating, ↓ physical activity as consequences of poor diet quality, stress

    JAMA, published online May 16, 2014

Association Between Casino Opening and Obesity

- 117 school districts that encompassed tribal lands in California between 2001 and 2012
  - 57 gained/expanded a casino
  - 24 had a preexisting casino but did not expand
  - 36 never had a casino
- Every slot machine per capita gained was assoc with a $541 ↑ in per capita annual income and a decrease in percentage in poverty of 0.6% among AI living on tribal lands
  - **And ↓ probability of overweight/obesity of 0.19% in AI children**

JAMA 2014;311:929-936

Family Spirit Impact: Pregnancy to Age 3

Parenting

- Increased maternal knowledge [1,2,3,4]
- Increased parent self-efficacy [3,4]
- Reduced parent stress [2,4]
- Improved home safety attitudes[3]

Mothers' Outcomes

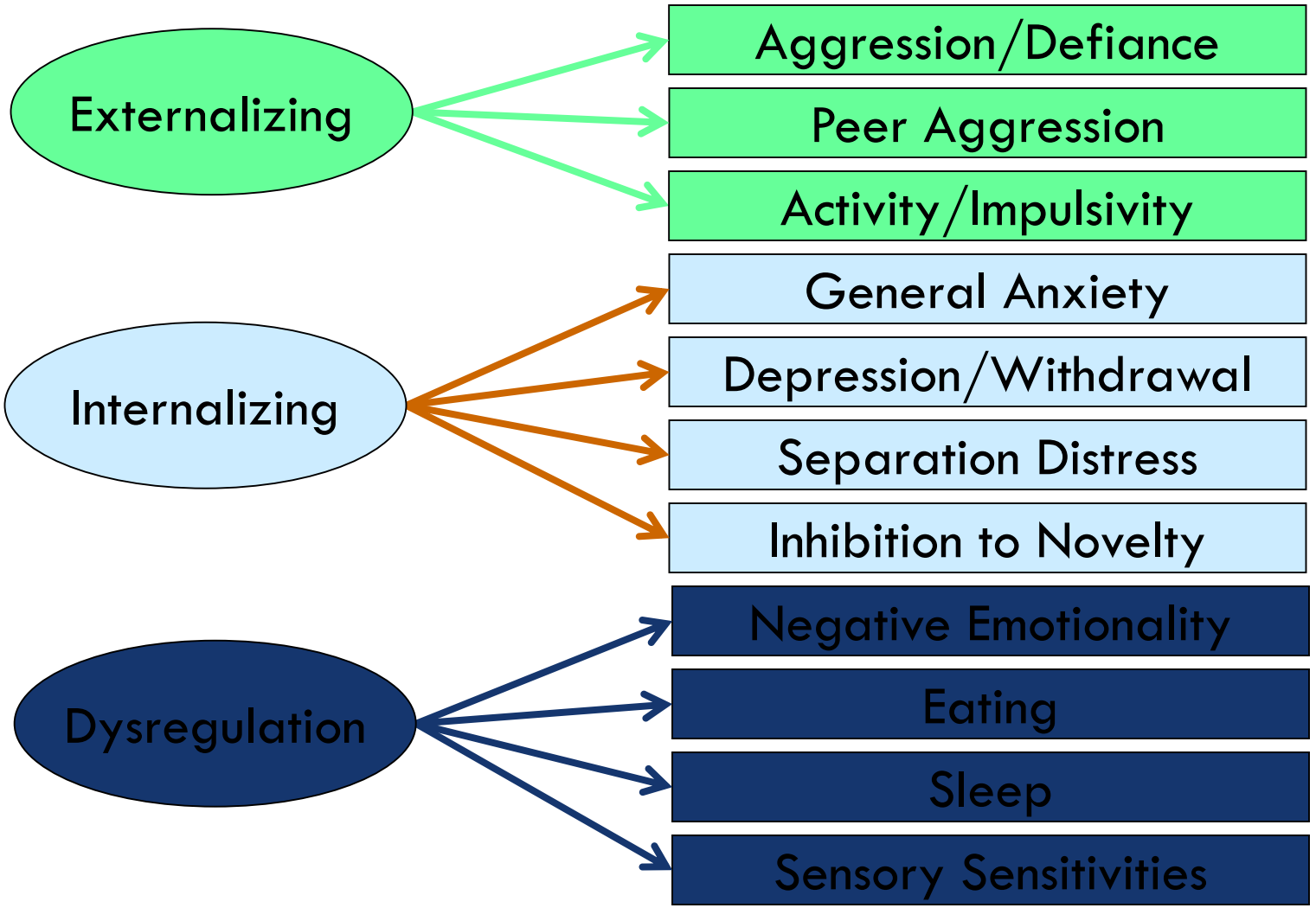
- Decreased depression. [1,2,4]
- Decreased substance use [4]
- Fewer risky behaviors [3,4]

Child Outcomes

- Fewer social, emotional and behavior problems through age 3. [2, 3, 4] → Decreased Externalizing, Internalizing and Dysregulation
- Lower clinical risk of behavior problems over life course [4]

1 Barlow A, Varipatis-Baker E, Speakman K, et al *Arch Pediatr Adolesc Med.* 2006;160:1101-1107
2 Walkup J, Barlow A, Mullany B, et al. *Journal of the American Academy of Child and Adolescent Psychiatry.* June 2009.
3 Barlow A, Mullany B, Neault N, et al. *American Journal of Psychiatry.* January 2013.
4 Barlow A, Mullany B, Neault N, et al. *American Journal of Psychiatry.*, February 2015.

ITSEA Problem Domains and Subscales within Domains



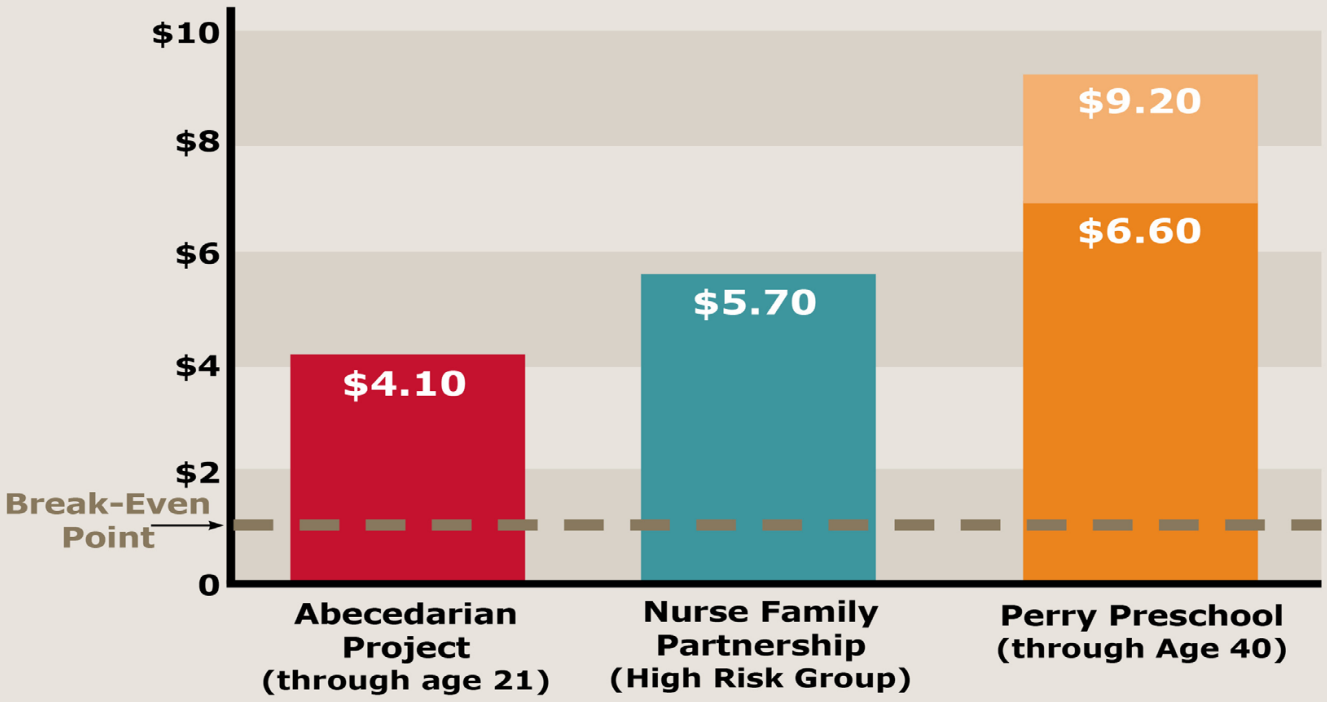
Parenting and Early Childhood Behavior Problems Associated with Obesity

