

Call to Action

The Dangers of Influenza and Benefits of Vaccination in Adults with Chronic Health Conditions



September 2018



Experts stress the importance of protecting adults with chronic health conditions from influenza

The recommendations in this Call to Action are based on discussions at a July 2018 Roundtable convened by the National Foundation for Infectious Diseases (NFID). The multidisciplinary group of subject matter experts gathered to discuss the underrecognized burden of influenza (flu) on adults with chronic health conditions, the connection between inflammation caused by influenza, and the resulting exacerbation of common chronic health conditions. Discussions focused on recommendations and strategies to protect vulnerable populations by emphasizing the benefits of flu vaccination to overall health, mitigation of illness severity and flu-related complications, and improved patient outcomes.

Call to Action

The Dangers of Influenza and Benefits of Vaccination in Adults With Chronic Health Conditions

Overview

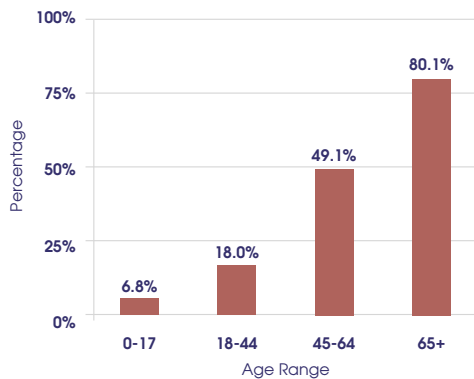
Influenza (flu) is a serious health concern in adults with certain chronic health conditions, including heart disease, lung disease, and diabetes. These individuals are at increased risk of flu-related complications and exacerbation of underlying disease, even when the condition is well-controlled, due to the effects of flu-related inflammation that may occur long after acute infection.

Unfortunately, flu vaccination coverage rates remain suboptimal in adults, partly due to a lack of confidence in vaccine efficacy. However, strong evidence exists to support the benefits of flu vaccination in mitigating disease severity, reducing hospitalization rates, and disrupting viral transmission. There is an urgent need to raise awareness of both the dangers of influenza infection and the benefits of vaccination in adults with chronic health conditions.

Connection Between Influenza and Exacerbation of Chronic Health Conditions

Nearly 50 percent of US adults age 45-64 years¹ have two or more chronic health conditions (Figure 1).^{2,3} As the US population ages, the proportion of adults with chronic health conditions will likely rise, as the prevalence of many chronic health conditions increases with age.^{3,4}

Figure 1: Percentage of US Individuals With Multiple Chronic Health Conditions, By Age^{2,3}



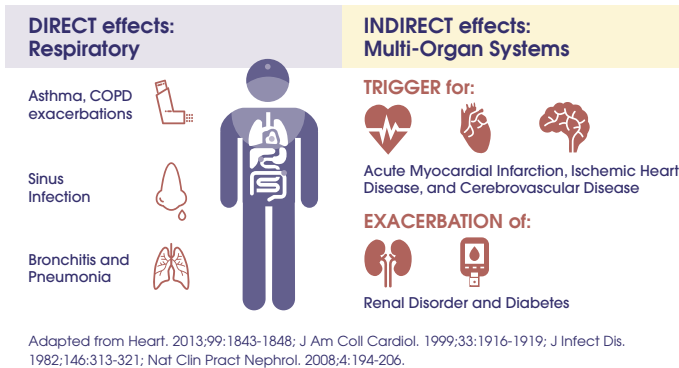
The high proportion of adults with chronic health conditions is of particular concern due to the potentially serious interaction between influenza virus and certain chronic health conditions, including heart disease, lung disease, and diabetes. Flu can exacerbate these conditions and may increase the risk of persistent catastrophic disability.⁵ Flu can have direct effects, such as exacerbation of asthma or chronic obstructive pulmonary disease (COPD), and indirect effects that may trigger certain events or exacerbate conditions such as heart disease or diabetes (Figure 2).

Chronic Health Conditions and Increased Risk for Influenza-Related Complications

The Centers for Disease Control and Prevention (CDC)⁶ have identified a long list of chronic health conditions that increase risk of flu-related complications, including:

- Asthma
- Neurological and neurodevelopmental conditions, including cerebral palsy, epilepsy, stroke, muscular dystrophy, spinal cord injury, and more
- COPD and other chronic lung conditions, including cystic fibrosis
- Heart disease, including coronary artery disease, congestive heart failure, and congenital heart disease
- Sickle cell disease and other blood disorders
- Diabetes and other endocrine or metabolic disorders
- Kidney disorders
- Liver disorders
- People with HIV/AIDS, cancer, or other conditions that weaken the immune system
- Extremely obese individuals (BMI ≥ 40)

Figure 2: Flu Exacerbation of Chronic Health Conditions: Direct and Indirect Effects



Chronic health conditions may put adults at increased risk of flu-related complications.⁶ Estimates indicate that 31 percent of US adults age 50-64 years, and 47 percent of those age 65 years and older, are at high risk for flu-related complications due to certain chronic health conditions, including heart and lung disease as well as diabetes, or are likely to have decreased vaccination response because of immunocompromising conditions.⁷

Data from the 2017-2018 flu season shows a disproportionate impact on adults age 50 years and older with chronic health conditions. Among adults hospitalized due to flu, for whom information on underlying medical condition was available, 92 percent had at least one reported underlying medical condition that placed them at high risk for flu-related complications, the most frequent of which included

- cardiovascular disease (46 percent)
- metabolic disorders such as diabetes (43 percent)
- obesity (37 percent)
- chronic lung disease (30 percent)⁸

