



## Public Health in Pharmacy Practice



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# Foreword

The overarching goal of public health is to protect and improve the health of individuals, families, communities, and populations, locally and globally.<sup>1</sup> In collaboration with physicians, nurses and other healthcare professionals, pharmacists have incredible opportunity and skills to be able to contribute toward this goal. In recent years, the place of public health education within the profession of pharmacy has formalized, both for students and practicing pharmacists alike. Training is prevalent in areas such as immunizations, tobacco cessation counseling, cardiovascular and diabetes risk management. Pharmacy curricula, as part of accreditation requirements, are required to design programs that achieve educational outcomes in population-based care, cultural sensitivity, interprofessional collaboration and health and wellness.<sup>2</sup>

In an effort to further these goals, the following casebook was developed. While a number of public health pharmacy educational texts are available, currently, there is a paucity of resources that focus on application of public health knowledge in a case-based format for pharmacists. Casebooks in health sciences allow opportunity for students to work toward educational competencies through patient-oriented scenarios prior to or in concert with formal clinical experiences.

This casebook is a collaboration of over 35 individuals with expertise and training in public health pharmacy. A total of 21 chapters are presented, aimed to cover a broad array of topics relevant to the pharmacy applications of public health. These topics include, but are not limited to, cross-cultural care, health literacy and disparities, infectious disease, health promotion and disease prevention, medication safety, women's and rural health and more. The book is designed to allow educators/students to choose chapters of interest as they feel suited, as each chapter is independent from the others. Each chapter contains learning objectives and an introduction to the topic, followed by a case and questions. The chapter closes with commentary from the authors (e.g. 'pearls' associated with the topic) and patient-oriented considerations for the topic at hand.

It is our hope that this casebook may serve as a useful tool in furthering the understanding and application of pharmacy skills within the field of public health.

Regards,  
The editors

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# Glossary

*Note: references for definitions can be found in chapters where the concepts are utilized*

**Cross cultural care:** learning how to transcend one's own culture in order to form a positive therapeutic alliance with patients from other cultures

**Culture:** the integrated pattern of human behaviors that includes thoughts, communications, languages, practices, beliefs, values, customs, courtesies, rituals, manners of interacting and roles, relationships and expected behaviors of a racial, ethnic, religious or social group; and the ability to transmit the above to succeeding generations

**Disaster:** a sudden, calamitous event that seriously disrupts the functioning of a community or society, causing human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources

**Epidemiology:** the study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems

**Equity:** the absence of avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically, or geographically

**Global North:** a group based on a geographic and economic divide, inclusive of relatively richer countries within the global sphere; includes the United States, Canada, Europe, developed parts of Asia (Japan, Hong Kong, Singapore, South Korea and Taiwan) as well as Australia and New Zealand

**Global South:** a group based on a geographic and economic divide, inclusive of relatively poorer countries within the global sphere; includes countries mostly located in tropical regions and in the Southern Hemisphere

**Health:** a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity

**Health disparities:** a particular type of health difference that is closely linked with social, economic and/or environmental disadvantage

**Health equity:** fair distribution of health determinants, outcomes, and resources within and between segments of the population, regardless of social standing

**Health literacy:** the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions

**Healthy People:** a US government program from the ODPHP that identifies US health improvement priorities and sets 10-year goals and targets

**Herd immunity:** the circumstance in which a sufficient proportion of the population is protected from a disease such that transmission among members is unlikely is insufficient to protect unvaccinated members

**Information literacy:** being able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information

**Interprofessional education:** when two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes

**Pharmacoepidemiology:** the study of the use and effects/side-effects of drugs in large numbers of people with the purpose of supporting the rational and cost-effective use of drugs in the population thereby improving health outcomes

**Preventive medicine:** delivery of medical care that is focused on the health of individuals, communities, and defined populations in order to protect, promote, and maintain health and well-being and to prevent disease, disability, and death

**Social determinants of health:** the conditions in which individuals live, work, and play that can affect health outcomes

**Telepharmacy:** the provision of services by pharmacists to patients or their caregivers through the use of technology to provide cost-effective routine and highly specialized clinical services in remote areas where the need may be greatest

# Abbreviations

ACIP	Advisory Committee on Immunization Practices
ADE	Adverse drug events
ADHD	Attention deficit hyperactivity disorder
AHRQ	Agency for Healthcare Research and Quality
AIDS	Acquired immunodeficiency syndrome
APhA	American Pharmacist's Association
ASHP	American Society of Health-System Pharmacists
ASTHO	Association of State and Territorial Health Officials
BID	Twice daily
BP	Blood pressure
BPM	Beats per minute
CC	Chief complaint
CDC	Centers for Disease Control and Prevention
CMR	Comprehensive Medication Review
CMS	Centers for Medicare & Medicaid Services
COPD	Chronic obstructive pulmonary disease
CT	Computed tomography
CV	Cardiovascular
CVA	Cerebrovascular accident
DOT	Directly observed therapy
ED	Emergency department
eDOT	Electronic directly observed therapy
EHR	Electronic health record
EPT	Expedited partner therapy
FBG	Fasting blood glucose
FDA	Food and Drug Administration
FGC	Female genital cutting
FGM	Female genital mutilation
FH	Family history
FQHC	Federally-qualified health center
HCV	Hepatitis C virus
HEENT	Head, eyes, ears, nose and throat
HgA1c	Glycosylated hemoglobin
HIV	Human immunodeficiency virus
HLD	Hyperlipidemia
HPI	History of present illness

HR	Heart rate
HTN	Hypertension
IAC	Immunization Action Coalition
IPE	Interprofessional education
IPEC	Interprofessional Education Collaborative
KFF	Kaiser Family Foundation
LTBI	Latent tuberculosis infection
LRN	Laboratory Response Network
MAI	Medication Appropriateness Index
MDR	Multi-drug resistant
MDR-TB	Multi-drug resistant tuberculosis
MI	Myocardial infarction
MOU	Memorandum of understanding
MSM	Men who have sex with men
MTM	Medication Therapy Management
N/A	Not available
NACDS	National Association of Chain Drug Stores
NASPA	National Alliance of State Pharmacy Associations
NKDA	No known drug allergies
NT/ND	Non-tender, non-distended
ODPHP	Office of Disease Prevention and Health Promotion
OTC	Over-the-counter
PATH	Partnership Assessment Tool for Health
PDMP	Prescription drug monitoring program
PERT	Pharmacy emergency response team
PMH	Past medical history
PO	Per oral
POD	Point of dispensing
POC	Point of care
PPD	Pack per day/Purified protein derivative
PRN	As needed
ROS	Review of systems
RR	Respiratory rate
SBIRT	Screening followed by brief interventions
SDG	Sustainable Development Goals
SDH	Social determinants of health
SH	Social history
SNS	Strategic National Stockpile
SQ	Subcutaneously

STD	Sexually transmitted disease
STI	Sexually transmitted infection
STOPP/START	Screening Tool of Older People's Prescriptions/Screening Tool to Alert to Right Treatment
T2DM	Type 2 diabetes mellitus
TB	Tuberculosis
Tdap	Tetanus, diphtheria and acellular pertussis
TID	Three times daily
UN	United Nations
US	United States
USPSTF	United States Preventive Services Task Force
VS	Vital signs
WHO	World Health Organization
WNL	Within normal limits

# An ounce of prevention: pharmacy applications of the USPSTF guidelines

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## TOPIC AREA

Health promotion/disease prevention

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Describe preventive medicine and the role of the pharmacist
- Differentiate between primary, secondary, and tertiary prevention and give examples of each type of prevention
- Describe the United States Preventive Services Task Force (USPSTF) and the methods used to evaluate the potential harms and benefits of clinical preventive services
- List and describe the clinical preventive services recommended for the general adult population by the USPSTF
- Apply USPSTF recommendations for clinical preventive services to a patient case

## Introduction

Preventive medicine, as defined by the American College of Preventive Medicine, “*focuses on the health of individuals, communities, and defined populations. Its goal is to protect, promote, and maintain health and well-being and to prevent disease, disability, and death.*”<sup>1</sup> Disease prevention utilizes screening and risk factor assessment to identify individuals and populations at elevated risk and intervenes to modify those factors to prevent the onset of disease. Health promotion can be viewed from the positive side as the promotion of healthy lifestyles which will prevent or delay the onset of disease. Disease management is also an important part of preventive medicine in that it seeks to ensure that conditions are managed according to guidelines to delay disease progression. Preventive medicine can be delivered by many healthcare professionals, including pharmacists.

Preventive medicine relies on the provision of evidence-based preventive services to individuals based on their age, sex and risk level. The United States Preventive Services Task Force (USPSTF) is a panel of experts who review the published literature and the evidence for clinical preventive services or specific populations (e.g., general adult population, pregnant women, children). The USPSTF then creates a list of recommended preventive services for each population based on the grades assigned to the services (see USPSTF Grade Definitions below).<sup>2</sup> Services evaluated encompass all levels of prevention. A common way of classifying services is by primary, secondary and tertiary prevention. Primary prevention services intervene prior to disease occurrence, secondary prevention services intervene to identify early stage disease and to lessen the disease’s impact, and tertiary prevention services manage diagnosed disease to slow or stop progression.<sup>3</sup>

## USPSTF Grade Definitions<sup>2</sup>

- **Grade A:** The USPSTF recommends the service. There is high certainty that the net benefit is substantial.
- **Grade B:** The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.
- **Grade C:** The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.
- **Grade D:** The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.
- **Grade I:** The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.

The USPSTF recommends that Grade A and B services be routinely offered in primary care settings to patients who meet their established criteria. Patients with symptoms of a particular disease may follow a different screening schedule. However, for patients who are uninsured or underinsured, out-of-pocket expenses may be associated with these services. The present challenge of preventive medicine is to ensure that all people have access to age- and sex-appropriate services at an affordable cost. Additionally, there is the challenge to empower and motivate individuals to practice disease prevention and health promotion.<sup>2</sup> The USPSTF guidelines provide an evidence base for routinely delivering clinical preventive services to all patients. Pharmacists can play an important role in providing clinical preventive services as specified by the USPSTF.

## Case

### SCENARIO

You are working as a pharmacist in a Florida community pharmacy. Your pharmacy is in close proximity to highly diverse communities, with large numbers of individuals of lower socioeconomic status. Therefore, your pharmacy has a robust protocol for conducting a short intake interview with all new patients and taking advantage of the opportunity to do basic disease prevention and health promotion counseling with patients needing it. Furthermore, you are located near a Federally Qualified Health Center (FQHC), with which you have a strong referral collaboration established. This FQHC takes all patients regardless of insurance status and charges patients on a sliding fee scale, based on their income. Because of your location, and the service model of your pharmacy, pharmacists in your pharmacy are well trained in the social determinants of health.

**CC:** “Every night I keep coughing, I would like to purchase a bottle of Sudafed®.”

**Patient:** LC is a 23-year-old female (66 in, 68 kg) agricultural worker currently working in Florida. She has been living and working in the US for four months, although she does not have authorization to work in the US. She is from southern Mexico. LC presents to the local community pharmacy for a persistent cough. She has no usual source of primary care, so she had no place else to go.

Since Sudafed® is a “behind-the-counter” medication, you conduct a short intake interview with her when she comes to the counter to request the product. As she rarely accesses the healthcare system, you recognize this as an opportunity to provide LC with a comprehensive review of recommended clinical preventive services in addition to helping her with her chief complaint.

**HPI:** Persistent cough for more than a week. She reports night sweats, which she dismisses as being a result of the hot and humid climate in Florida.

PMH: Mild eczema on hands and forearms; seasonal allergies (pollen); no prior hospitalizations or surgeries

FH:

- Father: T2DM, HTN
- Mother: T2DM
- Three younger siblings, alive and well

SH:

- Sexually active, in a committed relationship with a male partner; no children
- Never used tobacco or illicit drugs, but her partner smokes cigarettes

Medications:

- Loratadine 10 mg once daily PRN seasonal allergies (OTC)

Allergies: NKDA

SDH: Fluent in Spanish; conversational English only. Eight-grade education. Annual income approximately \$13,500. Lives in a small trailer with 8 other adults.

Additional context: Agricultural workers, also known as farm workers or crop workers, have unique exposures and backgrounds that may increase their risk of adverse health outcomes.<sup>4,5</sup> It has been estimated that about 53% of agricultural workers had work authorization in the United States in 2013-2014. About 74% of agricultural workers indicate that Spanish is their preferred language. The average level of formal education completed by agricultural workers is the eighth grade, and their mean annual income is estimated to be \$15,000.<sup>5</sup>

Only about 35% of agricultural workers have health insurance and therefore bear a high burden of out-of-pocket healthcare costs. In a national survey, 43% indicated that they paid for their last health care visit out-of-pocket, and the cost of healthcare was cited most often by agricultural workers as a challenge in accessing healthcare.<sup>5</sup>

Many agricultural workers have exposure to environmental hazards such as pesticides and may be at increased risk for work-related injury. “Crowded” living conditions (defined as the number of persons per room is greater than one),<sup>5</sup> inadequate sanitation, and poor nutrition are common experiences for seasonal agricultural workers, all of which can facilitate spread of infectious disease.<sup>4</sup>

## Case Questions

1. What social determinants of health did you identify with LC?
2. What USPSTF-recommended clinical preventive services (Grade A or B only) is this patient eligible for based on established criteria?
3. Which of the services above could be considered as primary prevention services? Secondary prevention? Tertiary prevention?
4. Which services do you think should be prioritized for her to receive first? And how will you make this decision?
5. What can the community pharmacist do to increase the likelihood that LC will receive the other needed services?

## Author Commentary

Pharmacists’ services, especially those being provided in community pharmacies, can fill important gaps in care for vulnerable populations. Depending on worksite and resources available, pharmacists will be involved in provisions of clinical preventive

services to varying degrees. Most community pharmacies typically provide several preventive services, such as vaccinations; and blood pressure, glucose, and/or lipid screenings. However, the community pharmacy is often one of the only healthcare facilities that some uninsured or underinsured people will visit. Therefore, it is advantageous to use the patient encounter to discuss preventive services with these patients and to offer services as available or refer for services as appropriate. Having a collaboration with a nearby clinic or health center is an opportunity to make referrals for patients to receive additional preventive services that are not offered in the pharmacy. In this way, pharmacists can truly realize their role in clinical-community linkages.

## Patient Approaches and Opportunities

When working with patients for whom English is not their first language, you should first determine whether the patient's English or your foreign language level is adequate to communicate effectively. If not, trained medical interpreters or telephone-based interpretation services may need to be utilized during the patient encounter.

Community pharmacists have the unique opportunity to offer face-to-face interventions every day. Collecting a comprehensive medical history during the patient's first visit is a great way to identify opportunities to apply strategies from the USPSTF; however, some community pharmacies' workflow may limit this opportunity. Realize that you may not have all of the patient information that you may need or want, like information on childhood illnesses or vaccination status, and consider how you will handle that limitation in patient information. Remember to use best practices related to cultural competency and low health literacy. You may need to determine, based on eventual disease diagnoses, whether there are any intervention(s) that need to be provided to a patient's partner(s) and/or close contacts. Assuring the patient that you will respect confidentiality regarding their information is critical to developing a trusting relationship.

Finally, because the guidelines are updated by USPSTF as new information becomes available, pharmacists should stay up-to-date on the current USPSTF Grade A&B recommendations for various patient populations. The AHRQ electronic Preventive Services Selector (ePSS) referenced below is a valuable tool to quickly identify services appropriate for an individual patient.

### IMPORTANT RESOURCES

#### *Related chapters of interest:*

- [Saying what you mean doesn't always mean what you say: cross-cultural communication](#)
- [More than just diet and exercise: social determinants of health and well-being from belly to baby: preparing for a healthy pregnancy](#)

#### *External resources:*

- Websites:
  - AHRQ ePSS (Electronic Preventive Services Selector) – note: this resource can be used online or downloaded onto a device (tablet or smartphone) <https://epss.ahrq.gov/PDA/index.jsp>
  - Centers for Disease Control and Prevention. Creating Community-Clinical Linkages Between Community Pharmacists and Physician: A Pharmacy Guide. <https://www.cdc.gov/dhds/pubs/docs/ccl-pharmacy-guide.pdf> USPSTF Grade Definitions: <https://www.uspreventiveservicestaskforce.org/Page/Name/grade-definitions>
  - USPSTF A and B Recommendations for Primary Care Practice <https://www.uspreventiveservicestaskforce.org/Page/Name/uspstf-a-and-b-recommendations/>
  - USPSTF Full Recommendations for Primary Care Practice: <https://www.uspreventiveservicestaskforce.org/Page/Name/recommendations>

- Journal articles:

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- Murphy BL, Rush MJ, Kier KL. Design and implementation of a pharmacist-directed preventive care program. *American Journal of Health-System Pharmacy* September 2012, 69 (17) 1513-1518. DOI: <https://doi.org/10.2146/ajhp110384>
- Scott DM, Strand M, Udem T, Anderson G, Clarens A, Liu X. Assessment of pharmacists' delivery of public health services in rural and urban areas in Iowa and North Dakota. *Pharm Pract*. 2016;14(4):836.

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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# Communicating health information: hidden barriers and practical approaches

**Kayce M. Shealy, PharmD, BCPS, BCACP, CDE**

**Neyda V. Gilman, MLS**

## TOPIC AREA

Health literacy

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Recognize the role health information literacy plays in health care and how pharmacists literacy skills are necessary to improve patients' understanding of their health
- Discuss the red flags of limited health literacy
- Identify resources that may be useful for patients with limited health literacy, and why these resources are useful
- Apply the *Health Literacy Universal Precautions* to a patient case

## Introduction

According to the 2003 National Assessment of Adult Literacy, 36% of US adults aged 16 years or older have health literacy skills at a basic level or below.<sup>1</sup> For adults greater than 65 years old, this jumps to 59%, with 29% of those having below basic skills. There are many definitions, but generally health literacy is defined as the “*degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.*”<sup>2</sup> Even broader, information literacy is defined as being able to “*recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.*”<sup>3</sup> These skills are necessary for patients to be able to understand their health and their current or potential treatments. With poor health literacy, patients are less likely to understand what their health provider is telling them, to see how different aspects of their health tie together, or to know what steps they need to take to keep or improve their health. Additionally, patients with limited health literacy are more likely to experience poorer health outcomes and increased healthcare costs.<sup>4-7</sup>

In 2009, The Calgary Charter was created by individuals from Canada, the US, and the UK to identify the core principles of health literacy. The definition of health literacy defined by this document includes the important component of the health provider having the information literacy skills necessary to recognize and efficiently solve their own information needs.<sup>8</sup> Health literacy is important for pharmacists to be able broaden their knowledge and stay current with health and medical research. An information literate pharmacist is also more aware of his or her patient's health literacy and has the skills needed to find needed information for the patient, the patient's prescribing provider, and his or herself as necessary.

Assisting patients with their health literacy and understanding of even one piece of health information can have a beneficial rippling effect, including increasing their comfort and willingness to discuss health questions or concerns with health care providers.<sup>9-11</sup> Patients with improved health literacy are also more likely to discuss screening and treatment options, as well as follow recommended treatment procedures and healthy lifestyle habits in order to reduce health risks.

## Case

### SCENARIO

You are a pharmacist in the community setting.

CC: “I need some refills on my meds.”

HP: Steve tells the pharmacy technician that he needs to refill his “pink round pill, his blue rectangle pill, and his white round pill, and there may be one or two other ones.” While the technicians are submitting the refill requests, you take time to review Steve’s medication profile (see below).

PMH: Depression; hypertension; T2DM

FH: Noncontributory

SH: Current tobacco use

#### Medications:

Medication	Fills
Amlodipine 10 mg PO daily	#90 filled 4 months ago #90 filled 6 months ago
Aspirin 81 mg PO daily	#30 filled 28 days ago #30 filled 3 months ago
Benazepril 20 mg PO daily	#90 filled 4 months ago #90 filled 6 months ago
Bupropion SR 200 mg PO BID	#60 filled 6 months ago #60 filled 7 months ago
Glimepiride 4 mg PO daily	#30 filled 28 days ago #30 filled 3 months ago
Metformin 1000 mg PO BID	#180 filled 4 months ago #180 filled 6 months ago
Sertraline 100 mg PO daily	#30 filled 28 days ago #30 filled 3 months ago

Allergies: NKDA

SDH: Steve completed high school, and currently works at the local post office.

Additional context: Once his prescriptions are ready, you ask Steve if you may take a few minutes to review his medications and other health information. During the counseling, you observe that although Steve has been taking the same medications for the past year, he is unsure as to the exact purpose of each. In addition, he admits to missing some of his follow up appointments with his primary care provider due to various reasons.

## Case Questions:

1. From this one interaction with Steve, how would you classify his health literacy? Are there any red flags that led you to your conclusion?
2. What concepts and/or techniques can be used when communicating with Steve to ensure his complete understanding?
3. What things should be considered when looking for appropriate health information for patients?
4. What additional resources are available for you to learn more about methods to improve health literacy?

## Author Commentary

Limited health literacy is linked with poor health outcomes.<sup>4-7</sup> Patients with limited health literacy are more likely to utilize emergency room services, have more hospitalizations, and are less likely to utilize preventive services like mammography or receive influenza vaccinations compared to their more health literate counterparts. Focused interventions, such as those recommended in the [Health Literacy Universal Precautions](#), have been shown to improve health literacy. In addition, delivery of the interventions by a healthcare professional, like a pharmacist, increases efficacy of the intervention.

While communication skills overlap with health literacy skills, they are not the same thing. It is important to remember that just because a person may have great communication skills, he or she may not necessarily be health literate. In order to effectively communicate about health, especially with a range of levels of health literate individuals, it is necessary to be health literate yourself. Some patients with health literacy issues may benefit by bringing their prescribing providers into the conversation. Prescribing providers and pharmacists who have an understanding and awareness of the importance of health literacy may have improved communication that allows enhanced learning about their patient's medications and concerns, further benefiting their patients. Positive experiences while communicating with pharmacists could also lead to more open and honest communication and collaboration.

Health literacy not only affects individual patients, but also can affect health-systems due to the costs of increased hospitalizations and healthcare utilization overall. Organizations like Joint Commission recognize the important impact that health literacy plays on patient safety and have encouraged institutions to incorporate policies that facilitate enhanced patient-provider communication.

There are many tools available to formally assess a patient's health literacy; however, their routine use in practice may be limited due to the time necessary to administer. Quick assessments such as the Single Item Literacy Screener or Newest Vital Sign may be useful for the general population, and assessments such as the Literacy Assessment for Diabetes are more suited for specific patient populations.

## Patient Approaches and Opportunities

Health literate pharmacists can positively affect patients. Pharmacists may be able to take more time discussing the patient's health than other health professionals. They also are able to have their discussions in a different environment than a cold clinical office. By being health literate themselves, and assessing and acknowledging their patients' level of health literacy, pharmacists can help patients improve understanding of their health information. With this understanding, patients are more likely to take steps to improve their health, including improved drug adherence.<sup>12</sup> Pharmacists should apply the Health Literacy Universal Precautions during each patient encounter. Be sure to provide clear communication that incorporates words, numbers, and

images that are familiar to the patient or population with whom you are communicating. Strategies that can improve spoken communication include using the patient's own words; limiting content presented to 3-5 key concepts and repeat; encouraging questions; and incorporating the teach-back method. Utilizing these strategies can help increase patients' understanding of health information.

Other strategies to help improve health literacy include using clear, basic, and respectful language, a moderate speaking pace, open-ended questions, and easy-to-understand materials including images and diagrams. Other strategies include making and sharing action plans with patients, and directing patients to resources for additional literacy and/or math skill training, as well as community resources as applicable. Example resources include [Medline Plus' Medical Encyclopedia](#) and [Word Part appendix](#), as well as simple articles such as [healthywomen.org's post on health literacy](#). Regardless of the patient's health literacy level, having a health literate provider enhances the patient-provider relationship.<sup>8</sup>

## IMPORTANT RESOURCES

### *Related chapters of interest:*

- [More than just diet and exercise: social determinants of health and well-being](#)
- [Saying what you mean doesn't always mean what you say: cross-cultural communication](#)

### *External resources:*

- Health People 2020, Evidence-Based Resource Summary. <https://www.healthypeople.gov/2020/tools-resources/evidence-based-resource/national-action-plan-improve-health-literacy>
- Health Literacy Tool Shed. <http://healthliteracy.bu.edu/all>
- AHRQ Health Literacy Universal Precautions Toolkit. <https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/literacy-toolkit/index.html>
- Centers for Disease Control and Prevention, What is Health Literacy. <https://www.cdc.gov/healthliteracy/learn/index.html>
- The Joint Commission, "What Did the Doctor Say?:" Improving Health Literacy to Protect Patient Safety. [https://www.jointcommission.org/assets/1/18/improving\\_health\\_literacy.pdf](https://www.jointcommission.org/assets/1/18/improving_health_literacy.pdf)
- Medline Plus Health Literacy. <https://medlineplus.gov/healthliteracy.html>
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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# Medication safety: to ‘error’ is human

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## TOPIC AREA

Medication safety

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Define medication-use safety and the importance to public health
- Identify risk factors associated with medication safety and reasons for unsafe medication use in elderly patients
- Examine the pharmacist’s role and tools used to improve medication safety
- Recommend resources pharmacists can provide to patients with physical impairments to overcome medication-related issues
- Recommend a plan of action using the Medication Appropriateness Index (MAI)

## Introduction

Medication use safety is an important aspect of the healthcare delivery system to consider in all patients as it can affect the patient’s overall health at home and within the healthcare system. When thinking about this issue, it is common to consider the use of medication in specific populations (such as elderly patients), language barriers, adverse drug events (ADE), drug shortages, and acquisition of medications.

