

Teaching Immunization

for Medical Education (TIME)



MULTISTATION CLINICAL TEACHING SCENARIOS

Influenza Prevention: Small Group Booklet

DEVELOPED AND REVISED BY

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FOR MORE INFORMATION

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BACKGROUND ON THE MULTISTATION CLINICAL TEACHING SCENARIOS (MCTS) METHOD

The multistation clinical teaching scenarios were developed to encourage active small-group learning in a clinically relevant context with a modest amount of faculty time. The time commitment of both the facilitator and the student is typically 50 to 90 minutes, depending on the setting and goals. The MCTS teaching method may be readily used in medical pre-clinical and clinical years when students' or residents' time is limited. MCTS is well-suited to objective-driven curricula. In the MCTS session, one facilitator can interact with groups ranging from 10 to 30 residents or students. The facilitator needs basic knowledge about the disease and immunization covered but does not need to be a content expert.

Students and residents are assigned to small groups of 2 to 5 for an MCTS session. All of the small groups simultaneously address the first scenario. Each small group spends approximately 5 to 10 minutes attempting to solve the problem addressed in the scenario. The scenario is then discussed in a large group. The facilitator calls on one of the small groups to present their answers, then the facilitator and the large group discuss each small group's response to the scenario and summarize the teaching points. The facilitator should correct wrong answers and discuss the teaching points. Generally, the large-group discussion should not last more than 7 minutes per scenario. After the first scenario is discussed, each small group works on the second scenario.

A large-group discussion follows. The process is repeated until all scenarios are completed or the allotted time expires.

SUGGESTED SCHEDULE

1. Arrange chairs in groups of 3 to 5, and separate students or residents into small groups.
2. Distribute one copy of the Influenza Prevention MCTS *Small-Group Booklet* to each group along with a copy of the learning aids listed for the scenarios to be discussed. A major learning aid is needed: appropriate chapter from the CDC's Pink Book*, www.cdc.gov/vaccines/pubs/pinkbook/pink-chapters.htm and/or slide set from http://www.aptrweb.org/resources/curriculum_time.html, SHOTS app software from www.immunizationed.org, and/or internet access to CDC's website www.cdc.gov/vaccines. Review the objectives briefly, focusing on the primary objectives.
3. The students or residents are to start the first scenario by having one member of each small group read the scenario aloud. Subsequently, each small group should work on answering the questions for that scenario. To answer the questions, the learners should use their previous knowledge and experience, the resource materials/internet, and the abstracts included in selected scenarios. They should divide the resource materials since each individual may not have time to read all of the materials.
4. Convene as a large group after 5 to 10 minutes, depending upon the complexity of the scenario. Select one group to present their answers to the questions. Critique answers and discuss the teaching points for 5 to 7 minutes.
5. Repeat steps 3 and 4 for the remaining scenarios that have been selected.

*Centers for Disease Control and Prevention. Influenza In: Epidemiology and Prevention of Vaccine-Preventable Diseases. Atkinson W, Wolfe S, Hamborsky J, eds. 12th ed. Washington DC: Public Health Foundation, 2011.

ABBREVIATIONS**Diagnostic Tests**

PCR: Polymerase Chain Reaction

Vaccines

TIV: Trivalent inactivated influenza vaccine (TIV) for intramuscular (IM) use

LAIV: Live, attenuated influenza vaccine (LAIV)

H-D TIV: High-dose trivalent inactivated influenza vaccine

TIV ID: Trivalent inactivated influenza vaccine for intradermal (ID) use

Objectives

At the end of this session, every learner should be able to accomplish the following core set of objectives:

Primary Objectives:

1. Evaluate a given patient who has symptoms and identify possible diagnoses.
2. Explain the general epidemiology of seasonal influenza, including the risk of contracting disease in confined environments, e.g., nursing homes and complications.
3. Given a patient scenario, recommend influenza vaccination appropriately, according to guidelines and at different types of health care encounters (e.g., hospital discharge).
4. Describe influenza vaccines, vaccine safety, and adverse events.
5. Given an office setting, (a) describe the process of choosing a target patient group and a goal, i.e., vaccination rate, for influenza vaccination; (b) devise office procedures to improve provider ability to recommend influenza vaccination, if indicated; and (c) select office procedures to improve patient compliance, given that patients may not routinely visit their physician during the ideal time period.

