Primary Care Patient Case Example

Chief Complaint (CC): K.G. presents to your clinic for a follow-up. You work in an interprofessional clinic with physicians. He has no complaints today.

History of the Present Illness (HPI): K.G. is a 55-year-old white man who was given a diagnosis of hypertension (HTN) 6 months ago by his family physician. At that time, his physician recommended dietary modifications and an exercise regimen. K.G. generally adhered to the lifestyle changes, losing 20 lb in 3 months, yet his BP continued to be elevated. At that time, his physician initiated lisinopril 10 mg once daily. At his physician visit today, you are consulted about his persistently elevated BP readings and are asked to see the patient. K.G. also expresses interest in quitting smoking.

Medical History:

Disease:

HTN x 6 months

Osteoarthritis (OA) of knee x 2 years

Surgical:

None

Medication History:

Allergies/Intolerances: No known drug allergies (NKDA)

Immunization History: Up-to-date

Current Medications:

Start	Medication	Strength (mg)	Sig	Indication	Comments
2 years ago	Ibuprofen (Motrin)	400	1 tablet po q6h prn pain	OA	Taking 2 tablets one to three times/day for 2 years
3 months ago	Lisinopril	10	1 tablet po once daily	HTN	

Family History:

Father: Living; acute myocardial infarction (MI) at age 55

Mother: Died of breast cancer at age 55

Children: No health problems

Social History:

Tobacco: Has smoked 1 pack/day x 30 years

Alcohol: Denies alcohol use

Diet: Low fat/low sodium/high fiber

Exercise: 30 minutes/day, three times/week

Review of Systems (ROS):

Cardiovascular (CV): Denies chest pain (CP)

Pulmonary (Pulm): Denies shortness of breath (SOB) or cough

Gastrointestinal (GI): Denies nausea, vomiting, diarrhea, and constipation (N/V/D/C); denies heartburn or dyspepsia

Extremities (Ext): Denies edema; reports 3/10 pain on most days and 5/10 on days after exercising

Physical Examination:

General: No abnormality detected (NAD)

Head, eyes, ears, nose, throat (HEENT): Pupils equal, round, reactive to light, and accommodation (PERRLA); extraocular movements intact (EOMI); funduscopic examination reveals no hemorrhages, exudates, or papilledema; no bruits

CV: Regular rate and rhythm (RRR), no murmurs, rubs, [or] gallops (m/r/g)

Pulm: Clear to auscultation bilaterally (CTAB)

Ext: No edema

Vital Signs:

Today:

BP 158/92 mm Hg, 152/94 mm Hg

Heart rate (HR) 60 beats/minute; respiratory rate (RR) 14 breaths/minute; Temp 98.4°F; Ht 6′0″; Wt 210 lb

3 months ago:

BP 166/98 mm Hg (average of two readings)

HR 62 beats/minute; RR 16 breaths/minute; Temp 98°F; Ht 6′0″; Wt 215 lb

BP readings from past 3 months (from local pharmacy):

152/90
158/92
166/96
160/90
156/92
150/88
152/90
154/92

Laboratory Data:

Today at 8:30 a.m. (fasting):

		Normal Range
Na	138 mEq/L	136–145
K	4.0 mEq/L	3.5–5.0
Cl	104 mEq/L	96–106
CO_2	27 mmol/L	24–30
BUN	14 mg/dL	8–20
SCr	1.02 mg/dL	0.7–1.5
Glu	86 mg/dL	70–110
Total cholesterol	250 mg/dL	NA
HDL	38 mg/dL	NA
LDL	184 mg/dL	NA
TG	140 mg/dL	NA

Studies:

Electrocardiogram (ECG) (5/6/2011): Normal sinus rhythm (NSR); no other abnormalities noted

Pharmaceutical Care Application

Collect patient-specific information
(as previously summarized).

Includes Pharmacotherapy Workup
In this interprofessional setting, the review of systems by the pharmacist is not necessary, as it was already done by the physician. The Pharmacotherapy Workup also includes asking the patient about his or her existing medical conditions to determine what conditions exist. In a setting such as a community pharmacy, this would be important, but in this setting, it is not necessary as all the medical conditions are already in the medical record.

Analyze clinical data (reported below).

Identify drug-related problems.
- Effectiveness: Dosage too low – BP elevated despite treatment with lisinopril 10 mg once daily
- Safety: Adverse drug reaction – Ibuprofen may be increasing BP.
- Indication: Needs additional drug therapy for new diagnosis of dyslipidemia
- Indication: Needs additional drug therapy for smoking cessation
- Indication: Needs additional drug therapy for MI prevention (aspirin)

Identify goals of therapy.