ADEs often result from unsafe medication use, leading to more than one million visits to the emergency room and 350,000 hospitalizations on an annual basis.<sup>1</sup> Billions of dollars are spent addressing ADEs, with the elderly population particularly at risk.<sup>2-4</sup> Reasons for this include physiologic changes, health literacy barriers, health disparities, polypharmacy, and nonadherence. Nonadherence can be intentional or unintentional and affected by medication efficacy, perceptions of one’s health or illness, or cultural beliefs.<sup>5</sup> The inherent nature of medications can also predispose patients to ADEs.<sup>4,6</sup> Although not limited to the elderly, physical impairments can also result in medication nonadherence and ADEs. Impairments can include, but are not limited to, dexterity, vision, mental status, and hearing.

Due to the large impact on public health, pharmacists have access to many tools and resources that have been developed to prevent and resolve ADEs. For example, many medications that may be unsafe for older adults (e.g., anticholinergics, antihypertensives, antipsychotics, insulin, and sedatives) exist on the *Beers Criteria for Medication Use in Older Adults*.<sup>7</sup> Pharmacists can use these criteria to determine the appropriateness of an older adult patient’s medication regimen and seek alternative therapeutic choices. As one of the most widely used resources, the *Criteria* is regularly updated based on the most current research to support the safe and effective use of the listed medications along with corresponding strengths of recommendation. The combination of the *Screening Tool of Older People’s Prescriptions (STOPP)* and *Screening Tool to Alert to Right Treatment (START)* criteria can also be used to determine potentially inappropriate prescribing in older adults while

offering treatment alternatives.<sup>8</sup> The *Medication Appropriateness Index (MAI)* is another tool that can be used to prevent ADEs; this tool consists of 10 questions that a pharmacist may ask regarding each drug a patient is taking.<sup>9</sup> The questionnaire assesses a medication's indication, effectiveness, dose, directions for use, administration, interactions, duration of use, and cost. Based on a score ranging between 0 and 18, the *MAI* provides a final rating of appropriateness: appropriate, marginally appropriate, or inappropriate. Additional screening tools and scales used to assess a patient's understanding of medications and diseases include the Drug Regimen Unassisted Grading Scale (DRUGS), Medication Management Instrument for Deficiencies in the Elderly (MedMaIDE), Medi-COG, and the Self-Administration of Medication (SAM).<sup>10,11,12</sup>

## Case

### SCENARIO

You are a pharmacist working in a family medicine clinic.

CC: "I need a refill on my shots"

HPI: GR is a 79-year-old female patient (65 in, 77 kg) presenting to her family medicine clinic for follow-up for her chronic disease states. The patient has been in India the past four months with family members and indicates no healthcare concerns at this time. She reports no hypoglycemic events and states that her blood sugar levels are "good". The patient did not bring her blood glucose log to clinic.

PMH: T2DM; HTN; HLD; severe osteoarthritis in her hands

FH:

- Mother: T2DM, breast cancer
- Father: MI at age 57

Medications:

- Metformin 500 mg BID
- Insulin glargine 42 units SQ at bedtime (vials and syringes for insurance purposes)
- Glyburide 10 mg daily
- Atorvastatin 80 mg daily
- Lisinopril 20 mg daily
- Hydrochlorothiazide 25 mg daily
- Acetaminophen 500 mg four times daily as needed for pain

Labs:

- Na 140 mmol/L
- K 4.2 mmol/L
- Cl 101 mmol/L
- CO<sub>2</sub> 27 mmol/L
- BUN 16 mg/dL
- SCr 0.92 mg/dL
- Ca 9.6 mg/dL
- Glucose 148 mg/dL
- HgA1c 9.1%
- LDL: 98

- HDL 41
- Triglycerides 137
- Total cholesterol 166
- Alk phos 64 U/L
- AST 25 U/L
- ALT 32 U/L

VS:

- BP 138/72
- HR 84 bpm
- RR 12/min

SDH: Because GR's English proficiency is low, she is accompanied by her son to her appointment to aid in translation.

Additional context: Upon interviewing the patient (by way of her son), you found that she ran out of her insulin glargine while she was in India. While in India, her nephew ordered insulin online from an internet pharmacy because the pharmacy she normally uses could not acquire the medication due to a current shortage. She also states that her nephew thinks that she should be cooking with extra turmeric and cinnamon to help with her diseases rather than using the "chemicals" found in medications.

## Case Questions

1. Identify and describe the areas of increased medication safety concern for this patient.
2. Based on the *MAI*, which medication is least appropriate for this patient? How should this be addressed?
3. How would you address her statement about her nephew's beliefs in the use of turmeric and cinnamon instead of her prescription medications?
4. The patient's insulin glargine is currently on back order due to a medication shortage. What are some of the resources the pharmacist could turn to gather information on this shortage?
5. Because the patient's son bought her insulin online, this medication is at high risk of being counterfeit. What is the most common source of counterfeit medication? Identify the safety concerns related to counterfeit medication use.

## Author Commentary

Pharmacists are the key professionals positioned to address medication safety by ensuring appropriate prescribing, dispensing, administration, lab monitoring, and adherence. Drug shortages may also cause a number of safety concerns through delays in treatment that may compromise clinical outcomes.<sup>13</sup> Drug shortages have also been linked to medication errors and an increase in adverse events and death.<sup>13,14</sup> Counterfeit medications may arise due to difficulty in acquiring medications such as drug shortages, high costs for the patient, convenience of internet pharmacies, and breakdowns in the medication supply chains.<sup>15</sup> Counterfeit medications have been shown to present as safety concerns for patients, and multiple instances have occurred where purported 'medications' have no active ingredient whatsoever.<sup>15</sup> Other safety concerns include the addition of harmful substances (bacteria-laced water, paint, floor wax, boric acid, powdered cement, and antifreeze), incorrect active ingredient in the product, and wrong concentration or dose.<sup>15-18</sup> Internet pharmacies are the primary source of counterfeit medications, and many patients do not know the dangers.<sup>19</sup> Many companies claim that the medications are being manufactured in Canada, but this has been proven to be false. They often provide medications that are not approved by the FDA or Canadian government. Sadly, there have even been links to terror organizations.<sup>15</sup>

The FDA and ASHP have excellent resources available on their websites that display current drug shortages, reasons for shortage, expected availability and available products.<sup>20,21</sup>

## Patient Approaches and Opportunities

Pharmacists are uniquely positioned to identify medication safety issues, decrease patients' risk for adverse drug events, and improve the patient experience and outcomes. Community pharmacists often encounter patients with physical impairments and can provide resources to overcome medication-related issues and nonadherence. For patients with osteoarthritis, rheumatoid arthritis, lupus, or other conditions that challenge the use of hands and fingers, the following items may be suggested: prefilled blister packs, easy-open caps, easy-open pill extractors, bottle openers, spacer for inhalers, and eye drop guides. For patients who have trouble seeing, pharmacists may provide medication guides or educational pamphlets in larger print, have instructions/counseling spoken aloud, use color coding, or use talking devices. Patients who have trouble hearing instructions can use hearing aids, visual/written aids, or a TeleTYpe (TTY) device.

As the medication experts, pharmacists are also positioned to regularly conduct medication reconciliation to ensure accurate medication lists and work within an interprofessional team to ensure safe and effective use of medications.<sup>22</sup>

### IMPORTANT RESOURCES

#### *Related chapters of interest*

- [Safe opioid use in the community setting: reverse the curse?](#)
- [Saying what you mean doesn't always mean what you say: cross-cultural communication](#)
- [More than just diet and exercise: social determinants of health and well-being](#)

#### *External resources*

- Websites:
  - FDA Drug Shortages. <https://www.fda.gov/drugs/drugsafety/drugshortages/default.htm>
  - ASHP Drug Shortages. <https://www.ashp.org/drug-shortages/current-shortages>
  - Institute for Safe Medication Practices – <https://www.ismp.org/>
  - Consumer Med Safety – <http://www.consumermedsafety.org/>
  - Patient reporting of suspicious internet pharmacies – <https://nabp.pharmacy/programs/vipps/vipps-accredited-pharmacies-list/>.
- Journal Articles
  - Beers Criteria: American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults. *J Am Geriatr Soc.* 2015;63(11):2227-46.
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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# Drawing the line: preventing sexually transmitted infections

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**Lindsey M. Childs-Kean, PharmD, MPH, BCPS**

## TOPIC AREA

Infectious disease

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Explain the incidence of sexually transmitted infections (STIs) in the United States
- Describe groups of individuals at risk of developing complications related to specific STIs
- List the strategies for preventing and controlling STIs
- Recommend scheduling for immunizations to protect against STIs and other related infectious diseases

## Introduction

Sexually transmitted infections (STIs) present a unique public health problem. Approximately 20 million new STIs are diagnosed in the US each year, and a large number of cases remain undiagnosed or unreported.<sup>1</sup> And while appropriate treatment options exist for many STIs including syphilis, gonorrhea, and chlamydia,<sup>2</sup> the number of new cases continues to increase each year.<sup>1</sup> These infections increase the risk of chronic health issues such as complications in reproductive and fetal health as well as increase risk of acquiring other STIs such as human immunodeficiency virus (HIV).<sup>1</sup>

Certain groups have been identified as having a higher risk of acquiring particular STIs and/or developing serious long-term complications associated with STIs.<sup>1</sup> Approximately 50% of patients diagnosed with an STI are between the ages of 15 and 24 years of age.<sup>3</sup> Women of childbearing age are at high risk of long-term complications; the CDC estimates that approximately 20,000 women become infertile annually due to undiagnosed and/or untreated STIs.<sup>4</sup> Importantly, increasing rates of syphilis in women of childbearing age has led to an increase in congenital syphilis, which leads to significant morbidity and mortality in infants.<sup>4</sup> Another group with significant STI risk is men who have sex with men (MSM), and cases of reportable STIs among this population are also consistently increasing year to year.<sup>1</sup>

Many behavioral and socioeconomic factors also influence the spread of STIs.<sup>5</sup> Hispanics, African Americans, and American Indians have higher rates of STIs compared to white patients as these groups are also linked to decreased access to care, poverty, and communities/sexual networks with higher rates of STIs.<sup>5</sup> According to Healthy People 2020, STIs affect marginalized and indigent patients disproportionately due to decreased access to care and/or social networks with higher risk behaviors.<sup>5</sup> Patients with substance abuse disorders are also at a higher risk of acquiring an STI due to an increased likelihood

of engaging in high-risk behaviors.<sup>5</sup> An important aspect of decreasing the societal burden of STIs is the likelihood of patients to seek treatment for these infectious diseases; however, the stigma associated with STIs including HIV may limit patients from accessing diagnosis and care.<sup>5</sup>

Education, prevention measures, and prompt diagnosis and treatment are of utmost importance in controlling the STI epidemic in the US as rates of chlamydia, gonorrhea, and syphilis have consistently increased each year from 2013-2017.<sup>1</sup> Funding has also been cut from state resources including health departments; therefore, evaluating patients for sexual history and risky behaviors at any point of contact with the healthcare system is needed.<sup>1</sup> Prevention efforts should be coordinated between community, public health, and medical services. In addition, system-level obstacles should be reevaluated to allow for expedited partner therapy (EPT) for certain types of STIs as well as community-based test and treat programs. Pharmacists are easily accessible to many patients who otherwise may not seek medical care and are in a position to provide much needed patient education, counseling, and linkage to care for those patients who may benefit from STI evaluation and/or treatment.

## Case

### SCENARIO

You are a pharmacist working in an ambulatory care clinic in New York City where you often counsel patients about prevention and treatment of STIs.

CC: “I have a crazy rash that covers most of my body. I am really worried about it because I don’t know where it came from.”

Patient: JB is a 20-year-old African American male who is a senior art major at New York University (NYU). JB presents to clinic complaining of a rash that covers a large portion of his body, including the soles of his feet. He does not have a primary care physician in the city and was referred to the clinic by a friend.

HPI: New onset rash that covers ~60% of his body, including the soles of his feet. No fever, chills, or systemic signs of infection. No complaints of pain or trouble urinating.

PMH: No significant history or surgeries

FH:

- Father: unknown
- Mother: hypertension and hyperlipidemia
- One younger sister with no significant medical history

SH:

- Drinks socially (7-8 vodka drinks) on weekend nights
- Denies cigarette smoking
- Occasional drug abuse when “partying with friends” in the city
- Sexually active with multiple male partners (reports condom use ~60% of the time), states that he is typically the receptive partner

SDH: American-born student at NYU with a part-time job at an art studio, full scholarship to NYU with on-campus housing and meals provided, raised by a single mother in rural, upstate New York with minimal access to healthcare service

Medications:

- Acetaminophen PRN for headaches

- Melatonin PRN for sleep
- Multivitamin daily

Allergies: NKDA

Vaccinations: No documentation available, patient states that he thinks he has received all routine childhood vaccines but is unsure

Vitals:

- BP 116/70 mmHg
- HR 70 bpm

Labs: None available at this time

## Case Questions

1. Is JB considered to be a patient at high risk for acquiring STIs? Why or why not?
2. Without further laboratory data, which STI does JB most likely have? What is the appropriate therapy for JB at this time (include appropriate follow-up)? Without proper treatment, which additional STI is JB at high risk for?
3. JB is extremely upset with his diagnosis and wants to know more about how to avoid STIs in the future. What non-pharmacologic recommendations can you provide JB with at this time?
4. Which screening tests should be performed at least every year in MSMs who are sexually active?
5. According to the CDC & the 2015 STD Treatment Guidelines, what are the five major strategies for preventing and controlling the spread of STIs?
6. JB wants to know if there are any vaccinations available to protect patients against STIs. What information can you provide JB with at this time? What are the recommended age and dosing schedule for each of these vaccinations?

## Author Commentary

STIs are on the rise despite available education, prevention strategies, and antibiotic treatment. For the fourth consecutive year (2013-2017), STI rates, including chlamydia, gonorrhea, and primary/secondary syphilis, have increased based on CDC reports.<sup>1</sup> Resources for testing and treating STIs are limited, especially among groups who are at highest risk for infection. Without appropriate diagnosis and treatment, patients are at risk for long-term health consequences as well as transmitting the infection to others, increasing the societal burden. Partner services are often limited due to lack of appropriate health department resources and/or state laws that prevent EPT. Pharmacists may be one resource that can bridge the gap between patients and health departments/clinics by counseling patients on the importance of being tested and treated for STIs.

## Patient Approaches and Opportunities

Patients often do not understand that STIs can be transmitted by anal and oral sex; therefore, patient education at points of contact within the healthcare system is of utmost importance. Additionally, taking a thorough sexual history is necessary to assess the patient for STI risk factors and to recommend routine screening. Ensuring that the patient never feels “judged” by any healthcare worker is an imperative aspect of building a strong relationship. Pharmacists in community and/or ambulatory care settings have a unique opportunity to educate patients about STI transmission, the importance of partner screening, and

available prevention measures such as vaccines and barrier contraceptives. In addition, pharmacists can link patients to the nearest health department or local clinics to be tested and treated for STIs. When discussing STIs and sexual health, it is imperative to keep in mind cultural differences and the health literacy of the individual patient.

## IMPORTANT RESOURCES

*Related chapters of interest:*

- [HIV and hepatitis C co-infection: a double-edged sword](#)
- [An ounce of prevention: pharmacy applications of the USPSTF guidelines](#)

*External resources:*

- Healthy People 2020: <https://www.healthypeople.gov/2020/topics-objectives/topic/sexually-transmitted-diseases>
- Centers for Disease Control and Prevention- Sexually Transmitted Diseases (STDs): <https://www.cdc.gov/std/tg2015/tg-2015-print.pdf>
- 2015 Sexually Transmitted Diseases Treatment Guidelines: <https://www.cdc.gov/std/tg2015/default.htm>
- Centers for Disease Control and Prevention- Immunization Schedules: <https://www.cdc.gov/vaccines/schedules/index.html>

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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# Interprofessional collaboration: transforming public health through team work

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## TOPIC AREA:

Interprofessionalism

## LEARNING OBJECTIVES

At the end of this case, students should be able to

- Describe the Interprofessional Education Collaborative core competencies
- Discuss the importance of interprofessional collaboration in public health practice
- Identify different models or frameworks to build community partnerships and interprofessional collaborations in addressing public health needs
- Apply components of various models in creating and sustaining community partnerships to public health prevention initiatives

## Introduction

Research has identified effective healthcare teams as a factor in improved patient outcomes and reduction in medical errors.<sup>1</sup> In order for health professions to learn to work together optimally, health profession higher education has placed increased emphasis on interprofessional education (IPE). The World Health Organization (WHO) defines IPE as the process in which “two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes.”<sup>2</sup> The Interprofessional Education Collaborative (IPEC), which consists of national health education organizations, has identified the following four core competencies common to healthcare professions that support effective team development and function.

- **Values/ethics for interprofessional practice** To work with individuals of other professions to maintain a climate of mutual respect and shared values
- **Roles/responsibilities** To use the knowledge of one’s own role and those of other professions to appropriately assess and address the healthcare needs of patients and to promote and advance the health of populations
- **Interprofessional communication** To communicate with patients, families, communities, and professionals in health and other fields in a responsive and responsible manner that supports a team approach to the promotion and maintenance of health and the prevention and treatment of disease
- **Teams and teamwork** To apply relationship-building values and the principles of team dynamics to perform effectively in different team roles to plan, deliver and evaluate patient population-centered care and population health programs and policies that are safe, timely, efficient, effective, and equitable<sup>3</sup>

In regard to public health, building partnerships across health professions and community organizations is an important step in addressing complex health issues. Effective interprofessional collaboration is both necessary and critical, given the complexity of public health issues and the multiple stakeholders involved. Additionally, interprofessional collaboration in relation to public health often includes more disciplines than pharmacists typically see in clinical practice.

While these interprofessional teams can tackle complex public health issues, it is important that the team be moving in the same direction. A first step is conducting a community health needs assessment to identify and prioritize health issues.<sup>4</sup> Once a need has been selected, the team can utilize various models that provide a blueprint for creating and sustaining partnership,<sup>5-7</sup> such as the *Creating and Maintaining Partnerships* toolkit and the *Developing a Framework or Model of Change* toolkit from Community Toolbox.<sup>6,8</sup> The *Creating and Maintaining Partnerships* toolkit provides an outline of questions and resources to consider when building partnerships across professions and with community-based organizations. The *Developing a Framework or Model of Change* toolkit helps in developing an overarching framework for the program, activities, and intended outcomes. Once a partnership has been forged between health systems and community-based organizations, useful resources, such as the *Partnership Assessment Tool for Health (PATH)*, can assist collaborators in working together effectively to maximize the impact of the partnership.<sup>9</sup> Further guidance is available on approaches to consider for successful health partnerships.<sup>10</sup>

## Case

### SCENARIO

It's finally happened—you have your license to practice pharmacy! You've recently moved and accepted a residency position at a large teaching hospital downtown. On your first day at work, the residency director assigns a project she wants you to complete by the end of your one-year residency: developing a hypertension primary prevention interprofessional initiative in the surrounding community. The previous resident's project was a community health needs assessment that found hypertension to be a prevalent and growing issue in the community. The community you now work and live in is underserved and located in an urban setting with low socioeconomic status, low health literacy, a high disease burden, and a high crime rate. Although the community has its struggles, it also has a strong community presence, including many people, organizations, and institutions that want to help. Being at an academic medical center located in a heavily populated community lends itself to many diverse and creative opportunities for collaboration.

## Case Questions

- 1. Interprofessional/IPEC** Which professional healthcare groups do you want represented on the team to help with the project? Why?
- 2. Interprofessional/IPEC** How would the team identify and communicate about each member's functions or roles, responsibilities, and accountabilities? How will the team communicate about the project's goals and progress?
- 3. Stakeholders/partners** Using the *Creating and Maintaining Partnerships* toolkit, which stakeholders and partners (other than healthcare professionals) do you want to include in this project? Why? How will you include them?
- 4. Shared goal/vision** Using the *Creating and Maintaining Partnerships* toolkit, create an overall shared goal/vision for the project.
- 5. Initiative** Using the *Developing a Framework or Model of Change* toolkit, develop a feasible initiative concerning hypertension primary prevention in your community.

## Author Commentary

The multifaceted nature of public health requires a sound, interprofessional approach in addressing issues. Tackling public health issues requires a team-based approach, often with disciplines pharmacists are not typically familiar with. Such collaborations are necessary but are also difficult to establish and maintain. Taking the time to carefully and purposefully choose an interprofessional team, where each member brings unique connections, knowledge, and/or skills, is critical for success. Once you have your team, it is equally important that you are all on the same page, so as to promote open communication and engagement among members. Ensuring that your initiative is clear, impactful, and feasible can help team members fully engage in the project and prevent unnecessary barriers from impeding progress. Utilizing tools (such as those included herein) aimed to create impactful initiatives, establish and maintain interprofessional teams, and establish a shared vision among teams, can be extremely helpful when pursuing public health initiatives.

## Patient Approaches and Opportunities

When developing an interprofessional team, it is important to be both creative and critical, so as to include a wide range of professionals who can contribute in unique, meaningful ways. Establishing relationships with stakeholders, especially those from the community, is critical toward building trust and a strong foundation for resulting initiatives. Following a patient-centered paradigm of seeking to include patients (or, in this case, “community members”) in the design, implementation, and closure of a project, will lead to better-designed and, likely, more impactful programs. Utilizing toolkits and models (such as those included here) can help practitioners create and implement, in a logical, step-by-step fashion, an interprofessional public health initiative.

Pharmacists play an important role in public health. As medication experts, we understand the nuances associated with the ramifications of widespread medication use in our society, including issues of nonadherence, medication safety, adverse events, overdoses, and pharmacoconomics (costs). Your value as part of the interprofessional team is crucial. However, it can be difficult at times to integrate your knowledge and opinions in an interprofessional setting and/or team and, ultimately, show your value. Becoming a more effective team member takes practice. As you improve leadership and communication skills, your ability to work with others will improve. In addition to hands-on practice, resources are available to improve interprofessional teamwork skills. These resources are diverse and include articles, toolkits/models, surveys, reflections, modules, and curricula.

### IMPORTANT RESOURCES

#### *Related chapters of interest:*

- [Communicating health information: hidden barriers and practical approaches](#)
- [The ‘state’ of things: epidemiologic comparisons across populations](#)
- [More than just diet and exercise: social determinants of health and well-being](#)

#### *External resources:*

#### *Websites:*

- Agency for Healthcare Research and Quality, “TeamSTEPPS,” <https://www.ahrq.gov/teamstepps/index.html>.
- Interprofessional Education Collaborative, “Resources,” <https://www.ipecollaborative.org/resources.html>.
- National Center for Interprofessional Practice and Education, home page, <https://nexusipe.org>.
- US Department of Labor, Bureau of Labor Statistics, “Occupational Outlook Handbook,” <https://www.bls.gov/ooh/healthcare/home.htm>.

### Publications

- Robert Wood Johnson Foundation, “Lessons from the Field: Promising Interprofessional Collaboration Practices,” white paper, 2015.
- Stergios T. Roussos and Stephen B. Fawcett, “A Review of Collaborative Partnerships as a Strategy for Improving Community Health,” *Annual Review of Public Health* 21 (2000): 369–402.
- Steven A. Schroeder, “We Can Do Better—Improving the Health of the American People,” *New England Journal of Medicine* 357 (2007): 1221–28.
- Matthew K. Wynia, Isabelle Von Kohorn, and Pamela H. Mitchell, “Challenges at the Intersection of Team-Based and Patient-Centered Health Care: Insights from an IOM Working Group,” *Journal of the American Medical Association* 308, no. 13 (2012): 1327–28.

### Models

- Center for Health Care Strategies, Inc., “Partnership Assessment Tool for Health,” <https://www.chcs.org/resource/partnership-assessment-tool-health/>.
- Centers for Disease Control and Prevention, “Assessment & Planning Models, Frameworks & Tools,” <https://www.cdc.gov/stltpublichealth/cha/assessment.html>.
- Centers for Disease Control and Prevention, “Community Health Assessments & Health Improvement Plans,” <https://www.cdc.gov/stltpublichealth/cha/plan.html>.
- Community Tool Box, “Creating and Maintaining Partnerships,” <https://ctb.ku.edu/en/creating-and-maintaining-partnerships>.
- Community Tool Box, “Developing a Framework or Model of Change,” <https://ctb.ku.edu/en/4-developing-framework-or-model-change>.
- Robert Wood Johnson Foundation, “The Secret to Successful Health Partnerships,” [https://www.rwjf.org/en/blog/2015/02/the\\_secret\\_to\\_succes.html](https://www.rwjf.org/en/blog/2015/02/the_secret_to_succes.html).
- National Association of County and City Health Officials, “Mobilizing for Action through Planning and Partnerships (MAPP),” <https://www.naccho.org/programs/public-health-infrastructure/performance-improvement/community-health-assessment/mapp>.
- Practical Playbook, “Building a Partnership,” <https://www.practicalplaybook.org/section/building-partnership>.