Secondary Objectives:

1. Recall the appropriate laboratory test(s) and note when indicated.
2. Given a patient scenario, appropriately recommend antiviral agents, both as therapy and as a preventive measure (including precautions).
3. State the recommended time of year for vaccination, and the vaccine(s) that can be used (e.g., groups for TIV, H-D TIV, TIV ID, and LAIV), and state the need for two doses for children <9 years old in the initial year that the child was vaccinated.
4. Given a patient scenario, identify valid contraindications to vaccination.
5. Explain common misconceptions about contraindications.

SCENARIO ONE

Mr. Smith, a 55-year-old, presents to the Emergency Department with cough productive of yellow sputum, pleuritic chest pain, generalized myalgia, chills, and fever. His symptoms started 6 days ago with pharyngitis, cough, myalgia, and fever, at which time his primary care physician diagnosed influenza; influenza was occurring in the community. Subsequently, his symptoms improved. However, yesterday his symptoms worsened and the cough became productive. His vaccination record reveals that he received adult tetanus and diphtheria toxoids (Td) five years ago. He has diabetes mellitus with renal insufficiency. Vital signs today disclosed a temperature of 39.2°C (102.6°F) and respirations of 30 per minute. He has labored respirations and rales in the left lower lung field. Pulse oxymetry results reveal hypoxemia.

Learning Aids

1. Photo of chest x-ray on following page
2. Photo of sputum Gram stain on following page
3. Pink Book chapter on influenza
www.cdc.gov/vaccines/pubs/pinkbook/pink-chapters.htm
AND/OR
4. Shortened slide set from Pink Book at
http://www.aptrweb.org/resources/curriculum_time.html
AND/OR
5. www.cdc.gov/flu/professionals/ - section “Info for Health Professionals”
AND/OR
6. Shots Immunization Application for mobile devices and PCs from
www.immunizationed.org/shotsonline.aspx

Questions

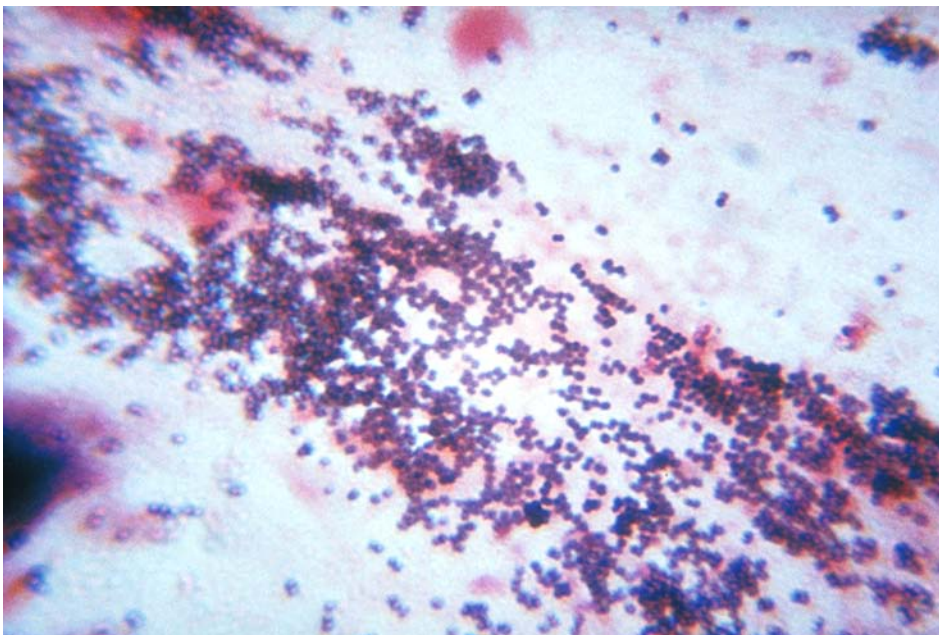
1. What is the differential diagnosis for his chief complaint?
2. In general, what treatment is needed and where should it be administered?
3. Was the diagnosis of influenza appropriate?
4. Before becoming ill, did Mr. Smith have an indication for influenza vaccine? If so, which formulation and what time of year should the vaccine be administered?