- Negative parenting (inconsistent discipline; restrictive, coercive parenting) associated with increased obesity risk in children.
  - Int J Obes (Lond). 2006 Dec;30(12):1766-74.
  - Trends Endocrinol Metab. 2013 Apr 19 E-pub

- Externalizing behaviors at 24 mos associated with higher BMI at 24 months and thru age 12
  - *BMC Pediatr*. 2010 Jul 14;10:49

- Obese children have higher rates of externalizing and internalizing disorders.
  - *Acad Pediatr*. 2013 Jan-Feb;13(1):6-13

$4-$9 in returns for every dollar invested in early childhood programs



TOTAL RETURN PER $1 INVESTED

To Individuals
Increased earnings

To The Public
Crime-cost, special education and welfare savings, increased income taxes

Center on the Developing Child at Harvard website

Sources: Masse, L. and Barnett, W.S., A Benefit Cost Analysis of the Abecedarian Early Childhood Intervention (2002); Karoly et al., Early Childhood Interventions: Proven Results, Future Promise (2005); Heckman et al., The Effect of the Perry Preschool Program on the Cognitive and Non-Cognitive Skills of its Participants (2009)

"Early Life Investments Substantially Boost Adult Health"

- Carolina Abecedarian Project
- Study: 4 cohorts of disadvantaged children born 1972-77
  - Birth thru age 5 yrs
  - Intervention children received
    - Devel of language, emotional regulation, cognitive skills
    - Caregiving/supervised play
    - Nutrition: 2 meals and a snack at childcare center
    - Primary pediatric care
- In their mid-30s: lower prevalence of CVD and metabolic disease risk factors incl BP, A1C, obesity, HDL c/w controls

Science 2014;343:1478-1485

Imagine what our interventions to prevent diabetes will look like!

What are we doing now?

What could we start doing?

Thank you for all you do to improve the health of AI/AN people in the California Area

www.diabetes.ihs.gov

Ann Bullock, MD
Acting Director/Clinical Consultant
Division of Diabetes Treatment and Prevention
Indian Health Service

Diabetes Alphabet Soup Part 2

Topics

- Yesterday:
  - A1C, BP, Lipids, and Aspirin Goals
  - DDTP Clinical Resources
  - Trauma-Informed Diabetes Care
  - Ever-expanding science on diabetes risk factors
- Today:
  - Data: Prevalence, Audit, ESRD, GPRA
  - Diabetes in AI/AN Youth

TTAG Data Symposium
February 19, 2015

Diabetes Data in the Indian Health Service

IHS Diabetes Data Sources

- Government Performance and Results Act (GPRA) Measures
- National Data Warehouse
- Diabetes Care and Outcomes Audit

GPRA Performance Measures

- Annual results submission required for IHS sites, optional for Tribes
- Diabetes GPRA Measures:
  - Good Glycemic Control A1C <8%
  - Controlled Blood Pressure <140/90
  - LDL cholesterol assessed
  - Nephropathy (kidney disease) assessed
  - Retinopathy (eye disease) exam

2014 National Dashboard (IHS/Tribal) - Final

2014 Final National Dashboard (IHS/Tribal) DIABETES	2013 Target	2013 Final	2014 Target	2014 Final	2014 Final Results
Good Glycemic Control	Baseline	48.3%	48.3%	48.6%	Met
Controlled BP <140/90	Baseline	64.6%	64.6%	63.8%	Within 1% of Target
LDL (Cholesterol) Assessed	68.0%	72.7%	73.9%	73.4%	Within 1% of Target
Nephropathy Assessed[a]	64.2%	68.2%	Baseline	60.0%	Met
Retinopathy Exam	56.8%	57.6%	58.6%	59.9%	Met
DENTAL					
Dental: General Access	26.9%	28.3%	29.2%	28.8%	Within 1% of Target
Sealants	Baseline	13.9%	13.9%	14.6%	Met
Topical Fluoride	Baseline	26.7%	26.7%	27.9%	Met
IMMUNIZATIONS					
Influenza 65+	62.3%	68.0%	69.1%	68.1%	Within 1% of Target
Pneumovax 65+[a]	84.7%	89.2%	Baseline	85.7%	Met
Childhood IZ	Baseline	74.8%	74.8%	75.4%	Met
PREVENTION					
(Cervical) Pap Screening[a]	Baseline	61.7%	Baseline	54.6%	Met
Mammography Screening	49.7%	53.8%	54.7%	54.2%	Within 1% of Target
Colorectal Cancer Screening	Baseline	35.0%	35.0%	37.5%	Met
Tobacco Cessation	Baseline	45.7%	45.7%	48.2%	Met
Alcohol Screening (FAS Prevention)	61.7%	65.7%	65.9%	66.0%	Met
DV/IPV Screening	58.3%	62.4%	64.1%	63.5%	Within 1% of Target
Depression Screening	58.6%	65.1%	66.9%	66.0%	Within 1% of Target
CVD- Comprehensive Assessment	32.3%	46.7%	51.0%	52.3%	Met
Prenatal HIV Screening	82.3%	87.7%	89.1%	88.0%	Not Met
Childhood Weight Control[b]	24.0%	22.8%	N/A[b]	22.8%	N/A
Breastfeeding Rates	Baseline	29.0%	29.0%	35.1%	Met
Controlling High Blood Pressure (MH)[c]	N/A	N/A	Baseline	59.5%	Met
Public Health Nursing Encounters	405,962	388,590	425,679	Pending	N/A
Suicide Surveillance[d] (forms completed)	1,376	1,438	1,668	Pending	N/A

[a] Measure logic changes in FY 2014

[b] Long-term measure; will be reported in FY 2016

[c] New measure reported by federal and tribal programs as of FY 2014

[d] Measure data is submitted from 11 Areas

Measures in red are GPRAMA measures

Measures Met: 14

Measures Within 1% of Target: 7

Measures Not Met: 1

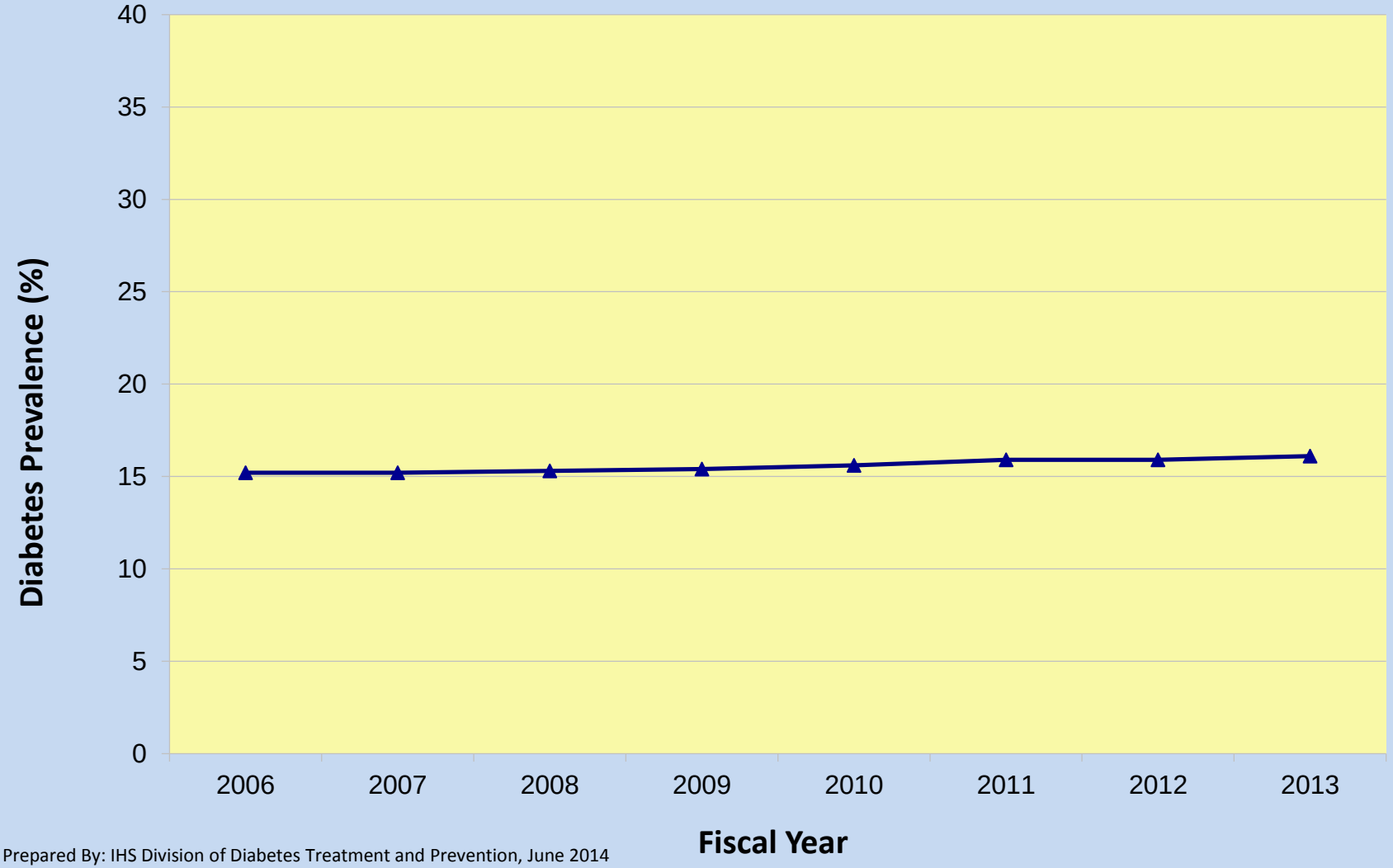
National Data Warehouse (NDW)

