

How to Use ADA's Type 2 Diabetes Treatment Algorithm

Part Two- Injectable Medications

Eric L. Johnson, M.D.
Associate Professor
University of North Dakota School of Medicine and Health Sciences
Assistant Medical Director
Altru Diabetes Center



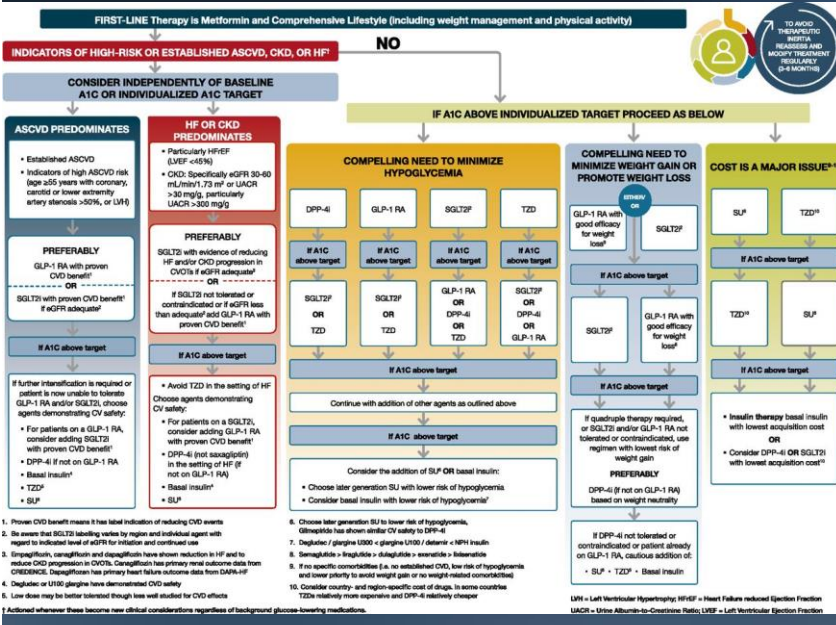
Learning Objectives

- Recognize drug-specific and patient factors of antihyperglycemic agents to support patient-provider shared decision making
- Demonstrate when and how to intensify therapy- in this case, injectable medications
- Identify opportunities to refer patients to Diabetes Self-Management Education

Management of Hyperglycemia in T2DM Outline

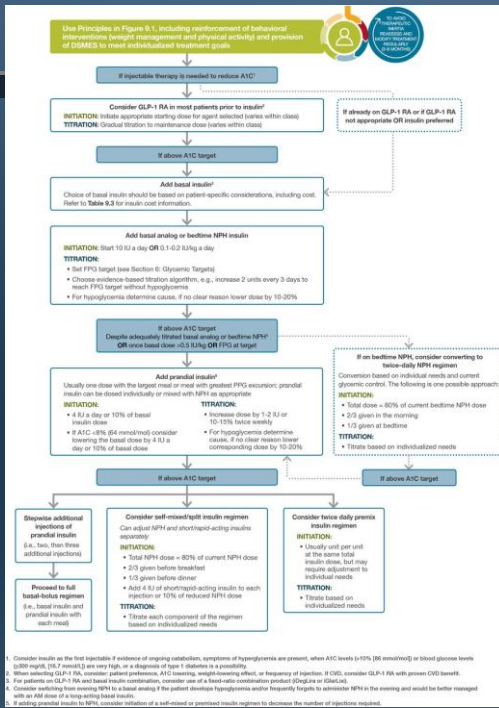
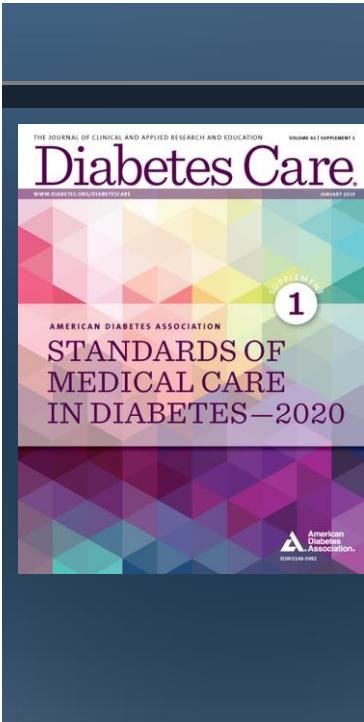
1. Patient-centered care
2. Anti-hyperglycemic therapy
3. Implementation strategies-Case based
4. Other considerations