Photo of chest x-ray



Source: CDC Public Health Image Library (PHIL)

Photo of sputum Gram stain



Source: CDC Public Health Image Library (PHIL)

SCENARIO TWO

Jonathan, a 5-year-old with asthma, has a cough, fever, and clear rhinorrhea. He attends kindergarten. Two days after Jonathan's illness started, his 31-year-old father acquired symptoms of cough, fever, generalized myalgia, sore throat, and headache. Jonathan's 70-year-old grandmother, who takes care of him twice per week, now has a cough and fever, 3 days after taking care of him. His grandmother had an uneventful cholecystectomy 1 month ago (December) and is being seen by her physician every 3 months for hypertension.

Learning Aids

1. Table 1 on following page
2. Abstract on Influenza Diagnostic Testing and Treatment on following pages
3. Pink Book chapter on influenza

www.cdc.gov/vaccines/pubs/pinkbook/pink-chapters.htm

AND/OR

4. Shortened slide set from Pink Book at

http://www.aptrweb.org/resources/curriculum_time.html

AND/OR

5. www.cdc.gov/flu/professionals/ - section "Info for Health Professionals"

AND/OR

6. Shots Immunization Application for mobile devices and PCs from

www.immunizationed.org/shotsonline.aspx

Questions

1. Other than time course and proximity, what evidence supports that their diseases are related?
2. What tests are available commonly and when should they be used?
3. Were these cases preventable?
4. Where was influenza most likely to have been contracted initially?
5. Jonathan's grandmother is being seen by her primary care physician one day after her cough started. Should any treatment be given?

Table 1 Age-specific symptom constellations in addition to fever for culture-proven influenza in hospitalized persons.

Major Symptom Constellations	0-4 years old	5-19 years old	20-49 years old	60-80 years old
Cough	35%	22%	18%	55%
Cough, aches, headache			19%	6%
Cough, aches, headache, sore throat			25%	2%
Cough, headache		30%	14%	30%
Cough, rhinorrhea	19%			
Croup	24%	22%		
Vomiting, diarrhea	5%			
No symptoms of influenza: positive culture was incidental	11%	4%		

Table adapted from Bennett NMck: Diagnosis of Influenza. *Medical Journal of Australia Special Supplement* 1973; 1:19-22.

Abstract

Influenza Diagnostic Testing

Diagnostic testing should be considered when an institutional outbreak of influenza is suspected or if test results would influence clinical decision making. Once influenza activity has been documented in the community, a clinical diagnosis can be made for outpatients with signs and symptoms consistent with influenza, especially during peak influenza activity. When there is influenza in the community, testing is recommended for inpatients who have signs and symptoms of influenza.

A variety of tests are available to diagnose influenza. Rapid diagnostic tests have been used because they can yield results in a clinically relevant time frame, i.e., approximately 30 minutes. Most of the rapid influenza tests are approximately 50 to 70% sensitive for detecting influenza and approximately >90% specific compared with virus culture. Reverse-transcriptase polymerase chain reaction (RT-PCR) testing for influenza viruses is highly sensitive and specific. This test provides higher sensitivity and quicker results (i.e., 24 hours) than viral culture. Historically, viral culture was the standard.

Treatment

When started within the first two days of symptoms, an influenza antiviral medication can reduce illness severity and shorten duration of illness. Data suggest that influenza antiviral medications may also prevent serious influenza-related complications (e.g., pneumonia or exacerbation of chronic diseases).

Influenza antiviral medications should be started as soon as possible after symptom onset (i.e. within 48 hours) and should be selected based on current resistance patterns.

- Oseltamivir is approved for treatment of people 1 year of age and older for influenza types A and B.
- Zanamivir is approved for treatment of people 7 years of age and older for influenza types A and B.
- The recommended duration of treatment is 5 days.
- Rimantadine is approved for treatment of influenza type A in people > 1 year of age.
- Amantadine is approved for treatment of influenza type A in people > 1 year of age

Resistance patterns vary by year and strain; contact public health authorities for the latest patterns.

