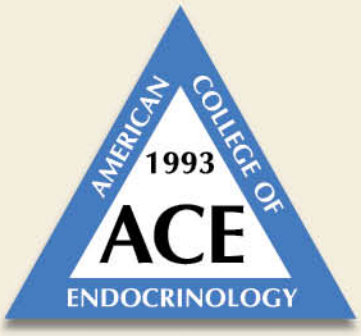


AACE COMPREHENSIVE DIABETES MANAGEMENT ALGORITHM 2013

TASK FORCE

Alan J. Garber, MD, PhD, FACE, *Chair*

Martin J. Abrahamson, MD
Joshua I. Barzilay, MD, FACE
Lawrence Blonde, MD, FACP, FACE
Zachary T. Bloomgarden, MD, MACE
Michael A. Bush, MD
Samuel Dagogo-Jack, MD, FACE
Michael B. Davidson, DO, FACE
Daniel Einhorn, MD, FACP, FACE
W. Timothy Garvey, MD
George Grunberger, MD, FACP, FACE
Yehuda Handelsman, MD, FACP, FACE, FNLA
Irl B. Hirsch, MD
Paul S. Jellinger, MD, MACE
Janet B. McGill, MD, FACE
Jeffrey I. Mechanick, MD, FACE, ECNU, FACN, FACP
Paul D. Rosenblit, MD, FACE
Guillermo Umpierrez, MD, FACE
Michael H. Davidson, MD, *Advisor*

Copyright © 2013 AACE *May not be reproduced in any form without express written permission from AACE.*

To purchase reprints of this article, please visit: www.aace.com/reprints.
Copyright © 2013 AACE.

This material is protected by US copyright law. To purchase commercial reprints of this article, visit www.aace.com/reprints. For permission to reuse material, please access www.copyright.com or contact the Copyright Clearance Center, Inc. (CCC).

TABLE *of* CONTENTS

Copyright © 2013 AACE *May not be reproduced in any form without express written permission from AACE.*

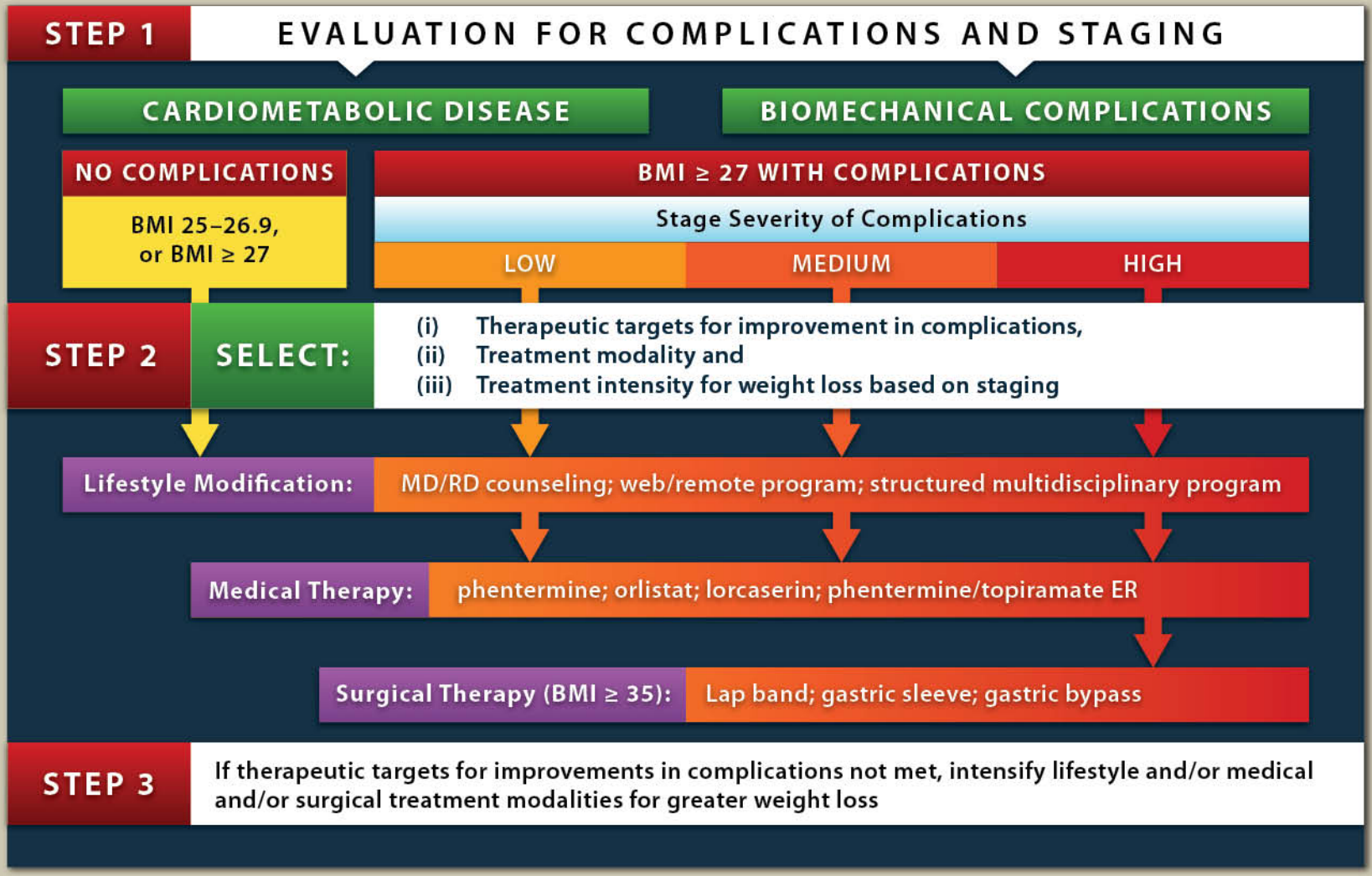
Principles of the AACE Algorithm for the Treatment of Type 2 Diabetes

