

Update on Glucose Management Issues



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This Advancements Session:

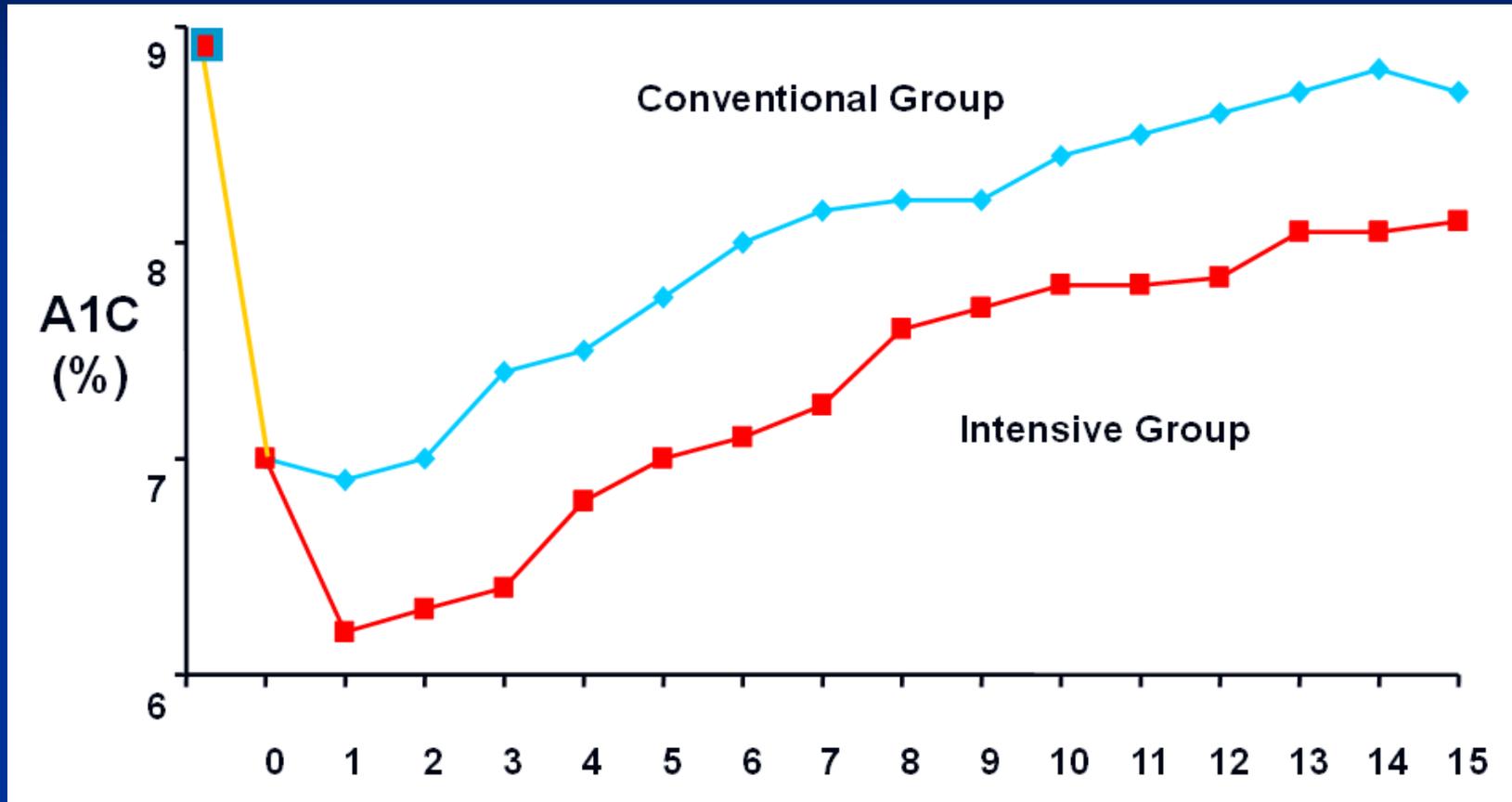
- Goals for treating glucose: one size *doesn't* fit all
- Medications: the good, the bad and the ugly
- Approaches that aid in glucose control, beyond medications alone
- Tools on the IHS DDTP website

