

Rx Number 3:**Case Study: A Patient with Uncontrolled Type 2 Diabetes and Complex Comorbidities Whose Diabetes Care Is Managed by an Advanced Practice Nurse****Case Presentation**

A.B. is a retired 69-year-old man with a 5-year history of type 2 diabetes. Although he was diagnosed in 1997, he had symptoms indicating hyperglycemia for 2 years before diagnosis. He had fasting blood glucose records indicating values of 118–127 mg/dL, which were described to him as indicative of “borderline diabetes.” He also remembered past episodes of nocturia associated with large pasta meals and Italian pastries. At the time of initial diagnosis, he was advised to lose weight (“at least 10 lb.”), but no further action was taken. Referred by his family physician to the diabetes specialty clinic, A.B. presents TO YOU - with recent weight gain, suboptimal diabetes control, and foot pain.

He has been trying to lose weight and increase his exercise for the past 6 months without success. He had been started on glyburide (Diabeta), 2.5 mg every morning, but had stopped taking it because of dizziness, often accompanied by sweating and a feeling of mild agitation, in the late afternoon.

A.B. also takes atorvastatin (Lipitor), 10 mg daily, for hypercholesterolemia (elevated LDL cholesterol, low HDL cholesterol, and elevated triglycerides). He has tolerated this medication and adheres to the daily schedule. During the past 6 months, he has also taken *chromium picolinate*, *gymnema sylvestre*, and a “pancreas elixir” in an attempt to improve his diabetes control. He stopped these supplements when he did not see any positive results.

He does not test his blood glucose levels at home and expresses doubt that this procedure would help him improve his diabetes control. “*What would knowing the numbers do for me?*,” he asks. “The doctor already knows the sugars are high.”

A.B. states that he has “*never been sick a day in my life.*” He recently sold his business and has become very active in a variety of volunteer organizations. He lives with his wife of 48 years and has two married children. Although both his mother and father had type 2 diabetes, A.B. has limited knowledge regarding diabetes self-care management and states that he does not understand why he has diabetes since he never eats sugar. In the past, his wife has encouraged him to treat his diabetes with herbal remedies and weight-loss supplements, and she frequently scans the Internet for the latest diabetes remedies.

During the past year, A.B. has gained 22 lb. Since retiring, he has been more physically active, playing golf once a week and gardening, but he has been unable to lose more than 2–3 lb. He has never seen a dietitian and has not been instructed in self-monitoring of blood glucose (SMBG).

A.B.’s diet history reveals excessive carbohydrate intake in the form of bread and pasta. His normal dinners consist of 2 cups of cooked pasta with homemade sauce and three to four slices of Italian bread. During the day, he often has “*a slice or two*” of bread with butter or olive oil. He also eats eight to ten pieces of fresh fruit per day at meals and as snacks. He prefers chicken and fish, but it is usually served with a tomato or cream sauce accompanied by pasta. His wife has offered to make him plain grilled meats, but he finds them “*tasteless.*” He drinks 8 oz. of red wine with dinner each evening. He stopped smoking more than 10 years ago, he reports, “*when the cost of cigarettes topped a buck-fifty.*”

The medical documents that A.B. brings to this appointment indicate that his hemoglobin A1c (A1C) has never been <8%. His blood pressure has been measured at 150/70, 148/92, and 166/88 mmHg on separate occasions during the past year at the local senior center screening clinic. Although he was told that his blood pressure was “*up a little,*” he was not aware of the need to keep his blood pressure 130/80 mmHg for both cardiovascular and renal health.

A.B. has never had a foot exam as part of his primary care exams, nor has he been instructed in preventive foot care. However, his medical records also indicate that he has had no surgeries or hospitalizations, his immunizations are up to date, and, in general, he has been remarkably healthy for many years.

Physical Exam

A physical examination reveals the following:

- Weight: 178 lb; height: 5'2"; body mass index (BMI): 32.6 kg/m²
- Fasting capillary glucose: 166 mg/dl
- Blood pressure: lying, right arm 154/96 mmHg; sitting, right arm 140/90 mmHg
- Pulse: 88 bpm; respirations 20 per minute
- Eyes: corrective lenses, pupils equal and reactive to light and accommodation, Fundi-clear, no arteriolo-venous nicking, no retinopathy
- Thyroid: nonpalpable
- Lungs: clear to auscultation
- Heart: Rate and rhythm regular, no murmurs or gallops
- Vascular assessment: no carotid bruits; femoral, popliteal, and dorsalis pedis pulses 2+ bilaterally
- Neurological assessment: diminished vibratory sense to the forefoot, absent ankle reflexes, monofilament (5.07 Semmes-Weinstein) felt only above the ankle

Lab Results

Results of laboratory tests (drawn 5 days before the office visit) are as follows:

Glucose (fasting): 178 mg/dl (normal range: 65–109 mg/dl)

Creatinine: 1.0 mg/dl (normal range: 0.5–1.4 mg/dl)

Blood urea nitrogen: 18 mg/dl (normal range: 7–30 mg/dl)

Sodium: 141 mg/dl (normal range: 135–146 mg/dl)

Potassium: 4.3 mg/dl (normal range: 3.5–5.3 mg/dl)

Lipid panel

Total cholesterol: 162 mg/dl (normal: <200 mg/dl)

HDL cholesterol: 43 mg/dl (normal: 40 mg/dl)

LDL cholesterol (calculated): 84 mg/dl (normal: <100 mg/dl)

Triglycerides: 177 mg/dl (normal: <150 mg/dl)

Cholesterol-to-HDL ratio: 3.8 (normal: <5.0)

