TYPE 2 DIABETES MELLITUS

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Potential trainer

OBJECTIVES

- Diagnosis of diabetes mellitus
- Screening
- Comprehensive Medical Evaluation and Assessment of Comorbidities
- Glycemic target
- Management of diabetes
  - Life-style modification
  - Pharmacological
  - Surgical
- Management of hypertension in patient with type 2 diabetes
- Microvascular complication management

TABLE 2.2/2.5 Criteria for the screening and diagnosis of prediabetes and diabetes

	Prediabetes	Diabetes
A1C	5.7–6.4% (39–47 mmol/mol)*	≥6.5% (48 mmol/mol)†
Fasting plasma glucose	100–125 mg/dL (5.6–6.9 mmol/L)*	≥126 mg/dL (7.0 mmol/L)†
Oral glucose tolerance test	140–199 mg/dL (7.8–11.0 mmol/L)*	≥200 mg/dL (11.1 mmol/L)†
Random plasma glucose		≥200 mg/dL (11.1 mmol/L)‡

DIAGNOSIS

DIABETES MELLITUS DIAGNOSIS

- Fasting plasma glucose➔ Fasting is defined as no caloric intake for ≥8 hours
- 2 hours plasma glucose during oral glucose tolerance test (OGTT) using 75 g anhydrase glucose
    - 3 days of unrestricted diet and exercise
    - Evening meal as normal the night before
    - Fast 8-14 hours
    - 75G anhydrous glucose in solution over 5-10 mins. (Rapilose)
    - Sit quietly and Blood sample taken 2 hours later
    - No smoking

DIABETES MELLITUS DIAGNOSIS

- HbA1c
  - The test should be performed in a laboratory using a method that is NGSP certified and standardized to the DCCT assay.
- Random blood sugar with **symptoms** of hyperglycemia

DIABETES MELLITUS DIAGNOSIS

- In the absence of unequivocal hyperglycemia results should be confirmed using repeat testing, consider the following situations:
  - No clear clinical diagnosis? = repeat the same test on a different day
  - Same test with same or similar results? = diagnosis confirmed
  - Different tests above diagnostic threshold? = diagnosis confirmed
- Discordant results from two separate tests? Repeat the test with a result above diagnostic cut-point

CASE 1

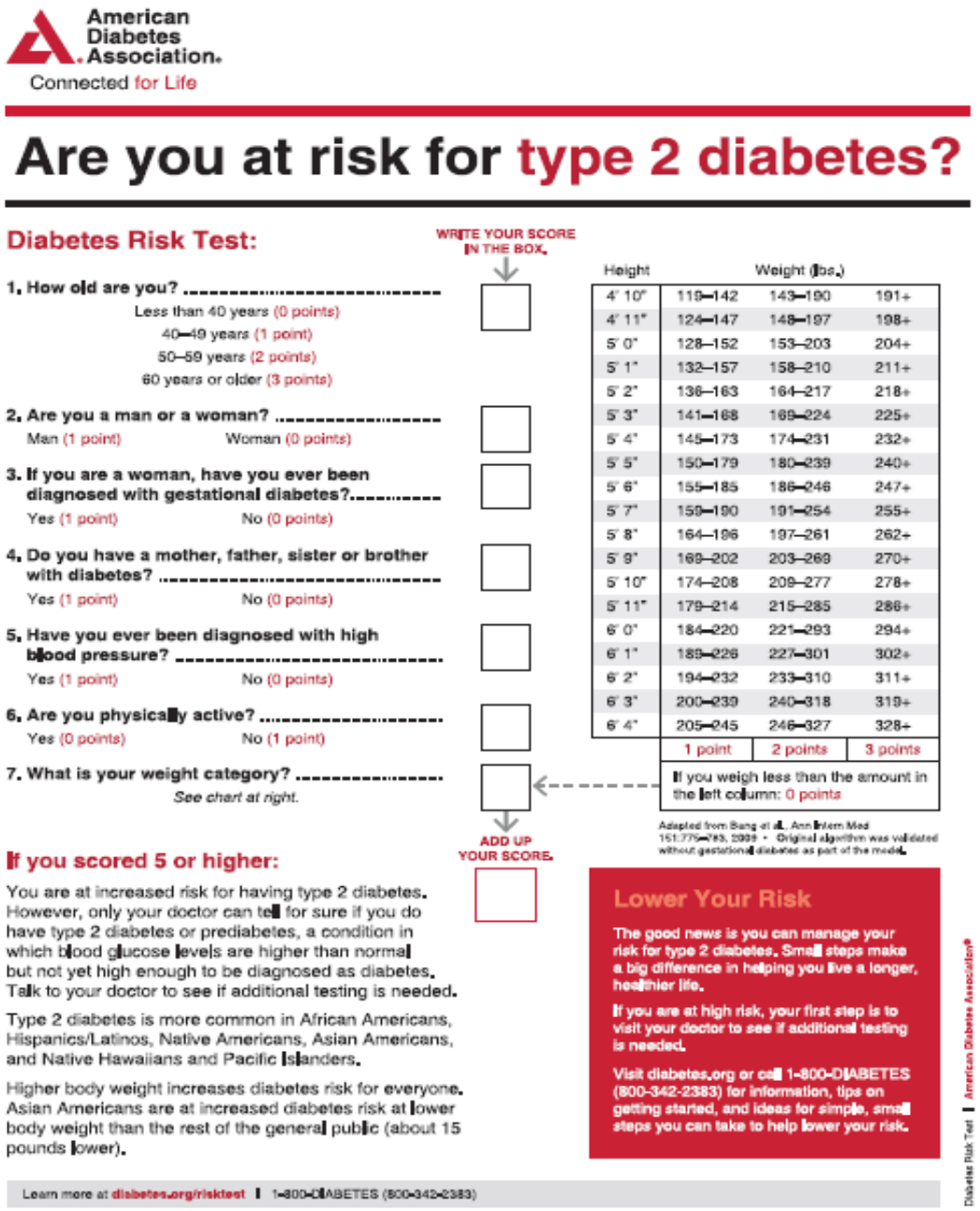
- Ahmed is a 47-year Kuwaiti gentleman
- He attends your clinic for a routine medical examination.
- You note his weight is 83kg with a BMI of 30.2.
- strong family history of diabetes.
- random blood sugar and an HbA1c test done
- These results come back as:
- HbA1c :49 (6.6%)
- Random Blood sugar: 8.5mmol/l (144mg/dl)
- What is next?

WHOM TO SCREEN?

TABLE 2.3 **Criteria for testing for diabetes or prediabetes in asymptomatic adults**

1. Testing should be considered in adults with overweight or obesity (BMI ≥25 kg/m^2 or ≥23 kg/m^2 in Asian Americans) who have one or more of the following risk factors:
   - First-degree relative with diabetes
   - High-risk race/ethnicity (e.g., African American, Latino, Native American, Asian American, Pacific Islander)
   - History of CVD
   - Hypertension (≥140/90 mmHg or on therapy for hypertension)
   - HDL cholesterol level <35 mg/dL (0.90 mmol/L) and/or a triglyceride level >250 mg/dL (2.82 mmol/L)
   - Women with polycystic ovary syndrome
   - Physical inactivity
   - Other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans)
2. Patients with prediabetes (A1C ≥5.7% [39 mmol/mol], impaired glucose tolerance, or impaired fasting glucose) should be tested yearly.
3. Women who were diagnosed with GDM should have lifelong testing at least every 3 years.
4. For all other patients, testing should begin at age 45 years.
5. If results are normal, testing should be repeated at a minimum of 3-year intervals, with consideration of more frequent testing depending on initial results and risk status.

SCREENING TOOLS



American Diabetes Association.
Connected for Life

Are you at risk for type 2 diabetes?

Diabetes Risk Test:

WRITE YOUR SCORE IN THE BOX.

1. How old are you?
Less than 40 years (0 points)
40–49 years (1 point)
50–59 years (2 points)
60 years or older (3 points)

2. Are you a man or a woman?
Man (1 point) Woman (0 points)

3. If you are a woman, have you ever been diagnosed with gestational diabetes?
Yes (1 point) No (0 points)

4. Do you have a mother, father, sister or brother with diabetes?
Yes (1 point) No (0 points)

5. Have you ever been diagnosed with high blood pressure?
Yes (1 point) No (0 points)

6. Are you physically active?
Yes (0 points) No (1 point)

7. What is your weight category?
See chart at right.

ADD UP YOUR SCORE.

Height	Weight (lbs.)		
4' 10"	119–142	143–190	191+
4' 11"	124–147	148–197	198+
5' 0"	128–152	153–203	204+
5' 1"	132–157	158–210	211+
5' 2"	136–163	164–217	218+
5' 3"	141–168	169–224	225+
5' 4"	145–173	174–231	232+
5' 5"	150–179	180–239	240+
5' 6"	155–185	186–246	247+
5' 7"	159–190	191–254	255+
5' 8"	164–196	197–261	262+
5' 9"	169–202	203–269	270+
5' 10"	174–208	209–277	278+
5' 11"	179–214	215–285	286+
6' 0"	184–220	221–293	294+
6' 1"	189–226	227–301	302+
6' 2"	194–232	233–310	311+
6' 3"	200–239	240–318	319+
6' 4"	205–245	246–327	328+
	1 point	2 points	3 points

If you weigh less than the amount in the left column: 0 points

Adapted from Bang et al., Ann Intern Med 151:775–783, 2009 • Original algorithm was validated without gestational diabetes as part of the model.

If you scored 5 or higher:

You are at increased risk for having type 2 diabetes. However, only your doctor can tell for sure if you do have type 2 diabetes or prediabetes, a condition in which blood glucose levels are higher than normal but not yet high enough to be diagnosed as diabetes. Talk to your doctor to see if additional testing is needed.

Type 2 diabetes is more common in African Americans, Hispanics/Latinos, Native Americans, Asian Americans, and Native Hawaiians and Pacific Islanders.

Higher body weight increases diabetes risk for everyone. Asian Americans are at increased diabetes risk at lower body weight than the rest of the general public (about 15 pounds lower).

Lower Your Risk

The good news is you can manage your risk for type 2 diabetes. Small steps make a big difference in helping you live a longer, healthier life.

