Timing of Influenza Vaccination Webinar

October 11, 2019

Dial-in to join audio: 1-888-455-1003
Passcode: 3780355#

Moderator

Litjen (LJ) Tan, MS, PhD
Chief Strategy Officer at the Immunization Action Coalition and co-chair and co-founder of the National Adult and Influenza Immunization Summit
Dr. Tan received his master of science degree in biology at New York University and earned his doctorate of philosophy in microbiology/immunology from Northwestern University Feinberg School of Medicine in Chicago. Dr. Tan’s current appointments include serving as a special consultant for the European Union Influenza Summit and the Asia-Pacific Influenza Summit, and serving as a member of the Advisory Board of the National Vaccine Advisory Committee. From 2008 to 2013 he was a voting member of the National Vaccine Advisory Committee from 2008 to 2013 and a liaison member of the Advisory Committee for Immunization Practices, Centers for Disease Control and Prevention (CDC), from 2002 to 2012.

Agenda

· Introduction – Dr. L.J Tan, IAC and Amy Parker Fiebelkorn, CDC

  · CDC Review of data on waning effectiveness of influenza vaccine – Dr. Jill Ferdinands, CDC

  · CDC communications update on messaging regarding influenza vaccination timing – Douglas Jordan, CDC

· Implementation and communications issues perspectives from:

  · Pharmacist and pharmacy vaccination venues - Mitch Rothholz, American Pharmacists Association and Lincy Abraham, National Association of Chain Drug Stores

  · Occupational health vaccination clinic venues - Vicki Sowards, Passport Health

  · Long term care and assisted living settings - Dr. Stefan Gravenstein, representing AMDA

Jill Ferdinands, PhD
Research epidemiologist at the US Centers for Disease Control and Prevention’s Influenza Division. Her area of expertise is influenza vaccine effectiveness and she leads a team responsible for evaluating the effectiveness of seasonal influenza vaccine in preventing hospitalization among adults.

Other research interests and areas of subject matter expertise include epidemiologic methods research for evaluating influenza vaccine effectiveness and disease modeling.

Prior to joining the Influenza Division, Dr. Ferdinands was a Commander in the US Public Health Service, where she served as a research epidemiologist in the Division of Information Services focused on the Investigation of Asthma and other respiratory health conditions. She holds a doctoral degree in health policy from Harvard University.

CAPT Amy Parker Fiebelkorn, MSN, MPH
Senior epidemiologist in the Immunization Services Division and the Influenza Vaccine Response Program Deputy for the Vaccine Task Force at the Centers for Disease Control and Prevention. She is the CDC technical lead of several multi-million dollar cooperative agreements focused on improving adult immunizations. She is the lead of the Influenza Working Group for the National Adult and Influenza Immunization Summit and is a member of the US Public Health Service. Prior to joining the Immunization Services Division in 2015, she was a subject matter expert in measles, mumps, rubella, and whooping cough in CDC’s Division of Viral Diseases for 12 years. She joined CDC as an Epidemic Intelligence Service Officer in 2005. She obtained her master degrees in nursing and public health from Emory University.

Review of data and communications plans

· CDC Review of data on waning effectiveness of influenza vaccine:

  · Dr. Jill Ferdinands, CDC

· CDC communications update on messaging regarding influenza vaccination timing:

  · Douglas Jordan, CDC
Waning of influenza vaccine protection: Exploring the trade-offs of changes in vaccination timing among older adults

Jill Ferdinands, PhD
October 11, 2019

Influenza epidemics vary in timing of arrival, peak, and duration

ACIP recommends annual vaccination for everyone ≥6 months of age

6/10 children are vaccinated
2/3 older adults are vaccinated
Vaccination should be offered by the end of October.

Children who require 2 doses should receive their first dose as soon as possible after vaccine becomes available to allow the second dose to be received by the end of October.

For those requiring 1 dose, early vaccination (i.e., in July and August) is likely to be associated with suboptimal immunity before the end of the influenza season, particularly among older adults.

Note: ACIP recommendations do not suggest withholding vaccination in September.

We modeled the impact of changes in vaccine timing

- Started with what actually happened in a “typical” season: 2012-13
  - Influenza A(H3N2) epidemic peaked in late January
  - 66% of Americans aged 65+ got vaccinated
  - Vaccine effectiveness was 26% in the 65+ yo
  - Vaccination prevented 65,000 hospitalizations in 65+ yo
  - Simulated what would have happened – in terms of hospitalizations prevented – if we changed vaccination timing and allowed vaccine effectiveness to decline with time since vaccination

Alternative vaccine timing scenarios

#1 Delayed vaccination
- All flu vaccination delayed until October 1
  - Some people who would have been vaccinated in August or September got vaccinated in October and the remaining didn’t get vaccinated at all

#2 Early vaccination
- Vaccination shifted earlier (more vaccination in August and September, less in October and November, with overall coverage achieved the same at 66%)
  - Assumed 7% decline in VE per month after vaccination
    - (11% in sensitivity analysis)
Influenza Vaccine coverage

Late season VE

With no loss of deferred vaccinees, delay prevented 2000 hospitalizations.