- Data submission required for IHS sites, voluntary for Tribal and Urban programs
- IHS Division of Diabetes estimates national diabetes prevalence from NDW Epi Data Mart
  - Many other uses, including childhood obesity prevalence

Diabetes Prevalence in AI/AN People* FY 2006-2013

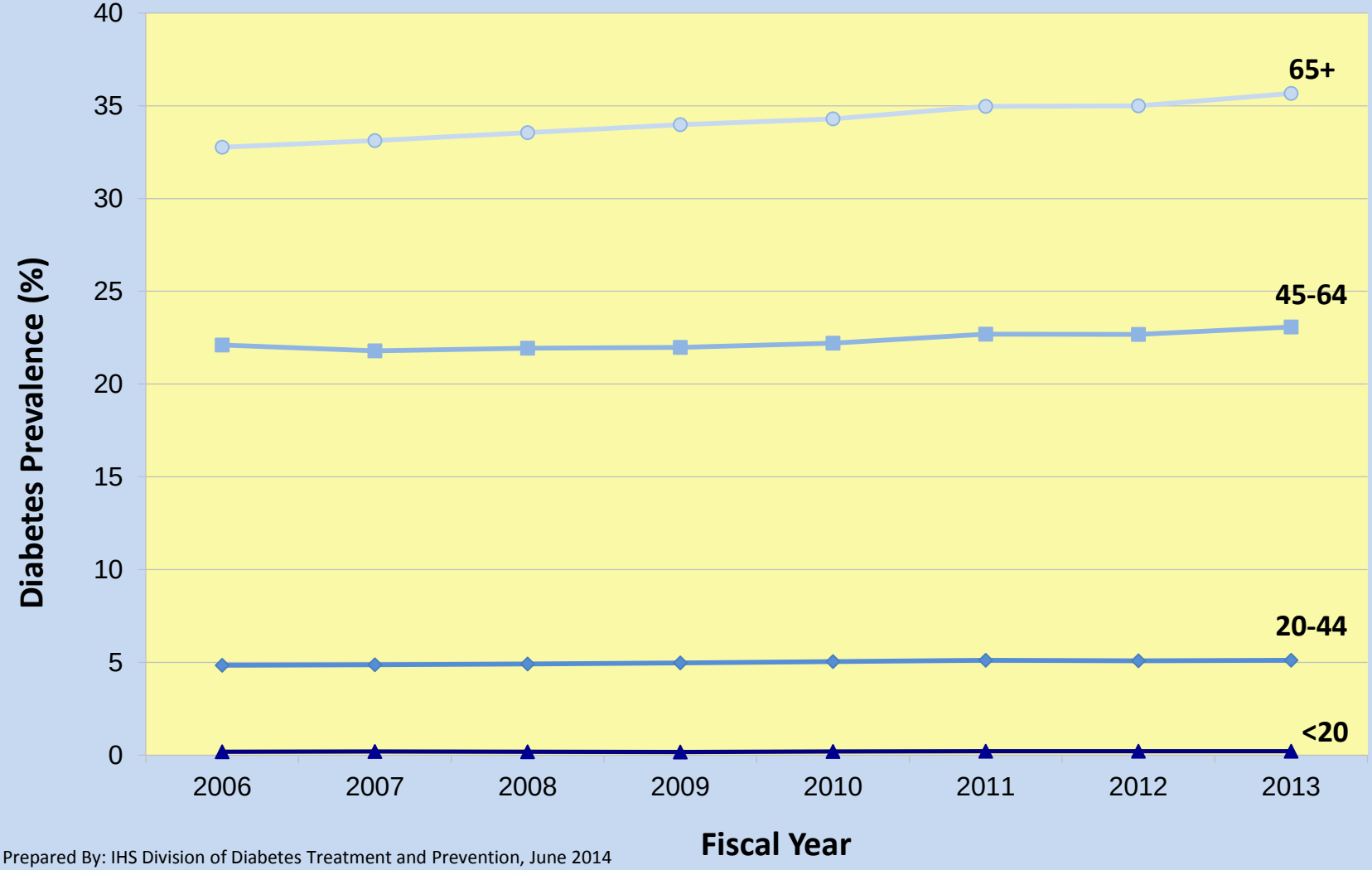
*Among people who seek care from sites that submit data to the IHS National Data Warehouse

Diabetes Prevalence in American Indians and Alaska Natives: 2006-2013
Adults (20+) - Age Adjusted to the US Population



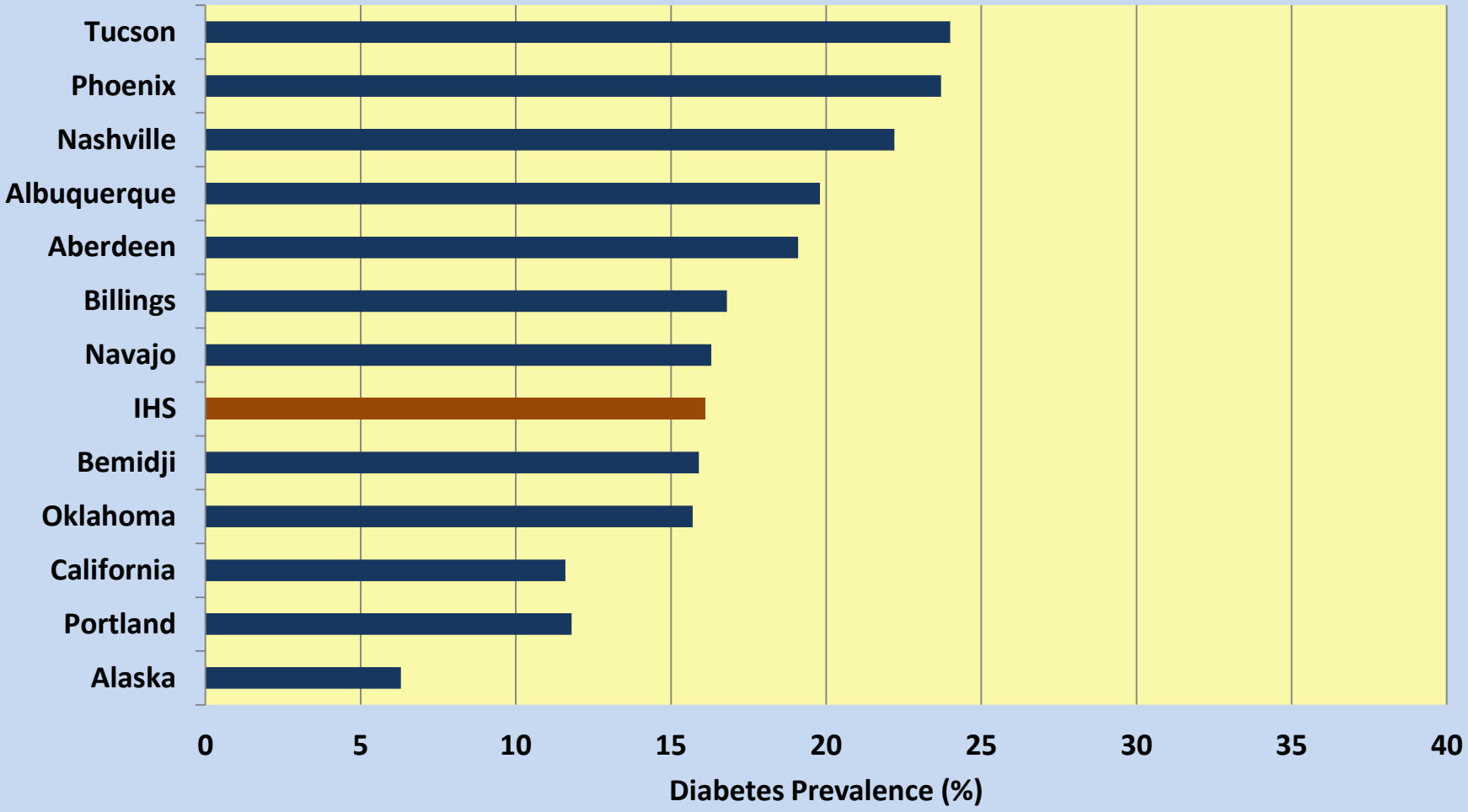
Prepared By: IHS Division of Diabetes Treatment and Prevention, June 2014
Data Source: IHS National Data Warehouse General Data Mart