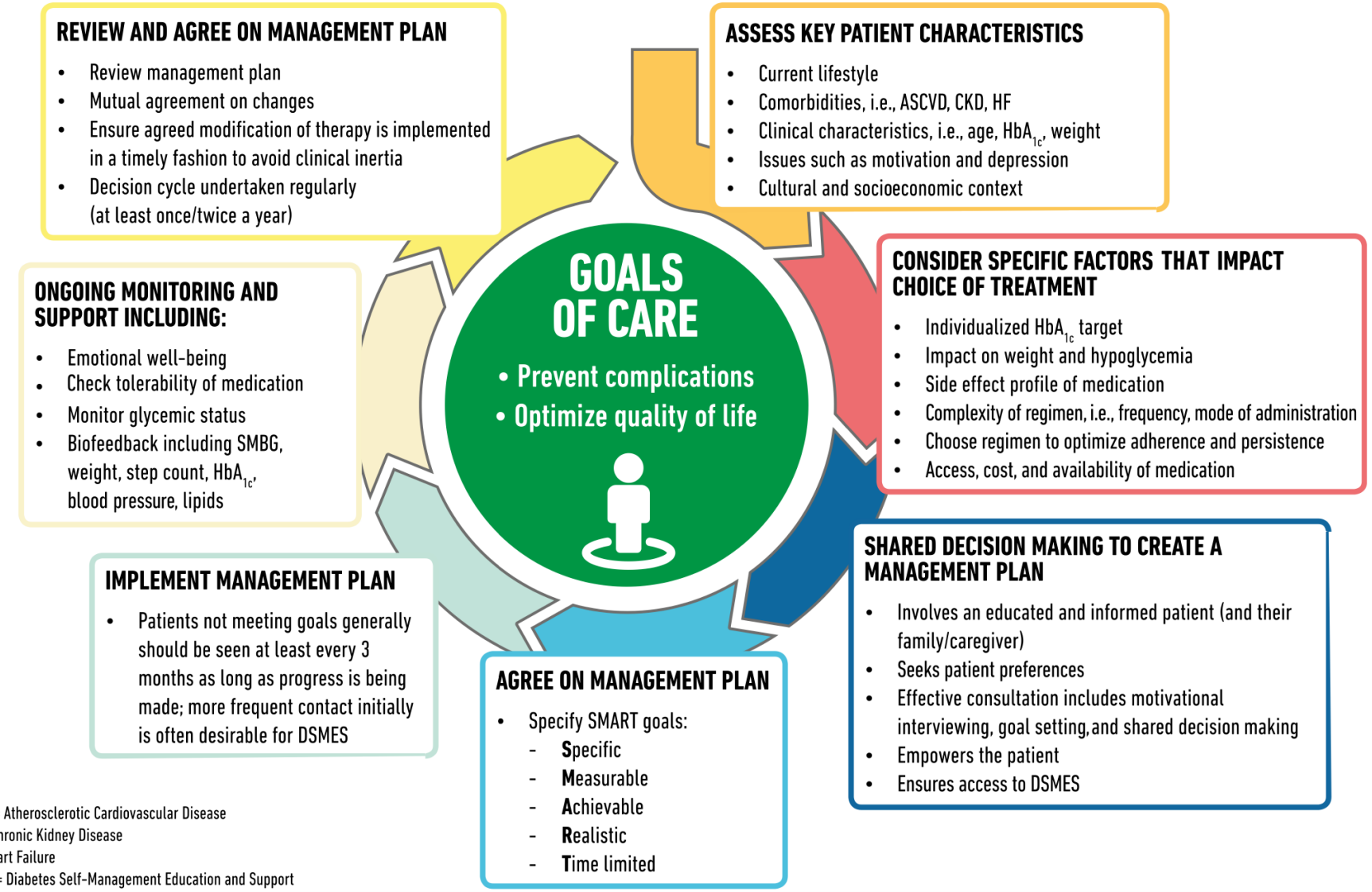
If you are at high risk, your first step is to visit your doctor to see if additional testing is needed.

Visit diabetes.org or call 1-800-DIABETES (800-342-2383) for information, tips on getting started, and ideas for simple, small steps you can take to help lower your risk.

Learn more at diabetes.org/risktest | 1-800-DIABETES (800-342-2383)

Diabetes Risk Test | American Diabetes Association®

DECISION CYCLE FOR PATIENT-CENTERED GLYCEMIC MANAGEMENT IN TYPE 2 DIABETES



ASCVD = Atherosclerotic Cardiovascular Disease
CKD = Chronic Kidney Disease
HF = Heart Failure
DSMES = Diabetes Self-Management Education and Support
SMBG = Self-Monitored Blood Glucose

PATIENT EMPOWERMENT

The person with diabetes needs to understand and accept their role in their care

The person with diabetes needs to know enough to be able to care for themselves and work with their health professional

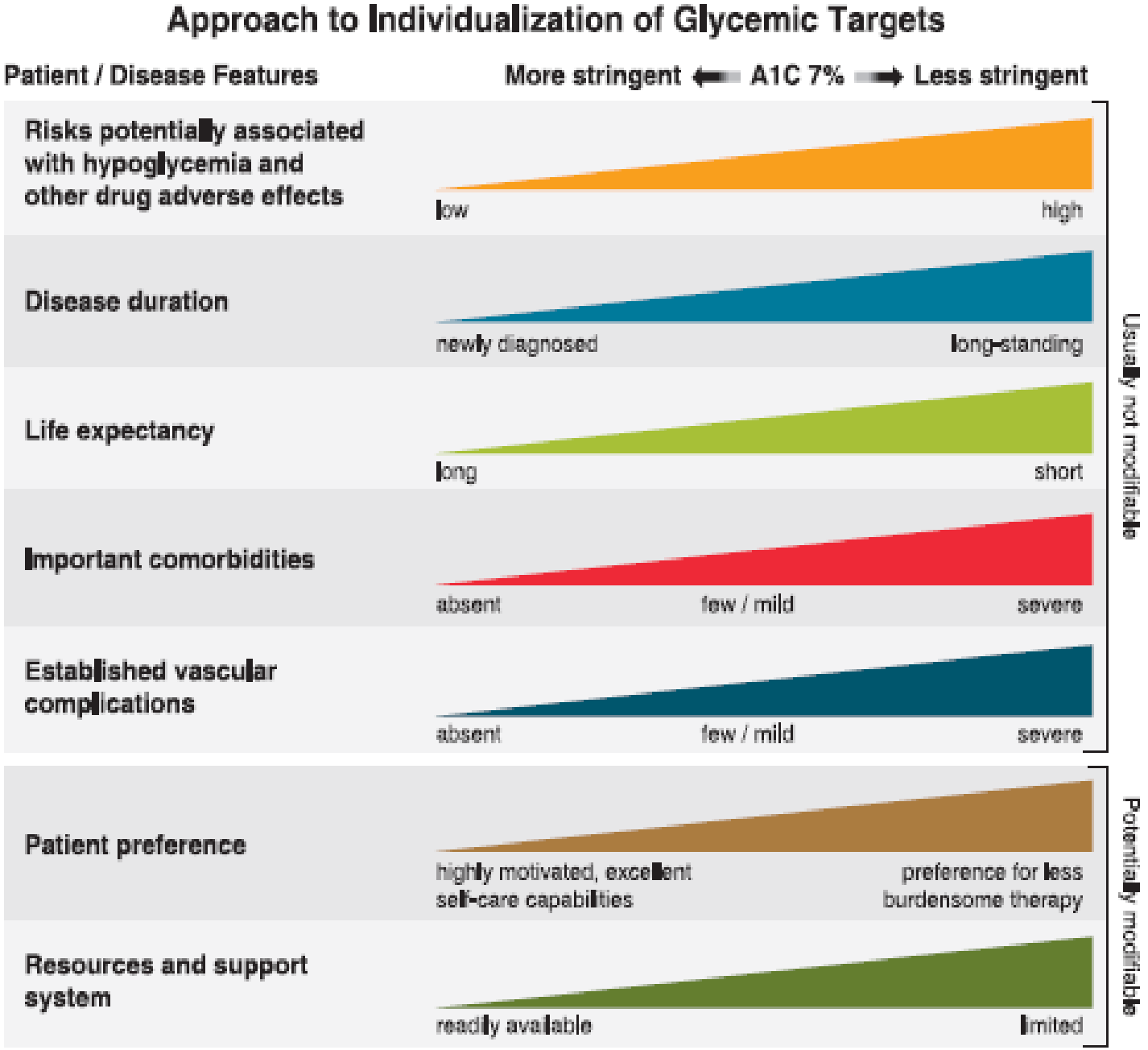
The person with diabetes needs skills to enable them to care for themselves

Their environment (i.e., their home, the health care system, and wider society) must be facilitative or supportive

GLYCEMIC ASSESSMENT

- A1C or other glycemic measurement at least two times a year in patients who are meeting treatment goals
- At least quarterly, and as needed, in patients whose therapy has recently changed and/or who are not meeting glycemic goals.

GLYCEMIC TARGET



CONTINUOUS GLUCOSE MONITORING

GLYCEMIC TARGETS

AGP Report

Name

MRN

GLUCOSE STATISTICS AND TARGETS

14 days
% Sensor Time

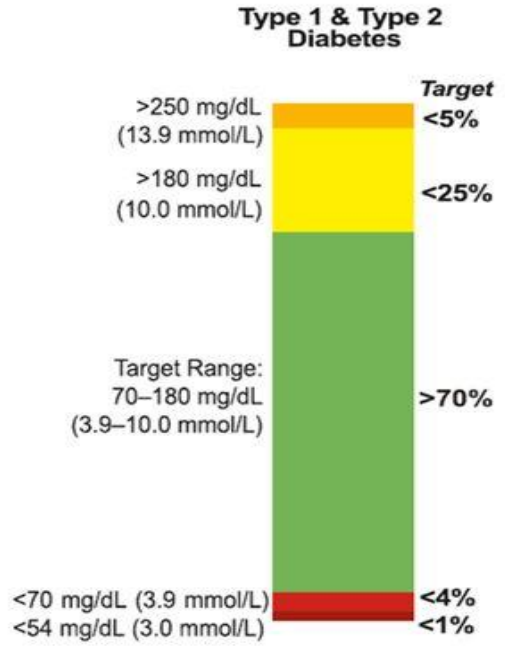
Glucose Ranges	**Targets** [% of Readings (Time/Day)]
Target Range 70–180 mg/dL	Greater than 70% (16h 48min)
Below 70 mg/dL	Less than 4% (58min)
Below 54 mg/dL	Less than 1% (14min)
Above 180 mg/dL	Less than 25% (6h)
Above 250 mg/dL	Less than 5% (1h 12min)

Each 5% increase in time in range (70–180 mg/dL) is clinically beneficial.