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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# HIV and hepatitis C co-infection: a double-edged sword

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## TOPIC AREA

Infectious disease

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Describe specific patient groups that require screening for HIV and Hepatitis C infections
- Explain methods to prevent the transmission of HIV and Hepatitis C infections
- Detail non-pharmacologic counseling points for patients newly diagnosed with HIV and/or Hepatitis C infection

## Introduction

Human immunodeficiency virus (HIV) and Hepatitis C virus (HCV) infections can cause significant morbidity and mortality if left untreated. The Centers for Disease Control and Prevention (CDC) estimates that 1.1 million adults and adolescents are living with HIV infection<sup>1</sup> and 3.5 million individuals are living with chronic HCV infection.<sup>2</sup> A significant portion of the individuals infected do not know that they are infected. Fortunately, there are available antiviral treatments that are effective at suppressing HIV replication and eradicating HCV.<sup>3,4</sup> These treatments not only decrease the chances of disease progression but also decrease the risk of transmitting the diseases to other individuals.<sup>3,4</sup> Therefore, it is vital that appropriate patient groups are screened for these viral infections and then linked to care with appropriate healthcare providers.

Patients who should be screened for HCV include both patients who are in certain risk groups as well as those born between 1945-1965.<sup>4</sup> HCV is most efficiently transmitted by infected blood-to-blood contact. Therefore, those individuals who should be screened due to risk include those who could have come into contact with HCV-infected blood, such as injection drug users, patients on long-term hemodialysis, healthcare workers after a needle stick injury, children born to HCV-infected mothers, and patients receiving blood before 1992.<sup>4</sup> Additionally, individuals who were ever incarcerated, have HIV infection, have unexplained liver disease, and solid organ donors should be screened for HCV.<sup>4</sup>

All individuals at least 13 years of age should be tested for HIV at least once as a part of routine healthcare.<sup>5</sup> For those patients who may come into contact with HIV-infected bodily fluids (e.g., blood, semen, vaginal fluids, rectal fluids, breastmilk), at least yearly screening is recommended.<sup>5</sup>

Patients diagnosed with HIV and/or HCV should undergo further testing, evaluation, and counseling. The counseling for both infections includes ways to reduce the risk of transmission to others and encouragement to have sexual partners tested.<sup>3,4</sup> Additionally, counseling should focus on reducing disease progression, both through antiviral treatment and non-pharmacologic

methods. For example, alcohol consumption should be avoided in patients with HCV because both can hasten liver function decline.<sup>4</sup> Patients diagnosed with HIV should be counseled about the risk of and signs and symptoms of opportunistic infections.<sup>3</sup>

In addition to direct clinical care, pharmacists are involved in the public health aspect of HIV and HCV care by participating in the screening and detection process for both viruses.<sup>6,7</sup> Pharmacists assist in identifying patients and patient groups who should be screened for HIV and/or HCV, conducting the screening test when applicable, counseling patients on the results of the screening test, assisting other health care providers with interpretation of screening results, and linking patients to further care if the screening test returns positive.

## Case

### SCENARIO

You are a pharmacist practicing in a busy clinic setting. One of your primary roles is to counsel patients who are newly diagnosed with infectious diseases, including HIV and HCV. Your counseling points during these encounters generally include an overview of the viral infections, prevention of transmission, and general points of treatment.

CC: “My new fiancée wanted me to get ‘checked up’ by the doctor before we got married.”

Patient: RC is a 55-year-old male (70 in, 200 lb) who works as a car mechanic in Georgia. At his fiancée’s request, he saw his usual PCP who ordered a number of lab tests. He has now received new diagnoses of HIV and HCV infection from his physician and is presenting to the clinic pharmacist.

HPI: Presented to clinic one month ago. No significant complaints at that time or at this visit. Patient denies any history of rash, fever/chills, night sweats, and jaundice.

PMH: Hypertension (x 5 years); HIV (diagnosed at this visit); Hepatitis C (diagnosed at this visit)

FH:

- Father: died at age 75 from a MI, had prior hypertension and dyslipidemia
- Mother: died at age 76 from a CVA, had prior hypertension
- Siblings: One brother, 58 years old, alive with hypertension and dyslipidemia
- Child(ren): One son, 25 years old, alive and well

SH:

- Reports drinking one 12 ounce bottle of beer per day
- Denies current smoking, but smoked one-half pack per day for 10 years and quit 10 years ago
- Denies current illicit drug use, but did inject heroin “just one time” in the mid-1980s

Sexual History:

- Identifies as heterosexual and has been sexually active since 18 years old.
- Monogamous during prior 15 year marriage to a woman.
- For the last five years, he has had vaginal, anal, and oral sex with multiple female sexual partners until meeting current fiancée six months ago.
- Has not participated in oral, anal, or vaginal sex in current relationship with fiancée, but has been monogamous.

SDH: RC is English-speaking with a high-school diploma (with a few trade school courses). His annual income (with fiancée) is approximately \$75,000. He lives in a single family home with his fiancée.

Medications:

- Hydrochlorothiazide 25 mg daily
- Ibuprofen 200 mg every 6 hours as needed for “aches and pains”

Allergies: NKDA

Vitals:

- BP (seated) 128/76 mm Hg
- Other vital signs WNL

Labs:

- HIV screen: positive
- HIV viral load: 56,783 copies/mL
- CD4 count: 562
- HIV genotype: wild type virus
- HCV screen: positive
- HCV viral load: 125,000 IU/mL
- Hepatitis A antibody: Nonreactive
- Hepatitis B surface antigen: Nonreactive
- Hepatitis B surface antibody: Nonreactive
- Hepatitis B core antibody: Nonreactive
- Other labs: WNL
- Other health screenings: negative

## Case Questions

1. The patient understands how he potentially contracted HIV due to his sexual activity in the last year, but he wants to know if that’s how he got Hepatitis C as well. How do you counsel him about the similarities and differences in the transmission risks of the two viruses?
2. Now that the patient knows how HIV and Hepatitis C are transmitted, he desperately wants to know how to prevent transmitting it to his fiancée. What options are there for both him and his fiancée to lessen transmission risks?
3. RC is unsure that he is ready to start treatment for either disease yet. Besides further discussing treatment details with him, what non-pharmacological recommendations can you give him to help lessen his risk of disease progression?
4. How would you counsel the patient about the possibility of being a blood and/or organ donor?
5. Because a diagnosis of HIV and HCV can be devastating and carries negative stigma, what steps can you take to help the patient cope with the new diagnosis?

## Author Commentary

HIV and HCV are two common viral illnesses that create significant morbidity and mortality. Pharmacists play several important roles in the care of these patients. As modeled in the above case, pharmacists are commonly involved with an interdisciplinary healthcare team and will counsel patients shortly after a diagnosis is made. While the bulk of this conversation usually centers on

antiviral medications the patient will receive for treatment, there are other important counseling points that pharmacists should make regarding transmission risks and other management considerations besides antiviral treatment, including but not limited to determining need for vaccinations, particularly Hepatitis A and B, and maintaining a healthy lifestyle.

## Patient Approaches and Opportunities

Receiving a diagnosis of HIV and/or Hepatitis C can be a devastating situation for a patient. There is still stigma surrounding diagnoses of these diseases even though they are treatable. Therefore, it is important to assess how the patient is coping mentally and emotionally during this counseling session. It might be prudent to offer a follow-up clinic visit or phone call to discuss some of the necessary counseling points if the patient seems overwhelmed. Additionally, keep in mind possible cultural concerns that might cause patients to feel uncomfortable talking with the pharmacist about these particular diagnoses. Asking the patient what you can do to make them more comfortable for this discussion is prudent. One important counseling point at this time of diagnosis is discussion about risks of transmission with sexual partners. The patient's sexual partner(s) should be screened for all sexually transmitted infections, including HIV and HCV. This is also an ideal time to counsel a patient on safer sexual practices, such as barrier methods, as well as the possible use of pre-exposure prophylaxis if the sexual partner is not infected with HIV.

### IMPORTANT RESOURCES

#### *Related chapters of interest:*

- [Communicating health information: hidden barriers and practical approaches](#)
- [Interprofessional collaboration: transforming public health through team work](#)
- [Drawing the line: preventing sexually transmitted infections](#)
- [An ounce of prevention: pharmacy applications of the USPSTF guidelines](#)

#### *External resources:*

- Department of Health and Human Services. Guidelines for the use of antiretroviral agents in adults and adolescents living with HIV. <https://aidsinfo.nih.gov/guidelines/html/1/adult-and-adolescent-arv/0>
- American Association for the Study of Liver Diseases/Infectious Diseases Society of America. HCV Guidance: Recommendations for testing, managing, and treating Hepatitis C. <https://www.hcvguidelines.org/>

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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# Ethical decision-making in global health: when cultures clash

John Rovers, PharmD, MIPH

Erin Ulrich, PhD

## TOPIC AREA

Global health

## TRIGGER WARNING

This case discusses an actual event that some people may find disturbing. Those who have suffered gender-based violence, childhood abuse, or other physically or emotionally traumatic events are encouraged to prepare emotionally before proceeding.

**Disclaimer:** This case is a critical analysis of a topic that most readers will view as an act of gender-based violence. A critical analysis of the subject requires reviewing it from several different perspectives, not all of which are disapproving of the subject. Although the subject is discussed from varying perspectives, the authors are in no way supportive of the practice.

**Acknowledgement:** We gratefully acknowledge the assistance of Rachel Purdy, PharmD 2019, for her assistance with reviewing and editing this case.

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Explain why pharmacists practicing in the Global South cultural skills to address ethical and cultural situations not usually seen in pharmacy practice.
- Describe the limitations of pharmacy's usual ethical principles and codes of conduct that may not apply in communities practicing female genital cutting (FGC)
- Apply the six-step ethical decision-making process to determine an appropriate course of action when faced with cultural differences while serving on a medical mission trip

## Introduction

Pharmacists planning to serve on a short-term medical mission trip often prepare by reviewing the pathophysiology and treatment for diseases they do not normally see as part of their usual practice. Being clinically prepared to serve on a mission trip is vital, but so is preparing for cultural situations that will be new and maybe disturbing.

This case discusses the practice of surgically altering the external female genitalia as part of a cultural or religious practice. Most in the Global North, including the WHO, refer to this practice as female genital mutilation (FGM). The term “mutilation” may be problematic because it suggests that harm is intentionally inflicted, and not all cultures see the practice as intentionally harmful. Consequently, this case study uses the term female genital cutting (FGC). Regardless of terminology, the WHO indicates that FGC creates risks for both short-term and long-term adverse consequences including pain, excessive bleeding, fever, infection, dyspareunia, difficult childbirth, and psychological problems.<sup>1</sup>

FGC is practiced primarily in a wide swath across Africa from the Atlantic Coast to the Horn of Africa and is highly variable in where it is practiced, how it is practiced, and who practices it.<sup>2</sup> Although prevalence is highest in Somalia, Egypt, Sudan, Mali, Guinea and Sierra Leone, all with rates >80%, different regional, ethnic, or tribal groups within and between countries may differ widely in how (or even if) they practice FGC.<sup>2</sup> Although most countries in which FGC is practiced are majority Muslim, the practice is not limited to (or required by) Islam. While the practice is widespread in sub-Saharan Africa, it may also occur in immigrant communities in Europe, North America and Australia.

In most countries, girls are cut before 15 years of age and often below the age of five. In other regions, the event may not happen until shortly prior to, or even after, marriage. There is great variability in who performs the procedure. For example, in Senegal, nearly all FGC is performed by traditional practitioners, while in Egypt, nearly 80% is performed by trained health personnel.<sup>2</sup>

Although the WHO describes FGC as a violation of women’s human rights,<sup>3</sup> in communities where it is practiced, FGC is often seen as providing a sense of identity within the culture and is a purifying rite that signals a girl is of good moral character.<sup>4,5</sup> Although Westerners often believe the practice is intended to inhibit female sexual pleasure or preserve female virginity, women who have undergone the procedure often disagree.<sup>6-8</sup>

## Case

### SCENARIO

You have arrived in Mali, West Africa on your first medical mission trip. Your medical team consists of two physicians (one of whom serves as your medical director), a physician assistant, a pharmacist (you), one of your pharmacy student interns, and a nurse.

The village has not only welcomed your team to the village but has treated you as honored guests. Over the weeks, the clinic your team has worked in has been highly successful and you have treated nearly 120 patients for malaria and various other tropical diseases.

One evening, your team is invited to an enormous village celebration with feasting and dancing. As you are enjoying yourself, one of your team members quietly comes up to you and tells you the celebration is to honor a village girl who will undergo FGC in the morning.

Your team gathers back at your bunk house to discuss the situation and what you all should do. Frankly, most of you are angry with your medical director for not informing you beforehand this was a situation the team could possibly find itself in. The team is divided as to what to do. However, it is clear to all team members that they are working in a culture that they do not understand.

In the end, the team cannot come to any agreement about what to do. You go to bed for the night and try in vain to get some sleep under your bed net. The next morning, you go to clinic as usual and try to act like nothing has happened.

## Case Questions

1. What are some culturally expected practices you must adhere to in order to live an ordinary life in your own community?

2. Adherents to FGC may not be persuaded by the facts presented in an educational program to end FGC. Provide some examples of beliefs some Americans may have that may be impervious to generally accepted facts.
3. What body modification practices are common in the Global North?
4. Who does your body belong to?
5. FGC is gradually becoming less common as countries become more developed and people become more educated. Should Western aid workers continue to work to end the practice or should we just let those in the Global South work this out for themselves and let it end naturally?
6. If the mission team in the case had wanted to intervene to end FGC in their service community, what would they need to do?

## Author Commentary

Usually, the role of the pharmacist on a global health mission trip is to ensure the smooth running of the pharmacy, consult with team members on drug therapy decision making, and to counsel patients on their medicines. But there will be times when no one on the team is adequately prepared to deal with situations that may arise. Providers' clinical education may not include adequate cultural humility training, leading to providers making negative judgments about the community they serve. Consequently, all team members, including pharmacists, should be able to negotiate these cultural differences and adopt a process for ethical decision making when cultural differences may impair patient care.

Practicing global health or volunteering for a medical mission trip to a medically underserved region can be a life-changing experience. Volunteers often gain a deeper understanding of themselves and their place in the world. They also come to recognize that what we think of as normal in the US is not always considered normal somewhere else. As a result, any actions taken (or not taken) may not be the same as what you would do in the usual course of your pharmacy practice in an American setting. The case presents an extreme practice situation which most Americans would certainly not see as normal. However, the process of working through and identifying an ethical response will be similar no matter if the cultural divide is about FGC or if the patient refuses drug therapy due to a belief that his illness is caused by evil spirits. The take home messages in nearly every case will be the same:

1. Have a process by which to identify and address culture-based ethical problems;
2. Realize there is rarely a right answer for what to do. You may have to make the best choice among several unappealing options;
3. Learn and appreciate the acronym SPADFY – Some People Are Different From You.

## Patient Approaches and Opportunities

Ethical analysis requires time and reflection. The gut instincts that we experience around complex and controversial situations are more likely related to our moral system than an ethical framework. Purtilo presents a formalized scheme called the Six-Step Ethical Decision-Making Process, to take a situation apart, organize your thoughts, and come to an ethical decision.<sup>10</sup> The process includes the following steps:

### *Step 1: Gather Relevant Information*

Factors that may help the team decide a course of action may include:

- How does the local community view FGC? This is part of getting the story straight. Best practices in global health make it a requirement to understand the community the team serves in. Proposing solutions before we even understand what may or may not even be a problem is bad practice. Cultural practices need to be understood within their own contexts, and not compared to an outsider's perspective on that culture so as to denigrate it. Cultures don't exist to make observers or visitors feel better, they exist to provide those who live within them a set of cultural rules, values, behaviors, and practices

that make daily life in that culture possible. So, if one can see past one's own cultural biases (e.g. FGC is barbaric) it becomes possible to see (if not necessarily agree with or understand) that FGC may assist women to live within the culture they inhabit.

- Why do cultures practice FGC? If we can see the practice through the eye of the local community, we learn that it is not the parents' intention to mutilate their daughters, nor is it necessarily the result of living in a deeply patriarchal society. Rather, FGC is often seen as a proper, socially acceptable, cultural expectation that is thought to be purifying.
- Are there existing interventions that have been shown to be helpful? If the decision is made to intervene, gathering needed information will require knowing what experts have found to be helpful. Making clinical recommendations that are not evidence-based is unprofessional. So is making cultural recommendations that are not evidence-based. Ending FGC involves changing cultures, not just educating villagers about the harms of a long-standing practice. Although cultures do change (e.g. cigarette smoking in public in the US is now prohibited) they may change slowly and from the bottom up, not from a top down program. One thing is clear – if an intervention is to have any hope of success, it must be focused as a community change effort. The most effective work appears to have been done by a non-governmental organization called Tostan working in West Africa.<sup>11</sup>

### *Step 2: Identify Type(s) of Ethical Problem(s) Occurring*

After collecting relevant information, it is critical to determine what type(s) of ethical problem(s) are occurring in your particular situation. There are four types of ethical problems:

- Ethical distress occurring due to an existing barrier to acting on an obvious solution;
- Ethical distress occurring because two or more solutions are possible; however, value is lost if only one solution was acted upon;
- A dilemma of justice occurring because resources or benefits are not distributed fairly;
- A locus of authority ethical problem occurring because someone other than yourself holds the power to decide and act.

A situation may result in more than one ethical problem. However, this FGC case is a good illustration of a locus of authority ethical problem.

### *Step 3: Use Ethical Approaches and Tools to Analyze the Problem*

During their training, most health professionals were provided some basic tools to evaluate and proceed when faced with an ethical situation, but when faced with the cultural divide posed by FGC, these tools may not be sufficient.

Consider the Pharmacist's Code of Ethics provided by APhA.<sup>12</sup> The Code discusses the covenantal relationships with the patient but since a young woman about to undergo FGC is not actually the pharmacist's patient, much of the Code does not readily apply. The eight principles listed are the desirable characteristics that American society desires from a pharmacist practicing in the US. Could or should the Code be applied to an individual who is not your patient and who is not residing in the US?

Consider next the ethical principles of autonomy, beneficence, non-maleficence, and justice that most practitioners are familiar with. Since Westerners may frequently believe FGC impairs a woman's sexual pleasure, perhaps the best ethical argument against is it justice. However, ethnographic studies of the sexual experiences of women who have undergone FGC found that some women continue to have a satisfying sex life while others think the Western world's emphasis on sexual pleasure and orgasm is misguided.<sup>5,13</sup>

### *Step 4: Explore the Practical Alternatives*

Up until this step, you have had the opportunity to decide what you *should* do. The next step is to take all the information and tools and determine what you *can* do in this situation. This step encourages brainstorming of all possible actions and non-action. It is important to not oversimplify the possible actions. One option to prevent tunnel vision is to bring those who should be involved in this decision to the table to make sure all perspectives are represented in the alternatives. Please keep in mind that non-action is a form of decision. Doing nothing should be considered as a possible alternative.

## Steps 5 & 6: Complete Action and Evaluate

Once an action/non-action is taken, take time to engage in personal reflection. Conduct an evaluation of how effective your process was in helping the team to come to a decision. Determine what the outcome of your action was. This is important for personal and professional growth. Additionally, lessons learned may be passed to other healthcare providers and educators.

### KEY TAKEAWAYS

*Related chapters of interest:*

- [The cough heard 'round the world: working with tuberculosis](#)
- [Saying what you mean doesn't always mean what you say: cross-cultural communication](#)

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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# Safe opioid use in the community setting: reverse the curse?

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**Mark A. Strand, PhD, CPH**

## TOPIC AREA

Opioid safety

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Describe the epidemiology of the opioid crisis in the 21<sup>st</sup> century
- Identify patients at risk of opioid misuse when provided patient information
- Identify harm reduction and safety solutions for opioid users
- Discuss the opportunities for policy, legislative, or regulatory changes that will improve the pharmacist's ability to optimize the public's health regarding opioid use

## Introduction

Opioids – prescription and illicit – are the main driver of drug overdose deaths in the US. Opioids were involved in 42,249 deaths in 2016, and opioid overdose deaths were five times higher in 2016 than 1999.<sup>1</sup> In recent years, there has been a surge in deaths due to alcohol, drug abuse, and suicide, which some have described as “deaths of despair.”<sup>2</sup> Among the individuals involved in this trend are persons living with chronic pain and persons living with a substance use disorder.

The current opioid misuse crisis is made more complex for pharmacists because of concerns that many of those abusing prescription opioids, or even heroin, had a prescription medication as their entry point.<sup>3-6</sup> Prior to 1990, heroin addiction began with heroin use, but since that time, heroin addiction has primarily begun with prescription opioids.<sup>4</sup> An estimated 25 million adult Americans suffer daily from pain and require some analgesic to provide relief.<sup>7</sup> With liberalization of opioid prescribing practices, many opioid-naive patients were exposed to opioids. One in four patients receiving long-term opioid therapy in a primary care setting struggles with an opioid use disorder.<sup>8</sup> This set the stage for a generation of patients unexpectedly misusing opioid medications.

Educating patients about their medications has been required of all Medicaid patients and, in many states, all patients (see Important Resources for more information). With controlled medications, patient education and counseling is even more critical. Pharmacists' cognitive services are increasingly recognized as an essential added clinical value for patients. While the opioid misuse epidemic facing the country requires a multidisciplinary approach, community pharmacists are key players in ensuring patients use these medications safely and, if there are concerns, linking patients to needed care.

## Case

### SCENARIO

You are a floater pharmacist working at a new pharmacy on the weekend in the outskirts of an urban area.

**CC:** “I would like to have this prescription filled.”

**Patient:** BC is a 39-year-old male (70 in, 79.5 kg) with pain in his back and leg associated with a multi-car accident. He reports that he frequently experiences pain associated with his work as a temporary concrete layer.

**HPI:** Toward the end of the day, BC approaches your pharmacy counter with a new prescription for Percocet 10/325 #60 with directions to take 1-2 tablets every 4-6 hours as needed for severe pain. The prescription is from Dr. Stevens at the local urgent care facility.

**PMH:** Depression; anxiety; ADHD; alcohol use disorder; allergic rhinitis

**FH:**

- Mother (alive) with T2DM, depression, and HTN
- Father (deceased) with history of alcohol use disorder, HTN, cirrhosis

**SH:**

- Reports tobacco use
- Reports alcohol use
- Living alone and not in the same city as the rest of his family

**Medications:**

- Sertraline 50 mg daily
- Alprazolam 1 mg TID
- Cetirizine 10 mg daily (OTC)

**Allergies:** NKDA

**SDH:** BC has been working but does not have benefits. He had been covered by Medicaid previously, but since moving to this state, he hasn't applied for it.

**Additional context:** Since he is a new patient, BC is asked to provide more comprehensive medical information. A new state law requires prospective review of the prescription drug monitoring program (PDMP) before dispensing any opioid prescription. His report is shown below.

Medication and dose	Instructions	Quantity (date)	Refills remaining	Prescriber	Pharmacy
Hydrocodone/ acetaminophen 7.5/325 mg	1 tab every 4-6 hours prn pain	15	0	Smith	ABC
		(10 days ago)			
Hydrocodone/ acetaminophen 7.5/325 mg	1 tab q6 hours prn pain	30	0	Jones	123
		(15 days ago)			
Methylphenidate 10 mg	1 tab BID	60	0	Jones	123
		(15 days ago)			

Medication and dose	Instructions	Quantity (date)	Refills remaining	Prescriber	Pharmacy
Hydrocodone/ acetaminophen 5/325 mg	1 tab every 4-6 hours prn pain	30	0	Hite	XYZ
		(20 days ago)			
Alprazolam 1 mg	1 tab TID	90	1	Hite	XYZ
		(20 days ago)			

## Case Questions

1. What do you conclude based on BC's PDMP review, and why?
2. What is BC's ORT score and what does that score mean?
3. Based on the risk factors identified above, what is your assessment of the patient's risk of opioid misuse?
4. What is the risk for unintentional overdose?
5. Will you dispense the Percocet for BC? Why or Why not?
6. What treatment options are recommended for this patient to reduce harm? Who else needs to be included in the treatment plan discussion? What can be done today?
7. What resources are available for referral? What resources are available for education for the patient?
8. What are the discussion points that need to be conveyed to the patient and caregivers, including opioid safety and medication use?
9. What implications and/or opportunities for policy makers exist surrounding this case?

## Author Commentary

The opioid epidemic was accelerated by liberalized opioid prescribing practices in the US. Therefore, as the medication experts in the healthcare system committed to safe use of all medications, pharmacists are the key professionals to ensure safe use of prescription opioids, and evidence-based care for patients with pain. This case highlights the difficult role that pharmacists play when dispensing medications to a patient for whom it may not be appropriate. The hope is that pharmacists will rely upon their professional judgement in evaluating the information available to them — the PDMP record, identified risk factors with the patient, and concomitant disease states and medications – in order to ensure the patient's safe use of the medication. Although opioids are particularly high-risk medications, the vigilance promoted in this case study has relevance for the role in safe medication use that pharmacists play with other medications that carry significant risk as well.

