Academia-CPESN Transformation (ACT) Pharmacy Collaborative

Facilitating Collaborations between Colleges/Schools of Pharmacy and CPESN Pharmacies and Networks

The Academia-CPESN Transformation (ACT) Patient Casebook

ACT Pharmacy Collaborative

#ACTforPharmacy

ACT
Pharmacy Collaborative

University of
Pittsburgh
School of Pharmacy

American Association of
Colleges of Pharmacy
AACP

Community
Pharmacy
Foundation

CPESN®

ACT PHARMACY COLLABORATIVE LEADERSHIP:

Melissa Somma McGivney, PharmD, FCCP, FAPhA
Professor, Associate Dean for Community Partnerships
Director, Community Leadership & Innovation in Practice Ctr
University of Pittsburgh School of Pharmacy
Pittsburgh, PA
Director of Strategic Partnerships, Quality and Outcomes Evaluation
Pennsylvania Pharmacist Care Network/CPESN
Harrisburg, PA

Joni Carroll, PharmD, BCACP, CTTS
Senior Program Manager, Community Practice Development
Network Administrator, Pharmacy Innovation Network
University of Pittsburgh School of Pharmacy
Pittsburgh, PA

Sophia Herbert, PharmD
Fellow, Community Pharmacy Practice Development
University of Pittsburgh School of Pharmacy
Pittsburgh, PA
Pennsylvania Pharmacist Care Network/CPESN
Harrisburg, PA

Troy Trygstad, PharmD, MBA, PhD
Executive Director CPESN USA
Vice-President, Pharmacy Provider Partnerships
Community Care of North Carolina
Raleigh, NC

Nicholas Leon, PharmD, BCPS, BCACP, FCPP
Associate Professor of Pharmacy Practice
Jefferson College of Pharmacy
Philadelphia, PA
Board Chair and Director of Network Development
Pennsylvania Pharmacist Care Network/CPESN
Harrisburg, PA

Stephanie Harriman McGrath, PharmD
Senior Program Manager, Community Pharmacy Partnerships
University of Pittsburgh School of Pharmacy
Pittsburgh, PA
Executive Director of Network Operations
Pennsylvania Pharmacist Care Network/CPESN
Harrisburg, PA

Kim Coley, PharmD, FCCP
Professor of Pharmacy and Therapeutics
Network Director, Pharmacy Innovation Network
University of Pittsburgh School of Pharmacy
Pittsburgh, PA

ACT PHARMACY COLLABORATIVE TASK FORCE:

Amina Abubakar, PharmD, AAHIVP
Owner/Pharmacist, Rx Clinic Pharmacy, Charlotte, NC

Jennifer L. Bacci, PharmD, MPH, BCACP
Assistant Professor
University of Washington School of Pharmacy

Lynette Bradley-Baker, PhD, CAE, RPh
Senior Vice President of Public Affairs and Engagement
American Association of Colleges of Pharmacy

Christopher Daly, PharmD, MBA, BCACP
Clinical Assistant Professor
University at Buffalo School of Pharmacy

William R. Doucette, PhD, FAPhA, RPh
Deborah K. Veale Professorship in Healthcare Policy
Division Head and Professor, Department of Pharmacy Practice and Science
University of Iowa College of Pharmacy

Stefanie P. Ferreri, PharmD, BCACP, FAPhA
Henry L. Smith & James L. Olsen Distinguished Professor
Chair, Division of Practice Advancement and Clinical Education
University of North Carolina Eshelman School of Pharmacy

Nidhi Gandhi, PharmD
Academic Leadership and Education Fellow
American Association of Colleges of Pharmacy

Tripp Logan, PharmD
Pharmacist, L & S Pharmacy, Charleston, MO
Chief Operating Officer, ESPhA

Randy McDonough, BS, PharmD, MS, BCGP, BCPS, FAPhA
Co-Owner Towncrest Pharmacies, Towncrest Compounding Pharmacy, Iowa City and Solon, IA

Joe Moose, PharmD
Owner, Moose Pharmacy, Mount Pleasant, NC

Matt Osterhaus, BPharm
Owner, Osterhaus Pharmacy, Maquoketa, IA

Erin Selby, PharmD
Executive Resident
National Community Pharmacists Association

Megan G. Smith, PharmD, BCACP
Assistant Professor
University of Arkansas for Medical Sciences

Carlie Traylor, PharmD
Associate Director, Strategic Initiatives and Student Affairs
National Community Pharmacists Association

CASE AUTHORS:

College/School of Pharmacy: Campbell University College of Pharmacy & Health Sciences
Faculty Members: Katie Trotta, PharmD, BCACP; Cara Beth Brann, PharmD
Student Pharmacists: Abigail Penninger Comer, Class of 2021

College/School of Pharmacy: Pacific University School of Pharmacy
Faculty Members: Huy Hoang, PharmD
Student Pharmacists: Alvin Leung, Class of 2020

College/School of Pharmacy: Philadelphia College of Pharmacy at USciences
Faculty Members: Elizabeth Harris, PharmD, BCACP
Student Pharmacists: Elizabeth DeMarco; Kathleen Macalalag, Class of 2020

College/School of Pharmacy: Temple University School of Pharmacy
Faculty Members: Anisha Grover, PharmD, BCACP
Student Pharmacists: Ashley Gosner; Liesel Groninger; Alicia Nordberg; Latifatu Ojo, Class of 2022
Sydney Jekielek, Neelesh Agarwal, Ruth Garcia, Junwen Yu, Class of 2021

College/School of Pharmacy: University of Arkansas for Medical Sciences College of Pharmacy
Faculty Members: Megan Smith, PharmD, BCACP
Student Pharmacists: Abigail Williams, Class of 2020
Community Pharmacists: Tyler R. Walsh, PharmD

College/School of Pharmacy: University at Buffalo School of Pharmacy and Pharmaceutical Sciences
Faculty Members: Christopher Daly, PharmD, MBA, BCACP
Student Pharmacists: Anant Shah; Xin Pan, Class of 2022

College/School of Pharmacy: University of Findlay College of Pharmacy
Faculty Members: Sothea Phon-Xue, PharmD; Kate Alt, PharmD, BCGP
Student Pharmacists: Eunyoung (Laura) Na, Class of 2020

College/School of Pharmacy: University of Illinois at Chicago College of Pharmacy
Faculty Members: Jewel Younge, PharmD; Daniel Anzalone, PharmD; Anitha Nagelli, PharmD
Student Pharmacists: Abbey Londa; Hai Pham; Besa Bellcishta, Class of 2022
Community Pharmacists: Daniel Anzalone, PharmD

College/School of Pharmacy: University of Mississippi School of Pharmacy
Faculty Members: Jordan Ballou, PharmD, BCACP
Student Pharmacists: Amy Catherine Love Baggett, Class of 2020

College/School of Pharmacy: University of Pittsburgh School of Pharmacy
Faculty Members: Sophia Herbert, PharmD; Melissa McGivney, PharmD, FCCP, FAPhA
Student Pharmacists: Arianna Sprando, Christian Rosikiewicz, Class of 2021

College/School of Pharmacy: University of Rhode Island College of Pharmacy
Faculty Members: Virginia Lemay, PharmD
Student Pharmacists: Sydney Cassell, Class of 2020
Community Pharmacists: Alex Gianfrancesco, PharmD

College/School of Pharmacy: University of Washington School of Pharmacy
Faculty Members: Jennifer L. Bacci, PharmD, MPH, BCACP
Student Pharmacists: Maurice N. Tran, Class of 2020

College/School of Pharmacy: Wingate University School of Pharmacy
Faculty Members: Cortney M. Mospan, PharmD, BCACP, BCGP, CPP
Student Pharmacists: Michael Deme, Class of 2020
Community Pharmacists: Scott Brewster, PharmD

EDITORS:

Sophia Herbert, PharmD
Fellow, Community Pharmacy Practice Development
University of Pittsburgh School of Pharmacy
Pittsburgh, PA
Pennsylvania Pharmacist Care Network/CPESN
Harrisburg, PA

Kelsey Hake, PharmD
Fellow, Community Pharmacy Practice Development & Research
University of Pittsburgh School of Pharmacy
Pittsburgh, PA

ACKNOWLEDGEMENTS:

The editors would like to the thank the 46 case authors from 13 colleges/schools of pharmacy and several community pharmacy practices who contributed their time, effort, and expertise to the creation of this casebook. We also thank Cody Clifton, PharmD for providing expertise on the Pharmacist eCare Plan Standard and its use within the Casebook. We also acknowledge University of Pittsburgh School of Pharmacy student pharmacists Ryan Durbin, Emma Haught, Nick Sherman, and Parker Stewart for their assistance in review of the submissions for the Casebook. We thank the ACT Pharmacy Collaborative Task Force and Leadership for their support and scholarly contributions to the Casebook. Thanks also to pharmacists Kiera Emery, Heather Jarvis, Amber Morgan, and Jessica Sinclair for their contributions. Lastly, we thank the collective efforts of our Founding Partners, the University of Pittsburgh School of Pharmacy, and American Association of Colleges of Pharmacy, CPESN USA, and the Community Pharmacy Foundation, without whom the creation of this casebook would not be possible.

Suggested citation: Herbert S and Hake K, eds. The ACT Patient Casebook. Academia-CPESN Transformation (ACT) Pharmacy Collaborative. November 2020.

Table of Contents

Introduction……………………………………………………………………………………………………….1

A Guide for Use of the Casebook………………………………………………………………………………..2

Part 1 Cases……………………………………………………………………………………………………….3

Part 2 Cases……………………………………………………………………………………………………….38

Part 3 Cases……………………………………………………………………………………………………….90

Appendices:……………………………………………………………………………………...………146

1. **Glossary of Terms**……………………………………………………………………………….…..…147
2. **Glossary of Abbreviations**………………………………………………………………………..……..150
3. **ACT Patient Case Report Template**…………………………………………………………………..….151
4. **eCare Plan Documentation Guide for Commonly Used Medication Related Problems and Interventions: SNOMED CT Codes**…………………………………………………………………………………………156

Introduction

Welcome to the ACT Patient Casebook! This casebook is the result of the combined efforts of many individuals, including our Partners and many ACT Member colleges/schools of pharmacy. The Academia-CPESN Transformation (ACT) Pharmacy Collaborative is an operational learning and acting collaborative between colleges/schools of pharmacy and clinically integrated networks of community-based pharmacies. The goal of the Collaborative is to support the transformation of community-based pharmacy practice from a product-based care model to a community-based pharmacy care delivery model. The mission of the Collaborative since its formation in 2019 is to unite colleges/schools of pharmacy, mobilize stakeholders and resources, and amplify the development and implementation of sustainable community-based pharmacy care delivery.

One of the initiatives of the Collaborative during its inaugural year was the ACT Patient Case Challenge. Colleges/schools of pharmacy were invited to create and submit impactful patient case reports that demonstrate enhanced patient care provided by pharmacists and student pharmacists in community pharmacies. The Collaborative received over 20 case reports from 16 colleges/schools of pharmacy. Cases underwent peer review, and we now present to you 17 cases in the casebook, divided into three sections.

The intent of this casebook is to provide college/school of pharmacy faculty and staff, student pharmacists, and community pharmacists a compilation of patient cases demonstrating impactful patient care provided in the community pharmacy setting. Importantly, these case reports are founded in a robust pharmacotherapy workup format, with elements of the Pharmacist eCare Plan (PeCP) Standard interwoven to reflect how pharmacists in the community may document patient care within an eCare plan. There is variety in how patient care documentation is completed in practice depending on the eCare planning technology solution and on the scope of the services provided. This casebook will provide student pharmacists and community pharmacists alike the opportunity to conceptualize how patient care can be captured using elements of PeCP Standard. Though all elements of a traditional pharmacotherapy workup may not be documented within a community pharmacy technology solution, the framing of these case reports will reinforce the Pharmacists' Patient Care Process to student pharmacists and others interacting with these cases.

The PeCP Standard allows pharmacists to document care over time to reflect the longitudinal care provided to the patient. You will see some of the included cases demonstrate care provided to a patient over weeks or months. In others, you may see a snapshot of care provided during an initial encounter between a patient and pharmacist. Additionally, documentation style both within the traditional "SOAP" categories of the case reports, as well as within the PeCP Standard sections vary. There are no "right" or "wrong" SNOMED-CT codes to capture care provided by a pharmacist, unless codes are specified within the bounds of a payer contract or otherwise. This casebook includes examples of how to document but is not comprehensive or representative of the only correct way to document. These cases are based on real encounters with real patients, and the resultant variability in how care is provided and documented in the cases is to be expected. We challenge you to examine the nuances of the cases in this book and consider--Are there ways that you would document things differently? Different problems you would identify or act on within the patient encounter? Chances are there is more than one right answer.

We are at a turning point in community pharmacy practice. CPESN USA is expanding, pharmacists at the state and national level are pursuing provider status, and pharmacy care delivery in the community setting is growing. The role of medical billing in community pharmacy is being explored, with resources to help community pharmacists being created rapidly to keep up with the changing marketplace. This casebook does not delve into this area, but instead demonstrates an array of how care can be documented, regardless of if this care was tied to billing and reimbursement in the corresponding real-world case scenarios. We hope these cases will provide student pharmacists and others a better understanding of the reality of community pharmacy practice—that pharmacists provide excellent patient care to their communities every day across our country.

A Guide for Use of the Casebook

Background

Cases included here were originally submitted as a part of the ACT Patient Case Challenge 2020. A key part of the Challenge was that all submitted cases achieve the following:

- Developed by at least one faculty member and one student pharmacist
- Based on an actual patient encounter in a community pharmacy practice
- Documented using a standard Case Report format, which integrates the PeCP Standard
- Generalizable to community pharmacy practice in any state and
- Demonstrate value through a return on investment (ROI) and/or personal value to the patient or patient's caregiver

Case Color Codes

Throughout the casebook you will see different colors used. Blue text marks open/plain text responses and pink text marks where SNOMED-CT codes should be included, following the PeCP Standard. For more information on the PeCP Standard, visit www.ecareplaninitiative.com. The list of potential SNOMED-CT codes pharmacists can use to document care is ever-evolving, and can be found at this website. This "Summary of Codes" document provided on the PeCP Initiative website is what was utilized by case authors when selecting SNOMED-CT codes to capture the patient care provided.

Return on Investment Sections

Notably, the return on investment (ROI) section of each case was developed individually by contributing teams at colleges/schools of pharmacy. Estimating cost avoidance is always difficult and can be challenged. Using full amounts for costs avoided tends to overestimate the savings/return. To be most precise when estimating cost avoidance, it is recommended to adjust the cost avoidance based on the likelihood of an outcome. For example, if 20% of patients in a situation end up having a heart attack, then the potential estimated cost savings reported should be 20% of the cost of a hospitalization for heart attack. When estimating ROI/cost savings of patient care, always refer to the primary literature. Estimated ROI/cost savings from community pharmacy care will become clearer over time as additional payer contracts for care are executed and as care provided by community pharmacists and the corresponding patient outcomes are further evaluated and elucidated through research.

Casebook Organization

Cases are separated into three sections and are grouped by estimated level of complexity and length (Part 1 is least complex; Part 3 is most complex). We hope this assists in selecting cases for use with student pharmacists at different stages of learning. Those using this casebook for educational purposes may also benefit from the provided Appendices. The Glossary of Terms in Appendix 1 may provide further clarity on the terminology used within the cases. The Blank Case Report Template in Appendix 2 is provided should readers wish to create their own case or use the template in educational activities.

Part 1

Case Report 1: Gladys Camel

Setting Description

State: North Carolina

Community Type: Suburban

Prescription Volume per Week: 3,000

Enhanced Services Offered: Adherence Packaging, Comprehensive Medication Reconciliation (CMR), Compounding, Chronic Care Management (CCM), Delivery Services, Immunizations, Online Refills, Medicare Part D Review, Medication Synchronization

CPESN Member Pharmacy? Yes

If yes, which CPESN Network(s)? Mutual CPESN (North Carolina)

Patient Case Summary

Brief Summary

Patient with hypertension (HTN), type 2 diabetes (T2DM), coronary artery disease (CAD), hyperlipidemia (HLD), gout, and diabetic peripheral neuropathy was referred to the pharmacy by a home health agency for nonadherence to medications and as an appropriate candidate for adherence packaging. The patient's medications were filled through a mail-order pharmacy and stored in a plastic tote. Due to the proximity to the patient, the pharmacist and student conducted a home visit and completed a CMR. Adherence packaging options were discussed with patient and blister cards were selected as best fit. The student contacted the patient's primary care physician (PCP) and cardiologist to obtain an up to date medication list. Inconsistencies were identified between the providers' medication lists and clarifications were requested from each provider. Pharmacist and student planned to perform another home visit to explain how to use the blister packs using mock cards and review the indications for each medication. Patient would be contacted a week following initiation of the blister cards to follow-up.

Value Expression Explanation

Potential Estimated Potential Estimated Return on Investment: Under the patient's Medicare Part D plan, a CMR was completed and reimbursement was received. This allowed the pharmacist to directly assess the patient, evaluate appropriateness of current medications, and develop/initiate a plan of action specific to the patient. Under Medicare Part B, the patient was scheduled for a cardiovascular behavioral therapy session with her PCP. The Medicare national payment for a heart attack patient in 2018 was $24,627 (CMS, 2020).

Personal value to patients/caregivers: The pharmacist and student advocated for a patient that had fallen through the cracks of healthcare. Because they spent time discussing with the patient why she was unable to stay compliant with medications, they were able to establish an adherence method specific to the patient. They served as a liaison between the patient and her providers to ensure each medication had a clear indication. Adherence packaging allowed the patient to keep track of multiple daily doses and therefore appropriately manage chronic disease states, as well as combat exacerbations/hospitalizations.

Key Learnings for Community Pharmacy Practice from this Case Report

- Due to their centralized locations, community pharmacists are able to provide convenient care without sacrificing quality.
- Pharmacists strive to create valuable relationships with their patients by offering support and fulfilling unmet health concerns of the public. Through these relationships, pharmacists are able to easily identify and resolve drug therapy problems.
- Pharmacists ensure their patients are being managed appropriately and work alongside their patients and other healthcare providers to create medication plans specific to patients' needs.
- Community pharmacists are able to recognize social determinants of health and put in place action plans that give patient's autonomy over their healthcare.
- Pharmacists remain steadfast in adapting to the ever-changing healthcare system and continue seeking out opportunities to serve their patients, often breaking the mold of a traditional pharmacist.

Patient Description

Patient Name: Gladys Camel
Age: 71
Race: African American
Gender: Woman
Sex: Female
Occupation: Retired
Living Arrangements/Family: Alone in low-income housing
Health Insurance: Medicaid and Medicare

Date of encounter: 9/12/2019
Encounter Type (Initial or Follow up): Initial patient assessment (315639002)
Encounter Class (In person or Telephone encounter): In person encounter (453701000124103)
Encounter Reason (See Summary for codes document): Medication synchronization (415693003)

History of Present Illness

During a home health visit on 9/9/2019, a nurse recognized that the patient could not recall whether she had taken her medications that morning or the previous evening. Patient had a past medical history of HTN, T2DM, CAD, HLD, gout, and diabetic peripheral neuropathy. Further inquiries revealed the patient was inconsistently administering her medications with no record of doses given. Patient was referred to pharmacy for adherence packaging and medication reconciliation.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Metformin XL	1,000 mg	T2DM	Take 1 tablet by mouth twice daily	2/2000	PCP
Gabapentin	300 mg	Diabetic Peripheral Neuropathy	Take 2 tablets by mouth twice daily	5/2007	PCP
Atorvastatin	80 mg	CAD/HLD	Take 1 tablet by mouth once daily	11/2018	Cardiologist

Aspirin	81 mg	CAD	Take 1 tablet by mouth once daily	7/1999	PCP
Clopidogrel	75 mg	CAD	Take 1 tablet by mouth once daily	11/2018	Cardiologist
Metoprolol tartrate	50 mg	CAD	Take 1 tablet by mouth twice daily	11/2018	Cardiologist
Losartan	25 mg	CAD/HTN	Take 1 tablet by mouth once daily	11/2018	Cardiologist
Nitroglycerin SL	0.4 mg	CAD	Take 1 tablet by mouth as needed for chest pain; may repeat every 5 minutes up to 3 doses	11/2018	Cardiologist
Colchicine	0.6 mg	Gout	Take 2 tablets at first sign of flare, followed in 1 hour by 1 tablet on day 1; Take 1 tablet by mouth once daily starting on day 2 until flare resolves	5/2011	PCP
Allopurinol	100 mg	Gout	Take 1 tablet by mouth once daily	5/2011	PCP
Potassium Chloride	20 mEq	Supplementation	Take 1 tablet by mouth once daily with meal	9/2002	PCP
Chlorthalidone	25 mg	HTN	Take 1 tablet by mouth once daily	6/2000	PCP

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Calcium Carbonate	500 mg	Heartburn	Chew 2-4 tablets as needed for heartburn	3/2007	PCP

Allergies and Alerts

Medication Allergies: No known drug allergies (NKDA)

Adverse reactions to drugs in the past: Metformin – gastrointestinal (GI) upset; Methylprednisolone – pruritus

Other Alerts/Health Aids/Special Needs: Poor health literacy; mild cognitive impairment; limited mobility (uses walker)

Immunization History

Immunization	Date(s) Administered
Influenza	10/2017
Shingrix	3/2018, 5/2018
Pneumovax	7/2016

Current Medical History/Problem List

Medical Condition	Date/Year of Diagnosis
Type 2 Diabetes Mellitus	1998
Diabetic Peripheral Neuropathy	2005
Coronary Artery Disease s/p MI	2018
Hyperlipidemia	1999
Essential Hypertension	1989
Gout	2011
Heartburn	2007

Prescription Fill History

Medications synchronized? No

If yes, last sync fill date: Not applicable

Pertinent gaps in refill history: Yes; patient reports nonadherence although she could not determine how many missed doses

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
Simvastatin	CAD/HLD	10/1999	11/2018	Switched to high-intensity statin s/p myocardial infarction (MI)
Amlodipine	HTN	3/1991	11/2018	Switched to angiotensin II receptor blocker (ARB)/Beta blocker s/p MI
Metformin immediate-release (IR)	T2DM	4/1999	2/2000	GI upset with IR formulation

Past Medical History

Medical condition or recent hospitalization	Date
Percutaneous Coronary Intervention (PCI) s/p MI	11/2018

Social History

Tobacco Use: Former smokeless tobacco use (quit 1993)

Alcohol Consumption: Denies any alcohol use

Caffeine Consumption: Reports 1 cup of caffeinated black coffee each morning and 2 cans of Pepsi with lunch and dinner

Recreational Drug Use: Denies any recreational drug use

Describe Diet: Patient reports she typically eats 1 piece of toasted white bread with grape jelly, 1 scrambled egg, and a cup of black coffee for breakfast. For lunch, she eats buttered pasta or a sandwich with a Pepsi. Patient rarely snacks during the day; however, when she does she will have peanut butter crackers or a handful of pretzels. Patient reports that her dinners depend on the time of the month (relative to when she receives her monthly check). When she has more money she prefers to have baked chicken, a canned vegetable (corn or string beans), yeast roll and a Pepsi. Other times she will have canned soup (chicken and rice or vegetable).

Describe Exercise: Patient reports difficulty exercising due to limited mobility. She tries to walk around her neighborhood using her walker for 15 minutes each day following lunch.

Relevant Social Determinants of Health: Patient is unable to drive and therefore relies on public transportation. Patient lives alone and has poor family support. A home health nurse comes three times weekly to help with bathing, etc. Fixed income limits patient's ability to afford healthier food options and money often runs out before the end of the month. Poor health literacy makes it difficult for patient to verbalize importance of each medication.

Vital Signs/Physical Assessment/Labs

	Results	Date
Height	5' 2"	8/14/2019
Weight	187 lb.	8/14/2019
Blood Pressure	138/76 mmHg 142/88 mmHg 132/80 mmHg 146/82 mmHg	8/14/2019 7/22/2019 2/11/2019 1/17/2019
Heart Rate	91 bpm	8/14/2019
Respirations	Not available	
Temperature	97.9 °F	8/14/2019
Hemoglobin A1c	6.4%	7/22/2019
Lipids	HDL – 42 mg/dL LDL – 74 mg/dL TC – 135 mg/dL TG – 96 mg/dL	7/22/2019 7/22/2019 7/22/2019 7/22/2019

Patient Encounter Assessment:

1. Adherence

Patient cannot remember to take her medications at the correct time and has no record of medication administration. Patient cannot recall what medications she is on or why she is taking them.

2. Immunizations

Patient due for annual influenza vaccine and consideration should be given to administering Prevnar 13. She received Pneumovax 23 in 2016, but has not received Prevnar 13 and is over 65.

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
9/12/2019	Noncompliance with medication regimen (129843002)	Patient receiving medications through mail-order pharmacy with automated refills. Patient had no method for administering medications (i.e., weekly pill box). Pill bottles stored in plastic tote. Several duplicate bottles and expired medications found in tote. Patient reported difficulty keeping track of what she took daily, causing her to miss doses or take extra doses.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
9/12/2019	Discussed with patient (395085009)	Available packaging services (i.e., pill box vs. blister cards) discussed with patient to determine patient preference.	Resolved
9/12/2019	Discussed with doctor (394696007)	Discussed with providers the identification of noncompliance during their respective office visits.	Resolved
9/12/2019	Medication reconciliation (430193006)	Student assisted patient in cancelling mail-order pharmacy deliveries and ensuring accurate medication list on file at the current pharmacy.	Resolved
9/12/2019	Development of medication care plan with patient (451741000124100)	Patient transitioned to blister packaging to improve medication adherence.	Resolved
9/12/2019	Synchronization of repeat medication (415693003)	A mock blister card was prepared for demonstration.	Resolved
9/12/2019	Education about medication regimen adherence (410123007)	Patient was allowed to practice punching out “medications” using the mock card.	Resolved
9/12/2019	Monitoring adherence to medication regimen (713116003)	Patient’s first blister card was placed in obvious location to cue medication administration. Blister cards delivered once monthly. Home health nurse checks for missed doses and was instructed to contact pharmacy if adherence declines.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
9/12/2019	Patient does not understand why taking all medication (408364003)	Poor health literacy contributed to lack of understanding of therapeutic benefits. Counseled on all meds today.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
9/12/2019	Medication education (967006)	Patient educated on the indication/common effects/adverse effects and importance of each medication	Resolved
9/12/2019	Comprehensive medication therapy review (428911000124108)	Student discussed indications for each medication, assessed for drug interactions, reviewed directions for use, and recommended lifestyle modifications.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
9/12/2019	Under care of multiple providers (209100124100)	Patient's prescriptions managed by PCP and Cardiologist.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
9/12/2019	Medication reconciliation with all providers (430193006)	Student communicated with both providers to establish a correct medication list for the pharmacy and both provider offices.	Resolved
9/12/2019	Renewal of prescription (103742009)	Student ensured all medications were refilled and medications were available for filling.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
9/12/2019	Not up to date with immunizations (171259000)	Patient due for influenza vaccine. Refused it at PCP visit last year. She is also eligible for the Prevnar 13 vaccine because she is over 65.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
9/12/2019	Immunization education (171044003)	Patient was educated on the importance of receiving an annual influenza vaccine given age and comorbidities. She was also educated on the Prevnar 13 vaccine, but decided to discuss it with her doctor before receiving it today.	Resolved

9/12/2019	Influenza vaccination (12866006)	Influenza vaccine will be administered by pharmacy student at follow-up appointment.	Active

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
9/12/2019	Patient will begin to use blister cards now as directed to avoid missing doses and better manage her health. At the one-week follow-up with the pharmacist, the patient will have missed 0 doses within a 7-day period.	Active
9/12/2019	Patient will reduce sugar and caffeine consumption, and begin replacing sodas with water. During the first week, she should replace her lunchtime Pepsi/soda with water. During the third week, she should replace her supper Pepsi/soda with water. By November, the patient should only be drinking 2-4 sodas per week to decrease sugar and caffeine consumption.	Active
9/12/2019	Patient will begin replacing canned vegetables with fresh vegetables. By November, the patient should only be eating canned soups/vegetables 2-3 times per week and should select low/reduced sodium options if available.	Active

Patient Encounter Plan:

1. Adherence

Patient educated on the importance of taking her medications as prescribed. Patient willing to discontinue mail-order pharmacy prescriptions and enroll in blister packaging for her medications. All expired medications were discarded appropriately. Patient will use adherence packaging as long as it remains effective. Monthly follow-ups are completed with the patient before packaging blister cards to discuss medication adherence and therapeutic changes made at physician appointments. Home health nurse will check blister cards for missed doses. Patient educated on each of her medications and what each medication is used for.

2. Immunizations

Patient will receive influenza vaccine at next appointment. She decided to defer the Prevnar 13 until she can speak to her doctor, which is appropriate based on the updated ACIP recommendation of shared clinical decision-making for Prevnar 13 at ages ≥ 65. If she declines Prevnar 13, she would still be indicated for a second dose of Pneumovax 23 five years after receiving the first dose. She can receive a second dose of Pneumovax 23 in 7/2021. If she receives Prevnar 13 soon, she can get Pneumovax 23 a year later, as long as it is also five years after her last Pneumovax 23 dose.

Case Report 2: April Clot

Setting Description

State: Arkansas

Community Type: Suburban

Prescription Volume per Week: 1,300

Enhances Services Offered: Comprehensive Medication Review (CMR), Point of Care Testing (POCT), Immunizations, Medication Synchronization

CPESN Member Pharmacy? No

If yes, which CPESN Network(s)? Not applicable

Patient Case Summary

Brief Summary

A 67-year-old female patient with chronic obstructive pulmonary disease (COPD), HTN, T2DM, and depression was identified within the OutcomesMTM platform as someone who would benefit from a CMR. She was contacted via phone by a fourth year pharmacy student on an Advance Pharmacy Practice Experience (APPE) Enhanced Pharmacy Services rotation, and a CMR was completed. The discussion involved an explanation of her high risk for blood clots due to her age, gender, medications, and smoking status. The pharmacy student contacted the prescriber and discussed this risk. The medication in question, estradiol 1 mg tablet by mouth once daily, was stopped.

Value Expression Explanation

Potential Estimated Return on Investment: The pharmacy was compensated for the CMR. Avoiding the potential risks for deep vein thrombosis (DVT) or pulmonart embolism (PE) from her treatment could result in preventable admission for a cost savings of approximately $8,764 (Fernandez et al. 2015)

Personal value to patients/caregivers: The pharmacist was able to identify a problem with this patient's medication therapy and tobacco use that could have resulted in a clot. This had the potential to help the patient avoid a hospital stay, additional medications, and the financial strain that comes with missed work days.

Key Learnings for Community Pharmacy Practice from this Case Report

- Women above 65 years old are at increased clot risk. Medications including hormones like estradiol should be avoided so as to not increase risk further. This is especially true in patients who use tobacco, another factor increasing their clot risk.
- Overall, all women over 35 years old who are on estradiol should have their smoking status evaluated regularly to assess their risk for developing clots.
- Pharmacists are uniquely positioned to recognize and mitigate risk factors for stroke based on age, gender, medications, and smoking status.