With 50% loss of deferred vaccinees, delay led to 5200 more hospitalizations.

Delayed vaccination was beneficial if no more than 14% of deferred vaccinees failed to get vaccinated.

If the season came a month EARLIER, delayed vaccination was never beneficial.
If the season came a month later, delayed vaccination was beneficial if no more than 27% of deferred vaccinees failed to get vaccinated.

Assuming historic average timing of US flu seasons, delayed vaccination was beneficial if no more than 11% of deferred vaccinees failed to get vaccinated.

Results varied substantially with rate of waning

<table>
<thead>
<tr>
<th>Delay was beneficial if no more than ... % ... of deferred vaccinees were lost</th>
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<tbody>
<tr>
<td>Early season</td>
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<tr>
<td>Typical season</td>
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<tr>
<td>Late season</td>
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<tr>
<td>Historic average</td>
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<tr>
<td>7% waning per month(^a)</td>
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<tr>
<td>[Never beneficial]</td>
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<tr>
<td>14%</td>
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<tr>
<td>27%</td>
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<td>11%</td>
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\(^a\) derived from Ferdinands et al (Clin Infect Dis 2017;64(5):544-50

Results varied substantially with assumed VE

On average, with higher VE of 50% (average across the season), delayed vaccination was beneficial if no more than 4% of vaccinees failed to get vaccinated.

Scenario #2

Earlier vaccination

Shifting more vaccination into August and September could be beneficial for early seasons, but on average, it prevented fewer hospitalizations than current vaccination timing.
Challenges and limitations

- Rate of waning of VE remains uncertain
  - Number of studies demonstrating waning of VE is growing but much remains unknown about the rate and pattern
  - An observed decline in VE may be related to how VE is measured and not necessarily to declining biologic immunity
  - The role of antigenic drift in observed waning is hard to measure
  - Measures of post-vaccination antibody levels aren’t particularly helpful
- Number of older adults who would forgo vaccination if recommended to delay is unknown
- Results could differ for other age groups

Conclusions from Ferdinands et al 2019

- Rate of waning is uncertain and overall VE differs season-to-season and by flu type, making it hard to predict best overall balance of vaccination timing
- Need to better understand patterns of waning and vaccine deferral behavior before considering changes to current US seasonal influenza vaccine recommendations
- However, it may be prudent to prevent a substantial shift toward early vaccine uptake

Discussion: Emerging questions

From a practical perspective, how do we deal with this waning?

Give a second dose of vaccine?

Give a different vaccine – adjuvanted or high dose – hoping they wane less?
Do we risk a loss of confidence in the vaccination program overall given wishy-washiness of the language and change from long-standing “never miss an opportunity to vaccinate” message?

Acknowledgments

- Alicia Fry, Carrie Reed, Elif Alyanak, Ivo Foppa, Jerry Tokars, Caroline Bridges, Sam Graitcer, Lisa Grohskopf
- Graphics courtesy of
  - Nirja Desai of Science Magazine
  - Andriwidodo, Maxim Kulikov, Melvin Salas, Symbolon IT, RocketDiction, and Adrien Coquet from the Noun Project under Creative Commons license

Supplemental slides

From Hewell 2018

Early Bird Gets the Flu, What Should Be Done About Waning Immunity Against Seasonal Influenza?

Use of 2-dose vaccines. A second possible change is to introduce a biannual vaccine schedule for susceptible populations. If VE is diminished after 3–5 months, a booster dose may confer supplemental protection for the remainder of the season, particularly for those vaccinated in August or September.

