

Type 2 Diabetes



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KNH 406

Meet Eileen Douglas

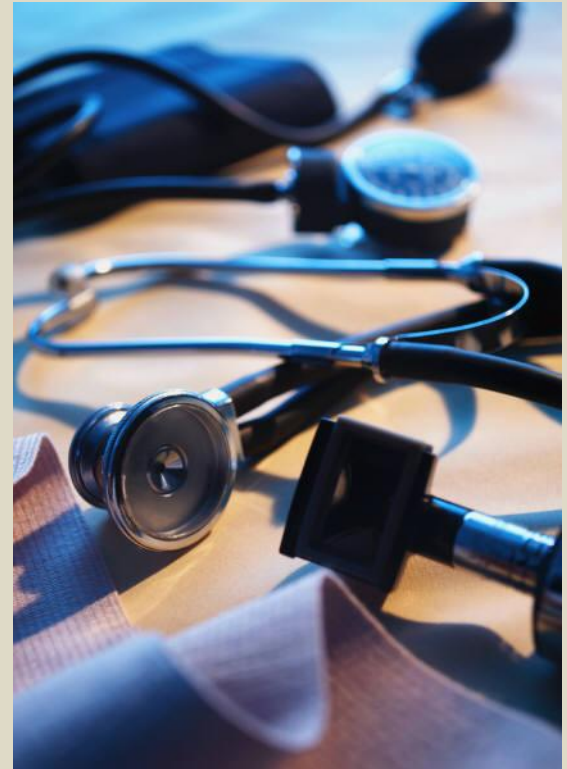


- 71-year-old African American woman
- 5'0", 155 lbs, BMI:30.3
- Admitted for surgical debridement of a nonhealing foot wound
 - Cut on foot has not healed for over 2 months
- Complained of not seeing as well recently
- Lives with her 80-year-old sister (diagnosed with T2DM 10 years ago)
- Live in two-bedroom, low income apartment

Symptoms



- Unhealed wound on left foot
- Blurry vision
- Frequent bladder infections
- Slight tingling and numbness in feet
- Blood glucose: 325 mg/dL (70-110 mg/dL normal)
- Hypertension



Diagnosis



- Type 2 Diabetes
- Review of T1DM and T2DM
 - Type 1 DM: insulin is not produced
 - Type 2 DM: insulin is produced but tissues are insulin resistant. Causes a need for insulin, so the pancreas increases production. Eventually pancreas will get worn out and stop producing insulin.
 - ✦ Two metabolic defects observed: insulin resistance & relative insulin deficiency

Lab Values



Parameter	Normal Value	Patient's Value
Glucose (mg/dL)	70-110 mg/dL	325 mg/dL
HbA1c (%)	3.9-5.2%	8.50%
Cholesterol (mg/dL)	120-199 mg/dL	300 mg/dL
LDL-cholesterol (mg/dL)	Less than 130 mg/dL	140 mg/dL
HDL-cholesterol (mg/dL)	Greater than 55 mg/dL	35 mg/dL
Triglycerides (mg/dL)	35-135 mg/dL	400 mg/dL
BUN (mg/dL)	18-18 mg/dL	26 mg/dL
Osmolality (mmol/kg)	285-295 mmol/kg	315 mmol/kg



Etiology



- Older Age
- Obesity (body fat distribution)
- Family History of DM
- Physical Inactivity
- Impaired Glucose Metabolism
- Race/Ethnicity



Complications of DM



- Cardiovascular disease (65% of deaths among individuals with DM)
- Hypertension
- Dyslipidemia
- Nephropathy (kidney damage)
- Retinopathy (leads to blindness)
- Nervous system diseases (60-70% have impaired sensation or pain in feet or hands)
- Autonomic Neuropathy (affects many organs in body)
 - E.g. Mrs. Douglas's frequent bladder infections
- HHNS (Hyperosmolar Hyperglycemic Nonketotic Syndrome)

Treatment



- Management of T2DM to normalize BG levels
 - Nutritional therapy
 - Physical activity (30-40 min, 3-5 days a week)
 - Medication to counteract abnormalities of glycemic control
 - ✦ Mrs. Douglas: Lipitor (a cholesterol-lowering medication) & Capoten (helps to treat BP, CHF, kidney problems caused by diabetes)
- Debridement of wound