Refresh: ADA Type 2 Medication Algorithm 2020



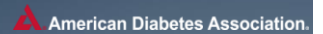
- Note that there is not a clear separation of oral medications and injectable medications
- The need for GLP-1 arises with ASCVD or renal disease, not necessarily after all orals have failed
- Insulin may be needed sooner (or at diagnosis) with very high A1C and symptomatic

Insulin/GLP-1 and Beyond

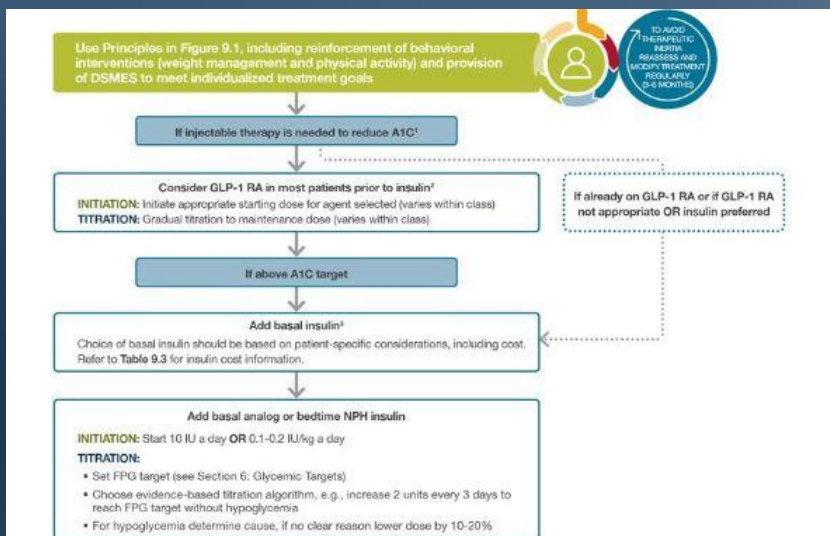


Diabetes Care 2020 Jan; 43(Supplement 1): S98-S110

This has been simplified compared to previous years.



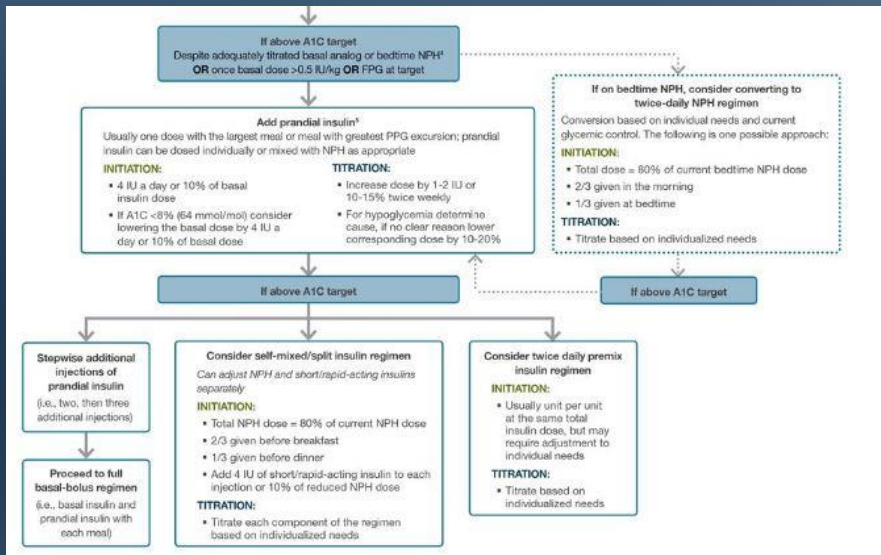
Approach to Starting an Injectable Medication in T2DM



Consider max dose 0.5u/kg



Beyond Basal Insulin/GLP-1



 American Diabetes Association.

Case 1

- GM is a 64 y/o white male
- Diagnosed with type 2 diabetes after 2 fasting blood sugars of 154 mg/dl and 142 mg/dl and A1C of 6.8%
- Saw Diabetes Educator and Dietician at diagnosis
- Pre-existing
 - HTN (on Lisinopril 10mg)
 - Dyslipidemia (on atorvastatin 40mg)
 - no history of ASCVD or renal disease
- ASA 81 mg daily (over 50 + DM)

 American Diabetes Association.