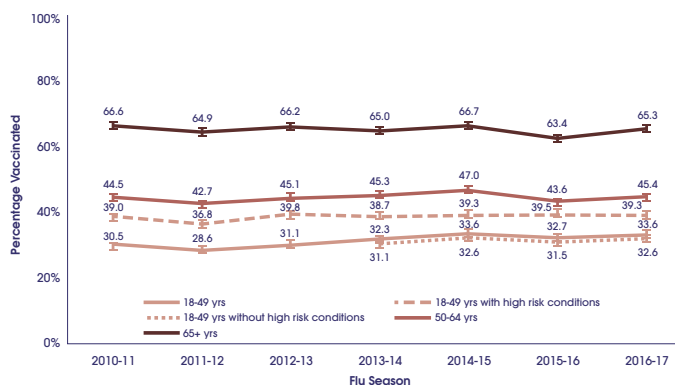
During the 2017-2018 season, flu-related hospitalizations were the highest since surveillance began in 2003. Adults age 50-64 years had one of the highest cumulative hospitalization rates, second only to adults age 65 years and older—surpassing the rate among infants and young children.⁸ This has significant implications for these vulnerable age groups that are a critical part of the workforce, many who also have family commitments to children and/or older family members.

Additionally, the serious consequences of flu in adults with chronic health conditions can be devastating and long term. In one study of hospitalized adults age 65 years or older, patients with laboratory-confirmed influenza were more likely to experience persistent catastrophic disability, shown by a significant decline in functional independence and activities of daily living one month after discharge.⁵ Ninety percent of flu-related deaths and the majority of flu-related hospitalizations occur in older adults⁹—the very individuals most likely to be living with chronic health conditions.



The concept of frailty as a measure of health and functioning may be a more accurate predictor of poor flu-related outcomes than chronological age.⁵ For example, a middle-age 53-year-old adult with diabetes and chronic lung disease may have the same risks of flu-related hospitalization or disability as a 78-year-old patient with fewer comorbidities. Nonetheless, flu vaccination rates remain well below the Healthy People 2020 targets of 80 percent for adults age 18-64 years, and 90 percent for adults with high-risk conditions, including those age 65 years and older (Figure 3).^{10,11}

Figure 3: Seasonal Flu Vaccination Among Adults, By Age Group, 2010-2017^{10,11}



Suboptimal Adult Influenza Vaccination Rates

Suboptimal vaccination rates are partly due to a lack of confidence in flu vaccines. According to one study, 43 percent of adults age 50-64 years old and 30 percent of those age 65 years or older have no or low confidence in flu vaccines.¹² Alarming, 60 percent of US adults age 31-49 years expressed that they have no or low confidence in flu vaccines, which may be a challenge among this cohort as they advance in age.

Drivers of the low confidence in flu vaccines include widespread misperceptions about the burden of flu and the benefits of vaccination. Among US adults

age 50-64 years, 47 percent believe that influenza infection would be “not very serious” or “not serious at all.”¹² These beliefs persist despite the known dangers of flu in this age group due to the significant prevalence of chronic health conditions and potential for long-term consequences beyond acute infection.

In addition, nearly half of US adults age 50-64 years admit they are not well-informed about the benefits of flu vaccination.¹² This may be attributed to misunderstanding the true benefits of flu vaccine—interruption of viral transmission and mitigation of disease severity.

Interruption of Viral Transmission

Prevention of influenza infection in vaccinated individuals—and unvaccinated individuals—guards against additional transmission of the virus into the community. Specifically, flu vaccination can protect the community in two ways: first, by inducing active immunity in vaccinated individuals which helps prevent infection and reduces severity of illness; and second, through indirect protection, by preventing susceptible persons from being exposed to the virus by disrupting human-to-human transmission.¹³

The greater the number of vaccinated individuals, the greater the protection of the population. This is especially important in preventing transmission of the virus to those ineligible for flu vaccination, such as infants under 6 months of age, as well as to older adults who may not respond well to vaccination with standard flu vaccines due to advanced age (immunosenescence). Additionally, community immunity may help protect those who forego annual flu vaccinations because they do not understand the full benefit of vaccination in reducing the severity of illness and lessening the chance of hospitalization or death.

Mitigation of Disease Severity

Recent studies show that flu vaccine may reduce the risk of severe disease among people who are infected despite vaccination. In one study of adults hospitalized with laboratory-confirmed influenza during the 2013-2014 season, vaccination was associated with a 52 percent reduction in flu-related deaths in adults age 50-64 years, and a 61 percent reduction in those age 65 years and older, compared to similar-aged unvaccinated adults. Vaccinated individuals were less likely to be admitted to the intensive care unit (ICU), and length of ICU stay was shorter.¹⁴ In addition, a recent study spanning multiple flu seasons (2012-2015) in New Zealand showed that receiving a flu vaccine reduced the odds of ICU admissions by 59 percent in hospitalized influenza-positive patients, resulting in a shorter length of stay and reduction in disease severity.¹⁵

Reducing the severity of disease is important not only for the general well-being of the infected individual and minimization of lost productivity, but also to minimize the impact of inflammation. An often underrecognized danger of influenza is the resulting inflammatory reaction that may last for several weeks after acute influenza infection. This inflammation can worsen certain chronic health conditions and may trigger a heart attack or stroke.