Patient Description

Patient Name: April Clot
Age: 67
Race: Caucasian
Gender: Female
Sex: Female
Occupation: Retired
Living Arrangements/Family: Lives alone
Health Insurance: Silver Script Medicare

Date of encounter: 7/24/19
Encounter Type (Initial or Follow up): Initial (315639002)
Encounter Class (In person or Telephone encounter): Telephone (185317003)
Encounter Reason (See Summary for codes document): Complete Medication Review (428911000124108)

History of Present Illness

The patient was identified as someone who would benefit from a CMR, whose primary pharmacy had not completed the service. Upon completion of the CMR, it was clear that the patient was at very high clotting risk due to the presence of multiple risk factors.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Ventolin HFA	108 mcg	COPD	Inhale 2 inhalations by mouth four times a day as needed	May 2019	Pulmonologist
Amlodipine	10 mg	HTN	Take 1 tablet by mouth every evening	April 2018	PCP
Escitalopram	10 mg	Depression	Take 1 tablet by mouth every morning	August 2017	PCP
Estradiol	1 mg	Hormones	Take 1 tablet by mouth daily	May 2017	Obstetrician/ Gynecolgist (OB/GYN)
Spiriva Handihaler	18 mcg	COPD	Inhale 1 inhalation by mouth daily	September 2017	Pulmonologist
Lisinopril/ Hydrochlorothiazide (HCTZ)	20-25 mg	HTN	Take 1 tablet by mouth every morning	January 2016	PCP
Metformin	500 mg	T2DM	Take 1 tablet by mouth daily	May 2019	PCP
Potassium Chloride	10 MEQ	Supplement	Take 1 tablet by mouth daily	May 2019	PCP

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Fluticasone Nasal Spray	50 mcg	Allergies	Instill 2 sprays in each nostril once daily	April 2018	PCP
Ibuprofen	200 mg	Pain	Take 2 tablets 3 to 4 times daily	April 2018	Self
Refresh Eye Drops	1.4-0.6%	Dry Eyes	Instill 1 drop in each eye once daily	September 2017	Self
Simethicone	180 mg	Gas	Take 1 tablet by mouth as needed	May 2019	Self

Allergies and Alerts

Medication Allergies: NKDA

Adverse reactions to drugs in the past: None

Other Alerts/Health Aids/Special Needs: None

Immunization History

Immunization	Date(s) Administered
Influenza	10/2018
Prevnar 13	9/2017
Shingrix	5/2019, 7/2019

Current Medical History/Problem List

Medical Condition	Date/Year of Diagnosis
Hypertension	January 2016
COPD	September 2017
Depression	April 2018
Allergies	April 2018
Pain	April 2018
Type 2 Diabetes	May 2019
Dry Eyes	September 2017
Gas	May 2019

Prescription Fill History

Medications synchronized? No

If yes, last sync fill date: Not applicable

Pertinent gaps in refill history: None. Patient is extremely adherent.

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
Ibuprofen	Pain	Unknown	July 2019	Blood pressure

Past Medical History

Medical condition or recent hospitalization	Date
Not applicable	

Social History

Tobacco Use: Patient reports tobacco use; ~1 pack per day (PPD) for 15 years

Alcohol Consumption: Patient reports social alcohol consumption.

Caffeine Consumption: Patient reports 1 cup of coffee every morning and 1 20-ounce bottle of Coke with dinner.

Recreational Drug Use: Patient denies recreational drug use.

Describe Diet: Patient reports a balanced diet. She states that she tries to keep fresh fruits and vegetables at home, but doesn't always eat them. She stated she eats a lot of frozen meals. She reports only eating out on special occasions.

Describe Exercise: Patient reports walking around her neighborhood 3-4 times weekly.

Relevant Social Determinants of Health: Not applicable

Vital Signs/Physical Assessment/Labs

Vitals and labs not available.

Patient Encounter Assessment:

1. Menopause

The patient was started on estradiol at menopause over 10 years ago. The estradiol prescriber was contacted regarding the increased risk of clot formation as an adverse effect of estradiol. Her hormones were reported stable by the prescriber.

2. Hypertension

Patient has high blood pressure and is currently taking ibuprofen to manage pain. Althought blood pressure values are not available to assess HTN control, ibuprofen is not optimal therapy for pain due to adverse effect of increasing blood pressure.

3. Smoking Cessation

Patient currently smokes 1PPD. After patient discussion about smoking status resulting in increased risk of clot, patient is open to smoking cessation.

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/24/19	Adverse Medication Interaction with Medication (448178009)	The patient is a female over 65 years old. Estradiol is not recommended due to increased clotting risk. The patient is already at increased clotting risk due to tobacco use.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/24/19	Drug Therapy Discontinued (274512008)	The prescriber was contacted regarding estradiol therapy, and was agreeable to discontinuing the treatment through a gradual taper. The patient agreed with the decision.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/24/19	Adverse medication interaction with medication (448178009)	The patient used ibuprofen on occasion for pain. Nonsteroidal anti-inflammatory drugs (NSAIDs) are not recommended as the patient has HTN and NSAIDs have the potential to raise blood pressure.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/24/19	Drug Therapy Discontinued (274512008)	The patient was agreeable to switching from ibuprofen to Tylenol as needed for pain. She was counseled on how to use Tylenol.	Resolved

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
7/24/19	Use support line to help with smoking cessation, taper cigarette use over next 2 months	Active
7/24/19	Continue taking medications as prescribed to maintain control of COPD, T2DM, and HTN with a goal of missing less than 3 doses per month	Active

Patient Encounter Plan:

1. Menopause

Discontinue estradiol due to increased clot risk. The patient now has a more complete understanding of her clotting risk and how to reduce this risk. The prescriber agreed to discontinue the estradiol by gradually tapering the dose. Patient was counseled to monitor for the presence of vasomotor symptoms, such as hot flashes; if hot flashes are noticed, patient was instructed to reach out to prescriber to adjust taper.

2. Hypertension

Discussed increased risk of raised blood pressure when taking NSAIDs, and suggested Tylenol (acetaminophen) instead. Patient agreed to take over-the-counter (OTC) acetaminophen. She was counseled to take a maximum of acetaminophen 1000mg by mouth three times daily as needed to manage pain.

3. Smoking Cessation

The patient was instructed to contact 1-800-QUIT-NOW and referred to tobacco cessation counseling. Pharmacist will follow-up with patient when she is ready to quit and will provide OTC nicotine replacement options, for example, nicotine patches, gum, and/or lozenges.

Case Report 3: Cara Caramel

Setting Description

State: Illinois

Community Type: Urban

Prescription Volume per Week: 1750

Enhances Services Offered: Point of Care Testing (POCT), Comprehensive Medication Reviews (CMR), Smoking Cessation, Medication Synchronization, Meds to Beds, Coordination of dialysis and transplant patients, Post-discharge care coordination

CPESN Member Pharmacy? Yes

If yes, which CPESN Network(s)? I-CPESN

Patient Case Summary

Brief Summary

CC is a 34-year-old African American female diagnosed with polycystic ovary syndrome (PCOS) with uncontrolled stage 2 HTN. She is currently taking amlodipine 5mg daily and hydrochlorothiazide 25mg daily but reports adherence issues. She is a caregiver for her father and this stress, as well as poor lifestyle habits such as diet and smoking, contributes to her HTN. During a free Flip the Pharmacy (FtP) blood pressure screening, she had a high blood pressure reading of 163/103 mmHg. In addition, multiple intervention opportunities to improve the patient's blood pressure were identified, including therapy optimization, medication adherence, tobacco cessation, and diet counseling.

Value Expression Explanation

Potential Estimated Return on Investment: In studies where a pharmacist provided similar patient care services, cost savings were identified. Based on two cost effectiveness articles, the pharmacist saved $298 per-member-per-month ($3,576/year) for improved medication adherence due to higher proportion of days covered for medications such as statins, angiotensin-converting enzyme inhibitors/angiotensin II receptor blockers, beta-blockers, and antidepressants (Doucette, 2003). There was also an additional $2,676 saved per patient who received a comprehensive medication history, continuous monitoring, oral and written instructions on medications, and discussion with physicians by the pharmacist (Murray, 2009).

Personal value to patients/caregivers: Given that the patient currently struggles to manage her health along with her father's, her routine could be streamlined by combining her personal medication routine with her father's care. By offering to transfer the patient's prescriptions to the pharmacy, she can pick up her medications at the same time as her father's. This will reduce travel, decrease her stress, and provide better management of her own medication regimen. The pharmacy will supplement with services such as medication education and blood pressure monitoring. Reaching controlled blood pressure readings through medication usage, diet modifications, and reduced stress will significantly improve her cardiovascular health. This will be of great benefit to the patient.

Key Learnings for Community Pharmacy Practice from this Case Report

- Flip the Pharmacy aims to complete more patient-centered services within workflow to address problem areas for commonly observed conditions.
- These key interventions, like blood pressure screenings, will enhance patient care to ensure optimized therapy.
- Patient-centered clinical services encourage stronger relationships with other healthcare providers due to enhanced communication, which can lead to optimized medication use.
- Interoperability will serve as a means of improving this communication so that notes and reliable out-of-clinic data from pharmacy visits will be easily accessible by other healthcare providers.

Patient Description

Patient Name: Cara Caramel
Age: 34
Race: African American
Gender: Woman
Sex: Female
Occupation: Gas station clerk
Living Arrangements/Family: Lives alone in apartment in Wicker Park but spends a lot of time at her father's place caring for him. No children.
Health Insurance: Medicaid Managed Care

Date of encounter: 01/22/2020
Encounter Type (Initial or Follow up): Initial
Encounter Class (In person or Telephone encounter): In person encounter (453701000124103)
Encounter Reason (See Summary for codes document): Taking patient vital signs (61746007)

History of Present Illness

CC was picking up medication for her father. Upon being approached by a pharmacy student, CC agreed to having her blood pressure measured. Her blood pressure was 163/103 mmHg. Patient denied symptoms of headache, dizziness, lightheadedness, shortness of breath, and chest pain. The pharmacy student discovered that CC has inadequate medication adherence. The stated she is aware of her HTN diagnosis secondary to PCOS. Patient was not aware of blood pressure lowering techniques or blood pressure goals.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Metformin	1000 mg	Insulin resistance for PCOS	Take two tablets by mouth in the morning	2/2018	PCP
Eflornithine	13.9% cream	Hirsutism due to PCOS	Apply to face twice daily	7/2018	PCP
Empagliflozin	10 mg	T2DM	Take one tablet by mouth in the morning	7/2018	Endocrinologist
Hydrochlorothiazide	25 mg	HTN	Take one tablet by mouth in the morning	8/2017	Cardiologist
Amlodipine	5 mg	HTN	Take one tablet by mouth daily	3/2017	Cardiologist

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Tums	750 mg	Heartburn	Chew 2 tablets as needed for heartburn (max 10 per day)	2/2019	PCP

Allergies and Alerts

Medication Allergies: NKDA

Adverse reactions to drugs in the past: None

Other Alerts/Health Aids/Special Needs: None

Immunization History

Immunization	Date(s) Administered
Influenza	8/2017, 9/2018
Recombivax HB	3/2017
Pneumovax	3/2017
Tdap	8/2017

Current Medical History/Problem List

Medical Condition	Date/Year of Diagnosis
Polycystic Ovarian Syndrome	2018
Type 2 Diabetes	2018
Hypertension	2017

Prescription Fill History

Medications synchronized? No

If yes, last sync fill date: Patient has not been to her PCP for 2 years. Suspected that patient goes to an outside pharmacy.

Pertinent gaps in refill history: Patient describes the nonadherence herself during the encounter with the student. Educated patient that it would be easier for her to pick up her dad's and her medications together.

Social History

Tobacco Use: Current smoker- ½ PPD with 20-year history. States that she smokes her first cigarette of the day within 15 minutes of waking prior to morning coffee.

Alcohol Consumption: Denies alcohol consumption

Caffeine Consumption: One cup of coffee every morning

Recreational Drug Use: Denies recreational drug use

Describe Diet: CC is always running from one thing to the next and reports not being able to follow a balanced diet. She skips breakfast a couple times per week, but always has snacks at her desk. She never is without a bag of kettle chips and a box of RedVines. Often her lunch consists of rice and fried chicken or pork, occasionally with a side of vegetables or fruit. She eats take out for every other dinner on the way home from work. On other nights, she eats whatever she can find at her dad's place which is usually a microwavable meal.

Describe Exercise: Patient reports not having much time to exercise as she cares for her dad around the clock.

Relevant Social Determinants of Health: Between caring for her father and working long hours to make low income, patient may have trouble accessing healthier alternatives. Eating out every-other meal may arise from the stress and lack of time between balancing her job and caring for her father. Additionally, lack of time does not allow the patient to exercise frequently, as the patient states being "too tired" from the activities she does throughout the day.

Vital Signs/Physical Assessment/Labs

	Results	Date
Height	64 inches	3/2017
Weight	180 lbs	3/2017
Blood Pressure	163/103 mmHg 120/81 mmHg	1/22/2020 6/22/2018
Heart Rate	80 bpm 85 bpm	8/2017 3/2017
Respirations	18 breaths per minute	3/2017
Temperature	Not available	

Patient Encounter Assessment:

1. Uncontrolled stage 2 hypertension

Patient's blood pressure of 163/103 mmHg is above the goal < 130/80 mmHg. Current intervention opportunities include reinforcement of adherence, medication dose optimization, and relevant lifestyle modifications, such as weight reduction, diet modifications, stress reduction, exercise, and salt reduction.

2. Medication nonadherence

CC should be enrolled into the pharmacy's medication management program. She currently makes multiple trips to the pharmacy for her and her father's medications. This presents a medication synchronization opportunity and should help reduce some of the struggles to manage her health along with her father's, which can also aid with hypertension treatment.

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
01/22/2020	Noncompliance with therapeutic regimen (697958005)	No documentation in the electronic health record since 2018 and she admits to being nonadherent to her medications.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
01/22/2020	Medication synchronization (415693003)	Adherence may improve if medication is synchronized to her father's pick-up date as she seems to be diligent about picking up his medications.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
01/22/2020	Unbalanced diet (424890008)	Based on the patient's social history, she regularly eats fast food and foods with high sodium content.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
01/22/2020	Low salt diet education (183063000)	Patient would benefit from a decrease in sodium intake due to high blood pressure and decrease in fast food consumption due to high blood pressure and obesity.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
01/22/2020	On examination - blood pressure reading very high (163028000)	Patient's blood pressure was 163/103 mmHg upon assessment at the pharmacy and she was not aware of blood pressure goals.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
01/22/2020	Blood pressure taking education (50723001)	Patient educated on the importance of monitoring blood pressure. Medicaid covers a free blood pressure monitor and it will subsequently be filled at the pharmacy. When she obtains the blood pressure monitor, the pharmacist will teach her how to appropriately use the monitor.	Active
01/22/2020	Hypertension education (39155009)	Patient admits to difficulty in medication adherence. Patient will be enrolled in the pharmacy's medication therapy management (MTM) program and HTN will be a focus during all MTM sessions.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
01/22/2020	Moderate cigarette smoker (10-19 cigs/day) (160604004)	Patient is a current smoker with a 20-year history.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
01/22/2020	Smoking cessation education (225323000)	Conduct a brief intervention regarding patient's willingness to quit and refer patient to Tobacco Cessation Clinic.	Active

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
01/22/2020	Improve adherence to medication with goal of missing 1 or fewer doses per week for at least a month	Active
01/22/2020	Monitor blood pressure weekly for at least one month	Active
01/22/2020	Lower blood pressure to ≤ 130/ 80 mmHg	Active
01/22/2020	Walk outside for 30 minutes a day 5-7 days per week	Active
01/22/2020	Per dietary approaches to stop hypertension (DASH) diet recommendations, slowly reduce sodium intake by consuming < 2300 mg per day for at least 14 days	Active
01/22/2020	Schedule appointment with Tobacco Cessation Clinic within 3 months	Active

Patient Encounter Plan:

1. Uncontrolled stage 2 hypertension

Report high blood pressure reading to patient's PCP. Appropriate blood pressure goals were reinforced with CC. She will be equipped with self-management tools and will be encouraged to be an active participant in her treatment plan. Patient was educated on how to monitor blood pressure daily using a supplied home device. The pharmacist plans to call the patient monthly through the pharmacy's MTM program to monitor her HTN and adherence progress and encourage keeping a blood pressure log. Pharmacist encouraged weight management through lifestyle modifications, including diet and exercise. The pharmacist recommended physical activities that fit the patient's busy lifestyle, such as walks during lunch breaks, as well as slow change the patient's diet to incorporate healthier options with less salt. If patient's blood pressure is still uncontrolled one month from now with improved patient adherence to medications, the pharmacist will discuss with the cardiologist a potential increase in amlodipine from 5 mg to 10 mg daily.

2. Medication nonadherence

Pharmacy re-integrated the patient back into the pharmacy medication synchronization system and will coordinate her medication pick-up date along with her father's. Patient was educated on the importance of medication adherence, and strategies, such as pillboxes and phone alarms, were suggested. The pharmacist plans to call the patient monthly through the pharmacy's MTM program to monitor her adherence progress.

Case Report 4: Tim Traveler

Setting Description

State: Washington

Community Type: Suburban

Prescription Volume per Week: 600

Enhances Services Offered: Medication therapy management (MTM), travel health consult service, immunizations

CPESN Member Pharmacy? No

If yes, which CPESN Network(s)? Not applicaable

Patient Case Summary

Brief Summary

Tim Traveler presented to the community pharmacy requesting a travel health consult for his upcoming trip to South Africa in approximately 6 weeks. He reported contracting traveler's diarrhea when he was vacationing in Japan a few years ago. Patient brought documentation of his immunization history and travel itinerary for pharmacist review. In reviewing patient's travel itinerary, it was identified that patient was at high risk for contracting typhoid fever, and the pharmacist administered the Typhoid Vi Polysaccharide Vaccine, Typhim Vi. Additionally, as the patient had a history of traveler's diarrhea and was scheduled to be traveling through high malaria risk areas for 10 days, the pharmacist prescribed and dispensed azithromycin and Malarone (atorvaquone and proguanil hydrochloride) via a collaborative practice agreement (CPA). Finally, as the patient was indicated to recieve his tetanus booster and seasonal influenza vaccine, the pharmacist administered Boostrix and Fluarix Quadravalent respectively. An updated immunization history document and medication list was sent to patient's primary care provider. Administered immunizations were also updated in the electronic Washington State Information Immunization System.

Value Expression Explanation

Potential Estimated Return on Investment: Based on available cost data, the pharmacist generated at least $24,469 total cost savings including $24,376 in cost savings for prevention of a malaria-related hospital admission (Khuu, 2018) and at least $93.02 in cost savings for prevention of influenza (Putri, 2018) that would require treatment in the outpatient setting.

Personal value to patients/caregivers: The pharmacist provided highly accessible and convenient care for this patient's travel-related health needs and was able to mitigate the patient's risk of contracting typhoid fever, malaria, and traveler's diarrhea. The pharmacist also added value by proactively addressing this patient's preventative health needs by identifying that the patient was indicated to receive a tetanus booster and influenza vaccination.

Key Learnings for Community Pharmacy Practice from this Case Report

- Pharmacists are well positioned and capable to prospectively evaluate the vaccine and travel health needs of a patient.
- The accessibility of a community pharmacist travel health service enabled the patient to recieve vaccines and medications to reduce risk of illness while abroad in a timely and convenient manner at their local pharmacy.
- Engaging patients with a travel consult service enabled the pharmacist to holistically evaluate a patient for other health needs, such as routine immunizations (i.e. – tetanus and influenza).

Patient Description

Patient Name: Tim Traveler
Age: 39
Race: Caucasian
Gender: Man
Sex: Male
Occupation: Engineer
Living Arrangements/Family: Married
Health Insurance: Private insurance

Date of encounter: 08/31/2019
Encounter Type (Initial or Follow up): Initial (315639002)
Encounter Class (In person or Telephone encounter): In person (4537101000124103)
Encounter Reason (See Summary for codes document): Immunization status screening (procedure) (268558004)

History of Present Illness

Patient presented to the community pharmacy on 08/31/2019 requesting a travel immunization and medication consult. He states he will be traveling to South Africa for a total of 12 days in approximately 6 weeks. Notably, 10 out of the 12 days will be in high malaria and typhoid fever risk areas. Patient states he traveled abroad a few years ago and contracted traveler's diarrhea and is concerned it will happen again. He denies any chronic medical conditions, has NKDA and reports no medication intolerances.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
None					

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
None					

Allergies and Alerts

Medication Allergies: None reported

Adverse reactions to drugs in the past: None reported

Other Alerts/Health Aids/Special Needs: None reported

Immunization History

Immunization	Date(s) Administered
Hepatitis A	04/1981, 12/1981
Hepatitis B	03/1980, 04/1980, 11/1980
Boostrix	01/2006
Influenza	11/2018

Current Medical History/Problem List

Medical Condition	Date/Year of Diagnosis
None	

Prescription Fill History

Medications synchronized? No

If yes, last sync fill date: Not applicable

Pertinent gaps in refill history: Not applicable

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
None				

Past Medical History

Medical condition or recent hospitalization	Date
None	

Social History

Tobacco Use: Denies tobacco use

Alcohol Consumption: Not available

Caffeine Consumption: Not available

Recreational Drug Use: Not available

Describe Diet: Not available

Describe Exercise: Not available

Relevant Social Determinants of Health: Not available

Vital Signs/Physical Assessment/Labs

Vitals and labs not available.

Patient Encounter Assessment:

1. Traveler's diarrhea

Patient is indicated to receive antibiotics for potential traveler's diarrhea to be used if needed during upcoming travel based on patient's concern and prevalence of traveler's diahrrea in his destination.

2. Malaria prophylaxis

Patient is indicated for malaria prevention due to upcoming travel through high malaria risk areas in South Africa.

3. Indicated immunizations

Patient is indicated for the typhoid vaccine due to travel through high typhoid fever areas in South Africa. He is also indicated for tetanus booster and annual influenza vaccines per ACIP recommendations.

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
08/31/2019	Additional medication therapy required (428981000124101)	As patient has a history of traveler's diarrhea and will be traveling abroad, patient would benefit from antibiotics for potential traveler's diarrhea management.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
08/31/2019	Prescription medication started (43286100124103)	Patient was prescribed to start azithromycin 500 mg by mouth once daily x 3 days in the event he develops travler's diarrhea symptoms.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
08/31/2019	Additional medication therapy required (428981000124101)	As patient will be traveling to a high malaria risk area of South Africa, he would benefit from receiving medication for malaria prophylaxis.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
08/31/2019	Prescription medication started (43286100124103)	Patient prescribed to start Malarone 250 / 150 mg by mouth once daily with food x 18 days. Patient was educated to begin taking medication one day before entering into rural and high malaria risk areas of South Africa and to continue taking until completed.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
08/31/2019	Not up to date with immunizations (finding) - Problem observation (171259000)	Given patient's upcoming plans to travel through high typhoid fever risk areas of South Africa and current immunization records, he is indicated to receive typhoid, tetanus booster, and influenza vaccines.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
08/31/2019	Administration of substance to produce immunity, either active or passive (127785005)	Patient recieved Typhim Vi vaccine to reduce risk for contracting typhoid fever. Patient also received Boostrix and Fluarix Quadravalent vaccines per ACIP recommendations. All adminstered vaccines were documented in the state's electronic immunization registry and faxed to his primary care provider.	Resolved

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
8/31/2019	Receive adequate immunity from medications and immunizations to reduce risk of contracting typhoid fever, malaria, and traveler's diarrhea.	Active

Patient Encounter Plan:

1. Traveler's diarrhea

Prescribe azithromycin 500 mg by mouth once daily x 3 days for traveler's diahrrea. The pharmacist reviewed signs and symptoms of traveler's diahrrea, such as nausea, vomiting, fever, abdominal cramps, and increased frequency of loose stools or urgency to defecate.

2. Malaria prophylaxis

Prescribe Malarone 250/150 mg by mouth once daily x 18 days. Patient was advised by pharmacist to start Malarone one day before travel, continue throughout entirety of travel, and continue for seven days after travel ends (18 days total).

3. Indicated immunizations

Administer Typhim Vi 0.5 mL IM x 1 dose, Boostrix 0.5 mL IM x 1 dose, and Fluarix Quadravalent 0.5 mL IM x 1 dose.

Case Report 5: Cassandra Newman

Setting Description

State: North Carolina

Community Type: Urban

Prescription Volume per Week: 1,000

Enhances Services Offered: Home Delivery, Specialty Pharmacy Dispensing, Adherence Packaging, Naloxone Dispensing, Medication Synchronization Program, Care Plan Development/Reinforcement, Immunizations, Pharmacogenomics, Point of Care Testing (POCT), Comprehensive Medication Reviews (CMR), Medication Reconciliation, Chronic Care Management (CCM), Human Immunodeficiency Virus (HIV) Support Community Pharmacy Care Management, Transitions of Care (ToC), Multilingual Capability

CPESN Member Pharmacy? Yes

If yes, which CPESN Network(s)? CPESN Mutual, CPESN USA

Patient Case Summary

Brief Summary

A patient was identified as needing enhanced care coordination due to homelessness, HIV status, behavioral health, and having multiple providers. Over the course of a year, the patient had been lost to follow-up with a mental health provider but has maintained regular and appropriate follow-up with a primary/HIV care provider. A pharmacist initially reached out to the behavioral health provider to confirm the medication list and to inform them of medication synchronization. The pharmacist noticed duplications and noncompliance with current medication regimen. The pharmacist resolved medication-related problems and synchronized current therapy. Pharmacists and pharmacy technicians coordinated care with this patient as much as possible, but relied on case management for care coordination. A pharmacist reached out to the case manager on 12/20/2019 to help coordinate the patient receiving medications. The case manager was apathetic and did not communicate effectively with the pharmacist. The pharmacist successfully advocated for a new case manager to be assigned for this patient. From 12/2019 to present, the pharmacist has worked more extensively with a new case manager who has been eager, proactive and communicative regarding the patient's needs and pharmacy outreach. Today (3/25/2020) the pharmacist follows up with the patient as they were recently discharged from the hospital. The pharmacist provides transitions of care support and reviews medication adherence and ongoing monitoring for the patient's conditions.

Value Expression Explanation

Potential Estimated Return on Investment: Patient did not qualify for an active payor contract with NC Medicaid. However, close follow-up with the pharmacist and subsequent pharmacist coordination with the patient's case manager and other healthcare providers likely reduced complications related to uncontrolled HIV, complications, hospital readmission, and opportunistic infection. Community pharmacist involvement in patient therapy can have an overall benefit and cost reduction impact on the healthcare system in various disease states.

Personal value to patients/caregivers: The pharmacy is providing immense value to the patient through multiple avenues: connecting and empowering patient care through case management, informing primary care of medication nonadherence, correcting loss to follow-up, and resolving medication-related problems. For someone who is managing complex medical situations while struggling with basic life necessities, navigating medication access can lead to poor outcomes if the patient does not have a complete care team, including an enhanced service pharmacy. The pharmacist advocated for a change in case management, resolved medication-related problems and synchronized medications, promoted medication adherence that has led to positive outcomes for CD4 count and viral load, communicated the loss to follow-up for mental health providers to the healthcare team, and assisted in transition of care follow-up to ensure medication access.

Key Learnings for Community Pharmacy Practice from this Case Report:

- This patient has value in a connected care team that includes case management, primary and HIV care, and an enhanced service pharmacy with electronic health record access.
- The pharmacy's ability to play a more integral role for the patient navigating the healthcare system is seen with adherence data like percent days covered (PDC) for her anti-retroviral (Triumeq) after the patient was assigned a new case manager (increasing from 36 to 94%).
- Leveraging relationships, being connected with providers and patient advocates, and monitoring for adherence indicators while keeping in mind the full social profile of the patient can create greater and deeper means of care.
- This patient case provides an example of how the eCare plan can be used to document patient care provided over multiple interactions with the patient.

Patient Description

Patient Name: Cassandra Newman
Age: 53
Race: African American
Gender: Female
Sex: Female
Occupation: Not applicable
Living Arrangements/Family: Homeless
Health Insurance: MEDICAID-NC (MEDICAID)

Date of encounter: 3/25/2020
Encounter Type (Initial or Follow up): Follow up (390906007)
Encounter Class (In person or Telephone encounter): Telephonic (185317003)
Encounter Reason (See Summary for codes document): Assessment of compliance with medication regimen (410122002)

History of Present Illness

Patient was identified on 1/16/2020 as needing medication adherence support through direct communication with case management, multiple providers, and sometimes the patient through text message and phone calls to help with adherence. The pharmacist assessed the patient's adherence on this date and discovered it has fluctuated greatly with mean medication possession ratio (MMPR) and PDC over the last year. Further care coordination between Case Management, Pharmacy, and Primary Care is taking place for her ToC follow-up, follow-up to mental health care, and ensuring continuation of therapies. After conferring with the patient's providers and case manager, the patient was engaged in the pharmacy's adherence program with communications from clinic and staff going to both patient and case management. Patient was doing well and has been receiving medication delivered to her new case manager who has been more engaged in her care. More recently, patient was discharged on 3/23/2020 from local hospital following an alcohol intoxication leading to diagnosis of pneumonia secondary to vomit aspiration. The patient's medical record shows discharged blood pressure elevated at 155/85, CD4 count 1252 (47%) and HIV RNA viral load detected <20 copies. The patient was tested for influenza and COVID19, for which she tested negative. Today the pharmacist calls the patient after learning of her recent hospitalization discharge. The pharmacist plans to review continued monitoring of her HIV and primary care, as well as review her synchronized medications.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Triumeq (abacavir – dolutegravir – lamivudine)	600-50-300mg	HIV1	Take one tablet by mouth every day	11/01/2017	Richard Wynn, MD
Valacyclovir	500mg	Combined Herpes Simplex 1 and 2 Infection	Take one tablet by mouth every day	12/08/2017	Richard Wynn, MD
Amlodipine	10mg	Essential Hypertension	Take one tablet by mouth every day	10/16/2017	Richard Wynn, MD
Bupropion XL	300mg	Schizophrenia, Post-traumatic stress disorder	Take one tablet by mouth every morning	4/27/2018	Latasha Rials, NP
Ziprasidone	40mg	Schizophrenia	Take one capsule by mouth twice daily. Take with high calorie meal	4/11/2019	Latasha Rials, NP
Prazosin	1mg	Post-traumatic stress disorder	Take one capsule by mouth at bedtime each night	4/11/2019	Latasha Rials, NP

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Not applicable					

Allergies and Alerts

Medication Allergies: NKDA

Adverse reactions to drugs in the past: None

Other Alerts/Health Aids/Special Needs: Highest education level: 8th grade

Immunization History

Immunization	Date(s) Administered
Influenza	10/2019

Current Medical History/Problem List

Medical Condition	Date/Year of Diagnosis
At risk of sexually transmitted infection (Z20.2)	2018
Bipolar I Disorder (F31.9)	2017
Chronic Bronchitis (J42)	2018
Combined Herpes Simplex 1 and 2 Infection (B00.9)	2017
Depressive Disorder	2017
Essential Hypertension (I10)	2017
Human Immunodeficiency Virus (B20)	2017
Polysubstance Dependence (F19.20)	2018
Posttraumatic Stress Disorder (F43.10)	2019
Schizophrenia (F20.9)	2017
Traumatic Brain Injury	2019
Homelessness (Z59.0)	2019
Illiteracy and low-level literacy (Z55.0)	2017

Prescription Fill History

Medications synchronized? Yes

If yes, last sync fill date: 3/12/2020

Pertinent gaps in refill history: Numerous – from 11/22/2019 to 1/09/2020 (when the patient was assigned a new case manager).

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
Benztropine 1mg	Extrapyramidal symptoms caused by medications	4/11/2019	10/2019	Patient stopped herself

Past Medical History

Medical condition or recent hospitalization	Date
Pneumonia	2018
Bilateral jaw surgery	2017

Social History

Tobacco Use: 3 packs per week

Alcohol Consumption: Yes

Caffeine Consumption: Occasional

Recreational Drug Use: Yes, cocaine and THC

Describe Diet: Poor

Describe Exercise: None

Relevant Social Determinants of Health: Chronically homeless, education through 8th grade, widowed, smoked since age of 15

Vital Signs/Physical Assessment/Labs

	Results	Date
Height	5'1"	12/1/19
Weight	122 lbs	12/1/19
Blood Pressure	123/80	12/1/19
Heart Rate	77	12/1/19
O2 Stat	97%	12/1/19
Temperature	97.8 F	12/1/19
CD4 Absolute Count	1215	12/1/19

Patient Encounter Assessment:

1. Homelessness

Being managed carefully by a case manager to establish secure housing. Case manager picks up the patient's medications for her and ensures that she receives them in a timely manner. She also coordinates access to food.