Average Glucose
Glucose Management Indicator (GMI)
Glucose Variability

Defined as percent coefficient of variation (%CV); target ≤36%

TIME IN RANGES



MANAGEMENT

LIFESTYLE INTERVENTION

Diet

Physical activity

GOALS OF MEDICAL NUTRITION THERAPY IN ADULTS

1. To promote and support healthful eating patterns, emphasizing a variety of nutrient-dense foods in appropriate portion sizes, to improve overall health and:

- achieve and maintain body weight goals (minimum weight loss of 5%).
- attain individualized glycemic, blood pressure, and lipid goals
- delay or prevent the complications of diabetes

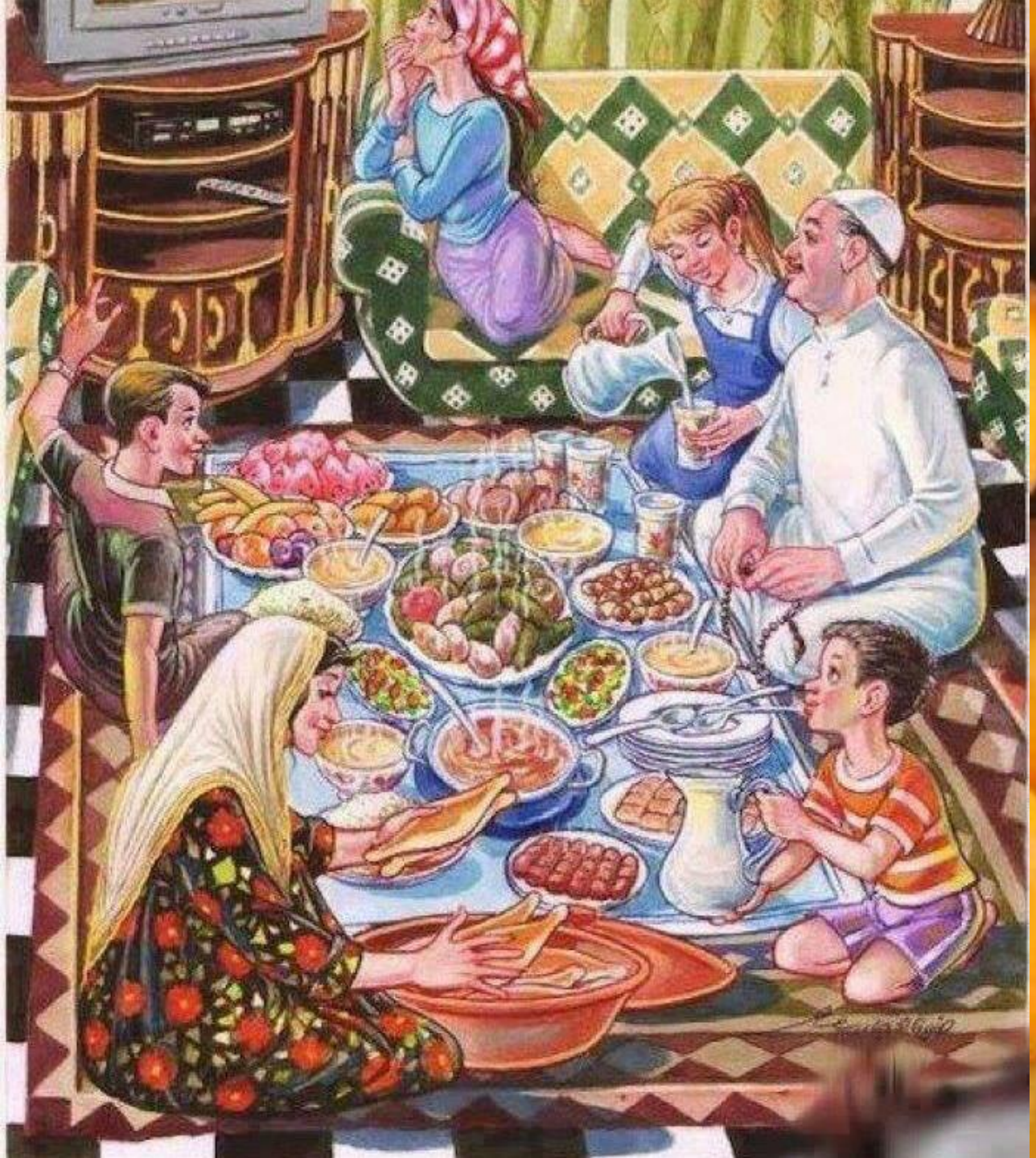
GOALS OF MEDICAL NUTRITION THERAPY IN ADULTS

2. To address individual nutrition needs based on personal and cultural preferences, health literacy and numeracy, access to healthful foods, willingness and ability to make behavioral changes, and existing barriers to change

GOALS OF MEDICAL NUTRITION THERAPY IN ADULTS

3. To maintain the pleasure of eating by providing nonjudgmental messages about food choices while limiting food choices only when indicated by scientific evidence

4. To provide an individual with diabetes the practical tools for developing healthy eating patterns rather than focusing on individual macronutrients, micronutrients, or single foods



LIFESTYLE INTERVENTIONS

- Evidence suggests that there is not an ideal percentage of calories from carbohydrate, protein, and fat for all people with diabetes
- macronutrient distribution should be based on an individualized assessment of current eating patterns, preferences, and metabolic goals.
- Consider personal preferences
- Referral to dietician

DIET

- DASH, Mediterranean, plant-based diet with high fiber and low glycemic index carbs
- High protein (1-1.5 g /day) ➔ increase insulin response without increasing glucose concentration
- Replace sugar sweatned bevarages (including fruit juices) with water
- Eat food rich in long chain n 3 fatty acids such as fatty fish , nuts, and seeds to prevent or treat CVD (supplement – no evidance)
- Reduce alcohol intack , smoking cessation
- Limit sodium consumption to < 2300 mg/ day

PHYSICAL ACTIVITY

Children and adolescent

- 60 min/day or more of moderate-or vigorous-intensity aerobic activity, with vigorous muscle strengthening and bone- strengthening activities at least 3 days/week.

Adult

- 150 min or more of moderate to vigorous-intensity aerobic activity per week, spread over at least 3 days/week
- minimum 75min/week of vigorous intensity or interval training may be sufficient for younger and more physically fit individuals.

Older adult

- Flexibility training and balance training are recommended 2–3 times/week
- Yoga and tai chi may be included based on individual preferences to increase flexibility, muscular strength, and balance

PSYCHOSOCIAL ISSUE

- Always screen for diabetes stress , anxiety(due to hypoglycemia and hypoglycemia unawareness, complications) and depression(esp elderly ≥65)
- its also important to consider eating disorders and cognitive impairment
- At initial visit then periodically
- Screen the caregivers as well
- refer to mental health provider if clinically indicated

PHARMACOLOGICAL INTERVENTION

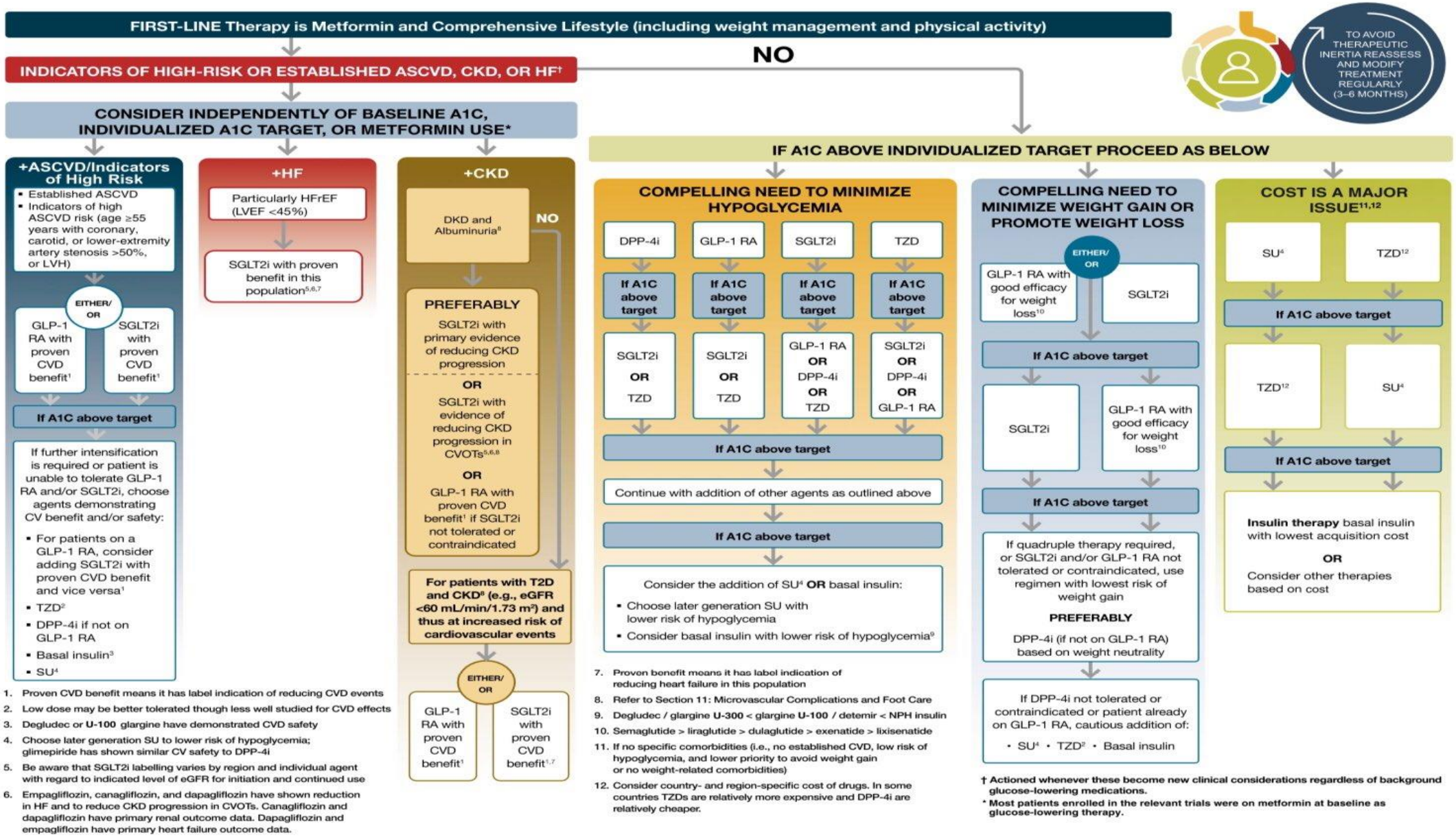


Figure 9.1—Glucose-lowering medication in type 2 diabetes: 2021 ADA Professional Practice Committee (PPC) adaptation of Davies et al. (35) and Buse et al. (36). For appropriate context, see **Fig. 4.1**. The 2021 ADA PPC adaptation of the **Fig. 9.1** "Indicators of high-risk or established ASCVD, CKD, or HF" pathway has been adapted based on trial populations studied. ASCVD, atherosclerotic cardiovascular disease; CKD, chronic kidney disease; CVD, cardiovascular disease; CVOTs, cardiovascular outcomes trials; DPP-4i, dipeptidyl peptidase 4 inhibitor; eGFR, estimated glomerular filtration rate; GLP-1 RA, glucagon-like peptide 1 receptor agonist; HF, heart failure; HFrEF, heart failure with reduced ejection fraction; LVEF, left ventricular ejection fraction; LVH, left ventricular hypertrophy; SGLT2i, sodium–glucose cotransporter 2 inhibitor; SU, sulfonylurea; T2D, type 2 diabetes; TZD, thiazolidinedione.

