

Insulin Algorithm for Type 1 Diabetes Mellitus in Children and Adults¹

ABBREVIATIONS

BASAL: Glargine or Detemir

BOLUS (Prandial):

Reg: Regular Insulin (peak action 3-4 hrs)

RAI: Rapid Acting Insulin = Aspart, Glulisine, or Lispro (peak action 1-1 ½ hrs)

PPG: Post-Prandial Glucose

SMBG: Self-monitored blood glucose³

TDI: Total daily insulin dosage in units

Glycemic Goals^{2,3}

Individualize goal based on patient risk factors

A1c	≤6%	<7%	<8%
FPG	≤110	120	140 mg/dL
2h PP	≤130	180	180 mg/dL

Split-Mix Insulin Therapies⁴

- Two shots: NPH + Reg or RAI
2:1 ratio AM; 1:1 ratio PM
- Three shots: AM: NPH + Reg or RAI
PM: Reg or RAI
HS: NPH
2/3 TDI ÷ as 2/3 AM NPH + 1/3 as Reg or RAI
1/3 TDI ÷ as ½ PM Reg or RAI + ½ NPH at HS
- Two shots Premix
2/3 AM + 1/3 PM

Total Daily Insulin⁵: 0.3-0.5 units/kg/day, and titrate to glycemic targets

OR

Intensive Insulin Therapy (IIT)

Physiologic Insulin-1:1 basal:bolus ratio SQ

Basal: Glargine QD or Detemir QD-BID^{6,9}

Bolus: RAI (or Reg) before each meal: If meal skipped, skip dose.

Premeal insulin dose includes:

- Insulin to cover carbohydrate ingested⁷; 1 unit RAI covers 500/TDI grams carbohydrate from meal
- Additional insulin to correct for high SMBG; 1 unit RAI lowers PG by approximately 1800/TDI mg/dL. (Reg lowers PG by ~1500/TDI)
- Consider adjustment for exercise⁸

Total Daily Insulin⁵: 0.3-0.5 units/kg/day and titrate to glycemic targets

Pramlintide^{1,9}

Consider as adjunct therapy to insulin in patients unable to stabilize PPG.

Follow A1c Every 3-6 months and Adjust Regimen to Maintain Glycemic Targets

Footnotes

¹ Consider referring all type 1 patients to pediatric/adult endocrinologist/comprehensive diabetes specialty team, and consider continuous glucose monitoring. If insulin pump therapy is considered-refer to Certified Pump Trainer.

² **Intensify management if:** Absent/stable cardiovascular disease, mild-moderate microvascular complications, intact hypoglycemia awareness, infrequent hypoglycemic episodes, recently diagnosed diabetes. **Less intensive management if:** Evidence of advanced or poorly controlled cardiovascular and/or microvascular complications, hypoglycemia unawareness, vulnerable patient (ie, impaired cognition, dementia, fall history). See "A1c Goal" treatment strategy for further explanation. A1c is referenced to a non-diabetic range of 4-6% using a DCCT-based assay. ADA Clinical Practice Recommendations. *Diabetes Care* 2009;32(suppl 1):S19-20.

³ Modern glucose meters give values corrected to plasma glucose.

⁴ Most type 1 patients need IIT to attain glycemic targets; IIT may be by SQ multiple injection or by SQ continuous insulin pump.

⁵ Dosages may differ in children and adolescents.

⁶ Twice daily dosing may be required at low basal insulin doses.

⁷ **Strongly recommend referral to Registered/Licensed Dietitian or Certified Diabetes Educator with experience in diabetes nutrition counseling.**

⁸ Consider decreasing 1 unit for every 30 minutes of vigorous physical activity.

⁹ **IMPORTANT:** See package insert for dosing