1) Lifestyle optimization is essential for all patients with diabetes. This is multifaceted, ongoing, and engages the entire diabetes team. However, such efforts should not delay needed pharmacotherapy, which can be initiated simultaneously and adjusted based on the response to lifestyle efforts. The need for medical therapy should not be interpreted as a failure of lifestyle management, but as an adjunct to it.
2) The A1c target must be individualized, based on numerous factors, such as age, co-morbid conditions, duration of diabetes, risk of hypoglycemia, patient motivation, adherence, life expectancy, etc. An A1c of 6.5% or less is still considered optimal if it can be achieved in a safe and affordable manner, but higher targets may be appropriate and may change in a given individual over time.
3) Glycemic control targets include fasting and postprandial glucose as determined by self blood glucose monitoring.
4) The choice of therapies must be individualized based on attributes of the patient (as above) and the medications themselves (see *Profiles of Anti-Diabetic Medications*). Attributes of medications that affect their choice include: risk of inducing hypoglycemia, risk of weight gain, ease of use, cost, and safety impact of kidney, heart, or liver disease. This algorithm includes every FDA-approved class of medications for diabetes. This algorithm also stratifies choice of therapies based on initial A1c.
5) Minimizing risk of hypoglycemia is a priority. It is a matter of safety, adherence, and cost.
6) Minimizing risk of weight gain is a priority. It too is a matter of safety, adherence, and cost.
7) The algorithm provides guidance to what therapies to initiate and add, but respects individual circumstances that would make different choices.
8) Therapies with complementary mechanisms of action must typically be used in combinations for optimum glycemic control.
9) Effectiveness of therapy must be evaluated frequently until stable (e.g. every 3 months) using multiple criteria including A1c, SMBG records including both fasting and post-prandial data, documented and suspected hypoglycemia, and monitoring for other potential adverse events (weight gain, fluid retention, hepatic, renal, or cardiac disease), and monitoring of co-morbidities, relevant laboratory data, concomitant drug administration, diabetic complications, and psycho-social factors affecting patient care.
10) Safety and efficacy should be given higher priorities than initial acquisition cost of medications per se since cost of medications is only a small part of the total cost of care of diabetes. In determining the cost of a medication, consideration should be given to monitoring requirements, risk of hypoglycemia and weight gain, etc.
11) The algorithm should be as simple as possible to gain physician acceptance and improve its utility and usability in clinical practice.
12) The algorithm should serve to help educate the clinician as well as to guide therapy at the point of care.
13) The algorithm should conform, as nearly as possible, to a consensus for current standard of practice of care by expert endocrinologists who specialize in the management of patients with type 2 diabetes and have the broadest experience in outpatient clinical practice.
14) The algorithm should be as specific as possible, and provide guidance to the physician with prioritization and a rationale for selection of any particular regimen.
15) Rapid-acting insulin analogs are superior to Regular because they are more predictable.
16) Long-acting insulin analogs are superior to NPH insulin because they provide a fairly flat response for approximately 24 hours and provide better reproducibility and consistency both between subjects and within subjects, with a corresponding reduction in the risk of hypoglycemia.