Diabetes Prevalence in American Indians and Alaska Natives by Age Group: 2006-2013



Prepared By: IHS Division of Diabetes Treatment and Prevention, June 2014
Data Source: IHS National Data Warehouse General Data Mart

Diabetes Prevalence in American Indians and Alaska Natives
By Area for FY 2013
Adults (20+) - Age Adjusted to the US Population



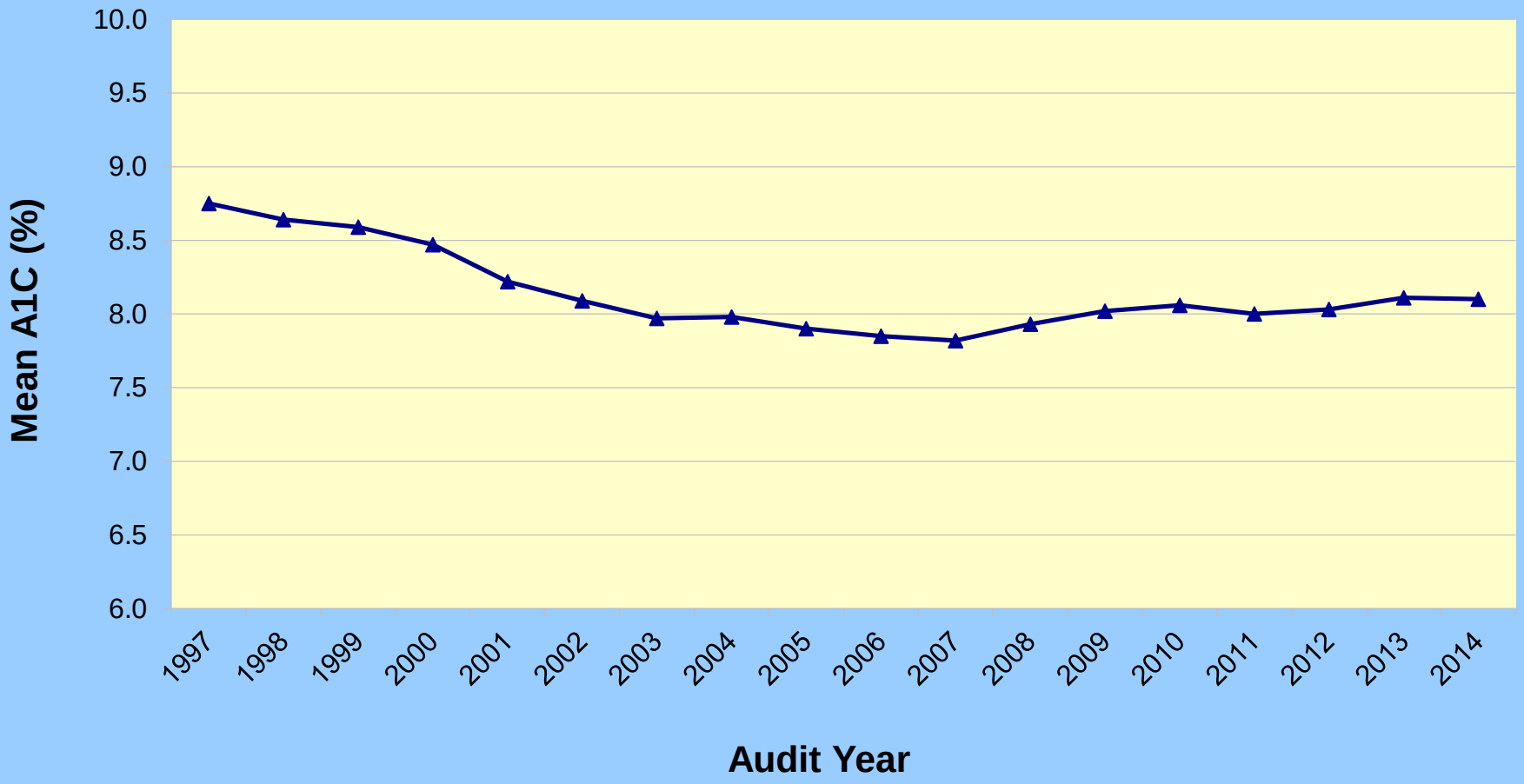
Prepared By: IHS Division of Diabetes Treatment and Prevention, June 2014
Data Source: IHS National Data Warehouse General Data Mart

