Management of Complex Diabetes Patients: Case Studies

Advancements in Diabetes Webinar Series

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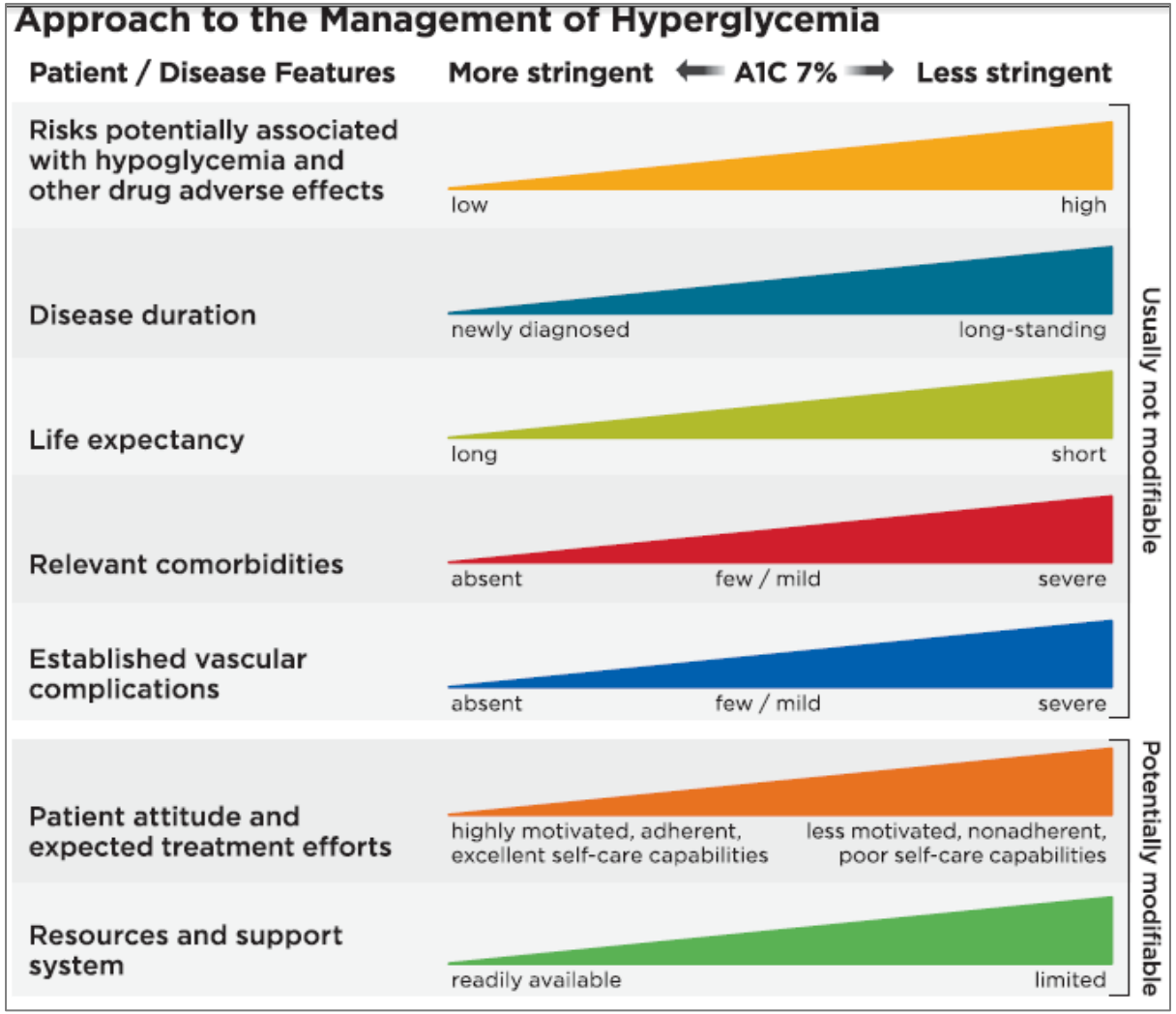
Back to the Basics!