2. HIV

Per the DHHS Guidelines updated in 2019, patient's HIV RNA viral load <20 copies/mL is at goal of "optimal viral suppression" which is defined as < 20-75 copies/mL depending on the assay used. The patient's CD4 count is currently well above > 500 cells/m^3 at 1252 (3/23/30) and was also acceptable at 1215 (12/1/19). Because the patient has been on anti-retroviral therapy for just over two years and has had recent readings above 500 cells/m^3 the monitoring interval can increase. Patient receives regular follow-up by her HIV provider in the clinic and the pharmacy team ensures she receives her HIV medications on time

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/20/2019	Noncompliance with medication regimen (129834002)	Patient is homeless and can be very challenging to reach. Patient has polysubstance use disorder and has had case management that was not engaged in her care.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/20/2019	Synchronization of repeat medication (415693003)	Educated her new case manager of the pharmacy program for care coordination, synchronizing medication on one pickup/delivery day between providers.	Resolved
12/20/2019	Discussed with provider (394696007)	Spoke to PCP and established care with new case manager.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/20/2019	Under care of multiple providers (209100124100)	Patient's medications are prescribed by PCP, HIV specialists (same office as PCP), and behavioral providers (different office than PCP/HIV care).	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/20/2019	Medication reconciliation with all providers (430193006)	Pharmacist engaged behavioral health providers in patient's care coordination.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/20/2019	Deficient knowledge of disease process (129864005)	Patient unsure of how often her medicines (ART included) need to be taken to be effective	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/20/2019	Human immunodeficiency virus education (428011000124107)	Educated patient on the U=U campaign on opportunities to maintain undetectable HIV viral load by taking HIV therapy (ART) as prescribed daily	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/20/2019	Unsatisfactory living conditions (308899009)	Patient is homeless and is therefore unable to dependably receive medication delivery herself.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/20/2019	Private home delivery booking (169624005)	Medication access will be coordinated through her case manager if not directly at her doctor office visits.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
1/16/2020	Noncompliance with medication regimen (129834002)	Patient is still getting into her new routine of receiving medication through case management.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
1/16/2020	Assessment of adherence to medication regimen (410122002)	Reinforced adherence with patient and followed up with case management for medication delivery.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
3/25/2020	Deficient knowledge of medication regimen (129866007)	Pharmacist followed up with patient after discharge to verify medication regimen post-discharge.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
3/25/2020	Medication education at discharge (454101000124104)	Pharmacist reviewed medication list, reinforced adherence, and discussed ongoing monitoring of conditions.	Resolved

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
12/20/2019	Maintain contact with the clinic, pharmacy, and case manager to sustain care coordination	Active
12/20/2019	Make appointment with mental health provider within the next two months	In Progress
12/20/2019	Take medications daily as prescribed, with a goal of missing less than 3 doses per month	Active

Patient Encounter Plan:

1. Homelessness

Patient will require continued monitoring and access to care through case management and provider communication. Continue to engage patient in pharmacy care through (HIPAA compliant) text message(s) and phone call(s) to case manager and patient monthly. Deliver medications to the case manager's agency and/or home so he can better reach the patient directly. Monitor primary care/clinic's schedule for her appointments to ensure medication can be received on the same day of visit if possible.

2. HIV

Continue Triumeq (abacavir/dolutegravir/lamivudine) 500/60/300mg 1 tablet by mouth daily. Continue coordinating with HIV/PCP to ensure regular monitoring and lab work. Because the patient has been on anti-retroviral therapy for just over two years and her HIV RNA viral loads and CD4 counts are acceptable, monitoring is optional based on the DHHS guidelines. However, because of her history of nonadherence risk of loss to follow up, monitoring should occur every 12 months. This will ensure the patient's HIV viral load is undetectable and she does not have any complications.

Part 2

Case Report 6: Elena Temple

Setting Description

State: Pennsylvania

Community Type: Urban

Prescription Volume per Week: 4200

Enhanced Services Offered: Medication reconciliation, Comprehensive medication review, (CMR) Medication synchronization, Adherence packaging, Blood pressure monitoring, Delivery service, Immunizations, Tobacco cessation program

CPESN Member Pharmacy? No

If yes, which CPESN Network(s)? Not applicable

Patient Case Summary

Brief Summary

A patient with past medical history of COPD, gastroesophageal reflux disease (GERD), HTN, HLD, chronic arthritic pain, and Meniere's disease recently underwent a heart catheterization, complicated by a subsequent transient ischemic attack (TIA). She presented to the pharmacy seeking help with her current medication regimen, as she sees multiple doctors and has a hard time keeping track of everything.

Value Expression Explanation

Potential Estimated Return on Investment: With continued monitoring and improved adherence, the pharmacist may generate apprixmately $1847 in cost savings over the span of 1 year (Lloyd, 2019). Intervention on a medication error in the patient's medication list may also save approximately $2,676 per patient (Murray, 2009). Medication management and optimization to ensure the appropriateness, effectiveness, safety, and adherence of each medication may also help prevent a hospitalization, which would result in additional cost savings (Pellegrin, 2017).

Personal value to patients/caregivers: The pharmacist was able to provide a much-needed service to the patient by helping to clear up patient confusion secondary to receiving care and medications from multiple prescribers. Through adherence packaging, medication synchronization, and medication delivery, the pharmacist was able to ensure that the patient received appropriate medications when due for their refills. The pharmacist was also able to help avoid a potential future hospitalization through intervention on a drug-drug interaction that may have had negative effects for the patient. The patient expressed gratitude for the increased convenience resulting from the streamlining of her medications to one refill date per month, home delivery of medications, adherence assistance through the use of blister packaging, and increased understanding of medications when the pharmacist addressed her concerns and provided education. Another benefit for the patient is the optimization of her care through improved communication, continuity, and collaboration across her healthcare team.

Key Learnings for Community Pharmacy Practice from this Case Report

- The patient was empowered and more involved in her healthcare through the development of a trusting relationship with her community pharmacist.
- The pharmacist was able to identify and resolve medication related problems and help to prevent potential future complications, such as avoidable physician visits, adverse events, and hospitalizations. The pharmacist optimized the patient's overall health, well-being, and satisfaction as a result.
- The community pharmacist strengthened connections with prescribers and their offices to enhance patient care and job satisfaction for all team members.

Patient Description

Patient Name: Elena Temple
Age: 73
Race: Caucasian
Gender: Woman
Sex: Female
Occupation: Retired
Living Arrangements/Family: Lives with husband
Health Insurance (coverage type and any issues): Medicare

Date of encounter: 4/16/2020
Encounter Type (Initial or Follow up): Initial patient encounter (315639002)
Encounter Class (In person or Telephone encounter): In person encounter (453701000124103)
Encounter Reason (See Summary for codes document): Comprehensive medication therapy review (428911000124108)

History of Present Illness

A patient with past medical history of COPD, GERD, HTN, HLD, chronic arthritic pain, and Meniere's disease recently underwent a heart catheterization, complicated by a subsequent TIA. The patient initially presents to the community pharmacy on 4/16/2020 as a new patient transfer from another local pharmacy. Upon initial conversation with the pharmacy technician, she expresses confusion about her current medication regimen and requests clarification of the following: 1) which doctor prescribes each medication, 2) the uses for each medication, and 3) the administration instructions for each medication. This confusion was impacting her medication adherence and she is interested in the adherence packaging program and delivery service to help her stay consistent with taking her medications. She has self-discontinued clopidogrel because she was confused following a conversation with her physician regarding concerns with this medication. The pharmacist called her PCP, cardiologist, pulmonologist, and vascular physician to obtain a comprehensive, updated medication list. The pharmacist discovered that her PCP and cardiologist had each prescribed different strengths of her statin medication, resulting in duplicative therapy. Additionally, the pharmacist identified a potential drug interaction between the proton pump inhibitor prescribed by the PCP for GERD and the antiplatelet medication prescribed by her vascular physician.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
omeprazole	20 mg	GERD	Take 1 capsule by mouth daily in the morning on an empty stomach	2007	PCP
triamterene-HCTZ	37.5-25 mg	Hypertension	Take 1 capsule by mouth daily	2004	PCP
rosuvastatin	20 mg	Hyperlipidemia and secondary atherosclerotic cardiovascular disease (ASCVD) prevention	Take 1 tablet by mouth daily	4/15/2020	PCP
rosuvastatin	10 mg	Hyperlipidemia and secondary ASCVD prevention	Take 1 tablet by mouth daily	2019	Cardiologist
clopidogrel	75 mg	Post-TIA stroke risk reduction	Take 1 tablet by mouth daily	2020	Vascular surgeon
albuterol (Proair HFA) inhaler	90 mcg/ actuation	COPD	Inhale 1 to 2 puffs by mouth every 4 to 6 hours as needed for shortness of breath	2008	Pulmonologist
fluticasone-salmeterol (Advair Diskus)	250-50 mcg	COPD	Inhale 1 puff by mouth twice daily	2008	Pulmonologist
scopolamine patch	1 mg/ patch	Meniere's Disease	Place 1 patch behind left ear every 3 days	2020	PCP
hydrocodone-acetaminophen	10-325 mg	Lower back and leg pain	Take 1 to 2 tablets by mouth every 8 hours as needed for pain	unknown	PCP

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
ibuprofen	200 mg	Headaches	Take 1 to 2 tablet(s) by mouth every 6 to 8 hours as needed for headache	2000	Self

Allergies and Alerts

Medication Allergies: penicillin VK, within 30 minutes, hives/anaphylaxis

Adverse reactions to drugs in the past: simvastatin – myalgia; atorvastatin – myalgia; pravastatin - myalgia

Other Alerts/Health Aids/Special Needs: Difficulty hearing, vision impairment at night while driving, decreased health literacy

Immunization History

Immunization	Date(s) Administered
influenza virus vaccine (Fluzone) high dose	09/03/2019
pneumococcal vaccine polyvalent (Pneumovax 23)	09/24/2008

Current Medical History/Problem List (list current medical conditions)

Medical Condition	Date/Year of Diagnosis
Gastroesophageal Reflux Disease (GERD)	2007
Chronic Obstructive Pulmonary Disease (COPD)	2008
Hypertension (HTN)	2004
Hyperlipidemia (HLD)	2014

Prescription Fill History

Medications synchronized? Yes

If yes, last sync fill date: 4/16/2020

Pertinent gaps in refill history: Patient was nonadherent to clopidogrel for more than 1 month due to confusion following a conversation with her physician.

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
pravastatin 40 mg	Hyperlipidemia/ primary ASCVD prevention	10/12/2014	10/22/2014	Myalgia
simvastatin 20 mg	Hyperlipidemia/ primary ASCVD prevention	10/30/2014	11/7/2014	Myalgia
atorvastatin 40 mg	Hyperlipidemia/ primary ASCVD prevention	04/30/2019	05/07/2019	Myalgia

Past Medical History

Medical condition or recent hospitalization	Date
Heart catheterization	2020
Hospitalization for TIA	2020
Diagnosis of Meniere's disease following a fall	2020

Social History

Tobacco Use: 1 PPD for 60 years

Alcohol Consumption: None

Caffeine Consumption: Average four to six 6-oz. cups of coffee per day

Recreational Drug Use: None

Describe Diet: Diet varies, but patient reports the following examples:
- Breakfast: bagel with cream cheese, cereal, or eggs
- Lunch: skips often; sometimes fruit or peanut butter and crackers
- Dinner: most nights, cooks meat (chicken, steak, pork), mashed potatoes, and a vegetable; sometimes pasta or pizza
- Snacks: ice cream or bowl of cereal before bed
- Beverages: drinks water with most meals when she is not drinking coffee

Describe Exercise: Walks or bike rides around the neighborhood at least 4-5 days per week; approximately 1-2 miles in length

Relevant Social Determinants of Health: Patient is able to afford her healthcare and her medication costs. Her living conditions are comfortable and she feels safe. Patient reports having trouble with her vision at night, so she reserves most of her activity for daylight hours. She reports occasional severe pain in her lower back and legs, which prevents her from walking. On those days, she takes hydrocodone-acetaminophen. She does not take this medication when she does not have pain. She sometimes experiences "dizzy spells," which interfere with her daily activities.

Vital Signs/Physical Assessment/Labs

	Results	Date
Height	5'0"	04/16/2020
Weight	137 lbs	04/16/2020
Blood Pressure	124/75 mmHg	04/16/2020
Heart Rate	67 bpm	04/16/2020
Respirations	Unknown	
Temperature	Unknown	
Other	Not applicable	

Patient Encounter Assessment:

1. Secondary Prevention of Stroke

The American Heart Association/American Stroke Association recommend antiplatelet treatment post stroke/TIA for non-cardioembolic stroke which the patient suffered an atherosclerotic TIA post-catheterization. With the help of her primary care physician, the pharmacist clarified that the patient should continue taking clopidogrel, with a plan to re-evaluate the need for continuation at a future date. The continuation of clopidogrel is important in helping to prevent future strokes from occurring. Patient is a current smoker and at this time does not demonstrate desire to quit.

2. GERD

There is a potential interaction between omeprazole and clopidogrel involving the diminished antiplatelet effect of clopidogrel. This is caused by a proposed decrease in serum concentrations of the active metabolites of clopidogrel as a result of concurrent administration of proton pump inhibitors. Per LexiComp online, studies regarding this interaction have demonstrated conflicting results. Some retrospective cohort studies and prospective trials reporting significantly increased risks for negative cardiac-related outcomes (6% to 18% increased incidence) and overall mortality (3% to 9% increased mortality rate) associated with concurrent use of omeprazole and clopidogrel (Ho, 2009; Pezalla, 2008; Evanchan, 2010; Juurlink, 2009; Gaglia, 2010). Other studies have reported insignificant impact on cardiovascular endpoints (Gupta, 2010; Ray, 2010; O'Donoghue, 2009).

After consultation with her physician, the pharmacist determined that the patient's GERD is currently well controlled. Given the long-term adverse events associated with proton pump inhibitor use and the potential drug-drug interaction between omeprazole and clopidogrel, the pharmacist took this opportunity to step down GERD therapy and recommend famotidine 20 mg by mouth twice daily for GERD. If the patient's symptoms become uncontrolled, the team may consider pantoprazole as a lower-risk alternative.

3. Dyslipidemia

Patient is currently being treated and is controlled (at goal LDL goal of >70 mg/dL per the 2018 ACC/AHA Guideline on the Management of Blood Cholesterol). She has duplicate therapy because she is taking both rosuvastatin 10mg and rosuvastatin 20mg, prescribed by her cardiologist and PCP, respectively. Despite taking both doses, her current therapy is well-tolerated. Patient does have a history of myalgia with statin use, but reports no issues with rosuvastatin thus far. Her PCP and cardiologist have been consulted to clarify her recommended dose, but the pharmacist recommended the patient be on at least rosuvastatin 20mg as a high intensity statin for secondary ASCVD prevention.

4. Medication Adherence

The patient's medication adherence has improved with the use of automatic refills, medication synchronization, adherence packaging, and medication delivery.

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
04/16/2020	Noncompliance with medication regimen (129834002)	Patient admitted to filling prescriptions late and not taking some medications due to overall medication-related confusion, secondary to seeing multiple prescribers with differing recommendations. She also states that she sometimes forgets to pick up her medications.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
04/16/2020	Syncronization of repeat medication (415693003)	Patient has been enrolled in automatic refills, medication syncrhonization, adherence packaging, and medication delivery to ensure she receives her medication on time. She agrees that this may be helpful in improving her ability to take her medications consistently.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
04/16/2020	Under care of multiple providers (209100124100)	Patient receives care from multiple providers and medications are ordered by several different prescribers, including the patient's PCP, cardiologist, pulmonologist, and vascular surgeon.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
04/16/2020	Medication reconciliation with all providers (430193006)	The pharmacist contacted all prescribers and conducted a medication reconciliation to create one comprehensive and current medication list. Discrepancies have been resolved regarding rosuvastatin dosing and the status of clopidogrel. GERD therapy has been stepped down. All prescribers have been informed of the comprehensive active medication list via verbal and written communication.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
04/16/2020	Patient misunderstood treatment instructions (182891003)	The patient stopped taking clopidogrel due to confusion regarding the need to continue the medication.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
04/16/2020	Medication regimen compliance education (410123007)	After speaking with her vascular surgeon, the pharmacist verified the recommended status and regimen of clopidogrel. The pharmacist educated the patient on the importance of taking the medication daily until told otherwise by her vascular surgeon.	Resolved

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
04/16/2020	Improve medication adherance by eliminating missed doses and picking up medication refills within 25-30 days following the last dispense date (for a 30-day supply) or within 85-90 days following the last dispense date (for a 90-day supply).	Active
04/16/2020	Maintain all follow-up visits with prescribers and inform all prescribers and pharmacists of any changes to your medication list, including new or changed over-the-counter medications, vitamins, supplements, or herbal products.	Active
4/16/2020	Restart clopidogrel and avoid any missed doses. Report missed doses in the first month of restarting clopidogrel.	Active
4/16/2020	Monitor frequency and/or severity of GERD symptoms upon switching from omeprazole to famotidine withing 2 weeks of starting famotidine.	Active
4/16/2020	Report signs and symptoms of muscle pain with rosuvastatin within 2 weeks of determining appropriate dose.	Active

Patient Encounter Plan:

1. Secondary Stroke Prevention

- Nonpharmacological interventions: Continue active lifestyle and healthy diet.
- Patient declined smoking cessation at this time, but follow up with patient in 1 month to re-assess willingness to quit.
- Pharmacological interventions: Continue clopidrogel 75mg by mouth daily.
- Monitoring efficacy: S/sx stroke, including aphasia, muscular weakness or instability, blurred vision, fatigue, facial numbness or weakness, confusion.
- Monitoring safety: Monitor for increased risk of bleeding and bruising. Bleeding can occur through nose bleeds, dark tarry stools, gum bleeding, cuts and scrapes, etc. Counsel patient on when she should seek medical help if she was to have significant bleeding or bruising.

2. GERD

- Nonpharmacological interventions: Patient should try to avoid acidic and spicy foods to help prevent any flare ups.
- Pharmacological interventions: Patient should discontinue use of omeprazole 20 mg by mouth daily. Patient should take OTC famotidine 20 mg by mouth twice daily to help with GERD symptoms.
- Monitoring efficacy: The pharmacist will monitor the patient's signs and symptoms of GERD to determine the effectiveness of the patient's switch from omeprazole to over-the-counter famotidine.
- Monitoring safety: If symptoms recur, the pharmacist will contact the primary care prescriber to recommend an alternative medication, such as pantoprazole.

3. Dyslipidemia

- Nonpharmacological interventions: Patient should increase consumption of whole grains, fruits, vegetables and decrease consumption of saturated fats. Limit sodium intake to 2 grams per day. Increase physical activity level as tolerated to a goal of 30 minutes of aerobic exercise, 4-5 days per week.
- Pharmacological interventions: Patient should continue to take rosuvastatin 20 mg daily.
- Monitoring efficacy: LDL goal of <70 mg/dL should remain, patient should get lipid panel checked at least yearly to make sure therapy is efficacious
- Monitoring safety: Patient should report any myalgia given history of myalgia with statins. Dose or drug change may be required if this occurs.

4. Medication Adherence

- Nonpharmacological interventions: Patient requires follow-up from the pharmacist to ensure improved clarity regarding medication regimen and improved adherence. The pharmacist will also monitor for any side effects that may present as a result of improved adherence. Pharmacy staff will continue to contact the patient prior to each medication fill for overall wellness checks. The patient will contact the pharmacist if she has any questions, concerns, or areas of confusion.

Case Report 7: Buffy Vamp

Setting Description

State: New York

Community Type: Urban

Prescription Volume per Week: 1,000

Enhances Services Offered: Medication Synchronization, Adherence, Hand Delivery, Comprehensive Medication Review (CMR), Personal Medication Record (PMR), Tobacco Cessation Program, Immunizations, Diabetes Self Management Education (DSME) Program, Monitoring of Vital Aigns, Nutritional Counseling

CPESN Member Pharmacy? Yes

If yes, which CPESN Network(s)? CPESN NY

Patient Case Summary

Brief Summary

Patient is a 71-year-old Hispanic male who lives in Buffalo. His chronic medical conditions include type 2 diabetes (requiring insulin) with peripheral neuropathy, COPD, CAD, HTN, and obesity. Patient's height is 5'10", weight iss 255 lbs, and BMI is 36.6 kg/m^2. Current social determinant of health factors include lack of transportation, and high medication costs. Social security is the only source of income.

Value Expression Explanation

Potential Estimated Return on Investment: Annual cost of untreated COPD, HTN, CAD, obesity, T2DM can be very costly. Providing the patient with enhanced pharmacy services, education, and engagement will help increase access to vital health care. The costs savings from these interactions will lead to health system, health plan, and patient savings.

Personal value to patients/caregivers: Health related interventions will lead to an increase in quality of life. The increased support to the patient and family in terms of providing transportation solutions is immense. Follow up and monitoring patient's health is team effort. The integration to new healthcare members to the patient's team will help the patient reach his health goals.

Key Learnings for Community Pharmacy Practice from this Case Report

- Addressing patient-specific Social Determinants of Health (SDoH) needs to be a foundational element to any patient interaction. Resolving underlyng issues will lead to reaching health goals.
- Patient learned that other members of the health care team (e.g. pharmacist) can help to lead to health care solutions (e.g. providing more cost-effective therapy).
- Disease state education (e.g. DSME, Nutritional Support, Smoking Cessation Counseling) is a cornerstone to overall health quality improvement and increasing patient quality of life.

Patient Description

Patient Name: Buffy Vamp
Age: 71-year-old
Race: Hispanic
Gender: Man
Sex: Male
Occupation: Retired bus driver
Living Arrangements/Family: Lives in a two story home with his wife who is also retried
Health Insurance: Medicare B and D (high deductable)

Date of encounter: 12/15/19
Encounter Type (Initial or Follow up): Initial patient assessment 315639002 (PCP Annual Wellness Visit)
Encounter Class (In person or Telephone encounter): In person 453701000124103
Encounter Reason (See Summary for codes document): CMR 428911000124108 (Annual Wellness Visit)

History of Present Illness

Patient had a clinic appointment on 12/15/2019 with HTN, COPD, HLD with elevated LDL, and T2DM requiring insulin with elevated A1C. She appeared in need of medication device training and adherence packaging to help with adherence. Patient's blood pressure at time of pharmacy visit was 142/88 mmHg, LDL was 167 mg/dL and HgbA1C 9.6%. He presents today for continued follow-up monitoring for blood pressure and to pick up his synced medication.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Fluticasone /salmeterol	250mcg/ 50mcg	COPD	Inhale 1 inhalation by mouth twice daily	10/2016	Pulmonologist
Albuterol	90 mcg	COPD	Inhale 2 inhalations by mouth every 4 to 6 hours as needed for shortness of breath	08/2009	Pulmonologist
Metformin	1000 mg	Diabetes	Take 1 tablet by mouth twice daily	04/2015	PCP
Sitagliptin	100 mg	Diabetes	Take 1 tablet by mouth once daily	07/2015	PCP
Lantus (glargine insulin)	100U/mL	Diabetes	Inject 20 units under the skin every evening	06/2015	PCP
Lisinopril	40 mg	Hypertension	Take 1 tablet by mouth once daily	03/2013	PCP
Rosuvastatin	20 mg	Hyperlipidemia	Take 1 tablet by mouth once daily	10/2016	PCP

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
None					

Allergies and Alerts

Medication Allergies: Penicillin – patient reports reaction as rash

Adverse reactions to drugs in the past: None

Other Alerts/Health Aids/Special Needs: None

Immunization History

Immunization	Date(s) Administered
Prevnar 13	Unknown
Pneumovax 23	Unknown
Shingrix	Unknown
Influenza	09/2018, 12/2019
HepB	03/2013

Current Medical History/Problem List (list current medical conditions)

Medical Condition	Date/Year of Diagnosis
Chronic obstructive pulmonary disease (COPD)	10/2016
Type 2 Diabetes	04/2015
Coronary Artery Disease	10/2016
Hypertension	03/2013
Obesity	01/2012

Prescription Fill History

Medications synchronized? Yes

If yes, last sync fill date: ~1 month ago

Pertinent gaps in refill history: Always misses medication ~60-120 days per year.

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
Unknown				

Past Medical History

Medical condition or recent hospitalization	Date
Hospitalization due to COPD exacerbation	04/2018
Hospitalization due to stroke	2016

Social History

Tobacco Use: Current smoker – 1/2 PPD, approximately 30-year history

Alcohol Consumption: Reports does not drink alcohol

Caffeine Consumption: Denies caffeine consumption

Recreational Drug Use: Denies recreational drug use

Describe Diet: High in sodium, fat, and carbs

Describe Exercise: 20 minute walks, not often

Relevant Social Determinants of Health: Patient had a stroke 3 years ago and no longer drives. His wife does not have a driver's license.

Vital Signs/Physical Assessment/Labs

	Results	Date
Height	5'10''	12/15/19
Weight	255 lbs	12/15/19
Blood Pressure	142/88 mmHg	12/15/19
Heart Rate	95 bpm 92 bpm 85 bpm	10/1/19 11/7/19 12/15/19
Respirations	22 BPM	12/15/19
Temperature	98.1 F	12/15/19
Other	N/A	

Patient Encounter Assessment:

1. Diabetes

A1C is uncontrolled at 9.6% based on the ADA guidelines. The patient-specific goal for this patient, established through shared clinical decision making, is <8.0% based on the patient's age. The patient does not currently check his blood sugar at home, so fasting and post prandial glucoses are not available at this time. The patient is in need of a home glucometer, test strips, and lancets. Patient's nonadherence combined with unhealthy diet and sedentary lifestyle may contribute to his uncontrolled T2DM.

2. COPD

Patient scored ≥10 on COPD assessment test and has had multiple exacerbations. The patient's nonadherene to his daily COPD maintenance inhaler could contribute to his lack of COPD control. Additionally, the patient's smoking status could add to this lack of control.

3. Smoking cessation

Patient is a current smoker and his conditions like HTN, CAD, and COPD could improve with smoking cessation. After assessment, patient is not ready to quit at this time but is open to hearing smoking cessation options when he decides to quit.

4. Medication adherence

Patient is nonadherent, reporting that he misses 2-4 months of medication each year. Patient quoted many reasons for nonadherence, including lack of understanding of directions, lack of transportation, and high costs for medications.

Medication Related Problems (MPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/15/19	Additional medication therapy required (428981000124101)	Patient scored ≥10 on COPD assessment test and has had multiple exacerbations	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/15/19	Recommendation to start prescription medication (428821000124109)	Recommend to start new prescription medication: Per 2019 GOLD guidelines, recommended adding inhaled anticholinergic	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/15/19	Noncompliance with medication regimen (129834002)	Patient is not adherent to medication regimen due to high cost and lack of understanding of instructions	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/15/19	Discussed with patient (395085009)	Patient was referred to social worker to enroll in Medicare Part D for lower medication costs. Medications were reviewed with patient to promote better understanding and adherence. Delivery was offered to patient so he doesn't have to rely on his own transportation.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/15/19	New medication needed for condition (436071000124104)	Patient does not know which method for smoking cessation is best for him, even though he is not ready to quit yet	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/15/19	Recommended to start OTC medication (432851000124100)	When patient decides to quit smoking, pharmacist recommended to start nicotine patches – Step 1 recommended	Resolved

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
12/15/19	Include social work as part of patient's healthcare team to address financial concerns (health care insurance coverage – medical and prescription) and transportation (to and from all medical appoinments) barriers so patient can make appointments and afford necessities for healthy living. The appointment may be set up in Jan-Feb 202 with the goal to have action by April 1st 2020.	In Progress
12/15/19	Enroll in disease state education for diabetes, nutrition, and smoking cessation in next 6 months.	Not Started
12/15/19	Have PCP address vaccination history. Patient may still need to obtain the following vaccines: Herpes zoster, Pneumococcal, Tetanus Diphtheria and acellular Pertussis, Influenza, Hepatitis-B, and COVID.	Pending

Patient Encounter Plan:

1. Diabetes

- Acquire prescription for glucometer, test strips, and lancets. Once the prescription is acquired, pharmacist will education patient on the use of the glucometer.
- Once glucometer is obtained, patient should start by checking fasting glucose once daily and maintain a blood glucose log.
- If fasting glucoses are consistently above 130, with a goal of 80-130, ensure adherence is maximized before titrating basal insulin.
- Enroll patient in pharmacy's DSME and focus on a diabetic diet that includes cultural foods as well as increasing physical activity to 30 minutes a day, at least 5 days a week.
- Re-check A1c in 3 months.

2. COPD

- Educated patient on the importance of daily maintenance inhaler, Fluticasone /salmeterol 250/50mcg, utilization to decrease symptoms of COPD, such as shortness of breath and wheezing. This should decrease need for albuterol rescue inhaler use.
- If patient establishes adherence to maintenance inhaler and still needs to use the albuterol rescue inhaler more than four times daily, consider adding an inhaled anticholinergic.
- Consider cost in all future inhaler adjustments for patient.

3. Smoking cessation

- Assess smoking cessation status in 1 month.
- Tobacco cessation options were shared with patient, and patient opted to start Step 1 nicotine patches (21mg) when he decides to quit.
- Enroll patient in pharmacy's tobacco cessation program when he is ready to quit.

4. Medication adherence

- Enrolled patient in pharmacy's delivery service so transportation is no longer a barrier to adherence.
- Pharmacist provided disease state and medication counseling.
- Pharmacist engaged social worker to assist with the patient's enrollment into Medicare Part D for more affordable drug copays

Case Report 8: Candesartan Migrant

Setting Description

State: Pennsylvania

Community Type: Urban

Prescription Volume per Week: Approximately 4,200 prescriptions

Enhanced Services Offered: Medication reconciliation, Comprehensive Medication Review (CMR), Medication synchronization, Adherence packaging, Blood pressure monitoring, Delivery service, Immunizations, Tobacco Cessation Program

CPESN Member Pharmacy? No

If yes, which CPESN Network(s)? Not applicable

Patient Case Summary

Brief Summary

Patient with past medical history (PMH) of HTN, cardiomegaly, and s/p MI in 2003 and financial barriers, for which she occasionally skips medication doses or cuts medications in half. Patient is an immigrant to the United States and is uninsured. She feels that she does not need to take her medication on days that she feels well. She has recently run out of medication and has not taken anything for several days. She presents to the pharmacy requesting some "hold-over" medication while she obtains a new prescription from her cardiologist in her home country. She needs to establish with a new primary care physician but has had difficulty connecting with one due to the deferral of routine visits related to COVID-19 precautions.

Value Expression Explanation

Potential Estimated Return on Investment: One study assessed the impact of community pharmacists on medication adherence and relevant health outcomes in patients with heart failure and hypertension (Murray, 2009). It compared outcomes of patients who received a comprehensive medication history, continuous monitoring, oral and written instructions on medications, and discussion with physicians by the pharmacist to those who didn't receive these benefits. Results revealed lower actual direct health care costs associated with the intervention's overall effects compared with usual care, with an average of $2,676 saved per patient.

Social determinants of health are often overlooked when providing medical care. Collaborating with other team members, such as social workers and behavioral health workers, can greatly impact a patient's health and well-being. Addressing social determinants of health reduced healthcare costs by 10% or $2443 in annual savings per member (HMS' Jennifer Forster, 2018).

A retrospective, secondary data analysis linked social service referral data with health care expenditures in 2 annual periods, before and after the first social service referral. Patients who reported all their social needs were met experienced an 11% reduction ($2601) in total health care expenditures 12 months post-referral (Pruitt, 2018).

Personal value to patients/caregivers: Pharmacist helped the patient to navigate the healthcare environment by recommending local healthcare clinics for underserved/uninsured patients and calling her regular pharmacy to reconcile and update the problem list and medication list. This patient was grateful for the support and education that the pharmacist provided to her, particularly with regard to the importance of consistent adherence to reduce the risk of cardiovascular morbidity and mortality and intiation of a statin medication for secondary prevention of ASCVD. The patient was also appreciative of the pharmacist's cost-savings interventions, as she was very concerned about her financial barriers.

Medication	Quantity	Medication pricing before savings program ($)	Medication pricing after enrollment in savings program ($)
Atenolol 50mg	45	18.19	11.44
Candesartan 16mg	45	134.99	39.91
Indapamide 1.25mg	90	58.59	33.47

Key Learnings for Community Pharmacy Practice from this Case Report

- Patient advocacy in a community pharmacy is important for uninsured patients.
- Pharmacists should consider barriers to accessible healthcare services.
- The pharmacist provided patient with education about the United States healthcare system and enrollment in a prescription savings program.
- The patient benefited from pharmacist-provided education that improved her understanding of hypertension and the role of her medications in preventing future complications.
- Patient formed realistic expectations regarding the impact of the medications on her short term, day-to-day experience versus her long term quality of life as a result of the interaction with the pharmacist

Patient Description

Patient Name: Candesartan Migrant
Age: 61
Race: African descent
Gender: Woman
Sex: Female
Occupation: 24-hour live-in health aide
Living Arrangements/Family: Lives with client
Health Insurance: None, cash paying. Although the patient states that she will be eligible for Medicaid in September 2020. Patient's employer does not offer health coverage.