Exacerbation of Heart Disease

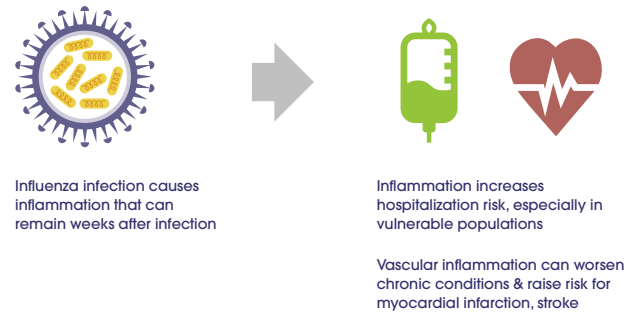
In the US, 15.5 million people have heart disease,¹⁶ and it is the leading cause of death.¹⁷ Not surprisingly, the prevalence of heart disease increases with age, with the highest frequency in individuals age 65 years or older. However, it is not solely a disease of older adults—more than half of individuals age 45-64 years have some form of cardiovascular disease.¹⁸

The effects of flu on individuals with heart disease are well-established, yet they remain underappreciated. In fact, a recent study noted

that acute myocardial infarction (heart attack) is six times more likely within seven days of laboratory-confirmed influenza infection.¹⁹

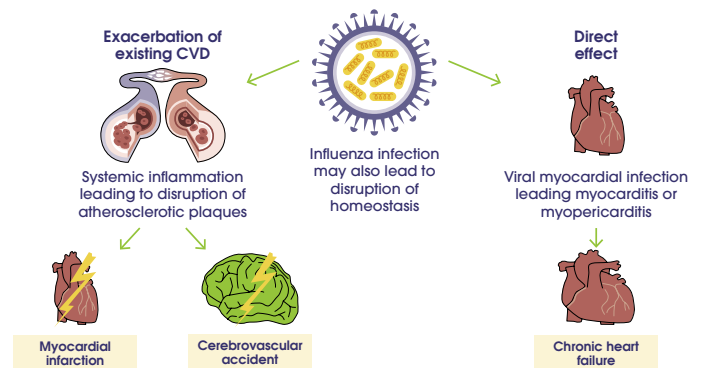
An increasing body of evidence points to inflammation as the mechanism by which flu exacerbates heart disease and other chronic health conditions (Figure 4).²⁰

Figure 4: Impact of Inflammation Related to Influenza Infection²⁰



Exacerbation of existing cardiovascular disease may result in blocked arteries, which can lead to a heart attack or stroke (Figure 5).²¹ Flu-associated inflammation can remain for weeks after viral symptoms have resolved, leaving patients vulnerable to disease exacerbation weeks after they have “recovered” from acute flu illness. The end result can be a permanent loss of function and even catastrophic disability, particularly among frail older individuals with chronic health conditions.⁵

Figure 5: Possible Causative Role of Influenza Infection in Cardiovascular Diseases²¹



Exacerbation of Lung Disease

In the US, there are an estimated 11.3 million adults living with COPD and an estimated 18.7 million adults with asthma (a lung condition caused by chronic airway inflammation). Chronic lower respiratory diseases, including COPD and asthma, are the third-leading cause of death in the US.²²

Flu is a major driver of mortality and morbidity in COPD patients.²³ It is well-established that COPD increases susceptibility to flu-related complications,²⁴ and there is evidence that acute viral infections may alter the clinical course of the disease (e.g., progressive loss of lung function) after acute exacerbation.²⁵ In a US study, influenza virus was detected in 25 percent of individuals hospitalized for COPD exacerbations.²⁶

In addition, the number of US adults with COPD is likely to be even greater than the official data indicates. More than 50 percent of US adults with impaired pulmonary function (likely due to COPD) have not been diagnosed,^{27,28} and consequently, are less likely to take necessary precautions against flu. Furthermore, individuals with asthma are at increased risk of severe disease and complications resulting from influenza infection.²⁹

Exacerbation of Diabetes

In the US, diabetes is widespread—affecting nearly one-quarter of adults age 65-74 years and one-fifth of adults age 75 years or older.⁴ Diabetes is the seventh-leading cause of death in the US and a leading cause of blindness, end-stage kidney failure, lower limb amputation, and cardiovascular disease.^{30,31} Type 2 diabetes accounts for up to 95 percent of all diabetes cases.^{32,33}

Emerging data have identified probable links between obesity, chronic inflammation, and insulin resistance. Prospective studies have documented an association between insulin resistance and accelerated cardiovascular disease in individuals with Type 2 diabetes.^{34,35}

Flu can cause significant and severe health complications for individuals with diabetes. The interaction of flu and diabetes is associated with significant morbidity and mortality attributed to metabolic complications.³⁶ In addition, the emerging data regarding inflammatory reactions to the flu and increasing cardiovascular risk must be considered when addressing flu risk in diabetic patients.³⁷

One study of individuals with diabetes found a six-fold increased risk of hospitalization due to flu.³⁸ In addition, the frequency of comorbid conditions, such as renal disease and heart disease, complicates the impact of flu on this population and can leave individuals with long-term disability beyond acute flu infection.³⁹

“*Flu vaccination must be included as one of the key diabetes prevention strategies to be administered with annual diabetes exams.*”

– Melissa Young, PharmD, CDE, BC-ADM
University of Utah School of Medicine
(representing American Association
of Diabetes Educators)

Benefits of Influenza Vaccination for Adults with Chronic Health Conditions

Due to the serious complications of flu in individuals with chronic health conditions, it is critical to protect them from flu. Even during seasons when flu vaccines are not well-matched with circulating virus strains, vaccination is still important in preventing serious outcomes.⁴⁰ A recent study showed that flu vaccines reduced the risk for cardiovascular events in individuals with pre-existing heart disease by 53 percent among patients who had a heart attack in the previous year and 36 percent overall; in addition, the vaccine reduced the risk for death by 19 percent among all study participants.⁴¹

“Flu vaccination for patients with heart disease can be just as effective as quitting smoking.”