- Assess and treat the “whole” person.
  - Spiritual, cultural, emotional, social, as well as physical
- Prioritize care - what is important to the patient?
- Assess and address health disparities.
- Involve the family in the care, if possible.
- Establish a healthy, trusting rapport with the patient.
- Involve the patient in establishing the plan of care.
- Assess readiness to learn and readiness to provide self-care.
- Practice active listening.
- Individualize care and set realistic goals.
  - Know when to be more stringent or less stringent with treatment goals.

Approach to the Management of Hyperglycemia



Case #1

J.T. is a 70-year-old AI male that presents to the clinic with his wife for DM management. Diagnosed with Type 2 DM 10 years ago. He was initially treated with diet and exercise for the first three years and now is taking “pills”. He is typically managed by his PCP, but hasn’t see her “in a while”. He lives with his wife and is currently unemployed. He reports that he has a glucose meter, but only checks his sugar when he doesn’t feel well. He reports excessive thirst and frequent urination (10 or more times a day). He reports that he doesn’t exercise and eats whatever there is available in the house.

History and Physical

- **Medical History:**
  - Cardiovascular disease – stent placed 2003 (following with a cardiologist – last visit six months ago)
  - Hypertension (last 10 years)
  - Retinopathy – laser treatment in 2015 (last eye exam two years ago)
  - Peripheral neuropathy – reports numbness, tingling, and pain in feet bilaterally
- **Medications:**
  - Glipizide 10 mg BID
  - Metformin 1000 mg BID
  - Simvastatin 20 mg HS
  - Metoprolol 100 mg BID
  - Lisinopril 20 mg QD

History and Physical (cont.)

- **Recent Labs** (six months ago):
  - *Glucose 200*
  - *A1c 10.5%*
  - Normal kidney functioning
  - Normal LFTs
  - Total Chol 189; *HDL 35; LDL 110; TG 350*
- **PE**: Grade II Systolic murmur; large habitus; and decrease sensation feet bilaterally (via 10 gram monofilament)
  - *BP 143/89; P 62*
  - *BMI 35*
  - Point of care testing results: *glucose 285 (fasting); A1c 10.8%*

Based on Information Presented, How Would You Proceed? (1)

1. Stop glipizide and immediately start a basal/bolus insulin regimen.
2. Add a DPP-4 Inhibitor to his current regimen.
3. Enroll him into a weight reduction program and have him come back in six months.
4. Counsel him about his poor lifestyle habits and set him up for self-management education classes.
5. Obtain a more in-depth history – not enough information to develop a safe and effective plan of care.

What Other Components of the History Would Be Helpful to Obtain at This Time?

- Medication compliance
- Food availability, eating patterns, nutritional status
- Relationship with significant other and other support systems
- Employment/financial situation
- Substance abuse
- Needle phobias
- Preconceived ideas of diabetes and treatment for hyperglycemia
- Access to care
- Spiritual and cultural beliefs
- Transportation
- History of depression, anxiety, etc.

What Would Be Your Plan of Care ***Now***? (1)

- Establish A1c target
- Start glargine insulin
  - Educate on insulin, injection technique, and proper ID and treatment of hypoglycemia
  - Advised to monitor glucose BID
- Discontinue glipizide and continue metformin at 1000 mg BID
- Start ASA 81
- DSME classes
- Referral for nutrition counseling and social work services
- Advised to walk 10-minute QOD
- Screen for depression and refer for psychotherapy, if needed
- Order retinal exam
- Lab panel