Date of encounter: 5/15/2020
Encounter Type (Initial or Follow up): Initial patient encounter (315639002)
Encounter Class (In person or Telephone encounter): In person encounter (453701000124103)
Encounter Reason (See Summary for codes document): Assessment of compliance with medication regimen (410122002)

History of Present Illness

A 61-year-old African American female with a PMH of obesity, HTN, cardiomegaly, and s/p MI in 2003 presents to the pharmacy requesting consultation with the pharmacist about getting a few "hold-over" tablets since she had been out of her medications for the past few days. The patient is an immigrant to the United States and states that she continues to receive prescriptions from a cardiologist in her home country. She reports symptoms of headache, fatigue, and "water retention" in both legs. Patient tries to stay adherent to medication and she also states that it is difficult for her to afford her medication, so she skips it occasionally on days that she feels "better." Also due to financial constraints, the patient is not currently taking medications as prescribed by her cardiologist in her home country. She states that she has been taking half of her candesartan 16mg tablet "for years" and she "feels ok." The patient states that she does not like leaving the house due to increased urinary frequency related to her indapamide. She skips this medication when she has social or work-related events, which results in increased fatigue and mild chest palpitations. The pharmacist proceeded to measure the patient's blood pressure at the pharmacy. Since the patient was not a regular patient at this particular community pharmacy, the pharmacy team proceeded to update her medical history and contact the pharmacy where she regularly fills to verify her prescription history.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Indapamide	1.25mg	Hypertension	Take 1 tablet by mouth once daily	2004	Cardiologist from home Country
Atenolol	50mg	s/p MI Hypertension	Take 1 tablet by mouth once daily **Confirmed 5/15: Patient takes half tablet daily due to cost.**	2003	Cardiologist from home Country
Candesartan	16mg	Hypertension	Take 1 tablet by mouth daily. **Confirmed 5/15: Patient takes half a tablet daily due to cost.**	2008	Cardiologist from home Country
Aspirin	81mg	Secondary MI prevention	Take 1 tablet by mouth once daily	2004	Cardiologist from home Country

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Centrum Women's Vitamins	Varying	General health	Take 1 tablet by mouth once daily	Unknown	Self
Vitamin C with Rose Hip	1000mg	Unknown	Take 1 tablet by mouth once daily.	Unknown	Self
Paracetamol	500mg	Mild knee pain	Take 1 tablet every 6 hours as needed for pain	Unknown	Self

Allergies and Alerts

Medication Allergies: quinidine (timing and reaction unknown)

Adverse reactions to drugs in the past: lisinpopril (cough)

Other Alerts/Health Aids/Special Needs: Patient requested an English to Efik language translation.

Immunization History

Immunization	Date(s) Administered
MMR	2018
influenza vaccine (brand unknown)	2018, 2019, 2020
hepatitis B vaccine series	2018
pneumococcal vaccine (product/brand unknown)	2018

Current Medical History/Problem List

Medical Condition	Date/Year of Diagnosis
Hypertension	2007
Myocardial infarction	2003

Prescription Fill History

Medications synchronized? No

If yes, last sync fill date: Not applicable

Pertinent gaps in refill history: Patient originally filled her medications here in 2016, then transferred her prescriptions to another community pharmacy. Patient still has some active prescriptions at this particular community pharmacy.

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
Lisinopril	Hypertension	2008	2008	Dry, hacking cough

Past Medical History

Medical condition or recent hospitalization	Date
Hypertension-related hospitalization	Unknown
Myomectomy	2009
Acute MI	2003

Social History

Tobacco Use: None

Alcohol Consumption: None

Caffeine Consumption: Three 4-6-oz. cups of caffeinated tea daily (one with each meal)

Recreational Drug Use: None

Describe Diet: Patient has a piece of bread or bagel for breakfast. She reports using a small amount of butter or cream cheese. For lunch, she reports a carbohydrate-focused meal including rice, bread, maize, yam, or plantain. For dinner, the patient reports eating soup and some of the carbohydrates listed previously.

Describe Exercise: Walks with her patient for 30 minutes per day.

Relevant Social Determinants of Health: Uninsured, financial barries, needs to establish with a low-cost or free healthcare clinic. Comfortable and safe home environment.

Vital Signs/Physical Assessment/Labs

	Results	Date
Height	5'2"	5/15/2020
Weight	185 lbs	5/15/2020
Blood Pressure	118/60 mmHg	5/15/2020
Heart Rate	58 bpm	5/15/2020
Respirations	61 bpm	5/15/2020
Temperature	Unknown	
Other	2+ pitting edema	5/15/2020

Patient Encounter Assessment:

1. Need for primary care provider

Patient requires establishment with a primary care provider at a free/low-cost clinic, given her lack of insurance. She is currently receiving medications from a cardiologist from her home country, but she will need to establish care with a physician in the United States to ensure continuity of care, initiation of preventative healthcare measures, and assessment of ongoing symptomology.

2. Hypertension/History of MI

Blood pressure of 118/60 mmHg (5/16/2020) and repeat BP of 120/76 mmHg (5/26/2020) is at goal of < 130/80 mmHg per 2017 ACC/AHA hypertension guidelines. Patient is s/p MI and is currently experiencing 2+ pitting edema. She would benefit from establishment with a PCP to evaluate symptoms and determine appropriateness of her medication regimen based on a more extensive past medical history that may be obtained from her home-country physicians. Patient is currently cutting her tablets in half to save money. Her blood pressure remains controlled despite this self-adjustment of doses. Consider discontinuing 1 antihypertensive following cardiac workup. The patient cannot take an ACEi due to history of a dry, hacking cough. She is currently taking an expensive ARB. There are more cost-effective alternatives to the patient's candesartan, including losartan or valsartan.

3. Secondary prevention of Atherosclerotic Cardiovascular Disease

Patient requires treatment with a high intensity statin for secondary prevention of ASCVD.

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
05/15/2020	Ankle edema (finding) (26237000)	Pharmacist identified bilateral 2+ pitting edema in lower extremities	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
05/15/2020	Referral to general practitioner (183561008)	Pharmacist explained importance of primary care physician and provided contact information for local clinics.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
05/15/2020	Financial problem (finding) (160932005)	Patient does not have insurance, preventing her from establishing with a primary care provider in the United States.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
05/15/2020	Referral to general practitioner (183561008)	Pharmacist provided patient with information regarding free clinics in the Philadelphia, Pennsylvania area. Information was also provided regarding the patient insurance marketplace, as she will be eligible for Medicaid in September 2020.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
05/15/2020	Noncompliance with medication regimen (129834002)	The patient is nonadherent to prescriptions written by the doctor. Patient takes half of the atenolol and the candesartan for cost saving purposes.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
05/15/2020	Assessment of barriers to adherence (710838003)	Identified patient-specific barriers	Resolved
05/15/2020	Medication education 967006	The patient has been educated on the importance of adherence to the prescribed regimen. Patient should also establish with a new PCP so that her symptoms can be evaluated, and her medication regimen can be optimized.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
05/15/2020	Financial problem (finding) (160932005)	The patient is nonadherent to prescriptions written by the doctor. Patient takes half of the atenolol and the candesartan for cost saving purposes.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
05/15/2020	Cost effective alternatives available (448151007)	Lower cost alternatives to include candesartan 16 mg by mouth daily, losartan 25 mg by mouth daily, and valsartan 80 mg by mouth daily	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
05/15/2020	Noncompliance with medication regimen (129834002)	The patient monitors her BP daily and twice daily when she has to skip or stop her medication due to financial barriers. According to the patient, her highest BP obtained was at 165/100 mmHg with a HR of 80 BPM, immediately following her MI. Later that year, she received her diagnosis of HTN. Patient reported BP measure has been <130/80 mmHg with HR in the range of 55-60 BPM, despite self-reduction of her doses by half, due to financial barriers.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
05/15/2020	Referral to general practitioner (183561008)	Need to obtain a detailed medical and medication history from the patient's home country. Patient should also establish with a new PCP so that her symptoms can be evaluated, and her medication regimen can be optimized.	Resolved
05/15/2020	Recommendation to discontinue medication-(4701000124104)	BP has remained controlled despite self-reduction of her doses by half. Recommend discontinuing one antihypertensive medication.	
05/15/2020	Medication education (967006)	The patient has been educated on the importance of adherence to the prescribed regimen.	

MRP Date	MRP Description/Code	MRP Note	MRP Status
05/15/2020	Financial problem (finding) (160932005)	Patient has difficulty paying for medications, due to lack of prescription insurance. As a result, she cuts her tablets in half to save money.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
05/15/2020	Enrollment in co-pay assistance program (procedure) (451601000124109)	Patient was enrolled in GoodRx program.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
05/15/2020	Lipid lowering therapy indicated (situation) (135797000)	Based on history of ASCVD, paitent would benefit from the initiation of high intensity statin therapy for secondary prevention of ASCVD.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
05/15/2020	Recommendation to start prescription medication (428821000124109)	Recommend initiation of a high intensity statin.	Active

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
05/15/2020	Enroll in a prescription savings program today.	Resolved
05/15/2020	Improve medication adherence by avoiding missed doses, taking medications as instructed by the doctor, and avoiding cutting medications in half.	Active
05/15/2020	Visit a low-cost or free healthcare clinic to find a primary care provider within the next 2 weeks.	Active
05/15/2020	Discuss symptoms (leg swelling, urinary frequency related to indapamide, heart palpitations) with new primary care provider.	Active
05/15/2020	Discuss starting a new medication to help prevent heart attacks and strokes with new primary care provider.	Active

Patient Encounter Plan:

1. Need for primary care provider

- Pharmacist provided patient with contact information for local free/low-cost clinics in the Philadelphia, PA area.
- Patient to discuss current symptoms, including lower extremity edema and mild palpitations in her chest.
- Enroll patient in patient assistance programs to assist with copays of medications.

2. Hypertension/History of MI

- Patient will continue her current regimen for now, pending cardiac workup and symptom evaluation by a new primary care physician.
- Medication regimen:
    - Continue indapamide 1.25 mg – 1 tablet once daily
    - Continue atenolol 50 mg – one-half tablet once daily
    - Continue candesartan 16 mg – one-half tablet once daily – consider switching to lower-cost alternative, including losartan 25 mg by mouth daily or valsartan 80 mg by mouth daily
    - Continue aspirin 81 mg – 1 tablet by mouth daily
- Monitor:
    - In 1 month, follow-up on blood pressure, heart rate (HR), basic metabolic panel (BMP), s/sx edema, chest palpitations, adherence, electrocardiogram (EKG)

3. Secondary prevention of Atherosclerotic Cardiovascular Disease

- Recommend initiation of high-intensity statin, such as atorvastatin 40 mg by mouth daily or rosuvastatin 20 mg by mouth daily
- Monitor lipid panel 4-6 weeks following initiation of statin, GI upset, myalgia/myopathy

Follow up in 2 weeks to ensure establishment with primary care provider in the United States. Follow up in September for assistance with enrollment in Medicaid plan.

Case Report 9: Alberta Torale

Setting Description

State: Arkansas

Community Type: Suburban

Prescription Volume per Week: 1,400

Enhances Services Offered: Comprehensive Medication Review (CMR), Point of Care Testing (POCT), Immunizations, Medication Synchronization

CPESN Member Pharmacy? No

If yes, which CPESN Network(s)? Not applicable

Patient Case Summary

Brief Summary

A 54-year-old female was identified as someone who would benefit from a CMR. She was contacted via telephone by a fourth year pharmacy student on an APPE enhanced pharmacy services rotation, and the CMR was completed. It was discovered that she was suffering from frequent COPD exacerbations. During the patient interview, smoking cessation, inhaler technique, and disease state management were discussed. This education was key for the patient understanding her health and how to manage her treatments.

Value Expression Explanation

Potential Estimated Return on Investment: The pharmacy was compensated for this CMR through OutcomesMTM. The disease state education and monitoring could reduce hospital re-admissions for COPD exacerbations, reducing overall health care expenses by approximately $7,100 in cost savings per hospitilazation for a COPD exacerbation (Agusti, 2020; Lexicomp [Internet], 2020; Guarasico, 2013).

Personal value to patients/caregivers: The pharmacist and student pharmacist provided education that will allow for improvement in the quality of life of the patient. COPD is a difficult disease state to manage without proper education on the correct use of the inhalers prescribed. In this case, the pharmacist was able to educate the patient on her disease state and clarify any confusion about the use of her inhalers. The pharmacist also discussed the benefits of smoking cessation with the patient. In the end, this education will be invaluable to the patient in managing her symptoms and preventing future hospitalizations.

Key Learnings for Community Pharmacy Practice from this Case Report

- Through pharmacist provided education, this patient was able to gain insight on her disease state that had resulted in numerous hospitalizations.
- The pharmacist was able to clarify inhaler technique and the indications for each inhaler.
- Ensuring that even patients who have been on maintenance inhalers are counseled on proper inhaler use at every refill is key to prevent COPD exacerbations and reduce the overall cost to the healthcare system.

Patient Description

Patient Name: Alberta Torale
Age: 54
Race: Caucasian
Gender: Female
Sex: Female
Occupation: Office Manager
Living Arrangements/Family: Lives alone
Health Insurance: Humana Medicare

Date of encounter: 7/24/19
Encounter Type (Initial or Follow up): Initial (315639002)
Encounter Class (In person or Telephone encounter): Telephone (185317003)
Encounter Reason (See Summary for codes document): Complete Medication Review (428911000124108)

History of Present Illness

The patient was identified in July 2019 as someone who would benefit from a CMR, whose primary pharmacy had not completed the service. Upon completion of the CMR it was clear that the patient did not understand her respiratory condition. When walking across the parking lot at her job, the patient experiences shortness of breath. She was unsure if she had asthma or COPD and did not understand which inhalers to use at what times. She is also a frequent tobacco user. She presents today for completion of her yearly CMR.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Albuterol HFA	108 mcg	COPD	Inhale two puffs by mouth twice daily as needed	12/2018	Pulmonologist
Spiriva Handihaler	18 mcg	COPD	Inhale 1 puff by mouth daily	12/2018	Pulmonologist
Atenolol	50 mg	Cardiovascular disease (CVD)	Take 1 tablet by mouth at bedtime	2017	Cardiologist
Atorvastatin	80 mg	CVD	Take 1 tablet by mouth at bedtime	2015	PCP
Lisinopril/HCTZ	10/12.5 mg	CVD	Take 1 tablet by mouth at daily	2016	Cardiologist
Nitroglycerin	0.4 mg	Chest Pain	Dissolve one tablet under tongue as needed	2016	Cardiologist
Prednisone	20 mg	COPD	Take by mouth as directed for COPD exacerbation	01/2019	Pulmonologist
Hydrocodone-acetaminophen	5-325 mg	Pain	Take 1 tablet by mouth every 4 to 6 hours as needed for pain	2014	PCP

Amlodipine	5 mg	Hypertension	Take 1 tablet by mouth daily	2017	Cardiologist
Dexlansoprazole	60 mg	Heartburn	Take 1 tablet by mouth daily in the morning	07/2018	PCP
Isosorbide Mononitrate	30 mg	Chest Pain	Take 1 tablet by mouth daily	2016	Cardiologist
Levothyroxine	50 mcg	Hypothyroidism	Take 1 tablet by mouth daily in the morning	2015	PCP
Lorazepam	1 mg	Anxiety	Take 1 tablet by mouth every 8 hours as needed for anxiety	2014	PCP
Metoclopramide	10 mg	Acid Reflux	Take 1 tablet by mouth twice daily with meals	04/2018	PCP
Mupirocin	2%	Wounds	Apply topically to the affected area(s) as needed	05/2019	PCP
Ondansetron	4 mg	Nausea	Take 1 tablet by mouth every 4 hours as needed for nausea	05/2019	PCP
Pramipexole	0.25 mg	Restless Leg Syndrome	Take 1 tablet by mouth at bedtime	042018	PCP
Ranolazine	1000 mg	CVD	Take 1 tablet by mouth twice daily	2016	Cardiologist
Trazodone	50 mg	Insomnia	Take 1 tablet by mouth at bedtime	2016	PCP

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Aspirin	81mg	CVD	Take 1 tablet by mouth in the evening	2016	Self
Cetirizine	10 mg	Allergies	Take 1 tablet by mouth daily as needed	2017	Self

Allergies and Alerts

Medication Allergies: Zocor (elevated WBC), Triple Antibiotic Ointment (rash), Darvon (rash)

Adverse reactions to drugs in the past: None

Other Alerts/Health Aids/Special Needs: None

Immunization History

Immunization	Date(s) Administered
Influenza	10/2018
Pneumovax 23	7/2018

Current Medical History/Problem List

Medical Condition	Date/Year of Diagnosis
Cardiovascular Disease	2016
Hypercholesterolemia	2015
Acid Reflux	2018
Hypothyroidism	2015
Anxiety	2014
Allergies	2017
Restless Leg Syndrome	2018
Sleep Disorder	2016
COPD	2019

Prescription Fill History

Medications synchronized? No

If yes, last sync fill date: Not applicable

Pertinent gaps in refill history: Patient had sporadic refills of Spiriva due to being unaware of the importance of this medication to help her control her COPD. Spiriva (fill dates: 11/18, 1/19, 4/19, 6/19)

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
Simvastatin	Hyperlipidemia	2016	2016	Elevated WBC

Past Medical History

Medical condition or recent hospitalization	Date
COPD Exacerbation (2x)	04/2019 and 06/2019

Social History

Tobacco Use: Patient reports frequent tobacco use (~1 PPD for 30 years).

Alcohol Consumption: Patient denies alcohol use.

Caffeine Consumption: Patient reports 2 cups of coffee every morning.

Recreational Drug Use: Patient denies any recreational drug use.

Describe Diet: Patient reports a diet high in processed foods and lacking in fresh fruits and vegetables.

Describe Exercise: Patient reports minimum amount of exercise due to uncontrolled COPD.

Relevant Social Determinants of Health: Since patient lives alone, she has trouble remembering to take her medications and sometimes has trouble getting to every doctor's appointment. She also finds it hard to cook for one person and eats out a lot adding to her poor health.

Vital Signs/Physical Assessment/Labs

Vitals and labs not available.

Patient Encounter Assessment:

1. COPD

The patient's COPD is not well controlled. The patient has had two recent hospitalizations for COPD exacerbations and has required steroids. The patient was using her rescue inhaler three times daily and is nonadherent to her daily maintenance inhaler, Spiriva. She was experiencing shortness of breath with her normal daily activities. At rest she is asymptomatic.

2. Opioid Safety

The patient takes hydrocodone-acetaminophen 5-325mg chronically for her pain as well as lorazepam 1mg as needed for anxiety. These two medications, when taken concurrently, increase her risk for accidental respiratory depression even when taken as prescribed. Patient can benefit from naloxone education and prescription.

3. Smoking Cessation

Patient currently smokes 1 PPD and is not interested in quitting, although it is contributing to her uncontrolled COPD.

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/24/19	Uses less medication than prescribed 129834002	The patient was underusing her maintenance inhaler for COPD.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/24/19	Medication regimen compliance education 410123007	The patient was educated on how, when, and why to use her maintenance inhaler.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/24/19	Noncompliance to medication regimen 129834002	The patient was not taking her medications as prescribed due to lack of understanding of medication regimen and necessity.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/24/19	Comprehensive Medication Therapy Review 428911000124108	The patient was educated on all of her medications and their indications and disease states. She reported newfound understanding of the importance of medication adherence.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/24/19	Medication Overuse 429611000124105	The patient was overusing her albuterol inhaler due to not understanding its indication for rescue only.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/24/19	Medication Education 967006	The patient was educated to use her maintenance inhaler every day, and her rescue inhaler only when needed for difficulty breathing.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/24/19	Deficient knowledge of disease process 129864005	Patient did not recognize the worsening symptoms as a reason to contact her PCP.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/24/19	Education about chronic obstructive pulmonary disease 741056003	Educate patient about COPD disease progression, current medication therapy, and when to contact her PCP.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/24/19	Adverse drug interaction with drug 448178009	Informed patient of respiratory depression risks of chronic opioid (hydrocodone) administration with benzodiazepine (lorazepam).	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/24/19	Education about take home naloxone for opiate overdose intervention 718021000	Provided patient education about naloxone and importance of having it on-hand for treatment of accidental overdose.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/24/19	Heavy cigarette smoker (20-39 cigs/day) (finding) 160605003	The patient has smoked 1 PPD for approximately 30 years.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/24/19	Smoking cessation education (procedure) 225323000	The patient is not willing to quit at this time, but was open to hearing options for quitting.	Active

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
7/24/19	Begin using maintenance inhaler consistently, with a goal of missing 3 doses or fewer a month; use rescue inhaler only when needed, goal of <4 times daily	Active
7/24/19	Start a plan for smoking cessation within 6 months	Active
7/24/19	Continued blood pressure control < 130/80	Active

Patient Encounter Plan:

1. COPD

The patient now has a more complete understanding of her disease states, primarily her COPD. The pharmacist/student pharmacist discussed proper inhaler technique as well as maintenance inhalers versus rescue inhalers. The team also discussed the meaning of COPD, and how to prevent and manage COPD exacerbations. The patient was comfortable with this information, and was able to teach it back to the pharmacist. She was instructed to notify the pharmacist or physician if she continues to utilize the rescue inhaler more than 4 times/day, even once maintaining adherence of Spiriva. This could indicate that she needs additional drug therapy. Pharmacist will follow up with patient in 1 week to readdress adherence and assess frequency of rescue inhaler use.

2. Opioid Safety

The signs/symptoms of respiratory depression and accidental overdose were reviewed with the patient when taking both hydrocodone-acetaminophen 5-325mg chronically for her pain as well as lorazepam 1mg as needed for anxiety. Pharmacist informed patient that 911 would need to be called if she presented with signs/symptoms of overdose, then naloxone education was provided to ensure proper administration if any of these signs/symptoms occurred. Patient instructed to bring in family members and/or friends to learn about naloxone administration.

3. Smoking Cessation

The patient was educated about her options for smoking cessation, including OTC options like nicotine patches, gum, and lozenges as well as prescription options, such as bupropion and Chantix. She should contact her pharmacy or 1-800-QUIT-NOW as an alternative and initiate smoking cessation when she feels she is ready to quit.

Case Report 10: Rosie McDoggins

Setting Description

State: Pennsylvania

Community Type: Suburban

Prescription Volume per Week: 1,250

Enhances Services Offered: Medication Therapy Management (MTM), Point of Care Testing (POCT) for A1C, Cholesterol POCT

CPESN Member Pharmacy? Yes

If yes, which CPESN Network(s)? PPCN

Patient Case Summary

Brief Summary

Patient with new diagnoses of T2DM, HLD, and HTN presented to the pharmacy for refills and to complete a CMR with the pharmacist. Medication therapy problems identified during this visit and recommended changes were communicated to both the patient and her primary care physician. The pharmacist was able to conduct a follow-up visit with the patient a few weeks later to assess the effects of the accepted medication changes.

Value Expression Explanation

Potential Estimated Return on Investment: According to a study conducted by Pringle et al., interventions completed by pharmacists for patients taking statin therapy and oral diabetes medications lead to a significant reduction in per patient annual health care spending. Specifically, interventions related to statin therapy led to a reduction by $241 in per patient annual health care spending, and a $341 reduction in patients taking oral diabetes medications (2014). For the patient in this case, interventions made were related to both of these items. Therefore, it can be speculated that the interventions conducted by this pharmacist led to an overall reduction in the patient's annual health care spending by at least $582. Additional interventions were made outside of statin therapy and diabetes therapy in this case, therefore leading to an even more significant reduction in annual health care spending for the patient.

Personal value to patients/caregivers: The pharmacist in this case provided interventions that would keep the patient's disease states under better controlled and addressed the patient's suspected adverse drug reaction. As a result, the patient will not need to dedicate as many sick days or paid time off days towards care of her disease states (e.g. doctor's visits, hospitalizations). By requiring less frequent doctor's appointments/hospitalizations as a result of increased control of disease states, this also allows the patient to have more personal time outside of work to spend with family and friends.

Key Learnings for Community Pharmacy Practice from this Case Report

- The pharmacist identified opportunities to simplify this patient's medication regimen through prioritizing the use of evidence-based pharmacotherapies and utilizing nonpharmacologic measures.
- Minimizing exposure to potentially unnecessary therapy is especially important for this patient, who was nonadherent to her other therapies due to experiencing adverse drug effects.

Patient Description

Patient Name: Rosie McDoggins
Age: 32
Race: Caucasian
Sex: F
Occupation: Grocery home-delivery service driver for local supermarket
Living Arrangements/Family: Lives in a two-story house with husband and one dog. No children.
Health Insurance: Independence Blue Cross Health Plan East (commercial plan - no prescription coverage issues)

Date of encounter: 3/1/2020
Encounter Type (Initial or Follow up): Initial (315639002)
Encounter Class (In person or Telephone encounter): In person (453701000124103)
Encounter Reason (See Summary for codes document): Medication Reconciliation (430193006)

History of Present Illness

Patient presented to the pharmacy to pick up her monthly medications and to meet with the pharmacist for an initial CMR. The patient was diagnosed approximately 6 months ago with T2DM, HLD, and HTN. She reports that she had not seen a physician in many years due to access issues prior to her diagnoses in September 2019, but has been able to see her primary care physician regularly since. Patient reports that she has not been taking her metformin as regularly as she knows she should because it has been causing her to have loose stools and stomach pain.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Metformin	500mg	T2DM	Take 1 tablet by mouth twice daily with meals	9/11/2019	Dr. RG
Fenofibrate	145mg	HLD	Take 1 tablet by mouth once daily	9/11/2019	Dr. RG
Losartan	25mg	HTN	Take 1 tablet by mouth once daily	9/11/2019	Dr. RG

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Vitamin D3	2000 IU	General health	Take 1 capsule by mouth once daily	Patient cannot recall	N/A

Allergies and Alerts

Medication Allergies: NKDA

Adverse reactions to drugs in the past: Stomach ache after taking ibuprofen over the counter

Other Alerts/Health Aids/Special Needs: None

Immunization History

Immunization	Date(s) Administered
Tdap	9/20/2019
Influenza vaccine	9/2/2019
MMR	Received series as a child
VAR	Received as a child

Current Medical History/Problem List

Medical Condition	Date/Year of Diagnosis
T2DM	September 2019
HLD	September 2019
HTN	September 2019
Peripheral Arterial Disease	September 2019

Prescription Fill History

Medications synchronized? No

If yes, last sync fill date: Not applicable

Pertinent gaps in refill history: Yes - fills metformin 2+ weeks late

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
None				

Past Medical History

Medical condition or recent hospitalization	Date
Not applicable	

Social History

Tobacco Use: Current smoker x 5 years, 1 PPD

Alcohol Consumption: 1 glass of wine once every month or less

Caffeine Consumption: 1 cup of coffee each morning

Recreational Drug Use: Denies illicit drug use

Describe Diet: Attempts to eat healthy - whole grain carbohydrates, 2 to 3 chocolate chip cookies per day, full serving of fruits/vegetables every day. Eats fast food everyday Monday through Friday for lunch (hamburgers, fries, chicken nuggets, etc.)

Describe Exercise: Cardio exercise for 30 minutes 3 days per week (running, elliptical)

Relevant Social Determinants of Health: Not applicable

Vital Signs/Physical Assessment/Labs

	Results	Date
Height	5'1''	3/1/2020
Weight	172 lbs	3/1/2020
Blood Pressure	122/80 mmHg 118/80 mmHg 120/78 mmHg 112/78 mmHg 118/80 mmHg 120/80 mmHg 146/86 mmHg (obtained in MD office) 144/90 (obtained in MD office)	3/1/2020 2/21/2020 2/1/2020 1/5/2020 12/20/2019 11/13/2019 9/11/2019 9/2/2019
Heart Rate	74 bpm	3/1/2020
Respirations	18 breaths/minute	3/1/2020
Temperature	97.1 degrees Fahrenheit	3/1/2020
Other	Fasting blood glucose: 160 mg/dL A1C: 10.1% Total cholesterol: 240 mg/dL Triglycerides: 130 mg/dL HDL: 50 mg/dL LDL: 132 mg/dL 25 hydroxy D: 120 ng/mL	3/1/2020 2/28/2020 2/28/2020 2/28/2020 2/28/2020 2/28/2020 2/28/2020

Patient Encounter Assessment:

1. T2DM

The patient's late fills of metformin in addition to her complaints of GI issues from this medication suggest that a change should be made to her T2DM regimen. RM's fasting blood glucose and A1C are also above the ADA 2019 guidelines' goals of 80-130 mg/dL and <7%, respectively. This is most likely attributed to her irregular use of metformin.

2. HLD

Total cholesterol and LDL levels are above goal, suggesting that monotherapy with fenofibrate is not sufficient for hyperlipidemia control in this patient. Since the patient's triglyceride level is currently within normal limits, there is no indication for fenofibrate use for this patient.

3. Vitamin D therapy

The patient's 25 hydroxy D level is above goal, suggesting that the patient is consuming too much vitamin D through self-care with OTC vitamin D capsules.

4. HTN

Patient's blood pressure is currently at goal of < 130/80 mmHg per 2017 ACC/AHA hypertension guidelines and is therefore controlled on losartan 25mg once daily regimen.

5. Immunizations

According to the CDC 2020 Immunization Guidelines, patients with diabetes between the ages of 19 to 64 years old is Indicated to receive one dose of Pneumovax 23 (PPSV23). Patient has not received PPSV23 and is eligible to receive it at this time.

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
3/1/2020	Adverse reaction caused by drug (62014003)	Patient's fill history shows late refills of metformin. RM also reports during this encounter that she has not been taking her metformin regularly due to GI side effects that she has experienced since she started this medication.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
3/1/2020	Recommendation to change medication dose form (428751000124106)	Contact Dr. RG to suggest replacement of metformin 500mg twice daily with metformin ER 1000mg (one tablet by mouth once daily).	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
3/1/2020	Medication not effective (435501000124106)	Since the patient's triglyceride level is within normal limits (WNL), there is no indication for fenofibrate for this patient. The patient's LDL and total cholesterol levels are above goal. According to the 2018 ACC Guideline on the Management of Blood Cholesterol and therapy with a high-intensity statin is recommended for LDL-C reduction in patients with clinical ASCVD. The ADA 2019 diabetes guidelines also suggest use of a high-intensity statin in patients with T2DM and ASCVD.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
3/1/2020	Recommendation to change medication (428711000124105)	Contact Dr. RG to suggest discontinuation of fenofibrate and initiation of atorvastatin.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
3/1/2020	Medication not indicated (183966005)	Patient's serum levels of 25 hydroxy D are above goal, indicating that additional supplementation with vitamin D capsules is not necessary and should be discontinued.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
3/1/2020	Recommendation to discontinue dietary supplement (4711000124101)	Instruct patient to discontinue self-treatment with vitamin D.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
3/1/2020	Additional medication required (428981000124101)	According to the CDC 2020 Immunization Guidelines, patients with diabetes between the ages of 19 to 64 years old is Indicated to receive one dose of PPSV23. RM is up to date on all other immunizations indicated for patients with diabetes based off of her age group.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
3/1/2020	Immunization status screening (268558004)	Pharmacist will administer PPSV23 vaccination at the end of the MTM appointment today.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
3/1/2020	Additional medication required (428981000124101)	The patient's fasting blood glucose (FBG) and A1C are both above goal. The patient also has a history of ASCVD. The American Diabetes Association 2019 guidelines suggest use of GLP-1 RA as first-line therapy for glycemic control in addition to metformin for patients with ASCVD.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
3/1/2020	Recommendation to start prescription medication (428821000124109)	Contact Dr. RG to suggest initiation of Ozempic therapy.	Active

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
3/1/2020	Reduce consumption of fast food to 3 times weekly or less.	Active
3/1/2020	Check blood sugar every morning before breakfast and document readings in a logbook.	Active
3/14/2020	Take metformin ER as prescribed on a regular basis to lower blood sugar.	Active

Patient Encounter Plan:

1. T2DM

- Contact patient's prescriber to suggest replacement of metformin 500mg twice daily with metformin ER 1000mg one tablet by mouth once daily
- Reviewed patient's pharmacy benefit formulary to determine what, if any, GLP-1 RA is on formulary and the cost (to the patient) associated with this therapy.
- Patient was contacted and the pharmacist discussed GLP-1 RA therapy and that Ozempic is on their pharmacy benefit formulary as a level 2, with a $50.00 copay. Patient approves this cost.
- Contact patient's prescriber to consider initiation of a GLP-1 RA such as Ozempic - inject 0.25mg SQ once weekly x 4 weeks then increase to 0.5mg SQ once weekly after a few weeks of therapy with new metformin regimen
- Encourage patient to obtain daily FBG and document in a logbook to bring to future appointments at the pharmacy and prescriber's office
- Follow up with patient in two weeks of receiving metformin ER prescription to check for presence of GI side effects. If patient reports minimal side effects, discuss and plan titration schedule with the patient with goal maximum dose of 2000 mg metformin daily.
- Refer patient to local DSMES services

2. HLD

- Contact patient's prescriber to suggest replacement of fenofibrate with a high-intensity statin, such as atorvastatin 40mg (one tablet by mouth once daily)
- Encourage patient to reduce weekly intake of fast foods

3. Vitamin D Supplementation

- Suggest discontinuation of vitamin D OTC self-treatment, as her most recent labs suggest that her vitamin D levels are above normal limits

4. HTN

- Recheck patient's blood pressure each month when she comes to the pharmacy to pick up her medications

5. Immunizations

-PPSV23 administered

Case Report 11: Martha Ralli

Setting Description

State: Oregon

Community Type: Rural

Prescription Volume per Week: 2,450

Enhances Services Offered: Specialty Pharmacy/Infusion Services

CPESN Member Pharmacy? No

If yes, which CPESN Network(s)? Not applicable

Patient Case Summary

Brief Summary

ML comes in to pick up her prescription for Plaquenil (hydroxychloroquine) after being discharged from an urban center for having rheumatoid arthritis (RA). Patient is adherent with all of her current medications. She wants to know if her Plaquenil would interfere with her migraine prophylaxis medication, propranolol. ML has a family history of Lupus and hypermobility arthralgia.