Glucose targets across the lifespan

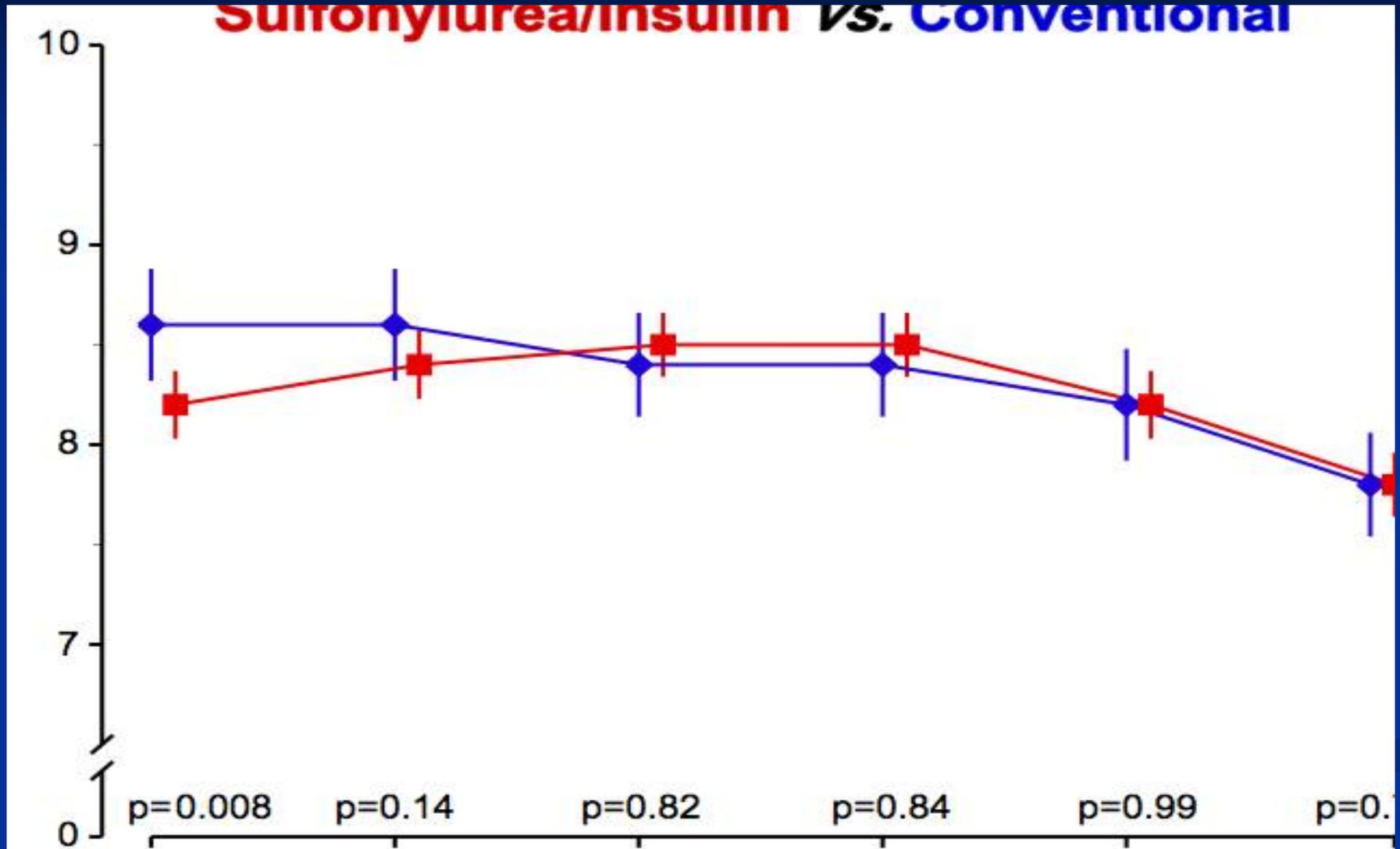
“To everything there is a season...”



United Kingdom Prospective Diabetes Study (UKPDS)



UKPDS: Post-Trial Changes in A1C



UKPDS: “Legacy Effect” of Glucose Therapy

After median 8.8 years post-trial follow-up

Aggregate Endpoint		1997	2007
Any diabetes related endpoint	<i>RRR:</i>	12%	9%
	<i>P:</i>	0.029	0.040
Microvascular disease	<i>RRR:</i>	25%	24%
	<i>P:</i>	0.009	0.001
Myocardial infarction	<i>RRR:</i>	16%	15%
	<i>P:</i>	0.052	0.014
All-cause mortality	<i>RRR:</i>	6%	13%
	<i>P:</i>	0.44	0.007

RRR = Relative Risk Reduction

P = Log Rank

The Legacy Effect: conclusions

“The UKPDS showed the benefits of an intensive strategy to control blood glucose levels in patients with type 2 diabetes sustained up to 10 yrs after cessation of the randomized intervention. Benefits persisted despite the early loss of within-trial differences in A1C levels between the intensive-therapy group and conventional-therapy group – a so-called *legacy effect*.”

Holman RH et al. NEJM 2008. 359: 1577-1589

UKPDS

- showed us that glycemic control *early* in diabetes has lasting effects, including for CVD risk (“legacy effect”)
- However, it was interpreted as implying that *everyone* should have an A1C <7%--and national guidelines followed suit
 - But UKPDS included only healthy, newly-diagnosed patients <65 years old

Lancet 1998;352:837-853

And then came major studies on intensive glucose control in more “real world” diabetes populations

- ACCORD, ADVANCE, and VADT
NEJM 2008;358:245-259 and 2560-72, NEJM 2009;360:129-139
- Showed little benefit to intensive glucose control other than for nephropathy (in ACCORD and ADVANCE)
- And showed increased mortality (ACCORD), weight gain, and hypoglycemia

ADA Statement on Glucose Control and CVD Prevention

- May not affect CVD outcomes *after* macrovascular disease established—but good glucose control in the *early* years of DM may affect long-term risk of macrovascular disease
- Makes a difference in microvascular disease
- However, BG goal should be adjusted to the individual patient
 - In general, A1C goal: <7%
 - Lower goal if short duration DM, long life expectancy, and little co-morbidity
 - Higher goal if the converse—there are risks with aggressive control

Intensive Glycemic Control and the Prevention of Cardiovascular Events: Implications of the ACCORD, ADVANCE, and VA Diabetes Trials --A position statement of the American Diabetes Association and a scientific statement of the American College of Cardiology Foundation and the American Heart Association, January 2009

2011 ADA Glucose Goal

- Goal: A1C <7%
 - *More* stringent for patients with short duration of diabetes, long life expectancy and no significant CVD
 - *Less* stringent goals (individualized) for patients with:
 - History of hypoglycemia
 - Limited life expectancy
 - Advanced micro/macrovascular complications
 - Comorbid conditions
 - Longstanding diabetes where it is difficult to achieve glucose goal despite DSME, glucose monitoring and effective doses of multiple medications including insulin

And the discussion continues

- Meta-analysis of 13 recent RCTs (>34,000 patients) that evaluated intensive glucose lowering:
 - *Limited* benefits on all-cause and CV mortality
 - At best, *modest* benefits for microvascular disease
 - ↓ albuminuria, a *trend* toward ↓ retinopathy, but little else
 - Severe hypoglycemic events doubled [BMJ 2011;343:d4243 doi:10.1136/bmj.d4243](#)
- *Guidelines* are starting to reflect recent evidence, now *Performance Measures* (e.g. GPRA) will need to be re-thought
 - Much more benefit to ↓ patient's A1C from 9% to 7.1% than to ↓ it from 7.1% to 6.9%
 - Unknown effects of adding on multiple meds to achieve target