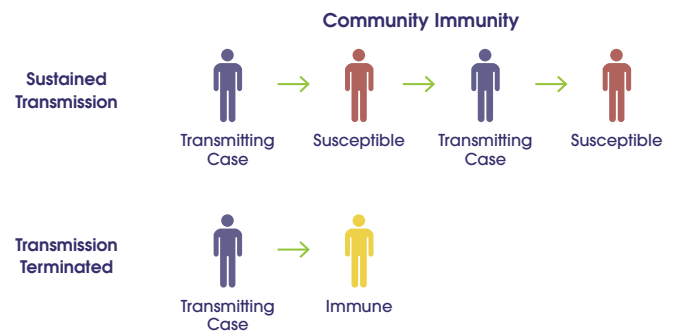
– Allen J. Taylor, MD
MedStar Washington Hospital Center
(representing American College of Cardiology)

In adults with chronic heart disease, the flu vaccine compares favorably with other preventive measures such as smoking cessation and the use of statins and anti-hypertensive drugs.⁴² Among individuals with COPD, flu vaccine produces a significant drop in COPD exacerbations compared to a placebo,⁴³ is associated with lower risk for ischemic heart disease in older COPD patients,⁴⁴ and can reduce serious illness as well as death.⁴⁵

For individuals with diabetes, the American Diabetes Association has stated that annual flu vaccination is an important part of preventive care (see callout box, Statements on Flu Vaccine in Persons With Chronic Health Conditions).⁴⁶ In this population, flu vaccine significantly reduces admission rates for stroke, heart failure, and all other causes of death in older patients with Type 2 diabetes.⁴⁷

It is also important to note that flu vaccination of household and community contacts reduces transmission of flu virus to all in the community, including those with chronic health conditions. High vaccination coverage helps protect vulnerable populations by reducing the number of infected individuals overall, disrupting transmission, and providing indirect protection by preventing exposure to the virus (Figure 6).¹³

Figure 6: Immunized Persons Interrupt Transmission¹³



Flu Vaccine Recommendations for 2018-2019 Season: Advisory Committee on Immunization Practices (ACIP) Recommendations⁴⁸

- Routine annual vaccination with a licensed age-appropriate influenza vaccine recommended for all individuals age ≥ 6 months who do not have contraindications
- Influenza can cause serious illness and death, especially in older adults, very young children, pregnant women, and individuals with chronic health conditions
- Vaccination is particularly important for persons at increased risk for severe complications and influenza-related outpatient/emergency department/hospital visits
- When vaccine supply is limited, vaccination efforts need to focus on persons at high risk of flu-related complications:
 - Children 6 to 59 months
 - Adults ≥ 50 years
 - Chronic disease: pulmonary (including asthma), cardiovascular, renal, hepatic, neurologic, hematologic, metabolic disorders (including diabetes)
 - Immunocompromised individuals
 - Women who are or will be pregnant during flu season
 - Residing in nursing home/long-term care facility
 - American Indian/Alaska Native
 - Extreme obesity (BMI ≥ 40)
 - Caregivers and contacts of those at risk

Statements on Flu Vaccination in Persons with Chronic Health Conditions

American Diabetes Association (ADA): Position Statement⁴⁶

- Vaccination should be recommended for patients with diabetes, age ≥ 6 months, beginning each September
- Intervention strategies strongly suggested for specific diabetes patients (e.g., >64 years of age, those with chronic cardiopulmonary disorders, residents of nursing homes/chronic care facilities)
- Dosage and type of flu vaccine vary based on patient age

American Heart Association (AHA)/American College of Cardiology (ACC): Science Advisory⁴⁹

- Vaccination recommended as a component of secondary prevention for persons with coronary disease and other atherosclerotic vascular conditions
- Should be administered to all persons with cardiovascular disease, unless they have a contraindication
- Providers can increase influenza vaccination coverage by stocking the vaccine, and by promoting annual immunization with strong recommendations and standing orders

American Lung Association (ALA): Influenza⁵⁰

- People with asthma or other lung diseases are at higher risk of developing complications from flu
- Health officials recommend that everyone 6 months of age and older receive an influenza vaccination every year
- Individuals are encouraged to speak to their healthcare providers to learn more about influenza and annual vaccination

Challenges to Increasing Influenza Vaccination Rates in Adults with Chronic Health Conditions

Healthcare Professional Challenges

Ownership/Accountability

Who should be responsible for ensuring and providing flu vaccination? Many specialists believe that it is the job of primary care providers. Consequently, specialists such as cardiologists and endocrinologists may not routinely stock flu vaccines. In fact, according to a joint publication of the American Heart Association and the American College of Cardiology, 50 percent of cardiologists do not stock the flu vaccine, even though flu prevention is paramount to avoiding exacerbations of heart disease.⁴⁹ Pharmacists may stock and offer vaccines, but strong recommendations from other healthcare professionals (HCPs) help to increase patient interest in seeking vaccination at the pharmacy.

Limited Time and Resources

Time with patients is limited, constrained by practices and payers. Predetermined time limits are particularly challenging with patients who have multiple chronic conditions. Physicians—particularly specialists who do not typically administer flu vaccines—may be reluctant to add the service due to concerns that it may increase the length of the visit. Patients may have questions about the effectiveness, necessity, and safety of a vaccine. Moreover, specialty medical office workflow often does not accommodate vaccination. A revised

workflow would be required to determine who administers the vaccine, who provides the informed consent, who answers patient questions, and when in the workflow does this all happen. In addition, clinicians and office staff need to be trained on the various types of vaccines, indications, and contraindications, and the importance of annual flu vaccination in mitigating severe illness.