Diabetes Care and Outcomes Audit 2014

331 I/T/U Facilities

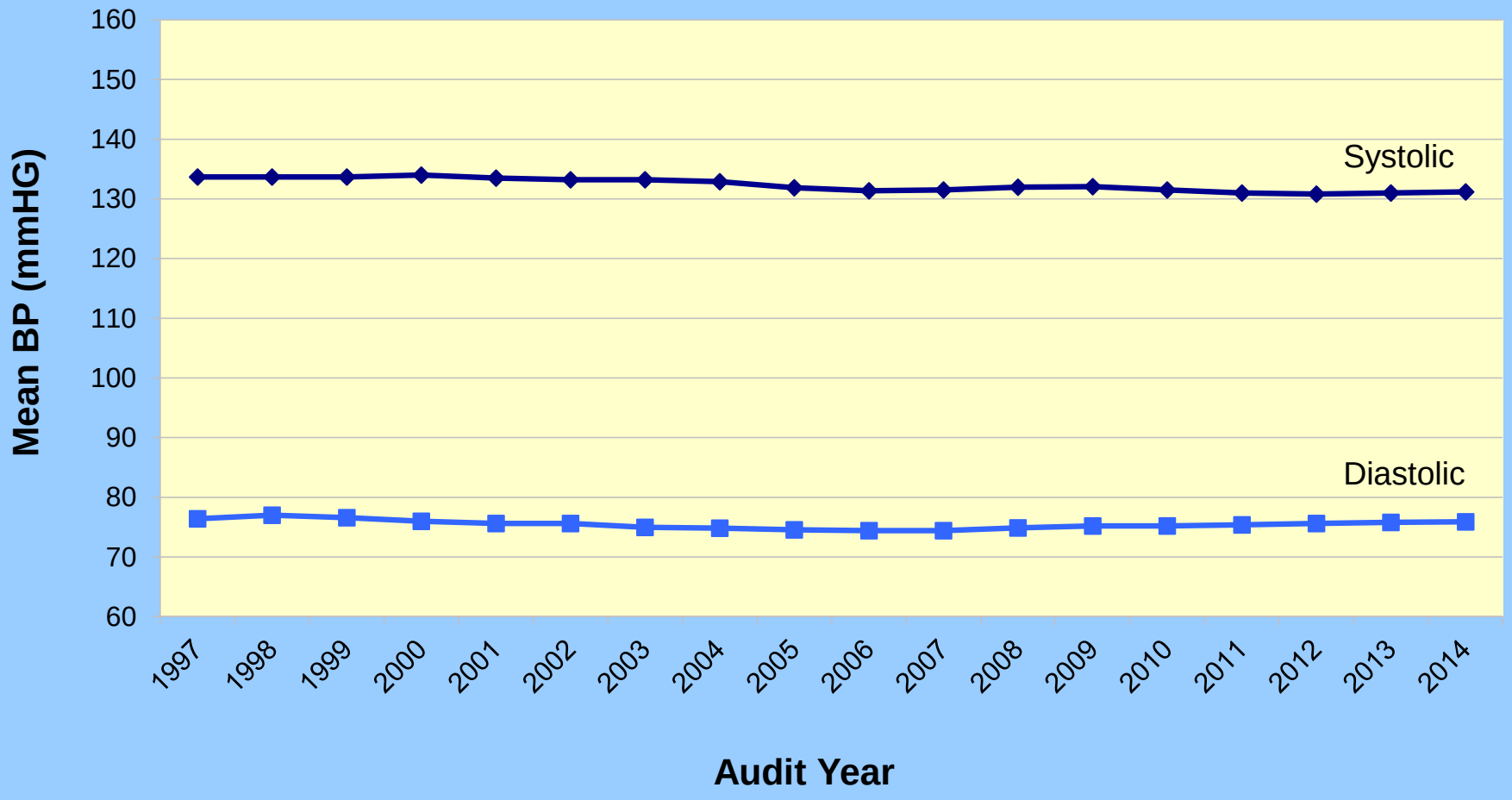
115,724 Charts

Mean A1C
1997-2014



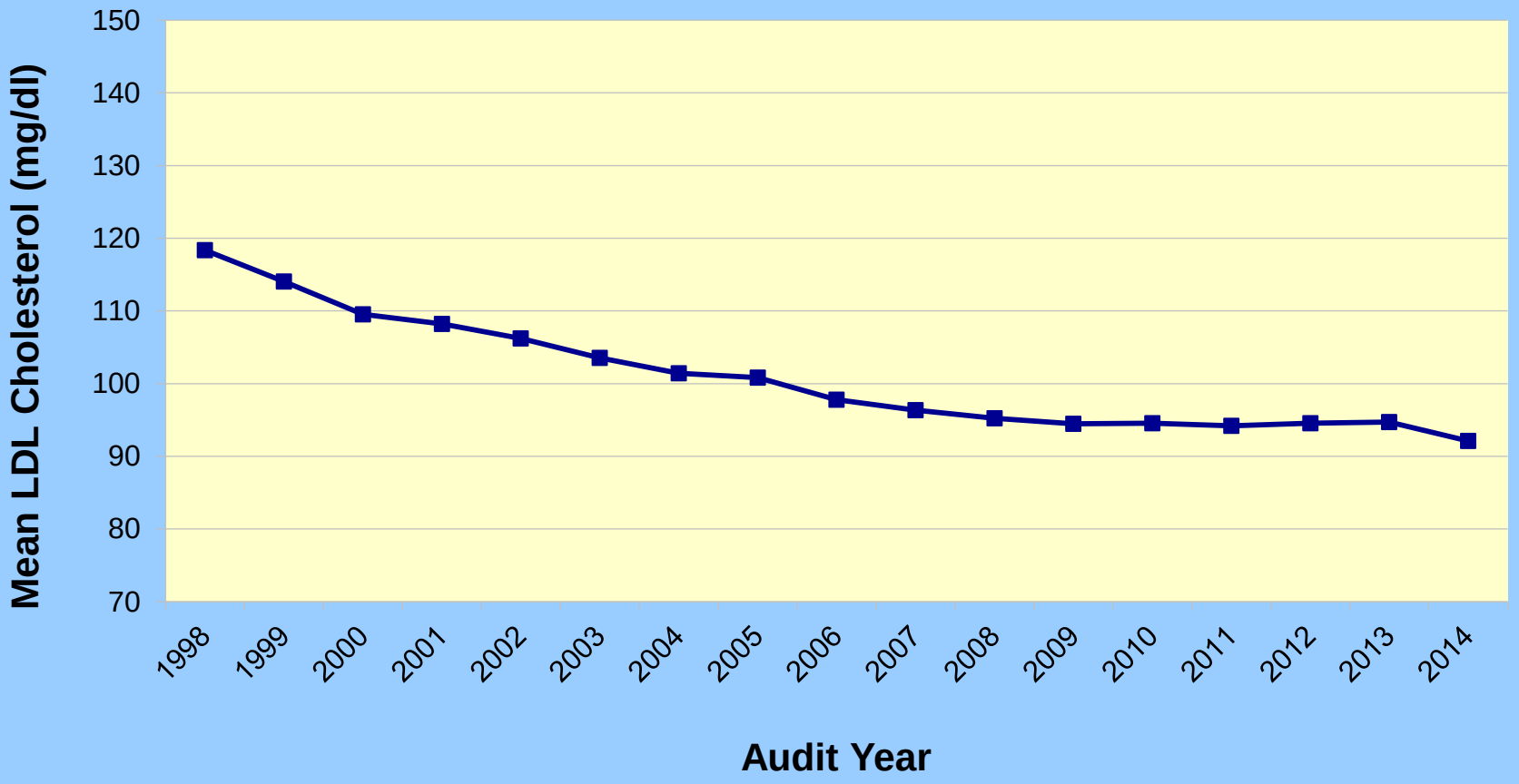
Source: IHS Diabetes Care and Outcomes Audit

Mean Blood Pressure
1997-2014



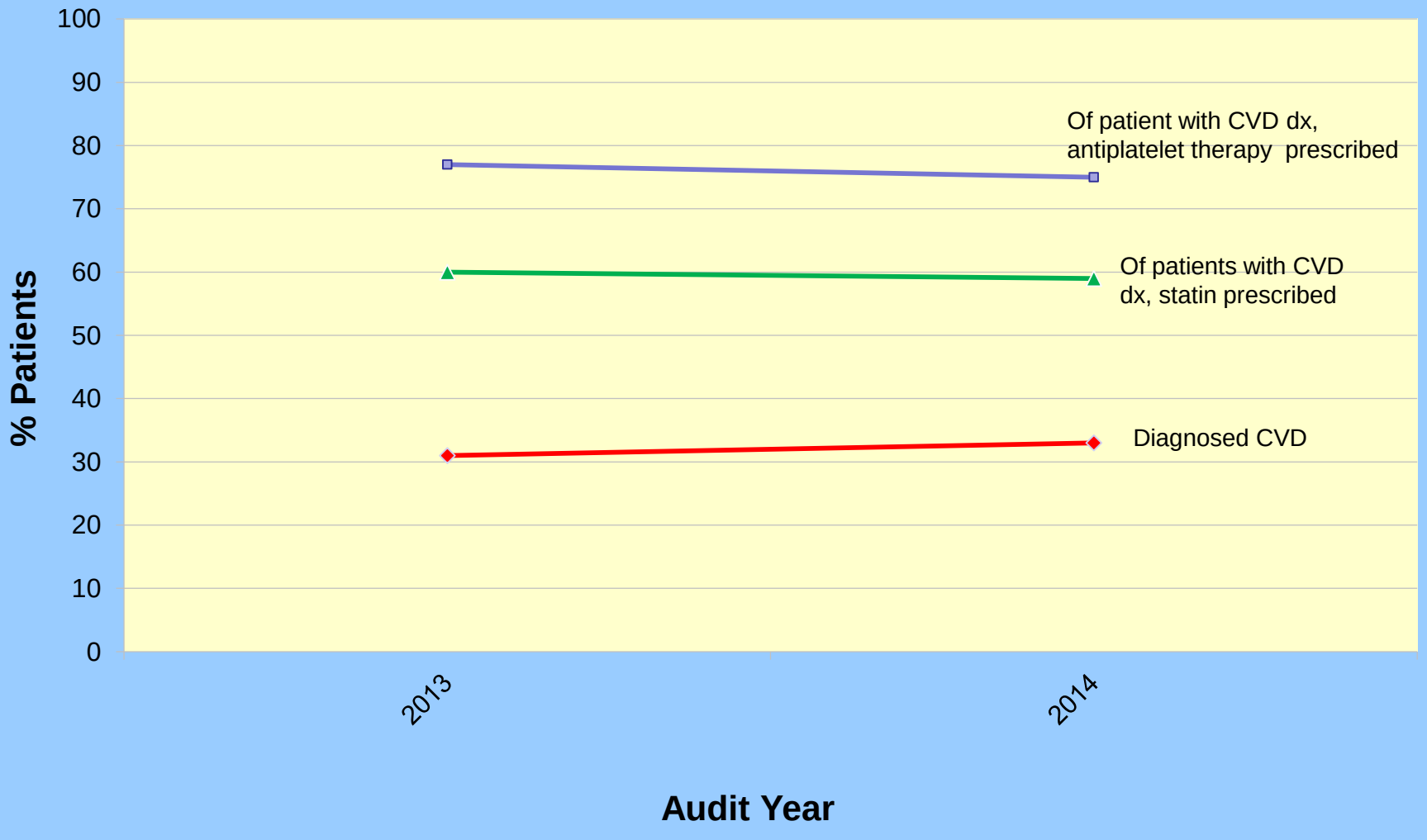
Source: IHS Diabetes Care and Outcomes Audit

