Clinical Guideline for Diabetes

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 quality of care that takes into account the whole patient as well as potential risks and complications.

Scope:
These guidelines provide evidence-based recommendations 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 conjunction 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


**Check A1c**  
Check "FBG"

- **A1c < 5.7 and FBG < 100**  
Patient is Unlikely to Have Diabetes

- **A1c: 5.7-6.4 or FBG: 100-125**  
Patient has Pre-Diabetes

- **"A1c ≥ 6.5 or FBG > 126 patient has classic symptoms of hyperglycemia and a random glucose > 200 on 2 occasions"**

  **Treatments to consider for Pre-Diabetes**  
  1. Weight Reduction/Exercise followed by retesting in 3-6 months  
  2. Metformin starting at 500 mg bid and titrating to 1600 mg bid.

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

**Control of Hyperglycemia in Type 2 Diabetes Guidelines**

- Counsel about lifestyle modification  
- Referral to certified diabetes educator

Set Personalized A1c Goal

- **A1c < 7 and pre-meal blood glucose at 80-130 in most patients**
- **A1c < 8 in specific patients (see Patients with A1c < 8 Goal)**

  **A1c < 10**

  Type 2 Diabetes Management Protocol

- **A1c > 8.5**
  - Consider insulin

  *Check every 6 months if at target  
  *Check every 3 months if not at target

  **A1c > 10**

  Metformin + Basal Insulin

  At target after 3 months?  
  - yes  
  - no

  Use Multi-Dose Insulin Protocols (See calculations for insulin dosing)

  Continue current treatment & reassess after 3 months
Patients with an A1C < 8 Goal

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


**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 following 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.

**Calculations for Prandial Insulin Dosing:**
- 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 1/6 th 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.

**Calculations for Intensive Insulin Regimen:**
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 2/3 TDD, PM NPH 1/3 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

**Calculations for Twice Daily Insulin Regimen:**

- 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
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Source(s):

3. AACE/ACE Comprehensive Type 2 Diabetes Management Algorithm 2016.
4. BSWH Diabetes Council Outpatient Workgroup