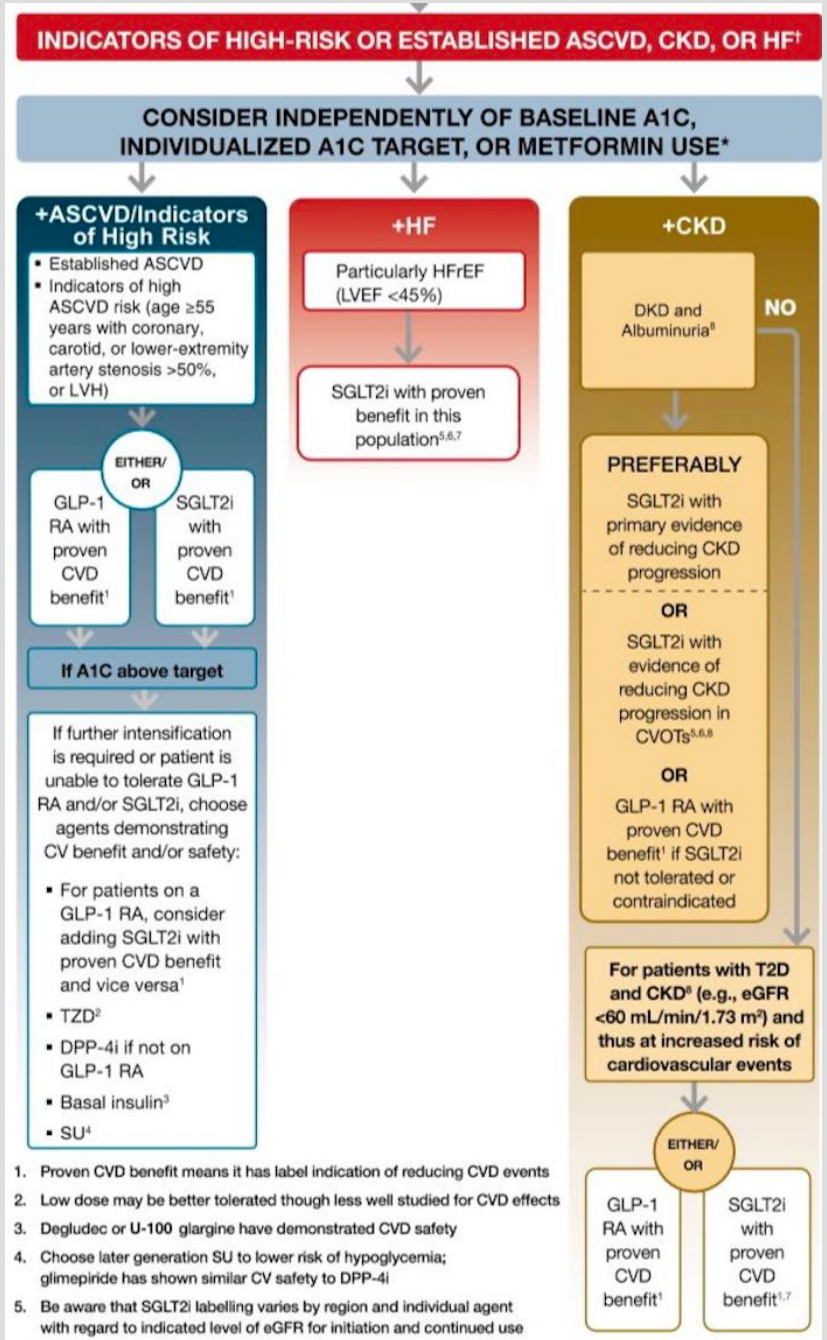
PHARMACOLOGICAL INTERVENTION

- Metformin is the preferred initial pharmacologic agent for the treatment of type 2 diabetes.
- Once initiated, metformin should be continued as long as it is tolerated and not contraindicated.

PHARMACOLOGICAL INTERVENTION

- Early combination therapy can be considered in some patients at treatment initiation to extend the time to treatment failure.
- The early introduction of insulin should be considered
  - if there is evidence of ongoing catabolism (weight loss) and symptoms of hyperglycemia are present
  - If A1C levels (>10% [86 mmol/mol])
  - blood glucose levels (≥300 mg/dL [16.7 mmol/L]) are very high.

- Efficacy : high
- Weight neutral
- Low cost
- ASCVD potential benefit
- No hypoglycemia
- Contraindicated if eGFR <30
- Half the dose if eGFR <45
- Side effects: diarrhea, nausea, B12 deficiency, lactic acidosis
- Dose : start 500mg titrate every week till maximum dose 2000 mg

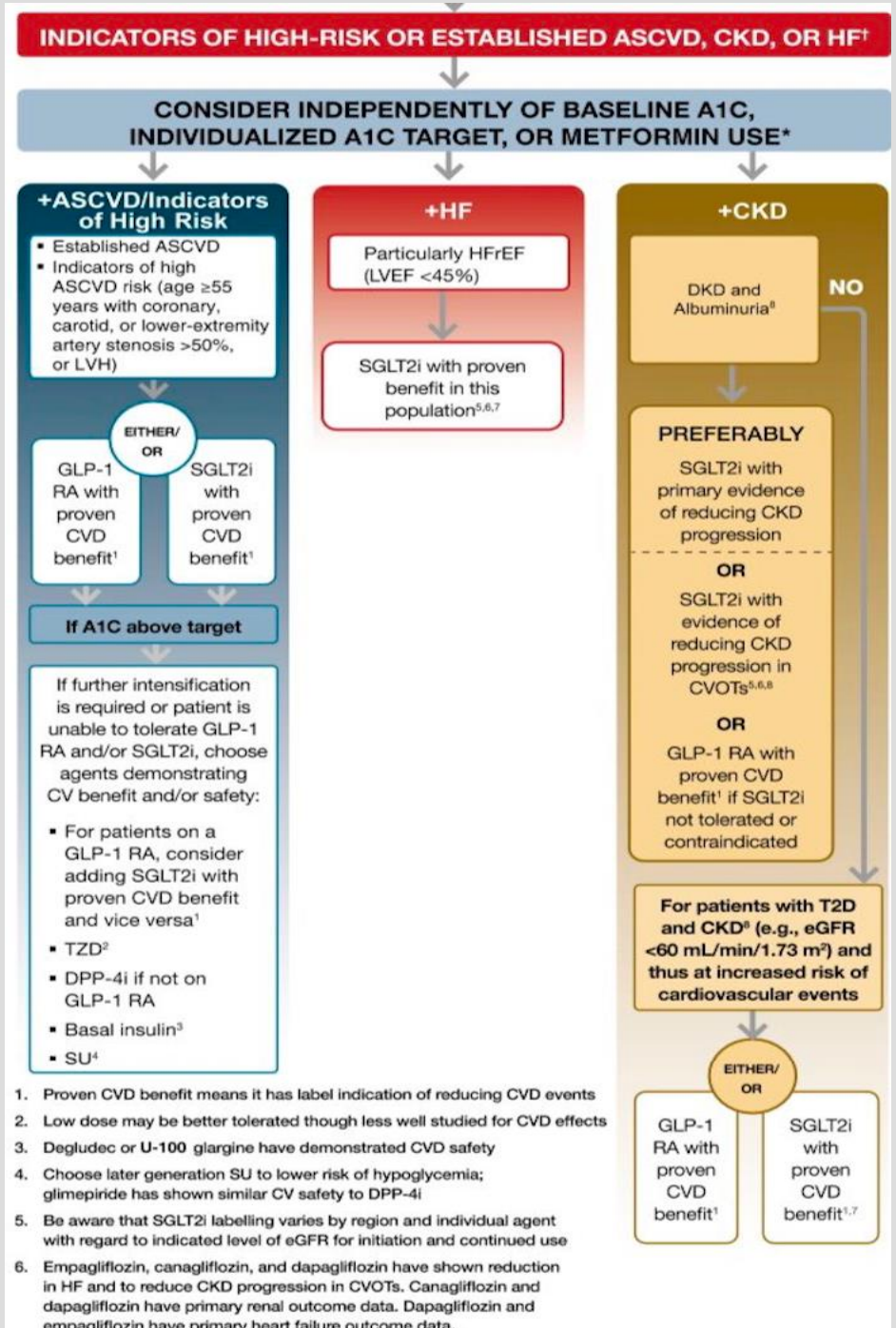


PHARMACOLOGICAL INTERVENTION

- Established ASCVD : ACS, MI, STABLE OR UNSTABLE ANGINA, CVA,TIA, PAD, coronary or arterial revascularization.
- Indicator of high ASCVD risks: age ≥ 55 years with coronary , carotid, lower extermity stenosis >50% or LVH
- Preferably GLP-1 receptor agonist with proven cvd benefit or SGLT2i with proven CVD benefit if egfr edequate
- If HBA1C above the target consider SGLT2i IF on GLP-1 Receptor agonist
- If GLP-1 Agonist or SGLT2 I not tolerated , choose an agent with CV safty (dpp4i if not on GLP1a- basal insulin – sulfanylurea).