Diabetes Care 2011;34:1651-1659

VA uses A1C target *ranges*

Major comorbidity or physiologic age	Microvascular complications		
	Absent or mild	Moderate	Advanced
Absent > 10 years of life expectancy	< 7	< 8	8-9
Present 5-10 years of life expectancy	< 8	< 8	8-9
Marked < 5 years of life expectancy	8-9	8-9	8-9

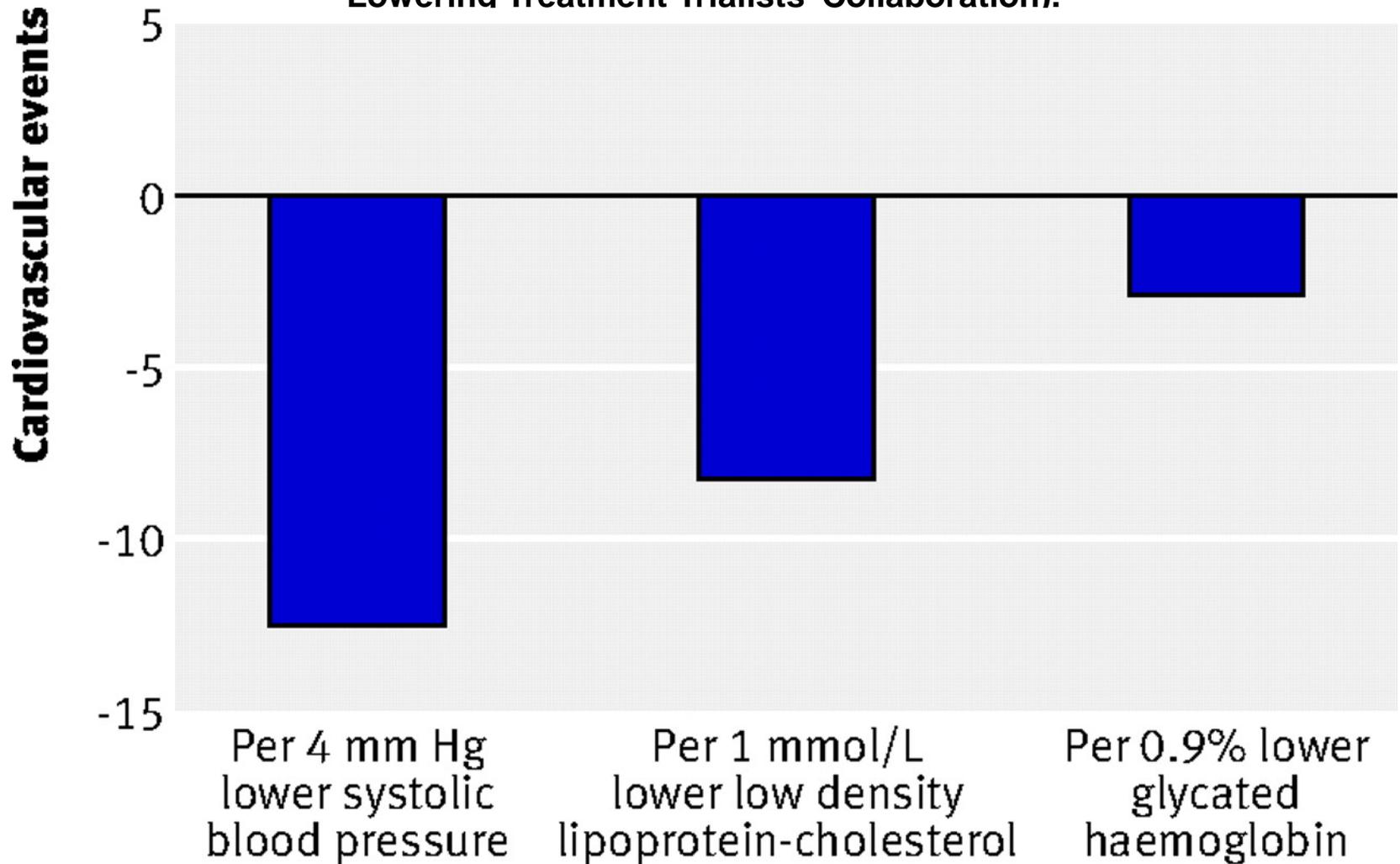
“Wait a minute—what happened to all the hype about getting everyone’s A1C down to <7% or even lower??”

- Do people who have A1Cs <7%, on their own or with a little bit of medication, do better in the long-run? Yes!
 - But this is a marker of their overall systemic health
- That is *not* the same thing as having to use 3 or 4 meds to beat someone’s glucoses down to achieve a certain target
 - Not known if polypharmacy is safe
- Performance measures (like GPRA) have reflected the national guidelines —and providers have felt pressured to get *all* their patients’ A1Cs down to <7%, no matter what it takes
 - Do what’s best for each individual patient

So, what do we do with all this?

