PriorityHealth

Using the type 2 diabetes glycemic treatment algorithm

Purpose

- Assist provider decision-making for the treatment of hyperglycemia in patients with type 2 diabetes.
- Serves as a recommended pathway for treating hyperglycemia.
- Encourages rapidly adding additional therapy if the patient does not achieve A1C goal

Creation

- Created by a collaborative group of physicians, pharmacists and diabetes educators working to improve care in members with diabetes.
- Based on recommendations from the American Diabetes Association and the American Association of Clinical Endocrinologists.
- Approved by the Pharmacy and Therapeutics (P&T) Committee.
- Updated in June 2012 to reflect recent recommendations published by the American Diabetes Association.

What changed with the Algorithm in 2012?

- The algorithm now suggests a drug treatment based on the potential to lower A1C and to help clinicians select treatments that are most likely to help the patient achieve the goal.
- It includes recommendations on when to use DPP-4 inhibitors and when oral 3-drug combinations are appropriate.

How to use this tool

- The algorithm is a five step approach to managing hyperglycemia.
- Treatment decisions should be made based on A1C in addition to patient self-monitored blood glucose results.
- Assure that the dosages of medications are maximized in each step prior to advancing to the next step.
- Steps of therapy are additive, as the medications in the algorithm have synergistic effects when used together. Do not discontinue previous steps of therapy when advancing through the algorithm unless otherwise noted.
- Refer to “Insulin initiation guidelines for type 2 diabetes mellitus” for guidance on dosing insulin.

Note: *All of the medications in the algorithm are available on the Priority Health formulary. GLP-1 and DPP-4 agents have step therapy requirements usually satisfied by maximizing metformin for 3 months, as suggested in the algorithm. Click on the “approved drug list” for details on what is required for these agents.*

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Therapy steps

- After diagnosis is made, start with step 1 recommendations:
  - Lifestyle modifications
  - Referral to diabetes self-management training
  - Metformin (in combination with Sulfonylurea or GLP-1 agonist if A1C >9% to <10%) or insulin (if A1C >10%)
  - Titrate medication dose
  - Recheck A1C after 3 months
- Add step 2 therapy if A1C >7%
  - If A1C 7% to <8%
- Sulfonylurea, GLP-1 agonist, pioglitazone, or DPP-4 inhibitor
  - If A1C 8% to <8.5%
- Sulfonylurea, pioglitazone, or GLP-1 agonist
  - If A1C 8.5% to <9%
- Sulfonylurea or GLP-1 agonist
  - If A1C >9%
- Basal insulin
- Continue adding therapy as outlined in steps 3 - 5 if the patient does not achieve an A1C <7% after 3 months.

Limitations of the algorithm

- This algorithm recommends addition of therapy based on an A1C goal of less than 7%.
- While this recommendation is appropriate for the majority of patients, Priority Health recognizes it may not apply to all patients.
- Recent evidence suggests an A1C goal of less than 8% may be appropriate for certain patients, including those with the following conditions: history of CABG or PTCA; diagnosis of IVD, heart failure, MI and ESRD.
- Clinicians may set an A1C goal of 6.5% for certain patients including those with a shorter duration of diabetes, a long life expectancy, no significant CVD, and who have a lower risk of hypoglycemia.
- Additionally, certain approved treatments including pramlintide, alpha-glucosidade inhibitors, the glinides, colesevelam, and bromocriptine are not included in this algorithm, owing to their generally lower overall glucose-lowering effectiveness, limited clinical data, and/or relative expense.
- However, these therapies may be appropriate choices in select patients.

Questions? Contact:

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Diagnosis

FBG>250mg/dl or random >300mg/dl or A1C%>10

No

Lifestyle + DSME + Metformin[$]

3 months

A1C% <9

Yes

Lifestyle + DSME + Insulin[$$-$$$$] (see initiation algorithm)

3 months

A1C% 7 to <7.5

+Sulfonylurea[$]

or

+GLP-1[$$$]

or

+Pioglitazone[$$-$$$]

or

+DPP-4[$$]

3 months
+ Third agent listed above

3 months
Metformin[$] + Basal Insulin[$$] only

3 months
Basal-Bolus Insulin[$$$$]

A1C% >7.5 to <8

+Sulfonylurea[$]

or

+GLP-1[$$$]

or

+Pioglitazone[$$-$$$]

or

+DPP-4[$$]

3 months
+ Third agent listed above

3 months
Metformin[$] + Basal Insulin[$$] only

3 months
Basal-Bolus Insulin[$$$$]

A1C% 8 to <8.5

+Sulfonylurea[$]

or

+Pioglitazone[$$-$$$]

or

+GLP-1[$$$]

3 months
+ Third agent listed above, only if A1C% is now <8

or

Metformin[$] + Basal Insulin[$$]
Only if A1C% is now ≥ 8%

3 months
Basal-Bolus Insulin[$$$$]

A1C% 8.5 to <9

+Sulfonylurea[$]

or

+GLP-1[$$$]

3 months
+ Pioglitazone only if A1C% is now <8.5

or

Metformin[$] + Basal Insulin[$$]
Only if A1C% is now ≥ 8.5%

3 months
Basal-Bolus Insulin[$$$$]

A1C% >9 to <10

Insulin[$$-$$$$] (recommended option)

or

Metformin[$] + Basal Insulin[$$] only (alternate option)

or

Metformin[$] + Sulfonylurea[$] (alternate option)

or

Metformin[$] + GLP-1[$$$] (alternate option)

3 months
Basal-Bolus Insulin[$$$$]

Cost Key

$ = low cost, generic
$$ = intermediate cost, brand
$$$ = high cost, brand
$$$$ = high cost, multiple brands

1. Insulin is the most effective treatment for hyperglycemia.
2. Sulfonylureas (glimepiride or glipizide) are the least expensive but have a hypoglycemia risk.
3. Add oral agents only when A1C% is within described limits, to make goal achievable. Don't add noninsulin treatment if A1C% is not in the listed range.
4. 4-drug combinations are not supported by evidence; patients should advance to insulin treatment.

Medication						
	Metformin	DPP-4 Inhibitor	GLP-1 Agonist	Sulfonylurea	Pioglitazone	Insulin
Cost						
	$	$$	$$$	$	$$-$$$	$$ (basal) $$$$ (basal-bolus)
Benefits						
Post-prandial glucose lowering	Mild	Moderate	Moderate to marked	Moderate	Mild	Moderate to marked
Fasting glucose lowering	Moderate	Mild	Mild	Moderate	Moderate	Moderate to marked
Nonalcoholic fatty liver disease	Mild	Neutral	Mild	Neutral	Moderate	Neutral
Risks						
Hypoglycemia	Neutral	Neutral	Neutral	Moderate	Neutral	Moderate to severe
Gastrointestinal adverse effects	Moderate	Neutral	Moderate	Neutral	Neutral	Neutral
Risk of use with renal insufficiency	Severe	Reduse dosage	Moderate	Moderate	Mild	Moderate
Contraindication in liver failure or lactic acidosis risk	Severe	Neutral	Neutral	Moderate	Moderate	Neutral
Heart failure/edema	Caution with CHF	Neutral	Neutral	Neutral	Contraindicted with class 3, 4 CHF	Neutral
Weight gain	Benefit	Neutral	Benefit	Mild	Moderate	Mild to moderate
Fractures	Neutral	Neutral	Neutral	Neutral	Moderate	Neutral
Drug-drug Interactions	Neutral	Neutral	Neutral	Moderate	Neutral	Neutral

*Chart adapted from AACE guidelines 2009

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