Mrs. Douglas's Usual Dietary Intake



- Breakfast: One egg fried in bacon fat; 2 strips bacon or sausage; 1 cup coffee; 1/2 cup orange juice
- Lunch: Bologna and cheese sandwich on enriched white bread with mustard; 1 glass unsweetened iced tea
- Dinner: 1 cup turnip greens seasoned with fatback, salt, and pepper; 2 small new potatoes boiled and seasoned with salt and pepper; 2 inch square of cornbread with tsp butter; 1 cup beans and ham; 1 cup black coffee
- Approx. Nutritional Analysis:
 - 1,389 kcal
 - 45% fat with 17% from saturated fat (less than 30% fat and less than 7% from saturated fat is recommended)
 - 39% COH, 136 g (less than 130 g is not recommended b/c brain and central nervous system need glucose)
 - 15% Protein, 54.6 g (56.4 g are recommended)
 - 16.3 g Fiber (AI is 21 g)
 - Sodium and Cholesterol were also high

Calorie Needs



- Using the Mifflin equation= 1,141kcal per day
- $1,141 \times 1.2 = 1,369$ kcal per day
 - Using 1.2 as the stress factor due to the infected wound and surgery
- $1,369 - 250 = 1,119$ kcal per day
 - Subtract 250 in order to lose $\frac{1}{2}$ pound per week
- Mrs. Douglas needs approximately 1,200 kcal per day

Protein Needs



- 0.8 g/kg recommended for diabetics
- $0.8 \text{ g} \times 70.45 \text{ kg} = 56.4 \text{ g}$ protein per day



Nutritional Therapy

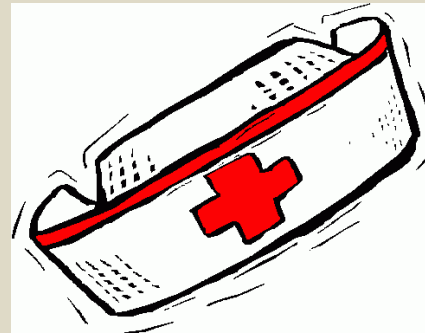


- 1,200 kcal per day (result in a 1/2 pound weight loss each week)
- Losing weight will help control glycemic levels and reduce risk of complications
- Decrease fat to less than 30% of total kcal and saturated fat to less than 7% of total kcal, will help with dyslipidemia and reduce risk of heart disease
- Introduce fruits into diet and more dairy and grains

Before Mrs. Douglas Goes Home



- Other than checking lab values...
 - The dietitian should check and evaluate what extra help Mrs. Douglas will need
 - ✦ Physician
 - ✦ Physical therapy
 - ✦ Social services
 - ✦ Nurses
 - Evaluate Mrs. Douglas's understanding of the disease and diet
 - ✦ She referred to her sister as “having sugar”
 - ✦ She used to think all starchy foods were bad
 - ✦ Need to make sure she understands how to lower fats and eat healthy balanced meals



Mrs. Douglas is back with HHNS



- Her levels were controlled for 6 months but couldn't afford the necessary supplies to check BG
- Hyperglycemic hyperosmolar nonketotic syndrome
 - Caused by high glucose levels, dehydration and infection
 - In the elderly often because they are unwilling to self-hydrate, which leads them to a process of gradual but steady fluid losses and rising blood glucose levels leading to severe dehydration and it could eventually even lead to death
 - Treatment: hospitalization to rehydrate the patient, often involves administering intravenous fluids (i.e., saline and sometimes electrolyte solutions) to restore fluid balance, combined with insulin to slowly bring down blood glucose level

Mrs. Douglas's Prognosis



- Monitor BG (keep in range of 70-110 mg/dL)
- Capoten 50 mg 2 times per day
- Lipitor 10 mg 1 time per day
- 1,200 kcal diet per day
- At least 130 g COH
- At least 56.4 g protein
- Limit cholesterol (less than 200 mg per day) and Na (less than 2,400 mg per day)
- Include dairy, fruits and whole grains
- Stay hydrated!
- Stay active



Questions??



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