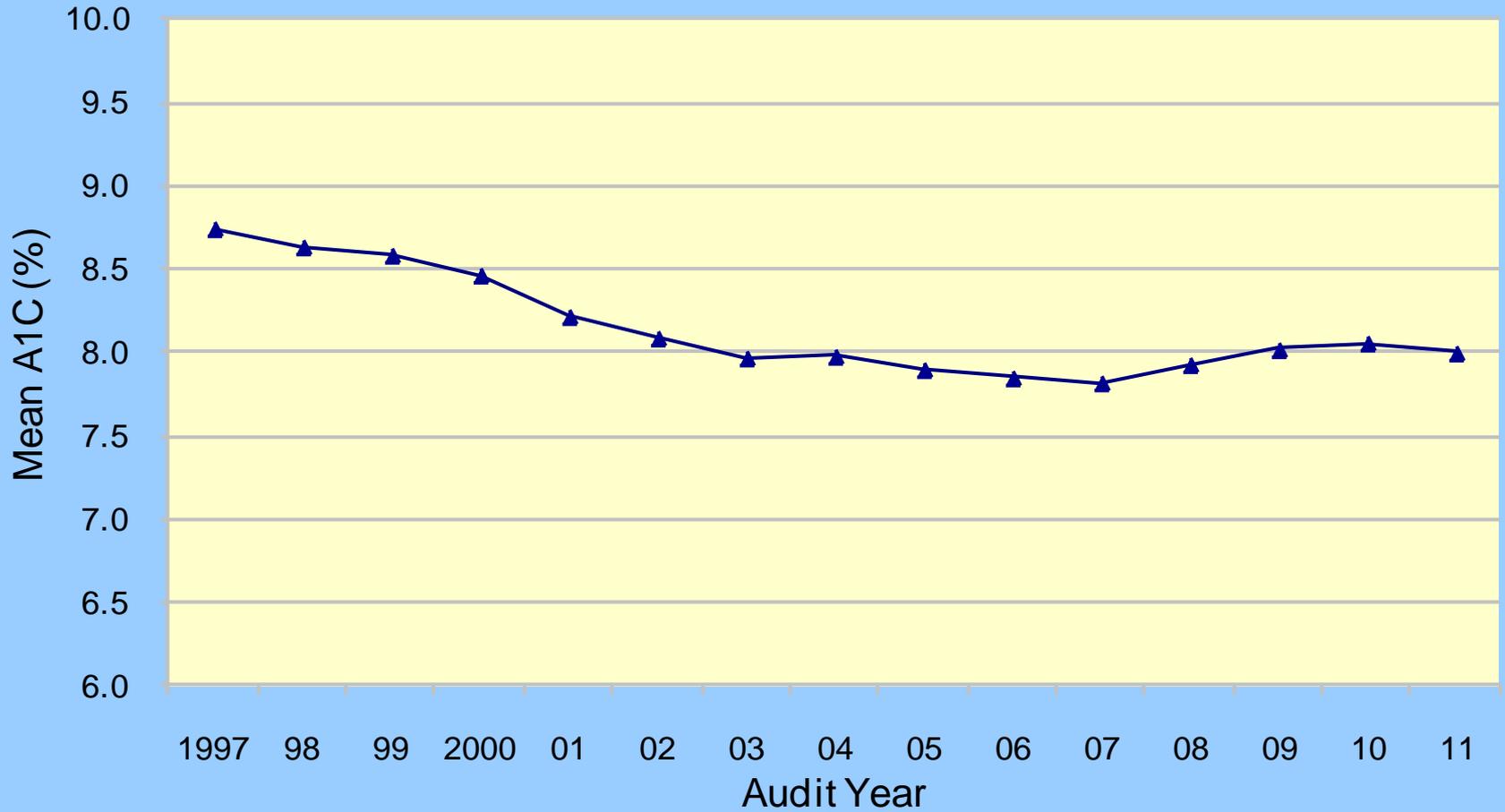
- *Individualize* glucose targets—really!
 - Younger, healthier patients: aim for $<7\%$ (or *lower*)
 - Excellent glucose control achieved and maintained *early* in the course of diabetes has long-term benefits, including for CVD
 - Longer duration of diabetes, more co-morbidities and lots of meds already: liberalize glucose targets (ranges)
 - Think carefully about whether to add another medication (and which one) to lower glucose
 - Polypharmacy, hypoglycemia have consequences!
 - Focus some efforts on patients with A1Cs $>9.5\%$
 - Good project for case managers!

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

Mean A1C 1997-2011



Medications to Achieve Glycemic Targets

Classes of DM Meds: Old, New, “Retreads”

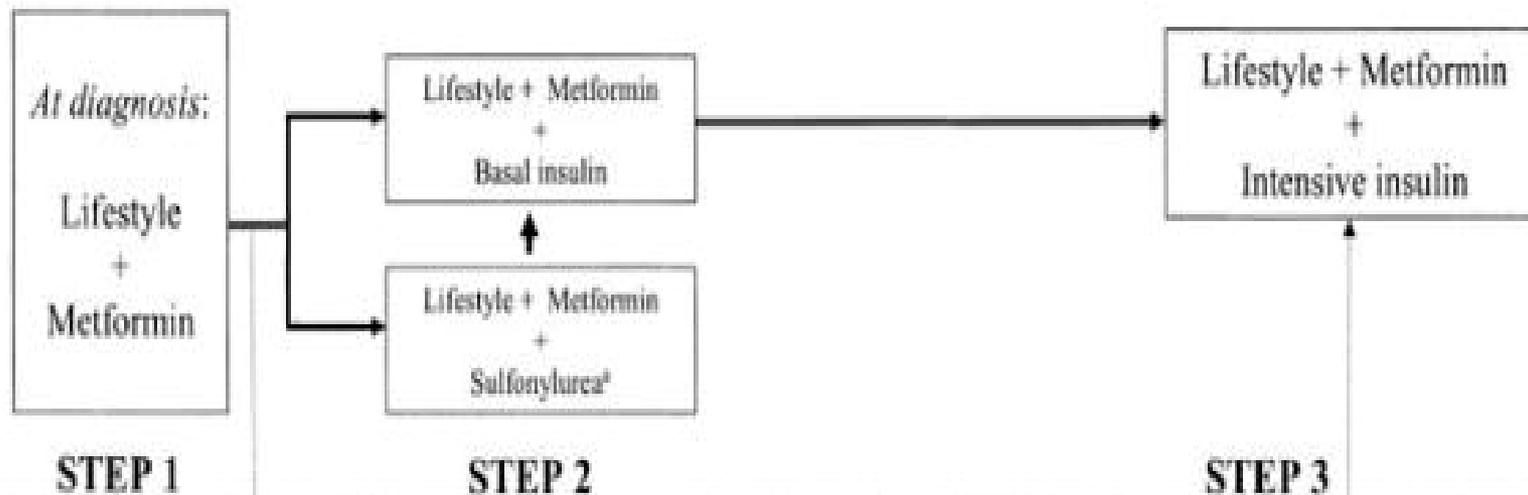
- Biguanide
 - metformin
- Sulfonylureas
 - glyburide, glipizide, glimepiride, chlorpropamide
- Glinides
 - repaglinide/Prandin, nateglinide/Starlix
- Alpha-glucosidase inhibitors
 - acarbose/Precose, miglitol/Glyset
- Thiazolidinediones
 - pioglitazone/Actos, rosiglitazone/Avandia
- Insulin
- Amylin agonist
 - pramlintide/Symlin
- Glucagon-like peptide-1 agonists (GLP-1)
 - exenatide/Byetta, liraglutide/Victoza
- Dipeptidyl peptidase-4 (DPP-4) inhibitors
 - sitagliptin/Januvia, saxagliptin/Onglyza, linagliptin/Tradjenta
- Dopamine agonist
 - bromocriptine/Cycloset
- Bile acid sequestrant
 - colesevelam/Welchol
- Combination drugs