Dosage Increase and/or Adding Another Medication

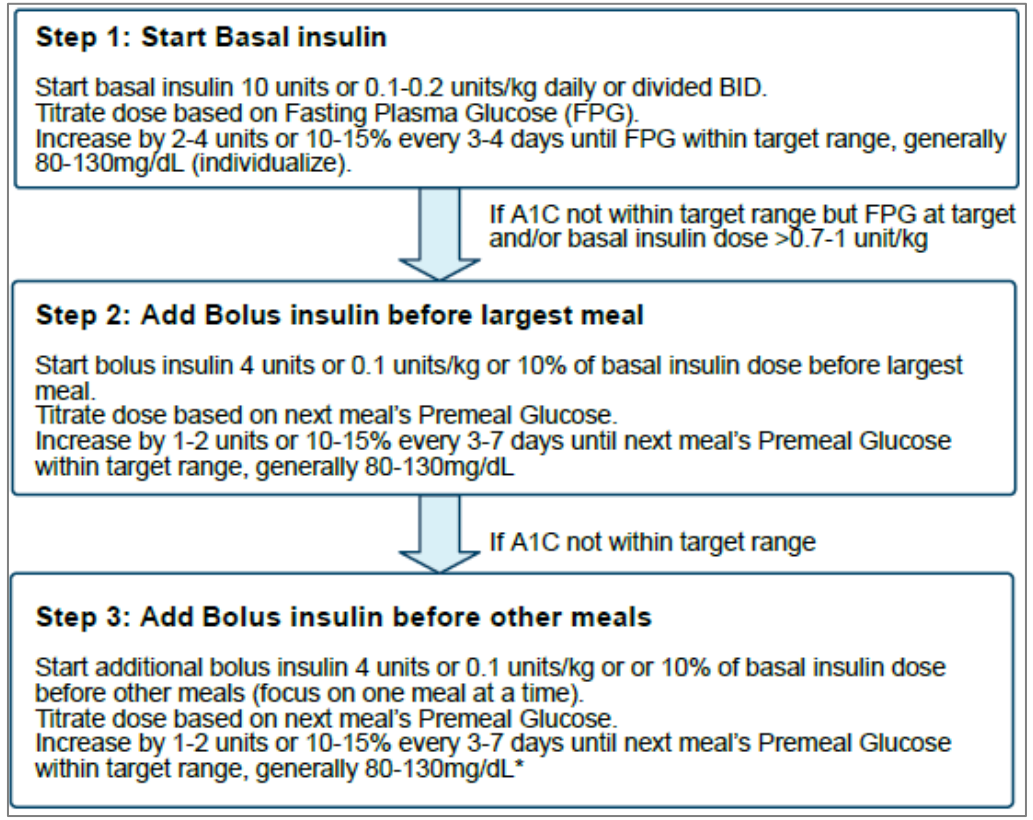
Step 3: Increase Dosage(s) and/or Add Another Medication
Select additional medication(s) based on formulary options, side effects, cost, comorbidities (e.g., CVD), medication regimen complexity, and patient preference.

Medication	Weight	A1C	Risk of Hypoglycemia	Cost
Metformin	- to ↓	↓↓	-	$
DPP-4 Inhibitor	-	↓	-	$$
GLP-1 Receptor Agonist	↓↓	↓↓	-	$$$
Insulin	↑↑ to ↑↑↑	↓↓↓	↑↑↑	$$ to $$$
SGLT2 Inhibitor	↓	↓	-	$$$
Sulfonylurea	↑↑	↓↓	↑↑	$
Thiazolidinedione	↑	↓↓	-	$

Do not use GLP-1 Receptor Agonists and DPP-4 inhibitors together as no A1C benefit

IHS Division of Diabetes Treatment and Prevention, Glucose Management in Type 2 Diabetes: https://www.ihs.gov/sites/diabetes/themes/responsive2017/display_objects/documents/algorithms/AlgorithmGlucoseMngmnt.pdf

Insulin Therapy



Basal Insulin	Onset (hrs)	Peak (hrs)	Duration (hrs)
NPH (Novolin N®)	1-2	4-14	10-24
Detemir (Levemir®)	1	-	8-24
Glargine (Lantus®/Basaglar®)	1	-	up to 24
Glargine U-300* (Toujeo®)	6	-	24 - 36
Degludec U-100, U-200* (Tresiba®)	1	-	up to 42

Bolus Insulin	Onset (hrs)	Peak (hrs)	Duration (hrs)
Regular (Novolin R®)	0.5-1	2-4	6-12
Aspart (Fiasp®)	2.5 min	1	5-7
Aspart (Novolog®)	< 15 min	1-2	3-5
Lispro U-100, U-200* (Humalog®)	15 min	1-2	3-5
Glulisine (Apidra®)	< 30 min	1-2	3-6