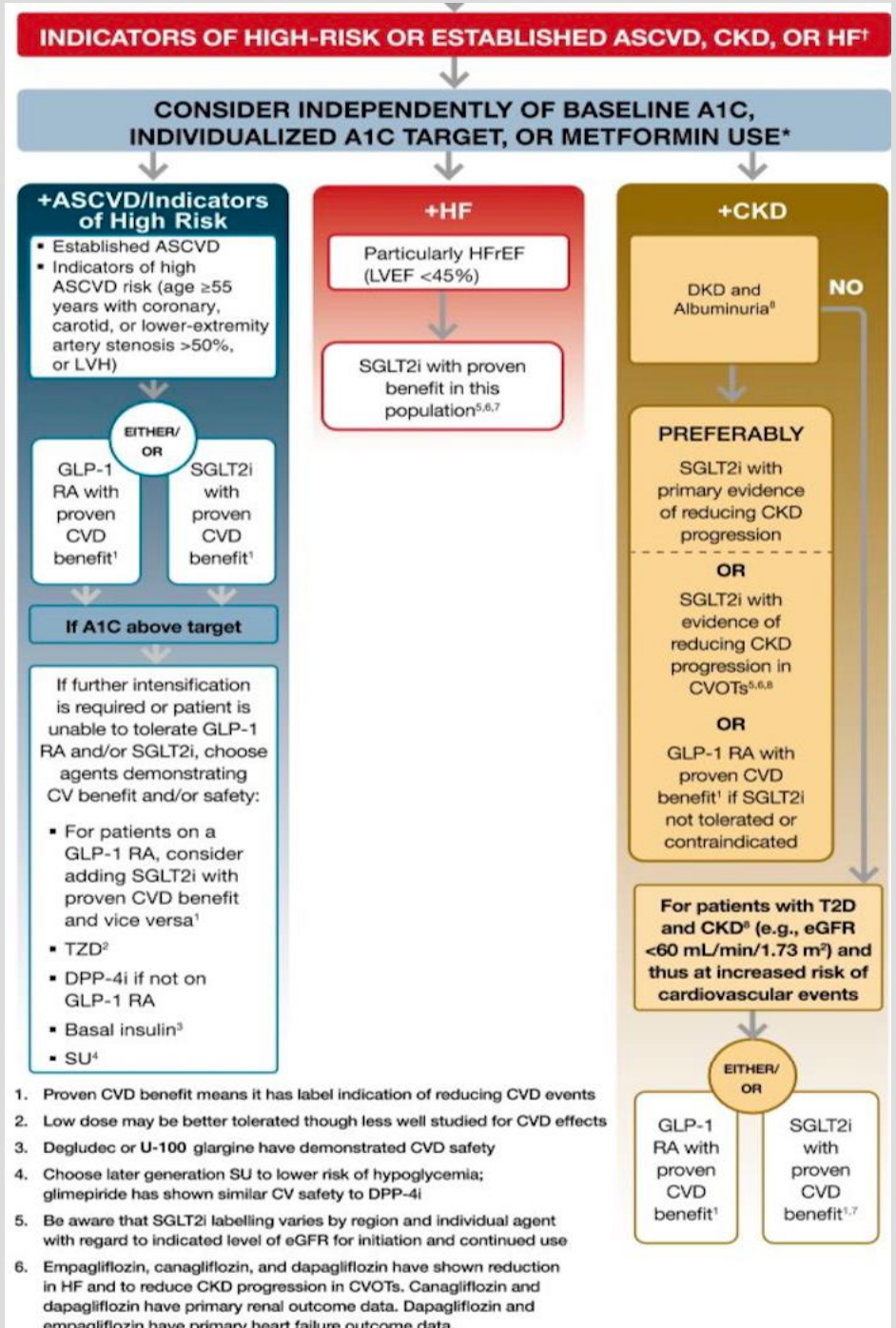
PHARMACOLOGICAL INTERVENTION

- If HF ,LVEF <45% (reduced ejection fraction)
- SGLT2i mainly Dapagliflozin, empagliflozin and canagliflozin



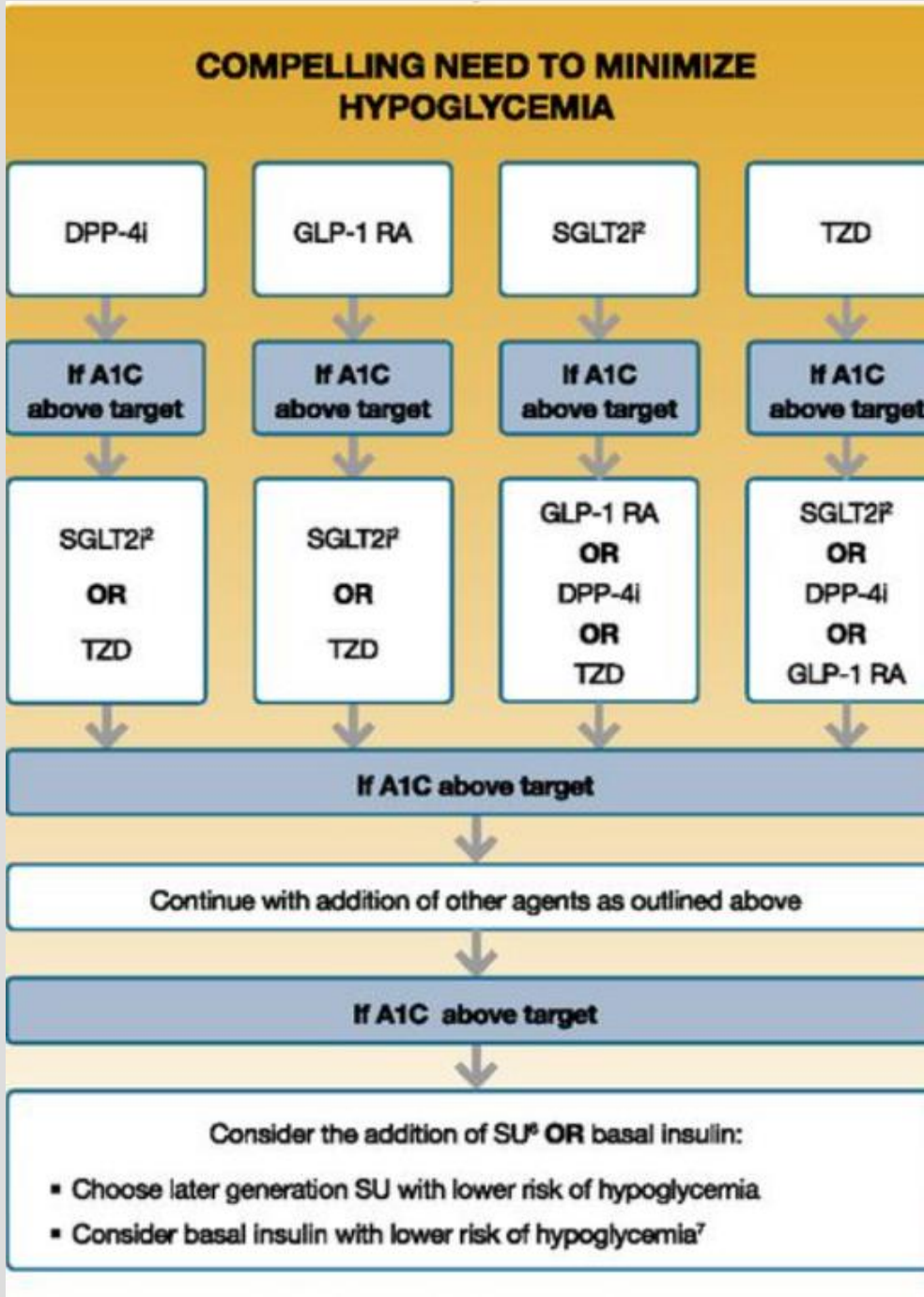
PHARMACOLOGICAL INTERVENTION

- The preferred choice for diabetic kidney disease and albuminuria is SGLT2i with primary evidence of reducing CKD progression (Dapagliflozin and canagliflozin)
- Or SGLT2i with evidance of reducing CKD progression in CVOTs (Dapagliflozin, empagliflozin and canagliflozin).
- GLP1 RA if SGLT2i not tolerated or contraindicated



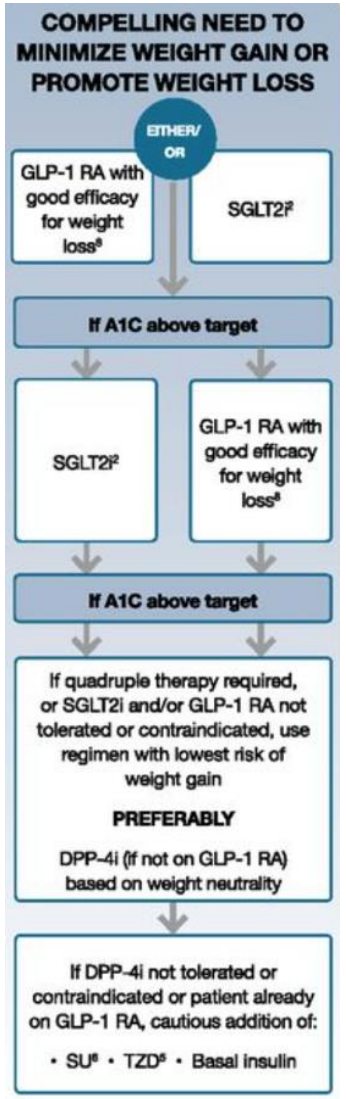
PHARMACOLOGICAL INTERVENTION IF NO ASCVD OR CHF OR CKD

- If hypoglycemia is an issue consider ddp4 I or GLP-1 RA or SGLT2i,TZD



PHARMACOLOGICAL INTERVENTION IF NO ASCVD OR CHF OR CKD

If weight loss needed, consider GLP-1RA or SGLT2-I



SGLT2I

- Efficacy : intermediate ➔ reduce HBA1C by 0.5-1%
- Weight loss
- No hypoglycemia
- Cost: high
- ASCVD (Jardiance, Invokana)
- HF benefit & Reduce CKD progression (Jardiance, Invokana, forxiga)
- Side effects: DKA risk , genitourinary infections, dehydration, hypotension, increase LDL, risk of amputation and bone fracture(Invokana).

GLP-1 RECEPTOR AGONIST

Efficacy: high

No hypoglycemia

Weight loss

Cost: high

ASCVD BENEFIT

Route: S/Q

Delay CKD progression (liraglutide-Victoza)

Caution when initiating or increasing the dose (risk of aki)

Side effects : nausea, vomiting, diarrhea , thyroid c cell tumor, injection site reaction acute pancreatitis risk

GLP-1 RECEPTOR AGONIST

- Initiate VICTOZA with a dose of 0.6 mg daily for one week. The 0.6 mg dose is a starting dose intended to reduce gastrointestinal symptoms during initial titration, and is not effective for glycemic control in adults.
- After one week at 0.6 mg per day, increase the dose to 1.2 mg daily
- If additional glycemic control is required, increase the dose to 1.8 mg daily after at least one week of treatment with the 1.2 mg daily dose.