So many choices...?

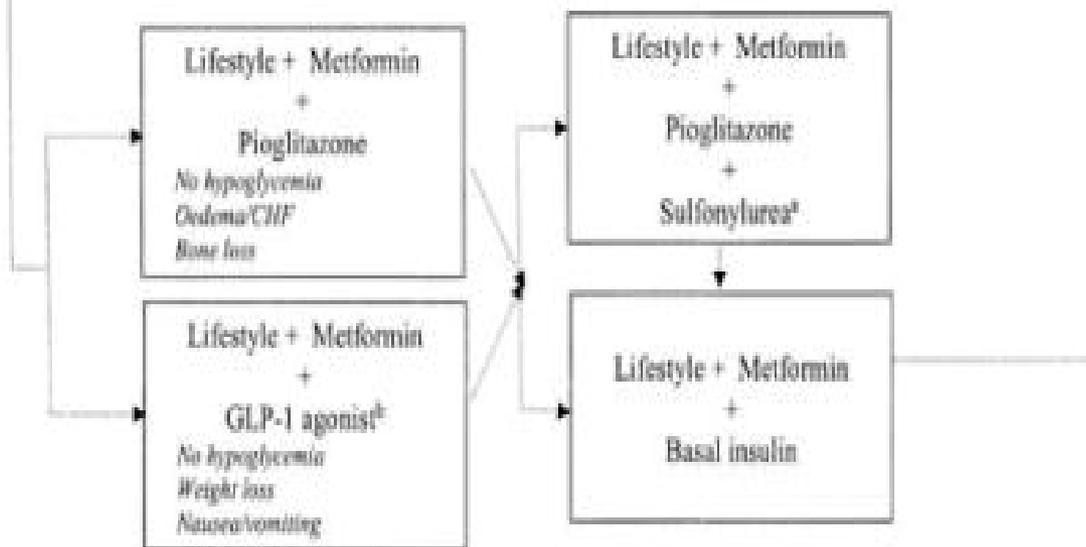
- Effective, well-validated and cost-effective
 - “Welcome back to 1995!”
 - Metformin
 - Sulfonylureas
 - Insulin
- We do *not* know:
 - Long-term safety of many of the newer medications
 - Safety, effectiveness, cost-effectiveness of using multiple medications to achieve a glucose target, especially in patients who are older and/or have co-morbidities

Tier 1: Well-validated core therapies

Figure 2



Tier 2: Less well-validated therapies



Medical Management of Hyperglycemia in Type 2 Diabetes: A Consensus Algorithm for the Initiation and Adjustment of Therapy: A consensus statement of the American Diabetes Association and the European Association for the Study of Diabetes.
 NATHAN, DAVID;
 BUSE, JOHN; MD, PHD;
 DAVIDSON, MAYER; FERRANNINI, ELE;
 HOLMAN, RURY; SHERWIN, ROBERT;
 ZINMAN, BERNARD

Diabetes Care. 32(1):193-203, January 2009.

Figure 2. Algorithm for the metabolic management of type 2 diabetes; Reinforce lifestyle interventions at every visit and check A1C every 3 months until A1C is $\leq 7\%$. aSulfonylureas other than glybenclamide (glyburide) or chlorpropamide. bInsufficient clinical use to be confident regarding safety.

Table 1

Intervention	Expected decrease in A1C with monotherapy (%)	Advantages	Disadvantages
Tier 1: well-validated core			
Step 1: initial therapy			
Lifestyle to decrease weight and increase activity	1.0–2.0	Broad benefits	Insufficient for most within first year
Metformin	1.0–2.0	Weight neutral	GI side effects, contraindicated with renal insufficiency
Step 2: additional therapy			
Insulin	1.5–3.5	No dose limit, rapidly effective, improved lipid profile	One to four injections daily, monitoring, weight gain, hypoglycemia, analogues are expensive
Sulfonylurea	1.0–2.0	Rapidly effective	Weight gain, hypoglycemia (especially with glibenclamide or chlorpropamide)
Tier 2: less well validated			
TZDs	0.5–1.4	Improved lipid profile (pioglitazone), potential decrease in MI (pioglitazone)	Fluid retention, CHF, weight gain, bone fractures, expensive, potential increase in MI (rosiglitazone)
GLP-1 agonist	0.5–1.0	Weight loss	Two injections daily, frequent GI side effects, long-term safety not established, expensive
Other therapy			
α -Glucosidase inhibitor	0.5–0.8	Weight neutral	Frequent GI side effects, three times/day dosing, expensive
Glinide	0.5–1.5*	Rapidly effective	Weight gain, three times/day dosing, hypoglycemia, expensive
Pramlintide	0.5–1.0	Weight loss	Three injections daily, frequent GI side effects, long-term safety not established, expensive
DPP-4 inhibitor	0.5–0.8	Weight neutral	Long-term safety not established, expensive

*Repaglinide more effective in lowering A1C than nateglinide. CHF, congestive heart failure; GI, gastrointestinal; MI, myocardial infarction.

