Clinical Guideline for Diabetes

Adopted: 12/7/2011

Revised/Approved: 04/2012, 04/2014, 06/2015, 06/2017

Next Review Date: 06/2019

Purpose:

The "SWHP Clinical Guidelines for Diabetes" is intended to provide clinicians, patients, payers, ancillary staff, and other interested individuals with a practical guideline including evidence-based components of diabetes care, general treatment goals, and a tool to evaluate the qualtity of care that takes into account the whole patient as well as potential risks and complications.

Scope:

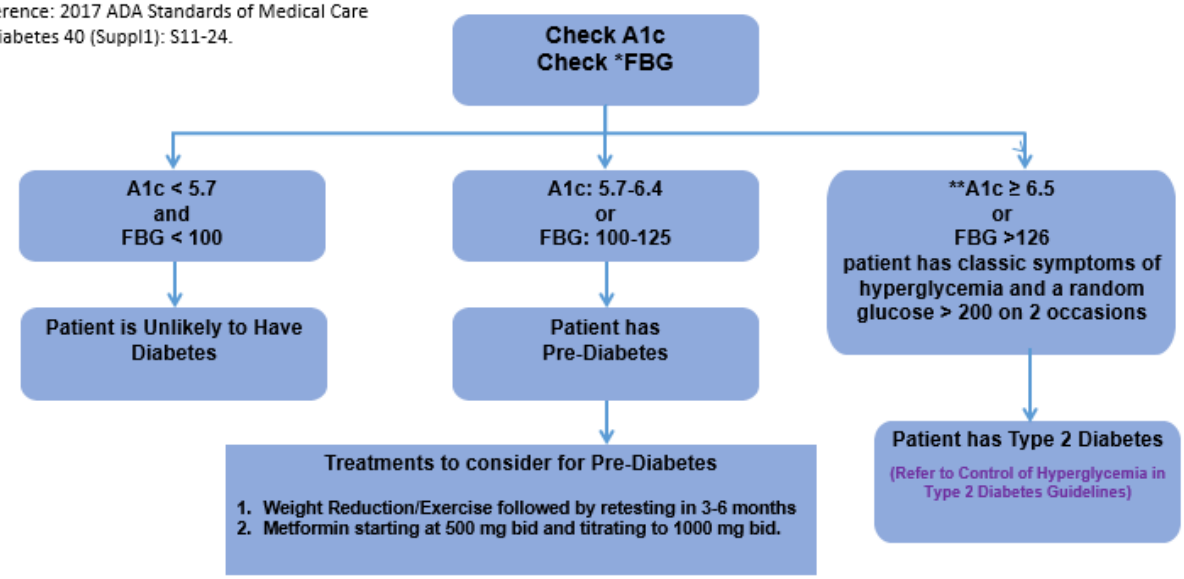
These guidelines provide evidence-based recommedations regarding screening, diagnostic, and therapeutic actions shown to promote positive health outcomes for patients with diabetes. These guidelines include new recommendations for the global assessment and management of pre-diabetes, type 1 & type 2 diabetes, hypoglycemia, and diabetes during pregnancy.

Guideline:

SWHP in conjuction with BSWH has adopted the American Diabetic Association (ADA) 2017 Standards of Medical Care along with the 2017 Consensus Statement by the American Association of Clinical Endocrinologists (AACE) and American College of Endocrinology (ACE) on the Comprehensive Type 2 Diabetes Management Algorithm.