Adapted from information from the Centers for Disease Control and Prevention
<http://www.cdc.gov/flu/professionals/>

SCENARIO THREE

Last winter, Poneyville experienced an influenza epidemic with increased pneumonia hospitalizations and deaths in comparison to levels seen in previous winters. Dr. Ford, a primary care physician at Poneyville Health Center, was assigned the hospital duties for his practice. One of the practice's faithful patients died after being admitted for Staphylococcal pneumonia following influenza and two others were hospitalized with complications of laboratory confirmed influenza. Because Dr. Ford wished to prevent influenza from occurring in other patients in the practice, he requested that a record review of influenza vaccination rates be conducted.

Learning Aids

1. Figure 1: Graph of record review on following page
2. Abstracts and Figure 2 on following pages
3. Pink Book chapter on influenza

www.cdc.gov/vaccines/pubs/pinkbook/pink-chapters.htm

AND/OR

4. Shortened slide set from Pink Book at

http://www.aptrweb.org/resources/curriculum_time.html

AND/OR

5. www.cdc.gov/flu/professionals/ - section "Info for Health Professionals"

AND/OR

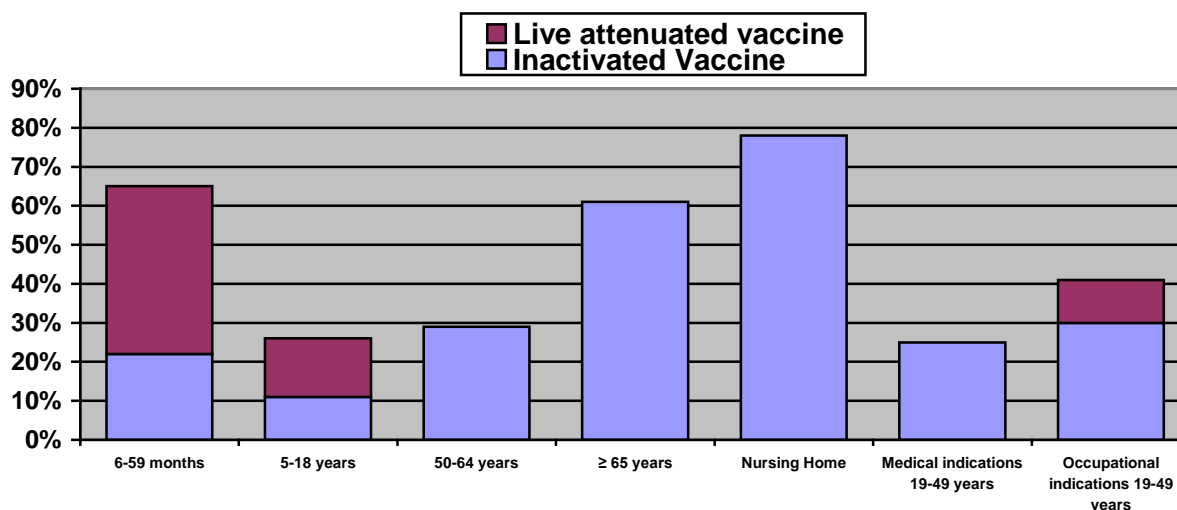
6. *Shots* Immunization Application for mobile devices and PCs from

www.immunizationed.org/shotsonline.aspx and information on standing orders at www.immunizationed.org/standingorders.

Questions

1. Was the record review important? How good are the influenza vaccination rates in the practice?
2. Why are the vaccination rates suboptimal?
3. What can be done to improve influenza vaccination rates, given that this is a busy practice with several different providers?

Figure 1: Influenza Vaccination Rates by Patient Group at Poneyville Health Center



Abstracts

Ten-year durability and success of an organized program to increase influenza and pneumococcal vaccination rates among high-risk adults.

Nichol KL. Am J Med. 1998 Nov;105(5):385-92.