This document represents the official position of the American Association of Clinical Endocrinologists and the American College of Endocrinology. Where there were no RCTs or specific FDA labeling for issues in clinical practice, the participating clinical experts utilized their judgment and experience. Every effort was made to achieve consensus among the committee members. Many details that could not be included in the graphic summary (Figure) are described in the text.

Copyright © 2013 AACE *May not be reproduced in any form without express written permission from AACE.*

Complications-Centric Model for Care of the Overweight/Obese Patient

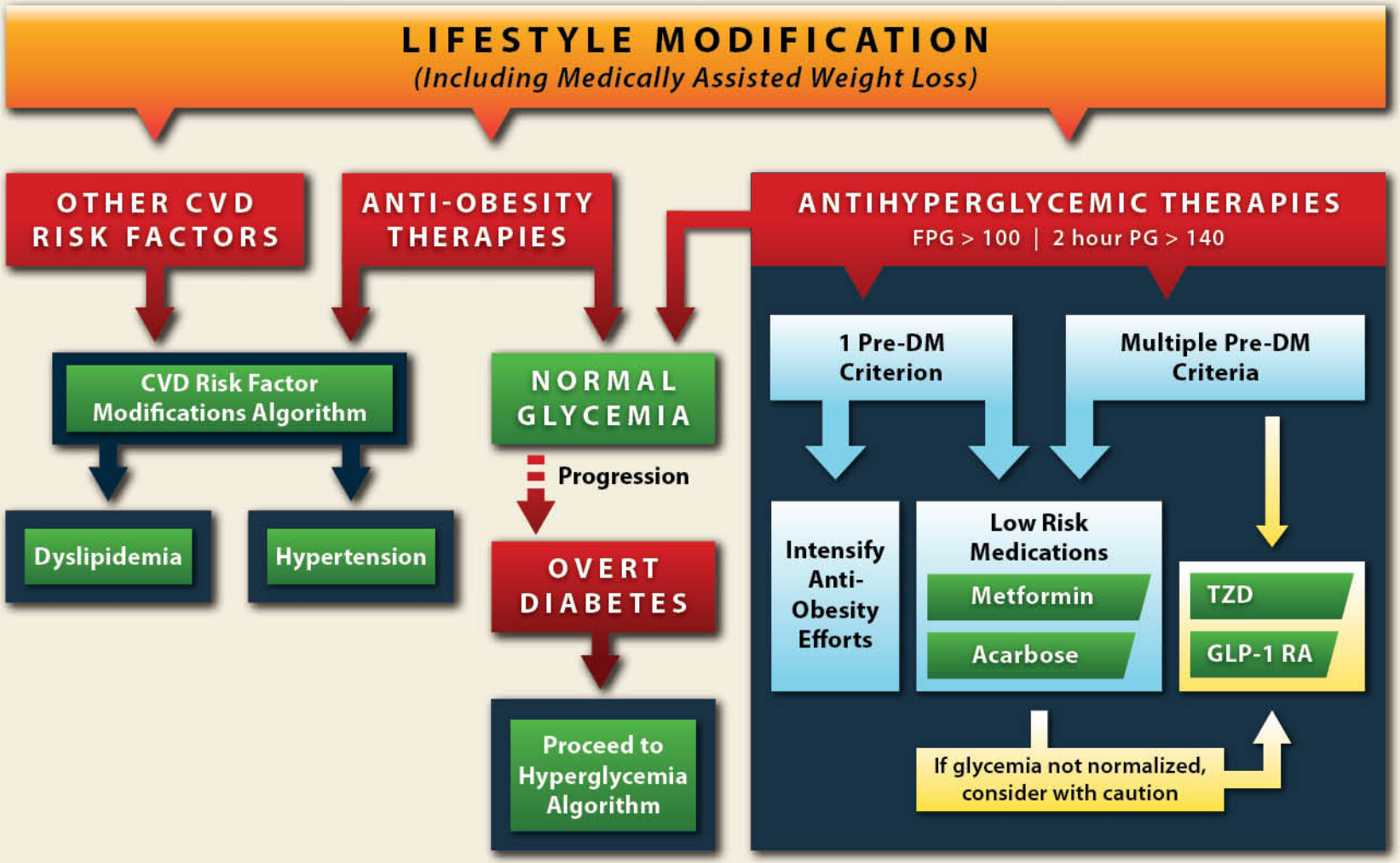


Copyright © 2013 AACE *May not be reproduced in any form without express written permission from AACE.*