Value Expression Explanation

Potential Estimated Return on Investment: Pharmacist-led MTM is a cost-effective approach to comprehensive patient management in several chronic diseases. This complements the services delivered by other members of the care team, resulting in improved outcomes (Medication therapy management, 2009). A study published in 2014 found that nurse-led follow-up care in patients with stable, low-activity RA and shared care without scheduled consultations resulted in lower mean scores in disease activity and higher scores for functional status and health-related quality of life (HRQoL) over 2 years compared with patients seen by a rheumatologist. Patients in the nursing group also improved their self-efficacy, confidence, and satisfaction scores compared with those in the rheumatologist group. The patients seen by nurses were also significantly less costly to care for (in terms of direct clinician costs) than the group seen by rheumatologists (Primdahl). Another study comparing nurse-led care to rheumatologist-led care in 181 adults with RA determined that nurse-led care was not inferior to rheumatology care and was more cost-effective. A Canadian study reported similar results (Ndosi, 2014).

Personal value to patients/caregivers: Access to care is scarce in rural America. Pharmacists are the most accessible healthcare provider to serve patients who need further education on their RA condition and treatment. Although no cure exists for such chronic conditions, numerous medications are available to lessen symptoms and improve function. As medication experts, pharmacists play a critical role communicating to other healthcare providers and optimizing patient medications. Treatment of RA includes using medications to achieve remission to prevent joint damage and loss of function while balancing the medication's side effect profile with inflammation control. Pharmacists communicate to both prescribers and patients about medication interactions that would be likely and suggest alternative medications.

Key Learnings for Community Pharmacy Practice from this Case Report

- Pharmacists play an integral role in helping patients manage their complext conditions. For example in this case, Plaquenil/Lupus/RA medications are used with a high-risk patient.
- Pharmacists are important in highlighting proper self-care health management and effective consultation points.

Patient Description

Patient Name: Martha Ralli
Age: 27
Race: White
Gender: Female
Sex: Female
Occupation: Unknown
Living Arrangements/Family: Single parent, lives with significant other and disabled child
Health Insurance: Medicare/Blue Shield Commercial Insurance

Date of encounter: 11/9/2019
Encounter Type (Initial or Follow up): Initial (315639002)
Encounter Class (In person or Telephone encounter): In person encounter (453701000124103)
Encounter Reason (See Summary for codes document): Comprehensive Medication therapy review (procedure) (428911000124108)

History of Present Illness

ML is a 27-year-old woman with a chief complaint of rash and chest pain from a possible allergic reaction. Over last several days, she had an urticarial type of rash. She has had this in the past and is followed by an allergy specialist. She has taken Benadryl and low dose prednisone 10 mg with no improvement. No difficulty breathing/swallowing/speaking. On 11/5/2019 she went in for a Rheumatology consult.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Hydroxychloroquine	200 mg	Allergy (Rheumatoid arthritis/Lupus)	Take 1.5 tablet by mouth once daily	11/6/2019	Rheumatoid Specialist
Prednisone	5 mg	Rash associated with SLE-like symptoms	Take 1 tablet by mouth 3 times daily	11/6/2019	Rheumatoid Specialist
Propranolol	20 mg	Migraine/ hypertension	Take 1 tablet by mouth twice daily	10/6/2019	PCP
Sumatriptan	100 mg	Migraine	Take1 tablet by mouth once daily after onset of migraine; may repeat after 2 hours if headache returns not to exceed 2 tablets in 24 hours	8/1/2019	PCP
Montelukast	10 mg	Asthma	Take 1 tablet by mouth once daily	1/2/2019	PCP

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Aspirin-Acetaminophen Caffeine (Excedrin)	250mg - 250mg-65 mg	Migraines prophylaxis	Take 2 tablets by mouth every 6 hours as needed	1/2/2019	OTC

Allergies and Alerts

Medication Allergies: NKDA

Adverse reactions to drugs in the past: None

Other Alerts/Health Aids/Special Needs: None

Immunization History

Immunization	Date(s) Administered
GARDASIL 9 (HPV 9-valent Vaccine, Recombinant)	Unknown
Tdap	02/2010
Measles, mumps, rubella (MMR)	02/2010
Influenza	11/2019

Current Medical History/Problem List (list current medical conditions)

Medical Condition	Date/Year of Diagnosis
Polyarthralgia/Hypermobility Arthralgia	2017
Migraine	2014
Depression	2010

Prescription Fill History

Medications synchronized? No

If yes, last sync fill date: Not applicable

Pertinent gaps in refill history: None

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
Beclomethasone 80 mcg HFA (QVAR)	Asthma (profiled)	12/2/2017	2/7/2018	Seasonal Allergy/Asthma
Albuterol 90 mcg (Proventil HFA)	Asthma (expired)	12/2/2017	2/7/2018	Seasonal Allergy/Asthma
Fluoxetine 10 mg capsule	Migraine Prophylaxis	8/1/2019	10/6/2019	Does not have depression/does not like adverse effects
Erenumab-aooe (Aimovig) 70 mg/ml	Migraine Prophylaxis	8/1/2019	Not applicable	Need insurance; never picked up
Clindamycin 1%	Acne	9/2010	12/2014	Acne is controlled
Tretinoin 0.05% cream (Retin-A)	Acne	9/2010	12/2012	Acne is controlled

Past Medical History

Medical condition or recent hospitalization	Date
Osteoarthritis of left hip	2017
Appendectomy and Tonsillectomy	2015
Anxiety	2015
Asthma (seasonal)	2011
DM Gestational	2012
Adolescent Sexual Assault	2010
Depression	2008-2013

Social History

Tobacco Use: None

Alcohol Consumption: None

Caffeine Consumption: One cup per morning

Recreational Drug Use: None

Describe Diet: Mediterreanean/Vegan

Describe Exercise: Yoga 2-3 per week

Relevant Social Determinants of Health: Single, lower income bracket

Vital Signs/Physical Assessment/Labs

	Results	Date
Height	165.1 cm	11/2019
Weight	67.6 kg	11/2019
Blood Pressure	128/88 mmHg	11/2019
Heart Rate	85 BPM	11/2019
Respirations	20	11/2019
Temperature	36.4 C	11/2019

Patient Encounter Assessment:

1. Polyarthralgia/Hypermobility arthralgia and extra articular manifestations

Systemic lupus erythematosus (SLE) was not ruled out (ACR Criteria was done but did not have an immunologic criterion such as Antinuclear antibodies or immunological ones just clinical criteria: non-erosive arthritis and anemia.) Patient has history of elevated HR and blood pressure with an abnormal EKG (T-Wave inversion) and consistent tiredness. Patient complains of consistent joint pain, flu like malaise, "foggy mind," and difficulty concentrating. She complains that her joints pop all the time and all joints hurt especially hips and knees. No history of malar rash, genital ulcers, discoid rash. Repeated oral ulcers but no genital ulcers. Rheumatology/allergy specialist diagnosed her with hypermobility arthralgia. Patient has a family history of SLE and the doctor prescribed her a low dose corticosteroid (prednisone 10 mg) and a disease-modifying antirheumatic drug (DMARD) (hydroxychloroquine 300 mg), which is first line therapy (EULAR 2019). Latest updates state glucocorticoid should be <=7.5 mg or prednisone equivalent and hydroxychloroquine not to exceed (NTE) 5 mg/kg.

2. Migraine Medication

Patient takes propranolol 20 mg for prevention of migraine, uses aspirin/acetaminophen/caffeine for mild symptoms of migraine and uses sumatriptan for severe symptoms of migraine. She has a history of hypertension and the doctor prescribed propranolol to control both. Notes do not describe the quality of her migraines. The frequency/duration of the pains would be described as chronic (<15 monthly migraine days/ month headache days MMD/MHD) lasting for 12 hours on one side, pulsating and takes away from normal routine with nausea and vomiting. Patient was prescribed a Calcitonin Gene Related Peptide (CGRP); injectable erenumab subcutaneous (SC) but was never filled due to cost. She had trialed fluoxetine but did not like adverse effects (weight gain and stigma).

3. Immunizations

Patient is in need of a Gardasil shot. Cervical neoplasia is increased in women with SLE presumably due to cervical infection with oncogenic Human Papillomavirus (HPV) types, which persist in an immunosuppressed host. Vaccinating women with SLE against HPV are thus an important part of health prevention in this population.

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
11/9/2019	Patient notified of eligibility for medication therapy management service (situation)/ (435411000124108)	Migraine injectable needed	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
11/9/2019	Insurance Authorization (386336002)	Insurance will not pay unless patient talks to a neurologist	Active
11/9/2019	Discussed with Doctor (3946960070)	Patient will be referred to a neurologist in May 2020	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
11/9/2019	Not up to date with immunizations (finding) - Problem observation (171259000)	Patient is eligible for the Gardasil series and has not yet received it	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
11/9/2019	Immunization education (171044003)	Informed patient of the benefits of Gardasil, especially considering her pre-existing chronic conditions	Active

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
11/9/2019	Schedule 1 hour per day for stress-relieving activity (e.g. exercise, meditate) to minimize flare ups	Active

Patient Encounter Plan:

1. Polyarthralgia/HJM

Continue both Hydroxychloroquine and prednisone (EULAR 2019). Hydroxychloroquine needs a yearly eye exam. As directed by her allergist, she needs an Echocardiogram to rule out MVP/aortic root dilation. SLE patients are at a risk of atherosclerosis so regular exercise is needed to decrease MI risk. Needs to learn joint protection exercise to prevent or delay early osteoarthritis (OA). Prednisone 10mg is used for mild flareups to suppress inflammation and immune response. Needs regular exercise and a healthy diet to reduce risk for atherosclerosis, sufficient rest to avoid exhaustion, she also needs sunscreen protection (SPF 30).

2. Migraine

Is scheduled in May 2020 for a follow up appointment with Neurology for Migraine treatment. Continue to take propranolol for prevention and use Excedrin for mild-moderate attacks. Keep a migraine journal and avoid triggers. If migraine injectable therapy is still indicated after Neurology appointment, potential therapies could include: Aimovig 70 mg SC once monthly or Ajovy 675 mg SC every three months.

3. Immunizations

Administer first dose of Gardasil at next patient appointment.

Case Report 12: Delois Diabetes

Setting Description

State: Mississippi

Community Type: Rural

Prescription Volume per Week: 3500

Enhances Services Offered: Medication reconciliation, Comprehensive Medication Review (CMR), Medication synchronization, Adherence packaging, Blood pressure monitoring, Diabetes Self Management Education (DSME) Classes, Delivery service, Immunizations, Long-Acting Injections, Medicare Annual Wellness Visits (AWV), Chronic Care Management (CCM)

CPESN Member Pharmacy? Yes

If yes, which CPESN Network(s)? CPESN Mississippi

Patient Case Summary

Brief Summary

The patient presented to the pharmacy before a dental procedure with prescriptions for an antibiotic and opioid medication. Due to the patient's age and opioid-naïve status, they were identified to be counselled on their opioid medication. The patient was also newly diagnosed with T2DM and recently picked up new prescriptions for metformin, a glucometer, and diabetic testing supplies. The student pharmacist, under the guidance of the preceptor pharmacist, counselled on how to use the opioid medication, potential side effects, where to dispose of unused medication, and the availibility of receiving a naloxone prescription. Based on the conversation with the student pharmacist, the patient was open to receiving naloxone. Additionally, the patient expressed interest in being educated on her glucometer, and the student pharmacist provided device education. Throughout the encounter, the student pharmacist and preceptor discovered that the patient had not been given any education on the disease state and was unaware of what her target blood glucose measurements should be. The student pharmacist educated the patient on diabetes, discussing her medication, target fasting and post-prandial measurements, diet, exercise, and hypoglycemic action plans. The student pharmacist provided a blood glucose log for the patient to document all readings, too. The student pharmacist documented their encounter with the patient and provided their patient work-up to the preceptor, who reviewed, provided comments, and signed off on the eCare plan.

Value Expression Explanation

Potential Estimated Return on Investment: This simple screening conversation at the point-of-sale allowed the community pharmacy to enroll the patient in a billable service that would generate revenue for the site. The average DSME reimbursement for Mississippi is approximately $20 per 30 minute unit of billing in a group setting. If the patient completed the 10 eligible billable hours this would result in revenue of $400 for this single patient in the first year and an additional $80 in each subsequent year in which the patient is eligible to receive 2 hours per year. Additional revenue will be generated from diabetic testing supplies including alcohol wipes and needles which are also covered by many Part D plans. Pharmacies that offer diabetic shoe fittings and medical nutrition therapy may also experience additional return on investment. The

patient may also benefit from enrolling in remote patient monitoring through a partnership between provider and pharmacy, which would bring in additional revenue.

Personal value to patients/caregivers: The pharmacy team provided instrumental support to the patient. Patients with acute problems combined with new disease state diagnoses can be overwhelmed, and patient ignorance for the proper way to monitor and care for themselves can lead to poor outcomes. The pharmacy team in this case was able to properly educate this patient to manage her opioid prescription and diabetes. This kept the patient from experiencing many micro- and macro-complications of her conditions. While not in the scope of this particular case description, the community pharmacy resident on-site contacted the patient's provider and enrolled her in DSME classes. Two weeks later, the student pharmacist followed-up via telephone and ensured that she was self-monitoring her blood glucose. After being enrolled in the DSME classes and self-monitoring blood glucose levels at home for 3 months, her fasting and post-prandial levels as well as her A1C were at goal.

Key Learnings for Community Pharmacy Practice from this Case Report

- Counseling on all new medication fills is critical for identifying key gaps in knowledge and opportunities for revenue-generating services.
- Patients with a new prescription for an opioid medication should be counselled on potential side effects, especially those at a higher risk of respiratory depression.
- This case serves as evidence for community pharmacies to develop specific packages of service offerings for patients who are newly diagnosed with a chronic condition (ex. Hypertension, heart failure, COPD, etc.)

Patient Description

Title of Patient Case: Delois Diabetes
Age: 65
Race: AA
Gender: Woman
Sex: Female
Occupation: Secretary at First Baptist Church
Living Arrangements/Family: Lives with her husband, has 2 grown children out of the home.
Health Insurance: Medicare

Date of encounter: 2/12/2020
Encounter Type (Initial or Follow up): Initial (315639002)
Encounter Class (In person or Telephone encounter): In person encounter (453701000124103)
Encounter Reason (See Summary for codes document): Opioid medication review (452861000124102)

History of Present Illness

Patient picking up two prescriptions for a dental procedure later in the week and identified to be counselled on her opioid treatment. She was newly diagnosed with T2DM on 01/20/2020, and was identified for counseling and disease state education. Patient's blood glucose at the time of counseling was 154 mg/dL (fasting).

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Hydrocodone-Acetaminophen	5-325 mg	Pain	Take 1 tablet by mouth every 6 hours as needed	02/14/2020	Toth, Eddy
Amoxicillin	500 mg	Prophylaxis	Take 4 capsules by mouth the morning of procedure, then take 1 capsule by mouth 4 times a day for 7 days	02/14/2020	Toth, Eddy
Metformin ER	500 mg	T2DM	Take 2 tablets by mouth twice daily with meals	01/2020	Cabe, Annabelle
Tizanidine	4 mg	Muscle Spasms	Take ½ to 1 tablet by mouth twice daily as needed	11/2019	Cabe, Annabelle
Naprosyn	500 mg	Pain and Inflammation	Take 1 tablet by mouth with food every 12 hours	11/2019	Cabe, Annabelle
Amitriptyline	75 mg	Pain	Take 1 tablet by mouth once daily at night	8/2018	Harrell, Erin
Atorvastatin	40 mg	Dyslipidemia	Take 1 tablet by mouth once daily at bedtime	2015	Cabe, Annabelle

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Co-Enzyme Q 10	100 mg	Dyslipidemia	Take 1 tablet by mouth once daily with food	2016	Cabe, Annabelle

Allergies and Alerts

Medication Allergies (drug, timing, reaction): Penicillin – 1990 – hives

Adverse reactions to drugs in the past: None

Other Alerts/Health Aids/Special Needs: None

Immunization History

Immunization	Date(s) Administered
Influenza vaccine	9/18/2019

Current Medical History/Problem List

Medical Condition	Date/Year of Diagnosis
Type 2 Diabetes Mellitus	2/2020
Dyslipidemia	2015
Arthritis	2012

Prescription Fill History

Medications synchronized? Yes

If yes, last sync fill date: 2/11/2020

Pertinent gaps in refill history: Prior to being synced, the patient would skip almost entire months of medication, because she did not have insurance. Once she got Medicare, the pharmacy team was able to sync her medications and call monthly so she did not miss any medications.

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
Not applicable				

Past Medical History

Medical condition or recent hospitalization	Date
Pneumonia hospitalization	12/2018

Social History

Tobacco Use: None

Alcohol Consumption: None

Caffeine Consumption: Daily (one-two cups of coffee daily)

Recreational Drug Use: None

Describe Diet: Mainly consists of southern-style home cooking, which she does for her family. Lots of fried foods, seasoned with salt. Loves to bake cakes on the weekends.

Describe Exercise: None

Relevant Social Determinants of Health: Patient's muscle spasms and osteoarthritis make it difficult for her to move around, complete daily chores, and cook. Patient also reports sharing a car with her husband, who still works, so she sometimes has difficulty coordinating transportation to doctors' appointments, the pharmacy, and grocery shopping.

Vital Signs/Physical Assessment/Labs

	Results	Date
Height	5'2"	2/12/2020
Weight	189 lbs (86 kg)	2/12/2020
Blood Pressure	129/86	2/12/2020
Heart Rate	74	2/12/2020
Respirations	Not available	2/12/2020
Temperature	Not available	2/12/2020
Other	Blood Glucose:154 mg/dL (Fasting)	2/12/2020

Patient Encounter Assessment:

1. Diabetes

Patient with newly diagnosed diabetes and a fasting blood glucose of 154mg/dL above goal of 80-130mg/dL per ADA. Nonadherence may be attributable to elevate FBG.

2. Opioid Therapy

Patient is opioid-naïve and at high-risk of opioid-related side effects. She was open to counseling on the medication. She could benefit from having naloxone on-hand, and she was also receptive to hearing more information about it.

3. Athritis

Patient states that her pain is well-controlled on her current regimen of naprosyn and amitriptyline.

4. Dyslipidemia

Unable to assess due to no recent lipid lab values. Diabetes puts her at higher risk of CV events, but other risk factors not known. She is currently on a high-intensity statin which is appropriate based on ADA guidelines.

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
2/12/2020	Additional medication required 428981000124101	Patient at high risk of opioid side effects, including respiratory depression, due to age and being opioid-naive. Naloxone indicated.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
2/12/2020	Prescription medication started 432861000124103	Patient accepted offer of naloxone prescription. Provided counselling on use which patient will provide to husband.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
2/12/2020	Deficient Knowledge of disease process (129864005)	Patient states that she does not know her goal blood glucose levels or potential complications of diabetes. Patient does not check blood glucose at home.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
2/12/2020	Diabetes Education (6143009)	Patient is willing to take fasting and post-prandial blood glucose readings at home and log them. It will be monitored at the pharmacy monthly when receiving DSME classes.	Active

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
2/12/2020	Use post-dental procedure medications correctly and effectively, thereby avoiding potential side effects.	Active
2/12/2020	Avoid complications associated with high blood glucose by maintaining a fasting blood glucose goal of 80-130 mg/dL and a 2-hour post-prandial goal of <180 mg/dL	Active
2/12/2020	Check blood glucose at home daily and keep log	Active
2/12/2020	Take diabetes medications as prescribed by physician to improve medication adherence and wellbeing.	Active

Patient Encounter Plan:

1. Diabetes

Provide education on diabetes self-management for new diagnosis. Follow-up with patient regarding enrollment in diabetes education classes when it is offered. Patient will monitor and log fasting and post-prandial blood glucoses and will report them to the pharmacist and physician. Patient was enrolled in medication synchronization and encourage to maintain adherence to reach blood glucose goals.

2. Opioid Therapy

Patient counseled on side effects of opioid medication, such as sedation, dizziness, constipation, nausea. Signs and symptoms of respiratory depression were reviewed with the patient and naloxone education was provided, including when to call 911 and administer naloxone. Patient indicated that she could teach her husband how to administer naloxone in case he recognized the signs and symptoms of respiratory depression.

3. Arthritis

No changes to treatment plan. Counselled that treatment may not be needed while using opioid medication after dental procedure.

4. Dyslipidemia

Obtain labs from PCP to ensure patient's lipid panel is at goal while taking atorvastatin 40mg daily.

Part 3

Case Report 13: Michael Milligram

Setting Description

State: Pennsylvania

Community Type: Suburban

Prescription Volume per Week: 6,500

Enhanced Services Offered: Medication reconciliation, Comprehensive medication review (CMR), Medication synchronization, Adherance packaging, Blood pressure monitoring, Home delivery service, Hospital discharge delivery service, Hospital discharge counseling program, Immunizations, Tobacco Cessation Program, Healthy lifestyle education program, Long-acting Injections, Drive-Thru Services

CPESN Member Pharmacy? No

If yes, which CPESN Network(s)? Not applicable

Patient Case Summary

Brief Summary

A patient with history of medication nonadherence presents to the pharmacy following discharge from a hospital, admission for congestive heart failure (CHF) exacerbation. The patient requires medication reconciliation and an adherence consultation. Despite reported adherence to statin therapy, the patient's LDL remained elevated greater than 200 mg/dL. Based on atherosclerotic cardiovascular disease (ASCVD) risk factors and per the 2018 ACC/AHA Blood Cholesterol Management Guidelines, the pharmacist suggested increasing the strength and intensity of the patient's current statin therapy. The patient presented to the pharmacy with his wife to pick up all of his medications, which were organized into pill packs. The pharmacist also assessed the patient's smoking status and over-the-counter medications.

Value Expression Explanation

Potential Estimated Return on Investment: Based on the pharmacist's recommendations to add hydralazine/isosorbide dinitriate to the patient's regimen, increase the dose of the patient's statin, and to consider the addition of medications for diabetes management and smoking cessation, it is possible that the patient will experience a decrease in future heart failure exacerbations and hospitalizations, reduced risk of ASCVD, reduced risk of morbidity and mortality related to diabetic complications, as well as a decrease in all cause mortality. The post discharge transitional care results in 28% less readmissions within a 30-day period (Ni, 2017). By enrolling the patient in pill packaging to increase adherence, there is a potential cost saving of $20,734 (Lloyd, 2019).

Personal value to patients/caregivers: The pharmacist provided an invaluable service to this patient by making the patient's health and safety a top priority, thereby improving his satisfaction with the care he received and his overall quality of life. Without intervention, the patient's health status could have remained unchanged, leaving him vulnerable to experience more frequent heart failure exacerbations and hospitalizations. As a key member of this patient's care team, the pharmacist was able to improve the overall patient care experience and enhance communication, continuinty, and collaboration across the team. The patient also received adherence support in the form of pill packaging, automatic refills, medication synchronization, and medication delivery.

Key Learnings for Community Pharmacy Practice from this Case Report

- Demonstrates the importance of a community pharmacist in transitions-of-care.
- When a pharmacist is given more insight into the patient's current health standing, such as lab values, health screening results, or medical charts post-discharge, they can use their knowledge to optimize medication therapy and improve patient outcomes.
- Pharmacists are medication specialists and should be properly utilized as such to ensure the efficacy of therapy, monitor the safety of therapy, and troubleshoot adherence strategies to improve the overall health and well being of all patients.

Patient Description

Title of Patient Case: Michael Milligram
Age: 67
Race: African-American
Gender: Man
Sex: Male
Occupation: Retired
Living Arrangements/Family: Lives with wife in condominium community
Health Insurance: Medicare & American Association of Retired Persons (AARP) Supplement

Date of encounter: 5/20/2020
Encounter Type (Initial or Follow up): Follow up (390906007)
Encounter Class (In person or Telephone encounter): In person encounter (435701000124103)
Encounter Reason (See Summary for codes document): Transition from acute care to self-care (448511000124101)

History of Present Illness

A patient presents to the pharmacy after being discharged from the local hospital. The patient has a history of nonadherence with maintenance medications for HTN, T2DM, and CHF, which likely contributed to his previous and most recent hospitalizations for heart failure exacerbations. The patient was diagnosed with a CHF exacerbation. The patient was successfully diuresed with intravenous furosemide and was discharged on his original home medication regimen, without changes (including an angiotensin converting enzyme inhibitor (ACEi), beta blocker, and loop diuretic). After reaching out to the patient's physicians and confirming current vitals and labs, the discharge counseling pharmacist recommended initiation of oral hydralazine/isosorbide to decrease future heart failure hospitalization risk according to the 2017 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guidelines for the Management of Heart Failure. The pharmacist also offered enrollment in prescription synchronization to streamline refills for the patient and adherence pill packaging. Despite reported adherence to statin therapy, the patient's LDL remained elevated greater than 200 mg/dL. The patient presented to the pharmacy with his wife to pick up all of his medications, which were organized into pill packs.

Active Prescription Medications

Medication	Strength	Indication	Directions	Start Date	Prescriber
Metoprolol Succinate	200 mg	Heart failure Hypertension	1 tablet by mouth once daily	1/2019	Cardiologist
Lisinopril	20 mg	Heart Failure Hypertension	1 tablet by mouth once daily	8/2016	Cardiologist
Furosemide	40 mg	Heart Failure Hypertension	1 tablet by mouth once daily	1/2019	Cardiologist
Metformin ER	1000 mg	Type 2 Diabetes	1 tablet by mouth twice daily	1/2020	PCP
Atorvastatin	20 mg	Hyperlipidemia Prevention of ASCVD	1 tablet by mouth once daily	5/2020	PCP
Dapagliflozin	10 mg	Type 2 Diabetes	1 tablet by mouth once daily	4/2020	Endocrinologist

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Acetaminophen	325 mg	Joint pain	1 tablet by mouth as needed for pain	3/2016	PCP

Allergies and Alerts

Medication Allergies: NKDA

Adverse reactions to drugs in the past: None

Other Alerts/Health Aids/Special Needs: Patient has some limited mobility and uses a cane to steady himself.

Immunization History

Immunization	Date(s) Administered
Tdap (tetanus, diptheria, pertussis)	8/2000
Td booster	unknown
Pneumococcal 13-valent conjugate vaccine (Prevnar 13)	4/2019
pneumovoccal vaccine polyvalent (Pneumovax 23)	4/2020
zoster vaccine – recombinant, adjuvanted (Shingrix)	4/2019, 7/2019
influenza virus vaccine (Fluzone) high dose	10/2019

Current Medical History/Problem List

Medical Condition	Date/Year of Diagnosis
Heart Failure	1/2019
Hypertension	7/2015
Hyperlipidemia	5/2014
Type 2 Diabetes	9/2017

Prescription Fill History

Medications synchronized? Yes

If yes, last sync fill date: Filled and picked up following hospital discharge 5/20/2020

Pertinent gaps in refill history: Patient has been on auto-refill since 2015. There were times where the patient filled prescriptions a few days later than due, which could indicate that the patient may have been missing doses.

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
Naproxen	Joint pain	6/2009	7/2015	Naproxen could exacerbate heart failure and increase blood pressure

Past Medical History

Medical condition or recent hospitalization	Date
Hospitalized for heart failure exacerbation	5/2020
Hospitalized for heart failure exacerbation	1/2019

Social History

Tobacco Use: Moderate smoker – smokes ½ PPD; no quit attempts

Alcohol Consumption: Patient does not drink alcohol

Caffeine Consumption: Patient drinks 1 cup of tea in the mornings

Recreational Drug Use: Patient denies all recreational drug use

Describe Diet: Patient has a variable diet. He states that, at times, he skips meals. He has unintentionally lost weight over the past year. He endorses decreased salt intake as compared with previous years but is still inconsistent with these diet modifications and seeking additional guidance on diet improvement.

Describe Exercise: Patients admits to not exercising "in years."

Relevant Social Determinants of Health: Patient's wife lives with him and is currently his caretaker. He states that he, at times, will rebel and go against his doctors' guidelines. He feels that his wife nags him too much about what the doctor says.

Vital Signs/Physical Assessment/Labs

	Results	Date
Height	5'6"	5/2020
Weight	120 lbs	5/2020
Blood Pressure	134/86 mmHg	5/2020
Heart Rate	70 BPM	5/2020
Respirations	30 breaths/min	5/2020
Temperature	98.9 degrees F	5/2020
Other	HgA1C 7.2% LDL 200 mg/dL	5/2020 5/2020

Patient Encounter Assessment:

1. Diabetes

A1c of 7.2% (5/20/2020) is slightly above goal of < 7% per the 2020 American Diabetes Association (ADA) Standards of medical care in diabetes. Patient currently has Type 2 diabetes and is taking appropriate first-line therapy, metformin ER 1000mg by mouth twice daily. He is also receiving a sodium-glucose cotransporter-2 (SGLT2) inhibitor, dapagliflozin 10mg by mouth once daily, which is recommended as add-on therapy for patients with heart failure, regardless of A1c. This medication was approved by the Food and Drug Administration (FDA) for reducing hospitalization for heart failure in adults with type 2 diabetes and other cardiovascular risk factors, based on the results of the DECLARE-TIMI 58 cardiovascular outcomes trial. Given the proximity of his current A1c (7.2%) to the goal of < 7%, recommend continuing the current regimen for now and consider adding a GLP-1 receptor agonist with proven cardiovascular benefit (if covered by insurance and if eligible based on patient-specific factors) in the future if additional glycemic control is warranted.

2. Hypertension/Heart failure

BP of 134/86 mmHg is slightly above goal of < 130/80 mmHg per the 2017 ACC/AHA hypertension guidelines. Patient is currently receiving standard of care for heart failure, including an ACEi, beta blocker, and loop diuretic. He is unable to receive spironolactone due to risk for hyperkalemia. His hypertension is fairly well controlled. Per the African American Heart Failure Trial (A-HeFT), the combination of hydralazine-isosorbide dinitrate, when added to standard therapy (including a combination of ACEi, ARBs, beta blockers, spironolactone, digoxin, and/or diuretics deemed appropriate by treating physicians), was associated with a 43% reduction in the rate of all-cause mortality (p = 0.01) and a 33% relative reduction in the rate of first heart failure hospitlization (p = 0.001). There was also a statistically significant improvement in quality of life (p = 0.02). This African American patient remains symptomatic and has had 2 hospitalizations for heart failure in the past 1.5 years despite therapy with ACEi and beta blockers and may benefit from the addition of hydralazine/isosorbide to manage symptoms and improve outcomes.