Goals of therapy
- BP less than 130/80 mm Hg; uncontrolled
- Low-density lipoprotein (LDL) less than 100 mg/dL (coronary artery disease [CAD] risk equivalent; 10-year coronary heart disease [CHD] risk of 30% or greater); uncontrolled
- Successful cessation of smoking
- Reduce/eliminate pain; improve joint function.

Develop a care plan.
- Change dosage regimen: Increase lisinopril to 20 mg once daily.
- Discontinue drug therapy – Ibuprofen
- Initiate new drug therapy – Initiate acetaminophen 1 g orally three times/day for OA.
- Initiate new drug therapy – Simvastatin 40 mg once daily
- Initiate new drug therapy – Aspirin 81 mg once daily
- Initiate new drug therapy – Set a quit date; start nicotine patch (21 mg x 4 weeks; then 14 mg x 2 weeks; then 7 mg x 2 weeks)
- Institute a monitoring plan – Serum creatinine (SCr) and potassium (K+) in 2 weeks for increased lisinopril dose; fasting lipid profile in 6 weeks for simvastatin initiation

Develop a schedule for follow-up.
- Follow up in 2 weeks to assess drug therapy changes and record outcomes.
  i. Draw serum potassium and SCr to monitor increase in lisinopril dose.
  ii. Measure BP to assess the efficacy of the increased lisinopril dose.
  iii. Monitor smoking cessation.
  iv. Monitor adherence to lifestyle modifications.
  v. Monitor for adverse effects of simvastatin.
  vi. Monitor for adverse effects of aspirin.
- Follow up in 6 weeks to assess drug therapy changes and record outcomes.
  i. Draw fasting lipid profile to assess the efficacy of simvastatin.

Evaluate patient outcomes (at follow-up, select category from a list).
HTN: Improved
Dyslipidemia: Partly improved
OA: Worsened
Smoking: Failure

Medication Therapy Management Application

Medication Therapy Review

Medication	Indication	Efficacy	Safety	Adherence	Medication-Related Problem	Priority	Plan
Lisinopril 10 mg once daily	HTN	Poor – BP not controlled Goal BP < 130/80	N/A	Good	Lisinopril dose too low	1	Increase lisinopril dose to 20 mg once daily.
Ibuprofen 400 mg q6h prn pain	OA pain	Still has pain	May ↑ BP; patient taking higher-than-prescribed dose	Take when exercising.	Safety: ibuprofen may be increasing BP; not first line for OA	2	D/C ibuprofen; initiate APAP.
N/A	Smoking cessation				Needs new drug therapy for smoking cessation	2	Initiate nicotine patch.
N/A	New diagnosis of dyslipidemia	N/A Goal LDL < 100; CHD risk equivalent; 10-year CHD risk ≥ 30%	N/A	N/A	Needs new drug therapy for dyslipidemia	1	Initiate simvastatin 40 mg once daily.
N/A	High CV risk; needs aspirin for primary prevention	N/A High CV risk	N/A	N/A	Needs new drug therapy for MI prevention	1	Initiate aspirin 81 mg once daily.

Personal Medication Record (PMR)

(both patient and pharmacist keep one)

Drug and Dose	Take for…	When do I take it?				Start Date	Stop Date	MD	Special Instruct-ions
		AM	Noon	PM	Bed				
Lisinopril 20 mg once daily	High BP	x				x/x/xx		Smith	
Acetaminophen 500 mg 2 tablets 3x/day	OA pain	x	x		x	x/x/xx		Smith	Try to space three doses equally apart.
Simvastatin 40 mg once daily	High cholesterol				x	x/x/xx		Smith	Take in evening.
Aspirin 81 mg once daily	Heart protection	x				x/x/xx		Smith	
Nicotine patch: 21 mg x 4 wk; then 14 mg x 2 wk; then 7 mg x 2 wk	To help quit smoking	x				x/x/xx		Smith	Start on the quit date; do not smoke when using patch; alternate sites.