DPP4 I

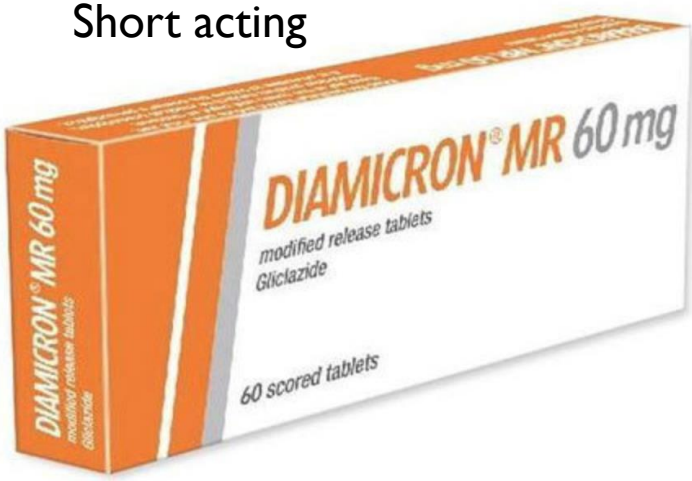
- Efficacy : intermediate➔ reduce hba1c by 0.5- 1.2%
- No hypoglycemia
- Weight neutral
- Saxagliptin (onglyza) has potential risk must be avoided in HF
- Cost : high
- Januvia, galvus, onglyza can be used in renal impairment but with dose adjustment
- Trajenta safe no need for adjustment in renal impairment
- Side effects : acute pancreatitis , joint pain

SULFONYLUREA

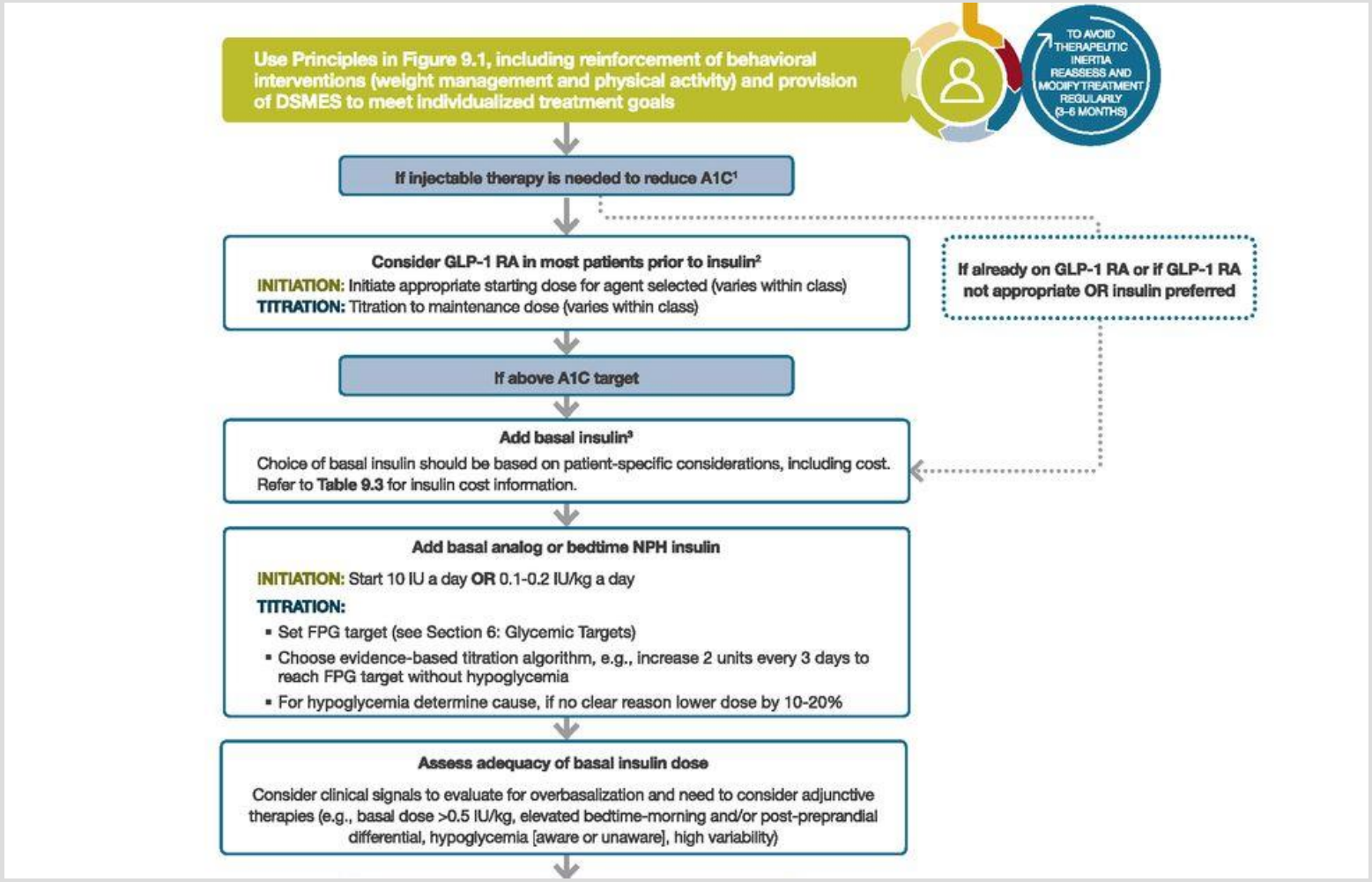
Efficacy :high ➔ reduce HbA1c by
HBa1c by 0.8% to 1.5%
Can cause hypoglycemia
Weight gain
Cost : low
Side effects: increased risk of cardiovascular mortality

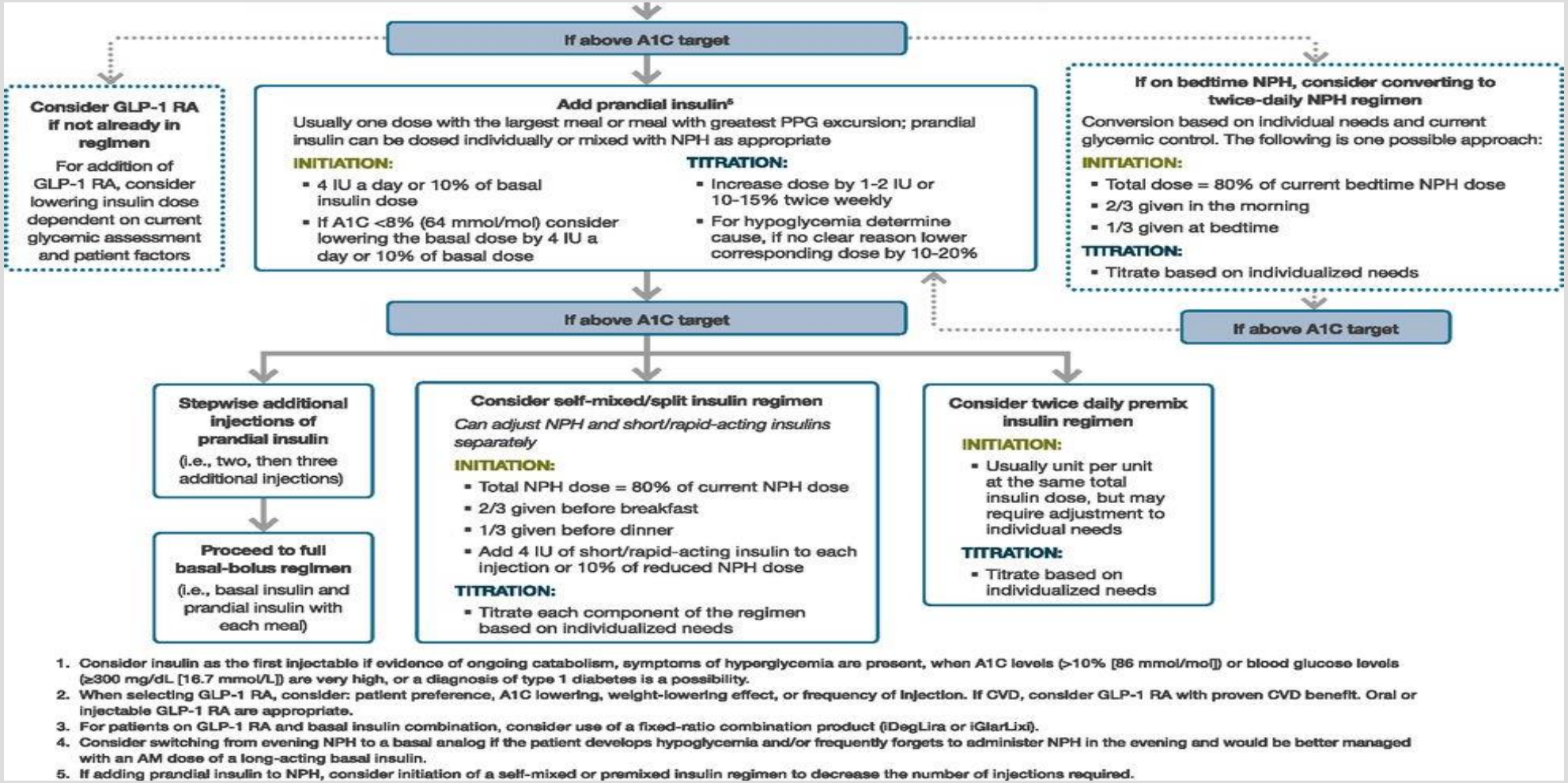
Long acting

Short acting



INJECTABLE THERAPY




If above A1C target
Consider GLP-1 RA if not already in regimen
For addition of GLP-1 RA, consider lowering insulin dose dependent on current glycemic assessment and patient factors
Add prandial insulin5
Usually one dose with the largest meal or meal with greatest PPG excursion; prandial insulin can be dosed individually or mixed with NPH as appropriate
INITIATION:
4 IU a day or 10% of basal insulin dose
If A1C <8% (64 mmol/mol) consider lowering the basal dose by 4 IU a day or 10% of basal dose
TITRATION:
Increase dose by 1-2 IU or 10-15% twice weekly
For hypoglycemia determine cause, if no clear reason lower corresponding dose by 10-20%
If on bedtime NPH, consider converting to twice-daily NPH regimen
Conversion based on individual needs and current glycemic control. The following is one possible approach:
INITIATION:
Total dose = 80% of current bedtime NPH dose
2/3 given in the morning
1/3 given at bedtime
TITRATION:
Titrate based on individualized needs
If above A1C target
If above A1C target
Stepwise additional injections of prandial insulin
(i.e., two, then three additional injections)
Proceed to full basal-bolus regimen
(i.e., basal insulin and prandial insulin with each meal)
Consider self-mixed/split insulin regimen
Can adjust NPH and short/rapid-acting insulins separately
INITIATION:
Total NPH dose = 80% of current NPH dose
2/3 given before breakfast
1/3 given before dinner
Add 4 IU of short/rapid-acting insulin to each injection or 10% of reduced NPH dose
TITRATION:
Titrate each component of the regimen based on individualized needs
Consider twice daily premix insulin regimen
INITIATION:
Usually unit per unit at the same total insulin dose, but may require adjustment to individual needs
TITRATION:
Titrate based on individualized needs
1. Consider insulin as the first injectable if evidence of ongoing catabolism, symptoms of hyperglycemia are present, when A1C levels (>10% [86 mmol/mol]) or blood glucose levels (≥300 mg/dL [16.7 mmol/L]) are very high, or a diagnosis of type 1 diabetes is a possibility.
2. When selecting GLP-1 RA, consider: patient preference, A1C lowering, weight-lowering effect, or frequency of injection. If CVD, consider GLP-1 RA with proven CVD benefit. Oral or injectable GLP-1 RA are appropriate.
3. For patients on GLP-1 RA and basal insulin combination, consider use of a fixed-ratio combination product (iDegLira or iGlarLixi).
4. Consider switching from evening NPH to a basal analog if the patient develops hypoglycemia and/or frequently forgets to administer NPH in the evening and would be better managed with an AM dose of a long-acting basal insulin.
5. If adding prandial insulin to NPH, consider initiation of a self-mixed or premixed insulin regimen to decrease the number of injections required.