## Patient Approaches and Opportunities

Pharmacists serve as gatekeepers of safe medication use for patients. This includes verifying the appropriateness and safety of the medication being dispensed and educating patients about appropriate use of that medication.<sup>9</sup> Screening followed by brief interventions (SBIRT) have been shown to be feasible and effective.<sup>10,11</sup> Therefore, pharmacists are well positioned to make essential contributions to the prevention and management of opioid misuse among their patients through screening and patient education.<sup>12-14</sup>

Naloxone prescribing, strengthened pharmacist-prescriber communication channels, increased pharmacist access to patient health information (shared EHR), and access to prescription monitoring program data have created opportunities for pharmacists to practice the SBIRT model with opioid users.<sup>16</sup>

## IMPORTANT RESOURCES

### Related chapters of interest:

- [Saying what you mean doesn't always mean what you say: cross-cultural communication](#)
- [More than just diet and exercise: social determinants of health and well-being](#)
- [Communicating health information: hidden barriers and practical approaches](#)

### External resources:

- Guidelines
  - TIP 63. <https://store.samhsa.gov/product/TIP-63-Medications-for-Opioid-Use-Disorder-Full-Document-Including-Executive-Summary-and-Parts-1-5-/SMA18-5063FULLDOC>
  - Overdose toolkit. <https://www.samhsa.gov/capt/tools-learning-resources/opioid-overdose-prevention-toolkit>
- Websites:
  - Prescribe to Prevent <http://prescribetoprevent.org/>
  - Prevent-protect <https://prevent-protect.org/>
  - Prescription Drug Abuse Policy System (PDAPS) <http://pdaps.org/>
  - Healthy People 2020: HP2020 – Substance Abuse. <https://www.healthypeople.gov/2020/topics-objectives/topic/substance-abuse/objectives>
- Screening Tools:
  - Opioid Risk Tool. <https://www.drugabuse.gov/sites/default/files/files/OpioidRiskTool.pdf>
  - The Screener and Opioid Assessment for Patients with Pain-Revisited tool (SOAPP-R). <http://www.ccwjc.com/Forms/Chronic%20Pain/SOAPP-R.pdf>
  - The Brief Risk Interview. <http://www.painmed.org/2014posters/abstract-206/>

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# Opioid Risk Tool

This tool should be administered to patients upon an initial visit prior to beginning opioid therapy for pain management. A score of 3 or lower indicates low risk for future opioid abuse, a score of 4 to 7 indicates moderate risk for opioid abuse, and a score of 8 or higher indicates a high risk for opioid abuse.

Mark each box that applies	Female	Male
<b>Family history of substance abuse</b>		
Alcohol	1	3
Illegal drugs	2	3
Rx drugs	4	4
<b>Personal history of substance abuse</b>		
Alcohol	3	3
Illegal drugs	4	4
Rx drugs	5	5
<b>Age between 16—45 years</b>	1	1
<b>History of preadolescent sexual abuse</b>	3	0
<b>Psychological disease</b>		
ADD, OCD, bipolar, schizophrenia	2	2
Depression	1	1
<b>Scoring totals</b>		

Derived (with permission) from Webster LR, Webster RM. Predicting aberrant behaviors in opioid-treated patients: preliminary validation of the Opioid Risk Tool. Pain Med. 2005;6(6):432-42.

## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# The ‘state’ of things: epidemiologic comparisons across populations

Jonathan Thigpen, PharmD

## TOPIC AREA

Epidemiology/Pharmacoepidemiology

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Apply epidemiologic principles to a public health scenario
- Compare and contrast disease occurrence and health determinants across populations
- Generate conclusions about the health of a population using epidemiologic and pharmacoepidemiologic data
- Explain the dynamic relationship between health data, epidemiology, and public health policies

## Introduction

Given pharmacy’s increasing role in research, shaping public policy, and assessing medication use and safety across populations, learning fundamentals of epidemiology and pharmacoepidemiology is a critical component of pharmacy education. This is especially true for pharmacy students interested in pursuing careers in research, industry, administration, or public policy where these skills are consistently required.

Epidemiology is “*the study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems.*”<sup>1</sup> Pharmacoepidemiology, a subset of epidemiology, is “*the study of the use and effects/side-effects of drugs in large numbers of people with the purpose of supporting the rational and cost-effective use of drugs in the population thereby improving health outcomes.*”<sup>2</sup> As drug experts, pharmacists are already routinely responsible for monitoring drug use and safety across various populations. Additionally, the increasing complexity of health systems and push for a more holistic approach to health – not just drugs – necessitates an increased focus on epidemiology training for pharmacists. This is underscored by the fact that research – and by extension epidemiology and pharmacoepidemiology – serves as the tenth and all-encompassing essential service of public health.<sup>3</sup>

In every professional setting, pharmacists are at least in some part responsible for monitoring diseases and drug use. For some pharmacists, the population may be the patients in their community pharmacy, while for other pharmacists, their population may include serving millions of individuals while working for the FDA. Regardless of the setting, you will work with diverse, often ill or at-risk, populations reinforcing the importance of skills and experience in monitoring disease and medication use across populations. To gain further appreciation for epidemiology and its utility, consider the opioid epidemic. Pharmacists lead the charge in tracking opioid utilization, identifying high-risk patients, exploring the risk/benefit of opioids, and designing/assessing various public health policies aimed at mitigating the crisis (e.g., opioid reversal strategies). Examples of pharmacy-related epidemiology and pharmacoepidemiology duties include:

- Monitoring levels of disease and/or drug utilization

- Guiding distribution of resources
- Discovering exposures that facilitate or mitigate patterns in disease and/or drug use
- Providing useful information on the beneficial and harmful effects of drugs, including risk/benefit information.

## Case and Case Questions

You have volunteered to serve as a consultant for a new non-profit agency. The agency’s mission is to “improve the health of the population by promoting safe and effective use of medications”. The agency wants to establish roots in a particular state, but isn’t sure where to go. The agency’s board of trustees has asked you to provide a recommendation as to which state they should go to and start their work. Your task is to compare various state pairs and provide a recommendation (with rationale) as to which you think is the “unhealthier” state in regards to a particular health topic. Utilize the various data (outcomes, risk factors, determinants) available on the Henry J Kaiser Family Foundation (KFF) State Health Facts web site (<https://www.kff.org/statedata/>) and specific to that particular health issue to make your decision. Your recommendation should be written into a clear, focused format that you will present to the board of trustees.

The board of trustees has provided you with several topics of interest and several state pairings for your analysis (see **Table**). For each of the eight topics, pick one pairing, and conclude which state is “worse” concerning that particular topic (aka, “which state is in more need of your non-profit agency’s help”). The board has asked that you analyze a different state pair for each topic. Use the outcome data available on KFF State Health Facts website to support your decision.

Topics	Pairings
Immunizations	District of Columbia vs. Georgia
Alcohol and drug dependence	Nevada vs. Delaware
Opioid epidemic	New Mexico vs. New Jersey
Prescription drugs	Arkansas vs. Illinois
HIV/AIDS	Mississippi vs. Utah
Medicare	New York vs. Wyoming
Medicaid and CHIP	Hawaii vs. Ohio
Women’s health	Alabama vs. Massachusetts
	California vs. Kentucky
	Colorado vs. Pennsylvania
	Texas vs. Connecticut

1. Topic #1: Immunizations
2. Topic #2: Alcohol and Drug Dependence
3. Topic #3: Opioid Epidemic
4. Topic #4: Prescription Drugs
5. Topic #5: HIV/AIDS
6. Topic #6: Medicare
7. Topic #7: Medicaid and CHIP
8. Topic #8: Women’s Health

## Author Commentary

Epidemiology and pharmacoepidemiology are extremely broad and complex fields, and this activity is only meant as an introduction into these areas. These concepts are crucial to developing an appreciation for population health, its intricacies, and the many factors that contribute to health. As you delve into these comparisons, you should be careful in how you interpret and present the available data. Also, understand that the available data is limited and that you must make the most informed decision you can with imperfect and incomplete information. This closely reflects what happens in the real world. Lastly, when reviewing topics, you will notice many disparities and inequalities across state populations. As you find these differences, especially large differences, begin to consider how state-level policies and culture may contribute to these found differences. In this way, you will be extending the focus of this activity to include additional related epidemiological concepts such as determinants of health and health disparities.

## Patient Approaches and Opportunities

Epidemiology is the “scientific arm” of public health and is essential for assessing trends and patterns of disease and medication use across populations. Pharmacists are responsible for safe and effective medication use, and accordingly, must lead the effort in monitoring medication utilization and safety in populations. A strong foundation in epidemiological concepts is a critical component for pharmacists to have so that they can perform public health research and make sound conclusions when interpreting data. Ultimately, such foundational knowledge will lead to enhanced ability to create effective and meaningful public health programs and policies.

### IMPORTANT RESOURCES:

#### *Related chapters of interest:*

- [More than just diet and exercise: social determinants of health and well-being](#)
- [Medication safety: to ‘error’ is human](#)

#### *External resources:*

- Websites:
  - Henry J Kaiser Family Foundation. *State Health Facts*. <https://www.kff.org/statedata/>. Accessed November 30, 2018.
- Books and Chapters:
  - Centers for Disease Control and Prevention. *Principles of Epidemiology in Public Health Practice; 3rd Edition*. <https://www.cdc.gov/ophss/csels/dsepd/ss1978/ss1978.pdf>. Accessed November 30, 2018.
  - Jean Carter and Marion Slack. *Pharmacy in Public Health: Basics and Beyond. Chapter 10: Epidemiology and Disease*. Pages 197-226.

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3. The Public Health System & the 10 Essential Public Health Services. <https://www.cdc.gov/stltpublichealth/publichealthservices/essentialhealthservices.html>. Accessed November 30, 2018.

## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# Saying what you mean doesn't always mean what you say: cross-cultural communication

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## TOPIC AREA

Cultural competency/cross-cultural care

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Recognize cultural aspects that influence and impact patient care
- Apply a skills-based approach using concepts of cross-cultural care to a patient case
- Determine how to approach unfamiliar cultural situations focusing on communication, awareness of cultural differences, adopting information, eliciting patients' illness experiences, assessing how decisions are made, and determining health beliefs
- Utilize tools to elicit illness experiences and cultural information to tailor and improve patient care

## Introduction

Culture can be defined as the “*integrated pattern of human behaviors that includes thoughts, communications, languages, practices, beliefs, values, customs, courtesies, rituals, manners of interacting and roles, relationships and expected behaviors of a racial, ethnic, religious or social group; and the ability to transmit the above to succeeding generations.*”<sup>1</sup> Each individual is part of an extraordinary number of cultures at any given time, influencing one's beliefs, attitudes, and lifestyle. It is impossible to know every culture and how that culture may impact a person's health. The ability to account for the myriad of different cultures, especially from provider and public health perspectives, is an important but at times overwhelming task.

Unfortunately, cultural misunderstandings are common when seeking to provide care for individuals or a community, potentially leading to poor health and health disparities. Accordingly, the challenge for healthcare professionals is to acknowledge this barrier and seek to bridge cultural divides. Applying cross-cultural care is important for patient care, public health, and policy development, and those designing and implementing interventions for patients or large-scale interventions for populations need to keep in mind those groups with non-mainstream cultures and those who may have cultural aspects vastly different from their own. So, how can you provide care for a community you don't understand? Cross cultural care involves “*learning how to transcend one's own culture in order to form a positive therapeutic alliance with patients from other cultures.*”<sup>2</sup>

Cross-cultural care requires utilizing a skills-based approach, focusing on communication, being aware of cultural differences, adopting information, eliciting patients' illness experience, assessing how decisions are made (e.g., the role of family), and

determining health beliefs.<sup>3</sup> Cultural aspects that may influence the health of an individual encompass a range of variables and include more than just ethnicity.<sup>4</sup> Underlying beliefs and assumptions develop at a young age and are determined by the environment that a child grows up in. As an adult, perspectives on what is respectful, what is rude, and even what is fun, is determined by culture. As a result, a patient's actions with regards to their own health are inherently connected to their culture.<sup>5</sup> For example, consider your own assumptions on the topic of eating dinner: (1) What time should dinner be eaten? (2) What should dinner consist of? (3) Is it okay to eat dinner alone without waiting for your family? (4) Is it okay to skip dinner? (5) Is it okay to leave food on your plate? (6) Where do you eat dinner? (7) Can the television be on?

Various tools are available to help clinicians extract important cultural information from their patients, leading to better understanding and tailored care. The 4Cs is a tool often used by clinicians to “elicit the patient illness experience” and consists of asking patients:

- What do you **CALL** your problem?
- What do you think **CAUSED** your problem?
- How do you **COPE** with your condition?
- What **CONCERNS** do you have regarding your condition?<sup>6</sup>

## Case (part 1 – communication)

### SCENARIO

You are a pharmacist in a family medicine clinic.

CC: “My physician, Dr Simmons, sent me here.”

HPI: Sijin Kim is a 38-year-old South Korean male (69 in, 165 lb) who reports he immigrated to the US ten years ago to provide a better life for his family. He is a new patient and was diagnosed with T2DM six months ago, and is having a very hard time keeping his glucose and HgA1c controlled.

FH:

- Married with 2 children
- Father died at age 45 from a motor vehicle accident
- Mother alive with T2DM and osteoporosis
- 

SH:

- 1-2 alcoholic beverages daily
- ½ pack cigarettes per day
- No illicit drug use

Surgical history: N/A

Medications:

- Metformin 1000 mg PO BID (started 6 months ago)
- Glipizide 10 mg PO daily (started 1 month ago)
- Ginseng 200 mg PO daily (started 8 years ago)

#### Labs:

- POC glucose (today): 224 mg/dL
- HgA1c: 8.2%

**Additional Context:** Mr. Kim arrives to your clinic and greets you with a bow. You politely smile back, say hello, and ask him to have a seat. You begin by reviewing his past medical, family, and surgical history as well as reviewing his medications with him. The visit seems to be going great, Mr. Kim can speak English and is nodding with understanding to everything you are saying to him. You ask him about medication adherence and if he is taking all of his medications; he says, “yes,” with a smile. You ask him if he ever misses any of his medication doses, and he says, “no,” with a smile. You proceed to review his diet and exercise regimen with him and realize he is likely eating too many grains – causing his T2DM to be uncontrolled. He confirms that he eats rice with every meal. You review the plate method with him and show him how much rice he should be eating for each meal. Mr. Kim nods with understanding and smiles, saying he will do as told. The rest of the visit goes equally smoothly. Mr. Kim is able to repeat the general instructions back to you and smiles and bows as he leaves, being very gracious and thankful for the time taken to see him. You begin working on documenting the visit, and have a funny feeling that this visit was way too “easy.” You begin questioning if Mr. Kim was just saying what he thinks you wanted to hear.

## Case Questions

1. What type of miscommunication may have happened with Mr. Kim?
2. What cultural factors may have influenced this interaction?

## Case (part 2 – perception of illness/disease)

Mr. Kim returns to clinic four weeks later. He brings his medications and his glucose log with him as he was instructed at the last visit. You find that his glucose is still very out of control. You check his medications to confirm adherence and find that he seems to have more pills than he should in his bottles. When you ask him if he has missed any doses, he politely smiles and says he rarely forgets and tries his best to take his medications according to the instructions. You feel you need to dig deeper into the root of his non-adherence.

## Case Questions

3. Using the 4C’s model, what questions should you ask to find out more about Mr. Kim’s view of his illness?

## Case (part 3 – cultural dimensions of health)

After asking some questions, you find out that Mr. Kim has been speaking with his mom in South Korea and despite agreeing to follow your instructions, is listening to advice from his mother, since she also has the same diagnosis. She told him that she doesn’t always take her medicine and her doctor doesn’t correct her, so it must be okay to miss it sometimes. She also says she has had diabetes longer than him, and she is okay, so he will be fine if he does the same. He says that he has seen his mother live with this problem for many years and doesn’t think it’s anything to be too concerned about.

## Case Questions

4. Why do you think Mr. Kim would listen to his mother’s advice over yours?
5. What is Mr. Kim’s perception of his illness and how has that been impacted by his life experiences?

## Case (part 4 – cross-cultural care in population health)

You acknowledge the advice from his mother, and ask if it is okay for you to provide your own professional advice that may be a little different from his mother's. You spend the rest of the visit educating Mr. Kim about the importance of taking the medications as prescribed and why you really want him to try to take all his medications when they are scheduled. He responds positively, and it seems you have really reached him this time. Just to be safe, you go back and also review the diet and nutrition advice regarding his rice consumption, and he nods with understanding.

Mr. Kim returns in another four weeks. His glucose seems better but is still not at goal. After checking his medications, you are happy to find that he seems to have been adherent. Before adding or adjusting his medications, you want to find out if his lifestyle habits have changed at all. Upon some questioning, you find that his diet and exercise has not improved and Mr. Kim is still eating a full bowl of rice at every meal. When you ask him why, he says, "I have to set a good example for my children during meal time". Additionally, Mr. Kim comes from a country that is predominantly Asian, where it is near impossible not be served lots of grains at a meal when eating out. Currently, he still lives in a community in the US that has a high Asian population that has retained a very similar diet. He states that he understands what you are asking him to do, but it is very hard.

### Case Questions

6. What is Mr. Kim's greatest barrier currently and how might you help him overcome it?
7. What cultural factors will you consider when developing your community educational materials? What resources could you use to create your educational materials?
8. How will you gain trust within the Asian community that you are reaching out to?

### Author Commentary

As a pharmacist, you will likely encounter patients from a wide variety of cultures, often with patients that belong to more than one culture. It is vital that you understand how each patient's cultural make-up influences his/her actions both in and outside of your interactions with that patient. Although it is impractical to try and become competent in all cultures, understanding the right questions to ask to understand your patient's frame of mind is a crucial skill. You will be better equipped to meet your patient's individual needs if you respect his or her culture and establish a trusting relationship with each of your patients. Lastly, remember, culture is influenced by a patient's larger community; so sometimes, it is important to ask not only about the patient in front of you, but also about aspects of his or her life and community.

### Patient Approaches and Opportunities

As you consider and review the chapter case questions, recognize that depending on where and how someone grew up, the answers to these questions may all be drastically different. These different answers, for example, may influence how someone perceives your advice if he or she is being counseled on lifestyle changes for diabetes mellitus. Apply this train of thought to what your patients may be thinking as you provide medical advice and try to help them with their medications. Pharmacists must consider how patients will interpret and implement their suggestions or whether their suggestions will be ignored.

In many cultures, respecting elders is more important than listening to healthcare providers – an important point to remember when trying to change someone's behavior. Although it is impossible to touch upon all of the ways culture impacts a patient's health, it is essential to recognize that culture is always an underlying factor to consider. Cultural awareness and competency allows pharmacists to provide better care to patients from various cultural backgrounds.

## IMPORTANT RESOURCES

### Related chapters of interest:

- [More than just diet and exercise: social determinants of health and well-being](#)
- [Ethical decision-making in global health: when cultures clash](#)
- [The cough heard 'round the world: working with tuberculosis](#)
- [The 'state' of things: epidemiologic comparisons across populations](#)

### External resources:

- Websites:
  - U.S. Department of Health & Human Services and Office of Minority Health – Think Cultural Health <https://www.thinkculturalhealth.hhs.gov>
  - U.S. Department of Health & Human Services, Health Resources & Services Administration – Culture, Language, and Health Literacy: <https://www.hrsa.gov/cultural-competence/index.html>
  - Centers for Disease Control and Prevention – Cultural Competence
  - EthnoMED: <http://ethnomed.org/>
- Journal articles:
  - O'Connell M, Korner E, Rickles N, and Sias J. ACCP White Paper: Cultural Competence in Health Care and Its Implications for Pharmacy, Pharmacotherapy 2007;27(7):1062–1079.
- Books:
  - The Spirit Catches You and You Fall Down by Anne Fadiman
  - Essentials of Cultural Competence in Pharmacy Practice by Kimberly Vess Halbur
  - “Kleinman’s Questions” derived from Kleinman A. *Patients and healers in the context of culture: an exploration of the borderland between anthropology, medicine, and psychiatry*. Berkeley, CA: University of California Press; 1980.
- Games:
  - Barnga: [http://www.acphd.org/media/271383/barnga\\_instructions.pdf](http://www.acphd.org/media/271383/barnga_instructions.pdf)
  - BaFa BaFa: <https://www.simulationtrainingsystems.com/corporate/products/bafa-bafa/>

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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# The cough heard ‘round the world: working with tuberculosis

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## TOPIC AREA

Global health/Infectious disease

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Describe how the health of US populations is impacted by the health of populations around the world
- Understand the mechanism of and risk factors for tuberculosis (TB) transmission
- Explain proper TB prevention measures, including the use of personal protective equipment, as well as recommendations for TB screening
- Analyze the impact of multidrug-resistant tuberculosis (MDR-TB) on currently available treatment options, length of therapy, and elimination of TB worldwide

## Introduction

Tuberculosis (TB) is the world’s leading killer amongst infectious diseases. In 2017, 1.6 million people died from TB, making it one of the top ten causes of mortality worldwide.<sup>1</sup> TB is preventable and curable, but elimination remains a challenge. Worldwide, the regions with the highest number of cases of TB are Southeast Asia and Africa, accounting for approximately two-thirds of the reported cases.<sup>2</sup> As such, the elimination of TB is a key priority of the WHO,<sup>3</sup> included in the Sustainable Development Goals (SDGs) with a target to “end the epidemics of AIDS, TB, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases” by 2030.<sup>3</sup>

In the United States specifically, public health initiatives within health departments and TB control programs had a tremendous impact on the prevention and management of TB.<sup>5</sup> Although it remains a concern, the rate of TB in the United States continues to drop slowly. A total of 9,105 TB cases (a rate of 2.8 cases per 100,000 persons) were reported in the US in 2017. This is a decrease from the number of cases reported in 2016 and the lowest case count on record.<sup>6</sup> However, due to the ongoing public health implications of the disease, TB remains a focus area in the Healthy People agenda for the nation. Included in the specific topics and objectives are goals to reduce TB, increase the completion rate of all TB patients who are eligible to complete therapy, and to increase the percentage of contacts to sputum smear-positive TB cases who complete treatment after being diagnosed with latent TB infection (LTBI) and initiated treatment for LTBI.<sup>7</sup>

Elimination of TB will require a worldwide effort to decrease transmission for active cases, access to quick treatment, as well as strategies to screen for and manage latent TB infection. The USPSTF recommends screening for latent TB infections in populations at increased risk.<sup>8</sup> Cases of active TB must be treated quickly, as the disease is contagious, with an estimated capacity of a single person with untreated and active disease to infect as many as 15 people within a year.<sup>1</sup> Drug resistance is also a concern, with over half a million new cases of TB in 2017 demonstrating resistance to first-line therapy, including 82% with multi-drug resistant TB (MDR-TB).<sup>1</sup> Effective treatment requires adherence to complex medication regimens over several months.<sup>9</sup> Management requires trained health care providers who are able to provide long-term, patient-centered care.

## Case (part 1)

BR is a 38-year-old female nurse who works full time at a local academic hospital within the United States. A couple of months ago, she traveled to India in order to spend time with her family and experience the community in which her parents were raised. During the month BR spent in India, she was in close contact with various friends and family, as well as many members of the local community. Upon her return to the US, BR returned to her job as a bedside nurse, moved in with her fiancé, and resumed volunteering on the weekends at a local homeless shelter. She is also excited for an upcoming trip to Singapore but is anxious about the 24 hours of flying that it will involve.

Due to her role as a healthcare worker, BR was recently required to be screened for TB during the hospital's annual TB testing period. Much to BR's surprise, the healthcare worker who read her PPD skin test reaction stated that she had a positive result of 11 millimeters. Thinking that this could be a false-positive test, BR agrees to get further testing completed including a chest x-ray.

1. How common is TB worldwide and within the US? Which countries have the highest incidence of TB? Which countries have the highest rates of drug resistant TB?
2. What are some factors that have contributed to the rise and fall of TB infections around the world? What are some barriers to combating the disease worldwide?
3. How are tuberculin skin testing reactions interpreted? Does the classification of positive tuberculin skin test reactions differ depending on patient risk factors?

## Case (part 2)

After some consideration, BR decided that she was too busy planning her rapidly approaching Singapore trip to squeeze in doctors' appointments and, therefore, would postpone any further testing until her arrival back in the US. She argued that "she didn't look sick and had no cough" and could not possibly be infectious. Five days later BR boarded a flight from John F. Kennedy airport in New York to Hong Kong International airport and then a separate flight from Hong Kong to Singapore Changi airport. Enduring the 24 hours of travel she proceeded to enjoy her trip according to her itinerary and two weeks later reversed her trip from Singapore to Hong Kong and then from Hong Kong to New York.

4. Which factors influence the extent to which communicable diseases are transmitted? How is TB transmitted, and why is that important to public health?
5. How do you explain to BR some of her risk factors for contracting TB?

## Case (part 3)

Upon returning to the US, BR's chest x-ray showed abnormalities and her physicians performed further testing to confirm a diagnosis of TB and to obtain a sample isolate. BR did not understand how this could be possible, since she did not have any symptoms of an active infection. While awaiting further testing on her isolate by the CDC, BR was started on standard therapy for the treatment of TB and was advised by her providers to refrain from any further travel. It was also advised that any family

members, friends or coworkers that had been in close contact with BR also be tested for TB. Additional testing by the CDC of her TB isolate confirmed MDR-TB, and BR's physicians told her that she would have to undergo more extensive treatment in isolation until she was no longer infectious.