Medication-Related Action Plan (MAP)
(both patient and pharmacist keep one)

My Medication Action Plan Follow this checklist and make notes of your actions.	
Action Steps: What I Need to Do	Notes: What I Did and When
High BP: Monitor BP at the pharmacy weekly. My goal BP is < 130/80.	x/x/xx: 148/88 x/x/xx: 146/86 x/x/xx: 146/82
OA: Take my acetaminophen regularly.	x/x/xx: Took all three doses x/x/xx: Missed two doses; pain worse x/x/xx: Took all three doses x/x/xx: Missed one dose; pain a little worse
High cholesterol: Take my simvastatin daily and in the evening.	x/x/xx: Missed my dose x/x/xx: Took in the AM accidentally
Smoking cessation: Remember to change my patch weekly. Don't smoke while wearing the patch. Use gum and mints for cravings.	x/x/xx: No cigarettes for a week! x/x/xx: Slipped and had one cigarette

Intervention and/or Referral
Recommendations:

1. Increase lisinopril to 20 mg/day.
2. Discontinue ibuprofen.
3. Start acetaminophen.
4. Start simvastatin.
5. Start aspirin.

Documentation and follow-up:

Follow up in 2 weeks.

a. Draw serum potassium and SCr to monitor increase in lisinopril dose.
b. Measure BP to assess the efficacy of increased lisinopril dose.
c. Monitor smoking cessation.
d. Monitor adherence to lifestyle modifications.
e. Monitor for adverse effects of simvastatin.
f. Monitor for adverse effects of aspirin.

Follow up in 6 weeks.

a. Draw fasting lipid profile to assess the efficacy of simvastatin.

In addition to the previous documentation, a detailed SOAP (subjective, objective, assessment, plan) note must be included in the medical record, and a letter must be sent to the physician (if applicable).

Assessment of patient's medication-related needs

Medication	Indication	Goals of Therapy
Ibuprofen 400 mg po q6h prn pain	OA (knee)	Reduce/eliminate pain. Improve joint function.
Lisinopril 10 mg po once daily	HTN	BP consistently < 130/80 mm Hg

Identify and categorize MRPs.

Medication	MRP	Appropriateness	Effectiveness	Safety	Adherence
Ibuprofen 400 mg po q6h prn pain	2 MRPs Appropriateness Safety	Ibuprofen not first line for OA; not appropriate		Can increase BP, which is uncontrolled; patient is taking higher-than-prescribed dose	Good
Lisinopril 10 mg po once daily	1 MRP Effectiveness		Goal BP < 130/80; not at goal Dose too low		Good
N/A	1 MRP Indication	Not receiving medication for smoking cessation			
N/A	1 MRP Indication	Not receiving medication for dyslipidemia			
N/A	1 MRP Indication	Not receiving medication for MI prevention (high cardiovascular risk)			

Development of a care plan

Indication/Intervention	Goals of Therapy	Plan	Follow-up
HTN	BP < 130/80 mm Hg	Increase lisinopril to 20 mg once daily.	Follow up in 2 weeks: Monitor BP, K, SCr
OA	Reduce/eliminate pain. Improve joint function.	D/C ibuprofen. Start acetaminophen 1 g po tid.	At 2-week follow-up, assess pain control and function.
Smoking cessation	Quit smoking.	Set a quit date. Initiate nicotine patch.	Follow up weekly.
Dyslipidemia	LDL < 100 mg/dL High CHD risk 10-year risk ≥ 30%	Initiate simvastatin 40 mg once daily.	Follow up in 6 weeks. Fasting lipid profile
MI prevention	High CHD risk MI prevention	Initiate aspirin 81 mg once daily.	Yearly

<u>Follow-up</u>
HTN: BP improved; not at goal; laboratory values show safety
Dyslipidemia: Partly improved; not at goal
OA: Worsened
Smoking: Failure; patient did not quit smoking; still smoking 1 pack/day