Lack of Awareness

The relationship between acute flu infection, inflammation, and exacerbation of a patient's underlying disease, even if the disease is well-controlled, are underappreciated by both primary care physicians and specialists.

“We need to emphasize that getting vaccinated is the socially responsible thing to do. By receiving flu vaccine, individuals give themselves a measure of protection, but they also become less likely to transmit the virus to others—not only the vulnerable older relative with chronic lung disease or diabetes, but also friends and acquaintances at the gym, at work, at community events, and elsewhere.”

– William Schaffner, MD
National Foundation for Infectious Diseases
Medical Director

Patient Challenges

Myths and Misperceptions about Vaccination

In addition to misperceptions about the burden of flu, false notions about flu vaccines are also prevalent. It is not uncommon to hear individuals incorrectly state that flu vaccines “do not work,” that they “cause the flu,” or even that they are “toxic.” Overcoming these ingrained beliefs may be difficult, even when countering these false declarations with scientific facts.

Myths and misperceptions held by patients may stem from friends, family, or social cohorts such as parent groups or retirement communities. Social media posts against flu vaccine can influence decision-making, as can news reports with misleading information about low vaccine efficacy, despite various studies affirming the benefits of flu vaccination in mitigating disease.

Of particular concern, patients may assume that flu vaccination is not necessary if HCPs are not strongly recommending it, which may, in part, be due to lack of awareness around the importance of annual flu vaccination for patients with chronic health conditions.

Misperceptions about the Burden of Flu

In addition to misunderstandings about flu vaccines, false notions about the burden of flu also present a challenge. Eighty percent of unvaccinated adults believe their likelihood of getting the flu is somewhat low or very low.¹² Among adults age 50-64 years, 47 percent think the flu would not be

serious for them personally, and fewer than half of 50- to 64-year-olds admit they are “less than very well-informed” about the impact of flu and the elevated burden and risks for adults with chronic health conditions.¹²

Lack of Awareness of Risks of Flu for Adults with Chronic Health Conditions

Information about the interactions between flu and chronic health conditions is not widely available or understood by patients. This may well be due to lack of clear accountability (between primary care and specialty providers) and underappreciation of the impact of flu on these vulnerable populations.

“Are you willing to risk losing your independence—forever—by not getting a flu shot?”

– Janet E. McElhaney, MD
Northern Ontario School of Medicine and
Health Sciences North Research Institute

Recommendations for Increasing Flu Vaccination Rates in Adults with Chronic Health Conditions

All Healthcare Professionals Have a Role in Protecting Adults with Chronic Health Conditions from Influenza

- Both primary care providers and appropriate specialists should stock and insist upon annual flu vaccination—particularly for patients with known chronic health conditions and for all patients age 50 years and older, who may have an undiagnosed chronic health condition or are likely to spread flu to others.
- Specialists, such as cardiologists, endocrinologists, and pulmonologists, who treat patients with chronic health conditions must routinely incorporate flu vaccine into fall visits.
- HCPs should reach out to patients with chronic health conditions who do not have a scheduled fall visit and ask them to come in for flu vaccination.
- HCPs who are unable to provide flu vaccination on-site should write a “prescription” for flu vaccine for patients with chronic health conditions. Although a prescription is not required to get a flu vaccine at a pharmacy or other health provider, a written “flu vaccine prescription” can help reinforce the importance and urgency of the recommendation. A strong HCP recommendation is known to improve vaccination rates.

Identify/Assign a Flu Vaccine Champion in Your Medical Practice or Health System

- Educate all clinicians and office staff on current US flu vaccination recommendations.
- Clearly communicate that flu vaccine is an integral and important part of healthcare for adults with chronic health conditions. Emphasize the potential for disease exacerbation and continuous frailty that can result from influenza infection.

- Create a point in the workflow during flu season specifically for flu vaccine administration.
- Establish a targeted goal of at least 90 percent vaccination coverage among patients in the practice and assess progress on an ongoing basis.



Reset Messages About the Value of Flu Vaccination

- Highlight the benefits of flu vaccination not only for individuals, but for the community at large. Benefits include:
 - **Risk reduction.** Flu vaccination helps to reduce risk in individuals by reducing flu viruses circulating in the community. No vaccine is 100 percent effective, but partial protection against infection is the norm for flu vaccines.
 - **Mitigation of disease.** Vaccination lessens the effect of flu illness and reduces the risk for long-term consequences if an individual becomes infected despite having been vaccinated.

Reinforce Medical/Scientific Consensus Linking Improved Patient Outcomes with Annual Flu Vaccination

- **Disruption of transmission.** The more people who are vaccinated, the less influenza virus will be transmitted in the population, leading to a healthier community overall. Vaccination also provides indirect protection by reducing exposure of susceptible individuals to flu viruses.
 - **Community immunity.** Getting a flu vaccine is the socially responsible thing to do to protect healthy individuals as well as others, including those with chronic health conditions.
 - Motivate patients:
 - Insist on flu vaccination for all patients, with a strong recommendation.
 - Inform adults with heart disease, lung disease, and/or diabetes that flu can exacerbate their condition or trigger an adverse cardiovascular event.
 - Emphasize the importance of remaining vital and active, going to work, enjoying life, and spending time with family/friends.
 - Explain the potential for post-flu frailty. A frail person may lose the ability to take care of themselves and maintain independence without burdening family members. Individuals may never return to their pre-flu state.
 - Integrate flu vaccine messages into overall wellness messages and programs. Eating healthfully, not smoking, exercising—and getting the flu vaccine every year—are all part of maintaining a healthy lifestyle.
 - Create a practical vaccination reminder tied to an annual fall ritual—Labor Day, the first day of school, etc.
- HCP audience:
 - Educate HCPs via professional meetings, publications, and continuing medical education.
 - Consumer/patient audience:
 - Enhance point of care education, including waiting room videos and brochures, targeted signage, and direct conversations between patients and HCPs.
 - Initiate public awareness campaigns to ensure that individuals can self-identify as having a health condition that may be exacerbated by flu. One way to do this is to associate flu vaccination with behaviors vs. diagnosis. For example, instead of saying that patients with chronic heart or lung disease or with diabetes should get a flu vaccine, emphasize that those who take statins, those who use an inhaler, or those who use insulin should get a flu vaccine.