Methods: We performed a 10-year time-series study to examine the durability and success of an ongoing, multifaceted, institution-wide influenza and pneumococcal vaccination program. Specific elements include an annual mailing to patients, standing orders for nurses, walk-in clinics, and the use of standardized, preprinted documentation forms. Initially the program targeted high-risk outpatients for influenza vaccination. It was extended to include inpatients. Vaccination rates are estimated each year from surveys mailed to randomly selected patients, and vaccine utilization is monitored through pharmacy logs.

Results: Influenza vaccination rates for all high-risk patients followed up at the medical center have increased from 58% following the 1987-88 vaccination season to 84% in 1996-97 ($P < 0.001$). Pneumococcal vaccination rates have also increased from 34% in 1994-95 to 63% in 1996-97 ($P < 0.001$).

A target-based model for increasing influenza immunizations in private practice.

Buffington J, Bell KM, LaForce FM, and the Genesee Hospital Medical Staff.
 J Gen Intern Med. 1991;6:204-209.

Objective: To measure the impact of a population-based tracking system on influenza immunization rates.

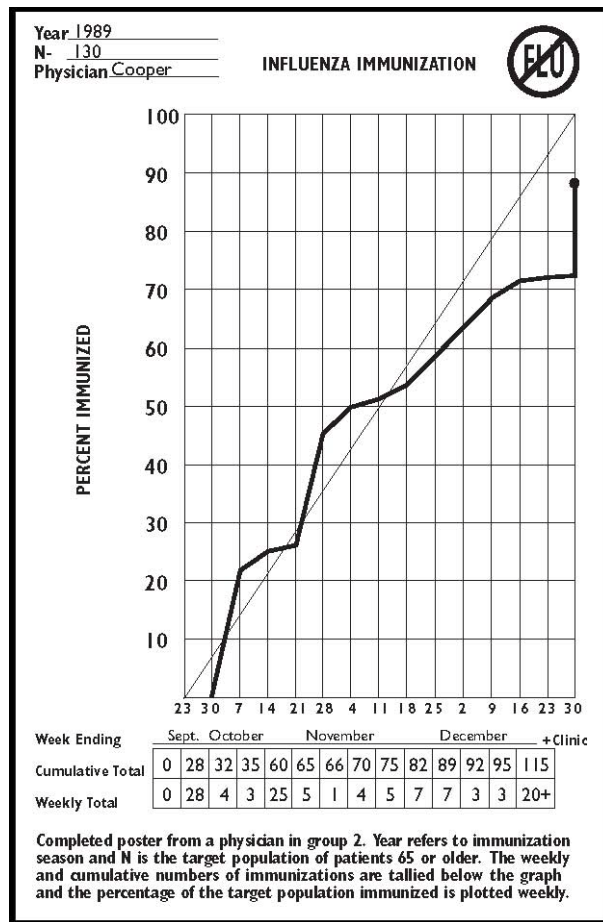
Design: 13 practices with 45 physicians were randomized to a control and 2 intervention groups.

Intervention: In both intervention groups, influenza immunization rates for physicians were recorded weekly as cumulative percentages of their target populations, using a specially prepared poster (see Figure 2). In addition, postcard reminders were sent to all the patients in one of the intervention groups.

Measurements and main results:

Immunization rates in the two intervention groups were 30% higher than in the control group; the control group immunized 50% of its target population, while the poster and poster/postcard groups immunized 66% and 67%, respectively.

Figure 2: Poster of Influenza Immunization Rates



SCENARIO FOUR

Mrs. Gaither, a 68-year-old, is in your office because her husband was hospitalized yesterday for complications of influenza (an outbreak of H3N2 is occurring in the community). Mrs. Gaither has chronic renal disease and has not received any vaccinations this year. She recalls a friend who had "a bad case of flu" following influenza vaccination. She has a history of a severe hypersensitivity reaction following exposure to duck feathers, but she does eat eggs. Currently, she has allergic rhinitis. Her mother has a history of clonic-tonic (grand mal) convulsions.