Society of Hospital Pharmacists of Australia (SHPA) Application

Medication Action Plan	
Interpretation of patient-specific data	BP not well controlled (158/92 mm Hg) Ibuprofen not first line for OA – may increase BP No therapy for smoking cessation Lipid profile shows high LDL. Patient not taking aspirin for MI prophylaxis
Identification of clinical problems	(1) BP uncontrolled on lisinopril 10 mg once daily (MRP: Dose too low) (2) Ibuprofen may be increasing BP, taking higher-than-prescribed dose, not first line for OA (DRP: Adverse reaction) (3) New diagnosis of dyslipidemia; untreated. Needs statin (MRP: Needs additional drug therapy) (4) Wants to quit smoking; needs therapy to help him quit (nicotine patch) (MRP: Needs additional drug therapy) (5) High CAD risk; not taking aspirin; needs aspirin 81 mg once daily (MRP: Needs additional drug therapy)
Establishment of therapeutic goals	HTN BP goal < 130/80 mm Hg (high CAD risk) Dyslipidemia Goal LDL < 100 mg/dL (CHD risk equivalent; 10-year CHD risk ≥ 30%) OA Reduce/eliminate pain; improve joint function Smoking Quit smoking High CAD risk Reduce risk of future MI
Evaluation of therapeutic options AND Individualization of therapy	HTN Lisinopril appropriate first-line antihypertensive therapy Makes sense to titrate vs. add additional therapy Discussed with patient, who agrees Dyslipidemia 46% LDL reduction needed Simvastatin 80 mg/day no longer recommended Options: Simvastatin 40 mg/day, atorvastatin 20 or 40 mg/day, rosuvastatin 5 or 10 mg/day. May get adequate LDL reduction with pitavastatin 4 mg/day, lovastatin 80 mg/day, or pravastatin 80 mg/day. Atorvastatin is generic but still more expensive. Rosuvastatin and pitavastatin not generic Discussed with patient, who agrees OA Acetaminophen first line for OA Patient willing to try acetaminophen Smoking Discuss options for pharmacotherapy to help patient quit smoking. Nicotine replacement is what patient desired. High CAD risk Aspirin 81 mg/day is recommended over other therapies for reducing the risk of MI in patients with a high risk of CAD such as K.G. Patient willing to take
Monitoring of patient outcomes	Monitor for BP control in 2 weeks. ■ Improved; still not at goal BP Monitor K/SCr 1–2 weeks after increase in lisinopril dose. ■ WNL Monitor for pain control and function with acetaminophen. ■ Worsened; OA pain no longer controlled Monitor for efficacy of nicotine replacement once a quit date is determined. ■ Failure; patient did not quit smoking on the quit date Monitor fasting lipid profile in 6 weeks. ■ Partly improved; LDL still not at goal

Accurate medication history

Lisinopril 10 mg orally once daily
Ibuprofen 400 mg orally every 6 hours as needed for pain (taking 2 tablets one to three times/day for 2 years)

Assessment of current medication management

Patient adherent to lisinopril, taking ibuprofen regularly; higher-than-prescribed dose

Clinical review

BP not well controlled (158/92 mm Hg) – Lisinopril dose too low
Ibuprofen not first line for OA – May be increasing BP
No therapy for smoking cessation

Decision to prescribe a medicine

Recommend increasing lisinopril to 20 mg once daily.
Recommend discontinuing ibuprofen.
Recommend starting acetaminophen 1000 mg orally three times/day.
Recommend initiating smoking cessation therapy with nicotine patches.
Recommend initiating simvastatin 40 mg/day.
Recommend initiating aspirin 81 mg/day.

Therapeutic drug monitoring

Monitor for BP control.
Monitor K/SCr 1–2 weeks after increasing lisinopril dose.
Monitor for pain control and function with acetaminophen.
Monitor for efficacy of nicotine replacement once a quit date is determined.
Monitor fasting lipid profile in 6 weeks.

Participation in multidisciplinary ward rounds and meetings – N/A

Provision of medicines information to health professionals

None identified at this time

Provision of medicines information to patients

HTN: Reduce salt intake. Minimize foods high in salt content such as prepared foods, canned soups and vegetables, fast food, and processed food.
Increase moderate-intensity exercise to 30–60 minutes 5 days/week.
Continue reduced-calorie diet and weight loss.

OA: Continue exercises from physical therapist.
Continued weight loss will decrease stress on joints and decrease pain.
Acetaminophen use
Avoid excessive alcohol use.

Smoking cessation: Set a quit date and start patches on this date. It is important not to smoke while taking nicotine patches.
Nicotine patch use
Controlling urges

Information for ongoing care – N/A

Adverse drug reaction management

Lisinopril:	Monitor for development of cough, dizziness, rash, angioedema
Acetaminophen:	Nausea, yellowing of skin or eyes (rare)
Nicotine patches:	Monitor for development of rash, itching, and burning at application site; abnormal dreams, dizziness, sweating
Simvastatin:	Monitor for muscle aches and pains; liver function test monitoring no longer required
Aspirin:	Monitor for signs and symptoms of GI bleeding.