Medical Management of Hyperglycemia in Type 2 Diabetes: A Consensus Algorithm for the Initiation and Adjustment of Therapy: A consensus statement of the American Diabetes Association and the European Association for the Study of Diabetes.

NATHAN, DAVID; BUSE, JOHN; MD, PHD; DAVIDSON, MAYER; FERRANNINI, ELE; HOLMAN, RURY; SHERWIN, ROBERT; ZINMAN, BERNARD

Diabetes Care. 32(1):193-203, January 2009.

What happened to TZDs?

- Thiazolidinediones (“TZDs”, “glitazones”)
 - ↑ insulin sensitivity in muscle, fat, liver
 - Pioglitazone (Actos) and rosiglitazone (Avandia)
 - Remember troglitazone (Rezulin)?—removed from market in 2000
- Common adverse effects of *both* Pio and Rosi
 - Weight gain
 - Fluid retention
 - Peripheral edema
 - Heart Failure risk ↑ x 2
 - Bone loss and fractures in women, ? men
- Pio vs. Rosi
 - CVD risk: ↑ risk with Rosi
 - FDA restricted access Sept 2010
 - ADA Consensus Statement: advise against using rosiglitazone
 - Pioglitazone/Actos
 - FDA drug safety communication, 2010—possible ↑ risk of bladder cancer
 - Still relatively expensive—patent expired Jan 2011, so may get cheaper
 - Removed from IHS Core Formulary Feb 2010

What about the newer meds?

- Amylin agonist: pramlintide (Symlin)
 - Beta cells produce amylin: ↓ gastric emptying, ↓ glucagon
 - Role in type 2 DM unclear
 - ↓A1C 0.5-0.7%, ↓ wt 1-1/2 kg
 - Injected before meals along with rapid/short-acting insulin (separate shot)
 - Expensive, frequent GI side effects
- Glucagon-like peptide-1 (GLP-1)
 - Produced by small intestine: ↑'s glucose-stimulated insulin secretion, ↓'s glucagon secretion, slows gastric motility
 - Synthetic versions have longer half-life
 - Dipeptidyl peptidase-4 (DPP-4): enzyme that breaks down GLP-1
- GLP-1-based drugs
 - GLP-1 agonists: exenatide (Byetta), liraglutide (Victoza)
 - DPP-4 inhibitors: sitagliptan (Januvia), saxagliptan (Onglyza), linagliptin (Tradjenta)

Meds related to GLP-1: “Incretin-based” medications

- GLP-1 agonists
 - Benefits: ↓ A1C 0.5-1%, ↓ weight 2-3 kg
 - Require injection
 - Side effects: GI *common*
- DPP-4 inhibitors
 - Benefits: ↓ A1C 0.6-0.9%
 - Side effects: effect on immune function
- Issues with both classes
 - Cost
 - Side effects (especially GLP-1 meds)
 - Long-term safety not known

Incretin-based Therapies: Long-term Safety Not Known

- “...the available evidence supports the use of incretin-based therapies for patients requiring effective control of glycemia and body weight while minimizing the risk of hypoglycemia.”

Diabetes Care 2010;33:428-433

- “...the implications of the data are sufficiently serious that continuing to promote this class of drugs without establishing clear experimental evidence to permit the concern to be rejected is irresponsible.”

Diabetes Care 2010;33:453-455

- Review of FDA adverse events reported 2004-2009 for exenatide and sitagliptin:
 - 6 x ↑ pancreatitis risk, ↑ pancreatic cancer risk
 - Sitagliptin ↑ risk for all cancers

Gastroenterology 2011;doi:10.1053/j.gastro.2011.02.018

- What do we do ‘til the evidence is more clear?
 - Consider avoiding in patients at ↑ risk for pancreatitis or cancer

Type 2 Diabetes - Glucose Control

Type 2 Diabetes - Glucose Control

DM DX – confirm with second test

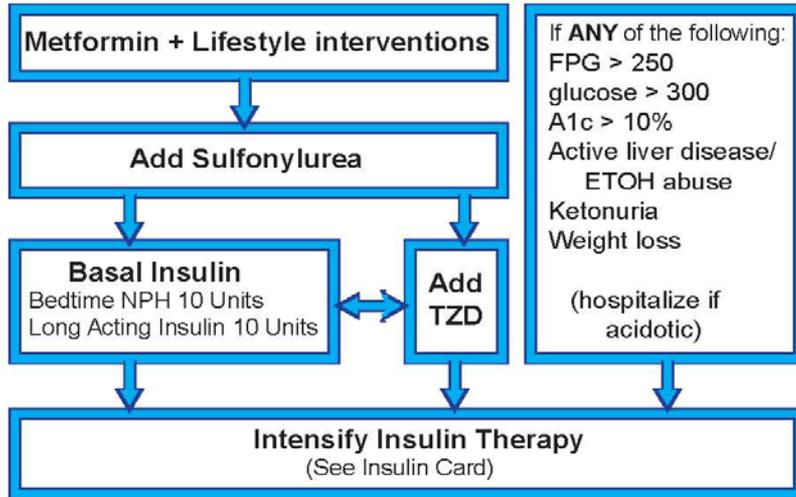
1. A1c \geq 6.5% (preferred method)
2. FPG \geq 126
3. 2° (OGTT) \geq 200
4. Non-fasting lab glucose \geq 200 with sx

Prediabetes is defined as A1c 5.7-6.4%, FPG 100-125, or 2° (OGTT) 140-199

DM BG Targets

- Premeal: < 70-130
 2° PP: < 160-180
 A1c: < 7%

Individualize targets based on patient condition



Immunizations

- Pneumovax—At Dx & again at age 65 (if \geq 5 yrs. since 1st shot)
- Flu shots yearly
- Td /Tdap (routine)
- PPD once after Dx of DM (Pos is \geq 10mm)

Don't Forget

Glucose toxicity— Insulin production ↓'s if prolonged hyperglycemia; insulin shots short-term reverse this.
 Pancreatic Exhaustion— Almost all Type 2 diabetics will eventually require insulin.