3. Hyperlipidemia/ASCVD Risk

The patient's hyperlipidemia is not well controlled, as his LDL is 200 mg/dL (5/20/2020) despite patient-reported adherence to moderate-intensity statin (atorvastatin 20 mg). Although he does not have a history of ASCVD, he would benefit from additional LDL lowering given his LDL of ≥190 mg/dL per the 2018 ACC/AHA Blood Cholesterol Management Guidelines.

4. Smoking Cessation

According to the U.S. Public Health Service Clinical Practice Guidelines for Treating Tobacco Use and Dependence, every patient undergoing a quit attempt should be encouraged to start pharmacotherapy. The patient's willingness to quit smoking was assessed; he is not ready to quit smoking at this time, but was open to discussing over-the-counter nicotine replacement therapy for smoking cessation. He is interested in discussing these options further when he is ready to quit.

5. Immunizations

Patient is up to date on Tdap, pneumococcal, zoster, and influenza vaccines. For patients with diabetes who are over the age of 60, hepatitis B vaccination should be considered, at the discretion of the health care provider for unvaccinated adults. Adult patients should also receive a Td booster dose every 10 years; this patient's history of Td boosters is unkonwn.

6. Medication Adherence

Patient admits to nonadherence with some of his medications due to forgetfulness, lack of organization, and disengagement with his own health management. Patient may benefit from adherence support in addition to his existing automatic refills, including pill packaging and prescription synchronization.

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/20/2020	Patient forgets to take medication (408367005)	After reviewing the patient's fill history, it is likely that he is missing some doses.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/20/2020	Synchronization of repeat medication (415693003)	In addition to his existing automatic refills, the patient has been enrolled in a pill packaging program and will receive his medications delivered to his home to improve adherence. The patient has also been counseled to use an alarm clock to remember his medication doses.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/20/2020	Additional medication therapy required (42898100124101)	Patient is having frequent heart failure hospitalizations since initial diagnosis.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/20/2020	Recommendation to start prescription medication (428821000124109)	The addition of hydralazine/isosorbide 37.5 mg/20 mg in an African American patient who remains symptomatic despite standard of care is proven to decrease hospitalization risk.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/20/2020	Medication dose too low (448152000)	Patient should be on a high-intensity statin given his ASCVD risk and high LDL despite patient-reported adherence to moderate-intensity statin therapy.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/20/2020	Recommendation to increase medication dose (428811000124101)	Patient's current atorvastain dose was increased from 20mg to 80 mg, with a goal of decreasing ASCVD risk.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/20/2020	Unbalanced diet (424890008)	Patient endorses eating poorly, including high intake of carbohydrates and saturated fats and low intake of vegetables and fruits.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/20/2020	Diet education (11816003)	Patient has been counseled on the importance of a well-balanced diet and considerations for diet based on his current chronic conditions.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/20/2020	Moderate cigarette smoker (160604004)	Patient currently smokes ½ pack per day (PPD) and would like to hear about OTC smoking cessation options. Though he is "not interested in quitting just yet," he would like to consider quitting "soon."	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/20/2020	Smoking cessation medication review (1821000124104)	Patient was counseled to talk to the pharmacist when he is ready to quit and also educated about the importance of quitting to reduce cardiovascular risk. Patient was introduced to OTC pharmacologic options, such as the nicotine patch and nicotine gum.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/20/2020	Not up to date with immunizations (171259000)	Patient does not know last date of Td booster, so a dose is indicated.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/20/2020	Administration of substance to produce immunity, either active or passive (127785005)	Administered Td booster today.	Resolved

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
5/2020	Revisit willingness to quit smoking in one month during patient follow-up.	Active
5/2020	Improve medication adherence by eliminating missed doses.	Active
5/2020	Reduce heart failure symptoms and prevent subsequent hospitalizations for heart failure.	Active
5/2020	Reduce A1c to less than 7% in 3 months and avoid hypoglycemia symptoms.	Active
5/2020	Reduce LDL to less than 100 mg/dL in 4-6 weeks and avoid signs and symptoms of muscle pain.	Active
5/2020	Reduce BP to less than 130/80 mmHg in 1 month.	Active
5/2020	Increase consumption of whole grains, fruits, vegetables and decrease consumption of saturated fats. Limit sodium intake to 2 grams per day. Increase physical activity level as tolerated to a goal of 30 minutes of aerobic exercise, 4-5 days per week.	Active

Patient Encounter Plan:

1. Diabetes

- Continue current medication regimen:
    - metformin ER 1000 mg – 1 tablet by mouth twice daily
    - dapagliflozin 10 mg – 1 tablet by mouth daily
- Monitor:
    - A1c in 3 months (08/20/2020)
    - s/sx hypoglycemia if patient makes modifications to diet or activity level

2. HTN/HF

- Continue current medication regimen:
    - metoprolol succinate 200 mg – 1 tablet by mouth daily
    - lisinopril 20 mg – 1 tablet by mouth daily
    - furosemide 40 mg – 1 tablet by mouth daily
- Initiate hydralazine-isosorbide – 37.5-20mg – 1 tablet by mouth three times daily
- Monitor:
    - BP at each visit
    - BMP in 3 months
    - s/sx HF (weight gain, SOB, DOE, edema)
    - side effects of hydralazine-isosorbide (e.g. flushing, dizziness, hypotension, headache, nausea)
    - frequency of heart failure hospitalizations
- The patient was counseled on the importance of maintaining or decreasing his intake of carbohydrates, reducing his intake of saturated fats to below 5-6%, switching to whole grains, increasing his intake of fresh vegetables and fresh fruits (moderate consumption, to avoid increasing blood sugar), and drinking water within limits provided by cardiologist.

3. Hyperlipidemia/ASCVD Risk

- Adjust current regimen:
  - Discontinue atorvastatin 20 mg
  - Initiate atorvastatin 80 mg – 1 tablet by mouth once daily
- Monitor:
  - s/sx myopathy/myalgia
  - lipid panel in 4-6 weeks

4. Smoking cessation

- Follow up with patient in 1 month regarding his willingness to quit smoking. If patient prefers nicotine replacement gum or lozenges, he should be given sugar-free formulations to avoid exacerbation of his diabetes.
- The patient may benefit from use of a nicotine patch or a prescription product.
- Pharmacotherapy will help to decrease withdrawal symptoms and increase the patient's likelihood of succesfully quitting. If successful, smoking cessation will decrease the patient's carvdiovascular risk factors and improve his overall health.

5. Immunizations

- Continue to administer influenza vaccine each year, high-dose product if available.
- Discuss consideration of hepatitis B vaccination series with PCP.
- Administered Td booster today since last dose date unknown.

6. Medication adherence

- Patient will be called for an adherence check in 2 weeks.
- In addition to existing automatic refills, initiate pill packaging, prescription synchronization, and home delivery of medications.

Case Report 14: Jonas Pitt

Setting Description

State: Pennsylvania

Community Type: Suburban

Prescription Volume per Week: 800

Enhances Services Offered: Adherence packaging, blood pressure monitoring, clozapine dispensing and monitoring, sterile and non-sterile compounding, Durable medical equipment (DME) billing-Medicare and Medicaid, DSMES site, Home delivery 10 mile radius, home visits, immunizations, hospice service, long-acting injections, long term care services, medication disposal program, medication synchronization program, naloxone dispensing, tobacco cessation, specialty pharmacy dispensing, and travel consult

CPESN Member Pharmacy? YES

If yes, which CPESN Network(s)? Pennsylvania Pharmacists Care Network

Patient Case Summary

Brief Summary

A 53-year-old male presented to the pharmacy after years of being a regular patient for an initial CMR. In the past, the patient had struggled with adherence to medications due to lack of transportation and financial struggles. The patient's chief complaint was new onset leg cramps. During the CMR, the pharmacist was able to review the patient's laboratory values, monitor blood pressure, and conduct a medication reconciliation with the patient. The leg cramps were most likely attributed to the patient's atorvastatin. The pharmacist recommended OTC CoQ10 to address the leg cramps. The patient's diabetes and hypertension were not controlled and required additional action. The patient was noncompliant with his metformin because of diarrhea associated with taking the medication. The patient was also out of refills for his warfarin and required a new prescription from the doctor. Additionally, the patient was unable to obtain refills for his ranitidine due to ongoing shortages. The pharmacist also noticed that the patient had an incomplete immunization status, and was indicated for additional vaccines based on his age and comorbidities considering the patient's social determinants, the pharmacist also saw the opportunity to enroll the patient in their medication synchronization program and delivery service.

Value Expression Explanation

Potential Estimated Return on Investment: $15,491

Estimated cost of nonadherence per beneficiary per year (Medicare):
- Diabetes: $5170 (Ni, 2018)
- Hypertension: $5824 (Ni, 2018)
- Dyslipidemia: $1847 (Ni, 2018)

Estimated cost of preventable outpatient infectious disease in patients >50:
- Herpes zoster: $1974 (McLaughlin, 2015)
- Pneumonia: $6762 (McLaughlin, 2015)

Personal value to patients/caregivers: The patient has no means of personal transportation. Being enrolled in the pharmacy's delivery service gives the patient peace of mind that he will receive his medications every month. In the past, the patient had been hospitalized due to a low international normalized ratio (INR) resulting from a lack of refills. This simple intervention helped to improve the patient's overall health and prevented complications that could have resulted from nonadherence. By addressing the patient's concerns with the adverse effects associated with metformin, the pharmacist will improve the patient's quality of life, and increase his adherence. This encounter also established rapport, trust, and understanding between the patient and the pharmacist.

Key Learnings for Community Pharmacy Practice from this Case Report

- The pharmacist had a key role in minimizing adverse effects in this patient such as hyperglycemic events, cardiovascular complications due to uncontrolled hypertension, primary prevention of atherosclerotic disease, potential drug therapy side effects, and infectious disease prevention through immunization administration.
- By maximizing the patient's current drug therapy regimen, the pharmacist prevented many potential adverse effects. The pharmacist not only impacted the clinical well-being of the patient but also served as a social support system for this patient.
- Enrolling the patient in medication synchronization and delivery services took a huge burden away from the patient. Having social support provided encouragement to the patient and motivated him to continue adherence to his medications.

Patient Description

Patient Name: Jonas Pitt
Age: 53
Race: Caucasian
Gender: Male
Sex: Male
Occupation: Unemployed
Living Arrangements/Family: Lives at home alone
Health Insurance: State Medicaid

Date of encounter: 12/13/2019
Encounter Type (Initial or Follow up): Initial (315639002)
Encounter Class (In person or Telephone encounter): In person (453701000124103)
Encounter Reason (See Summary for codes document): Comprehensive medication therapy review (428911000124108)

History of Present Illness

JP had presented for an initial CMR after being a regular patient at the pharmacy for years. The patient had been struggling to remain adherent to all his medications because of his lack of transportation and challenge of managing his multiple disease states. The patient's chief complaint was recurrent leg cramps.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Ranitidine	150 mg	GERD	Take 1 tablet by mouth daily	2008	Dr. Lyons
Amlodipine	5 mg	Hypertension	Take 1 tablet by mouth daily	2010	Dr. Lyons
Metoprolol ER	50 mg	Hypertension and Atrial fibrillation (Afib)	Take 1 tablet by mouth daily	2010	Dr. Lyons
Clopidogrel	75 mg	Afib	Take 1 tablet by mouth daily	2016	Dr. Santiago
Lisinopril/ HCTZ	10/12.5	HTN	Take 1 tablet by mouth daily	2010	Dr. Lyons
Warfarin	1 mg	Afib	Take as directed by physician	2016	Dr. Santiago
Warfarin	5mg	Afib	Take as directed by physician	2016	Dr. Santiago
Atorvastatin	40 mg	Dyslipidemia	Take 1 tablet by mouth daily	2010	Dr. Lyons
Metformin	500 mg	T2DM	Take 2 tablets by mouth twice daily	2018	Dr. Patel
Glipizide ER	5 mg	T2DM	Take 1 tablet by mouth daily	2018	Dr. Patel

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Zyrtec	10 mg	seasonal allergies	Take 1 tablet by mouth daily as needed	unknown	Self-Prescribed
Tums		Heartburn	Take 3-4 tablets by mouth as needed for heartburn	unknown	Self-Prescribed
Tylenol	500 mg	Headaches	Take 2 tablets by mouth as needed for pain	unknown	Self-Prescribed
One A Day Mens Silver		Multivitamin	Take 1 tablet by mouth daily	2017	Self-Prescribed

Allergies and Alerts

Medication Allergies: Penicillin, rash, during childhood illness

Adverse reactions to drugs in the past: None

Other Alerts/Health Aids/Special Needs: Moderate level health literacy

Immunization History

Immunization	Date(s) Administered
Influenza	09/2019
Tetanus	2007
Pneumonia	Negative
Shingrix	Negative

Current Medical History/Problem List

Medical Condition	Date/Year of Diagnosis
Type 2 Diabetes	2018
Atrial Fibrillation	2016
Hypertension	2010
Dyslipidemia	2010
GERD	2008

Prescription Fill History

Medications synchronized? No

If yes, last sync fill date: Not applicable

Pertinent gaps in refill history: Metformin 500 mg- patient refills 30 day supply every other month

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
Methylprednisolone Dose Pack	Upper Respiratory Infection	2015	2015	Infection Cured
Albuterol Inhaler	Upper Respiratory Infection	2015	2015	Infection Cured

Past Medical History

Medical condition or recent hospitalization	Date
Appendectomy	1994

Social History

Tobacco Use: Smokes socially on the weekends

Alcohol Consumption: 1-2 drinks on the weekend

Caffeine Consumption: 1 cup of coffee/tea in the morning

Recreational Drug Use: None

Describe Diet: Frozen meals and takeout often, very minimal servings of fruits or vegetables throughout the week

Describe Exercise: Patient does not exercise regularly

Relevant Social Determinants of Health: Patient has low income and no independent means of transportation. Patient relies on family or friends for travel needs.

Vital Signs/Physical Assessment/Labs

	Results	Date
Height	5'11"	12/2019
Weight	250 lb	12/2019
Blood Pressure	146/92 mmHg 142/90 mmHg 152/94 mmHg	12/2019 09/2019 07/2019
Heart Rate	75 BPM	12/2019
Respirations	18	12/2019
Temperature	98.6	12/2019
HDL	54	09/2019
LDL	110	09/2019
Triglycerides	155	09/2019
Blood Glucose	192 post prandial	09/2019
A1c	7.4%	09/2019

Patient Encounter Assessment:

1. Muscle Pain

Patient has been experiencing bilateral muscle cramps in his legs, most likely due to current atorvastatin regimen.

2. Hypertension

Patient's blood pressure has been above goal of < 130/80 mmHg per 2017 ACC/AHA hypertension guidelines for consecutive visits: 152/94 mmHg, 142/90 mmHg, and most recently 146/92 mmHg.

3. Diabetes

The patient's A1C is not at goal (<7%) and neither is post-prandial blood glucose (<180mg/dL) per ADA guidelines. Patient is nonadherent to metformin due to adverse effects.

4. Atrial Fibrillation

Patient is out of refills of warfarin. INR result not available to pharmacist, but patient endorses regular INR readings at PCP's office.

5. GERD

Patient is unable to obtain ranitidine due to a medication shortage and backorder. He has not been taking any medication to treat his GERD.

6. Smoking Cessation

The patient socially smokes on the weekends and smoking cessation education is indicated for this patient. Patient not ready to quit at this time.

7. Immunization Status

Patient has not received a tetanus booster in the last 10 years. Patients' age and disease states also indicate him for Shingrix and Pneumovax 23.

8. Social Determinants

The patient struggles to obtain transportation to the pharmacy. This negatively influences the patient's adherence to medications. The patient could benefit from being enrolled in the pharmacy's medication synchronization program and delivery service.

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/13/2019	Patient unable to obtain medication (finding) 429611000124105	Patient ran out of refills on his warfarin, he prefers that the pharmacist reach out to the cardiologist on his behalf.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/13/2019	Discussion about refilling prescription (procedure) 451621000124104	Requested refills on warfarin from his prescriber to ensure that the patient does not go without his medication.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/13/2019	Not up to date with immunizations (finding) 171259000	Through review of patient's immunization history, it was identified that the patient is indicated for Shingrix and Pneumovax.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/13/2019	Immunization status screening (procedure) 268558004	Pharmacist provided the patient education and counseling on the various vaccines that he is indicated for. -Patient had a slight cold and did not want to receive the vaccine during this visit. Patient has been scheduled to receive vaccine at next visit.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/13/2019	Finding of increased blood pressure (finding) 24184005	During patient's trip to the pharmacy, his blood pressure was high.	Recurrence
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/13/2019	Hypertension monitoring (regimen/therapy) 275944005	Reviewed blood pressure goals and appropriate action for high blood pressure readings with patient. Encouraged patient to start using his previously purchased home blood pressure monitor to assist in clinical decision making.	Recurrence

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/13/2019	Adverse reaction caused by drug (disorder) 62014003	Patient was experiencing an adverse event from atorvastatin.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/13/2019	Recommendation to start over-the-counter medication (procedure) 4811000124105	The pharmacist recommended that the patient trial CoQ10 in order to assist with the adverse effects he is experiencing. Will confirm patient cost acceptable.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/13/2019	Medication changed to therapeutic equivalent (situation) 432901000124105	Patient was not able to fill ranitidine due to lack of availability.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/13/2019	Recommendation to change medication to therapeutic equivalent on formulary (procedure) 428851000124100	Requested a new prescription for famotidine to replace the medication that is unavailable.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/13/2019	Assessment of barriers to adherence 710838003	Identified that patient has trouble getting to the pharmacy frequently due to transportation issues.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/13/2019	Synchronization of repeat medication (procedure) 415693003	The patient's medications were synchronized to assist the patient with ease of picking up his medications monthly.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/13/2019	Noncompliance with medication regimen (finding) 129834002	It was identified that the patient has not been able to tolerate his metformin due to GI side effects. Requested a new prescription for metformin 1000 mg ER to help mitigate side effects and increase adherence.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/13/2019	Synchronization of repeat medication (procedure) 415693003	Patient's medications were synchronized to provide easier access to care. Will keep patient accountable and simplify daily regimen to minimize nonadherence.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
12/13/2019	Cigarette Smoker (finding) 65568007	Identified that the patient currently smokes cigarettes socially on weekends.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
12/13/2019	Smoking cessation education (procedure) 225323000	Discussed with patient, provided recommendation to quit smoking. Patient not ready to quit at this time, will follow up to reassess readiness to quit.	Active

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
12/13/2019	Patient should monitor blood pressure once daily at home	Recurrence
12/13/2019	Add CoQ10 to medication regimen if cost acceptable and monitor for statin-associated muscle pain. If muscle pain continues after 1-2 weeks of CoQ10 therapy, follow-up with prescriber to discuss alternative statin therapy.	Active

Patient Encounter Plan:

1. Muscle Pain

Recommend that the patient initiate OTC CoQ10 to combat statin-related muscle cramps if cost is acceptable to the patient. Follow up with patient to determine if patient is still experiencing side effects. Educate the patient on the benefits of statin therapy and encourage continued adherence to the regimen. If CoQ10 cost is unacceptable to the patient or if side effects persist with CoQ10 therapy, recommend alternative statin regimen ex. Rosuvastatin with dose based on shared clinical decision making.

2. Hypertension

Patient may require an increased dose of lisinopril/hydrochlorothiazide to 20/12.5mg strength. The pharmacist will follow up with the physician and discuss potential therapy changes. Patient also has a blood pressure machine, and should be monitoring at-home readings. Follow up with the patient during each monthly pickup and discuss blood pressure monitoring and motivate him to continue blood pressure logging. If out of range, the physician will be notified.

3. Diabetes

Patient's adherence will be assessed, and consideration will be given to contacting the physician and transitioning the patient to the extended release formulation of metformin to reduce GI upset. The pharmacist will also educate the patient on diabetes and the importance of regular glucose testing. The patient will be contacted each month as part of medication synchronization and adherence to medication and resolution of side effects will be monitored.

4. Atrial Fibrillation

The pharmacist will contact the physician to obtain a new prescription of warfarin for the patient.

5. GERD

Contact the patient's PCP to obtain a new prescription for famotidine to replace the ranitidine.

6. Smoking Cessation

Provide smoking cessation education. Follow up with patient in one month at time of medication synchronization appointment to reassess patient's readiness to quit smoking.

7. Immunization

The pharmacist will provide education and counseling to the patient regarding the importance of these vaccinations. The patient should be scheduled in the coming weeks to receive a tetanus booster, Shingrix, and Pneumovax. Will follow-up with the patient's PCP to obtain a full immunization history.

8. Social Determinants

Verify that once monthly pharmacy pickups work for the patient. Can recommend mailing or delivery of prescriptions if necessary

Case Report 15: Stella Owl

Setting Description

State: Pennsylvania

Community Type: Urban

Prescription Volume per Week: 5000

Enhanced Services Offered: Long term care services, Dispill multi-dose packaging/adherence packaging, Immunizations, Scheduled appointments for medication managements, Medication synchronization, Medication reconciliation, Comprehensive medication review (CMR), Blood pressure monitoring, Home delivery service, Tobacco Cessation Counseling, Durable medical equipment (DME), Medication Therapy Management (MTM), Wellness Classes: Diabetes, Smoking Cessation, Weight loss, High blood pressure, High cholesterol, Asthma

CPESN Member Pharmacy? No

If yes, which CPESN Network(s)? Not applicable

Patient Case Summary

Brief Summary: This patient is a 69-year-old female referred by her PCP for medication reconciliation. Her primary pharmacy had recently closed, and her prescriptions had been transferred to a different location, offering a different style of blister packaging. Without accompanying pill images, the patient became increasingly confused about her medications, resulting in nonadherence and worsened control of several disease states.

Value Expression Explanation

Personal value to patients/caregivers: The pharmacy team was able to get ahold of the primary pharmacy to get the patient a visual representation of the medications she would need to make it easier for her. Patient was educated about some of the external pain she had been feeling.

Key Learnings for Community Pharmacy Practice from this Case Report

- Learning about the story of each patient, along with patient-specific concerns, barriers, and preferences, is an essential component in the optimization of drug therapy.
- During transitions of care (between health care settings or even in the transfer of prescriptions across pharmacies), patients are particularly vulnerable.
- Unpredictable circumstances, such as the ones surrounding the COVID-19 pandemic, create an even larger opportunity and responsibility for community pharmacists, as they often bridge care gaps and serve as liaison between the patient and the other members of the health care team.
- The pharmacist is an accessible health care provider that can individualize adherence tools, address communication and socioeconomic barriers (e.g. providing cost-effective options or enrollment in prescription savings programs), improve patient access to medications and healthcare services, promote public and population health, minimize adherence barriers, ensure the appropriateness/effectiveness/safety of each medication, and provide patient advocacy.

Patient Description

Title of Patient Case: Stella Owl
Age: 69 years
Race: African American/Black
Gender: Woman
Sex: Female
Occupation: Nursing
Living Arrangements/Family: Lives with her grandson
Health Insurance: Medicare

Date of encounter: 5/13/2020
Encounter Type (Initial or Follow up): Follow up (390906007)
Encounter Class (In person or Telephone encounter): Telephone encounter (185317003)
Encounter Reason (See Summary for codes document): Medication reconciliation (procedure) (430193006)

History of Present Illness

A 69-year-old patient with past medical history of T2DM, diabetic neuropathy, HTN, dyslipidemia, asthma, and GERD is referred by her primary care physician for an initial pharmacy consult for medication reconciliation. Her original independent community pharmacy has recently closed, and her prescriptions have been transferred to a different independent pharmacy. She continues to receive blister packs, but the medication names are listed in a smaller font and she is no longer provided pill images. Her confusion has led to nonadherence, which has worsened the control of several disease states.

She has "very severe 8/10" foot pain and was given gabapentin 100 mg by mouth daily by an urgent care provider. She is confused because she already takes gabapentin daily at a higher dose for diabetic neuropathy. Per recommendation from the urgent care provider, she has stopped taking ibuprofen prescribed by her PCP because "it can mess up my blood pressure," though the ibuprofen was adequately controlling her pain. The patient admits to missing the last several doses of her dulaglutide 1.5 mg and she says it makes her nauseous now, but it never did before. She has run out of her Embrace Talk glucose test strips, so she is not currently self-monitoring her blood glucose. She believes she is taking all blood pressure medications except spironolactone 50 mg by mouth daily, which she hasn't taken "in months." She is not currently taking atorvastatin 40 mg by mouth daily because she ran out of refills. She has recently increased her use of albuterol HFA 90 mcg/actuation – inhale 2 puffs by mouth every 6 hours for wheezing from less than once weekly to once daily. She has not been using budesonide-formoterol 80-4.5 mcg/actuation – inhale 2 puffs by mouth twice daily because she does not believe her new pharmacy has the prescription. She also reports occasional nighttime awakening from asthma symptoms. She attributes her increased shortness of breath and rescue inhaler use to her high pill burden: "All of these pills are breaking down my body and I can't breathe right anymore." She is unsure if she is currently taking montelukast 10 mg by mouth daily. She describes taking her omeprazole 40 mg by mouth once daily along with her other morning medications. She takes her morning medications with breakfast. She endorses heartburn symptoms 3-4 times per week.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Amlodipine	10mg	HTN	Take 1 tablet by mouth every morning	12/29/2010	PCP
Benazepril	40mg	HTN	Take 1 tablet by mouth every morning	10/25/2018	PCP
Chlorthalidone	25mg	HTN	Take 1 tablet by mouth every morning	9/26/2017	PCP
Metoprolol XL	100mg	HTN	Take 1 tablet by mouth every morning	9/27/2010	PCP
Insulin glargine	100units/ mL	T2DM	Inject 30 units into the skin at bedtime	12/29/2010	PCP
Metformin XR	500mg	T2DM	Take 2 tablets by mouth twice daily	12/29/2010	PCP
Dulaglutide	1.5mg/0.5 ml	T2DM	Inject 0.5mLs (1.5mg) into the skin every 7 days	7/19/2018	PCP
Atorvastatin	40mg	HLD	Take 1 tab by mouth daily in the evening	6/23/2016	PCP
Gabapentin	300mg	Diabetic neuropathy	Take 1 capsule by mouth every morning	2/12/2019	PCP
Gabapentin	600mg	Diabetic neuropathy	Take 1 capsule by mouth every evening	2/12/2019	PCP
Ibuprofen	800mg	Diabetic neuropathy	Take 1 tablet by mouth every 8 hours as needed for pain	3/22/2012	PCP
Omeprazole	40mg	GERD	Take 1 capsule by mouth 30mins before breakfast	2/12/2019	PCP
Montelukast	10mg	Asthma	Take 1 tablet by mouth every morning	12/29/2010	PCP
Symbicort	80-4.5mcg	Asthma	Inhale 2 puffs by mouth twice daily	6/1/2018	PCP
Albuterol	90mcg/ actuation	Asthma	Inhale 2 puffs by mouth every 4 hours as needed	12/29/2010	PCP
Fluticasone propionate	50mcg/ actuation	Nasal congestion	Instill 2 sprays into each nostril twice daily	2/28/2020	PCP
Embrace TALK TEST STRIPS		T2DM	Check blood sugar once daily in the morning	5/20/2020	PCP

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Vitamin D	1000 units	Supplement	Take 1 tablet by mouth daily	6/30/2016	PCP

Allergies and Alerts

Medication Allergies: No Known Drug Allergies

Adverse reactions to drugs in the past: None

Other Alerts/Health Aids/Special Needs: Hearing loss of left ear

Immunization History

Immunization	Date(s) Administered
Prevnar (PCV13)	01/12/2009 and 05/07/2015
Tdap	11/04/2011
Influenza quadrivalent injectable Pres Free 3+yrs	12/01/2014, 10/12, 2015
Influenza Split	10/24/2003, 10/27/2004, 11/26/2007, 01/12/2009, 11/11/2009, 12/29/2010, 11/04/2011, 12/03/2012
Influenza High Dose	01/13/2017, 09/26/2017, 11/20/2018, 2/28/2020

Current Medical History/Problem List

Medical Condition	Date/Year of Diagnosis
Diabetes	04/17/2007
Hypertension	12/20/2010
Asthma	04/17/2007
Joint pain	04/17/2007
Osteoarthritis	05/17/2010
Weight loss	08/27/2010
Depressive disorder/ not elsewhere classified	02/24/2010
Stenosis of right carotid artery	04/17/2007
Total knee replacement	05/21/2010
Hyperlipidemia	Unknown
Neuropathic pain	Unknown
GERD	Unknown

Prescription Fill History

Medications synchronized? Yes

If yes, last sync fill date: 5/7/2020

Pertinent gaps in refill history: Patient's original independent community pharmacy has recently closed, and her prescriptions have been transferred to a different franchise location within the same chain; however, because each pharmacy is independently owned, technological platforms, policies, and procedures vary slightly among stores. The pharmacist at the new store is unable to determine a complete prescription fill history following the closing of the original pharmacy.

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
Pravastatin	Hyperlipidemia	05/11/2015	01/14/2016	Duplicate therapy
Ranitidine	GERD	08/01/2018	11/27/2018	Patient preference
Famotidine	GERD	08/17/2018	11/27/2018	Patient preference
Esomeprazole	GERD	12/29/2010	11/27/2018	Formulary change
Potassium Chloride 20mEq	Hypokalemia	05/11/2015	07/19/2018	Therapy Completed
Hydrochlorothiazide	Hypertension	Unknown	07/19/2018	Side effects
Fluticasone- Salmeterol	Asthma	01/16/2017	06/06/2017	Alternate therapy
Citalopram	Depression	Unknown	03/24/2014	Nonadherence
Spironolactone	Hypertension	11/5/2019	05/13/2020	Nonadherence

Past Medical History

Medical condition or recent hospitalization	Date
Colonoscopy	09/14/2018 and 11/05/2018
Total knee arthroplasty	05/21/2010
Tuberculin test reaction	01/01/2006
Breast mammogram	10/01/2008
Hysterectomy	05/03/2003
Cholecystectomy	02/03/2016
Cardiac Catheterization	04/11/2007
Iron deficiency anemia	12/21/2010
Stress test exercise	03/16/2020
Smoking	01/01/1969

Social History

Tobacco Use: Former smoker (quit date: 05/10/2018) used to have 0.5 PPD, 20 pack-years

Alcohol Consumption: No

Caffeine Consumption: No

Recreational Drug Use: No

Describe Diet: Patient reported eating breakfast, lunch and dinner (approximately equal amounts per meal, but food choices vary. She also "snacks a lot" during the day. Her snacks consist of chocolate, ice cream, and cakes.

Describe Exercise: Hesitant to return to the gym until cardiac testing has been completed.

Relevant Social Determinants of Health: Patient reports living with her grandson. She feels comfortable and safe at home. She believes she has sufficient access to food. She is able to pay for her medications and basic necessities.

Vital Signs/Physical Assessment/Labs

	Results	Date
Height	64" (1.626 m)	2/28/2020
Weight	244 lb (110.9 kg)	2/28/2020
Blood Pressure	149/74	2/28/2020
Heart Rate	80 BPM	2/28/2020
Respirations	16 breaths per minute	2/28/2020
Temperature	97.5 degrees F	11/26/2019
Other	BMI: 41.99 BSA: 2.24 HbA1c: 6.9%	2/28/2020 12/5/2019

Patient Encounter Assessment:

1. Diabetes

HbA1c of 6.9% (12/5/2019) is at goal < 7.0% per the 2020 American Diabetes Association Standards of Medical Care in Diabetes. Patient has some nausea with Trulicity, likely due to sporadic dosing/missed doses, along with large portion sizes of food. Patient would benefit from adherence support in the form of a more convenient schedule and a reminder mechanism.

2. Hypertension

BP of 129/74mmHg (2/28/2020) is at goal of <130/80 mmHg per the 2017 ACC/AHA hypertension guidelines, despite nonadherence to spironolactone for several months. Spironolactone has no clear indication, as patient does not have heart failure or resistant hypertension. Patient is tolerating her current regimen well and is taking all 4 other antihypertensives.