Dual Action Insulin	Onset (hrs)	Peak (hrs)	Duration (hrs)
Regular U-500* (Humulin®)	varies with dose	varies with dose	8-24

Pre-Mixed Insulin	Onset (hrs)	Peak (hrs)	Duration (hrs)
NPH/Reg (Novolin® 70/30)	0.5	2-12	18-24
NPA/Aspart (Novolog Mix® 70/30)	0.25	1-4	12-24
NPL/Lispro (Humalog Mix® 50/50)	0.5	1-4	6-12
NPL/Lispro (Humalog Mix® 75/25)	0.5	1-4	6-12

Consider for people who cannot mix insulin or who would benefit from a simpler regimen.

- When **starting**, use 10-12 units or 0.3 units/kg per day:
  Give 2/3 in AM and 1/3 in PM before meals or
  1/2 in AM and 1/2 in PM before meals.
- When **switching** to pre-mixed insulin, divide current daily insulin dose:
  Give 2/3 in AM and 1/3 in PM before meals or
  1/2 in AM and 1/2 in PM before meals.
- Increase dose by 1-2 units or 10-15% every 3-7 days

IHS Division of Diabetes Treatment and Prevention, Insulin Therapy in Type 2 Diabetes:
https://www.ihs.gov/sites/diabetes/themes/responsive2017/display_objects/documents/algorithms/AlgorithmInsulinTherapy.pdf

Aspirin Therapy for ASCVD

Secondary Prevention:

Patients with a history of ASCVD should receive aspirin 75-162mg daily if they are not at an increased risk of bleeding.

If allergic to aspirin, consider clopidogrel 75mg daily.

Primary Prevention:

Consider aspirin 75-162mg daily in patients with increased risk of ASCVD, (e.g., age ≥50 years and one or more risk factors*), if they are not at an increased risk of bleeding.

Aspirin is not recommended in patients at lower risk of ASCVD, (e.g., age <50 years with no major ASCVD risk factors*).

IHS Division of Diabetes Treatment and Prevention, Type 2 Diabetes - Lipid & Aspirin Therapy: https://www.ihs.gov/sites/diabetes/themes/responsive2017/display_objects/documents/algorithms/AspirinLipid_Therapy.pdf

Six Months Later (1)

J.T. comes into the clinic for his six-month check-up. He has been seeing the provider every 1-2 months to make adjustments to his medication regimen. He's now taking 20 units glargine HS, aspart 6 units with breakfast, and 8 units with dinner. He reports compliance with his medications and has been monitoring his glucose levels 2-3 times QD ac meals and/or HS. He arrived with his log book and meter to the visit. Reports no S/S of hypoglycemia.

- **PE**: unremarkable
  - BP 136/86; P 62
  - *BMI 35*
  - *Point of care test results: glucose 140 (random); A1c 8.1 %*
- **Labs**: normal

Based on the Information Presented, How Would You Proceed? (2)

1. Patient is almost at his A1c goal and denying S/S of hypoglycemia. Maintain current medication regimen, reinforce diet and exercise, and have him come back in six months for a check-up.
2. Enroll the patient in a weight management program and have him come back in six months.
3. Analyze his glucose log, identify patterns in the values, obtain a more in-depth history of his lifestyle behaviors, and change his medication regimen.
4. Consider adding a GLP-1 receptor agonist (exenatide) to his regimen.

Log Book Results

AC Breakfast	AC Lunch	AC Dinner	HS
58		250	
120			90
350		62	
112			140
250	180		150
70			250
120		113	
90	42		145
180		300	
195		100	

Case #2

A.B. is a 52-year-old AI female that presents to the clinic for diabetes management. She was diagnosed with Type 2 DM five years ago. She was initially treated with metformin and is now taking metformin and glipizide. She is currently unemployed and states that she lives with her sister and her sister's husband. She doesn't have a car, so she relies on her friends for transportation.

She reports that she doesn't have a glucose meter and only takes her medications when she has them. She reports that she doesn't exercise and eats whatever there is available.

