

Step-Wise Dosing and Titration of Insulin for Type 2 Diabetes in the Ambulatory Setting

last update 5/2010



Insulin	When to start	Starting dose	Average fasting AM BG Goal<130	Average Pre-lunch BG	Average Pre-supper BG	Average Bedtime BG	Adjust Insulin dose every 3 days until BG < 130, or optimal dose is reached	When to Change to Different Regimen Recheck A1C every 3 months
Lantus (glargine) OR Levemir (detemir) OR NPH insulin	A1C greater than 8% on 2 or 3 antidiabetic agents OR 1 or 2 agents if Serum Creatinine greater than 2	10 units or up to 0.2 units/kg SQ at bedtime (DC sulfonylurea if part of regimen)	Greater than 130 mg/dL				Increase dose by 2-4 units at bedtime. Optimal long acting (basal) insulin dose keeps bedtime and AM fasting glucose values consistent.	If after 3 months if A1c is greater than 7% and optimal bedtime dose has been reached with fasting blood glucose at goal, consider adding a pre-meal bolus insulin at the largest meal of the day, pre-meal bolus insulin at each meal or 70/30 premix insulin. DC all oral agents except Metformin.
Pre-meal bolus with rapid acting OR regular insulin AND Lantus (glargine) OR Levemir (detemir) OR NPH insulin	A1C greater than 7% with optimal long acting (basal) insulin.	2-4 units of rapid acting or regular insulin SQ at each meal (base dose) with +2 or +1 sliding scale depending on sensitivity. (correction)	Greater than 130				Increase long acting (basal) insulin dose by 2-4 units at bedtime	
				Greater than 130			Increase AM rapid/regular insulin dose by 2-4 units.	
					Greater than 130		Increase lunch rapid/regular insulin dose by 2-4 units.	
						Greater than 130	Increase supper rapid/regular insulin dose by 2-4 units.	
Pre-mix 70/30 Insulin	A1C greater than 7% on maximized long acting (basal) insulin. Alternative to long acting insulin with premeal boluses for patients who prefer not to exceed 2 injections/day	Calculate 0.5 units/kg/day body weight (called total daily dose)						
			AM dose = 2/3 of total daily dose before breakfast	Greater than 120	150-250		Increase AM dose by 3 units.	
					Greater than 250		Increase AM dose by 5 units.	
			PM dose= 1/3 of total daily dose before supper.	Less than 120	Greater than 150			Consider changing to Custom-mixed NPH & Regular
				Greater than 250		Greater than 150	Increase PM dose by 3 units. Increase PM dose by 5 units.	
Greater than 150		Less than 150			Consider changing to Custom-mixed NPH & Regular			

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Custom-mixed NPH and Regular Insulin	Failed above pre-mix 70/30 regimen	Calculate 0.5 units/kg/day body weight (total daily dose)						
		AM dose = 2/3 of total daily dose given as custom-mix: 2/3 NPH and 1/3 Regular before breakfast			150-250		Increase AM NPH dose by 2 units.	
					Greater than 250		Increase AM NPH dose by 4 units.	
				150-250			Increase AM Regular dose by 2 units.	
				Greater than 250			Increase AM Regular dose by 4 units.	
		PM dose = 1/3 of total daily dose given as custom-mix: 1/2 Regular before supper (PM) and 1/2 NPH at bedtime (HS).					150-250	Increase PM Regular dose by 2 units.
							Greater than 250	Increase PM Regular dose by 4 units.
				150-250				Increase HS NPH dose by 2 units.
				Greater than 250				Increase HS NPH dose by 4 units.

ABC's of Diabetes Management



Outcome Measure (ABC's...K)	Optimal	Less Optimal	Poor Control
A = A1C	Less than 7.0	7.0 - 8.9	9 or Greater
B = Blood pressure	Less than 130/80		
C = Cholesterol - LDL	Less than 100 CAD < 70	100 - 130	Greater than 130
D = Diet, as directed	Optimal: Carbohydrate counting, food exchange, eating fruits and vegetables instead of fried foods		
E = Eye exam Exercise regularly	Optimal: Annually		
F = Foot Exam – Comprehensive, Patient check daily	Optimal: At every visit. Comprehensive, Annually		
G = Glucose Monitoring	Optimal: As directed		
H = Healthy living using action plan to achieve self-management goals	Optimal: getting active, healthy diet, medication knowledge, checking blood glucose, daily foot checks, quit smoking		
I = Immunizations Influenza Pneumococcal	Optimal: Flu vaccine annually unless contraindicated Pneumococcal vaccine once at diagnosis and repeat once after age 65		
J = Join a smoking cessation program	Optimal: Quit smoking		
K = Kidneys; microalbuminuria, creatinine	Optimal: Annually		