6. What are considered common treatments for active TB and what is the typical duration of treatment?

7. What are risk factors for multidrug resistant TB? How does treatment differ if a patient is diagnosed with MDR-TB?

## Case (part 4)

With the knowledge that a passenger onboard recent international flights had been traveling with active TB infection, the CDC began trying to track down all passengers and crewmembers who were on the commercial flights of which BR had been a passenger. It was highly suggested that these individuals also get tested for TB after having been in a confined space for many hours with an infected person. The CDC placed a specific focus on the flights from New York to Hong Kong, due to the duration of the flight, and extra attempts were made to get in touch with the passengers seated close to BR during the time of travel. Additionally, the hospital where BR was actively employed had to alert all employees and patients, who had been in close contact with her for extended periods of time, to consider undergoing additional TB testing.

8. What is the risk of communicable diseases being transported on board an aircraft? Does the duration of the flight have any impact on risk?

9. What is the incubation period for TB, and does that affect the timing of testing for individuals who may have been exposed?

10. Is there a role in the future for a coordinated, international approach to data collection and operational decision-making, and what is the role of the US in these discussions?

11. Does the US government have the authority to isolate or quarantine individuals traveling to and from the US if they are deemed a public health risk?

## Author Commentary

Treatment for TB is a long and challenging process. It is difficult for patients and for the health systems that are funding these long, expensive treatments. While the WHO and others are spearheading shorter MDR-TB treatment regimens,<sup>10</sup> challenges still exist in bringing the disease under control.<sup>11</sup> Newer drugs that are less toxic, require shorter treatment durations, and are less expensive are needed. While new drugs are being developed, it is a slow process. The required research and development prospects are thin,<sup>1</sup> and pharmaceutical industry spending in this area is continuing to decline.<sup>12</sup>

At one time, TB was viewed as a disease of despair – affecting those with low-incomes, substandard housing, and little access to care. TB is still linked with health disparities; however, with as many as 36% of those with active TB going unrecognized in a world with millions of people with active disease,<sup>1</sup> TB is a disease that knows no boundaries. This puts the US population at risk. It is clear investments also need to be made into TB screenings and prevention. While UN SDGs aim to end the TB epidemic by 2030, major gaps exist in the funding required to reach this goal.<sup>12</sup>

As health care providers, we need to be able to recognize the signs and symptoms of TB and to link our patients to care, but that is not enough. We need to be advocates for our patients and for our communities. We need to speak up and work with policymakers to tackle social determinants of health and TB. As pharmacists, we call ourselves the “drug experts.” TB is a disease with massive drug impacts, and if we truly are public health professionals and drug experts, we cannot stay silent.

## Patient Approaches and Opportunities

While the therapeutics of TB treatment is not the focus of this chapter, it is important for public health providers – especially pharmacists – to understand patients' treatment burden. Drug-susceptible TB treatment typically lasts at least six months with

the intensive phase including four drugs.<sup>9</sup> Drug-resistant TB regimens are generally considerably longer – some as long as 24 months – often with regular injections.<sup>10</sup> These drugs also have significant side effects, and patients with the disease are often grappling with stigma. This is concerning as patients who abandon treatment midcourse not only do not improve, but they are more likely to develop a resistant form of TB. As such, it is vital that patients are adequately prepared and that trusting relationships are built so that our patients can seek guidance if support is needed during the treatment process.

Adherence to TB treatment is vital because with proper treatment TB is curable. It is important that as pharmacists we properly counsel patients on their medications and help them develop adherence strategies. These concepts need to be reinforced during every pharmacy visit. Patients who are not compliant with their medications should be connected with a public health department to investigate enrolling in a Directly Observed Therapy (DOT) program where a healthcare worker can observe the patient taking medications each day. The Missouri Department of Public Health and Senior Services, for example, has an eDOT program where healthcare providers can remotely observe the patient taking medications either in real time or via recordings.<sup>13</sup>

While overcoming the worldwide TB burden can seem like a daunting task, pharmacists have an opportunity to play a vital role in the battle against TB. By building relationships with our patients, we can help them to process and overcome stigma, work together to navigate cultural differences and help to increase adherence. We are also at the front lines and can help to identify patients with TB symptoms and refer them to the appropriate healthcare provider.

## IMPORTANT RESOURCES

### *Related chapters of interest:*

- [Ethical decision-making in global health: when cultures clash](#)
- [An ounce of prevention: pharmacy applications of the USPSTF guidelines](#)
- [HIV and hepatitis C co-infection: a double-edged sword](#)

### *External resources:*

- Missouri Department of Health and Senior Services Tuberculosis Case Management Manual: <https://health.mo.gov/living/healthcondiseases/communicable/tuberculosis/tbmanual/pdf/Chap9.pdf>
- WGBH (Television station: Boston, Mass.) & Vulcan Productions. (2005). *Rx for survival: A global health challenge*. Boston, MA: WGBH Boston Video. DVD available or available online at: <http://www.pbs.org/wgbh/rxforsurvival/index.html>
- Global TB report through WHO: [https://www.who.int/tb/publications/global\\_report/en/](https://www.who.int/tb/publications/global_report/en/)
- CDC Respiratory protection fact sheet: <https://www.cdc.gov/tb/publications/factsheets/prevention/rphcs.htm>
- Rise of MDR-TB in Russia: <https://www.ncbi.nlm.nih.gov/books/NBK62453/>
- WHO Drug-Resistant TB: <https://www.who.int/tb/areas-of-work/drug-resistant-tb/global-situation/en/>
- CDC Tuberculin Skin Testing fact sheet: <https://www.cdc.gov/tb/publications/factsheets/testing/skintesting.htm>
- Tuberculosis and Air Travel: Guidelines for Prevention and Control: <https://www.ncbi.nlm.nih.gov/books/NBK143710/>
- CDC Isolation and Quarantine: <https://www.cdc.gov/quarantine/aboutlawsregulationsquarantineisolation.html>

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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# More than just diet and exercise: social determinants of health and well-being

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## TOPIC AREA

Health disparities

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Explain the definition of social determinants of health
- Identify the broad factors that influences an individual's health status important to public health
- Compare and contrast determinants of health that impact overall health and well-being specific to unique patient populations
- Identify patient specific needs related to determinants of health using a holistic approach

## Introduction

Our health is determined by more than just our genetics and our physical well-being. In fact, according to the World Health Organization (WHO), health is not limited to the lack of disease but includes an individual's physical, mental and social states.<sup>1</sup> The leading causes of death worldwide include heart disease, pulmonary disease and diabetes,<sup>2</sup> and these non-communicable diseases are impacted by our personal behavior and by larger factors such as where we live, our education level and our ability to access care. However, in the US and beyond, inequalities in these environments and social factors create health inequities.

According to the CDC, social determinants of health (SDH) are the conditions and circumstances surrounding an individual's life that can affect their health outcomes.<sup>3</sup> Healthy People, the US government's agenda for improving health outcomes,<sup>4</sup> defines these conditions as places in which people thrive or are adversely affected.<sup>5</sup> Health disparities and health inequity exist when differences lie among these environments, particularly where obstacles to good health are many and great. Equity is "*the absence of avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically, or geographically.*"<sup>6</sup> Thus, health equity exists when access to resources linked to good health is equitable and fair, regardless of social status.<sup>7</sup> Health inequities result from differences in SDH and unequal distribution of resources. Health equality is achievable when health inequities are addressed accordingly. SDH impact health disparities,

defined as the differences seen in health outcomes as a result of an individual's disadvantages, whether social, economic, or environmentally.<sup>8</sup> Such negative outcomes include increased illnesses, lower quality care, higher mortality rates, and greater health care costs.

In order for populations and individuals to achieve health, many factors must be considered. This is clear when looking at the many outcomes and objectives of Healthy People 2020. Healthy People 2020 provides a framework that helps to identify resources and tools to address SDH. The framework consists of five key determinants – economic stability, education, social and community context, health and health care, and neighborhood and built environment – all of which exhibit factors that can dictate an individual's health-associated risks and outcomes.<sup>5</sup> Globally, there is also a concerted effort to improve the lives, health and well-being; the Sustainable Development Goals (SDG) were developed to ensure a sustainable future and to assist in achieving health for all by fighting poverty and inequalities. Good health as a human right should be obtainable by all. Thus, SDG 3 addresses health and well-being at all ages.<sup>9</sup> There are multiple factors for health care providers to consider when providing care. It is especially pertinent to consider how socioeconomic status (e.g., income, education, occupation) impacts health, particularly when considering how it influences the ways individuals interact with their environment. For example, how might income affect health care access and utilization? How might education influence health literacy and the ability of an individual to feel empowered and engaged in their own health? Furthermore, how might differences in SDH contribute and exacerbate health disparities? These are important considerations we, as practitioners, must understand in order to aid others in achieving their full health potential.

## Case

### EXERCISES

You are a clinical pharmacist at a family medicine ambulatory care clinic

CC: "I'm here for a follow-up appointment."

HPI: AJ is a 45-year-old, Hispanic male (69 in, 82 kg) who comes into the clinic today for an appointment to manage his medications and ensure his disease states are controlled.

PMH: T2DM; hypertension; COPD; high cholesterol

FH:

- Mother: alive, with T2DM
- Father: alive, with T2DM and HF
- Brother with pre-diabetes
- One daughter

SH:

- Drinks alcohol socially
- Previous smoker (1.5 PPD), quit 2 years ago
- Denies illicit drug use

Surgical history: N/A

ROS: (+) Chronic cough with sputum production

VS:

- BP 144/88
- HR 60
- RR 16/min
- Temperature 37°C
- Pulse oximetry 93% on room air

Labs (drawn at last visit 1 month ago):

- Na 135 mEq/L
- K 4.2 mEq/L
- Cl 108 mEq/L
- CO<sub>2</sub> 26 mEq/L
- BUN 19 mg/dL
- SCr 1.1 mg/dL
- Glu 168 mg/dL
- Ca 9.6 mg/L
- Mg 3.6 mg/L
- A1c: 7.8%

Medications:

- Metformin 500 mg – 2 tablets PO BID
- Hydrochlorothiazide 25 mg – 1 tablet PO daily
- Lisinopril 20 mg – 1 tablet PO daily
- Atorvastatin 40 mg – 1 tablet PO daily
- Fluticasone/salmeterol 100/50 mcg – 1 inhalation BID
- Albuterol 90 mcg HFA – 1-2 puffs every 4-6 hours as needed

SDH and additional context: AJ is married and has a five-year-old daughter. He was born in the US, and his parents are immigrants from Mexico and made barely enough to support him and his younger brother. He grew up in a relatively under-resourced neighborhood in a small apartment with 1 bedroom, 1 bathroom, and a shared living/eating space. He often likes to tell short stories about how he grew up when he comes for clinic visits, describing how they had to squeeze his whole family into one bedroom at night, and often, how his little brother would accidentally kick or punch him in his sleep. He talks about growing up eating fast food hamburgers because they were inexpensive and his parents didn't have much time to cook for him and his brother. Additionally, there was only one grocery in his neighborhood that was over five miles away, and since his parents did not own a car, they rarely went. He remembers sometimes the water ran a little strange colored from the faucets, that streets were almost always covered in trash, and that many buildings were broken down and not maintained. He and his brother did not play outside often because it was not safe to be out after dark, there was barely any clean park space, and so he would be at home and either watch tv or play card games with his brother.

AJ works as a bank teller at a local bank. He finished high school with average grades, but decided to go work immediately because his parents were getting old and he had to make money to support their life and health care. He mentioned once that he considered applying for college but could not afford it, and therefore, never bothered. His wife is a stay at home mom, taking care of the apartment and their daughter. She previously worked as a bank teller (this is how they met), but had to quit her job to take care of their daughter because child care was not affordable.

As an adult and father, AJ has made enough money to move out of the neighborhood he grew up in. His family now lives in two-bedroom apartment in a neighborhood that has a fairly average income. There are two grocery stores within walking distance, and one decent school that his daughter will eventually be able to go to. AJ makes sure he provides everything he can for his daughter, giving most of his income to pay for healthy meals, saving up for school supplies and eventually college,

and providing her with toys and clothes that she needs. They use the second bedroom for her so she can have her own bed and room. Additional income goes to his mother and father, who are now retired and living off very little. Because most of his money goes to his family, he has very little for himself, often still eating the fast food hamburgers that he grew up on to leave the healthy meals for his family. Additionally, AJ sometimes skips picking up his medications because they can cost a lot. He will take medications every other day to make them last longer. AJ is quite proud of what he has been able to provide for those he loves, especially because he was given so little as a child.

## Case Questions

1. What aspects of AJ's childhood may have influenced his current health status? Elaborate on each aspect and explain why it influences his current health status.
2. Compare and contrast the childhood AJ had and the one his daughter now has. What does she have (that AJ didn't) that might impact her health in the future?
3. How do AJ's current responsibilities impact his health? What advice would you give him as his healthcare provider?
4. Consider the neighborhood AJ grew up in and all those who lived in this neighborhood. How do you think this neighborhood's poor resources and state may have impacted all of its residents?
5. What can pharmacists do to help patients and communities with low-resources?

## Author Commentary

Health disparities and inequities drive negative health outcomes and have long-lasting impact on patients and entire communities. When communities are not healthy, it not only has negative implications for an individual's health status, but it also has adverse effects on the community's economy, safety and education. This creates a negative cycle as these same issues can further health disparities divides. As pharmacists, we must care for the patients in front of us, but in our ever-expanding roles as public health professionals, we must also begin advocating for our patients and communities. We must educate ourselves on the implications of subpar and disparate housing, food access, parks and recreation, safety and violence, and education, as we must use our knowledge for advocacy and policy change a local, regional, national and international levels.

## Patient Approaches and Opportunities

As pharmacists, we can do our best to optimize medication therapy; however, it is critical to think about the larger picture and the social determinants of health that are influencing a patient's lifestyle and environment. Before making lifestyle-change recommendations, it is vital to consider what is possible for the patient to accomplish. Pharmacists must remember to recommend culturally appropriate diet and lifestyle changes that are within the realm of possibility for a patient so they have the ability to follow them. Additionally, pharmacists have the potential to make an impact at the population-health level by utilizing their patient-care experiences to advocate for larger community or district-level policy changes.

### IMPORTANT RESOURCES

*Related chapters of interest:*

- [Saying what you mean doesn't always mean what you say: cross-cultural communication](#)
- [Communicating health information: hidden barriers and practical approaches](#)
- [Plant now, harvest later: services for rural underserved patients](#)

- [The 'state' of things: epidemiologic comparisons across populations](#)

*External resources:*

- Websites:
  - Healthy People 2020: <https://www.healthypeople.gov/>. Accessed February 20, 2019.
  - Sustainable Development Goals: <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>. Accessed February 20, 2019.
  - Federally Qualified Health Center locator <https://findahealthcenter.hrsa.gov/>. Accessed February 20, 2019.
  - Find a local foodbank with Feeding America <https://www.feedingamerica.org/>. Accessed February 20, 2019.
- Games:
  - Spent: <http://playspent.org/>. Accessed February 20, 2019.
- Videos:
  - UNNATURAL CAUSES...is inequality making us sick? Place Matters. Ellie Lee, Producer and Director, Andrea Williams, Editor. California Newsreel 2008. [https://www.unnaturalcauses.org/about\\_the\\_series.php](https://www.unnaturalcauses.org/about_the_series.php). Accessed February 20, 2019.

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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# Deciphering immunization codes: making evidence-based recommendations

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**Lindsey Childs-Kean, PharmD, MPH, BCPS**

## TOPIC AREA

Immunizations

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Recall the resources available from the CDC pertaining to adult vaccination recommendations
- Determine an appropriate vaccination plan using a patient case
- Identify important education points to provide to patients during consultations

## Introduction

According to the ‘Oath of the Pharmacist,’ pharmacists promise to devote their lives to others through the pharmacy profession. A major part of this oath is to consider the welfare of humanity and assure optimal outcomes in all patients.<sup>1</sup> Although pharmacists may work in different practice settings, each has the opportunity to be a key component of disease prevention by becoming a vaccine advocate.<sup>2</sup> Pharmacists can promote the use of vaccines by providing immunization administration services, screening patients in each practice setting, conducting patient counseling, and provide widespread public education regarding vaccine use.<sup>2</sup> Although pharmacists are immunizers in every state, it is important to review your state’s laws regarding pharmacist delivered immunization services. Up-to-date information can be found on the American Pharmacists Association’s website.<sup>3</sup>

There are many resources the pharmacist can turn to for vaccines schedules and patient education documents. The CDC’s website will link the pharmacist to many different materials for providers and patients regarding many different topics for vaccines.<sup>4</sup> One of these documents that the pharmacist should always review are the immunization schedules that are available for children and adults. The CDC has different documents organizing the immunization schedules by age groups or comorbid conditions. They also include documents that outline contraindications, as well as a mobile phone application for quick access to the vaccine schedules.<sup>5</sup> The CDC website also has links for more patient-friendly information (including an easy to read schedule) as well as a library of previous immunization schedules, specific changes for each year’s recommendations, and specific Advisory Committee on Immunization Practices’ recommendation.<sup>6,7</sup> An emerging role for pharmacists is in travel health, which include the administration of travel vaccinations. The CDC has a comprehensive resource for clinicians to identify the appropriate vaccines each patient needs depending on the country of travel.<sup>8</sup>

Another resource available to pharmacists is a website from the Immunization Action Coalition (IAC). The IAC works closely with the CDC to provide information and education to health care providers and the community to increase immunization rates.<sup>9</sup> On this website are many documents for both health care providers and patients on many different vaccine related topics including documentation, vaccine hesitancy, temperature logs, promotional material, and much more. There are also educational resources for patients in other languages such as Spanish, Korean, Russian and French.<sup>10</sup> A valuable resource included in the website is the 'Ask the Experts' section where experts from the CDC answer questions pertaining to each vaccine, as well as administration, billing, safety, and recommendations.<sup>11</sup>

## Case

### SCENARIO

You are a pharmacist in a pharmacotherapy management clinic.

CC: "This is my first time here."

HPI: Michael Smith is a 57 year old male presenting to your clinic.

PMH: T2DM; hypertension; gastroesophageal reflux disease; seasonal allergies

FH:

- Mother: HTN, T2DM, died at 71 (NSTEMI)
- Father: HLD, COPD

SH:

- Tobacco: denies
- Alcohol: socially, one or two drinks weekly

Medications:

- Metformin 1000 mg PO BID
- Atorvastatin 40 mg PO daily
- Lisinopril 10 mg PO daily
- Cetirizine 10 mg PO daily
- Omeprazole 20 mg PO before breakfast

Allergies: NKDA

Vitals:

- BP 146/98
- HR 88 bpm

Labs:

- BMP (fasting)
- Na 142 mmol/L
- K 4.5 mm/L
- Cl 102 mmol/L
- CO<sub>2</sub> 27 mmol/L

- Glucose 153 mg/dL
- BUN 18 mg/dL
- SCr 0.97 mg/dL
- Ca 8.8 mg/dL
- HgA1c 9.1%

Blood count:

- WBC 9.2 K/mcL
- RBC 4.03 M/mcL
- HGB 14.3 gm/dL
- Hct 37.2%

Liver function:

- Alk Phos 80 U/L
- ALT 20 U/L
- AST 24 U/L

Other information:

- 10 year ASCVD Risk: 15.3%
- Vaccination history per state registry: none

## Case Questions

1. One of the first items you evaluate in your clinic are the vaccinations each patient is eligible to receive. Using the most recent vaccine CDC schedule, which vaccines would the patient be eligible to receive?
2. What if the patient was 67 years old? What vaccines would you screen for?
3. The patient is interested in receiving the above vaccines, but states that he is concerned with overwhelming his immune system. How would you respond to this patient?
4. The patient found his immunization record from his previous primary care provider. According to his immunization record, he has received one dose of the hepatitis B vaccine two years ago. How should you proceed with finishing his vaccination series?
5. The patient reports that he will be traveling to Egypt with his family and is curious to what vaccines are recommended prior to his trip. Using the CDC's travel health database, what vaccines would the pharmacists potentially recommend, depending on the activity of his trip?
6. A physician in your clinic asks you if patients taking methotrexate for rheumatoid arthritis are eligible to receive Zostavax<sup>®</sup>. How would you answer this?

## Author Commentary

Pharmacists are well respected and easily accessible, particularly those involved in community pharmacy. Hence, they often function as a first resource for many people and parents and serve, not only to counsel patients on current medications, but also to suggest over-the-counter products for common ailments such as fever and sore throat. Because some infectious diseases may initially present with mild symptoms common among many infections, it is imperative that pharmacists are aware of which diseases are endemic or circulating in the community, so they may ask relevant questions to assess disease exposure and vaccination status. Such conversations between the pharmacist and patient may result in patients receiving appropriate referrals and care to further prevent spread of vaccine-preventable diseases.

## Patient Approaches and Opportunities

As pharmacists, it is important to consider the impact of infectious disease on the lives of our patients. Regardless of practice site, pharmacists can screen patients for immunizations for which they are eligible, recommend and counsel patients regarding the importance of immunization, educate on vaccine safety, and discuss concerns regarding myths related to vaccination. Pharmacists are uniquely positioned to provide immunization services within community pharmacies and outpatient clinics and should utilize opportunities to promote immunization and public health whenever possible.

### IMPORTANT RESOURCES:

#### *Related chapters of interest:*

- [Interprofessional collaboration: transforming public health through team work](#)
- [An ounce of prevention: pharmacy applications of the USPSTF guidelines](#)

#### *External resources:*

- Centers for Disease Control and Prevention. Immunization Schedules. <https://www.cdc.gov/vaccines/schedules/index.html>
- Centers for Disease Control and Prevention. Travelers' Health. <https://wwwnc.cdc.gov/travel>
- Immunization Action Coalition. <http://www.immunize.org>
- Centers for Disease Control and Prevention. Manual for the Surveillance of Vaccine-Preventable Diseases. <https://www.cdc.gov/vaccines/pubs/surv-manual/index.html>
- Centers for Disease Control and Prevention. Community immunity definition. <https://www.cdc.gov/vaccines/terms/glossary.html#commimmunity>

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11. Ask the Experts. Immunization Action Coalition. <http://www.immunize.org/askexperts/>. Updated November 5, 2018. Accessed January 31, 2019.

## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# Getting to the point: importance of immunizations for public health

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## TOPIC AREA

Immunizations

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Define herd immunity and how unvaccinated individuals are protected
- Describe presumptive evidence of immunity
- Explain the timeline of an antibody response
- Describe counseling points to increase adult immunizations
- Discuss when and how to notify public health officials of suspected infectious disease cases

## Introduction

Immunizations have led to the eradication of some of the world's most deadly diseases (such as smallpox) and to significant decreases in incidence of diseases such as rubella and measles. Total eradication is achieved when there is no circulating disease and no further measures to stop the disease are required. Despite significant gains toward the eradication of several infectious diseases, outbreaks may still occur, typically the result of an under-vaccinated population. In these populations, herd immunity (also known as "community immunity"), in which a sufficient proportion of the population is protected from a disease such that transmission among members is unlikely, is insufficient to protect unvaccinated members.<sup>1,2,3</sup> The Office of Disease Prevention and Health Promotion's (ODPHP) has set several goals of reducing the number of vaccine-preventable diseases in the US. Pharmacists can play a large role in reaching such public health goals by understanding how immunizations confer protection, how diseases circulate in communities and counseling all patients to receive necessary immunizations as appropriate.<sup>4</sup>

In 2000, measles was declared eliminated in the US, although it was and still is endemic in other countries. However, since this time, the US has seen resurgence of this vaccine-preventable disease. Resurgence and resulting outbreaks are largely caused by introduction of the virus into a community from unvaccinated, overseas travelers, followed by disease transmission between unvaccinated individuals and those with an unknown vaccine history.<sup>5,6</sup> Acceptable or presumptive evidence of immunity includes written documentation of vaccination, laboratory evidence of immunity, laboratory confirmation of disease or in some cases, the age of an individual.<sup>7</sup> As an example, in April 2017, a measles outbreak was identified in a group of US-born children of Somali descent.<sup>8</sup> An investigation into the outbreak later revealed that this population had been subject to misinformation

about vaccines and as a result had developed significant fears about autism. Amidst the outbreak, susceptible, unvaccinated persons believed to have been exposed to the virus were treated with post-exposure prophylaxis with a measles vaccine or immune globulin as per the Advisory Committee on Immunization Practices (ACIP) guidelines.<sup>8</sup> However, the development of an adequate immune response to a vaccine requires several weeks.

From a scientific perspective, effective vaccination involves the development of a strong antibody response. The primary exposure to an antigen of interest (or vaccine) requires B-cells to recognize the antigen, become activated and begin to produce antibodies specific to this antigen as well as memory B-cells. This process can take between one to two weeks. Hence, if an unvaccinated individual is exposed to a pathogen, it is likely that pathology may occur during this development period. Although a certain amount of protection is afforded after initial vaccination, booster vaccinations are often required to further develop memory B-cells. Such memory B-cells can then produce antibodies to the antigen of interest within one to three days with no notable pathology.