History and Physical (more)

- **Medical History:**
  - Hypertension (last 10 years)
  - Alcohol abuse intermittently for ~20 years - admits to binge drinking on vodka (when it is available)
  - Drug abuse: last used heroin three month ago
  - Tobacco use: 1 ½ to 2 packs QD for 20 years
- **Medications:**
  - Glipizide 5 mg BID
  - Metformin 1000 mg BID
  - Simvastatin 10 mg HS
- **Recent Labs:** no recent labs available
- **PE:** unremarkable
  - *BP 140/95*; P 90
  - *BMI 30*
  - Point of care test results: *glucose 185 (fasting); A1c 9.5%*

Based on the Information Presented, How Would You Proceed? (3)

1. Counsel the patient on medication compliance, provide a glucose meter with instruction, schedule her for a visit with a dietician, and have her come back in three months.
2. Increase glipizide to 10 mg BID, provide a glucose meter and advise her to monitor BID.
3. Enroll her into a weight management program and diabetes education classes and have her return in three months.
4. Screen for depression, explore her living arrangement in more detail, assess for food insecurity, and order a full metabolic lab profile and a glucose meter.

What Additional Information Would be Helpful to Develop an Appropriate Plan of Care?

Case #2 (cont.)

After further discussion with A.B., she disclosed that her living arrangement is not stable. She visits shelters and stays with her sister when she is allowed. She has a difficult time getting food, but relies on friends and family to help her. During the discussion, A.B. became tearful.

Patient Health Questionnaire (PHQ-9) score: *12*
(https://www.cdc.gov/diabetes/ndep/pdfs/83-balanced-life-ndep-123-phq-9-symptom-checklist-508.pdf)

PHQ-9

PHQ-9 Score	Provisional Diagnosis	Treatment Recommendation *Patient Preferences should be considered*
5-9	Minimal Symptoms*	Support, educate to call if worse, return in one month
10-14	Minor depression ++ Dysthymia* Major Depression, mild	Support, watchful waiting Antidepressant or psychotherapy Antidepressant or psychotherapy
15-19	Major depression, moderately severe	Antidepressant or psychotherapy
>20	Major Depression, severe	Antidepressant or psychotherapy (especially if not improved on monotherapy)

** If symptoms present ≥ two years, then probably chronic depression which warrants antidepressants or psychotherapy (ask "In past 2 years have you felt depressed or sad most days, even if you felt okay sometimes?")*

++ If symptoms present ≥ one month of severe functions impairment, consider active treatment

National Diabetes Education Program: https://www.cdc.gov/diabetes/ndep/pdfs/83-balanced-life-ndep-123-phq-9-symptom-checklist-508.pdf

What Would Be Your Plan of Care ***Now***? (2)

1. Depression/Substance abuse: mental health services referral.
2. Unstable housing: social work referral.
3. Food Insecurity: complete the Food Insecurity Resource List (https://www.ihs.gov/sites/diabetes/themes/responsive2017/display_objects/documents/clinicaldocs/FoodInsecurityAssessTool.pdf) and/or refer to dietician for resources.
4. DM: continue current regimen (encouraged med compliance). Refill meds. Order metabolic lab profile.

Six Months Later (2)