Diabetes Diagnosis Guidelines

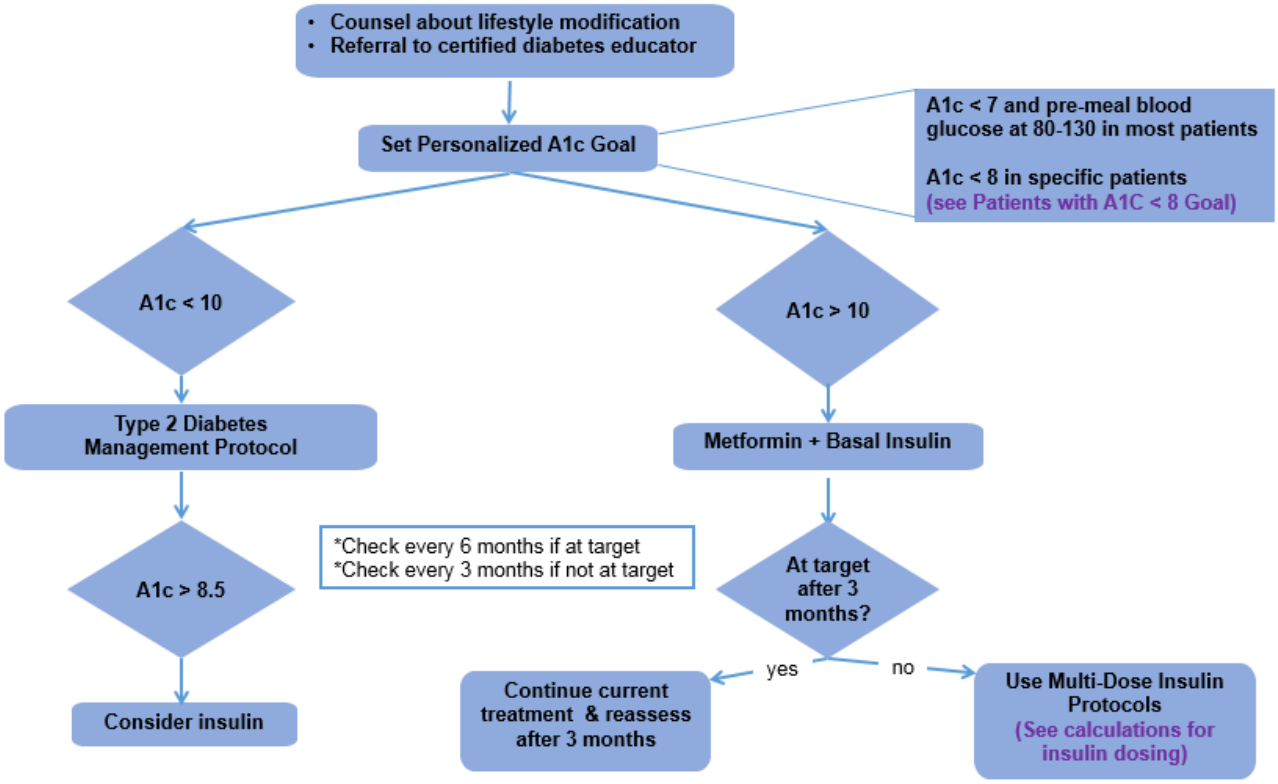
Reference: 2017 ADA Standards of Medical Care in Diabetes 40 (Suppl1): S11-24.



* FBG: Fasting Blood Glucose. Fasting is defined as no caloric intake for at least 8 hours

** In the absence of unequivocal hyperglycemia, results should be confirmed by repeat testing

Control of Hyperglycemia in Type 2 Diabetes Guidelines



Patients with an A1C < 8 Goal		
➢ Over 65 years old	➢ Amputation	➢ Blindness
➢ Chronic Renal Failure	➢ Dementia/Cognitive Impairment	➢ Heart Failure
➢ Hypoglycemic Risk	➢ Ischemic Vascular Disease	➢ Long Standing Duration of Diabetes
➢ Multiple Co-morbidities	➢ Short Life Expectancy	➢ Limited Resources
➢ Patient is Unwilling		

- Reference: 2017 ADA Standards of Medical Care 40 (Suppl 1): S48-S56.

Type 2 Diabetes Management:

Step 1
- Lifestyle modifications to decrease weight and increase activity
  - ✓ Always confirm adherence to diet, exercise, and previous medications as well as assess for possible need for Diabetes Education or Nutrition Therapy before proceeding to each of the followinging steps
- Metformin – titrate to 2000 mg/day, as tolerated

Step 2
- DPP-4-inhibitor
- Pioglitazone
- SLGT-2-inhibitor
- GLP-1 agonist
- Basal Insulin
- Sulfonylurea (Do not start Glyburide for patients >65 y/o)

Step 3
- Add GLP-1, Basal Insulin, or additional oral agent from Step 2

Step 4
- Add basal insulin
- If already on basal insulin, consider prandial insulin

Metformin + Basal Insulin Dosing:

A. **Starting Dose** (Given at Bedtime) 0.1 to 0.2 units/kg/day x weight (kg)

B. **Titration Schedule**

1. Adjust dosage no more often than every 7 days until FPG target is attained
2. Patient to check fasting glucose every morning and maintain a log
3. If 7-day average fasting glucose is:
   - > 180mg/dL: increase basal dose by 4 units
   - 131 – 180mg/dL: increase basal dose by 2 units
   - 70 – 130mg/dL: maintain current basal dose
   - < 70mg/dL: decrease basal dose by 4 units – instruct patient to decrease insulin for any reading <70mg/dL (fasting or post-prandial) and contact you (or their provider) if the patient has another blood glucose <70mg/dL

Recommendations from clinical experience/BSWH Diabetes Workgroup expert opinion:

- *If glargine (Lantus®, Toujeo®) or detemir (Levemir®) dose is over 50 units/day, consider splitting dose.
- *There is no pharmacologic basis for splitting the degludec (Tresiba®) dose due to its long half-life.

