



The Santa Barbara Diabetes Initiative Roadmap for Diabetes Care

Lois Jovanovič, M.D.
Neil Sullivan, M.D.
Alison Okada Wollitzer, Ph.D.

I. Newly diagnosed DM

If glucose is ≥ 300 mg/dL, patient has ketones, or is acidotic, initiate Insulin therapy immediately.

Otherwise, initiate dual therapy:

To treat elevated fasting glucose: If serum creatinine < 1.4 mg/dL (males) or < 1.2 mg/dL (females), prescribe metformin (500 mg per day week 1, 1000 mg per day week 2, 1500 mg per day weeks 3 and 4. If Metformin XR not available, take at dinnertime week 1, breakfast and dinner week 2; breakfast, lunch, dinner weeks 3 and 4).

To treat elevated postprandial glucose, chose from the following.

Januvia (100 mg once daily)

Prandin (2-4 mg three times daily before meals)

Starlix (150 mg three times daily before meals)

Do not prescribe sulfonylureas

Provide preconceptional counseling

Instruct to keep glucose diary

See monthly until controlled. Measure A1C at each visit, and use as indication of progress.

First Monthly Return visit

If ≥ 300 mg/dL, discontinue oral medications and initiate insulin therapy.

Otherwise:

If fasting glucose ≥ 100 mg/dL, increase metformin to 2000 mg/day

If postprandial ≥ 140 mg/dL, add rapid-acting insulin 1 unit/10g carbohydrates

Second Monthly Return Visit

If ≥ 300 mg/dL, discontinue oral medications and initiate insulin therapy.

Otherwise,

If fasting glucose ≥ 100 mg/dL, add glargine (0.3 x weight in kg) or long-acting insulin

If postprandial ≥ 140 mg/dL, increase ratio of rapid acting insulin to 1 unit/8g carbohydrates

Third Monthly Return Visit

If glucose readings still not in range, discontinue oral medications and initiate insulin therapy.

Definitions

Diabetes mellitus

fasting BG ≥ 126 mg/dL and/or
2 hour postprandial > 200 mg/dL

Impaired fasting glucose

fasting 100 - 125 mg/dL

Impaired glucose tolerance

1 hour postprandial > 200 mg/dL
2 hour postprandial < 200 mg/dL

Overall Treatment Approach

Refer to Case Manager for meter and glucose diary instruction, education, referrals to ophthalmologist and podiatrist

Order lab panel to include fasting lipid profile, renal function and thyroid function

Treat hypertension, dyslipidemia, microalbuminuria, or other abnormalities such as thyroid dysfunction as appropriate

Prescribe diabetes medications based on glucose readings.

Treat aggressively until normal glucose (fasting < 100 mg/dL; one hour postprandial < 140 mg/dL) is achieved.

For further information contact
Lois Jovanovič, M.D.
Sansum Diabetes Research Institute
2219 Bath Street
Santa Barbara, CA 93105
ljovanovic@sansum.org
(805) 682-7638

A1C Equivalents

A1C	Average Blood Glucose
10	190 mg/dL
9.5	180 mg/dL
9	170 mg/dL
8.5	160 mg/dL
8	150 mg/dL
7.5	140 mg/dL
7	130 mg/dL
6.5	120 mg/dL
6	110 mg/dL
5.5	100 mg/dL
5	90 mg/dL

II. Type 2 Diabetes Already on Treatment

Interview regarding compliance with medications, diet, glucose monitoring, education. Refer again to Diabetes Case Manager if indicated.

Check for ophthalmologist and podiatrist exam; re-refer if indicated

Labs should include fasting lipid profile, renal function and thyroid function

All patients should be on dual therapy (metformin up to 2000mg/day plus one of the postprandial medications listed for Newly Diagnosed).
If on sulfonylureas and A1C $> 6.0\%$, change therapy

See monthly until controlled. Measure A1C at each visit, and use as indication of progress.

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III. Children with Type 2 Diabetes

Metformin is approved for use in teenagers
Otherwise, initiate insulin therapy
If under 13 years old, refer to a pediatric endocrinologist

IV. Impaired glucose tolerance or impaired fasting glucose

If A1C <6.5%, treat with diet and exercise
If A1C ≥6.5%, treat as per type 2

INSULIN THERAPY

Calculating "Big I"

For non-pregnant patients:
Weight in kilos x 0.6

For pregnant women: Weight in kilos x :
0.7 if 0-12 weeks gestation
0.8 if 13-28 weeks gestation
0.9 if 29-34 weeks gestation
1.0 if >34 weeks gestation

Administer "Big I" as:

1/2 as basal:
NPH 1/3 before breakfast, dinner and bedtime OR
glargine once/day or 2/3 before bed and 1/3 before
breakfast OR
detemir 1/2 before breakfast and 1/2 before bedtime
1/2 as meal-related bolus
aspart, lispro or glulisine 1/3 before meals

IN PREGNANCY, use NPH and aspart or lispro

Adjustments to insulin dose based on Blood Glucose (BG) measurements

0800 Pre-breakfast: NPH or detemir

Check yesterday's pre-dinner BG. If is was:

- < 60 mg/dL, decrease today's morning NPH or detemir by 3%.
- 61-90 mg/dL, no change in today's morning NPH or detemir.
- > 91 mg/dL, then increase today's morning NPH or detemir by 3%.