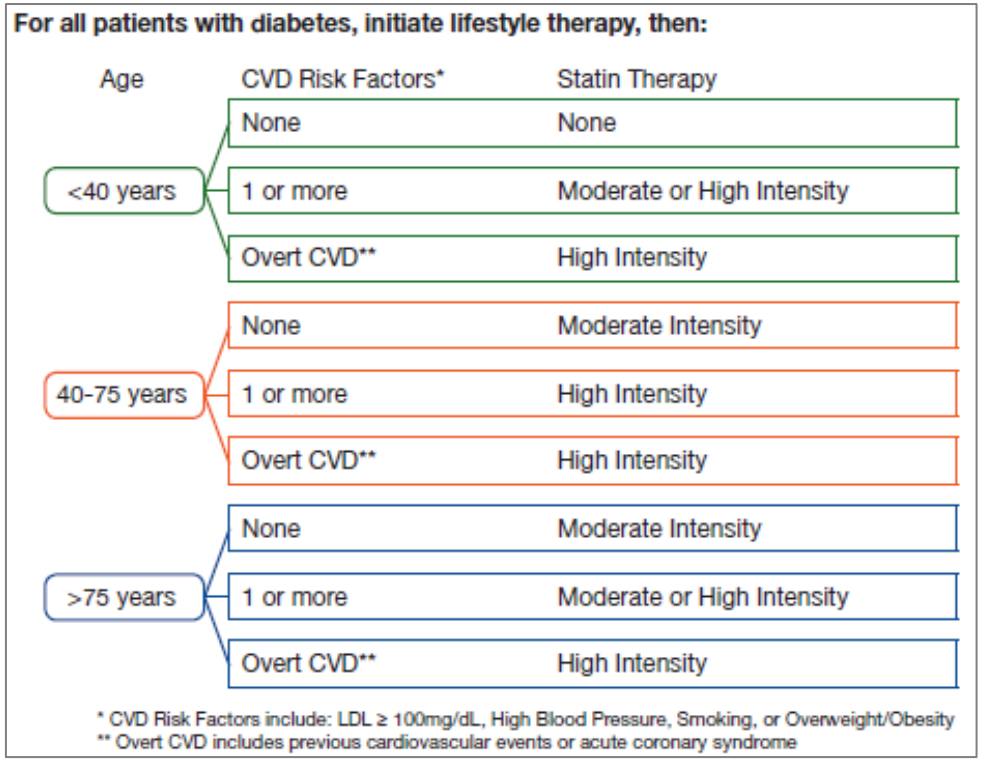
A.B. presents to the clinic for her six-month diabetes management visit. She has been following up with her social worker and mental health provider and has secured stable housing, is being treated for depression and anxiety, and is enrolled in an outpatient drug rehab program. She reports improved compliance with her medications, is getting food from local food pantries and churches, and is currently seeking employment opportunities.

- **Medications:**
  - Glipizide 5 mg BID
  - Metformin 1000 mg BID
  - Simvastatin 10 mg HS
  - Effexor 75 mg QD
- **Recent Labs:**
  - Glucose 120
  - *A1c 8.9%*
  - Normal kidney functioning
  - Normal LFTs
  - Total Chol 189; *HDL 35*; LDL 100; *TG 200*
- **PE**: unremarkable
  - *BP 140/95*; P 90
  - BMI 30
  - Point of care test results:
    - glucose 135 (fasting)
    - *A1c 9%*

What is an Appropriate Plan to Treat her DM?

- Increase glipizide to 10 mg BID and continue metformin.
- Start ASA 81 mg QD.
- Dispense glucose meter and supplies and advise monitoring one time QD, varying the times.
- Refer for nutrition counseling and DM education classes.
- Encourage 10 minutes walking QOD and increase as tolerated.
- Advise smoking cessation—refer for cessation counseling, if needed.
- CHR referral, if needed.

What is an Appropriate Plan to Treat her Hyperlipidemia?