Mean LDL Cholesterol
1998-2014



Source: IHS Diabetes Care and Outcomes Audit

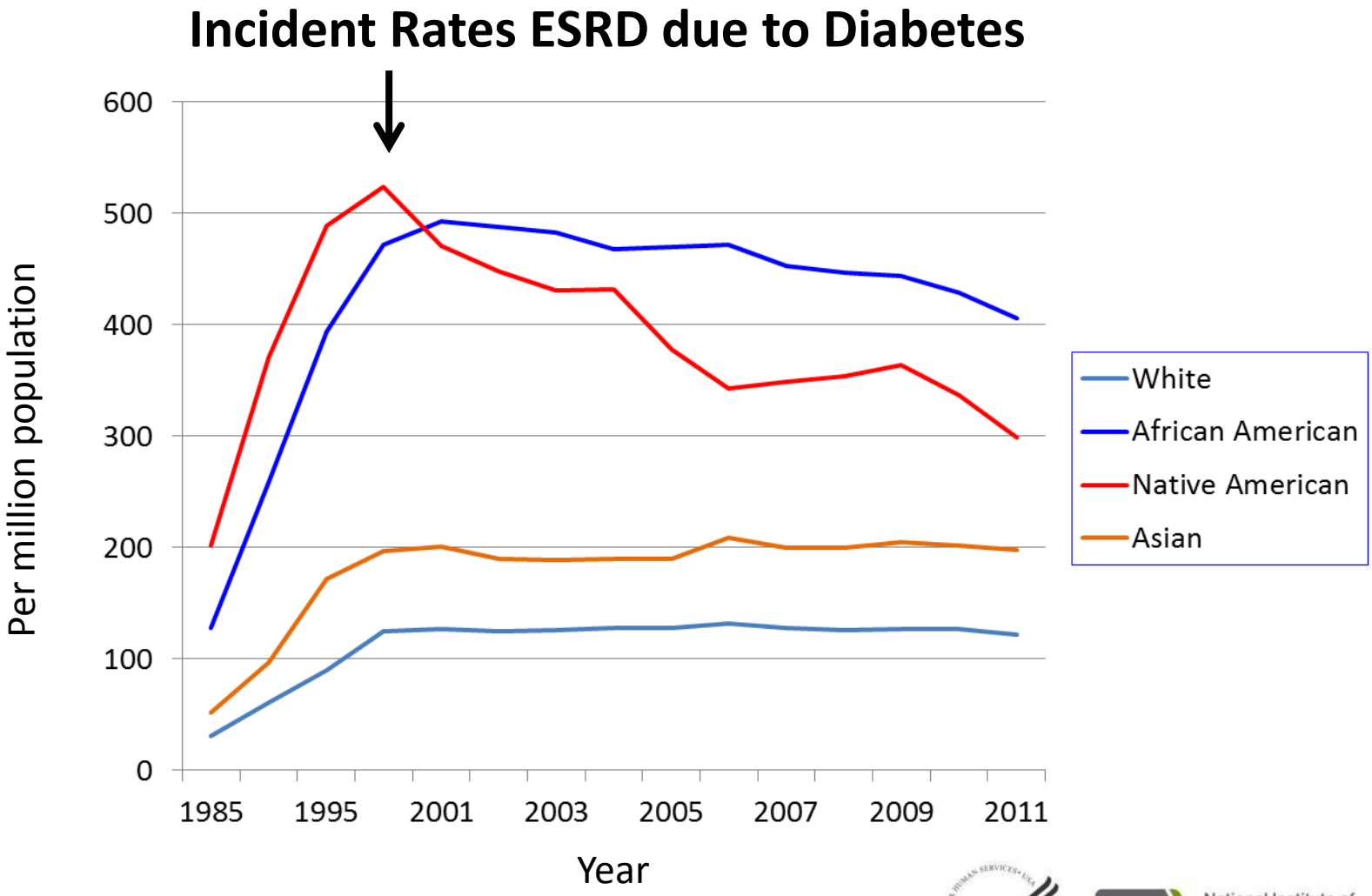
Diagnosed CVD
2013-2014



Source: IHS Diabetes Care and Outcomes Audit

Other Data Sources on AI/AN People with Diabetes

Implementation of Research Results Can Impact Public Health



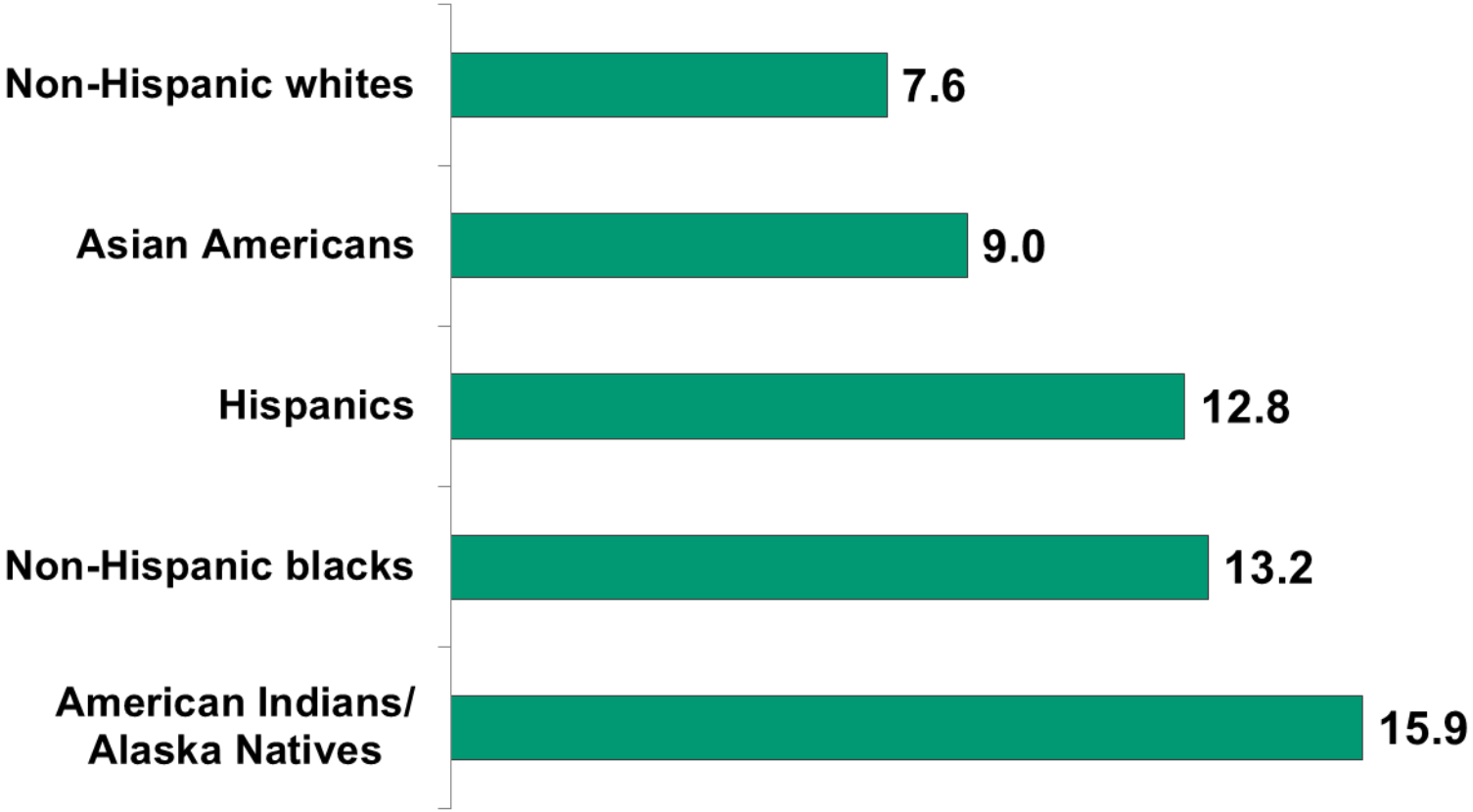
National Institute of Diabetes and Digestive and Kidney Diseases