The CDC has developed standards for adult immunization practices which may be found on the CDC website.<sup>9</sup> It is well known that many individuals, including adults, are hesitant to receive immunizations. The reasons for adult vaccine hesitancy may be due to a variety of factors, such as complacency (not recognizing the risk of disease), lack of convenience or lack of confidence due to concerns regarding vaccine safety.<sup>10</sup> However, several studies have suggested that a key factor in adult immunization is a strong recommendation from their provider.<sup>11</sup> It is important to understand that a key factor in adults becoming immunized is a strong recommendation from healthcare providers. For example, instead of asking a patient “Are you interested in being vaccinated for pneumococcal disease today?” say “I see it is time you are vaccinated for pneumococcal disease, which can help prevent pneumonia. If you give me a moment, I can prepare the vaccine for you and do it right now.” Pharmacists may also use the acronym SHARE to help them remember key counseling points:

- **S:** Share why the vaccine is recommended for that particular patient
- **H:** highlight positive benefits of the vaccine
- **A:** address patient questions in lay terms
- **R:** remind that vaccines not only protect the patient, but their loved ones around them
- **E:** explain the potential costs of disease.

## Case

### SCENARIO

Scenario: You are a pharmacist in a community pharmacy.

CC: “I’m worried the flu shot will hurt my unborn baby.”

Patient: TF is a 24-year-old female (62”, 58kg), 12 weeks pregnant with her second child. Her first child is a four-year-old male and was diagnosed with autism spectrum disorder (ASD) when he was three years old.

HPI: TF is at the pharmacy to pick up her prescription for prenatal vitamins. She tells you that her physician recommended that she receive an influenza vaccine. She is hesitant as her first son is on the autism spectrum, and she has heard conflicting stories about vaccines and autism. She would like more information on how vaccines work before agreeing to receive the vaccine.

PMH:

- First pregnancy resulted in live vaginal birth with no complications
- Mild heartburn symptoms during both pregnancies

FH

:

- Both parents alive but with unknown health status
- No siblings
- One 4 year old son with ASD, otherwise healthy

SH:

- No alcohol, tobacco, or illicit drug consumption
- Lives with fiancée and son

Medications:

- Prenatal vitamin PO daily
- Calcium carbonate antacid PO as needed for heartburn

Allergies: none

Vitals:

- BP 120/70 mmHg
- HR 65 bpm

## Case Questions

1. Why is vaccination after exposure to infection not as effective as prior vaccination?
2. Why is it important for pharmacists to be aware of diseases circulating within their community of practice?
3. How would you respond to a patient that states they do not need to vaccinate because they are healthy and can fight off most vaccine preventable diseases, such as influenza?
4. In talking with the patient, she states she stopped vaccinating after her son's ASD diagnosis. How would you discuss this with her?
5. Describe how you could use the acronym SHARE to address this patient's concerns for her unborn baby and today's recommendation for an influenza vaccine.
6. What other vaccination(s) will the patient need to receive during her pregnancy?

## Author Commentary

Immunizations are the best way to protect the general public from the spread of communicable disease. Some diseases such as influenza have several unique strains and hence yearly influenza vaccines are needed. Other vaccines prevent diseases caused by pathogens that do not change significantly over time. Without herd immunity, a population has enough potential disease vectors for a pathogen to circulate easily and infect not only the unvaccinated, but also those too young to receive vaccination or people that may be immune compromised.

Because many people are vaccine hesitant and do not vaccinate themselves or their children there has been a resurgence in some diseases, such as measles. According to the CDC, only 91.1% of children between ages 19-35 months old have received a measles vaccine, short of the 95% desired, and only 47% of children between six months and 17 years receive an influenza vaccine, leaving a significant portion of the population vulnerable to this disease. Vaccine hesitancy continues despite changes in vaccine formulations removing the preservative thimerosal, which was once blamed for adverse effects (although this has

been shown to be untrue.) Vaccines are now available in prefilled syringes so preservatives are not included. Vaccines also contain significantly fewer antigens than in previous years, as vaccinologists have discovered the primary antigens necessary in a vaccine formulation to confer appropriate protection from disease. The use of fewer antigens has been complemented by improved vaccine adjuvants that promote reliable cell mediated and humoral responses to vaccines.

## Patient Approaches and Opportunities

Pharmacists are well respected and easily accessible, particularly those involved in community pharmacy. Hence, they often function as a first resource for many people and parents to gain information regarding healthcare. Thus, it is critical that pharmacists are aware of how immunizations can protect a population, especially those that are unable to receive immunizations. Pharmacists should be aware of a patient's concerns and potential hesitancy regarding vaccination and use the SHARE technique to help talk with patients. Such conversations between the pharmacist and patient may result in patients receiving appropriate referrals and care to further prevent spread of vaccine-preventable diseases.

### IMPORTANT RESOURCES

#### *Related chapters of interest:*

- [Deciphering immunization codes: making evidence-based recommendations](#)
- [Interprofessional collaboration: transforming public health through team work](#)
- [An ounce of prevention: pharmacy applications of the USPSTF guidelines](#)

#### *External resources:*

- Centers for Disease Control and Prevention. Immunization Schedules. <https://www.cdc.gov/vaccines/schedules/index.html>
- Immunization Action Coalition. <http://www.immunize.org>
- Centers for Disease Control and Prevention. Manual for the Surveillance of Vaccine-Preventable Diseases. <https://www.cdc.gov/vaccines/pubs/surv-manual/index.html>
- Centers for Disease Control and Prevention. Community immunity definition. <https://www.cdc.gov/vaccines/terms/glossary.html#commimmunity>
- Centers for Disease Control and Prevention. Making the Vaccine Decision. <https://www.cdc.gov/vaccines/parents/vaccine-decision/index.html>

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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# Smoke in mirrors: the continuing problem of tobacco use

Sharon Connor, PharmD

## TOPIC AREA

Tobacco use

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Describe the prevalence of smoking in the United States
- List the health disparities in smoking prevalence
- Discuss the levels of influence that impact smoking behaviors
- Create a smoking cessation plan for an underserved patient

## Introduction

Smoking is the leading preventable cause of death in the United States.<sup>1</sup> Approximately 14% of the adult population are current smokers.<sup>2</sup> The rate of smoking continues to drop yearly, but disparities exist. The prevalence of smoking in medically underserved communities remains high, particularly among populations experiencing homelessness. Rates of cigarette smoking among homeless adults are three to four times higher than the general population.<sup>3</sup> The rate of smoking-induced death and disease among the homeless are also disproportionately high. Despite the high rate of smoking, homeless smokers do not differ from the general population in their desire to quit.<sup>3</sup> Smokers with substance use disorder have an even higher prevalence and smoke at five times the rate of the general population.<sup>4</sup> Between 70-90% of individuals receiving treatment for substance use disorder smoke cigarettes.<sup>4</sup> The impact on death rates is significant, in fact they have twice the expected rate of deaths attributable to tobacco use than in the general population.<sup>5</sup> Like smokers who are homeless, individuals with substance use disorder are interested in quitting.<sup>5</sup>

Smoking cessation services are not always offered to these populations due to the belief that quitting is a low priority or may interfere with substance abuse recovery. The literature supports that smoking cessation does not generally adversely affect substance use outcomes.<sup>6</sup> Effective smoking cessation services for the medically underserved are needed to reduce tobacco-related health disparities.

Pharmacists are key advocates in assisting patients toward cessation. Quit rates are higher when a pharmacist is involved. Pharmacists are accessible in most communities and nicotine replacement product are available over the counter. Nicotine replacement products will help with the physical aspects of addiction, but patients need more than just a product when trying to quit. They need assistance with behavioral modification and support. In addition, patients need a program that is tailored to their specific needs. In order enhance the delivery of services, there are pharmacist-focused materials available through the Centers for Disease Control and Prevention.<sup>7</sup>

Also needed is a setting that promotes cessation. One must consider the social determinants of health when creating a program.<sup>8</sup> If the program fails to be comprehensive and these factors are not addressed, disparities may persist.

## Case

### SCENARIO

You are a pharmacist that volunteers in a drug and alcohol rehabilitation facility for men. Many of the men desire to quit smoking, you want to help but wonder how to optimally provide services in a facility where it seems that smoking is part of the culture.

The leaders of the facility turn to you as a great asset for this need. You are ready for the challenge and hope to create a program that addresses all of the factors that influence smokers' abilities to quit successfully. You are excited to provide care to this population that smokes at a much higher rate than the general public.

CC: "I want to quit smoking!"

HPI: JS is a 54 year old white male (70 in, 80 kg) who started smoking when he was 10 years old. He is currently in a drug and alcohol rehabilitation program and heard that it is easier to stay away from the alcohol if he quits smoking at the same time.

PMH: HTN (10 years)

SH:

- History of substance use, in rehabilitation for excessive alcohol use
- Patient has smoked Marlboro one pack per day for 44 years. He has tried quitting in the past, cold turkey, and his longest time staying smoke free is two weeks. He started smoking again both times because of stress. This time he would like some help and is requesting the nicotine patch. He is highly motivated to quit, he rates his motivation a 10 on a scale of 10 and is somewhat confident in his ability to quit where he rates himself an eight on a scale of 10. His biggest motivation for wanting to quit is his health and the biggest barriers or concerns about quitting are stress and being around smokers.

FH:

- Father: alive with HTN and CAD
- Mother: Unknown

Medications:

- Hydrochlorothiazide 25 mg PO daily

Labs:

- BP 128/88 mmHg
- HR 64 bpm
- BMP normal

SDH: White male, divorced and was homeless for six months before he joined the rehabilitation program. His income last year when working was \$15,000. He is not currently working.

Additional context: Smoking cessation is a challenge for JS. Participants of the rehabilitation program live at the facility. The residents are not allowed to go anywhere without an escort/chaperone. Residents may smoke, but they must smoke outdoors. A smoke break is sometimes viewed as a "reward" because the patient is allowed outside of the building.

## Case Questions

1. What is the prevalence of smoking in an underserved population? Those living in poverty? Those who are homeless? Those who drink alcohol or use other drugs?
2. What types of interventions have an impact on the smoking rates of individuals? On the smoking rates of communities? On the smoking rate of populations?
3. Describe how you would conduct a smoking cessation intervention for JS. How would you assess JS's stage of change? What are the levels of intervention to consider?
4. Using the socioecological model, discuss interventions that may be helpful in lowering the smoking rate in this population in the drug and alcohol rehabilitation program. Describe individual level interventions, community level and policy level interventions that may have an impact.

## Author Commentary

Smoking is the leading preventable cause of death in the United States.<sup>1</sup> Although the number of adults who smoke continues to decrease, disparities exist in smoking rates.<sup>8</sup> Certain population continue to smoke at much higher rates than the general population.<sup>8</sup> Despite the higher rates of smoking, these populations have a desire to quit.<sup>9,10</sup> Guidelines for smoking cessation should be used in all populations who smoke.<sup>11</sup> Smoking cessation programs have been successful in some of the hard to reach populations.<sup>12</sup> Quitting smoking may be beneficial for other aspects of patients' health including substance abuse.<sup>13</sup> Pharmacists should offer smoking cessation assistance to all patients who smoke.<sup>14</sup> Providers must consider all aspects that influence cessation rates when offering services.<sup>15</sup> Smokers who participate in a structured smoking cessation program are more likely to quit.<sup>16</sup>

## Patient Approaches and Opportunities

Nicotine is a highly addictive compound. Cigarette smoking is one of the most challenging addictions. Most smokers want to quit and those who get help have higher quit rates. Pharmacists are in an ideal position to help.

Every smoker must be asked about their smoking status and desire to quit at each visit with a health care provider. Standardized screening allows this to be automatic and ensures no patient is excluded. Ideally patients may be provided with patient-centered tools for assistance with each quit attempt. These tools must target the behavioral and physical aspects of addiction.

It is not easy to quit and there is no perfect time to quit, but services should be offered. Pharmacists are in an optimal position to assist with smoking cessation. Pharmacists are one of the most accessible health care providers and have nicotine replacement therapy readily available in most circumstances. It may require multiple attempts, but each time the patient acquires cessation skills.

### IMPORTANT RESOURCES:

*Related chapters of interest:*

- [More than just diet and exercise: social determinants of health and well-being](#)
- [Communicating health information: hidden barriers and practical approaches](#)

*External resources:*

- Healthy People 2020 Leading Health Indicators: Tobacco
- <https://www.healthypeople.gov/2020/leading-health-indicators/2020-lhi-topics/Tobacco>
- Fiore MC, Jaén CR, Baker TB, et al. *Treating Tobacco Use and Dependence: 2008 Update*. Clinical Practice Guideline. Rockville, MD: U.S. Department of Health and Human Services. Public Health Service. May 2008.

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## GLOSSARY AND ABBREVIATIONS HYPERLINKS

- [Glossary](#)
- [Abbreviations](#)

# Plant now, harvest later: services for rural underserved patients

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## TOPIC AREA

Rural health

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- List barriers that make it difficult for rural residents to maintain their health
- Describe the unique challenges for patients and healthcare providers in rural settings
- Apply techniques to identify unmet healthcare needs when developing new clinical services in a rural community
- Design a pharmacologic and non-pharmacologic treatment plan for patients living in rural and underserved communities

## Introduction

There are many different definitions for the term “rural.” The US Census does not define the term and instead delineates rural as any population, housing or territory not located within an urban area – essentially “*whatever is not urban is considered rural.*”<sup>1</sup> Since there is no widely agreed upon definition, the qualifications for rural healthcare funding opportunities may vary greatly depending on the definition that is used and may lead to disparate health conditions.<sup>2</sup>

There are many barriers for rural residents to maintain their health. Food deserts, defined as areas lacking access to affordable produce (fruits, vegetables), grains, and low-fat dairy products, is a prevalent issue and is common in rural areas. Consumers may be unable to access healthy foods because they are geographically isolated from a supermarket or do not have transportation; even if there is a grocery store nearby, the food products may not be affordable.<sup>3</sup> Additionally, there is often a lack of facilities to support maintenance of health through exercise. Rural residents likely have less access to gyms/workout facilities or access to them is hindered by transportation issues. If there are opportunities, they are likely at the local community center and depend on resources such as money and workers to keep the program going.

Rural residents may have time constraints, transportation issues or other barriers that restrict their ability to obtain consistent healthcare. Access to medical facilities/specialists often involve traveling many miles and hours. Not only do patients often struggle to access healthcare and services in their communities, there is also a known shortage of healthcare professionals and especially specialists. Most residents have a limited number of healthcare workers that are taking care of a large population area. As such, specialist duties often fall on primary care providers. In some cases, there may not be an MD/DO in a rural clinic,

and care may be consolidated to a nurse practitioner or physician assistant, depending on state law for independent practice. In other cases, the pharmacist may be the sole healthcare provider in a rural town with residents depending on their local pharmacist to assist in their care and coordination of services.<sup>4,5</sup>

Finally, rural patients are more likely to be older, lack insurance, experience socioeconomic barriers, and have lower levels of health literacy; these factors culminate in higher rates of chronic diseases. Similarly, they are at increased risk for geographic isolation, limited job opportunities and have increased rates of health risk behaviors. These sets of barriers result in multiple barriers for optimal health for rural residents and provide health care workers with increased challenges when trying to manage the health of these patients.<sup>6,7</sup> Given these challenges there is a great public health need for patients who live in rural areas and was that pharmacists can be involved in helping the medically underserved in rural areas.

## Case

### SCENARIO

You are a local pharmacist who is thankful to still have a pharmacy in town after a threat of it closing down a few years ago. You have heard about pharmacists managing patients' chronic diseases through collaborative practice agreements (CPAs) and think it would really benefit the local patient population. You wonder what the next step should be in possibly pursuing such a program.

CC: "My wife said I need that new shot for shingles even though I already had a shingles shot before."

Patient: SM is a 68-year-old Caucasian male farmer (74 in, 285lbs). He is semi-retired but still helps his son farm the land that has been in his family for generations. He is busy farming during spring, summer and fall. Winter is a slower time for him, but due to cold winters full of snow, it is sometimes difficult for him to get to town. SM grew up eating meals of meat and potatoes the kinds of meals he says "sticks to your ribs." His wife enjoys gardening, cooking and baking and a meal is never complete without dessert! She uses her garden produce for side dishes during the summer and early fall. Meal times are often sporadic during planting and harvest time. His wife has tried cooking healthy for him, but he admits to sneaking to the local cafe for a caramel roll or other treats to satisfy his sweet tooth. After funding was cut for the senior exercise program, they bought a treadmill and stationary bike a few years ago but he prefers exercise activities that are more social like they used to have at the Senior Center in town.

PMH: T2DM; hypertension; dyslipidemia; obesity

FH:

- Father: died at 88 from heart attack, history of T2DM, hypertension, dyslipidemia, osteoarthritis
- Mother: died at age 95 from a CVA, history of hypertension and osteoporosis

SH:

- 20 pack-year history of smoking (quit 26 years ago)
- Drinks one to two 12-oz beers on the weekend
- Exercise mainly is farm and yard work activities

Medications:

- Metformin 1000 mg by mouth twice daily
- 70/30 insulin 54 units in the AM and 27 units in the PM
- Lisinopril/HCTZ 20/25 mg once daily by mouth

- Acetaminophen 650 mg every 6 hours as needed for pain
- Refuses statin due to fear of muscle pain

Vitals:

- BP 122/84 mm Hg (sitting; repeat 120/86 mm Hg)
- HR 76 bpm (regular)
- RR 16/min
- Temperature 37°C

Labs:

- Basic metabolic panel:
  - Na 138 mEq/L
  - Cl 102 mEq/L
  - K 4.1 mEq/L
  - CO<sub>2</sub> 26 mEq/L
  - SCr 0.9 mg/dL
  - BUN 14 mg/dL
  - Glucose 312 mg/dL
- Other electrolytes:
  - Mg 2.3 mEq/L
  - Phos 3.7 mg/dL
  - Ca 9.1 mg/dL
- Cholesterol:
  - Total 244 mg/dL
  - LDL 151 mg/dL
  - HDL 36 mg/dL
  - TC/HDL ratio 6.7
  - Trig 225 mg/dL
- Liver function tests:
  - AST 26 IU/L
  - ALT 29 IU/L
  - Total bilirubin 0.5 mg/dL
  - Albumin 3.7 g/dL
  - Alkaline phosphatase 62 IU/L
- Blood counts:
  - Hct 46%
  - WBC  $9.0 \times 10^3/\text{mm}^3$
  - Platelets  $220 \times 10^3/\text{mm}^3$
  - HgA1c 11.0%

Vaccinations: Up to date except for Shingrix

SDH: SM completed high school, is able to read and write at an 8th grade level and speaks English as his first language. His income at this stage of his life consists of a social security check that is supplemented with limited seasonal income from his part time work on his farm. The farm doesn't have any debt but requires workers to help SM complete all the harvesting.

He lives on farmstead with his wife. Son and family live just down the road and can help, though very busy with their own children. SM does drive and has access to a car but doesn't like to drive at night anymore due to declining sight. He has a high deductible insurance plan.

Additional context: Most of your pharmacy patients are similar to SM. Because prevalence is so high in the community, you already hold a quarterly class for the community about diabetes management including tips on eating smart, to information on self-monitoring of blood glucose plus information on different medications.

## Case questions

1. What are challenges facing both providers and patients in rural settings?
2. What should be included in a needs assessment for a new rural clinical pharmacy service, such as chronic disease management?
3. How should the pharmacist RK engage SM and the rest of the community in the pharmacy service?
4. What interventions and recommendations would you make to help SM control his disease states (pharmacological and non-pharmacological)?
5. What suggestions do you have for SM to exercise and improve his diet especially during the winter and times of limited transportation?

## Author Commentary

It is not uncommon that pharmacists are the only healthcare professional in a small town or rural area. Pharmacists in rural areas face different challenges when attempting to care for their patient population. By expanding services, pharmacists can help provide more comprehensive care for their patients in addition to potentially expanding their business model. In some states, pharmacists can identify patients at need for vaccinations and administer the vaccinations to the patient. Pharmacists can also impact other preventive, screening and monitoring services such as blood pressure checks, glucose and HgA1c point of care testing, testing lipids, DEXA scans, INR, HIV and Hepatitis C screening, and spirometry testing. Pharmacists can even participate in diagnostic testing such as influenza and Strep A with appropriate waivers. Through collaborative practice agreements (CPAs), pharmacists can prescribe medications for both chronic and certain acute disease states allowing for efficient and effective care for patients, especially in the rural setting. Some pharmacies offer weight management services. Although not applicable for the patient in this case, pharmacists in some states are able to prescribe contraceptives which play an integral role in public health.

CPAs authorizing pharmacists to prescribe vary by state. Some have limited authority while others approve pharmacists to prescribe medications to address a handful of conditions. Under specific conditions that may include protocols, inclusion and exclusion criteria, and need for referrals, pharmacists in some states can write for treatment of many medications, disease states and conditions including but not limited to: cold sores, seasonal influenza treatment and prophylaxis, strep throat (Group A streptococcal pharyngitis), uncomplicated urinary tract infections, statins for patients with diabetes, epinephrine auto-injectors, dietary fluoride supplements, contraceptives, vaccines and opioid antagonists. Many pharmacists work under a CPA for anticoagulation to manage that specific population of patients.

Specifically related to patients with diabetes, as in this case, pharmacists can partner with providers to manage patients' needs (or a multitude of other disease states) through a CPA. Pharmacists can provide both pharmacological and non-pharmacological intervention strategies. Pharmacists can also assist in providing diabetic shoes and performing diabetic foot exams. Pharmacists can also become certified pump trainers (CPT) to help manage patients who have insulin pumps. Additionally, pharmacists can work to help their community residents prevent diabetes and other conditions. For example, pharmacists can participate in the National Diabetes Prevention Program and pursue diabetes certification. If supported by law, pharmacists can be creative in the way they offer services to their patients and expand beyond the duty of dispensing medications.<sup>8-12</sup>

## Patient Approaches and Opportunities

It is important to remember that it takes time to develop trust for managing chronic disease. It involves trust between the provider and pharmacist but also between the pharmacist and patient. Often in rural towns, providers and pharmacists have a close relationship and managing patients together can be seamless. However, in other situations, providers can feel like pharmacists are ‘stepping on their toes.’ Providers in rural settings are often overworked managing the care of the community and welcome help from pharmacists willing to manage chronic diseases. For patients, many times the pharmacist is their first line “go-to” person for healthcare so it makes sense for the pharmacist to manage chronic disease. In other cases, some patients might feel that it is only the provider’s job to do so. In either case, providing education on the training and ability of the pharmacist along with earning trust can go a long way in expanding pharmacy services to improve patient care and outcomes. The pharmacist should demonstrate to patients and providers alike that the service provided is valuable and beneficial to all parties. While many ideas might seem like good ones, and while patient care is at the forefront, ultimately healthcare is a business and services need to be sustainable.

By collaborating with the provider and including the patient in the process, the pharmacist can provide patient centered care in the rural setting. American College of Clinical Pharmacy (ACCP) developed a white paper that addresses developing ambulatory pharmacy services. Personal interests, professional knowledge, and patient/customer needs should be merged. A market assessment should be performed and the ACCP white paper provides resources to assist pharmacists in carrying out steps and weighing factors involved for a market assessment including: what is the current state of the proposed service, what is the current standard of care, what current and future developments may affect the service, identifying factors in customer decision making, customer needs to be addressed, timing of the service. The white paper includes a plethora of other useful information and the authors encourage readers to examine the document.<sup>13</sup>

### IMPORTANT RESOURCES

#### *Related chapters of interest:*

- [Telepharmacy: building a connection to close the healthcare gap](#)
- [More than just diet and exercise: social determinants of health and well-being](#)

#### *External resources:*

- Websites:
  - CDC Advancing Team-Based Care Through Collaborative Practice Agreements: A Resource and Implementation Guide for Adding Pharmacists to the Care Team. <https://www.cdc.gov/dhdsp/pubs/docs/CPA-Team-Based-Care.pdf>.
  - Rural Health Promotion and Disease Prevention Toolkit <https://www.ruralhealthinfo.org/toolkits/health-promotion>.
  - A program guide for public health partnering with pharmacists in the prevention and control of chronic diseases. [https://www.cdc.gov/dhdsp/programs/spha/docs/pharmacist\\_guide.pdf](https://www.cdc.gov/dhdsp/programs/spha/docs/pharmacist_guide.pdf).
  - National Rural Health Association Policy Brief: Pharmacy. <https://www.ruralhealthweb.org/getattachment/Advocate/Policy-Documents/Pharmacy.pdf.aspx?lang=en-US>
  - Additional reading:
    - Merwin E, Snyder A, Katz E. Differential access to quality rural healthcare: professional and policy challenges. *Fam Community Health*. 2006;29(3):186-94.
    - Buzza C, Ono SS, Turvey C, et al. Distance is relative: unpacking a principal barrier in rural healthcare. *J Gen Intern Med*. 2011;26 Suppl 2:648-54.