Breakfast Rapid Acting insulin = 1/6 "Big I" to be adjusted according to the following scale:

If pre-breakfast BG is:

- < 60 mg/dL, decrease rapid-acting insulin by 3%
- 61-90 mg/dL, no adjustment
- 91-120 mg/dL, increase rapid-acting insulin by 3%
- > 120 mg/dL, increase rapid-acting insulin by 6%

If today's BG 1 hour after breakfast is:

- < 110 mg/dL, then decrease tomorrow's pre-breakfast rapid insulin by 3%.
- 111-120 mg/dL, no change in tomorrow's pre-breakfast rapid insulin.
- > 120 mg/dL, then increase tomorrow's pre-breakfast rapid insulin by 3%.

Pre-lunch: Rapid-acting insulin is 1/6 "Big I" to be adjusted according to the following scale:

If pre-lunch BG is

- < 60 mg/dL, decrease rapid-acting insulin by 3%
- 61-90 mg/dL, no adjustment
- 91-120 mg/dL, increase rapid-acting insulin by 3%
- > 120 mg/dL, increase rapid-acting insulin by 6%

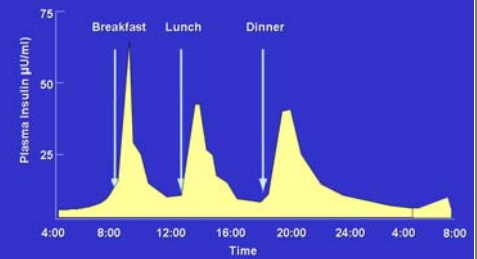
If today's BG 1 hour after lunch is:

- < 110 mg/dL, then decrease tomorrow's pre-breakfast rapid insulin by 3%.
- 111-120 mg/dL, no change in tomorrow's pre-breakfast rapid insulin.
- > 120 mg/dL, then increase tomorrow's pre-breakfast rapid insulin by 3%.

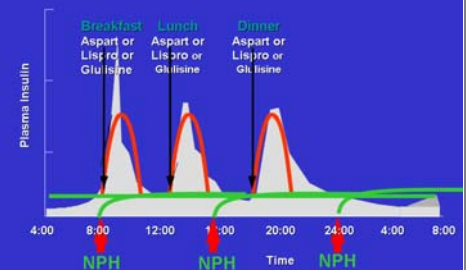
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NOTE: Patient should not eat unless the blood glucose is below 120 mg/dl

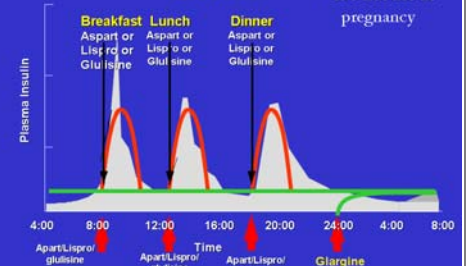
PHYSIOLOGICAL SERUM INSULIN SECRETION PROFILE



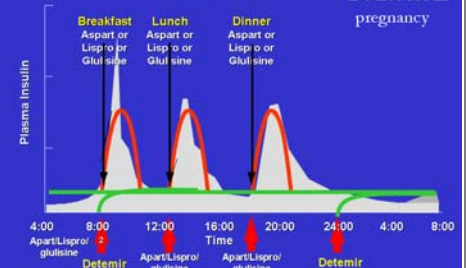
WHEN NPH IS USED AS BASAL



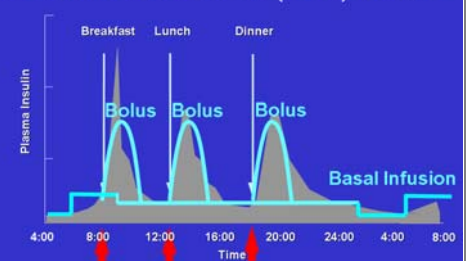
WHEN GLARGINE* IS USED AS BASAL



WHEN DETEMIR* IS USED AS BASAL



CONTINUOUS SUBCUTANEOUS INSULIN INFUSION (CSII) PUMP





INSULIN THERAPY continued

Pre-dinner: NPH = 1/6 "Big I"

If yesterday's pre-bedtime BG was:

- < 60 mg/dL, decrease today's dinner NPH or morning detemir by 3%.
- 61-90 mg/dL, no change in today's dinner NPH or morning detemir .
- > 90 mg/dL, increase today's dinner NPH or morning by 3%.

Rapid-acting insulin is 1/6 "Big I", to be adjusted according to the following scale:

If pre-dinner BG is:

- < 60 mg/dL, decrease rapid-acting insulin by 3%
- 61-90 mg/dL, no adjustment
- 91-120 mg/dL, increase rapid-acting insulin by 3%
- >121 mg/dL, increase rapid-acting insulin by 6%

If today's BG 1 hour after dinner is:

- < 110 mg/dL, decrease tomorrow's dinner rapid-acting insulin by 3%.
- 111-120 mg/dL, no change in tomorrow's dinner rapid-acting insulin.
- >120 mg/dL, increase tomorrow's dinner rapid-acting insulin by 3%.

2400 bedtime: NPH = 1/6 "Big I"

If today's pre-breakfast BG was:

- < 60 mg/dL, decrease today's bedtime NPH, or detemir or glargine by 3%.
- 61-90 mg/dL, no change in today's bedtime NPH, detemir or glargine.
- > 90 mg/dL, then check the 3:00 a.m. BG and, if it is
 - <70 mg/dL (regardless of today's pre-breakfast BG), decrease today's bedtime NPH, or detemir or glargine by 3%.
 - > 70 mg/dL, increase today's bedtime NPH, or detemir or glargine by 3%.
 - >90 mg/dL, also consider giving 3:00 a.m. rapid insulin scale equal to the pre-lunch rapid scale.

THE GOAL FOR THERAPY IS NORMOGLYCEMIA

Therapy is based on blood glucose concentrations

Do not wait for A1C to rise to make a therapeutic decision

Treat aggressively until normal glucose concentrations are achieved