Source: USRDS ADR, 2013; NEJM 329: 1456, 1993

CDC National Diabetes Statistics Report, 2014

http://www.cdc.gov/diabetes/pubs/statsreport14/national-diabetes-report-web.pdf

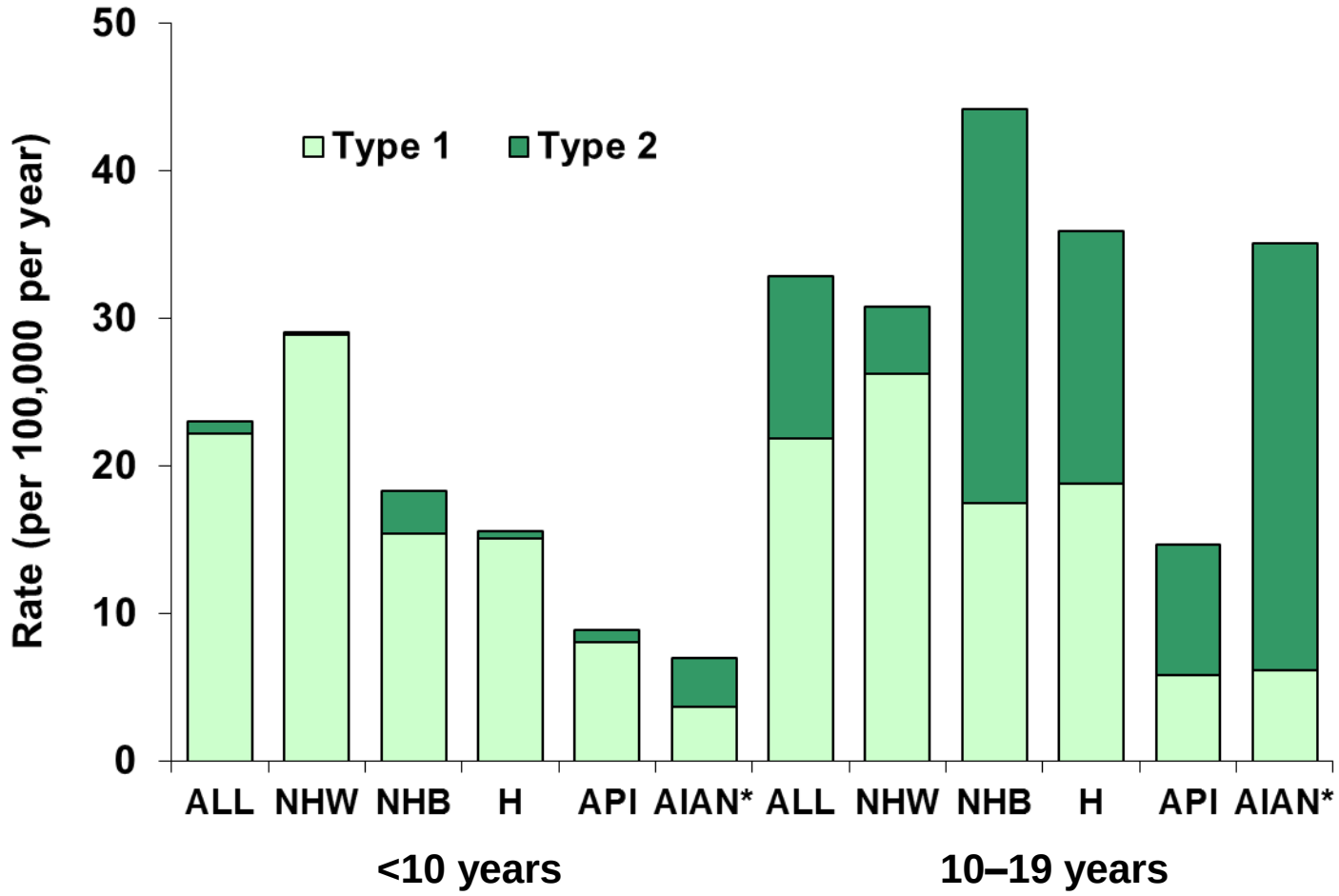
Age-adjusted* percentage of people aged 20 years or older with diagnosed diabetes, by race/ethnicity, United States, 2010–2012



*Based on the 2000 U.S. standard population.
Source: 2010–2012 National Health Interview Survey and
2012 Indian Health Service's National Patient Information Reporting System.

Diabetes in AI/AN Youth

Rate of new cases of type 1 and type 2 diabetes among people younger than 20 years, by age and race/ethnicity, 2008–2009



Source: SEARCH for Diabetes in Youth Study. NHW=non-Hispanic whites; NHB=non-Hispanic blacks; H=Hispanics; API=Asians/Pacific Islanders; AIAN=American Indians/Alaska Natives.

*The American Indian/Alaska Native (AI/AN) youth who participated in the SEARCH study are not representative of all AI/AN youth in the United States. Thus, these rates cannot be generalized to all AI/AN youth nationwide.

Diabetes Prevalence in Youth

- SEARCH for Diabetes in Youth Study
  - AI youth have the
    - Lowest prevalence of type 1 diabetes (0.35 per 1000)
    - Highest prevalence of type 2 diabetes (1.2 per 1000)
  - Between 2001 and 2009, prevalence of type 2 diabetes
    - Increased in whites, Hispanic, and black youth
    - No increase in AI or API youth

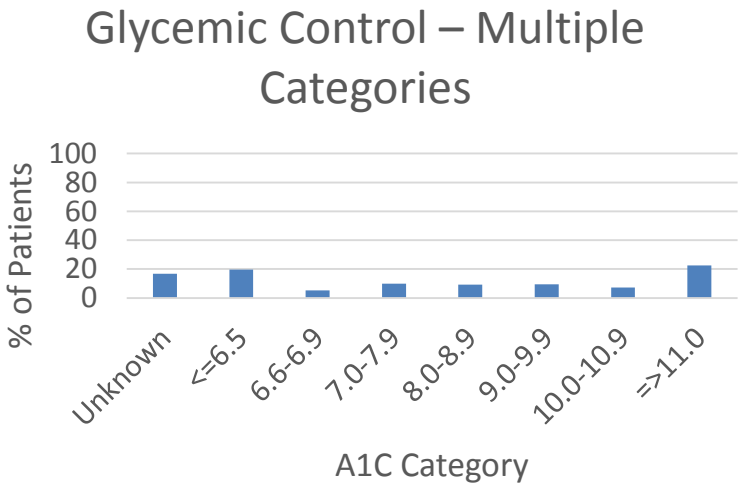
JAMA 2014;311:1778-1786

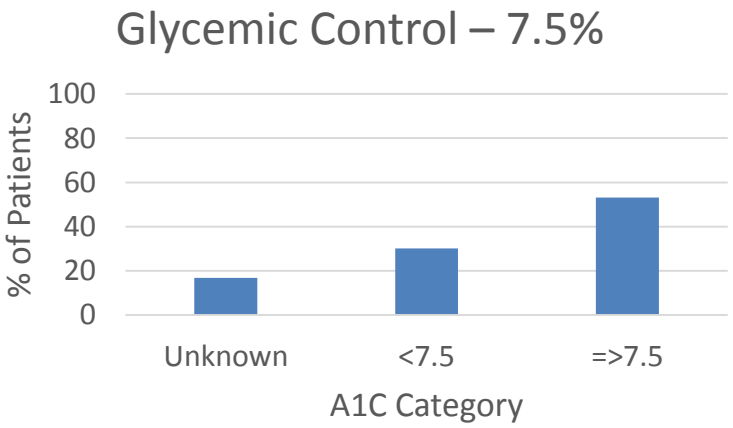
DM Audit 2014

N=712 patients age 0-19

- Age group
  - 0-9: n=40 (6%)
  - 10-19:n=672 (94%)
- Gender
  - Male: n=282 (40%)
  - Female: n=430 (60%)
- Diabetes type
  - Type 1: n=184 (26%)
  - Type 2: n=528 (74%)
- Type by age group
  - 0-9: 53% type 1/47% type 2
  - 10-19: 24% type 1/76% type 2

DM Audit 2014: Youth Age 0-19 (n=712)





DM Audit 2014

N=712 patients age 0-19

- BMI Category
  - Normal: 24% (most had type 1 diabetes: 71%)
  - Overweight: 19%
  - Obese: 56%
- Tobacco use
  - Current user: 14%
  - Not current user: 75%
  - Not documented: 11%
- Diagnosed depression: 14% (all ages 10-19)

Diagnosis and Management of Diabetes in Youth

ADA Classification of Diabetes

- Type 1: due to beta cell destruction
- Type 2: due to progressive insulin secretory defect on the background of insulin resistance
- Gestational: diabetes diagnosed in the 2nd or 3rd trimester of pregnancy that is not clearly overt DM
- Other types, e.g.:
  - Monogenic diabetes
    - includes MODY (Maturity-Onset Diabetes of the Young)
  - Diseases which affect the exocrine pancreas
    - includes cystic fibrosis
  - Drug- or chemical-induced—such as HIV treatment