Case 1

- Physical Exam
 - BP 132/78, pulse 80, BMI 34
 - Fundi normal
 - Obese
 - Feet healthy appearing other than benign calluses
- Lipids in target (measure of compliance), hepatic and renal chemistries all normal

Case 1

- Current Diabetes Medications:
 - Metformin 1000mg BID
 - Glimepiride 4mg daily
 - Basal insulin 60 units daily
- A1C 8.7%
- Fasting blood glucose values 180's-low 200's
- 2 hour post-prandial glucose values 220's-290's
- What next?

Case 1

- What would be an appropriate choice for this patient?
- A. DPP-IV inhibitor
- B. Higher dose of sulfonylurea
- C. GLP-1 RA
- D. SGLT-2
- E. Rapid acting insulin

Case 1

- What would be an appropriate choice for this patient?
- A. DPP-IV inhibitor
- B. Higher dose of sulfonylurea
- C. GLP-1 RA
- D. SGLT-2
- E. Rapid acting insulin

Answer: C or D or E

What would drive us toward a GLP-1?

- Compelling need for weight loss
- Renal disease
- ASCVD
- Compelling need for hypoglycemia avoidance

What Would Drive Us Toward SGLT-2?

- ASCVD
- Compelling need for weight loss
- Mild renal impairment (GR >45-60)
- CHF
- Compelling need for hypoglycemia avoidance

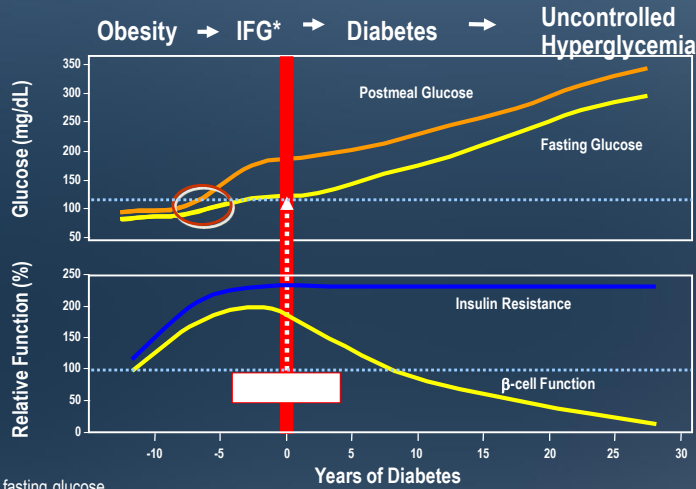
What Would Drive Us Toward Multiple Daily Injections of Insulin or an Insulin Pump?

- Not meeting A1C goals on other treatments
- Intolerant of GLP-1 or SGLT-2 as add on to this patient

Insulin Therapy in T2DM

- The progressive nature of T2DM should be regularly and objectively explained to T2DM patients
- Avoid using insulin as a threat, describing it as a failure or punishment
- Give patients a self-titration algorithm

Natural History of Type 2 Diabetes



*IFG=impaired fasting glucose.

Copyright© 2000 International Diabetes Center, Minneapolis, USA. All rights reserved. Adapted with permission.

Therapeutic Options: Insulins

Human Insulins

Neutral protamine Hagedorn (NPH)

Regular human insulin

Pre-mixed formulations

Insulin Analogues

Basal analogues (glargine, detemir, degludec)

Rapid analogues (lispro, aspart, glulisine)

Pre-mixed formulations

Biosimilar Insulin

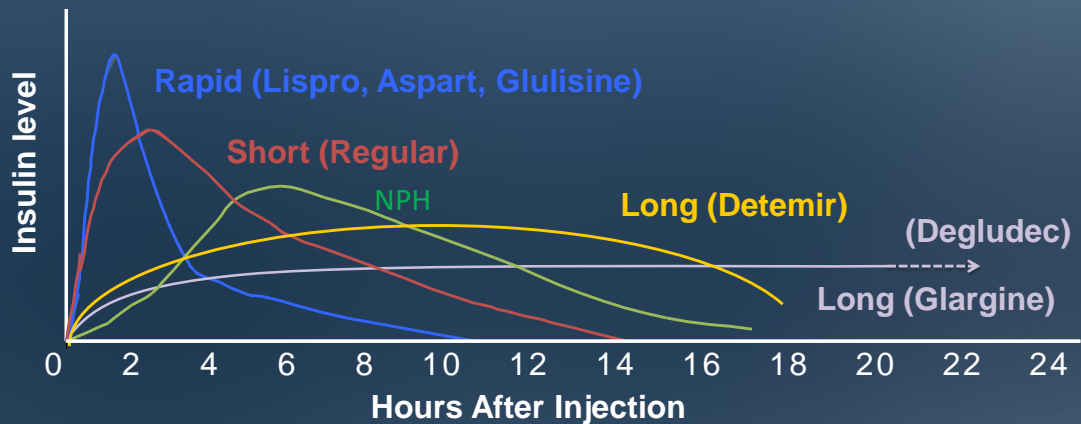
Basaglar (a biosimilar version of insulin glargine); long-acting