3. Hyperlipidemia/ASCVD Risk

Patient is achieving the goal of receiving a high intensity statin per the 2018 ACC/AHA Guidelines (she is considered high risk due to a history of Coronary Artery Disease). Patient was tolerating her current regimen well, but she has not been taking her medication for several months following the expiration of her prescription.

4. Asthma

Patient experienced an increase in shortness of breath and albuterol use following the self-discontinuation of her Symbicort maintenance inhaler. Per the 2020 GINA guidelines, she is not well-controlled based on her increased use of albuterol, increase in daily symptoms, and nighttime awakenings. Rather than increasing her step of therapy, will encourage improved adherence at this time and re-evaluate symptoms in 2 weeks.

5. GERD

Increased symptom frequency and severity due to improper administration of her proton pump inhibitor with food and medications. Proton pump inhibitors should be separated by 30 minutes from food and medications.

6. Acute worsening of foot pain/Diabetic neuropathy

Patient experienced resulting confusion following the receipt of conflicting information from an urgent care Nurse Practitioner. Patient would benefit from clarity regarding her pain regimen and pain assessment by her PCP.

7. Immunizations
Patient remains up to date on annual influenza vaccine. She is due for a tetanus booster in 2021 and would benefit from a zoster vaccination, given her age above 50 years. The patient is not interested in hepatitis B vaccine at this time.
8.Medication reconciliation/refills/adherence
Patient can benefit from adherence support in the form of continued blister packaging of medications, continued medication synchronization, continued automatic refills, and home delivery of medications. Her confusion related to her disease process and medication regimen can be addressed with education provided by the pharmacist, along with a personal medication record provided in a font that is large enough to ensure visibility. The patient would also benefit from pill images accompanying her blister packaging.

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Referred by primary care provider (276491000)	Primary care physician referred patient to pharmacist for comprehensive medication review and adherence support.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Medication reconciliation (430193006)	Comprehensive medication review completed	Resolved
5/13/2020	Comprehensive medication therapy review	Comprehensive medication review completed	Resolved
5/13/2020	Gathering of past medical history (procedure) (451571000124102)	Comprehensive medication review completed	Resolved
5/13/2020	Documentation of adverse drug event history (procedure) (451671000124103)	Comprehensive medication review completed	Resolved
5/13/2020	Medication care plan sent to primary care provider (situation) (451521000124103)	Comprehensive medication review completed	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Deficient knowledge of medication regimen (finding) (129866007)	Patient is confused regarding her medication regimen and pill identities. Patient is unclear regarding the indications of each of her medications.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Medication care plan discussed with patient (situation) (451721000124107)	Comprehensive medication review completed	Resolved
5/13/2020	Preparation of personal medication record (447281000124106)	PMR completed and provided to patient	Resolved
5/13/2020	Medication efficacy education (procedure) (223418001)	Patient counseling on the indication and effectiveness parameters of each medication	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Medication dosage too low (448152000)	Diabetic neuropathy pain persists, warranting pain assessment and potential titration of gabapentin dose	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Referral to general practitioner (procedure) (183561008)	Referral to PCP for management of acute foot pain and diabetic neuropathy	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Medication therapy unnecessary (429621000124102)	Patient is taking gabapentin 300mg in the morning and gabapentin 600mg in the evening for her neuropathic pain. She was also taking ibuprofen 800mg every 8 hours as needed to acutely help with the pain until the gabapentin was titrated to an effective dose. She reported that an urgent care Nurse Practitioner prescribed an additional gabapentin 100mg with instruction to take 1 capsule once daily. She did not take this, as she was nervous to combine the new gabapentin dose with her existing regimen. She also stopped taking the prescribed ibuprofen because the nurse practitioner told her that it would increase her blood pressure.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Discussed with doctor (394696007)	Consulted with PCP.	Resolved
5/13/2020	Recommendation to change medication (428711000124105)	After consultation with the PCP, the pharmacist advised the patient to disregard the gabapentin 100mg that was prescribed at urgent care and continue with her gabapentin regimen prescribed by her PCP. This may be titrated at future visits. She will resume ibuprofen 800mg every 8 hours as needed for pain for short-term use while her PCP-prescribed gabapentin is titrated.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Patient forgets to take medication (408367005)	Patient endorses missing the last several doses of her weekly Trulicity. She reports that her last dose was on 5/12/2020, but she missed several doses prior.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Assessment of barriers to adherence (710838003)	Identified patient-specific barriers	Resolved
5/13/2020	Education about medication regimen adherence (410123007)	After some discussion regarding adherence barriers, the patient identifies that Mondays may be an easier day of the week to remember her Trulicity dose. It was recommended to the patient to use a calendar to remember to take her dose. She would like to place a calendar on her fridge with a large "T" on Mondays.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Deficient knowledge of disease process (finding) (129864005)	Lack of understanding of disease process	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Diabetic education (procedure) (6143009)	Reviewed the overall disease process and the roles of her medications in helping to achieve health goals.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Adverse Reaction caused by drug (62014003)	Patient reported adverse effects (nausea) from her Trulicity, likely due to sporadic and missed dosing, along with large portion sizes with meals.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Medication regimen compliance education (410123007)	After identifying patient-specific barriers, the pharmacist provided education regarding the likely benefit of consistent dosing toward the minimization of side effects.	Active
5/13/2020	Patient counseling education (385719000)	The pharmacist recommended decreased portion sizes of food, since this medication may cause delayed gastric emptying and increased satiety.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Patient unable to obtain medication (129834002)	Run out of test strips, not testing blood glucose	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Renewal of prescription (103742009)	Renewed chronic prescription for glucose test strips per Collaborative Practice Agreement	Resolved
5/13/2020	Medical equipment or device education (procedure) (362978005)	Glucometer use was reviewed with the patient	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Noncompliance with medication regimen (129834002)	Nonadherence to spironolactone	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Assessment of barriers to adherence (710838003)	Identified patient-specific barriers	Resolved
5/13/2020	Recommendation to discontinue medication-4701000124104	Blood pressure remains controlled despite nonadherence with this medication for several months. Recommended discontinuation at this time.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Deficient knowledge of disease process (finding) (129864005)	Lack of understanding of disease process	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Hypertension education (procedure) (39155009)	Reviewed the overall disease process and the roles of her medications in helping to achieve health goals.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Noncompliance with medication regimen (finding) (129834002)	Ran out of atorvastatin refills 2 months ago	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Assessment of barriers to adherence (710838003)	Identified patient-specific barriers	Resolved
5/13/2020	Renewal of prescription (103742009)	Renewed chronic medication per Collaborative Practice Agreement	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Deficient knowledge of disease process (finding) (129864005)	Lack of understanding of disease process	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Dyslipidemia education (procedure) (426011000124106)	Reviewed the overall disease process and the roles of her medications in helping to achieve health goals.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Patient misunderstood treatment instructions (182891003)	Patient believed she could discontinue daily use of Symbicort maintenance inhaler once her symptoms improved	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Assessment of barriers to adherence (710838003)	Identified patient-specific barriers	Resolved
5/13/2020	Medication regimen compliance education (410123007)	Educated patient to monitor for efficacy parameters of her albuterol: frequency of SOB, frequency of albuterol use, frequency of nighttime awakenings, impact of SOB on quality of life	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Deficient knowledge of disease process (finding) (129864005)	Lack of understanding of disease process	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Asthma education (procedure) (401135008)	Reviewed the overall disease process and the roles of her medications in helping to achieve health goals.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Improper medication administration technique (finding) (2111000124109)	Taking omeprazole with food and other medications. Continued heartburn 3-4 times weekly despite therapy with PPI.	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Medication administration education (procedure) (396074002)	Patient educated on importance of taking medication on an empty stomach, 30 minutes prior to food and other medications. Medication will be dispensed in a vial instead of in the blister pack to encourage separation of administration times.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Deficient knowledge of disease process (finding) (129864005)	Lack of understanding of disease process	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Education about gastrointestinal disorder (procedure) (417011000124102)	Reviewed the overall disease process and the roles of her medication in helping to achieve health goals.	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Needs influenza immunization (finding) (185903001)	Additional drug needed – due for high dose influenza vaccine in Fall 2020	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Influenza vaccination (procedure) (86198006)	Patient agreeable to receiving high dose influenza vaccine in Fall 2020	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
5/13/2020	Not up to date with immunizations (finding)	Additional drugs needed – zoster vaccine; hepatitis B vaccine	Resolved
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
5/13/2020	Administration of substance to produce immunity, either active or passive (procedure) (127785005)	Administered first dose of zoster vaccine (Shingrix). Patient deferred hepatitis B vaccine.	Resolved

Patient-Centered Goals

Disease state	Goal Date	Goal Note	Goal Status
Pain	5/13/2020	Work with prescriber to optimize pain medication regimen and manage pain at a level that is tolerable to the patient	Active
Diabetes	5/13/2020	Improve adherence to Trulicity, missing one or fewer doses per month by next month's follow-up	Active
HTN	5/13/2020	Continued adherence to blood pressure regimen	Active
HTN	5/13/2020	Monitor blood pressure at a minimum during monthly pharmacy visits to ensure adequate control after discontinuation of spironolactone. Goal BP < 130/80 mmHg	Active
HLD	5/13/2020	Improve adherence to atorvastatin, missing five or fewer doses per month by next month's follow-up	Active
Asthma	5/13/2020	Improve adherence to Symbicort, missing five or fewer doses per month by next month's follow-up. Improve asthma symptoms so rescue inhaler is required less. Goal: use rescue inhaler 2 or fewer times per week	Active
GERD	5/13/2020	Decrease frequency and/or severity of symptoms with appropriate administration of omeprazole: Take on an empty stomach, 30 minutes prior to food or medications	Active

Patient Encounter Plan:

1. Diabetes

Continue current regimen as below:
- metformin XR 500 mg – 2 tablets (1000 mg) by mouth twice daily
- insulin glargine (Lantus) 30 units subQ every night
- dulaglutide (Trulicity) 1.5 mg/0.5 mL subQ weekly: patient to switch to Monday administration starting on 5/18/2020

Counseling/education:
- Emphasized importance of Trulicity adherence and recommended decrease of portion sizes to minimize N/V
- Recommend adequate hydration
- Patient will mark a letter "T" on Mondays on her wall calendar and will also place a reminder on her refrigerator to avoid forgetting doses

Monitoring:
- Efficacy: self monitoring of blood glucose (SMBG) as instructed (fasting), A1c due in June, weight loss
- Safety: hypoglycemia, nausea/vomiting/diarrhea (N/V/D), abdominal pain, fatigue, dehydration

2. Hypertension

Continue current regimen as below:
- amlodipine 10 mg by mouth daily
- benazepril 40 mg by mouth daily
- chlorthalidone 25 mg by mouth daily
- metoprolol 100 mg by mouth daily

Discontinue spironolactone

Monitor:
Efficacy: BP
Safety: BP, HR, BMP, uric acid

3. Hyperlipidemia/ASCVD Risk

Restart regimen as below:
- atorvastatin 40 mg by mouth daily

Monitor:
- Efficacy: lipid panel, 4-6 weeks following initiation of statin
- Safety: myalgia, myopathy, GI upset

4. Asthma

Restart regimen as below:
- budesonide-formoterol (Symbicort) 80-4.5 mcg/actuation: inhale 2 puffs by mouth twice daily
- albuterol (Ventolin) HFA 90 mcg/actuation: inhale 2 puffs by mouth every 6 hours as needed for wheezing/shortness of breath
- montelukast (Singulair) 10 mg by mouth daily

Patient education/counseling:
- Counseled regarding disease process and role of maintenance inhaler in minimizing shortness of breath (SOB), decreasing need for albuterol use, and decreasing future physician visits/emergency department visits/hospitalizations

Monitoring:
- Efficacy/disease parameters: SOB, frequency of short acting beta agonist (SABA) use, nighttime awakenings, impact of SOB on functionality, # asthma exacerbations, Forced Expiratory Volume (FEV1)
- Safety: oral thrush, hoarseness, dysphonia with inhaled corticosteroid (ICS); tachycardia with albuterol

5. GERD

Adjust current medication regimen as below:
- omeprazole 40 mg by mouth once daily – take 30 minutes before food or other medications

Monitor:
- Efficacy: frequency and severity of heartburn
- Safety: abdominal discomfort

6. Acute worsening of foot pain/Diabetic neuropathy

Patient was instructed to continue the regimen listed below and hold off on taking the gabapentin 100 mg prescribed by the urgent care nurse practitioner. Patient will restart ibuprofen for short-term analgesia with a long-term plan to titrate gabapentin as instructed by her PCP.

Current regimen as below:
- gabapentin 300 mg by mouth every morning
- gabapentin 600 mg by mouth every evening
- ibuprofen 800 mg by mouth every 8 hours as needed for pain – patient to restart on 5/13/2020

Monitoring:
- Efficacy: s/sx pain, numbness, tingling, mobility
- Safety: GI upset (N/V, s/sx bleed, BMP)

7. Immunizations
- Administer annual influenza vaccine (high dose) in Fall 2020
- Administer zoster vaccine (Shingrix) first dose today; second dose in 2-6 months

8. Medication reconciliation/refills/adherence
- Complete medication list finalized and sent to PCP for approval
- PCP approved and prescription renewals were sent to pharmacy with accompanying instructions regarding dispensing in blister packaging vs. vials

Case Report 16: Peter Pepperoni

Setting Description

State: Pennsylvania

Community Type: Urban

Prescription Volume per Week: 2700

Enhances Services Offered: Medication reconciliation, Medication synchronization, Delivery service, Immunizations, Tobacco cessation program

CPESN Member Pharmacy? No

If yes, which CPESN Network(s)? Not applicable

Patient Case Summary

Brief Summary

Patient with newly diagnosed major depressive disorder (MDD) contacted pharmacy after noting several elevated blood pressure readings following the addition of a new medication to treat MDD. Pharmacist contacted patient's primary care physician to discuss alternative MDD treatments with less risk of increasing BP. The patient was also educated on lifestyle changes he could make to improve his BP readings. The pharmacist requested authorization to switch the patient's prescriptions to 90-day supplies and enrolled the patient into the pharmacy's medication synchronization program to sync new MDD treatment with other chronic medications.

Value Expression Explanation

Potential Estimated Return on Investment: The adjusted annual incremental expenditure for patients with hypertension is estimated to be $1,920 compared to individuals without hypertension (Kirkland, 2018). By resolving drug therapy problems to achieve the patient's blood pressure goal, the pharmacist may be able to avoid these excess costs to the healthcare system.

Personal value to patients/caregivers: The patient became more educated on his own disease states and gained some control over a few modifiable lifestyle changes for his chronic conditions. Having the support from the pharmacist in the community setting can help ease any confusion experiences while being on multiple chronic medications.

Key Learnings for Community Pharmacy Practice from this Case Report

- This patient approached their pharmacist as the first point of contact when their blood pressure readings became elevated.
- Dedication to addressing potential adverse drug reactions from newly initiated treatment and providing education on actionable steps for patients to take may strengthen the relationship between pharmacists and their patients.

Patient Description

Title of Patient Case: Peter Pepperoni
Age: 68
Race: Caucasian
Gender: Male
Occupation: Retired
Living Arrangements/Family: Lives with spouse in center city townhome
Health Insurance: Medicare

Date of encounter: 1/20/2020
Encounter Type (Initial or Follow up): Initial (315639002)
Encounter Class (In person or Telephone encounter): In person encounter (453701000124103)
Encounter Reason (See Summary for codes document): Medication synchronization (415693003)

History of Present Illness

Patient arrives at the pharmacy to pick up his medications. He describes that his blood pressure this morning was 144/92mmHg using his home cuff. He notes that his blood pressure has been "over 140" for the past few days, and it is never usually this high.

The pharmacist notices that the patient was recently prescribed venlafaxine XR for MDD. The patient states that he hasn't noticed any big improvements to his mood yet, since he just started the medication approximately two weeks ago.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Venlafaxine XR	75mg	Major depressive disorder	Take one tablet by mouth once daily	2020	PCP
Eliquis (apixaban)	5mg	Atrial fibrillation anticoagulation	Take one tablet by mouth twice daily	2018	Cardiologist
Metoprolol succinate	50mg	Atrial fibrillation rate control	Take one tablet by mouth daily	2018	Cardiologist
Atorvastatin	40mg	Dyslipidemia	Take one tablet by mouth once daily at bedtime	2002	Cardiologist
Metformin	1000mg	Diabetes Mellitus Type 2	Take one tablet by mouth twice daily with meals	2002	PCP
Amlodipine	5mg	Hypertension	Take one tablet by mouth once daily	2000	Cardiologist

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Ibuprofen	200mg	Pain	Take one tablet by mouth as needed for mild pain	2018	N/A

Allergies and Alerts

Medication Allergies: Penicillin (rash as a child, does not recall date)

Adverse reactions to drugs in the past: None

Other Alerts/Health Aids/Special Needs: None

Immunization History

Immunization	Date(s) Administered
Influenza vaccine	10/20/2019
RZV	10/20/2019, 12/27/2019
PPSV23	9/28/2015
Td	8/3/2014
PCV13	8/3/2014

Current Medical History/Problem List

Medical Condition	Date/Year of Diagnosis
Major Depressive Disorder	2020
Atrial Fibrillation	2018
Diabetes Mellitus Type 2	2001
Dyslipidemia	2001
Hypertension	1997

Prescription Fill History

Medications synchronized? No

If yes, last sync fill date: Not applicable

Pertinent gaps in refill history: None, however, the patient's newly prescribed venlafaxine is not filled in sync with his other current medications.

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
Azithromycin 250mg	Pneumonia	9/12/2019	9/17/2019	Pneumonia infection resolved

Past Medical History

Medical condition or recent hospitalization	Date
Bacterial Pneumonia	9/2019

Social History

Tobacco Use: None

Alcohol Consumption: None

Caffeine Consumption: 1-2 cups of coffee daily

Recreational Drug Use: None

Describe Diet: Not available

Describe Exercise: Limited

Relevant Social Determinants of Health: Not applicable

Vital Signs/Physical Assessment/Labs

	Results	Date
Height	6’0”	10/2/2019
Weight	212lb	10/2/2019
Blood Pressure	156/92mmHg 152/89mmHg 149/90mmHg 150/88mmHg	1/20/2020 12/27/2019 10/2/2019 9/17/2019
Heart Rate	64 66 70	12/27/2019 10/2/2019 9/17/2019
Respirations	15 20 48	12/27/2019 10/2/2019 9/17/2019
Temperature	WNL	

Patient Encounter Assessment:

1. Hypertension

The patient’s BP of 144/92 is not at goal according to the 2017 ACC/AHA guidelines (<130/80mmHg). The venlafaxine recently prescribed for the patient’s MDD may be elevating his BP readings.

2. Major Depressive Disorder

The patient’s symptoms are currently uncontrolled due to inadequate treatment duration. Patient declined to complete the patient health questionnaire-9 (PHQ-9) today. He may benefit from switching to a selective serotonin reuptake inhibitor (SSRI) that has a decreased risk of elevating BP.

3. Pain

The patient has been taking ibuprofen for any mild, acute pain. Ibuprofen increases the risk of bleeding in combination with apixaban and aspirin. Ibuprofen can also contribute to an increased BP.

4. Adherence

The patient currently has to visit the pharmacy a few times per month since his medication refills are not synced.

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
1/20/2020	Adverse reaction caused by drug (62014004)	Patient's blood pressure is currently uncontrolled potentially due to venlafaxine XR.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
1/20/2020	Recommendation to change medication (428711000124105))	Contact the patient's primary care physician to change venlafaxine XR to sertraline 50mg daily.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
1/20/2020	At risk of adverse drug interaction (714665000)	Ibuprofen can increase BP through sodium and water retention and increase the risk of bleeding with apixaban and aspirin.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
1/20/2020	Recommendation to discontinue over-the-counter medication (4801000124107)	Advise the patient to take acetaminophen instead of ibuprofen if he experiences any acute mild pain	Resolved

MRP Date	MRP Description/Code	MRP Note	MRP Status
1/20/2020	Noncompliance with medication regimen (129834002)	Potential for nonadherence due to MDD treatment being filled out of sync with other chronic medications.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
1/20/2020	Synchronization of repeat medication (415693003)	Patient enrolled in medication synchronization so that sertraline is filled with other chronic medications	Resolved

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
1/20/2020	Maintain BP goal of <130/80mmHg to decrease risk of HTN-related target organ damage	Active
1/20/2020	Reduction in MDD symptoms of hopelessness and apathy.	Active
1/20/2020	Take at least 2 BP readings at home 1 min apart in the morning before taking medications, measure and record, and bring log to all appointments	Active

Patient Encounter Plan:

1. Major Depressive Disorder

- Contact patient's prescriber to change venlafaxine XR to sertraline 50mg daily.
- Counsel patient on sertraline 50 mg as a new medication. Monitor for side effects (headache, N/V/D, insomnia, somnolence).
- Follow up with patient to determine if sertraline is improving MDD symptoms. Administer PHQ-9 on follow-up.

2. Hypertension

- Counsel patient on lifestyle modifications to encourage lowering of BP such as decreasing salt intake, increasing physical, and keeping a log of BP readings at home to bring to his doctor's appointment and to the pharmacy.
- Follow up with patient to determine if the switch from venlafaxine to sertraline has helped to decrease BP readings back to patient's baseline.

3. Pain

- Counsel the patient to take acetaminophen instead of ibuprofen for any acute mild pain he experiences at home.
- Follow up with patient to determine if acute pain is adequately treated with acetaminophen.

4. Nonadherence

- Patient enrolled in medication synchronization

Case Report 17: Jay Diaz (JD)

Setting Description

State: Massachusetts

Community Type: Urban

Prescription Volume per Week: 4000

Enhances Services Offered: Medication Therapy Management (MTM), Medication Reconciliation, Medication Adherence Packaging, Immunizations, Transitions of Care (ToC), Delivery Service, Hypertension Clinic, and Blood Pressure Monitoring

CPESN Member Pharmacy? No

If yes, which CPESN Network(s)? Not applicable

Patient Case Summary

Brief Summary

Patient was seen at a community pharmacy located within a healthcare center to receive MTM services and discuss the initiation of medication adherence packaging. Prior to the visit, the pharmacist conducted a thorough patient assessment by contacting all active pharmacies listed in the patient's electronic health record and evaluated the patient's past medical history. A medication reconciliation was conducted to assess adherence when it became evident that the patient was nonadherent to the current medication regimen. During the visit, blood pressure was also assessed and revealed that the patient was experiencing a hypertensive emergency related to the medication nonadherence. To address problems identified during visit, the patient was initiated on medication adherence packaging and was educated on proper disease management strategies. The patient was scheduled for a follow-up visit with the pharmacist after 2-4 weeks to reevaluate adherence and health condition status.

Value Expression Explanation

Potential Estimated Return on Investment: According to the 2018 annual report by the Health Care Cost Institute, the average emergency department (ED) visit costs $1,500 (Annual Health Care, 2018). Each ED visit poses the potential for a hospital admission, which averages $20,000 per stay, depending on the severity of the diagnosis, cost of resources utilized, and length of stay (Nationwide Inpatient Sample, 2017). Most ED visits are associated with exacerbations of poorly controlled chronic conditions, including chronic heart failure (CHF), diabetes (DM), chronic obstructive pulmonary disease (COPD), etc. Most chronic conditions can be well managed through less costly interventions, such as pharmacist-led medication management and routine doctor visits, which costs an average of $300 per visit. Early disease management education and medication management provided through pharmacist intervention could save a patient anywhere between $1,000 to $10,000 by minimizing the risk of ED visits and hospital admissions.

Personal value to patients/caregivers: The pharmacist is an accessible resource for this patient to receive effective education on their disease management. The patient's goal for this Medication Therapy Management session was to be initiated on medication adherence packaging to improve adherence. The patient is concerned about emergency room visits for hypertension, because he feels "it's a waste of time and money". In addition, this appointment brings attention to immunization and education on disease management to improve overall health and wellbeing. In this case, the pharmacist found the patient to be in a hypertensive emergency and referred the patient to same day care to see a physician.

Key Learnings for Community Pharmacy Practice from this Case Report

- Within the community pharmacy setting, pharmacists have the potential to build strong relationships with patients and make impactful interventions.
- MTM services allow pharmacists to identify barriers affecting adherence and medication-related problems, including inappropriate medication administration, lack of non-pharmacological interventions, immunization status, and misunderstanding of disease management, all of which contribute to improving patient health outcomes.

Patient Description

Patient Name: Jay Diaz (JD)
Age: 55
Race: Hispanic
Gender: Male
Sex: Male
Occupation: Unemployed
Living Arrangements/Family: Lives alone in an apartment
Health Insurance: Medicaid

Date of encounter: 7/9/2019
Encounter Type (Initial or Follow up): Follow-up (390906007)
Encounter Class (In person or Telephone encounter): In person (45701000124103)
Encounter Reason (See Summary for codes document): Medication Synchronization (415693003)

History of Present Illness

Patient's medication adherence packaging was discontinued prior to incarceration in January 2019. Medication reconciliation revealed medications have not been refilled since December 2018. Pharmacy refill records confirmed patient adherence prior to December 2018 through use of medication packaging. Medication history from county jail was unavailable for review. Patient presents to the pharmacy for medication reconciliation and requests re-initiation of medication packaging. Upon meeting, patient reports experiencing a headache for several days; however, he denies chest pain, swelling or blurred vision. Patient smells of cigarette smoke and reports smoking less than a pack per day. He reports shortness of breath (SOB) approximately 5 times per week and a frequent cough that occasionally wakes him up at night about once a week. Patient appears uncomfortable sitting in chair and prefers to stand due to chronic back pain.

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Hydrochlorothiazide	25mg	Hypertension	Take 1 tablet by mouth once daily	02/2015	Dr. Watson
Clonidine	0.1mg	Hypertension	Take 1 tablet by mouth every morning	05/2018	Dr. Watson
Clonidine	0.3mg	Hypertension	Take 1 tablet by mouth every evening at bedtime	05/2018	Dr. Watson
Losartan	50mg	Hypertension	Take 1 tablet by mouth once daily	01/2014	Dr. Watson
Metformin	1000mg	Type 2 Diabetes	Take 1 tablet by mouth twice daily	11/2015	Dr. Watson
Flovent HFA	100mcg	Asthma	Take 1 puff by mouth twice daily	05/2017	Dr. Watson
ProAir HFA	90mcg	Asthma	Inhale 2 puffs by mouth every 4 to 6 hours as needed for shortness of breath	06/2011	Dr. Watson

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber
Not applicable					

Allergies and Alerts

Medication Allergies: Lisinopril (Dry Cough; unaware of time), Penicillin (hives; unaware of timing)

Adverse reactions to drugs in the past: Clonidine – drowsiness

Other Alerts/Health Aids/Special Needs: None

Immunization History

Immunization	Date(s) Administered
Influenza	10/15/2018

Current Medical History/Problem List

Medical Condition	Date/Year of Diagnosis
Asthma	05/1992
Hypertension	01/2012
Type 2 Diabetes	2001

Prescription Fill History

Medications synchronized? No

If yes, last sync fill date: Not applicable

Pertinent gaps in refill history: Medications have not been refilled in 6 months due to incarceration from January to June 2019. Patient was previously adherent to refilling medication packaging prior to December 2018.

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation
Lisinopril	HTN	2012	2014	Adverse Reaction – Dry Cough

Past Medical History

Medical condition or recent hospitalization	Date
Not applicable	

Social History

Tobacco Use: 1-3 cigarettes/day (duration unknown)

Alcohol Consumption: Denies alcohol use

Caffeine Consumption: Reports 1-2 cups of caffeine per day

Recreational Drug Use: Denies recreational drugs use

Describe Diet: Patient cooks for himself and reports a consistent diet. Breakfast consists of eggs and toast. For lunch, he reports eating leftovers or making a sandwich with chips. For dinner, he reports eating a meal consisting of a protein and vegetables. He reports minimizing the amount of pasta and carbohydrates consumed daily. Reports using "a lot" of salt when cooking meals. Drinks about 2 cans of soda per day.

Describe Exercise: Denies exercise. Reports he has difficulty exercising due to back pain.

Relevant Social Determinants of Health: Patient lives alone in an apartment. Recently released from the county jail and is currently unemployed. Reports hardship finding employment due to back pain and mobility limitations.

Vital Signs/Physical Assessment/Labs

	Results	Date
Height	70 in	7/5/2019
Weight	190 lbs	7/5/2019
Blood Pressure	184/100 mmHg 148/92 mmHg 128/88 mmHg	7/9/2019 7/5/2019 11/2/2018
Heart Rate	86 bpm	7/5/2019
Respirations	N/A	
Temperature	N/A	
	A1C = 9% BG = 303 mg/dL LDL = 100 mg/dL HDL = 45 mg/dL TRI = 190 mg/dL	7/5/19 7/5/19 6/2016 6/2016 6/2016

Patient Encounter Assessment:

1. Hypertension

At the last MTM visit on 11/2/18, patient's BP was at goal (< 130/80mmHg per AHA guidelines). Today, BP is above goal at 184/100 mmHg, and with patient's complaint of headache, this classifies as a hypertensive emergency, warranting referral to the emergency department (ED).

2. Diabetes

Patient has a past medical history of uncontrolled type 2 diabetes, most recent A1C of 9%, and is not performing self-monitoring of blood glucose (Goal A1C < 7% per ADA guidelines). Patient's calculated ASCVD risk is 27.4%, indicating the need for a high-intensity statin.

3. Asthma

Due to a lack of disease knowledge and adherence, asthma is poorly controlled with patient reporting shortness of breath upon exertion approximately 5 times per week, frequent coughing, and nighttime awakenings > 2 times per month (NAEPP/NHLBI).

4. Smoking cessation

Risk reduction strategies such as smoking cessation and lifestyle modifications have not been implemented.

5. Nonadherence

Recently incarcerated for the past 6 months and is nonadherent with medication regimen. Patient reports having difficulty remembering to take medications and requests initiation of medication adherence packaging.

6. Immunizations

Last, patient is not up to date on adult immunizations for an adult over the age of 50, reporting only receiving the influenza vaccine (ACIP/CDC).