AST: 14 IU/l (normal: 0–40 IU/l)

ALT: 19 IU/l (normal: 5–40 IU/l)

Alkaline phosphatase: 56 IU/l (normal: 35–125 IU/l)

A1C: 8.1% (normal: 4–6%)

Urine microalbumin: 45 mg (normal:<30 mg)

Assessment

Based on A.B.'s medical history, records, physical exam, and lab results, he is assessed as follows:

Uncontrolled type 2 diabetes (A1C>7%)

Obesity (BMI 32.4 kg/m²)

Hyperlipidemia (controlled with atorvastatin)

Peripheral neuropathy (distal and symmetrical by exam)

Hypertension (by previous chart data and exam)

Elevated urine microalbumin level

Self-care management/lifestyle deficits

Limited exercise

High carbohydrate intake

No SMBG program

Poor understanding of diabetes

Discussion

A.B. presented with uncontrolled type 2 diabetes and a complex set of comorbidities, all of which needed treatment. Your first task is to select the most pressing health care issues and prioritize his medical care to address them. Although A.B. stated that his need to lose weight was his chief reason for seeking diabetes specialty care, his elevated glucose levels and his hypertension also needed to be addressed during this visit.

The patient and his wife agreed that a referral to a dietitian was their priority. A.B. acknowledged that he had little dietary information to help him achieve weight loss and that his current weight was unhealthy and "embarrassing." He recognized that his glucose control was affected by large portions of bread and pasta and agreed to start improving dietary control by reducing his portion size by one-third during the week before his dietary consultation. Weight loss would also be an important first step in reducing his blood pressure.

You contacted the registered dietitian (RD) by telephone and referred the patient for a medical nutrition therapy assessment with a focus on weight loss and improved diabetes control. A.B.'s appointment was scheduled for the following week. The RD requested that during the intervening week, the patient keep a food journal recording his food intake at meals and snacks. She asked that the patient also try to estimate portion sizes.

Although his physical activity had increased since his retirement, it was sporadic and weather dependent. After further discussion, he realized that a week or more would often pass without any significant form of exercise and that most of his exercise was seasonal. Whatever weight he had lost during the summer was regained in the winter, when he was again quite sedentary.

A.B.'s wife suggested that the two of them could walk each morning after breakfast. She also felt that a treadmill at home would be the best solution for getting sufficient exercise in inclement weather. After a short discussion about the positive effect exercise can have on glucose control, the patient and his wife agreed to walk 15–20 minutes each day between 9:00 and 10:00 a.m.

Your Job: Fix A.B.

Your first concern- begin with a first-line medication targeted to improving glucose control without contributing to weight gain.

1. Begin with first deciding which medication addressed this first concern: *improve glucose control without worsening the weight gain.*
2. **Find a peer reviewed article that supports your decision.**
3. Then, write the correct Rx that includes all the correct components of the Rx including your starting dose. **This is the first Rx of two.**
4. Construct a snapshot statement that must defend this selection by including the advanced pharmaceutic principles that literally support your decision (aka – the drugs MOA).
5. Very briefly, address the behavioral changes necessary for A.B.
6. Include special instructions for this drug and using advanced pharmacology principles, argue why these are "special" (e.g. with or without food).
7. You must address a titration schedule that biologically increases the dose from your starting dose (i.e. *the starting dose is not the final dose*)
8. **Write the second Rx** that matched the planned titration dose and the time sequence for the end goal dose. In other words - you are staring with one dose, but you know that is not the end dose. What is your starting dose (Rx number 1), and where do you intend to end up (Rx number 2) – after your planned and articulated titration scheduled (e.g. 1 day versus 1 month, or one week, etcetera).
9. In the end – what are your glycemic goals, and how will you get there?

Consider these Highlights:

Task	Details	Possible Points	Awarded Points
Diagnosis Description	Your diagnosis, be specific.	15 points	
Disease Management	Logical argument for selected drug based on the disease description (e.g. length of treatment, dose, cure versus control, goals), and the titration consideration	15 Points	
Concise & Logical Patient Scenario: Address one concerns beyond the medical diagnosis (e.g. weight loss? Podiatric care?)	Demographics, VSS, PMH, PSH, List of Drugs, Social/ Smokers? Extrapolate from the provided data	10 Points	
Logical Overall Scenario	Likelihood this case makes sense, and the PMH /	20 Points	

	current history- supports the retrieved Peer Reviewed article and links to the teachings of the PR article. Article is current and applicable		
Logical dissection of the PI- how well you know your selected drug	All items Weeks 1 & 2: PK (5 pts). PD (5 pts). MOA (5 pts) At the cellular level, what specifics about the drug come into play.	10 Points	
The perfect executed RX	Identifies and contains <u>every</u> aspect of the perfect Rx. Your case scenario should identify why you have ordered the drug – for your selected time of treatment (e.g. Sig and Dispense amount) <u>AND- the second Rx is explained and argued based on the titration schedule.</u>	5 Points each (10 Points total)	
Format	*APA – doctoral level construction of the overall manuscript including: Suggested correct font (Times New Roman) Maximum 3 Pages – not including Ref and cover page (2 points). Conclusion/summary (3 points with ICD10 coding and diagnosis). Overall construction and command of APA including grammar (9 points). Layout - headers & header levels (2 points).	20 Points	

	APA = 16 points Low TurnItIn score (<20%): 2 points <i>At least one appropriate scientific Peer Reviewed</i> article (no more than 5-7 years old) to support your case and treatment: 2 points		
Total Possible Points 100		/ 100	