“*When you can't breathe, nothing else matters. If you have lungs, you need a flu vaccine.*”

– Albert A. Rizzo, MD
Senior Medical Advisor
American Lung Association

Summary and Conclusion

Flu is a dangerous and potentially deadly virus with impacts that extend beyond the initial acute infection. Flu is of particular concern for the millions of adults in the US who have chronic health conditions, such as heart and lung disease and diabetes, which may increase the risk of flu-related complications, including hospitalization, catastrophic disability, and even death. In particular, flu-related inflammation can exacerbate chronic lung diseases, and has been shown to increase the risk for heart attack and stroke long after resolution of the acute illness.

For these reasons, annual flu vaccination is critical in adults with chronic health conditions to mitigate disease severity, reduce hospitalization rates, and disrupt viral transmission. Unfortunately, vaccination rates remain suboptimal in adults, and the severity and true impact of flu infection is underrecognized and often misunderstood by both patients and HCPs.

There is an urgent need to raise awareness of the burden of flu in adults with chronic health conditions. HCPs play a key role in communicating the importance of protecting patients with chronic health conditions against flu and subsequent exacerbations and complications, as well as the known benefits of flu vaccine in mitigating these risks. They must be prepared to recognize and address key barriers to vaccination, including lack of consumer confidence in vaccine efficacy, lack of consistent and strong recommendations by HCPs for flu vaccination, and misperceptions about the impact of flu.

All HCPs have the opportunity to help reframe the conversation about the value of annual flu vaccination, not only for adults with chronic health conditions, but for the community as a whole. By following the recommendations outlined in this report, HCPs can significantly increase vaccination rates and improve patient outcomes in adults with chronic health conditions. Encouraging routine vaccination behaviors in middle-age adults may also ensure that they continue to seek annual vaccination as they age into the 65 years and older cohort—another group at particularly high risk of flu-related complications.

To learn more, visit www.nfid.org/flu and www.cdc.gov.

Supporting Organizations

The following organizations support the goals of increasing awareness of the dangers of influenza infection among adults with chronic health conditions and the benefits of annual vaccination, to ultimately improve public health and patient outcomes.

Alliance for Aging Research	American Osteopathic Association
American Academy of Family Physicians	American Pharmacists Association
American Association of Diabetes Educators	Caregiver Action Network
American College of Cardiology	Centers for Disease Control and Prevention
American College of Emergency Physicians	Immunization Action Coalition
American College of Physicians	National Adult and Influenza Immunization Summit
American Lung Association	National Association of Chain Drug Stores
American Medical Group Association	National Foundation for Infectious Diseases
American Nurses Association	The Gerontological Society of America

Sanofi Pasteur has provided funding and other support for this activity. [NEFD policies](#) restrict funders from controlling program content.