Medication Related Problems (MRPs) and Interventions

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/9/2019	Noncompliance with Medication regimen (129834002)	Patient was previously on medication adherence packaging but was discontinued once incarcerated. Reports difficulty remembering which medications he has already taken.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/9/2019	Synchronization of repeat medications (415693003)	Patient enrolled in medication adherence packaging; all medications will be prepackaged by a pharmacist each month. The pharmacy will assist patient in receiving refills.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/9/2019	Deficient knowledge of disease processes (129864005)	Upon examination, patient's BP was 184/100 mmHg with complaint of a headache. Patient refused same day care for fear of potential ED visit. Patient unaware of severity of high BP or hypertensive emergency.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/9/2019	Hypertension education (39155009)	Educated the patient on the importance of maintaining a controlled blood pressure. Educated him that hypertension can increase the risk for heart failure, stroke and other complications. Discussed the signs and symptoms of a hypertensive emergency, including a blood pressure of >180/110 mmHg along with symptoms of blurred vision, headache, chest pain, etc. Identified BP goal of <130/80 mmHg.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/9/2019	Deficient knowledge of medication regimen (129866007)	Patient reports taking BP medications in the morning, except losartan which is taken at bedtime. Denies taking clonidine due to patient reported side effect.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/9/2019	Hypertension Medication Review (473225006)	Discussed each hypertension medication. Advised patient that the morning dose of clonidine is a reduced dose to minimize risk of side effects. Patient previously had controlled BP. Recommended to provider to reassess BP medications once patient has been adherent with medication adherence packaging.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/9/2019	Cooks for himself (162542007)	Reports cooking for himself but adding salt to all meals.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/9/2019	Low salt diet education (183063000)	Educated patient that excessive salt intake can negatively impact BP. Recommended patient minimize salt intake to 1500mg a day, about ½ of a teaspoon and incorporate recipes from the DASH diet.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/9/2019	Uses medication less than prescribed (448176008)	Patient reports experiencing SOB about 5x/week. Reports using both ProAir and Flovent as needed for SOB.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/9/2019	Medication administration education (396074002)	Educated patient on the difference between Flovent and ProAir by addressing the dosing schedules. Explained that Flovent is used as a maintenance inhaler to prevent SOB while ProAir is used as a rescue inhaler to treat SOB. Encouraged patient to only use ProAir when experiencing difficulty breathing. Advised patient to contact MD if using ProAir more frequently as this may indicate a dose change of maintenance inhaler is needed.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/9/2019	Hemoglobin A1C between 7-10% indicating borderline diabetic control (165680008)	Patient found to have an A1C of 9% per the Electronic Health Record.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/9/2019	Recommendation to start prescription medication (428821000124100)	Assess adherence and may recommended addition of Trulicity 0.75 mcg SubQ once weekly, per ADA Diabetes Standard of Care. Additional medication should be added for an A1C goal of <7%. GLP-1 agonist is a once weekly injection with CV benefits and no weight gain.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/9/2019	Blood Glucose Abnormal (166922008)	Patient had a random BG of 303 mg/dL. Patient does not use his blood glucose monitoring device to monitor blood sugars.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/9/2019	Blood Glucose Monitoring (698472009)	Advised patient to test 4x/day before breakfast, lunch, dinner, and bedtime. Educated patient on goal BG levels; fasting blood glucose of 80-130 mg/dL and 2-hr post prandial of <180 mg/dL, per ADA guidelines.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/9/2019	Additional medication therapy required (428981000124101)	Patient has a PMH of T2DM. Per the 2019 ACC/AHA cholesterol guidelines, all patients 40-75 years old with T2DM should be prescribed a moderate or high intensity statin to reduce CVD risk.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/9/2019	Recommendation to start prescription medication (428821000124109)	Patient has an ASCVD risk of 27.4%, which indicates that use of a high intensity statin is appropriate. Recommended addition of Atorvastatin 40 mg once daily to his provider. Provider sent prescription for Atorvastatin 40 mg once daily on 7/10/19.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/9/2019	Light cigarette smoker (1-9 cig/day) 160603005	Patient smokes 1-3 cigarettes per day with a history of asthma and increased SOB.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/9/2019	Smoking Cessation education (225323000	Educated patient that smoking can increase the frequency of SOB and the risk of developing serious complications, including ulcers, neuropathy, and increased blood pressure. Readiness was assessed and smoking cessation options were reviewed; patient is not ready to quit smoking. Will reassess readiness to quit at next visit.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/9/2019	Exercise physically impossible (160629005)	Patient reports chronic back pain, which limits his ability to exercise and work.	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/9/2019	Recommendation to start over-the-counter medication (4811000124105)	Recommended use of acetaminophen 650 mg every 6 hours as need for pain. Advised patient to limit intake to 3 grams per day. If acetaminophen does not control pain refer to a provider for better pain control.	Active

MRP Date	MRP Description/Code	MRP Note	MRP Status
7/9/2019	Not up to date with immunizations (171259000)	Patient's vaccine history includes Influenza on 10/15/18	Active
Intervention Date	**Intervention Description/Code**	**Intervention Note**	**Intervention Status**
7/9/2019	Immunization status screening (268558004)	Per CDC guidelines, patient would benefit from administration of Shingrix since he is above the age of 50 and Pneumovax 23 due to his history of diabetes, asthma and smoking. Patient may also be a candidate for Tdap and Hepatitis B vaccination.	Active

Patient-Centered Goals

Goal Date	Goal Note	Goal Status
7/9/2019	Take medication every day as prescribed using the medication packaging system to improve adherence.	Active
7/9/2019	Keep a log of blood pressure readings, blood sugar levels and number of nighttime awakenings due to cough. Report these to the pharmacist and alert the physician of any abnormal findings.	Active
7/9/2019	Follow-up with pharmacist to receive Shingrix and Pneumovax 23 vaccines.	Active

Patient Encounter Plan:

1. Hypertension

During follow-up visit, blood pressure logs will be assessed to verify improvement in conditions and identify any new medication-related problems or barriers. Lifestyle modifications, including a low salt, DASH diet and exercise to be reinforced and discussed at every visit.

2. Diabetes

During follow-up visit, blood glucose logs will be assessed to verify improvement in conditions and identify any new medication-related problems or barriers. Discuss with prescriber the initiation of high-intensity statin.

3. Asthma

Changes in frequency of shortness of breath, coughing and nighttime awakenings will also be evaluated, and proper inhaler use will be assessed at follow-up, if there are no noted changes in symptoms.

4. Smoking Cessation

Readiness for change with quitting smoking to be assessed at follow-up visit and provide education/support to match his stage.

5. Immunizations

Adult immunizations to be administered; the first dose of Shingrix, with a booster at 2-6 months, in addition to the Pneumovax 23 vaccine, with a booster in 5 years.

6. Nonadherence

Patient requires a follow-up visit with the pharmacist in 2-4 weeks to ensure medication adherence has improved since initiating medication packaging. Pharmacy will continue to monitor refills and contact the patient to initiate refills each month.

REFERENCES:

American Diabetes Association. Standards of medical care in diabetes – 2020. *Diabetes Care*. 2020;43(Suppl1):S1-S212.

Bhatt DL, Cryer BL, Contant CF, et al. Clopidogrel with or without omeprazole in coronary artery disease. *N Engl J Med*. 2010;363(20):1909-1917.

Centers for Medicare and Medicaid Services (CMS). https://data.medicare.gov/Hospital-Compare/Payment-National/ygty-mm5a (accessed 2020 Apr 23).

Cipolle RJ, Strand LM, Morley PC. Pharmaceutical care practice: the patient centered approach to medication management. 3rd ed. New York: McGraw-Hill; 2012.

Clinical Practice Guideline Treating Tobacco Use and Dependence 2008 Update Panel, Liaisons, and Staff. A clinical practice guideline for treating tobacco use and dependence: 2008 update. *Am J Prev Med*. 2008;35(2):158-176.

Doucette WR, McDonough RP, Herald F, et al. Pharmacy performance while providing continuous medication monitoring. *J Am Pharm Assoc*. 2003; 57(6):692-697.

Evanchan J, Donnally MR, Binkley P, Mazzaferri E. Recurrence of acute myocardial infarction in patients discharged on clopidogrel and a proton pump inhibitor after stent placement for acute myocardial infarction. *Clin Cardiol*. 2010;33(3):168-171.

Fernandez MM, Hogue S, Preblick R, Kwong WJ. Review of the cost of venous thromboembolism. *Clinicoecon Outcomes Res*. 2015 Aug;7:451-462.

Flip the Pharmacy. Change Package January 2020. www.flipthepharmacy.com/change-packages (accessed 2020 Feb 5)

Gaglia MA Jr, Torguson R, Hanna N, et al. Relation of proton pump inhibitor use after percutaneous coronary intervention with drug-eluting stents to outcomes. *Am J Cardiol*. 2010;105(6):833-838.

Garvin E. HMS' Jennifer Forster Talks Leveraging Social Determinants of Health to Improve Population Health Outcomes. HIT Consultant (2014). https://hitconsultant.net/2018/10/03/social-determinants-of-health-phm-outcomes/#.X6nnt1BOnZs.

Global Initiative for Chronic Obstructive Lung Disease. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease (2020). https://goldcopd.org/wp-content/uploads/2019/12/GOLD-2020-FINAL-ver1.2-03Dec19WMV.pdf (accessed 2020 May 20).

Grundy SM, Stone NJ, Bailey AL, et al. 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the management of blood cholesterol: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation*. 2019;139(25):e1082-e1143.

Guarasico A, et al. The clinical and economic burden of chronic obstructive pulmonary disease in the USA. *Clinicoecon Outcomes Res*. 2013 Jun;5:235-45.

Gupta E, Bansal D, Sotos J, Olden K. Risk of adverse clinical outcomes with concomitant use of clopidogrel and proton pump inhibitors following percutaneous coronary intervention. *Dig Dis Sci*. 2010;55(7):1964-1968.

Health Care Cost Institute. Annual Health Care Cost and Utilization Report. 2018. https://healthcostinstitute.org/health-care-cost-and-utilization-report/annual-reports (accessed 2020 May 6).

Ho PM, Maddox TM, Wang L, et al. Risk of adverse outcomes associated with concomitant use of clopidogrel and proton pump inhibitors following acute coronary syndrome. *JAMA*. 2009;301(9):937-944.

Joint Commission of Pharmacy Practitioners. Pharmacists' Patient Care Process (2014). https://jcpp.net/wp-content/uploads/2016/03/PatientCareProcess-with-supporting-organizations.pdf.

Juurlink DN, Gomes T, Ko DT, et al. A population-based study of the drug interaction between proton pump inhibitors and clopidogrel. *CMAJ*. 2009;180(7):713-718.

Khuu D, Eberhard ML, Bristow BN, et al. Economic impact of malaria-related hospitalizations in the United States, 2000–2014. *J Infect Public Health*. 2018;12(3):424-433.

Kirkland EB, Heincelman M, Bishu KG, et al. Trends in healthcare expenditures among US adults with hypertension: National estimates, 2003-2014. *J Am Heart Assoc*. 2018;11(7).

Lexicomp Online [online database]. Hudson, OH: Wolters Kluwer. http://online.lexi.com.ezproxy.findlay.edu:2048/lco/action/home (accessed 2020 May 20).

Lloyd JT, Maresh S, Powers CA, et al. How Much Does Medication Nonadherence Cost the Medicare Fee-for-Service Program? *Med Care*. 2019;57(3):218-224.

McLaughlin J, McGinnis J, Tan L, et al. Estimated Human and Economic Burden of Four Major Adult Vaccine-Preventable Diseases in the United States, 2013. *J Prim Prev*. 2015;36(4):259-73.

Medication therapy management in pharmacy practice: core elements of an MTM service model. Version 2.0. American Pharmacists Association; National Association of Chain Drug Stores Foundation. Academy of Managed Care Pharmacy (2008). https://www.amcp.org/sites/default/files/2019-03/Core%20Elements%20-%20MTM%20including%20AMCP%20endorsement.pdf (accessed 2020 Aug 21).

Murray MD, Ritchey ME, Wu J, Tu W. Effect of a Pharmacist on Adverse Drug Events and Medication Errors in Outpatients with Cardiovascular Disease. *Arch Intern Med*. 2009;169(8):757-763.

Nationwide Inpatient Sample (NIS) Redesign Final Report. Healthcare Cost and Utilization Project (2017). https://www.hcup-us.ahrq.gov/db/nation/nis/nisrelatedreports.jsp (accessed 2020 May 6).

Ndosi M, Lewis M, Hale C, et al. The outcome and cost-effectiveness of nurse-led care in people with rheumatoid arthritis: a multicentre randomised controlled trial. *Ann Rheum Dis*. 2014;73(11):1975-1982.

Ni W, Colayco D, Hashimoto J, et al. Impact of a pharmacy-based transitional care program on hospital readmissions. *Am J Manag Care*. 2017;23(3):170-176.

Ni W, Colayco D, Hashimoto J, et al. Reduction of Healthcare Costs through a Transitions-of-Care Program. *Am J Health Syst Pharm*. 2018;75(10):613-621.

O'Donoghue ML, Braunwald E, Antman EM, et al. Pharmacodynamic effect and clinical efficacy of clopidogrel and prasugrel with or without a proton-pump inhibitor: an analysis of two randomised trials. *Lancet*. 2009;374(9694):989-997.

Pellegrin KL, Krenk L, Oakes SJ, et al. Reductions in Medication-Related Hospitalizations in Older Adults with Medication Management by Hospital and Community Pharmacists: A Quasi-experimental study. *J Am Geriatr Soc*. 2017;65(1):212-219.

Pezalla E, Day D, Pulliadath I. Initial assessment of clinical impact of a drug interaction between clopidogrel and proton pump inhibitors. *J Am Coll Cardiol*. 2008;52(12):1038-1039.

Primdahl J, Sørensen J, Horn HC, et al. Shared care or nursing consultations as an alternative to rheumatologist follow-up for rheumatoid arthritis outpatients with low disease activity—patient outcomes from a 2-year, randomised controlled trial. *Ann Rheum Dis*. 2014;73(2):357-364.

Pringle J, Boyer A, Conklin M, et al. The Pennsylvania project: pharmacist intervention improved medication adherence and reduced health care costs. *Health Affairs*. 2014;33(8):1444-1452.

Pruitt Z, Emechebe N, Quast T, et al. Expenditure Reductions Associated with a Social Service Referral Program. *Popul Health Manag*. 2018;21(6):469-476.

Putri WCWS, Muscatello DJ, Stockwell MS, Newall AT. Economic burden of seasonal influenza in the United States. *Vaccine*. 2018;36(27):3960-3966.

Ray WA, Murray KT, Griffin MR, et al. Outcomes with concurrent use of clopidogrel and proton-pump inhibitors: a cohort study. *Ann Intern Med.* 2010;152(6):337-345.

Taylor AL, Ziesche S, Yancy C, et al. Combination of isosorbide dinitrate and hydralazine in blacks with heart failure. *N Engl J Med*. 2004;351:2049-2057.

Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Hypertension*. 2018;71(6):e13-e115.

Wiviott SD, Raz I, Bonaca MP, et al. Dapagliflozin and cardiovascular outcomes in type 2 diabetes. *N Engl J Med.* 2019; 380:347-357.

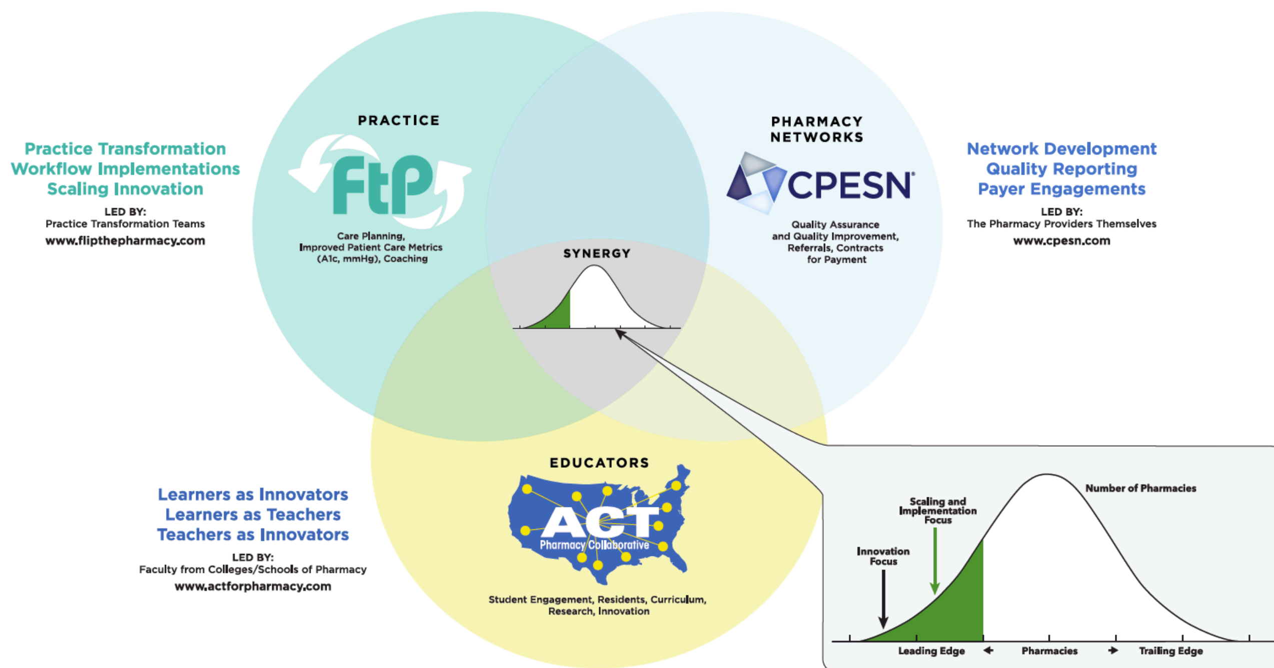
Yancy CW, Jessup M, Bozkurt B, et al. 2017 ACC/AHA/HFSA Focused update of the 2013 ACCF/AHA guideline for the management of heart failure: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Failure Society of America. *Circulation*. 2017;136(6):e137-e161.

Zairis MN, Tsiaousis GZ, Patsourakos NG, et al. The impact of treatment with omeprazole on the effectiveness of clopidogrel drug therapy during the first year after successful coronary stenting. *Can J Cardiol*. 2010;26(2):e54-e57.

Appendices

Appendix 1: Glossary of Terms

The following appendix is a supplement for further explanation on core concepts in the Academia-CPESN Transformation (ACT) Patient Casebook.



Core Concepts / Practice Transformation Movements:

- **CPESN:** CPESN USA is a clinically integrated network of community pharmacies that coordinates patient care with broader care teams to provide medication optimization activities and enhanced services for high-risk patients. More information can be found at: https://www.cpesn.com/.
- **Flip the Pharmacy (FtP):** Practice transformation initiative that empowers pharmacy networks to facilitate incremental change through practice through scaled enhanced service changes. More information can be found at: https://www.flipthepharmacy.com/.
- **Academia-CPESN Transformation (ACT) Pharmacy Collaborative:** An operational learning collaborative between colleges/schools of pharmacy and established clinically integrated networks of community-based pharmacies. Through the ACT Pharmacy Collaborative, connect with local CPESN pharmacies and networks to collaborate and advance practice transformation efforts. More information can be found at: www.actforpharmacy.com.
- **Pharmacist eCare Plan Initative (PeCP):** The PeCP is an interoperable standard that allows for pharmacy technology providers to have a common method of exchanging information related to care delivery, including patient goals, health concerns, active medication list, drug therapy problems, laboratory results, vitals, payer information and billing for services. More information can be found at: www.ecareplaninitiative.com.
- **ACT Patient Casebook:** Colleges/schools of pharmacy are encouraged to use this casebook in their curriculum to demonstrate enhanced patient care provided by pharmacists and student pharmacists in community pharmacies. These cases integrate the PeCP standard and demonstrate value within the health care system.[1]

Core Concept	Term	Definition
ACT Patient Casebook	Case Report	➢ Scientific reports documenting an individual patient scenario. Reports in this case book are written to document a common clinical presentation, treatment approach, adverse effect, and response to treatment. Designed as a great learning opportunity for both pharmacists and pharmacy students to understand a case progression and the unconventional response and effects of medications.
	Systematized Nomenclature of Medicine--Clinical Terms (SNOMED-CT)	➢ Enables the consistent, processable representation of clinical content in electronic health records.
	Encounter Type	➢ Initial or follow up classification
	Encounter Reason	➢ Method of patient encounter: in person or telephone
	MRP Description/Code	➢ SNOMED CT CODE related to medication related problem
	Intervention Description/Code	➢ SNOMED CT CODE related to medication related intervention
CPESN	Enhanced Services[2]	➢ Services that transcend conventional requirements of an outpatient pharmacy program contract that are focused on improving clinical and global patient outcomes. o Examples include: home delivery with patients status review, medication synchronization with clinical review, and adherence packaging with patient coaching o Services address the unique medication use needs of complex patients, thereby helping them achieve the best possible results from medication use.
CPESN	CPESN Member Pharmacy[3]	➢ A participating member pharmacy agrees to support medication optimization by offering the minimum set of enhanced pharmacy services that improve patient health outcomes. An agreement with CPESN USA and a local chapter is required. The list of minimum enhanced services includes: o <u>Face-to-Face Access:</u> Providing each patient receiving a dispensed medication from the participating pharmacy ready access to unscheduled face-to-face meeting(s) with a pharmacist employed by the participating CPESN pharmacy during operational hours o <u>Medication Reconciliation:</u> Comparing a patient's medication orders to all of the medications the patient has been taking to avoid medication errors during care transitions when they are vulnerable to medication errors o <u>Clinical Medication Synchronization:</u> Aligning a patient's routine refills to be filled at the same time each month and in conjunction pharmacist's clinical disease state management and monitoring, to progress toward desired therapeutic goals o <u>Immunizations:</u> Screening patients for ACIP recommended immunizations, educating patients about needed immunizations, and providing immunizations or referring to other health care providers o <u>Comprehensive Medication Reviews:</u> Providing a systemic assessment of medications to identify medication-related problems, prioritize those problems, and create a patient-

		specific plan to resolve them working with the extended healthcare team ○ **Personal Medication Record:** Creating a comprehensive list of current patient medications manually or from dispensing software
	Medication synchronization[4]	➢ A program aligning a patient's routine medications to be filled at the same time each month, or every 4 weeks as scheduled. The pharmacists will provide clinical medication management and monitoring for progression toward desired therapeutic goals during the patient appointment at time of medication pick-up or delivery.
Other	Social Determinants of Health (SDOH)	➢ *(WHO)* Social determinants of health are the conditions in which people are born, grow, live, work and age. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels. The social determinants of health are mostly responsible for health inequities – the unfair and avoidable differences in health status seen within and between countries.[5] ➢ (CDC) Social determinants of health are conditions in the places where people live, learn, work, and play that affect a wide range of health and quality-of life-risks and outcomes.[6]

REFERENCES:

1. Gandhi N, Baker, CML, Howland J, Ragucci K. PioneerRx Pharmacist eCare Plan Workgroup. *Am J Pharm Educ.* 2020; 84(10): ajpe8396.
2. CPESN. What is CPESN? https://cpesn.com/what-is-cpesn/ (accessed 2020 Nov 5).
3. CPESN. Services available from CPESN Network Pharmacies. https://cpesn.com/payors/services-available-from-cpesn-network-pharmacies/ (accessed 2020 Nov 5).
4. From Chapter Contract, CPESN of Upstate NY (updated 2018 Jan 20) (accessed 2020 Nov 5).
5. World Health Organization (WHO). Social Determinants of Health. https://www.who.int/social_determinants/sdh_definition/en (accessed 2020 Nov 5).
6. Centers for Disease Control and Prevention (CDC). Social Determinants of Health: Know What Affects Health. https://www.cdc.gov/socialdeterminants/index.htm (accessed 2020 Nov 5).

Appendix 2: Glossary of Abbreviations

AA: African American
ACEi: Angiotensin Converting Enzyme Inhibitor
Afib: Atrial Fibrillation
APPE: Advanced Pharmacy Practice Experience
ARB: Angiotensin II Receptor Blocker
ASCVD: Atherosclerotic Cardiovascular Disease
BMI: Body Mass Index
BMP: Basic Metabolic Panel
BP: Blood Pressure
CAD: Coronary Artery Disease
CCM: Chronic care Management
CHF: Congestive Heart Failure
CMR: Comprehensive Medication Review
COPD: Chronic Obstructive Pulmonary Disease
DASH: Dietary Approaches to Stop Hypertension
DMARD: Disease-Modifying Antirheumatic Drug
DME: Durable Medical Equipment
DSME/DSMES: Diabetes Self Management Education, Diabetes Self Management Education and Support
DVT: Deep vein thrombosis
ED: Emergency Department
EKG: Electrocardiogram
FBG: Fasting Blood Glucose
FEV_1: Forced Expiratory Volume
GERD: Gastroesophageal Reflux Disease
GI: Gastrointestinal
HCTZ: Hydrochlorothiazide
HIV: Human Immunodeficiency Virus
HLD: Hyperlipidemia
HPV: Human Papillomavirus
HR: Heart Rate
HRQoL: Health-Related Quality of Life
HTN: Hypertension
ICS: Inhaled Corticosteroid
INR: International Normalized Ratio
MDD: Major Depressive Disorder
MHD: Month Headache Days
MI: Myocardial Infarction
MMD: Monthly Migraine Days
MMPR: Mean Medication Possession Ratio
MTM: Medication Therapy Management
NKDA: No Known Drug Allergies
NSAID: Nonsteroidal Anti-Inflammatory Drug
NTE: Not to Exceed
N/V/D: Nausea, Vomiting, Diarrhea
OA: Osteoarthritis
OB/GYN: Obstetrician/Gynecologist
OTC: Over-the-Counter
PCI: Percutaneous Coronary Intervention
PCOS: Polycystic Ovary Syndrome
PCP: Primary Care Physician
PCV13: Prevnar 13
PDC: Proportion of Days Covered
PE: Pulmonary Embolism
PHQ-9: Patient Health Questionnaire-9
PMH: Past Medical History
PMR: Personal Medication Record
PPD: Packs Per Day
PPSV23: Pneumovax 23
RA: Rheumatoid Arthritis
SABA: Short Acting Beta Agonist
SC: Subcutaneous
SDoH: Social Determinants of Health
SLE: Systemic Lupus Erythematosus
SMBG: Self-Monitoring Blood Glucose
SOB: Shortness of Breath
SSRI: Selective Serotonin Reuptake Inhibitor
T2DM: Type 2 Diabetes Mellitus
ToC: Transitions of Care
WNL: Within Normal Limits

Appendix 3: Blank Case Report Template

Case Report Template

Setting Description

State:

Community Type (highlight one): Rural Suburban Urban

Prescription Volume per Week:

Enhances Services Offered:

CPESN Member Pharmacy? (highlight one) YES NO

If yes, which CPESN Network(s)?

Patient Case Summary

Brief Summary

Value Expression Explanation

Return on Investment:

Personal value to patients/caregivers:

Key Learnings for Community Pharmacy Practice from this Case Report

Patient Description

Title of Patient Case:
(can be creative patient name or topic)

Age:

Race:

Gender:

Sex:

Occupation:

Living Arrangements/Family:

Health Insurance (coverage type and any issues):

Date of encounter:
Encounter Type (Initial or Follow up):
Encounter Class (In person or Telephone encounter):
Encounter Reason (See Summary for codes document):

History of Present Illness

Active Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber

Active Non-Prescription Medications

Drug	Strength	Indication	Directions	Start Date	Prescriber

Allergies and Alerts

Medication Allergies (drug, timing, reaction):
Adverse reactions to drugs in the past:
Other Alerts/Health Aids/Special Needs (sight, hearing, mobility, literacy, disability):

Immunization History (relevant to patient age and health status)

Immunization	Date(s) Administered

Current Medical History/Problem List (list current medical conditions)

Medical Condition	Date/Year of Diagnosis

Prescription Fill History

Medications synchronized (highlight one)? YES NO

If yes, last sync fill date:

Pertinent gaps in refill history:

Past Medications

Drug	Indication	Start Date	Stop Date	Reason for Discontinuation

Past Medical History (relevant illness, hospitalization, procedures, etc.)

Medical condition or recent hospitalization	Date

Social History

Tobacco Use:

Alcohol Consumption:

Caffeine Consumption:

Recreational Drug Use:

Describe Diet:

Describe Exercise:

Relevant Social Determinants of Health:

Vital Signs/Physical Assessment/Labs

	Results	Date
Height		
Weight		
Blood Pressure		
Heart Rate		
Respirations		
Temperature		
Other		

Patient Encounter Assessment:

Medication Related Problems (MRPs) and Interventions

(For all MRP and Intervention Descriptions/Codes and Statuses, see the Summary for codes document and CPESN SNOMED Code Guide. **Please use FHIR Status options for MRP Status and Intervention Status: active, recurrence, relapse, inactive, remission, or resolved)

MRP Date	MRP Description/Code	MRP Note	MRP Status
Intervention Date	Intervention Description/Code	Intervention Note	Intervention Status

MRP Date	MRP Description/Code	MRP Note	MRP Status
Intervention Date	Intervention Description/Code	Intervention Note	Intervention Status

MRP Date	MRP Description/Code	MRP Note	MRP Status
Intervention Date	Intervention Description/Code	Intervention Note	Intervention Status

Patient-Centered Goals

Goal Date	Goal Note	Goal Status

Patient Encounter Plan:

REFERENCES:

1. Cipolle RJ, Strand LM, Morley PC. Pharmaceutical care practice: the patient centered approach to medication management. 3rd ed. New York: McGraw-Hill; 2012.
2. Flip the Pharmacy. Change Package January 2020. www.flipthepharmacy.com/change-packages (accessed 2020 Feb 5).
3. Joint Commission of Pharmacy Practitioners. Pharmacists' Patient Care Process (2014). https://jcpp.net/wp-content/uploads/2016/03/PatientCareProcess-with-supporting-organizations.pdf.

Learn more about the ACT Pharmacy Collaborative at: **www.actforpharmacy.com**

The ACT Pharmacy Collaborative is supported by grant funding to the University of Pittsburgh from the Community Pharmacy Foundation. ACT Pharmacy Collaborative partners include CPESN USA and AACP. The work of the Collaborative is guided by a task force of AACP Faculty Appointees and CPESN USA Luminary Appointees.

Appendix 4

eCare Plan Documentation Guide for Commonly Used Medication Related Problems and Interventions: SNOMED CT Codes

Medication Related **Problem**	SNOMED CT Code	Medication Related **Intervention**	SNOMED CT Code
Noncompliance with medication regimen (finding)	129834002	Medication change to generic	407611006
		Medication therapy changed	432701000124107
Detailed Reasons for Noncompliance:		Medication dosage form changed	432841000124102
Uses less medication than prescribed	448176008	Medication education	967006
		Synchronization of repeat medication	415693003
Patient unable to obtain medication	429611000124105	Assessment of barriers to adherence	710838003
		Monitoring adherence to medication regimen	713116003
Patient refuses to take medication	432401000124102	Assessment of adherence to medication regimen	410122002
		Medication regimen compliance education	410123007
Patient misunderstood treatment instructions	182891003	Renewal of prescription	103742009
		Drug therapy discontinued	274512008
Patient does not understand why taking all medication	408364003	Discussed with doctor	394696007
		Discussed with patient	395085009
Patient forgets to take medication	408367005	Synchronization of repeat medication	415693003
		Education about medication regimen adherence	410123007
Cost effective medication alternatives available	448151007	Medication change to generic	407611006
		Medication therapy changed	432701000124107
		Drug therapy discontinued	274512008
		Recommendation to discontinue medication	4701000124104
Adverse medication interaction with medication	448178009	Medication therapy changed	432701000124107
		Medication dose changed	432751000124106
		Drug therapy discontinued	274512008
		Recommendation to change medication	428711000124105
		Medication interaction education	698603008
		Discussed with doctor	394696007
		Discussed with patient	395085009
Medication Overuse	429611000124105	Medication Education	967006
		Discussed with doctor	394696007
Patient unable to obtain medication [e.g., prior auth needed or patient needs refills]		Insurance authorization	386336002
		Discussed with doctor	394696007
Drug allergy		Discussed with doctor	394696007
		Discussed with patient	395085009
		Recommendation to change medication	428711000124105
Medication therapy unnecessary	429621000124102	Drug therapy discontinued	274512008
		Recommendation to discontinue medication	4701000124104
		Recommendation to change medication	428711000124105
		Discussed with doctor	394696007
		Discussed with patient	395085009

Updated 10/21/2019

Medication Related **Problem**	SNOMED CT Code	Medication Related **Intervention**	SNOMED CT Code
Additional medication therapy required	428981000124101	Over-the-counter medication started	432851000124100
		Prescription medication started (situation)	432861000124103
New medication needed for condition	436071000124104	Recommendation to start prescription medication	428821000124109
		Discussed with patient	395085009
		Discussed with doctor	394696007
Medication not effective	435501000124106	Medication therapy changed	432701000124107
		Drug therapy discontinued	274512008
		Medication dosage form changed	432841000124102
		Recommendation to discontinue medication	4701000124104
		Discussed with doctor	394696007
Medication dosage too low	448152000	Medication therapy changed	432701000124107
		Medication course duration changed	432811000124101
		Medication dose changed	432751000124106
		Medication dose increased	432761000124108
		Medication dosing interval changed	432781000124103
		Medication education	967006
		Prescribed medication education	386465007
		Discussed with doctor	394696007
Medication dosage too high	448089004	Medication course duration changed	432811000124101
		Medication dose changed	432751000124106
		Medication dosing interval changed	432781000124103
		Drug therapy discontinued	274512008
		Recommendation to discontinue medication	4701000124104
		Discussed with doctor	394696007
Not up to date with immunizations (finding) - Problem observation	171259000	Administration of substance to produce immunity, either active or passive	127785005
		Influenza vaccination	86198006
		Pneumococcal vaccination	12866006
		Vaccine refused by parent	921000119109
		Vaccine refused by patient	591000119102
		Immunization status screening	268558004
		Immunization education	171044003
Other Common Medication Related **Interventions**			
		Medication Related **Intervention**	SNOMED CT Code
		Medication Reconciliation	430193006
		Medication Monitoring	395170001
		Comprehensive medication therapy review	428911000124108
		Risk evaluation and mitigation strategy consultation	6061000124109
		Discussed with carer	395084008

Updated 10/21/2019