Individualized Medication Assessment and Planning (iMAP) Application

Review and synthesize information from medical record.
- Lisinopril 10 mg orally once daily for HTN
- Ibuprofen 400 mg orally every 6 hours as needed for OA

Conduct comprehensive medication review with patient.
- Lisinopril – Using as prescribed, good adherence
- Ibuprofen – Taking higher-than-prescribed dose: 2 tablets one to three times/day for 2 years

Identify MRPs.
(1) Suboptimal dosing: Lisinopril; goal BP less than 130/80; BP not controlled
(2) Suboptimal drug: Ibuprofen not first line for OA and may be increasing BP
(3) Drug therapy needed: Needs drug therapy for new diagnosis of dyslipidemia (statin); goal LDL less than 100 mg/dL
(4) Drug therapy needed: Needs drug therapy for smoking cessation
(5) Drug therapy needed: Needs drug therapy for MI prevention (aspirin)

Formulate assessment/propose plan to optimize medication use.
- Recommend increasing lisinopril to 20 mg once daily.
- Recommend discontinuing ibuprofen.
- Recommend starting acetaminophen 1 g orally three times/day.
- Recommend starting simvastatin 40 mg once daily.
- Initiate nicotine replacement therapy with patch once a quit date is set.
- Recommend starting aspirin 81 mg once daily.

Communicate proposed plan to primary care provider.
- Discussed all recommendations with Dr. Smith, who agreed; OR
- Plan is according to collaborative practice agreement in place with Dr. Smith.

Implement plan once consensus is reached.
- Call in/write prescription for new lisinopril dose, acetaminophen, simvastatin, aspirin according to collaborative practice agreement or verbal order; Dr. Smith

Educate patient.
- Provided written medication list with all medications and changes noted
- Educated patient on proper use of all new medications
- Educated patient on adverse effects of new medications to watch out for
- Set a quit date and start patches on this date. Educated patient not to smoke with nicotine patches
- Discussed controlling urges, coping with cravings, and dealing with triggers for smoking

Document plan in medical record and provide written summary to patient.
- SOAP note written in medical record
- Written medication list and summary of plan given to patient

Reconcile medications at all encounters, including transitions of care.

Provide ongoing face-to-face and telephone follow-up.
Follow up in 2 weeks.
1. Draw serum potassium and SCr to monitor increase in lisinopril dose.
2. Measure BP to assess the efficacy of the increased lisinopril dose.
3. Monitor success with smoking cessation.
4. Monitor adherence to lifestyle modifications.
5. Monitor for adverse effects of simvastatin.
6. Monitor for adverse effects of aspirin.

Follow up in 6 weeks.
1. Draw fasting lipid profile to assess the efficacy of simvastatin.
2. Monitor success with smoking cessation.

Acute Care Patient Case Example

CC: J.B. presents to the emergency department with altered mental status, "yellow skin," and increased abdominal distension; also, she is vomiting blood.

HPI: J.B. is a 44-year-old white woman with a known history of alcohol abuse for 20 years. She was given a diagnosis of cirrhosis 1 year ago.

Medical History: Alcoholic cirrhosis x 1 year
HTN x 1 year

Medication History:
Allergies: NKDA
Current medications (nonadherent, according to family):
Lactulose 30 mL orally twice daily
Lisinopril 10 mg orally daily

Family History:

Father:	Living; HTN, diabetes mellitus (DM)
Mother:	Died of "liver disease because of drinking"
Brother:	Living; alcoholic

Social History:

Tobacco:	None
Alcohol:	Drinks 12 beers per day and 750 mL of vodka on weekends
Diet:	Doesn't eat much

ROS/Physical Examination:
HEENT: (+) Icteric sclera
CV: No CP, no palpitations, tachycardic
Pulm: (+) SOB; crackles heard at lung bases
GI: (+) Abdominal distension; (+) black stools; (+) bloody vomit
Skin: Jaundiced, (+) spider angiomata

Vital Signs:
BP: 100/70
HR: 110; RR: 18; Temp: 99.0; Ht: 5′6″; Wt: 110 lb

Pharmaceutical Care Application

Collect patient-specific information (as previously summarized).

Includes Pharmacotherapy Workup

In this interprofessional setting, the review of systems by the pharmacist is not necessary, as it was already done by the physician. The Pharmacotherapy Workup also includes asking the patient about his or her existing medical conditions to determine what conditions exist. In a setting such as a community pharmacy, this would be important, but in this setting, it is not necessary because all the medical conditions are already in the medical record.

Analyze clinical data (reported below).

Identify drug-related problems.

- Indication: Needs additional drug therapy for esophageal varices
- Indication: Needs additional drug therapy for hyperammonemic hepatic encephalopathy
- Indication: Needs additional drug therapy for ascites