Learning Aids

Table 2 and Figure 3 on following pages

Supplemental Learning Aids

1. Pink Book chapter on influenza
www.cdc.gov/vaccines/pubs/pinkbook/pink-chapters.htm
AND/OR
2. Shortened slide set from Pink Book at
http://www.aptrweb.org/resources/curriculum_time.html
AND/OR
3. www.cdc.gov/flu/professionals/ - section "Info for Health Professionals"
AND/OR
4. Shots Immunization Application for mobile devices and PCs from
www.immunizationed.org/shotsonline.aspx

Questions

1. What treatment should Mrs. Gaither receive?
2. Can trivalent inactivated influenza vaccine (TIV) cause "flu"?
3. Given that she has an allergy to duck feathers, should she receive TIV?
4. What are the chief side effects of antiviral drugs that are used for influenza?
5. Which groups of patients have the highest influenza hospitalization rates?

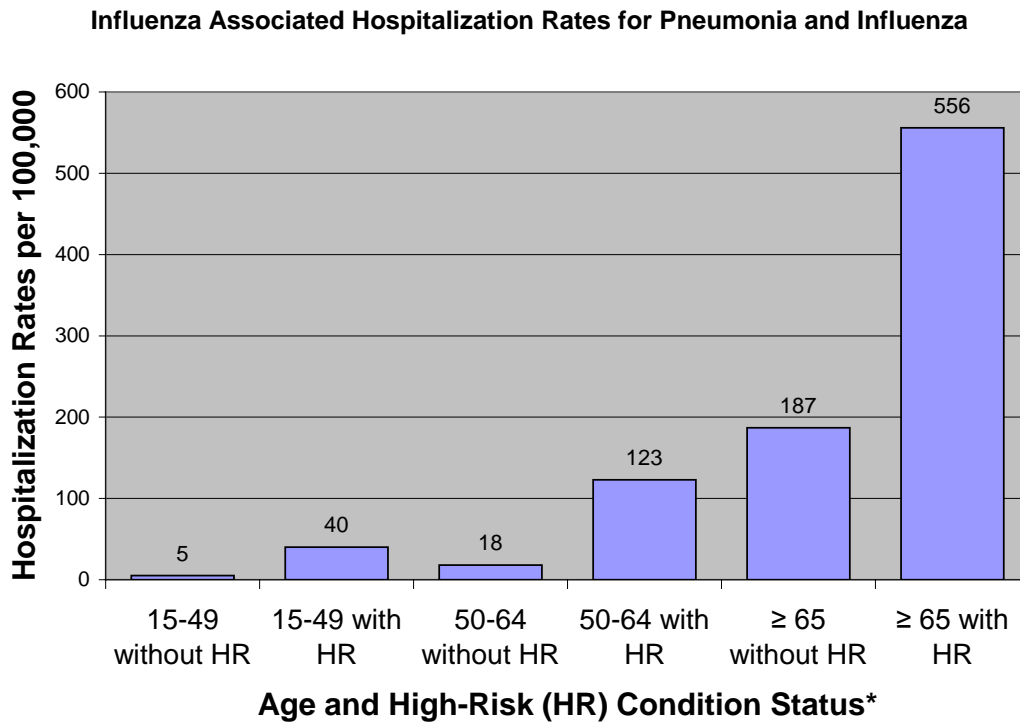
Table 2 Inactivated Influenza Vaccine Post-injection Symptoms

Symptom	Vaccine %	Placebo %	p-value
Fever	6	4	NS*
Cough	7	5	NS
Coryza	13	10	NS
Fatigue	8	8	NS
Malaise	7	6	NS
Myalgia	5	4	NS
Headache	7	8	NS
Nausea	5	2	NS
Any symptom	28	23	NS
Sore arm	20	5	<.001
Disability	3	4	NS

* not significant

Modified from Margois KL, Nichol KL, Poland GA, Pluhar RE et al: Frequency of adverse reactions to influenza vaccine in the elderly: a randomized placebo-controlled trial. *JAMA* 1990;264(9):1140.

Figure 3



Modified from Mullooly JP, Bridges CB, Thompson WW, et al. Influenza- and RSV-associated hospitalizations among adults. *Vaccine* 2007; 25:846-855.

*Examples of high-risk conditions are rheumatic heart disease, ischemic heart disease, asthma, emphysema, nephritis, diabetes mellitus, and malignancies.