INJECTABLE THERAPY

Insulin available in Kuwait

Insulin category	Human insulin	Analogue insulin
Bolus	Humulin Regular	Aspart (NovoRapid) Glulisine (Apidra) Lispro (Humalog)
Basal	Humulin N	Detemir (Levemir) Glargine (Lantus 100U, Toujeo 300U) Degludec (Tresiba)
Premixed	Humulin 30/70	Humalog Mix25 Humalog Mix50 NovoMix 30

METABOLIC SURGERY

- indications:
- should be recommended to treat T2DM for all appropriate surgical candidates with BMIs > 40 (37.5*)
- BMIs 35.0-39.9 (32.5-37.4*) when hyperglycemia is inadequately controlled despite lifestyle & optimal medical therapy.

METABOLIC SURGERY

- Metabolic surgery should be performed in high-volume centers with multidisciplinary teams.
- Long-term lifestyle support and routine monitoring of micronutrient/nutritional status must be provided after surgery.
- People presenting for metabolic surgery should receive a comprehensive mental health assessment.

METABOLIC SURGERY

- younger age, shorter duration of dm <8 years, nonuse of insulin, and better glycemic control are consistently associated with higher rated of diabetes remission.
- beyound improving glycemia control, metabolic surgery is associated with great reduction in CVD risks and enhancements in quality of life.

HYPERTENSION

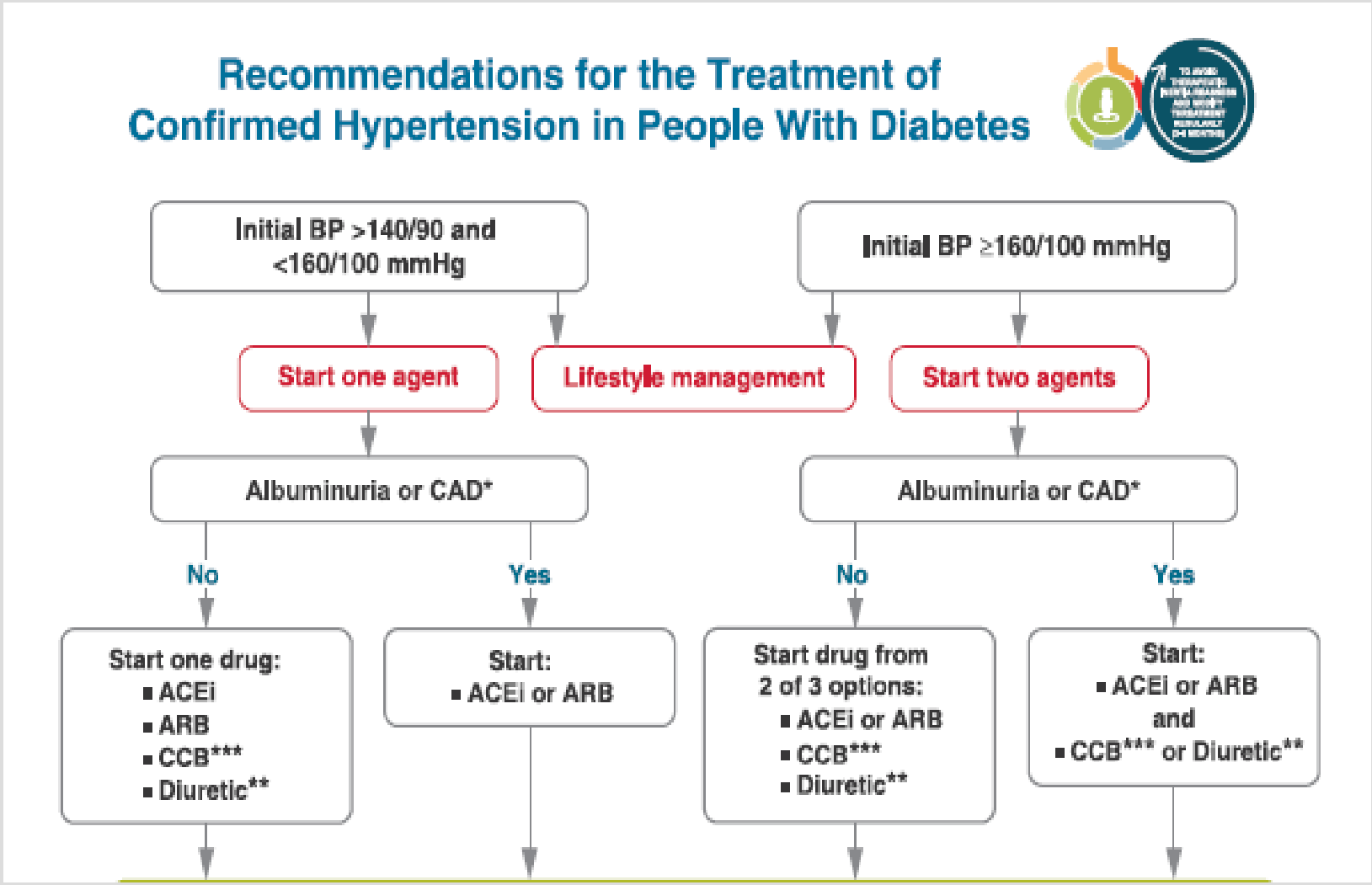
- Blood pressure should be measured at every routine clinical visit.
- Patients with blood pressure ≥140/90 mmHg ➔ blood pressure confirmed using multiple readings, including measurements on a separate day, to diagnose hypertension.
- All hypertensive patients with diabetes should monitor their blood pressure at home

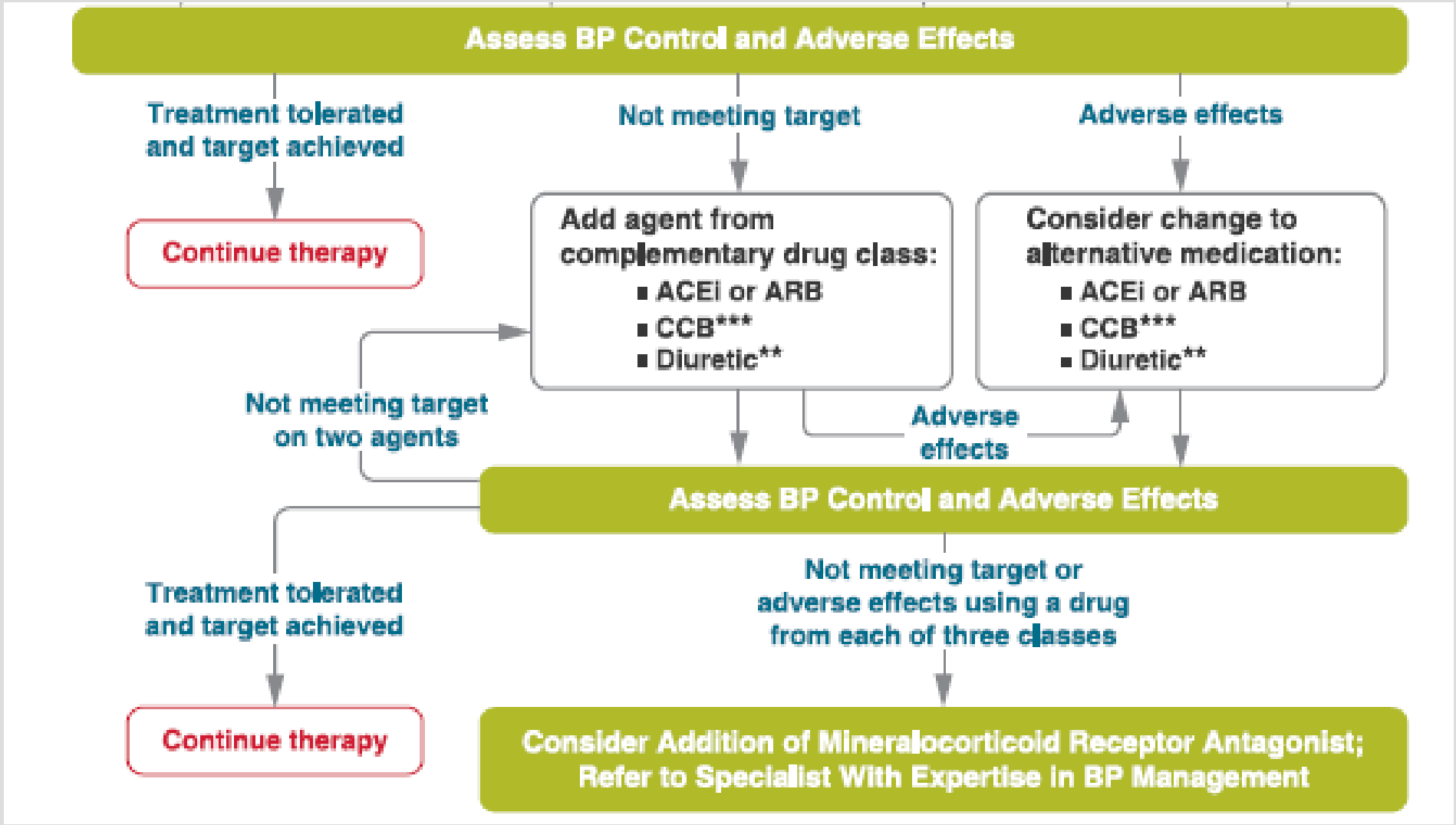
HYPERTENSION

- For individuals with diabetes and hypertension at higher cardiovascular risk existing ASCVD or 10-year ASCVD risk ≥15%), a blood pressure target of <130/80 mmHg may be appropriate, if it can be safely attained

- For individuals with diabetes and hypertension at lower risk for cardiovascular disease (10-year ASCVD risk <15%), treat to a blood pressure target of <140/90 mmHg.