The time is now to acknowledge the evidence that points to loss of immunity in individuals who receive the vaccine early in the season... and make the appropriate changes to better protect individuals and populations.
Recent literature on waning VE and vaccine policy implications

Papers reporting empirical evidence of waning VE:

- Young K et al. Influenza vaccine effectiveness in older adults: a health state transition (Markov) model that simulated movement of a cohort of individuals through a season using 20 semi-annual cycles. Vaccine. Sep 2019 [Epub ahead of print]

Papers analytically evaluating optimal influenza vaccine schedule:


Model methods

- Health state transition (Markov) model that simulated movement of a cohort of individuals through a season using 20 semi-monthly cycles for the 10 month period from July to April
- Individuals could get vaccinated or not, get flu or not, get hospitalized from flu or not, based on probabilities derived from empirical data
- Vaccine effectiveness declined with time since vaccination according to the pattern seen in US Flu VE Network (Ferdinands et al 2017): VE = 30.85 - 1.37*biweeks + 0.18*biweeks^2 - 0.03*biweeks^3

Douglas Jordan, BBA, MA

Health communications specialist in CDC’s Influenza Division. Mr. Jordan leads the IVA webinars, the Repeer Briefs of Changes in Vaccination Timing among Older Adults (No. MMWR 2017;66:1666-1670)

Centers for Disease Control and Prevention

Timing of Flu Vaccination 2019-2020 Season

Doug Jordan
Health Communications Specialist
Influenza Division
Centers for Disease Control and Prevention
**Vaccine Timing Language Over Time**

<table>
<thead>
<tr>
<th>Year</th>
<th>Language</th>
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<tr>
<td>2013-2014</td>
<td>&quot;Providers should offer vaccination as soon as vaccine is available.&quot;</td>
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<tr>
<td>2013-2014</td>
<td>&quot;Providers should begin offering vaccination soon after vaccine becomes available and, if possible, by October.&quot;</td>
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<tr>
<td>2013-2016</td>
<td>&quot;Health care providers should offer vaccination by October, if possible.&quot;</td>
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<td>2015-2016</td>
<td>&quot;Although vaccination by the end of October is recommended, vaccine administration in December or later, even if influenza activity has already begun, is likely to be beneficial in the majority of influenza seasons.&quot;</td>
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<td>2016-2017</td>
<td>&quot;Flu viruses are circulating at X levels nationally though activity varies by location. CDC recommends vaccination continue as long as influenza viruses are circulating. Though the timing of flu season varies, significant flu activity can last as late as May.&quot;</td>
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<tr>
<td>2017-2018</td>
<td>&quot;Although vaccination by the end of October is recommended, vaccine administration in December or later, might be beneficial in the majority of influenza seasons.&quot;</td>
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<td>2018-2019</td>
<td>&quot;It’s not too late to get vaccinated. CDC recommends vaccination continue as long as influenza viruses are circulating. Though the timing of flu season varies, significant flu activity can last as late as May.&quot;</td>
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<tr>
<td>2019-2020</td>
<td>&quot;Balancing considerations regarding the unpredictability of timing of onset of the influenza season and concerns that vaccine-induced immunity might wane over the course of a season, it is recommended that vaccination should be offered by the end of October.&quot;</td>
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**ACIP Recommendation, 2019-20**

"Balancing considerations regarding the unpredictability of timing of onset of the influenza season and concerns that vaccine-induced immunity might wane over the course of a season, it is recommended that vaccination should be offered by the end of October.

Children aged 6 months through 8 years who require 2 doses (see Children Aged 6 Months Through 8 Years) should receive their first dose as soon as possible after the vaccine becomes available to allow the second dose (which must be administered at least 4 weeks later) to be received by the end of October.

- For those requiring only 1 dose for the season, early vaccination (i.e., in July and August) is likely to be associated with suboptimal immunity before the end of the influenza season, particularly among older adults.
- Although vaccination by the end of October is recommended, vaccine administered in December or later, even if influenza activity has already begun, might be beneficial in the majority of influenza seasons."

**Vaccine Timing Messaging Throughout Flu Season**

- **July-August:**
  - "It might be too soon to get vaccinated, particularly if you are an adult 65 years of age or older. For a child needing two doses of vaccine, July-August administration of the first dose is ok. CDC recommends flu vaccination by the end of October."`
- **Beginning in September:**
  - CDC recommends flu vaccination by the end of October. While it’s fine to get vaccinated in September, keep four things in mind:
  1. Current flu levels are (low/rising/high).
  2. It takes about two weeks after vaccination for protective antibodies to develop;
  3. Immunity from vaccination wanes over time; and,
  4. Flu activity most often peaks in February and can last as late as May.
- **October:**
  - "Get vaccinated by the end of October."
- **Beginning in November:**
  - "CDC recommends vaccination continue as long as influenza viruses are circulating. Though the timing of flu season varies, significant flu activity can last as late as May."