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Statin Medications

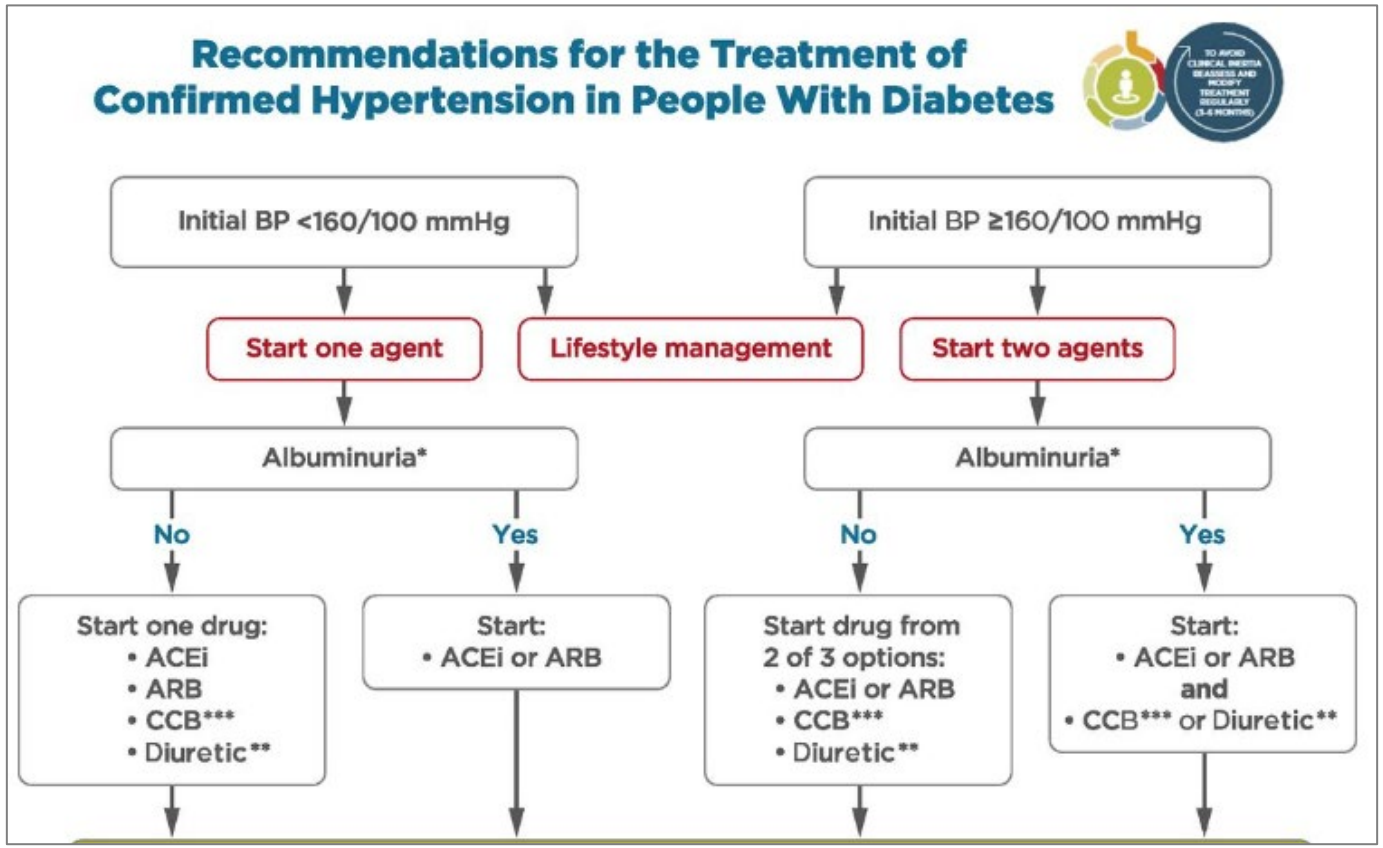
Statin	Moderate Intensity Dose	High Intensity Dose
Atorvastatin (Lipitor®)***	10-20 mg	40-80 mg
Rosuvastatin (Crestor®)	5-10 mg	20-40 mg
Simvastatin (Zocor®)	20-40 mg	NA
Pravastatin (Pravachol®)	40 mg	NA
Lovastatin (Mevacor®)	40-80 mg	NA
Fluvastatin (Lescol®)	80 mg	NA

Note: Medications in green (italicized) are not on the IHS National Core Formulary.

***Note**: Only atorvastatin 40-80 mg is on the IHS National Core Formulary.

IHS Division of Diabetes Treatment and Prevention, Type 2 Diabetes - Lipid & Aspirin Therapy: https://www.ihs.gov/sites/diabetes/themes/responsive2017/display_objects/documents/algorithms/AspirinLipid_Therapy.pdf

What is an Appropriate Plan to Treat Her HTN?



American Diabetes Association, Standards of Medical Care in Diabetes- 2019: https://professional.diabetes.org/content-page/practice-guidelines-resources

Dear Diabetes God,

Please bless us with good numbers today!

Thank you!

Questions