HYPERTENSION




Assess BP Control and Adverse Effects
Treatment tolerated and target achieved
Not meeting target
Adverse effects
Continue therapy
Add agent from complementary drug class:
ACEi or ARB
CCB***
Diuretic**
Consider change to alternative medication:
ACEi or ARB
CCB***
Diuretic**
Not meeting target on two agents
Adverse effects
Assess BP Control and Adverse Effects
Treatment tolerated and target achieved
Not meeting target or adverse effects using a drug from each of three classes
Continue therapy
Consider Addition of Mineralocorticoid Receptor Antagonist; Refer to Specialist With Expertise in BP Management

HYPERTENSION

- For patients treated with an ACE inhibitor, ARB, or diuretic, serum creatinine/estimated glomerular filtration rate and serum potassium levels should be monitored at least annually.

DIABETIC NEUROPATHY

- All patients should be assessed for diabetic peripheral neuropathy starting at diagnosis of type 2 diabetes and 5 years after the diagnosis of type 1 diabetes and at least annually thereafter.
- Optimize glucose control to prevent or delay the development of neuropathy in patients with type 1 diabetes and to slow the progression of neuropathy in patients with type 2 diabetes.
- Assess and treat patients to reduce pain related to diabetic peripheral neuropathy and symptoms of autonomic neuropathy and to improve quality of life.
- Pregabalin, duloxetine, or gabapentin are recommended as initial pharmacologic treatments for neuropathic pain in diabetes

DIABETIC RETINOPATHY

- All patients should be assessed for diabetic retinopathy starting at diagnosis of type 2 diabetes and 5 years after the diagnosis of type 1 diabetes and at least annually thereafter.
- Gestational diabetes screen at every trimester
- management: control bp, glycemic control, laser and anti growth and precaution when exercising

DIABETIC NEPHROPATHY

- At least annually, urinary albumin (e.g., spot urinary albumin-to-creatinine ratio) and estimated glomerular filtration rate should be assessed in patients with type 1 diabetes with duration of ≥5 years and in all patients with type 2 diabetes regardless of treatment
- Patients with diabetes and urinary albumin.300 mg/g creatinine and/or an estimated glomerular filtration rate 30–60 mL/min/1.73 m^2 should be monitored twice annually to guide therapy.

CKD is classified based on: · Cause (C) · GFR (G) · Albuminuria (A)				Albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30-299 mg/g 3-29 mg/mmol	≥300 mg/g ≥30 mg/mmol
GFR categories (ml/min/1.73m^2) Description and range	G1	Normal or high	≥90	1 if CKD	Treat 1	Refer* 2
	G2	Mildly decreased	60-89	1 if CKD	Treat 1	Refer* 2
	G3a	Mildly to moderately decreased	45-59	Treat 1	Treat 2	Refer 3
	G3b	Moderately to severely decreased	30-44	Treat 2	Treat 3	Refer 3
	G4	Severely decreased	15-29	Refer* 3	Refer* 3	Refer 4+
	G5	Kidney failure	<15	Refer 4+	Refer 4+	Refer 4+

DIABETIC NEPHROPATHY

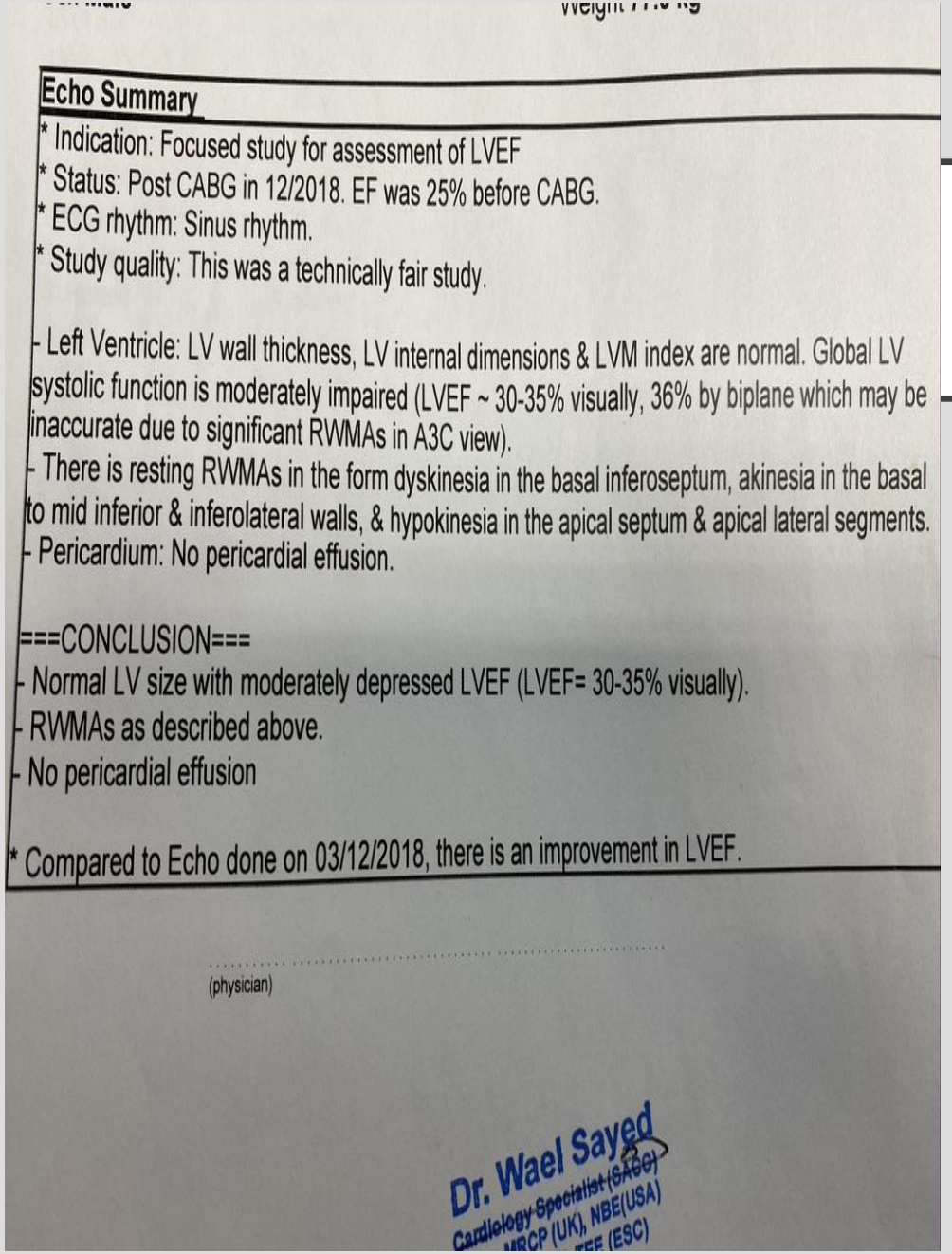
- If eGFR <30 ➔ REFER
- If albuminurea ≥300mg/g ➔ refer
- eGFR <60 ➔ treat with either ACEI or ARBS
- Optimize bp control , glucose control.
- dietary protein intake should be approximately 0.8 g/kg body weight per day

FOOT CARE

- Perform a comprehensive foot evaluation at least annually to identify risk factors for ulcers and amputations
- Patients with evidence of sensory loss or prior ulceration or amputation should have their feet inspected at every visit

CASE 2

- **67 years old diabetic**
- K/c/o IHD did CABG 2019 EF 40 it was 25 before CABG
- PAD
- Carotid artery stenosis
- Diabetic on onglyza and amaryl 4 mg
- Today RBS 17
- Acetone neg
- Rft normal ;Total Cholesterol 4.2 tg3.3 ldl 1.7 on ezetrol and lipitor
- Egfr normal (89)
- Cbc hgb 11.8
- Hba1c pending ..
- What do you want to do regarding his medication?



Weight 77.0 kg

Echo Summary

* Indication: Focused study for assessment of LVEF
* Status: Post CABG in 12/2018. EF was 25% before CABG.
* ECG rhythm: Sinus rhythm.
* Study quality: This was a technically fair study.

- Left Ventricle: LV wall thickness, LV internal dimensions & LVM index are normal. Global LV systolic function is moderately impaired (LVEF ~ 30-35% visually, 36% by biplane which may be inaccurate due to significant RWMAs in A3C view).
- There is resting RWMAs in the form dyskinesia in the basal inferoseptum, akinesia in the basal to mid inferior & inferolateral walls, & hypokinesia in the apical septum & apical lateral segments.
- Pericardium: No pericardial effusion.

===CONCLUSION===
- Normal LV size with moderately depressed LVEF (LVEF= 30-35% visually).
- RWMAs as described above.
- No pericardial effusion

* Compared to Echo done on 03/12/2018, there is an improvement in LVEF.

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(physician)

Dr. Wael Sayed
Cardiology Specialist (SABC)
MRCP (UK), NBE(USA)
FEE (ESC)

Right Lower Limb:
-Triphasic waveforms over all examined arteries (poor over tibial arteries).

Left Lower Limb:
-Triphasic waveforms over femoral and popliteal arteries.
-Biphasic waveforms over tibial arteries.
-Monophasic waveforms over dosalis pedis artery.

SLP:
*Both Lower Limbs: Pressure gradient were detected at ankle level.

*ABI: Right = 0.74 Left = 0.53

PPG:
-Significant flow reduction in all examined digital arteries at left foot.

Impression:
Above findings were suggestive of:
*Bilateral infra popliteal (tibial arteries) occlusive disease (much more significant at Left Lower Limb).

*N.B: Vascular surgeon consultation is highly recommended.

Approved by: Dr. Abdulaziz Almuzaini
Vascular Ultrasound Consultant

Date of Approval: 13.02.2019 11:58

Dr. Abdulaziz Al-Muzaini
Vascular Ultrasound Consultant
(London-UK)
Diagnostic Imaging Center
Dasman Diabetes Institute

KFAS | أحد مراكز Center

Impression:
Above findings were suggestive of:
- Patent left ICA post carotid endorterectomy (CEA) without any significant stenosis
-50-60% stenosis at right internal carotid artery (ICA).

Approved by: Dr. Abdulaziz Almuzaini
Vascular Ultrasound Consultant

Date of Approval: 13.02.2019 11:24

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Diagnostic Imaging Center
Dasman Diabetes Institute

Imaging Report

TAKE HOME MESSAGES

- Always Screen high risk patients for diabetes as early intervention will prevent diabetes complications
- Always be patient centered
- Encourge diabetes self management and patient empowerment

THE END

Take a deep breath
You can do it
Good luck