References

- Centers for Disease Control and Prevention, AARP, American Medical Association. Promoting Preventive Services for Adults 50-64: Community and Clinical Partnerships. Atlanta, GA: National Association of Chronic Disease Directors; 2009. www.cdc.gov/aging/pdf/promoting-preventive-services.pdf. Accessed August 1, 2018.
- Pew Research Center. The Diagnosis Difference. November 2013. www.pewinternet.org/2013/11/26/the-diagnosis-difference/. Accessed July 16, 2018.
- Agency for Healthcare Research and Quality. Multiple Chronic Conditions Chartbook: 2010 Medical Expenditure Panel Survey Data. www.ahrq.gov/professionals/prevention-chronic-care/decision/mcc/resources.html. Accessed September 12, 2018.
- National Health Interview Survey. Centers for Disease Control and Prevention, 2016. www.cdc.gov/nchs/nhis/index.htm. Accessed August 16, 2018.
- Andrew MK, Macdonald S, Ye L, et al. Impact of Frailty on Influenza Vaccine Effectiveness and Clinical Outcomes: Experience from the Canadian Immunization Research Network (CIRN) Serious Outcomes Surveillance (SOS) Network 2011/12 Season. *Open Forum Infect Dis*. 2016 Oct 24; 3(suppl_1):710.
- Centers for Disease Control and Prevention. People at High Risk of Developing Serious Flu-Related Complications. www.cdc.gov/flu/about/disease/high_risk.htm. Accessed August 29, 2019.
- Zimmerman RK, Lauderdale DS, Tanc SM, Wagener DK. Prevalence of high-risk indications for influenza vaccine varies by age, race, and income. *Vaccine*. 2010;28(39):6470-6477.
- Garten R, Blanton L, Abd Elal, AI, et al. Update: Influenza Activity in the United States During the 2017-18 Season and Composition of the 2018-19 Influenza Vaccine. *MMWR*. 2018;67:634-642.
- Centers for Disease Control and Prevention. Estimates of deaths associated with seasonal influenza – United States, 1976-2007. *MMWR Morb Mortal Wkly Rep*. 2010 Aug 27;59(33):1057-1062.
- Office of Disease Prevention and Health Promotion. 2020 Topics & Objectives: Immunization and Infectious Diseases. www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives. Accessed September 12, 2018.
- Flu Vaccination Coverage, United States, 2016-17 Influenza Season. Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases (NCIRD), September 28, 2017. www.cdc.gov/flu/fluview/coverage-1617estimates.htm. Accessed July 23, 2018.
- Nowak GJ, Cacciatore MA, Len-Riós, ME. Understanding and Increasing Influenza Vaccination Acceptance: Insights from a 2016 National Survey of U.S. Adults. *Int J Environ Res Public Health*. 2018 Apr 10;15(4). pii: E711.
- National Foundation for Infectious Diseases. Influenza Vaccination: Protecting Yourself by Protecting Your Community. <https://nfid.wordpress.com/2018/02/12/influenza-vaccination-protecting-yourself-by-protecting-your-community/>. Accessed September 13, 2018.
- Arriola C, Garg S, Anderson EJ, et al. Influenza Vaccination Modifies Disease Severity Among Community-dwelling Adults Hospitalized With Influenza. *Clin Infect Dis*. 2018;65(8):1289-1297.
- Thompson MG, Pierse N, Sue Huang Q, et al. Influenza vaccine effectiveness in preventing influenza-associated intensive care admissions and attenuating severe disease among adults in New Zealand 2012-2015. *Vaccine*. 2018 Aug 1. pii: S0264-410X(18)30997-6.
- Mozaffarian D, Benjamin EJ, Go AS, et al. Heart Disease and Stroke Statistics—2015 Update: A Report From the American Heart Association. *Circulation*. 2015 Jan 27;131(4):e29-322.
- Kochanek KD, Murphy SL, Xu J, Arias E. Mortality in the United States, 2013. *NCHS Data Brief*. 2014 Dec;(178):1-8.
- American Heart Association. Cardiovascular Disease: A Costly Burden for America—Projections Through 2035. 2017. <https://healthmetrics.heart.org/cardiovascular-disease-a-costly-burden/>. Accessed August 15, 2018.
- Kwong JC, Schwartz KL, Campitelli MA, et al. Acute Myocardial Infarction after Laboratory-Confirmed Influenza Infection. *N Engl J Med*. 2018 Jan 25;378(4):345-353.
- Madjid M, Aboshady I, Awan I, Litovsky S, Casscells SW. Influenza and Cardiovascular Disease: is there a causal relationship? *Tex Heart Inst J*. 2004;31:4-13.
- Loomba RS, Aggarwal S, Shah PH, Arora RR. Influenza vaccination and cardiovascular morbidity and mortality: analysis of 292,383 patients. *J Cardiovasc Pharmacol Ther*. 2012;17(3):277-283.
- Centers for Disease Control and Prevention. Progress Reviews for Healthy People 2020: Respiratory Diseases & Sleep Health. www.cdc.gov/nchs/healthy_people/hp2020/hp2020_progress_reviews.htm. December 5, 2013. Accessed September 12, 2018.
- Sanei F, Wilkinson T. Influenza vaccination for patients with chronic obstructive pulmonary disease: understanding immunogenicity, efficacy and effectiveness. *Ther Adv Respir Dis*. 2016 Aug; 10(4): 349-367.
- Hsu A, Starkely M, Hanish I, et al. Targeting PI3K- P110A suppresses influenza virus infection in chronic obstructive pulmonary disease. *Am J Resp Crit Care Med*. 2015;191(9):1012-1023.
- Sethi S. Infection as a comorbidity of COPD. *Eur Respir J*. 2010;35:1209-1215.
- Rohde G, Wiethage A, Borg I, et al. Respiratory viruses in exacerbations of chronic obstructive pulmonary disease requiring hospitalisation: a case-control study. *Thorax*. 2003;58:37-42.