Copyright ® 2013 AACE AACE Comprehensive Diabetes Management Algorithm, *Endocr Pract.* 2013;19(No. 2) 329

Prediabetes Algorithm

IFG (100–125) | IGT (140–199) | METABOLIC SYNDROME (NCEP 2005)



Copyright © 2013 AACE *May not be reproduced in any form without express written permission from AACE.*

Goals for Glycemic Control

A1c ≤ 6.5%

For healthy patients without concurrent illness and at low hypoglycemic risk

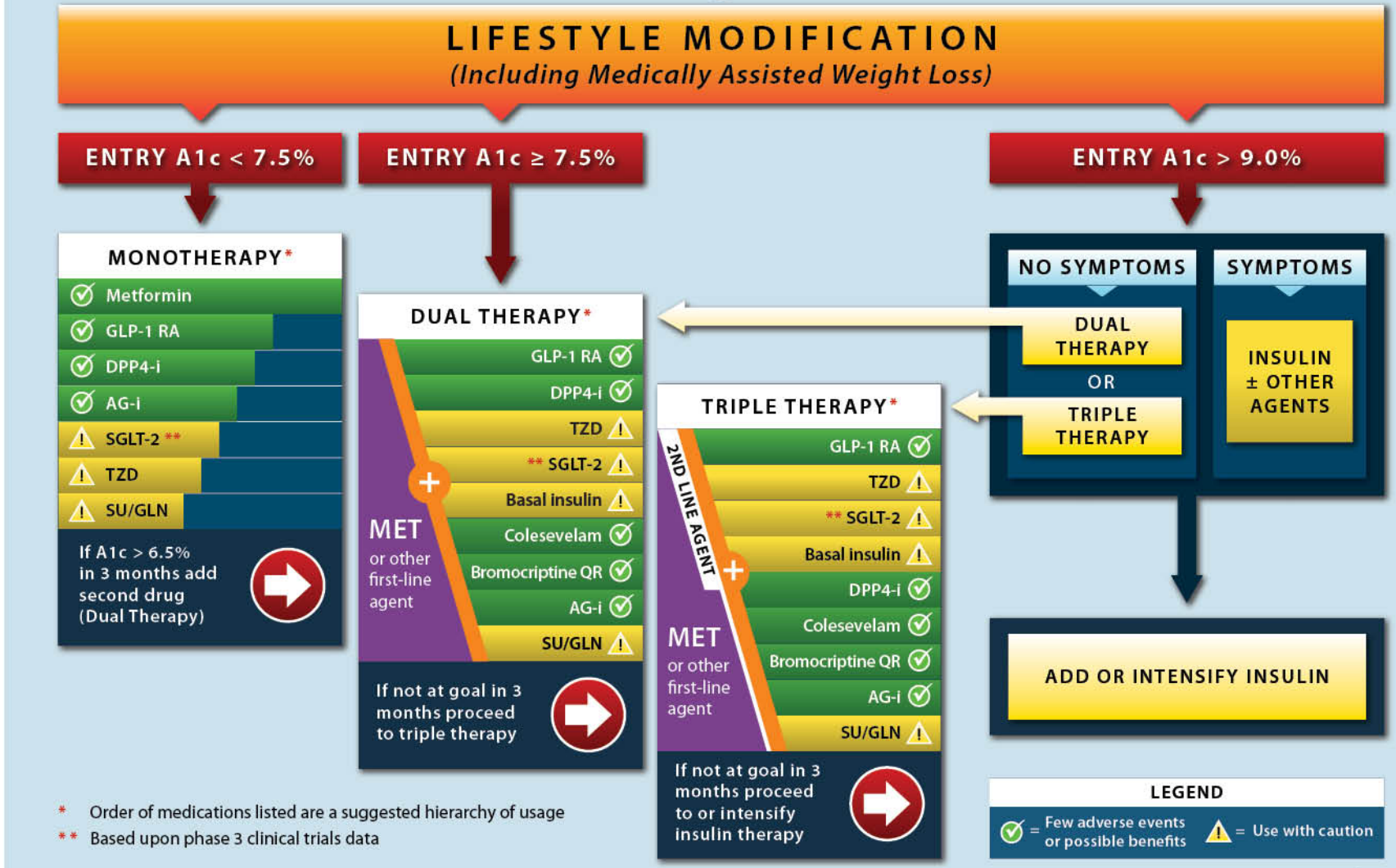
A1c > 6.5%

Individualize goals for patients with concurrent illness and at risk for hypoglycemia