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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# Telepharmacy: building a connection to close the healthcare gap

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## TOPIC AREA

Rural health

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Discuss the barriers to quality health care in rural settings
- Describe the types of available telepharmacy services
- Define Medication Therapy Management (MTM) and the requirements as developed by managed care organizations
- Explain the advantages and disadvantages of telepharmacy services

## Introduction

The United States is a country in transition. According to the US Census Bureau for 2010, about 60 million Americans, 19% of the population, lived in rural areas.<sup>1</sup> Although rural counties demonstrated a 3% growth in population since the 2000s, according to Pew Research Analysis, today, within each county, there has been about a 52% decline in population due to economic shifts.<sup>2</sup> Rural communities face multiple challenges that result in disparities compared to urban settings. Primarily, access to quality care is limited due to the lack of human and capital resources. Difficulties recruiting and retaining quality health care professionals (particularly for areas competing with urban settings)<sup>3</sup> and reduced funding and payer reimbursement for providers create barriers to consistent care. Patients in rural communities are also more likely to be older, less affluent and underinsured,<sup>4,5</sup> with higher rates of chronic conditions and adverse health outcomes compared to those in urban settings.<sup>6</sup>

Although the current supply of pharmacists in the United States is mostly meeting demand,<sup>7</sup> many of these pharmacists are not practicing in rural areas. The RUPRI Center for Rural Health Policy Analysis found that between 2003 and 2018, more than 1,200 independently owned pharmacies closed in rural communities.<sup>8</sup> Of this, 589 rural communities that had one pharmacy in 2003 had zero by March 2018.<sup>8</sup> With rural areas experiencing a shortage of other health care practitioners as well, the closing of pharmacies in these areas could also mean the loss of the only healthcare practitioner who may have been providing services to the community and filling a critical void. Telepharmacy, or the provision of services by pharmacists to patients or their caregivers using technology,<sup>9</sup> has become an increasingly popular strategy to fill such these voids while expanding both the role of and career opportunities for pharmacists. Telepharmacy provides a cost-effective means for pharmacists to provide routine and highly specialized clinical services in remote areas where the need may be greatest. In addition to remote order

entry, order verification, and medication dispensing, telepharmacy services performed by pharmacists can include drug reviews and monitoring, assessment of patients and clinical outcomes, patient counseling, medication therapy management, sterile and non-sterile compounding verification, drug information, and clinical consultations with other health care practitioners.<sup>10</sup>

The Centers for Medicare & Medicaid Services (CMS) encourages innovative healthcare models and recognizes the value of integrating pharmacists to coordinate the Triple AIM Initiatives to improve patients' care experience, improve population health, and reduce per capita healthcare costs. One of the ways Managed Care Organizations (MCOs) employ cost-saving and innovative practices is by providing telepharmacy services to their members.<sup>11</sup>

CMS adopted the Pharmacy Quality Alliance (PQA) MTM Completion Rate as a performance metric by which program sponsors will be evaluated. This requires sponsors offering Part D plans to establish MTM programs provided by pharmacists or other qualified providers to their members with the goal of optimizing therapeutic outcomes and reducing the risk of adverse events. Pharmacists at MCOs, PBMs, retail pharmacies, or MTM centers can utilize pharmacy and medical claims to identify eligible members to provide telephonic MTM services. The MTM programs target Part D enrollees with multiple chronic diseases, who are taking multiple Part D drugs, and who are likely to incur annual costs for these Part D drugs that exceed predetermined level; however, these services may be expanded to members who do not meet the eligibility criteria. Each sponsor has the ability to set the minimum number of chronic conditions as well as the minimum number of covered Part D drugs the member must have filled to be eligible for the MTM program. At the minimum, sponsors must offer interventions for members and prescribers utilizing an annual comprehensive medication review (CMR) and quarterly targeted medication reviews (TMRs).<sup>12</sup>

## Case

### SCENARIO

You are a pharmacist scheduled for a CMR using the telepharmacy service with a patient on your quarterly report.

CC: "I need my medication reviewed because I received this letter from my insurance."

Patient: GM is a 75-year-old Caucasian female of Scandinavian descent who lives independently in a rural town in upstate New York. She is wheelchair-bound and uses mail order for all of her prescriptions. She prides herself on her home cooking and enjoys baking "Amish" style pies with lard. GM would like to be more active but since GM became wheelchair bound, she does not believe that she can exercise and spends most of her free time knitting in front of the television or reading magazines that she receives in the mail. She is interested in sitting down with someone to learn more about why she is taking so many medications as well as healthy lifestyle changes but is unable to get transportation to the local pharmacy and does not have internet access.

HPI: GM has LASARA insurance and is eligible for a CMR by a pharmacist because she is currently taking more than eight medications to manage her chronic diseases. GM appears on the LASARA MTM pharmacist's quarterly report indicating to complete a CMR.

PMH: Osteoporosis; diabetes; HTN; vitamin D deficiency

FH:

- Father: T2DM and hyperlipidemia, died of heart attack at 83 years
- Mother: osteoporosis and hypertension, died of old age at 93 years

SH:

- Smokes cigarettes (one PPD)

- Drinks socially (1 glass of wine)
- Loves Mountain Mist (2 liters/day)
- Little to no physical activity

Medications:

- Miacalcin Instill 1 spray in one nostril once daily
- Calcium Citrate 250 mg and vitamin D 200 units twice daily
- Metformin 500 mg twice daily
- Lisinopril 10 mg daily
- HCTZ 25 mg once daily
- Lantus 25 units at bedtime
- Novolin R sliding scale three times a day before meals
- Senna S one tablet daily
- Miralax daily
- Diazepam 5 mg 1 tablet daily as needed for anxiety
- Ambien 5 mg daily as needed for insomnia
- Norco 5/325 mg every 6 hours as needed for pain

Vaccinations: Up to date

Labs: None available at this time

SDH: Patient resides in government-subsidized senior housing in rural upstate New York. She retired from her job as a Processing Technician at a multinational information technology company. She completed her Associates Degree in Computer Science from SUNY Broome. Her income consists of her pension and social security checks. Her family has relocated and may visit 1-2 times a year.

## Case Questions

1. What healthcare challenges do patients encounter in the rural setting?
2. How might a patient be identified for telepharmacy services in managed care?
3. In addition to a CMR, what additional services could be provided by a telepharmacist to GM?
4. What may be perceived advantages and disadvantages of telepharmacy?

## Author Commentary

With an increasing number of rural communities becoming pharmacy deserts, telepharmacy is an innovative pharmacy practice option that has the potential to both introduce and expand routine and clinical pharmacy services, while ensuring care in our rural populations is not lost. Telepharmacy not only benefits the rural patients who will be able to receive the high-quality services, but it also benefits rural hospitals, both small and large, by giving them access to 24-hour pharmacy coverage and helping them to expand its services. With renewed or continued access to pharmacy services, telepharmacy could also minimize or eliminate variables at the health care system level that contribute to health disparities, such as the availability of healthcare practitioners and the geographic location of services.

## Patient Approaches and Opportunities

It is important to recognize that telepharmacy is becoming one of the preferred strategies to expand pharmacy services to rural communities. As telepharmacy continues to evolve, we will see additional models developed and improved, while the role of

the pharmacist is also further defined. Today, the pharmacist is responsible for supporting the patient and encouraging the use of the technology-based telepharmacy services. Rural patients may have limited access and experience with computers, cell-phones, webcams, and other software used to host clinical services. Thus, patients may be apprehensive to the service and engaging an unknown pharmacist through the use of technology. It is critical to the pharmacist-patient relationship that time is dedicated to discussing any potential discomfort and/or concerns about the telepharmacy service before addressing the goals of the interaction. As pharmacists, insurance companies, PBMs, and other providers decide to expand their services to include a telepharmacy component, an environmental scan and/or needs assessment is critical to the success of the initiative.

## IMPORTANT RESOURCES

### *Related chapters of interest:*

- [Plant now, harvest later: services for rural underserved patients](#)
- [More than just diet and exercise: social determinants of health and well-being](#)
- [Communicating health information: hidden barriers and practical approaches](#)

### *External resources:*

- Telepharmacy: A Pharmacist's Perspective on the Clinical Benefits and Challenges: <https://www.dovepress.com/telepharmacy-a-pharmacistrsquos-perspective-on-the-clinical-benefits-a-peer-reviewed-fulltext-article-IPRP>
- The North Dakota Telepharmacy Project: Restoring and Retaining Pharmacy Services in Rural Communities: <https://journals.sagepub.com/doi/pdf/10.1177/875512250402000107>
- The North Dakota Telepharmacy Project: <https://www.ndsu.edu/telepharmacy/>
- One the Line: Telepharmacy Technology Expands Hospital Pharmacists' Reach: [https://www.pharmacytoday.org/article/S1042-0991\(16\)00530-2/fulltext](https://www.pharmacytoday.org/article/S1042-0991(16)00530-2/fulltext)
- Federal Office of Rural Health Policy: <https://www.hrsa.gov/rural-health/index.html>
- Rural Healthy People 2020: <https://srhrc.tamhsc.edu/rhp2020/index.html>
- National Rural Health Association Policy Documents: <https://www.ruralhealthweb.org/advocate/policy-documents>
- 2018 Medicare Part D Medication Therapy Management (MTM) Programs Fact Sheet: <https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovContra/Downloads/CY2018-MTM-Fact-Sheet.pdf>

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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# Hormonal contraception: from emergency coverage to long-term therapy

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## TOPIC AREA

Women's health

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Identify currently available emergency contraception (EC) products and their role in current practice
- Describe key differences, including efficacy and adverse effects, between different EC options currently available in the market
- Assess cost and ethical considerations related to EC
- Identify necessary patient assessments before prescribing or administration of hormonal contraceptives
- Determine an appropriate contraception plan using a patient case considering the patient's age, social habits, underlying disease states, and current medications
- Identify important counseling points to provide to patients for safe and effective use of contraception

## Introduction

Since the first emergency contraceptive (EC) pills were approved by the Food and Drug Administration (FDA) in the 1990s, advancements have led to several methods that are currently available to prevent pregnancy after unprotected or inadequately protected sexual intercourse. Despite this, 45% of pregnancies in the United States remain unintended.<sup>1</sup> This is primarily due to barriers to access and lack of awareness among women about their own risk of unintended pregnancy as well as safe and effective use of contraception.<sup>2</sup>

Levonorgestrel (Plan B<sup>®</sup>, My Choice<sup>®</sup>, Take Action<sup>™</sup>, etc.) is the only EC that is available over the counter to anyone regardless of age or gender and without parental consent. Ulipristal acetate (Ella<sup>®</sup>), copper intrauterine device (Cu-IUD, ParaGard<sup>®</sup>), and combined oral estrogen-progestin regimen (the Yuzpe method) are all EC methods that require a prescription.<sup>2,3,4</sup> Additionally, the Cu-IUD requires insertion by a trained healthcare professional. Both levonorgestrel and ulipristal have been shown to be less effective in patients who are overweight or obese, a concern considering more than 60% of adult patients in the US are overweight or obese.<sup>4</sup> All EC options can be used within five days of unprotected intercourse; however, levonorgestrel efficacy may decrease after 72 hours.

Prescription-only EC methods create major barriers to access as it delays care and can be a time consuming and expensive process. Pharmacies across the nation who have elected to prohibit dispensing of ECs or allow their pharmacists to refuse to dispense pose another barrier. From an ethical standpoint, it is important for healthcare professionals to understand the underlying mechanism of action of the EC methods so it is not confused with medical abortion methods. EC is effective in preventing pregnancy only before implantation phase, which means EC would not terminate an existing pregnancy.<sup>2</sup>

Use of EC products can be especially beneficial in specific circumstances, such as in the case of missed dose(s) or drug-drug interaction where oral contraceptive efficacy is compromised. However, use of EC products as a primary contraceptive method is not recommended.<sup>5</sup> Consistent use of EC as a primary method of contraception is not as effective as combined oral contraceptives (COC), can cause increased menstrual irregularities, and is often more expensive. Further, despite its availability during the past 20 years, there is limited data to show that EC availability has decreased pregnancy rates.<sup>2</sup> Twenty-five percent of women who are at risk for unintended pregnancy in the US experience challenges in obtaining a primary contraceptive method (e.g., difficulty obtaining a visit with a physician, inconvenient clinic hours or not desiring a pelvic exam).<sup>6</sup>

As of 2019, six states allow pharmacists to prescribe oral contraceptives, and more states are working on legislation.<sup>7,8</sup> Pharmacists must be prepared with adequate knowledge of necessary patient-assessment processes; differences between pharmacotherapy products' efficacy, safety, side effects, and drug interactions; and rules and regulations surrounding their prescribing activities. The US Medical Eligibility Criteria (MEC) and Selected Practice Recommendations (SPR) published by the CDC guide appropriate selection of contraception products for patients seeking contraception based on comorbidities, efficacy, and other factors.<sup>9,10</sup>

## Case (part 1)

### SCENARIO

You are a pharmacist in a community pharmacy in a rural area.

CC: "My boyfriend and I had sex last night and didn't use a condom. Do you have that pill I can take?"

Patient: RG is a 19-year-old college sophomore that has been coming to your pharmacy for the last year and a half for her sumatriptan and levothyroxine. Today, she presents looking a little pale and uncomfortable. She waits for the line at the pharmacy counter to die down before coming up to speak to you.

HPI: RG has been dating her current boyfriend for two years and they began having consensual monogamous sexual intercourse a few months prior. They have used condoms in the past but ran out and hadn't stopped at the pharmacy to pick up more. RG reports this was her first time having unprotected sex.

PMH: hypothyroidism (2 years); headaches (1-2/month)

FH:

- Mother: alive (55 years), HTN and hypothyroidism
- Father: alive (58 years), HTN

SH:

- Current sophomore studying electrical engineering at a public university
- Drinks socially 3-4 drinks every other weekend
- Denies use of nicotine, illicit substances, and non-prescribed medications.

SDH: Uninsured. Works part time at the campus bookstore. Lives in campus housing. Does not have a car on campus. Current PCP is located 6 hours away.

Medications:

- Sumatriptan 100 mg by mouth at onset of headache (may repeat if headache persists after 2 hours)
- Levothyroxine 88 mcg by mouth daily

Allergies: NKDA

Labs:

- BP 124/82 mmHg
- HR 68 bpm

## Case Questions

1. One of the largest barriers to contraceptive care is the ability to access medications. How might RG struggle to access contraception? How might current laws and ethical principles factor into access to care?
2. RG does not have insurance and cannot afford the cost of Plan B? What options are available to help minimize costs?
3. RG mentions she has heard some emergency contraception can cause an abortion. How would you respond to this?
4. Based on access, cost and patient concerns, what would be an appropriate recommendation for RG?

## Case (part 2)

RG returns to the community pharmacy to initiate a hormonal contraceptive after seeking her third course of EC in three months. She just finished her menstrual cycle and has not had unprotected sex since she last saw you for her EC. RG has one sexual partner and is in a committed relationship. She has never taken an oral contraceptive due to cost as she is uninsured and due to fears that it would make her gain weight.

Many of her friends who started OCs when she was a teenager told her they made them gain 15-20 lbs. She reports using EC is becoming expensive and her boyfriend doesn't like using condoms. RG wants to know if there is an affordable oral contraceptive she can start – she heard that pharmacists can now prescribe contraceptives.

RG has never taken any daily medications and is worried that she may struggle to remember taking a pill but doesn't think she would like the ring product. She reports that her menstrual cycle is fairly heavy and some of her friends told her their oral contraceptive shortens their period to every few months. RG would like to use one of these products to help alleviate symptoms of her menstrual cycle but wonders if there are any health risks associated with that.

## Case Questions

5. What family history and/or past medical history would be significant to collect in your assessment for RG? Why?
6. What factors should be considered when assisting RG in choosing an appropriate contraceptive method?
7. If RG had a PMH of VTE instead of migraines, how would her contraception selection and health risks from contraceptives change?
8. How could RG's cultural or religious beliefs impact her contraception preference, use, and adherence?

## Author Commentary

The development of safe, effective contraception is widely considered to be one of the greatest public health achievements of the 20<sup>th</sup> century.<sup>11</sup> There are an increasing number of safe and effective choices for contraceptive methods to reduce the risk for an unintended pregnancy, however with this comes an increasing need for healthcare providers' knowledge of evidence-based guidance to offer quality family planning care. This includes choosing the most appropriate contraceptive method, counseling on appropriate and consistent use of the contraceptive, and identification and resolution of adverse effect and adherence challenges. In addition to tolerability, accessibility and affordability of contraception should be ensured. Contraception recommendations by family medicine physicians were found to be inconsistent with CDC guidelines 23% of the time for oral contraceptives and 40% of the time for intrauterine devices (IUDs). The Direct Access study was the first study to evaluate the use of a collaborative drug therapy protocol by pharmacists for contraception prescribing.<sup>12</sup> It demonstrated that community pharmacists have the knowledge and skill to adequately screen female patients seeking contraception and select the most appropriate product to meet individualized patient needs.<sup>12,13</sup>

EC is an effective option for those who do not desire pregnancy if taken up to 120 hours from unprotected or inadequately protected sexual intercourse. The CDC US MEC for contraceptive use (2010) includes no medical conditions in which the risks of EC outweigh the benefits.<sup>9,10</sup> Thus, all women should be offered or made available EC when requested and should not be delayed waiting for pregnancy testing. Pharmacists can dispense and counsel patients on appropriate use of these products as well as improve access through knowledge of the laws and ethical considerations pertaining to these products. Pharmacists should make an effort to minimize barriers to dispensing of ECs and refer the patient to a colleague if morally conflicted.

## Patient Approaches and Opportunities

Pharmacists working in community and ambulatory care settings can and should screen all female patients for contraception use and access. Pharmacists should be aware of US MEC and SPR guidance published by the CDC. Using these and other resources available, females should be provided with an appropriate contraceptive method that is safe, effective, and affordable. They should also be well educated on what to do in the setting of missed doses, adverse effects (e.g., breakthrough bleeding), and drug-drug interactions. Pharmacists have the knowledge and opportunity to provide education and counseling on EC and non-contraceptive risks and benefits.

In addition to decreasing the risk of unintended pregnancy, many contraceptive methods reduce the risk of endometrial and ovarian cancers, are therapeutic agents for menstrual-related disorders and have other benefits.<sup>14,15</sup> Women should be empowered with the necessary education and counseling to make a shared decision in which method, if any, to use to prevent pregnancy and/or to ameliorate or treat symptoms related to their menses.

### IMPORTANT RESOURCES:

#### *Related chapters of interest:*

- [From belly to baby: preparing for a healthy pregnancy](#)
- [More than just diet and exercise: social determinants of health and well-being](#)
- [An ounce of prevention: pharmacy applications of the USPSTF guidelines](#)

#### *External resources:*

- Practice Bulletin No. 152. Emergency Contraception from Obstetrics and Gynecology. <https://www.acog.org/-/media/Practice-Bulletins/Committee-on-Practice-Bulletins---Gynecology/Public/pb152.pdf?dmc=1>
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- Birth Control Pharmacist. <https://birthcontrolpharmacist.com/>

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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)

- [Abbreviations](#)

# From belly to baby: preparing for a healthy pregnancy

**Jennifer Ball, PharmD, BCACP, BCGP**

## TOPIC AREA

Women's health

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Identify social determinants of health affecting infant and maternal morbidity and mortality
- List key preventative measures in pregnancy as recommended by the United States Preventative Services Task Force (USPSTF)
- Assess a patient in need of prenatal vitamin, iron, and aspirin for prevention of prenatal complications

## Introduction

Quality maternity care including pre-conception, pregnancy, and interconception care (care from one pregnancy to the next) has been shown to reduce rates of maternal and infant mortality and morbidity.<sup>1</sup> While rates of morbidity and mortality are lower in the United States than many other countries, there are numerous disparities that exist.

Sociodemographic and behavioral factors play into the maternal and fetal outcomes. Age, race, education, family income, nutritional status, and preconception health may affect mom and baby. Preterm births, low birthweight infants, and infant death are highest in teens under 18 years of age and women over 40. Women greater than 35 years old are also at risk for higher rates of maternal death or serious maternal outcomes. Interpregnancy intervals also affect the health of the baby with increased morbidity including neonatal intensive care or enhanced ventilation requirements in babies born within an interpregnancy interval less than 12 months or over 24 months. Mothers tended towards increasing risks of gestational hypertension or gestational diabetes when the interpregnancy interval increased beyond 24 months.<sup>2</sup> In addition, when compared with infants born to non-Hispanic white mothers, infants born to non-Hispanic black mothers and Native American mothers are more than twice as likely to die in the first year of life and to be at risk for preterm birth or other complications.<sup>3</sup> While a small number of racial or ethnic disparities may be due to genetic factors, the majority are due to inequalities in income, housing, and education level.<sup>4</sup> Women of lower socioeconomic status are more likely to have increased stress, poorer nutrition, and increased use of tobacco or other substances. This contributes to increases in preterm birth and small-for-gestational-age babies.<sup>5-6</sup> Women with lower levels of education have been associated with higher maternal mortality despite similar access to care.<sup>7</sup> Finally, health-care system disparities in access or affordability and provider-level factors including culturally derived mistrust of the healthcare system may also contribute to differences in prenatal and perinatal outcomes.<sup>4</sup> Improved maternal and infant health will likely require continued research and multidisciplinary approaches to understand these and other contributing factors.

Good nutritional status is essential in pregnancy. A prenatal vitamin in addition to a well-rounded diet is recommended prior to and during pregnancy to prevent adverse outcomes. Higher levels of folic acid and iron are needed in pregnancy.<sup>8</sup> Folic acid

should be started prior to conception at doses of 400-800 micrograms daily to prevent neural tube defects that can happen in the first few weeks of pregnancy.<sup>8-9</sup> Iron requirements increase from 15-18 milligrams to 27 milligrams during pregnancy as the body makes more red blood cells to provide oxygen to the fetus.<sup>10</sup> While the daily intake requirements do not change during pregnancy, calcium and vitamin D are essential for the development of the fetus' bones and teeth.

Addressing prior health conditions is also a component of maternal care. Typically, hypertension and diabetes diagnosed prior to 20 weeks gestation are categorized as chronic health conditions while those diagnosed past 20 weeks gestation are categorized as gestational conditions. Both chronic conditions and gestational conditions have been shown to increase the risk of miscarriages, small for gestational age, macrosomia, preterm birth, and neonatal intensive care stays.<sup>11-12</sup> In addition, there are increased rates of maternal death and long-term complications.<sup>11-13</sup>

Pharmacists should review a patient's medications including prescriptions, over-the-counter and herbal medications, and vitamins at every visit to determine safety during pregnancy. This is incredibly important as nine out of 10 U.S. women take a medication at some point in their pregnancy.<sup>14</sup> It is necessary to know how far along a patient is in the pregnancy to identify if a medication can be used as some adverse effects may only be seen in specific trimesters. Since 2015, medications have moved from the previous categorization system of A, B, C, D, and X to the more extensive risk summary and clinical considerations. This now involves three sections for pregnancy, lactation, and females and males of reproductive potential.<sup>15</sup> Pharmacists can utilize a variety of drug resources, case reports, and studies to best recommend medications to use or not to use in pregnancy.

## Case

### SCENARIO

You are a pharmacist in a family medicine clinic.

CC: "I missed my period. I think I may be pregnant."

Patient: TW is a 37-year-old African American female (68 in, 92 kg) coming in for evaluation of a new pregnancy.

HPI: TW is G2P2 with two healthy baby boys ages three and five. She reports her last period was 2.5 months ago. She has had some nausea throughout the day with vomiting two to three times daily for the last five weeks. In addition, she reports occasional dizziness. TW and her husband have not been using any contraception since her last pregnancy.

PMH: depression (four years); iron-deficiency anemia in last pregnancy

FH:

- Mother: alive (60 years) with HTN, T2DM, no prenatal complications (G4P4)
- Father: alive (58 years) with HTN

SH: Denies use of alcohol, nicotine, illicit substances, and non-prescribed medications

SDH: Medicaid insurance. Refugee status; moved to the US from Ethiopia 12 years ago

Medications:

- Sertraline 100 mg once daily
- One A Day® Vitacraves® Women's Gummy Multivitamin 2 gummies daily
- Ferrous sulfate 325 mg 1 tablet once daily (last took 2.5 years ago)

Allergies: NKDA

#### Vitals:

- BP 110/62 mmHg
- HR 72 bpm
- RR 16 rpm
- Temperature 98.6 °F

Labs: Pregnancy test (positive)

Imaging: Ultrasound confirms singleton pregnancy at 11 weeks gestation

## Case Questions

1. What socioeconomic factors may increase TW's risk for maternal and infant morbidity and mortality?
2. TW is currently on a few medications. Where can pharmacists and healthcare providers look to determine safety of a medication in pregnancy? Can TW continue her current medications in pregnancy?
3. List the current published USPSTF recommendations for pregnant women. Which might be appropriate for the pharmacist to address?
4. Looking at TW's chart, assess her need for supplementation of folic acid and iron
5. Using the USPSTF clinical risk assessment for preeclampsia, decide if TW should be recommended aspirin during this pregnancy.

## Author Commentary

Pregnancy comes with many stressors, with medications being just one. Pharmacists can provide support and answers to questions regarding what products may or may not be safe for mom and baby during pregnancy, and later in lactation and nursing. Recognizing the benefits and risks of medications and being able to explain it to both physicians and patients can optimize care and allow for patient-centered care. While it is important to avoid certain medications, some medications especially folic acid should be recommended to all pregnant women and those of childbearing potential to minimize risks for neural tube defects. It is just as important to know what medications to recommend as it is to know what medications to avoid. Pharmacists in all practice settings should stay up-to-date on changes to prenatal guidelines and recommendations, including those for preventative care.