27. Tilert T, Dillon C, Paulose-Ram R, et al. Estimating the U.S. Prevalence of Chronic Obstructive Pulmonary Disease Using Pre- and Post-Bronchodilator Spirometry: The National Health and Nutrition Examination Survey (NHANES) 2007–2010. *Respiratory Research*. 2013; 14(1):103.
28. Mannino DM, Gagnon RC, Petty TL, Lydick E. Obstructive lung disease and low lung function in adults in the United States: data from the National Health and Nutrition Examination Survey 1988-1994. *Arch Intern Med*. 2000;160:1683–1689.
29. Centers for Disease Control and Prevention. Flu and People with Asthma. www.cdc.gov/flu/asthma/index.htm. Accessed August 15, 2018.
30. Murphy SL, Xu JQ, Kochanek KD, Curtin SC, Arias E. Deaths: Final data for 2015. *Natl Vital Stat Rep*. 2017 Nov;66(6):1-75.
31. Rao Kondapally Seshasai S, Kaptoge S, Thompson A, et al. Diabetes Mellitus, Fasting Glucose, and Risk of Cause-Specific Death. *N Engl J Med*. 2011 Mar 3;364:829-841.
32. Centers for Disease Control and Prevention. Type 2 Diabetes. www.cdc.gov/diabetes/basics/type2.html. Accessed September 7, 2018.
33. National Institute of Diabetes and Digestive and Kidney Diseases. Insulin Resistance and Prediabetes. www.niddk.nih.gov/health-information/diabetes/overview/what-is-diabetes/prediabetes-insulin-resistance. Accessed September 7, 2018.
34. Eckel RH, Kahn SE, Ferrannini E, et al. Obesity and Type 2 Diabetes: What Can Be Unified and What Needs to Be Individualized? *J Clin Endocrinol Metab*. 2011 Jun;96:1654-1663.
35. DeFronzo RA. Insulin resistance, lipotoxicity, type 2 diabetes and atherosclerosis: the missing links. The Claude Bernard Lecture 2009. *Diabetologia*. 2010 Jul;53:1270-1287.
36. Peleg AY, Weerarathna T, McCarthy JS, Davis TM. Common infections in diabetes: pathogenesis, management and relationship to glycaemic control. *Diabetes Metab Res Rev*. 2007 Jan;23(1):3-13.
37. American Heart Association. Cardiovascular Disease and Diabetes. www.heart.org/en/health-topics/diabetes/why-diabetes-matters/cardiovascular-disease--diabetes/. Accessed September 5, 2018.
38. Bouter KP, Diepersloot RJA, van Romunde LKJ, et al. Effect of epidemic influenza on ketoacidosis, pneumonia and death in diabetes mellitus: a hospital register survey of 1976–1979 in The Netherlands. *Diabetes Res Clin Pract*. 1991;12:61–68.
39. Smith SA, Poland GA. Use of influenza and pneumococcal vaccines in people with diabetes. *Diabetes Care*. 2000;23(1):95-108.
40. Sah P, Medlock J, Fitzpatrick MC, Singer BH, Galvani AP. Optimizing the impact of low-efficacy influenza vaccines. *Proc Natl Acad Sci U S A*. 2018 May 15;115(20):5151-5156.
41. Udell JA, Zawi R, Bhatt DL, et al. Association Between Influenza Vaccination and Cardiovascular Outcomes in High-Risk Patients: a meta-analysis. *JAMA*. 2013;310:1711-1720.
42. MacIntyre CR, Mahimbo A, Moa AM, Barnes M. Influenza vaccine as a coronary intervention for prevention of myocardial infarction. *Heart Br Card Soc*. 2016;102(24):1953-1956.
43. Poole PJ, Chacko E, Wood-Baker RW, Cates CJ. Influenza vaccine for patients with chronic obstructive pulmonary disease. *Cochrane Database Syst Rev*. 2006 Jan 25;(1):CD002733.
44. Huang CL, Nguyen PA, Kuo PL, Iqbal U, Hsu YH, Jian WS. Influenza vaccination and reduction of risk in ischemic heart disease among chronic obstructive pulmonary elderly. *Comput Methods Programs Biomed*. 2013;111:507-511.
45. Wongsurakiat P, Maranetra KN, Wasi C, Kositanount U, Dejsomritrutai W, Charoenratanakul S. Acute respiratory illness in patients with COPD and the effectiveness of influenza vaccination: a randomized controlled study. *Chest*. 2004 Jun;125(6):2011-2020.
46. Immunization and the Prevention of Influenza and Pneumococcal Disease in People With Diabetes. *Diabetes Care* Jan 2003, 26 (suppl 1) s126-s128.
47. Vamos EP, Pape UJ, Curcin V, et al. Effectiveness of the influenza vaccine in preventing admission to hospital and death in people with type 2 diabetes. *CMAJ*. 2016 Oct 4;188(14):E342-E351.
48. Grohskopf LA, Sokolow LZ, Broder KR, Walter EB, Fry AM, Jernigan DB. Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices—United States, 2018-19 Influenza Season. *MMWR Recomm Rep*. 2018 Aug 24;67(3):1-20.
49. Davis MM, Taubert K, Benin AL, et al. Influenza vaccination as secondary prevention for cardiovascular disease: a science advisory from the American Heart Association/American College of Cardiology. *J Am Coll Cardiol*. 2006 Oct 3;48(7):1498-502. Epub 2006 Sep 15.
50. American Lung Association. Influenza (Flu). www.lung.org/lung-health-and-diseases/lung-disease-lookup/influenza/. Accessed August 30, 2018.

THE DANGERS OF INFLUENZA (FLU): WHY ADULTS WITH CHRONIC HEALTH CONDITIONS NEED TO GET VACCINATED

During the 2017-2018 flu season, highest hospitalization rates were among **adults age 50-64 and 65+**

US adults with chronic health conditions are at high risk for flu-related complications

- Exacerbation of chronic health conditions
- Permanent physical decline
- Risk of heart attack or stroke
- Death



90% of flu-related deaths occur in adults 65+



15+ million

have heart disease and are **10x** more likely to have a heart attack within **3 days** of flu infection



31+ million

have asthma and/or COPD putting them at greater risk of serious flu-related complications



30+ million

have diabetes and are at **6x increased risk** of flu-related hospitalization



Annual flu vaccination is the best way to protect patients with chronic health conditions from serious long-term complications of flu

Visit www.nfid.org/flu-chronic-health-conditions for additional resources



THE DANGERS OF INFLUENZA (FLU) FOR ADULTS WITH CHRONIC HEALTH CONDITIONS

What do they all have in common?



Susan, Age 75
HEART DISEASE



Janet, Age 50
HIV/AIDS



Jake, Age 62
OBESE (BMI≥40)



Darrell, Age 57
ASTHMA



Maria, Age 49
DIABETES



Jose, Age 64
**CHRONIC
OBSTRUCTIVE
PULMONARY
DISEASE (COPD)**

During the 2017-2018 flu season, highest hospitalization rates were among **adults age 50-64 and 65+**

Because of their chronic health conditions, they are at high risk for serious flu-related complications:

- Worsening of chronic health condition
- Disability
- Hospitalization
- Death

90% of flu-related deaths occur in adults 65+

15+ million have heart disease and are **10x** more likely to have a heart attack within **3 days** of flu infection

31+ million have asthma and/or COPD putting them at greater risk of serious flu-related complications

30+ million have diabetes and are at **6x increased risk** of flu-related hospitalization

Annual flu vaccination is the best way to protect yourself from flu and serious long-term complications. #GetVaccinated!