Diabetes Care 2012;35:1364–1379; *Diabetologia* 2012;55:1577–1596
Diabetes Care 2015;38:140–149; *Diabetologia* 2015;10.1077/s00125-014-3460-0
<https://investor.lilly.com/releasedetail.cfm?ReleaseID=1004325>
<https://www.basaglar.com/en/>

American Diabetes Association.

Anti-Hyperglycemic Therapy: Insulins



American Diabetes Association.

Case 1

- Patient should see Diabetes Educator (again) and Dietician for regimen change/instruction and lifestyle evaluation
- Could consider stopping sulfonylurea may not be adding a lot of benefit if we are adding other agents

American Diabetes Association.

Case 2

- TG, a 58-year-old African American, has had T2D for 8 years
- Currently being treated for hypertension (12 years) and dyslipidemia (10 years)
- History of acute coronary syndrome
- Concerned about uncontrolled blood glucose level, a recent increase in weight (5 lbs)
- Non-smoker and only occasionally consumes alcohol
- Walks 15-20 minutes, three times a week
- Diet has improved over last 5 years after consult with RD, but she admits to having a “sweet tooth”



(Continued...)

 American Diabetes Association.

Case 2

- **Physical exam:**
 - General examination normal, No pallor, cyanosis, clubbing or lymphadenopathy
 - Height, 5'2" (157 cm); weight, 152 lbs (69 kg)
 - BMI, 27.8 kg/m²
 - BP, 132/86 mmHg
 - Pulse 80/min, regular, peripheral pulses well felt
 - Systemic examination- normal
 - Foot examination is normal
 - Fundus examination :Grade I non proliferative diabetic retinopathy

(Continued...)

 American Diabetes Association.

Case 2

- Medications

- Glimepiride 2 mg daily BID
- Metformin sustained release preparation 1000 mg daily
- Telmisartan 40 mg daily
- Atorvastatin 80 mg at night
- Aspirin 81 mg at night

(Continued...)

Case 2

- Labs:

- A1C 8.3 %
- Lipids TC 160, TG's 210, HDL 35, LDL 68
- Fasting, preprandial blood glucose values 150's-160's
- Post-prandial blood glucose values 190's-220's
- GFR 55, serum creatinine 1.2, hepatic chemistries normal
- Urine normal (no albuminuria)

Case 2

From the lab results, which plasma glucose patterns of hyperglycemia are present?

- A. Fasting
- B. Preprandial
- C. Postprandial
- D. Nocturnal

Case 2

A drug from which of the following drug classes could you suggest to intensify Mrs. G's treatment to manage her hyperglycemia?

- A. GLP-1 receptor agonist
- B. DPP-4 inhibitor
- C. SGLT2 inhibitor
- D. Basal insulin

Case 2: Think-Pair-Share

- What option you would have tried first?
- Would you discontinue the sulfonylurea or add the GLP-1 receptor agonist to the metformin/sulfonylurea?

My Preferred Choices For Injectable

- Basal + GLP-1 over basal + mealtime insulin
 - Studies show as good or almost as good, may have weight loss
- Don't split basal in two
- If doing 2 shots a day, basal + GLP-1 is better (and remember, some GLP-1 are weekly)
- Remember CVD/renal benefit of GLP-1

Key Points

Individualize glycemic targets & BG-lowering therapies

Lifestyle foundation of any T2DM therapy program

Unless contraindicated, metformin is optimal first-line drug

- In patients with ASCVD and T2D, subsequent treatment should incorporate agent proven to ↓ CV events and/or CV mortality
- Ultimately, many patients will require insulin therapy alone or in combination with other agents to maintain BG control
- Shared decision making (focus on his/her preferences, needs & values)

Comprehensive CV risk reduction - a major focus of therapy

Avoid Clinical Intertia



Thank You!