Pharmacists may engage the pregnant patient in regular care, providing education during pregnancy for acute or chronic issues. As a pharmacist, one may be asked to co-manage gestational concerns such as gestational hypertension, gestational diabetes, or gestational anemias with the provider. Patients may come to the pharmacy for regular blood pressure checks or to review use of diabetic supplies and blood glucoses during pregnancy. Recognizing times to for education and self-care and referral for serious symptoms is needed to ensure timely care. Working with the patient and provider to select the right contraception, whether hormonal or family planning methods, during the interpregnancy period can allow for optimal spacing if more children are planned to minimize complications from shortened or lengthened interpregnancy intervals. Finally, providing care in a culturally competent, health literate way can help patients feel comfortable and confident in the pharmacist's knowledge and advice. Being aware of community resources can help patients to gain access to the care and provisions needed in pregnancy, hopefully minimizing disparities for a healthy pregnancy.

Ensuring the mom and baby are protected with the right medications, the right vaccinations, and the right education, pharmacists can prepare the patient for a healthy pregnancy and beyond.

## Patient Approaches and Opportunities

Pregnancy is an important health condition affecting many women at some point in their lives. Pharmacists must be able to appropriately address prenatal concerns and know when patients should be referred to other healthcare providers. Providing patients and healthcare providers with up to date information addressing the risks and benefits of medications prior to pregnancy for women of childbearing age, during pregnancy, breastfeeding and postpartum, is a vital area for pharmacists to minimize teratogenic risks and concerns for mother and baby. It is important to assess social determinants of health and recognize their importance in healthcare decision-making. Pharmacists can make key interventions to minimize adverse outcomes by being knowledgeable in medication and nutrition recommendations for pregnant patients.

Pharmacists play a public health role in so many ways. Pharmacists recommend and may administer vaccinations. During pregnancy, non-live vaccines can be recommended. All pregnant women without complications should receive an inactivated influenza during influenza season and a tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis (Tdap) between weeks 27 and 36. The Tdap vaccine improves protection and cocooning of young infants from pertussis. Additionally, pharmacists can provide recommendations for postpartum contraception depending on the needs of the patient. As durable medical equipment providers pharmacists may also counsel patients on breastfeeding and lactation support and supply breast pumps and supplies.

Despite being a time in which many patients are on few to no medications, pharmacists can truly provide outstanding care and support, contributing to the needs of the patients and healthcare team.

### IMPORTANT RESOURCES

#### *Related chapters of interest:*

- [Deciphering immunization codes: making evidence-based recommendations](#)
- [Getting to the point: importance of immunizations for public health](#)
- [An ounce of prevention: pharmacy applications of the USPSTF guidelines](#)
- [Hormonal contraception: from emergency coverage to long-term therapy](#)

#### *External resources:*

- Healthypeople.gov. <https://www.healthypeople.gov/>
- National Institutes of Health Office of Dietary Supplements. <https://ods.od.nih.gov/>
- American College of Obstetricians and Gynecologists (ACOG). <https://www.acog.org/>
- Centers for Disease Control and Prevention- Treating for Two. <https://www.cdc.gov/pregnancy/meds/treatingfortwo/index.html>
- Mother to Baby. <https://mothertobaby.org/>
- United States Preventative Services Task Force (USPSTF). <https://www.uspreventiveservicestaskforce.org/>

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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# When disaster strikes: managing chaos and instilling lessons for future events

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## TOPIC AREA

Emergency preparedness

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

- Describe methods to accelerate the resumption of normal operations following the occurrence of a natural disaster or emergency.
- Identify the potential hazards and major impacts of extreme weather events.
- Describe critical resources needed by pharmacists and considerations related to these resources to ensure access to medications and services during and following natural disasters.
- Formulate an emergency preparedness or action plan.

## Introduction

Natural disasters such as hurricanes, tornadoes and flooding are usually unpredictable. These events typically occur suddenly and with little or no warning and can cause widespread chaos. In recent years, a variety of types of natural disasters have occurred in the United States and around the world. Natural disasters have both short-term and long-term consequences and may result in severe infrastructural damage, personal injury, and public health threats. This can lead to an increased need for pre-emergency planning and post-disaster patient care. Pharmacists are recognized – with increasing responsibility – as important members of disaster preparedness planning and response teams.<sup>1-3</sup>

Following natural disasters, healthcare providers play a key role in recovery by providing patient care and helping to ensure access. However, during these times, pharmacists and other health providers also may be called upon for more nontraditional roles. In 2003, the American Society of Health-System Pharmacists (ASHP) released a statement outlining roles for pharmacists in emergency preparedness and provided advice tailored to specific groups (e.g., pharmacy directors, pharmacists, administrators).<sup>4</sup> The statement included commitments made by ASHP to assist in communication and dissemination of information related to emergency preparedness through their member network.

Potential roles identified for pharmacists in emergency preparedness and disaster management in other literature include medication provision and prevention of communicable diseases.<sup>5</sup> For example, pharmacists may be asked to provide medications and/or disease state education for rare infections or complications from exposure to contaminated flood water. Additionally, other literature identified that mass immunization campaigns might need to be initiated and patient needs can quickly overwhelm facilities that are working with limited resources. Pharmacists trained in the provision of immunizations

may help to address these challenges.<sup>1-6</sup> Finally, management of chronic disease states also was cited as becoming more challenging, with interrupted supplies of common medications and potentially dangerous or difficult living situations that can exacerbate chronic diseases such as diabetes or hypertension.<sup>7</sup> Pharmacist awareness of alternative supply chains may help to alleviate these challenges and ensure continuity of management of chronic diseases.

While the roles of pharmacists are expanded during a disaster, it is important to remain aware of and act within the laws, rules, and regulations. Following a severely damaging natural disaster, a state of emergency may be declared, which can lead to changes in rules and regulations that impact pharmacists and pharmacy operations. Specific changes vary among states, so it is important that pharmacists investigate their practice location.<sup>8,9</sup> Since natural disasters usually occur with little or no warning, development of comprehensive disaster preparedness plans tailored to individual pharmacies is important.<sup>10</sup> Pharmacists at all levels can and should be involved in developing and updating these plans on a regular basis.<sup>1</sup> Many resources are available for pharmacies and pharmacists to develop and refine an emergency response and disaster preparedness plan to allow for a more efficient and timely response when needed.

## Case

### SCENARIO

You are a pharmacist in a temporary medical clinic as a result of a hurricane five days ago.

CC: “I lost all of my medications when I had to evacuate.”

HPI: DS is a 42-year-old male (71 in, 90.9 kg). His house was flooded in the storm and badly damaged. He is currently staying at a nearby emergency shelter until arrangements for longer term housing can be made with his insurer. He has a minor cut on his leg from an injury sustained while helping a neighbor with cleanup of his flooded home. He states that the cut hurts. Upon examination, you notice the wound is warm to the touch and is red and swollen. He also has experienced some shortness of breath and difficulty breathing during cleanup.

: T2DM (controlled by diet); hypertension; asthma

FH:

- Father: heart attack at age 70
- Mother: history of DM

SH: Limited information about the patient’s social history has been provided. However, the patient states that he currently has limited access to shelter and basic medical resources as a result of his displacement following the hurricane.

Surgical history: Non-remarkable

Vitals:

- BP 149/85 mmHg
- HR 88 bpm
- RR 21/min
- Temperature 99.1 °F
- Pulse oximetry 92% on RA

Labs: Unable to access. The pharmacy and the local health system computers were impacted and are not accessible. Patient is also unable to recall specific values and states he had a paper with some of his valuables, but this was lost in the storm.

### Medications:

- Albuterol – Inhale 2 puffs every 6 hours as needed for SOB/wheezing for asthma
- Lisinopril/HCTZ 20/12.5 mg – Take 1 tablet by mouth daily for hypertension
- Advair HFA 115-21 mcg – Inhale 2 puffs 2 times daily for asthma
- Ibuprofen 200 mg – Take 1 tablet by mouth every 4 hours as needed for pain from leg injury/muscle soreness from clean up following natural disaster

### Allergies: NKDA

### Vaccinations: Patient is unable to recall

SDH: Patient states that he has medical and prescription insurance but cannot locate or provide his insurance card or identification. He is unable to recall a specific company that provides his health insurance but can tell you that he uses a local smaller chain pharmacy typically for accessing pharmacy services.

Additional context: A temporary clinic has been set up by employees of a local ambulatory care clinic to attempt to care for patients affected by the storm. The clinic location where the employees typically are employed was badly damaged in the storm and is not able to be used for normal operations for quite some time. The attached clinic pharmacy was also affected and is currently inaccessible; however, some supplies have been salvaged for urgent use. The clinic's medical and pharmacy records are currently inaccessible. Pharmacies located out of state but nearby have offered assistance with obtaining medication stock but need clarification of what supplies are most needed and a plan for transport of the supplies to the affected areas.

## Case Questions

1. What documentation needs to be done prior to dispensing medications to patients or providing medications to other healthcare providers involved in disaster management care? How and when should this documentation be completed to provide the patient with medications?
2. How can you determine or verify if a patient has a legitimate prescription when records are not accessible?
3. What pharmacy preparations could be undertaken in advance to ensure your ability to safely and appropriately respond in an extreme weather event?
4. What acute health risks does this patient have?
5. How can you help educate and prepare the community and the patient for response and recovery?

## Author Commentary

Although this case focuses on a specific situation of severe flooding, many of the issues and concepts discussed can be applied in emergency situations arising from other natural disasters. As discussed above, the period following a severe natural disaster may be chaotic and contribute to worsening of a patient's chronic disease states as well as introducing new disease concerns. Pharmacists can offer practical and creative solutions for health-related problems, especially in situations where the usual healthcare resources are limited or unavailable.

Many educational resources are available for pharmacists with an interest in disaster preparedness and management and are included in the references listed below. Participation in education and preparedness activities is key to effectiveness if faced with the challenge of providing care following a natural disaster. It is strongly encouraged that pharmacists seek out their local emergency management organizations to ensure that pharmacy interests are represented when plans are developed. Pharmacists also are reminded to contact state pharmacy boards for specific guidance and considerations pertaining to each state.

## Patient Approaches and Opportunities:

When counseling patients, it is important to consider the effect of changes in living conditions (emergency shelter, traveling to stay with friends/family, etc.) on the management of chronic disease states. Aside from the added stress of the disaster situation, patients may be unable to adhere to complicated medication schedules; may be unable to eat regularly scheduled, nutritious or well-balanced meals; may have more limited mobility or other functional losses due to loss of medical equipment such as walkers and important personal items like eye glasses, hearing aids, or false teeth; or decreased accessible shower/restrooms. Plans for patients may have to include managing the acute needs (e.g., 72 hours following natural disaster) and guidance on longer planning/response.

Connecting patients with mental health resources following a natural disaster may be important. Education provided to the public and providers can assist with recognition and awareness of mental health needs in times of crisis/recovery. Depending on the type of disaster, patients may experience anxiety and/or depression and feel overwhelmed as they begin the recovery process. Responders and volunteers can also be affected, especially in the acute phase of recovery when the need is greatest and volunteers may be working long hours in high stress situations and austere conditions. It is critical to watch for signs and symptoms related to depression, stress, and post-traumatic stress disorder. Depending on the culture and understanding of mental health, patients may not directly recognize what they are experiencing as stress, depression, or trauma.

Natural disasters happen all over the world. Preparedness is critical wherever you might be.

### KEY IMPORTANT RESOURCES

#### *Related chapters of interest:*

- [More than just diet and exercise: social determinants of health and well-being](#)
- [Saying what you mean doesn't always mean what you say: cross-cultural communication](#)
- [Anticipating anthrax and other bioterrorism threats](#)

#### *External resources:*

- <https://www.ready.gov/> or <https://www.listo.gov/es> (Spanish language version)
  - These websites are part of a national public service campaign to provide education and resources for all Americans to “prepare for, respond to, and mitigate emergencies, including natural and man-made disasters”.
  - Guidance and objectives for a business or workplace preparedness plan are available at <https://www.ready.gov/performance-objectives>
- <https://www.ccohs.ca/oshanswers/hsprograms/planning.html>
  - Canadian Center for Occupational Health and Safety (CCOHS) provides easy-to-read fact sheets on a variety of topics, including emergency planning
- <https://www.phe.gov/Preparedness/responders/pages/default.aspx>
  - US Department of Health and Hospitals (DHH) Public Health Emergency Page for Responders, Clinicians and Practitioners
  - Includes wide variety of relevant information including links to disaster response organizations, responder mental health and safety, and responder preparedness and planning for specific types of disasters (e.g., bioterrorism, Ebola, etc)

- <https://www.cdc.gov/phpr/index.htm>
  - CDC Office of Public Health Preparedness and Response is a comprehensive site with a broad range of information on emergency preparedness, potential bioterrorism agents and toxins, the Strategic National Stockpile program, and educational resources for both the public and healthcare providers
- <https://www.healthcareready.org/rxopen>
  - Searchable map resource that provides details of open pharmacies in areas affected by disaster
- <https://www.fema.gov/preparedness-checklists-toolkits>
  - This resource can be provided to patients and has a checklist of kits and plans that individuals can create for their own unique situation, location, and needs.
- <https://training.fema.gov/is>
  - FEMA provides many independent study courses online (free of charge) to learn more about disaster preparedness and response.
- Facebook check in:
  - <https://www.facebook.com/about/crisisresponse/>
  - In a time of a natural disaster, communication may be limited and batteries to cell phones or other devices may not be fully charged. Establishing a plan of how to check in or using resources that remove the need to contact a larger number of individuals can help establish peace of mind for loved ones.
- The World Health Organization and the Pan American Health Organization:
  - <https://www.paho.org/disasters/index.php?lang=en>
  - These organizations provide a variety of natural disaster surveillance and resources.

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## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)

# Anticipating anthrax and other bioterrorism threats

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## TOPIC AREA

Emergency preparedness/infectious disease

## LEARNING OBJECTIVES

At the end of this case, students will be able to:

Identify the clinical criteria for an inhalation anthrax diagnosis

Recommend an appropriate medication for post-exposure prophylaxis of anthrax

Describe the role of a pharmacist during a bioterrorist attack

## Introduction

Since the terrorist attacks of September 11, 2001, the US has been on high alert.<sup>1,3</sup> The anthrax exposures that followed shortly thereafter amplified the public cognizance that biological weapons remain a potential threat associated with terrorism.<sup>1,3</sup> Bioterrorism, the use of biological agents as a method of terrorism, may include agents such as anthrax, plague, smallpox, viral hemorrhagic fevers, or non-replicating agents such as toxins produced by living organisms.<sup>1</sup> A likely scenario for a biologic attack is via the dispersal of a pathogen in a densely populated area.<sup>1</sup> For this reason, it is imperative that health systems develop a disaster management team that they can quickly deploy in the event of a mass casualty event.

The role of the pharmacist in disaster management was first described in the 1960s.<sup>2</sup> Pharmacists were acknowledged as medication experts, capable of assisting in the emergent treatment of patients, educating the public, and developing and coordinating emergency preparedness measures.<sup>2</sup> In 1966, APhA advocated for the development of a national stockpile of medications and for disaster management plans to include plans for the preparation and mobilization of pharmacy activities throughout all phases of public health emergencies.<sup>2</sup> It was not until after the 2001 attacks that APhA released formal guidelines to address pharmacist involvement in bioterrorism preparedness planning.

These guidelines called for pharmacies to develop their own disaster management plans and to identify team members who should deploy in the event of a public health emergency. Furthermore, they emphasized the need for pharmacists to stay up to date on these procedures.<sup>2</sup> The following year, ASHP's statement describing health system pharmacists' role in counterterrorism measures emphasized that pharmacists are capable of not only medication dispensation but making therapy recommendations as well.<sup>4</sup> The guidelines stated that as medication experts, pharmacists can help optimize therapy as well as limit the overuse of antibiotics in a setting when the demand often exceeds the available supply.<sup>4</sup> During the 2001 anthrax exposures, the prescribing rate for ciprofloxacin and doxycycline far exceeded recommendations of the CDC.<sup>5</sup> In a bioterrorism event, delayed treatment, selection of incorrect antibiotics, and the overuse of antibiotics can increase resistance.<sup>3</sup> This further highlights the importance of incorporating pharmacists as members of disaster response teams.

The role of the pharmacist in disaster preparedness has further evolved since these early recommendations.<sup>2,5</sup> Pharmacists have also been incorporated into teams intended to protect their fellow healthcare workers at the front lines of mass casualty events. For example, at Maimonides Medical Center, pharmacists are members of both the hospital's incident command center and the pharmacy emergency response team (PERT). The PERT was developed with the goal of protecting the health of hospital staff and preventing the contamination of the healthcare facility.<sup>2</sup> Similarly, pharmacists at Montefiore Medical Center participated in a point-of-distribution exercise in conjunction with the New York City Department of Health and Mental Hygiene to simulate the mass prophylaxis of healthcare workers in the event of a public health emergency.<sup>5</sup> This exercise demonstrated that allowing pharmacists to immunize in a simulated public health emergency afforded approximately 12,000 healthcare workers the opportunity to receive prophylaxis within a 48 hour period.<sup>5</sup> Pharmacists have the potential to reduce the financial impact of bioterrorist attacks on both the healthcare facility and the surrounding community.<sup>5</sup>

## Case

### SCENARIO

You are a pharmacist in an urban emergency department (ED).

CC: "I feel like I can't breathe."

HPI: PD is a 32-year-old white male (82 kg) who presents to the ED (along with his wife) in severe respiratory distress. For the past 24 to 48 hours, PD's wife states he had a fever of 102.5<sup>0</sup>F, non-productive cough, shortness of breath, chest pain, and fatigue. His wife denies other respiratory symptoms. He has no other neurological symptoms. He first started to experience respiratory symptoms about two days after attending a professional hockey game.

PMI: Seasonal allergies (spring)

SH: PD works full time at a mail distribution center, is married with one child (five years old), and lives in an urban city with medical insurance and full access to healthcare services. He reports drinking one to two alcoholic drinks per week (beer/wine with dinner) and two cups of coffee per day, but denies any tobacco and illicit drug use.

Allergies: NKDA

Medications:

- Loratadine 10 mg by mouth daily PRN seasonal allergies

Vaccinations:

- Wife believes he received all routine childhood vaccines, Tdap booster 2 years ago, and is up to date on his annual flu vaccine (receives flu vaccine every year)

#### ROS:

- General: Well-nourished male in apparent respiratory distress
- HEENT: WNL
- Chest: Rhonchi present
- CV: No murmurs, gallops or rubs
- Abdomen: NT/ND
- Skin: WNL

#### VS:

- BP 112/60 mmHg
- RR 22 per minute
- HR 110 bpm
- Temperature 102.5 °F

#### Labs and Imaging:

- Chest x-ray: pleural effusion
- Chest CT: mediastinal widening, pleural effusions with pericardial effusion
- Lumbar puncture: negative
- Gram stain (sputum): gram-positive rods, square-ended, in pairs
- Sputum specimen sent to a Laboratory Response Network (LRN)

Additional context: Over the next several days, there are increasing numbers of patients complaining of similar symptoms seen at other hospitals throughout the area. The ED has reported ten other admissions with similar symptoms. PD sputum sample came back as culture confirmed detection of *B. anthracis* by LRN-validated polymerase chain reaction. The state department of public health has identified several other cases in two other hospitals in the state. The Incident Command Center is activated and the state requests Strategic National Stockpile (SNS) activation for mass prophylaxis.

## Case Questions

1. During public health outbreaks, epidemiologists must have a working case definition to identify probable and confirmed cases. What clinical signs and laboratory criteria confirm a diagnosis of inhalation anthrax?
2. Which antibiotics are approved for post-exposure prophylaxis for those exposed to *B. anthracis*?
3. What type of inventory can the SNS supply? How long will take from the initial notification to when points of distribution (PODs) will receive SNS assets?
4. What methods are used to educate the public? Who can dispense these medications?
5. Who can dispense post-exposure prophylaxis antibiotics?
6. What are the considerations for pediatric dispensing?

## Author Commentary

Pharmacists remain the most accessible healthcare member in the community. As medication experts, pharmacists are well-positioned to respond to bioterrorism threats. This role has evolved through the decades from public education and medication dispensing to formal training of pharmacists as volunteers, such as members of the Medical Reserve Corps. Following the September 11, 2001, terrorist attacks, thousands of ciprofloxacin and other antimicrobials were prescribed to postal workers, public health officials, and congressional staff members for potential anthrax exposure.<sup>6</sup> Furthermore, the public was needlessly

ordering ciprofloxacin from the internet and stockpiling it for future use without fully understanding the rare but serious adverse effects from unnecessary antibiotic exposure. This prompted the FDA to issue warnings to online vendors to prevent illicit drug sales.<sup>7</sup>

This scenario applies to bioterrorism threats beyond anthrax. Pharmacists can assist public health organizations and responders by administering vaccines, dispensing emergency medications on a mass scale and in a timely manner, providing emergency refills of chronic medications, counseling patients on appropriate antibiotic use and adverse effects, establishing community pharmacies as a point of dispensing (POD), and ensuring an adequate medication supplies are available for the response.

## Patient Approaches and Opportunities:

The International Federation of Red Cross and Red Crescent Societies define disaster as “*a sudden, calamitous event that seriously disrupts the functioning of a community or society, causing human, material, and economic or environmental losses that exceed the community’s or society’s ability to cope using its own resources.*”<sup>8</sup> Community resilience is the ability of a community to effectively utilize its own resources to respond to and recover from such a disaster.<sup>9</sup> Pharmacists are essential in community resilience, and the degree to which pharmacists are prepared for a bioterror or pandemic event may have a significant impact on a community’s ability to respond and recover.

Patients may develop strong, trusting relationships with their pharmacists over a lifetime and may be more willing to share concerns and seek information from, or believe information provided by their pharmacists than from news outlets and public health agencies. In this way, pharmacists may mitigate community panic that can lead to drug hoarding, inappropriate medication use and abuse, and dissemination of inappropriate or inaccurate information. Pharmacists are also essential public health partners in infectious disease surveillance. Because social, economic, and cultural factors influence patients’ health-seeking behaviors, in communities where patients are less likely to seek care from a primary care provider, pharmacists may be the first health care practitioners to recognize the emergence of pandemic disease.

Overarching strategies for managing a bioterrorist attack can be applied to the management of pandemic influenza or other emerging, highly contagious, high mortality infectious disease. During a declared disaster or public health emergency such as a bioterror attack or pandemic event, a temporary, legal change may be made to a state’s pharmacy practice act. A state, county, or community-wide standing-order or collaborative practice agreement may be prepared expanding the pharmacist’s scope of practice. This can include diagnosis, assessment, and prescribing of medications specific to the bioterror or pandemic event. Such methods may allow pharmacists to immunize pediatric patients when the health-care system is strained.

Community pharmacies can develop formal, working-relationships with public health agencies before disaster strikes and may develop a memorandum of understanding (MOU), a formal, written agreement that defines the roles of all parties in advance. The Association of State and Territorial Health Officials (ASTHO) has partnered with the National Association of Chain Drug Stores (NACDS), the National Alliance of State Pharmacy Associations (NASPA), the CDC, and APhA to develop a toolkit. This toolkit will help public health agencies and community pharmacies develop a MOU that could “*leverage all potential partners’ strengths and promote synergies that can be useful for additional services, beyond immunizations.*”<sup>10</sup> An MOU will allow pharmacies to coordinate and collaborate with public health agencies by becoming the POD for their neighborhood. In turn, community pharmacies benefit by receiving early allocation of federal vaccines and antibiotic supplies as needed.

Community pharmacies need to have a plan in place should disaster strike. To support public health, during a bioterror or pandemic event, community pharmacies should consider extending working hours and employing temporary pharmacies in quarantine or refugee areas.

## IMPORTANT RESOURCES:

### Related chapters of interest:

- [When disaster strikes: managing chaos and instilling lessons for future events](#)
- [HIV and hepatitis C co-infection: a double-edged sword](#)
- [Medication safety: to 'error' is human](#)

### Websites:

- Clinical Framework and Medical Countermeasure Use during an Anthrax Mass-Casualty Incident. Available at: <https://www.cdc.gov/mmwr/pdf/rr/rr6404.pdf>
- Anthrax (*Bacillus anthracis*) 2018 Case Definition. Available at: <https://wwwn.cdc.gov/nndss/conditions/anthrax/case-definition/2018/>
- Post-exposure Prophylaxis of Anthrax – Emergency Use Instructions for Healthcare Providers. Available at: <https://www.cdc.gov/anthrax/medical-care/emergency-use-doxycycline-ciprofloxacin.html>
- US Department of Health and Human Services – Assistant Secretary for Preparedness and Response. Public Health Emergency. Strategic National Stockpile Training and Exercises. Available at: <https://www.phe.gov/about/sns/Pages/training.aspx>

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10. Memorandum of understanding toolkit for public health agencies and pharmacies: Guidance and templates for state and territorial health agencies to establish a memorandum of understanding with pharmacies to support a coordinated response to influenza pandemics and other vaccine-related emergencies. (Aug 2018). Retrieved from <http://www.astho.org/Programs/Infectious-Disease/Pandemic-Influenza/MOU-Toolkit-for-Public-Health-and-Pharmacies/>

## GLOSSARY AND ABBREVIATIONS

- [Glossary](#)
- [Abbreviations](#)