

## Case Study: Geriatric Care and Polypharmacy

### Patient Background

- **Name:** Mrs. Jane Smith (pseudonym)
- **Age:** 78 years
- **Gender:** Female
- **Living Situation:** Lives alone but receives daily visits from her daughter
- **Medical History:**
  - Hypertension (10+ years)
  - Type 2 Diabetes (15+ years)
  - Osteoarthritis (progressive over 5 years)
  - Chronic Kidney Disease (Stage 3)
  - Mild Cognitive Impairment (diagnosed 2 years ago)

Mrs. Smith was known to be independent, though her daughter noticed subtle changes in her cognitive abilities over the past year. She occasionally forgot to take her medications or accidentally took them twice. Recently, she started experiencing more fatigue, dizziness, and confusion, which culminated in a fall at home.

### Medication List at Initial Presentation

1. **Amlodipine (10mg, once daily)** – Prescribed for hypertension
2. **Metformin (500mg, twice daily)** – Prescribed for Type 2 diabetes
3. **Glipizide (5mg, once daily)** – A sulfonylurea for diabetes management
4. **Acetaminophen (500mg, three times daily)** – For osteoarthritis pain
5. **Ibuprofen (400mg, as needed)** – Occasionally taken for joint pain
6. **Omeprazole (20mg, once daily)** – Prescribed for gastroesophageal reflux disease (GERD)
7. **Lorazepam (1mg, as needed)** – Taken for anxiety and occasional insomnia
8. **Simvastatin (20mg, once daily)** – Prescribed for hyperlipidemia

### Presenting Complaint

Mrs. Smith was brought to the emergency department by her daughter after experiencing the following symptoms:

- **Confusion and forgetfulness** (worsening over the past month)
- **Dizziness and lightheadedness**
- **Excessive daytime drowsiness**
- **A recent fall** resulting in bruising on her right hip and elbow
- **Decreased appetite and mild nausea**

Her daughter reported that Mrs. Smith had been increasingly lethargic and had difficulty remembering whether she had taken her medications.

## Assessment and Initial Findings

### Physical Examination:

- **Blood Pressure:** 98/65 mmHg (hypotensive)
- **Heart Rate:** 65 bpm
- **Temperature:** 36.7°C (normal)
- **Respiratory Rate:** 16 breaths per minute (normal)
- **Neurological Exam:** Mild confusion but no focal neurological deficits

### Laboratory Results:

- **Blood Urea Nitrogen (BUN):** Elevated (indicating worsening kidney function)
- **Creatinine:** Slightly elevated (suggesting renal impairment)
- **Glucose (Fasting):** 68 mg/dL (borderline hypoglycemia)
- **Liver Function Tests:** Normal
- **Electrolytes:** Within normal limits

### Potential Drug-Related Problems Identified:

1. **Polypharmacy (8 medications in use)**
2. **Risk of Hypoglycemia:** Combination of **Glipizide** + **Metformin** may contribute to low blood sugar, increasing the risk of dizziness and falls.
3. **Risk of Hypotension and Dizziness:** **Amlodipine** may be lowering her blood pressure too much.
4. **Risk of Drug-Induced Cognitive Impairment:** **Lorazepam** is known to cause sedation, confusion, and an increased fall risk in older adults.
5. **Potential Kidney Damage:** **Ibuprofen** can worsen kidney function, especially in elderly patients with pre-existing renal impairment.
6. **Potential Statin Toxicity:** **Simvastatin** + **Amlodipine** combination can increase the risk of muscle pain and weakness.

## Intervention and Management Plan

### 1. Medication Review and Adjustments (Deprescribing Approach)

A thorough review of Mrs. Smith's medication regimen was conducted, leading to the following changes:

Medication	Action Taken	Rationale
<b>Lorazepam</b> (1mg PRN)	<b>Tapered off and discontinued</b>	Benzodiazepines contribute to falls, sedation, and cognitive decline in the elderly. Alternative non-pharmacologic interventions for anxiety were recommended.
<b>Glipizide</b> (5mg)	<b>Reduced dose to 2.5mg daily</b>	Lowering the dose helps prevent hypoglycemia, especially given her mild cognitive impairment.
<b>Ibuprofen</b> (400mg PRN)	<b>Discontinued</b>	NSAIDs can worsen kidney function; an alternative pain management strategy was recommended.
<b>Amlodipine</b> (10mg)	<b>Reduced to 5mg daily</b>	High doses can cause excessive blood pressure reduction, increasing dizziness and fall risk.
<b>Simvastatin</b> (20mg)	<b>Monitored for adverse effects</b>	Given her risk of polypharmacy interactions, she was closely monitored for muscle pain or weakness.

## 2. Non-Pharmacological Interventions

- **Physical Therapy:** To improve balance, reduce fall risk, and manage osteoarthritis pain through low-impact exercises.
- **Cognitive Behavioral Therapy (CBT):** Suggested as an alternative to lorazepam for managing anxiety.
- **Dietary Modifications:** Encouraged smaller, balanced meals to help maintain stable blood sugar levels.
- **Hydration & Lifestyle Adjustments:** Increased fluid intake to support kidney function and prevent dehydration.

## 3. Caregiver Education and Monitoring Plan

Mrs. Smith's daughter was educated on the importance of:

- **Medication Adherence:** Ensuring her mother follows the revised medication regimen properly.
- **Recognizing Early Signs of Adverse Drug Effects:** Such as dizziness, confusion, or hypoglycemia.
- **Home Safety Modifications:** Installing grab bars, improving lighting, and removing tripping hazards to prevent future falls.

## Outcome and Follow-Up

After three months, Mrs. Smith's condition improved significantly:

- **Cognitive Function:** Improved alertness and reduced confusion.
- **Blood Pressure:** Stabilized at 120/75 mmHg.
- **Blood Sugar Levels:** No further episodes of hypoglycemia.
- **Pain Management:** Acetaminophen alone provided sufficient relief for her osteoarthritis pain.
- **No Further Falls:** Strength and balance exercises helped reduce her risk.

She continued to be monitored every three months to reassess her medication needs and overall well-being.

## **Key Lessons and Takeaways**

1. **Polypharmacy in older adults requires careful monitoring and regular medication reviews.**
2. **Deprescribing unnecessary or harmful medications can significantly improve cognitive and physical health.**
3. **Non-pharmacological interventions should be prioritized whenever possible.**
4. **Patient and caregiver education is essential to ensure long-term adherence to a safer medication regimen.**
5. **A multidisciplinary approach (physicians, pharmacists, physical therapists, and caregivers) leads to better outcomes in geriatric care.**

## **Conclusion**

This case highlights the importance of **comprehensive medication management in geriatric care**. Addressing **polypharmacy** through thoughtful deprescribing and patient-centered strategies can **reduce fall risks, improve cognitive function, and enhance the overall quality of life** for older adults.