Testing for Diabetes in *Asymptomatic* Youth

- ADA Criteria:
  - Overweight (BMI > 85th percentile for age and sex)
  - Plus any **2** of the following risk factors:
    - Family history of type 2 DM in 1st or 2nd degree relative
    - Race/ethnicity (includes AI/AN)
    - Signs of insulin resistance or associated conditions
      - Acanthosis nigricans, hypertension, dyslipidemia, PCOS, SGA at birth
    - Maternal history of diabetes or GDM during child's gestation
- Start testing at age 10 yrs or at onset of puberty if earlier
- Test every 3 yrs

Diagnosis of Diabetes

- Same criteria regardless of DM type
- All diagnostic tests should be done in a laboratory
  - Not POC
- Any of the following, confirm if positive with repeat of same test
  - A1C ≥ 6.5%
  - FPG ≥ 126 (fasting=no caloric intake ≥ 8 hrs)
  - 2-hour PG ≥ 200mg.dL

    Or
  - Patient with classic sx of hyperglycemia and a random plasma glucose ≥ 200mg/dL

Distinguishing Type 1 vs. 2

- Most patients clearly diagnosable as one type
- But some patients may not be as clear
  - It is important to determine whether an autoimmune process is taking place
    - Has significant management and prognostic implications
    - More likely to detect autoantibodies early in the course of diabetes than later
- "Classic" presentations:
  - Type 1 DM: ketoacidosis at presentation, thin, normal lipids and BP
  - Type 2 DM: little/no ketoacidosis, obese, ↑BP, metabolic syndrome dyslipidemia (↓HDL,↑ TG)

Distinguishing Type 1 vs. 2

- Beta cell destruction tends to occur more quickly in younger patients with type 1, so often present with ketoacidosis
  - Older patients often have a more variable presentation, some may not even need insulin at first
- With rise of obesity in youth, being heavy does not rule out type 1 DM
- Type 1 is genetically based
  - Virtually unheard of in patients of 100% AI/AN heritage
- Autoimmune markers—autoantibodies to:
  - Islet cell (ICA), Insulin (IAA), Glutamic acid decarboxylase (GAD), tyrosine phosphatases IA-2 and IA-2β, zinc transporter 8 (ZnT8)
  - + autoantibody test rules in autoimmune process, but
    - autoantibody test does not rule it out

Case Study: What type is this?

- 24 y/o AI male with a 1 month history of ↑'ing fatigue, polyuria, blurred vision. Had lost 20 lbs over last 3 months.
- Family History: Mother dx'd with diabetes at age 26, quickly failed tolazamide so went on insulin; she also had Graves Disease
- Glucose 350, BMI 26.6, bicarb 20, small serum ketones, A1C 8.5%, normal BP/lipids
  - Diagnosed with type 2 diabetes
- Admitted, quickly cleared ketones with fluids/insulin
  - Discharged home on NPH 6 units + Regular 6 units BB&BS

Case Study (cont'd)

- In out-patient follow-up:
  - C-peptide 1.3 ng/mL (0.8-4.0) when A1C was 5.2%
  - **GAD antibodies +**, Islet Cell antibodies –
  - Thyroid peroxidase antibodies ↑
- Based on the above, dx changed to type 1 DM
- Patient's C-peptide dropped to 0.4 over next 2 years.
  - Checked thyroid frequently and he did develop hypothyroidism
- A1Cs continued to be excellent on low dose insulin
  - Recent years, has become more insulin resistant with ↑ wt

Diabetes in Youth: Initial Assessment

- Ensure that type of diabetes is clear
  - If not, make plans for how to determine
  - Decide whether to check autoantibodies
- Evaluate degree of hyperglycemia (and ketosis, if present) to determine whether insulin should be initial therapy—even in type 2 DM
- Insulin therapy:
  - In type 1 or if unsure as to DM type
  - For pancreatic rest/to reduce glucose toxicity
    - May only be needed short-term in type 2 DM

C-peptide Test

- Measures endogenous insulin production
  - When pancreas produces insulin, proinsulin is split into insulin and C-peptide
  - Can be used even in patients taking insulin
- Can help distinguish type 1 from type 2 DM
  - However, C-peptide may be higher than expected initially in type 1 DM in patients with insulin resistance
  - May be lower than expected in type 2 patients with prolonged hyperglycemia
  - May be more useful to check once glucoses controlled and then, if needed, over time

Type 2 DM in Youth

- Even in youth, evidence of diabetes complications may already be present at DM diagnosis
  - As in adults, check initially and then periodically:
    - Blood pressure (use age-specific norms)
    - Fasting lipid panel
    - UACR
    - Retinal evaluation
  - Note that the GFR equation that should be used in youth <18 yrs old is different from the one used in adults (MDRD)
    - Bedside Schwarz Equation—Calculator on the NKDEP website:

    http://nkdep.nih.gov/lab-evaluation/gfr-calculators/children-conventional-unit.asp

Type 2 DM in Youth: Targets

- ADA Glycemic target in children/youth: A1C <7.5%
  - Individualize
    - If tighter control can be achieved without undue treatment burden, youth will have many years to benefit
    - Realities for many youth may not make this possible
- Blood Pressure
  - Consider treatment when BP consistently ≥ 95th percentile for age, sex, and height
- Lipids
  - Consider statin in pts >10 yrs of age if LDL cholesterol >160 mg/dL or >130mg/dL and ≥ 1 CVD risk factor

Type 2 DM in Female Youth

- Must consider risk of pregnancy
- Many medications used for diabetes-related care are contraindicated in pregnancy
  - Especially ACE inhibitors/ARBs and Statins
  - Many other meds not indicated in pregnancy
- Hyperglycemia is also not good in pregnancy
- **Contraception** must be addressed
  - Prefer long-acting, less user-dependent method
  - Excellent discussion on contraception by Dr. Jean Howe on DDTP website: http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=trainingSeminars
  - If can't ensure pregnancy prevention, must adjust DM meds prescribed

Psychosocial Issues in Youth with Type 2 DM

- Etiologies of youth-onset type 2 diabetes are only partially understood
  - Include exposure to maternal diabetes *in utero*
- Risk factors for diabetes include issues related to poverty, food insecurity, and other trauma/stressors
  - For the parents before conception, for the mother during pregnancy, and for young children
- Youth with diabetes often face many challenges in addition to their diabetes
  - May not have sufficient parental/adult support
  - May be dealing with trauma, depression, ADHD, food insecurity
  - Compassion, understanding, and developing best possible relationships with youth and family essential

Ann Bullock, MD
Acting Director/Clinical Consultant
Division of Diabetes Treatment and Prevention
Indian Health Service

Updates on Diabetes and SDPI

Special Diabetes Program for Indians (SDPI)

Review of SDPI FY 2015

- Reauthorization
  - Protecting Access to Medicare Act of 2014 (P.L. 113-93)
    - Signed by President Obama on April 1, 2014
    - Included SDPI: one year through FY 2015 at current $150m
- Federal grants can be up to a maximum of 5 years, unless special permission received
  - "Class Deviation Waiver" for FY 2015 to be a 6th year received from HHS on May 1, 2014

Update on FY 2016

- Congress passed and the President signed legislation which includes a 2-year authorization of SDPI at current $150m per year
  - Thank you to everyone who helped make this happen!
- National Tribal Consultation concluded April 20
- TLDC will meet May 14 to review Consultation input and make final recommendations to the IHS Director
- IHS Director will then make final decisions on the SDPI FY 2016 funding distribution and formula
- DDTP/DGM will issue new FOA

SDPI FY 2016 Issues

- "Dear Tribal Leader" Letter (DTLL) dated 3/19/15 opened national Tribal Consultation
- 5 Main Questions:

1. Should there be any changes in the national funding distribution and, if so, in what way?
    - Community-Directed grant program $108.9m
    - DP/HH Initiatives $27.4m
    - Set-asides:
        - Urban Indian Health Programs $7.5m
        - Data Infrastructure Improvement $5.2m
        - CDC Native Diabetes Wellness Program* $1.0m

SDPI FY 2016 Issues (cont'd)

2. SDPI Funding Formula and Data
   - User Population=30%
   - Tribal Size Adjustment (TSA)=12.5%
   - Disease Burden=57.5%
   - – Should there be changes to the formula?
   - – Should more recent data be used in the formula?
3. Structure and activities of the SDPI Grant Program
   - – Should there be changes in the SDPI Community-Directed grant program?
   - – Should there be changes in the SDPI DP/HH Initiatives grant program?

SDPI FY 2016 Issues (cont'd)

4. Should Tribes not currently participating in SDPI be allowed to apply for FY 2016 funding?

--If so, from what component of the SDPI funding distribution should these funds be taken?

5. One-Year Authorization or Multiple Year Authorization

– We now know we have a 2-year authorization