**Vaccine Timing Messaging Throughout Flu Season**

- **Early December through February:**
  - (Somewhat dependent on activity)
  - "It’s not too late to get vaccinated. CDC recommends vaccination continue as long as influenza viruses are circulating. Though the timing of flu season varies, flu season most often peaks in December and February, but significant flu activity can last as late as May."
- **March-May:**
  - Flu viruses are circulating at X levels nationally though activity varies by location. CDC recommends vaccination continue as long as influenza viruses are circulating. Check FluView Interactive for more information about flu activity in your state.
- **Starting in June:**
  - "Most flu vaccines expire by the end of June. If you haven’t gotten vaccinated and plan a trip to the Southern Hemisphere, where their flu season is just beginning, or plan to travel in a relatively crowded setting where people from many parts of the country might be in close proximity, e.g., a cruise, get a flu vaccine at least two weeks before traveling. Vaccine for the upcoming season will be available next fall."
NAIIS influenza vaccination timing
Pharmacist / Pharmacy Perspective
October 11, 2019

Speaker: Mitchel C. Rothholz, RPh, MBA
Chief Strategy Officer
American Pharmacists Association

Recommended that vaccination should be offered by the end of October.

Children aged 6 months through 8 years who require 2 doses should receive first dose as soon as possible to allow the second dose to be received by the end of October.

Community vaccination programs should balance maximizing likelihood of persistence of vaccine-induced protection through the season with avoiding missed opportunities to vaccinate or vaccinating after onset of influenza circulation occurs.

Efforts should be structured to optimize vaccination coverage before influenza activity in the community begins.

Providers should offer influenza vaccine routinely, and organized vaccination campaigns should continue throughout the influenza season, including after influenza activity has begun in the community.

Vaccine administered in December or later, even if influenza activity has already begun, might be beneficial in the majority of influenza seasons.

https://www.cdc.gov/mmwr/volumes/68/rr/rr6803a1.htm?s_cid=rr6803a1_w

Things to Consider...

Pharmacists are no different than any other providers

- Challenged with understanding the data and how to communicate it effectively to the public
- Communication between medical and immunization neighborhood
  - Has the practice communicated to their patients their preference for timing?
  - Are providers sharing the data and decision-making?
  - Is everyone reporting to and accessing IIS?

Providers are concerned about being left with excess vaccine

Challenges with extending the season

- Impact of holidays
- Education and messaging of providers and the public
- Conducting influenza vaccinations post January...

Lincy Abraham, PharmD
Pharmacy Care Manager at the National Association of Chain Drug Stores (NACDS) in Arlington, VA.

She received her Doctor of Pharmacy degree from the University of Maryland Eastern Shore School of Pharmacy in 2018 and completed a post graduate Executive Fellowship in Association Management at NACDS. Lincy is currently a licensed pharmacist in the state of Maryland. She previously interned with Walgreens Pharmacy, having gained experience at both the store and district level, and was previously a pharmacy technician at CVS Pharmacy.
Current Pharmacy Vaccination Landscape

- 91% of Americans live within 5 miles of a pharmacy
- Accessibility and convenience
  - 2013 national community pharmacy study reported that within one year:
    - 6,250,402 vaccinations administered by pharmacists
    - 30.5% provided during off-clinic hours
    - 17.4% on weekends
    - 10.2% on evenings
    - 2.9% on holidays
- Adults who reported receiving a flu vaccine from the pharmacy or store:
  - 2014 ~22.2%
  - 2018 ~32.2%

Considerations for Timing and Implementation

- Influenza Season Planning and Implementation Timeline
  - Workflow efficiency to best serve the public
  - Promoting vaccinations to educate and create awareness for patients
  - Communication and consistency across providers and the public

Final Thoughts

"Community vaccination programs should balance maximizing likelihood of persistence of vaccine-induced protection through the season with avoiding missed opportunities to vaccinate or vaccinating after onset of influenza circulation."

- Pharmacists stand ready to help fill gaps in vaccination uptake and improve public and population health through consistent communication and education for patients on the importance of receiving vaccines.
- Community pharmacies will continue to place quality patient care at the forefront as they prepare for the influenza season.

Victoria Sowards, BSN, RN
Director of Clinical Resources at Passport Health. She has been with Passport Health since 2013. She brought hospital and out-patient experiences with her to the role as Director of Clinical Resources. She educates the nurses who provide services for on-site corporate flu and vaccination events throughout the US. Vicki has a role in educating the employer about the choices in vaccination to keep the employees healthy and on the job. Vicki values the vision of Passport Health to "empower every person that we touch by providing premier education.

Vicki is currently pursuing a Master’s in Health Innovation through Arizona State University.

Stefan Gravenstein, MD, MPH, MA
Dr. Gravenstein is an academic geriatrician, Professor of Health Services, Policy and Practice, and Professor of Medicine at Brown’s schools of medicine and public health. Dr. Gravenstein has a long standing interest in immunity, inflammation and aging especially in the context of vaccines and the long term care setting.

Discussion
Thank you!

Slides and recording will be posted on www.izsummitpartners.org