Copyright © 2013 AACE *May not be reproduced in any form without express written permission from AACE.*

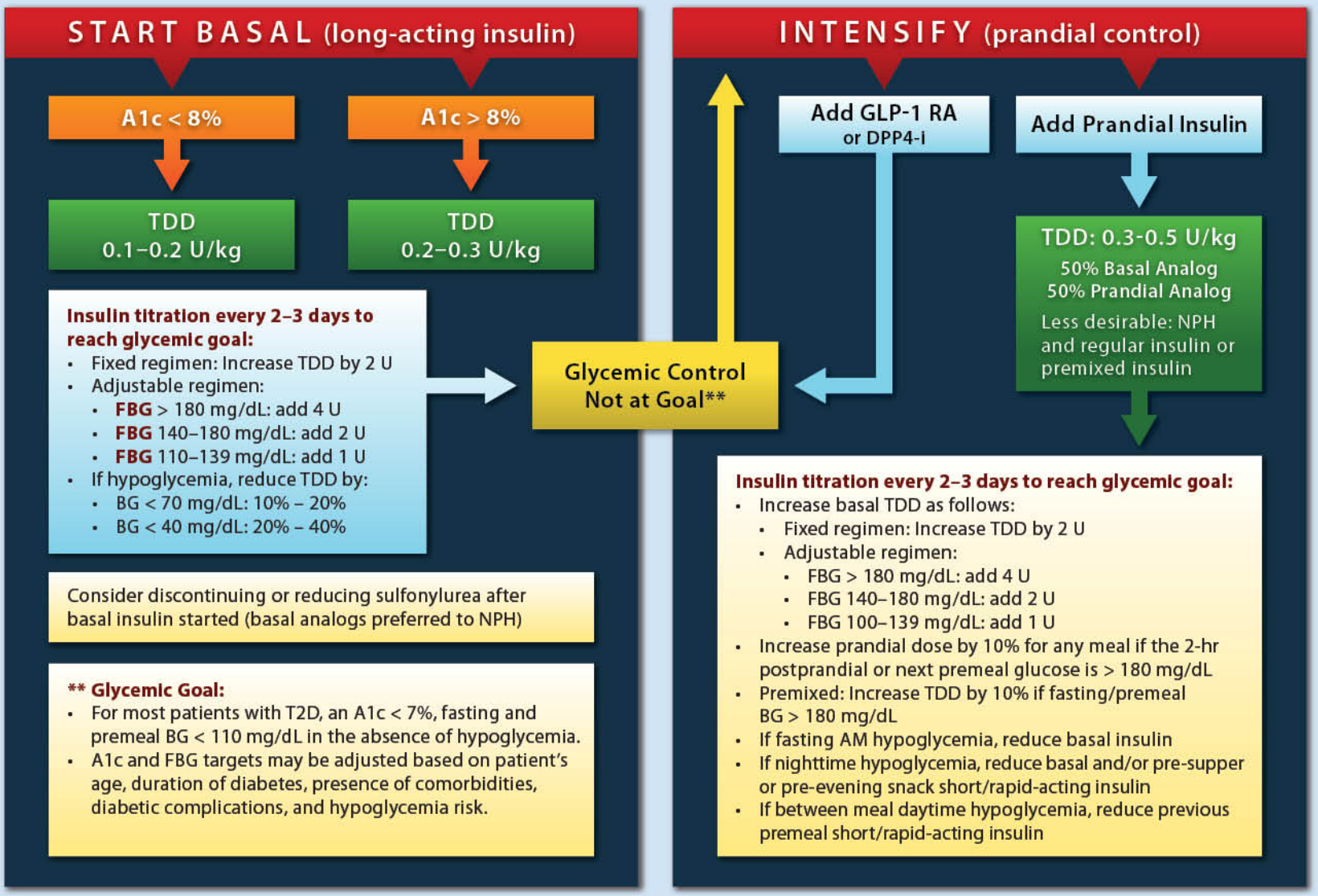
Copyright ® 2013 AACE AACE Comprehensive Diabetes Management Algorithm, *Endocr Pract.* 2013;19(No. 2) 331