SCENARIO FIVE

Rufus Cook, an otherwise healthy 35-year old, developed a cough, myalgia, and fever yesterday. His physician, Dr. A.M. Bradley, diagnosed influenza this morning. Influenza type A is in the community. This afternoon, Dr. Bradley received a fax from Mr. Cook's employer, Crestview Care Center, a nursing home. After reading the fax, Dr. Bradley called Crestview Care Center and found that five residents had developed symptoms consistent with influenza.

Learning Aids

1. Fax from Crestview Care Center on following page
2. Abstract on following pages
3. Pink Book chapter on influenza
www.cdc.gov/vaccines/pubs/pinkbook/pink-chapters.htm
AND/OR
4. Shortened slide set from Pink Book at
http://www.aptrweb.org/resources/curriculum_time.html
AND/OR
4. www.cdc.gov/flu/professionals/ - section "Info for Health Professionals"
AND/OR
5. Shots Immunization Application for mobile devices and PCs from
www.immunizationed.org/shotsonline.aspx

Questions

1. What can be done for Mr. Cook? When can he return to work?
2. What should be done for the nursing home residents and other employees with whom Mr. Cook was working?
3. Could this episode have been prevented?

Crestview Care Center

512 Sherwood Road
Poneyville, PA 15010
Telephone: (412) 032-7665
Fax: (412) 032-7664

December 8

A.M. Bradley, M.D.
1313 Mockingbird Lane
Poneyville, PA 15010

Dear Dr. Bradley:

We have been informed that Rufus Cook, one of the nurse's aides employed at Crestview Care Center, has been treated for influenza. As you know, Crestview has a number of chronically ill residents. Is Mr. Cook's illness contagious? Does it represent a health concern for any of our residents? What should we do about it? We appreciate your assistance and await your reply.

Sincerely,

Jill Herrick
Administrator

Crestview Care Center – where caring is our way of life.

Abstract**Effects of influenza vaccination of health-care workers on mortality of elderly people in long-term care: a randomised controlled trial.**

Carman WF, Elder AG, Wallace LA, McAulay K, Walker A, Murray GD, Stott DJ.

Methods: In a parallel-group study, healthcare workers in 20 long-term elderly-care facilities were randomly offered or not offered influenza vaccine. All winter deaths among patients were recorded over 6 months. On a random sample of 50% of patients, swabs for influenza culture and PCR were obtained every 2 weeks during the epidemic period.

Findings: Influenza vaccine uptake in healthcare workers was 50.9% in facilities in which they were routinely offered vaccine, compared with 4.9% in those in which they were not offered vaccine. The uncorrected rate of mortality in patients was 13.6% in vaccine facilities compared with 22.4% in no-vaccine facilities (odds ratio 0.58 [95% CI 0.40-0.84], $p=0.014$). At necropsy, PCR was positive in none of 17 patients from vaccine facilities and six (20%) of 30 from no-vaccine facilities ($p=0.055$).

Interpretation: Vaccination of health-care workers was associated with a substantial decrease in mortality among patients.

Abstracted from: Lancet. 2000 Jan 8;355(9198):93-7.

SCENARIO SIX

Scott is a 2½-year-old with chronic lung disease caused by premature birth and his healthy 4-year-old sister, Isabelle, are in the office today (November) for well-child care visits. Their father has congenital IgA deficiency but is otherwise healthy. Their mother is healthy. None of the family has had influenza vaccine previously except for the 66-year-old grandfather who lives with the family.

Learning Aids

1. Pink Book chapter on influenza
www.cdc.gov/vaccines/pubs/pinkbook/pink-chapters.htm
AND/OR
2. Shortened slide set from Pink Book at
http://www.aptrweb.org/resources/curriculum_time.html
AND/OR
3. www.cdc.gov/flu/professionals/ - section “Info for Health Professionals”
AND/OR
4. Shots Immunization Application for mobile devices and PCs from
www.immunizationed.org/shotsonline.aspx

Questions

1. Is influenza vaccine recommended for any family members?
2. Given that Scott and Isabelle have never received influenza vaccine, if they were to be vaccinated, how many doses would be needed? What type of vaccine can each receive?
3. Can influenza vaccine be administered simultaneously with other vaccines?