Monitoring of DM

- A1c every 3-6 months
- Creatinine and eGFR yearly
- UACR yearly
- Lipid Panel yearly
- LFTs yearly
- ECG every 2-5 years
- Complete Foot Exam yearly
 - Foot inspection each visit
- Retinopathy exam yearly
- Paps, Mammograms, and Contraception
- Evaluate sexual function
- Depression, Tobacco, ETOH, and DV screening yearly

Estimated Average Glucose (eAG)

A1c %	6	7	8	9	10	11	12
Mean plasma gluc	126	154	183	212	240	269	298mg/dL

Biguanides: Metformin & Metformin XR (Glucophage,)

Start 500 mg daily with meals and increase no faster than 500 mg each week. If GI sx occur may increase more slowly.

Max. dose: 2000mg daily or divided with XR tablets. Do not split XR tablets.
 2500 mg divided BID-TID with regular release tablets.

Can decrease weight. Pt. must have normal creatinine (males <1.5, females <1.4), Do not use if liver disease (check ALT) or significant ETOH use. Discontinue before surgery or IV contrast dye administration.

Sulfonylureas: Glyburide (Micronase,) and Glipizide (Glucotrol®)

Start 2.5-5mg daily – Max 10 mg BID
 Can increase weight and cause hypoglycemia

Thiazolidinediones (TZD): Pioglitazone (Actos®)

Start 15mg daily; may increase to 30mg daily (little benefit dosing over 30mg)
 Max A1c changes may take up to 12 weeks to occur
 Check ALT at baseline & periodically. No underlying liver dz or significant ETOH use. Warning: heart failure and fracture risk. May use in renal insufficiency. Can cause weight gain.

DPP-4 Inhibitors: May reduce weight, mild to mod A1c lowering

Sitagliptan (Januvia®) - Dose: 100mg PO daily; Reduce dose if \geq Stage 3 CKD
Saxagliptan (Onglyza®) - Dose: 2.5-5mg PO daily
 Dose 2.5mg if strong P450 3A/4 inhibitors or mod-sev renal impairment

GLP-1 Mimetics: Can decrease weight, mild to mod A1c lowering

May be associated with pancreatitis – seek medical care if persistent severe abdominal pain with or without vomiting
Exenatide (Byetta®) Start 5 mcg/dose BID SC inj in thigh, abdomen, or upper arm
 May increase to 10 mcg/dose BID after 1 month of treatment
 Administer within 60 minutes before meals Do not use if \geq Stage 4 CKD
Liraglutide (Victoza®) - Start 0.6mg daily SC inj in thigh, abdomen, or upper arm
 Inc to 1.2mg daily in 1 week. May increase to 1.8mg daily

Pramlintide (Symlin®) - Amylin mimetic

Mild A1c lowering, small decrease in weight
 Start 60 mcg daily subcutaneously immediately before a major meal
 (Reduce preprandial (short acting) insulin by 50% as appropriate)
 Start with lower doses in type 1 diabetes
 May increase to 120 mcg after significant nausea is gone x 3-7 days

Drug names in *italics* are not on the IHS National Core Formulary

Ref: ADA Clinical Practice Recommendations 2010 Diabetes Care 2010;33

Ref: Medical Management of Hyperglycemia in Type 2 Diabetes: A Consensus Algorithm for the Initiation and Adjustment of Therapy Diabetes Care 2009;32(1):193-203

Insulin

- Most powerful medication for reducing glucose
 - Consider using *early* in diabetes
 - Reduce glucose toxic effects on beta cells
 - May partly restore beta cell function and insulin sensitivity
- Diabetes Care* 2011;34:1848-1853
- Many different insulin varieties
 - None “better”
 - Adaptable to patients’ lives
 - Consider using U-500 when > 200 units/day
 - Smaller fluid bolus: \uparrow absorption and \downarrow pain
 - Less expensive on a *per unit* basis, fewer syringes
 - Good summary article: *Diabetes Spectrum* 2009;22(2):116-122

Insulins

- Rapid-acting: Lispro (Humalog), Aspart (Novolog), Glulisine (Apidra)
- Short-acting: Regular
- Intermediate (basal): NPH
- Long-acting (basal): Glargine (Lantus), Detemir (Levemir)
 - 1-2 injections/day (“Peakless”)
 - Cannot be mixed in same syringe w/other insulins
- Premixed: 70/30, 75/25, 50/50
- U-500

Common Insulin Regimens

- Basal Only
 - Long-acting once/day (AM or HS) or HS NPH
 - Only one shot/day, but no meal coverage
 - If use HS NPH, there is also no daytime coverage
- Twice-daily (intermediate and short/rapid)
 - Patient mixes or Premixed (70/30, 75/25, 50/50)
 - Only 2 shots/day but fixed peaks, not conducive to erratic schedules or large variations in portion sizes
 - Can do with basal insulin, but cannot mix in syringe (4 shots)
- Basal-Bolus (basal and short/rapid)
 - Very flexible, little trouble with peaks, but requires more patient involvement and 4-5 shots/day

Case Study

- 53y/o with type 2 DM for 17 years
 - BMI 31, A1C 8.5%
 - Meds: Glargine 90 units
Pioglitazone 45 mg
Metformin 1 gm BID
Glimeperide 8 mg qd
 - Avg BGs: Fasting 110
Premeal 170-240
Postmeal >300
- Need to add short/rapid insulin to cover meals
 - Take 80-100% of current dose (80%=72 units) and divide between long and short/rapid insulins
 - glargine 36 units qday, lispro 12 units with each meal,
 - adjust to relative meal sizes and then titrate to targets
 - consider d/c some oral meds