GLYCEMIC CONTROL ALGORITHM



Copyright © 2013 AACE *May not be reproduced in any form without express written permission from AACE.*

Algorithm for Adding/Intensifying Insulin



Copyright © 2013 AACE *May not be reproduced in any form without express written permission from AACE.*

Copyright © 2013 AACE AACE Comprehensive Diabetes Management Algorithm, *Endocr Pract.* 2013;19(No. 2) 333

CVD Risk Factor Modifications Algorithm

DYSLIPIDEMIA

THERAPEUTIC LIFESTYLE CHANGES *(See Obesity Algorithm)*

LIPID PANEL: Assess CVD Risk

Statin Therapy

If TG > 500 mg/dL, fibrates, omega-3 ethyl esters, niacin

If statin-intolerant

Try alternate statin, lower statin dose or frequency, or add nonstatin LDL-C-lowering therapies

Repeat lipid panel; assess adequacy, tolerance of therapy

Intensify therapies to attain goals according to risk levels

RISK LEVELS	MODERATE DM but no other major risk and/or age <40	HIGH DM + major CVD risk(s) (HTN, Fam Hx, low HDL-C, smoking) or CVD*
	DESIRABLE LEVELS	DESIRABLE LEVELS
LDL-C (mg/dL)	<100	<70
Non-HDL-C (mg/dL)	<130	<100
TG (mg/dL)	<150	<150
TC/HDL-C	<3.5	<3.0
Apo B (mg/dL)	<90	<80
LDL-P (nmol/L)	<1200	<1000

If not at desirable levels: Intensify TLC (weight loss, physical activity, dietary changes) and glycemic control; Consider additional therapy

To lower LDL-C: Intensify statin, add ezetimibe &/or colesevelam &/or niacin
To lower Non-HDL-C, TG: Intensify statin &/or add OM3EE &/or fibrates &/or niacin
To lower Apo B, LDL-P: Intensify statin &/or ezetimibe &/or colesevelam &/or niacin

Assess adequacy & tolerance of therapy with focused laboratory evaluations and patient follow-up

* even more intensive therapy might be warranted

HYPERTENSION

GOAL: SYSTOLIC ~130, DIASTOLIC ~80 mm Hg

ACEi or ARB

For initial blood pressure >150/100 mm Hg: Dual therapy

ACEi or ARB + Thiazide ✓ / Calcium Channel Blocker ✓ / ß-blocker ✓

If not at goal (2–3 months)

Add ß-blocker or calcium channel blocker or thiazide diuretic

If not at goal (2–3 months)

Add next agent from the above group, repeat

If not at goal (2–3 months)

Additional choices (α-blockers, central agents, vasodilators, spironolactone)

Achievement of target blood pressure is critical

Copyright © 2013 AACE *May not be reproduced in any form without express written permission from AACE.*

Profiles of Antidiabetic Medications

	MET	DPP-4i	GLP-1 RA	TZD	AGI	COLSVL	BCR-QR	SU / GLN	INSULIN	SGLT-2	PRAML
HYPO	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Moderate/Severe / Mild	Moderate to Severe	Neutral	Neutral
WEIGHT	Slight Loss	Neutral	Loss	Gain	Neutral	Neutral	Neutral	Gain	Gain	Loss	Loss
RENAL/ GU	Contra-indicated Stage 3B,4,5	Dose Adjustment May be Necessary (Except Linagliptin)	Exenatide Contra-indicated CrCl < 30	May Worsen Fluid Retention	Neutral	Neutral	Neutral	More Hypo Risk	More Hypo Risk & Fluid Retention	Infections	Neutral
GI Sx	Moderate	Neutral	Moderate	Neutral	Moderate	Mild	Moderate	Neutral	Neutral	Neutral	Moderate
CHF	Neutral	Neutral	Neutral	Moderate	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
CVD	Benefit			Neutral			Safe	?			
BONE	Neutral	Neutral	Neutral	Moderate Bone Loss	Neutral	Neutral	Neutral	Neutral	Neutral	? Bone Loss	Neutral

Few adverse events or possible benefits — Use with caution — Likelihood of adverse effects

Copyright © 2013 AACE May not be reproduced in any form without express written permission from AACE.

Copyright ® 2013 AACE AACE Comprehensive Diabetes Management Algorithm, *Endocr Pract.* 2013;19(No. 2) 335