<u>Calculations for Prandial Insulin Dosing:</u>

- If fasting BG is in target range but A1c out of range, prandial insulin is needed
- Two methods: Add to largest meal or add based on glucose readings

1. Add to largest meal
   - Add prandial short acting insulin at largest meal
   - Have patient check pre- and 2 hour post-meal glucose
   - Add additional prandial insulin until 2 hour glucose <180

2. Add based on pre-lunch, pre-dinner, and pre-bedtime glucose readings
   - If **bedtime** glucose not at goal, add rapid acting insulin at **dinner** (most common need due to size of meal)
   - If **dinner** glucose not at goal, add rapid acting insulin at **lunch**
   - If **lunch** glucose not at goal, add rapid acting insulin at **breakfast**

❖ Start with 1/6th current basal dose of insulin and adjust by 2 units every 3 days, if another pre-meal BG remains out of range, add another pre-meal injection based on above guidelines.

- Patients may have a decrease in basal insulin requirements after prandial insulin is added, especially if prandial insulin before dinner results in lower bedtime glucose values. Watch fasting blood glucoses for downward trending and decrease basal insulin as needed.

<u>Calculations for Intensive Insulin Regimen:</u>

3 step calculation for basal and prandial insulin doses:

1. Total Daily Dose (TDD)
    - 0.3 – 0.5 units/kg/day x weight (kg)
    - Choose higher for A1c >10% and lower for <10%
2. Basal Insulin Dose (important to recalculate basal dose if already on basal insulin)
    - Glargine (Lantus®, Toujeo®), Detemir (Levemir®), Degludec (Tresiba®) - TDD/2 = units
    - NPH is not preferred due to having substantial peak and short duration, but may be chosen due to cost considerations
        - Needs to be given twice daily due to shorter duration: AM NPH 2/3rd TDD, PM NPH 1/3rd TDD
3. Prandial Insulin Dose (Rapid acting insulin)
    - Lispro (Humalog®), Aspart (Novolog®), Glulisine (Apidra®) TDD/6 at each meal (or basal dose/3)
    - Regular insulin not preferred due to slow onset and long duration, but may be chosen due to cost considerations
        - Use same calculation as above

✓ If A1c not at goal in 3 months - increase TDD by 10-20% and recalculate doses
- Review home blood glucose logs for evidence of hypoglycemia or hyperglycemia events
- Consider adding correction insulin or referral to Endocrinology

<u>Calculations for Twice Daily Insulin Regimen:</u>

➢ May be suitable for select patients not controlled with basal insulin alone
- Cost considerations – NPH, Regular and premixed NPH/Regular are the least expensive insulins
- Need for a simple regime (keep in mind that pre-mixed insulins with analogue insulins offer no cost advantage)
- Major disadvantages:
    - Requires adherence to 3 meals daily at regular times
    - The NPH peak may cause afternoon or nocturnal hypoglycemia

➢ Calculate Total daily dose (TDD): 0.3 to 0.5 units/kg/day x weight(kg)
- Choose higher for A1c >10% and lower for HgbA1c <10%

➢ Premix Therapy (most common)
- Morning before breakfast: (70/30 or 75/25) 2/3 X TDD
- Evening before dinner: (70/30 or 75/25) 1/3 x TDD

➢ Split Mix Therapy (rarely used except for cost considerations since the complexity approaches basal/bolus regimens)
- Daily NPH Insulin = 2/3 TDD:
    - 2/3 daily NPH before breakfast & 1/3 daily NPH AC supper or 9-10 PM
- Daily Regular Insulin = 1/3 TDD
    - 2/3 daily regular before breakfast & 1/3 daily regular before dinner

✓ If A1c not met after 3 months, increase the TDD by 10-20% and recalculate doses, consider advancing to Intensive Insulin Therapy

Reviewing Physician: Veronica Piziak, MD (Endocrinology, BSWH)

Source(s):

1. 2017 ADA Standards of Medical Care. Diabetes Care 40 (Suppl 1): S48-S56.
2. Consensus Statement by the American Association of Clinical Endocrinologists and American College of Endocrinology on the Comprehensive Type 2 Diabetes Management Algorithm – 2016 Executive Summary. Endocrine Practice Vol 22 No. 1 Jan 2016.
3. AACE/ACE Comprehensive Type 2 Diabetes Management Algorithm 2016.
4. BSWH Diabetes Council Outpatient Workgroup