Type 2 DM – Insulin

STEP 1: Target Fasting Plasma Glucose with Basal Insulin Fasting Plasma Glucose (FPG) Target = 70-130mg/dl*

HS Basal Insulin – start 10 units or 0.2 units/kg

Increase dose 2 units every 3 days until FPG is 70 - 130mg/dl*
May increase by 4 units every 3 days if FPG is > 180mg/dl*

STEP 2: Target Premeal Glucose (target one at a time) Premeal Glucose Target = 70-130mg/dl*

If Pre-lunch glucose > 130mg/dl*
Start 4 units Bolus Insulin before breakfast

If Pre-supper glucose > 130mg/dl*
Start 4 units Bolus Insulin before lunch
OR Add/Increase morning NPH/levemir

If Bedtime glucose above target
(e.g. > 140mg/dl*), Start 4 units Bolus Insulin before supper OR Increase evening NPH/levemir

Increase Bolus Insulin by 2 units every 3 days

As insulin doses get larger, (over 10 units), begin to change insulin dose by 10-20%

STEP 3: If A1c not at goal: Target Post-Prandial Glucose with Bolus premeal insulin 2 Hour Post-Prandial Glucose Target <160-180mg/dl*

* Glucose targets should be individualized based on patient comorbidities, needs, and response to blood glucose lowering.

Type 2 DM – Insulin

Basal Insulin – intermediate to long acting insulin

Insulin	Onset	Peak	Duration
NPH (Novolin N ®) (Humulin N ®)	1-3 hours	6-10 hours	12-20 hours
Levemir (Detemir ®) Glargine (Lantus ®)	1 hour 1 hour	None None	12-24 hours 24 hours

Bolus Insulin – shorter acting insulin

Insulin	Onset	Peak	Duration
Aspart (Novolog ®) Lispro (Humalog ®) Gulisine (Apidra ®)	15-30 min	30-90 min	3-5 hours
Regular (Novolin R ®) (Humulin R ®)	30-60 min	1-2 hours	5-8 hours

Premixed Insulin – longer and shorter acting

Consider for people who cannot mix insulin, use an insulin pen, or whose stable dose of insulin is the same as the premix.

Insulin	Onset	Peak	Duration
Novolin, Novolog 70/30	30 min	2-5 hours	18-24 hours
Humulin 50/50	30 min	2-4 hours	14-24 hours
Humalog 75/25	15 min	½-2½ hrs	16-20 hours

Drug names in *italics* are not in the National Drug Formulary

Ref: Nathan, Buse, Davidson, et al. Medical Management of Hyperglycemia in Type 2 Diabetes: a Consensus Algorithm for the Initiation and Adjustment of Therapy. (2009). Diabetes Care 32, 193-203.

**Want to offer
something besides
medications?**

Non-pharmacologic things
programs can do

Case Management

- Many studies have shown that nurse (or pharmacist) case managers making medication adjustments using treatment algorithms improve care
 - VA study: patients in case management were more than twice as likely to achieve goals for A1C, BP and lipids than patients in usual care

Diabetes Care 2011;34:1689-1694

- Case management for patients with diabetes and/or CVD and depression
 - Better glucose, BP, LDL *and* depression scores than usual care control group

NEJM 2010;363:2611-2620 34

Integrative Approaches

- Relaxation Techniques *Surwit, The Mind-Body Diabetes Revolution: A Proven New Program for Better Blood Sugar Control, 2004*
- Guided Imagery
- Meditation
- Progressive Muscle Relaxation *Diabetes Care 2002;25:30-34*
- Biofeedback-assisted relaxation *Diabetes Care 2005;28:2145-9*
- Yoga/Tai Chi/Qi-Gong *Diabetes Care 2002;25:241-2*
Diabetes Care August 11, 2011;doi: 10.2337/dc10-2430
- Massage and other body work techniques
- Acupuncture (helps with chronic pain)



Group Medical Visits

- Improve A1C, blood pressure and lipids *beyond* an equivalent amount of one-on-one care

Diabetes Care 2001;24:995-1000, *Diabetes Care* 2003;26:2032-2036

Diabetes Care 2004;27:670-675, *Clinical Diabetes* 2008;26:58-62

Ann Intern Med 2010;152:689-696

- Decrease costs and health care utilization

J Am Geriatr Soci 1997;45:543-549

- Are well-liked by many patients

--~50% will participate in group visits

Cultural/Group Support

- Pima Pride Study
 - DPP pilot study
 - People randomized to “Action” group
 - Structured diet/exercise meetings
 - People randomized to “Pride” control group
 - Unstructured activities emphasizing Pima culture and history
- “Pima Pride” group showed more positive outcomes on every biological parameter measured

Narayan et al, Diabet Med 1998;15:66-72

“...it is also intriguing to consider the possibility that social support has a more direct effect on diabetes control or perhaps influences glycemic control in ways that extend beyond our current paradigm of diabetes management.”

Gregg and Narayan, *Diabetes Care* 1998;21:875

Key Points

- Individualize glucose targets/ranges—really!
- Glucose control good (especially early in DM) but not as helpful as controlling blood pressure or lipids
- Choose medications based on safety, effectiveness, cost-effectiveness
 - Consider whether adding yet another medication will really achieve something meaningful for patient
- Consider using insulin earlier in the course of diabetes—and be sure schedule, dose work for pt
- Case management, group medical visits, depression care, integrative approaches: good to add!

Tools on IHS Diabetes Website

- Algorithms:
 - Glucose Control, Insulin
 - HTN, Lipid control
 - Urine albumin testing, CKD
 - Neuropathic Pain, Foot Care
- Glucose Control “LEARN” Hub
 - Algorithms, on-line trainings, Quick Guides, podcasts, resources
- www.ihs.gov/MedicalPrograms/Diabetes/

Thank you!