Flu Vaccine: Myths and Facts

“It’s more dangerous to get the flu vaccine than to get the flu”
- ~236,000 people in the US are hospitalized or die from the flu each year.
- Only ~200 people in the US have a life-threatening reaction to the flu vaccine each year.
- Your risk of developing Guillain-Barre syndrome is higher after having the flu than after getting the flu vaccine.
- 79,000 hospitalizations every year are avoided because of the flu vaccine.

“If I don’t get vaccinated, the only person I am hurting is myself”
- Each person who gets the flu infects 1-2 other people.
- People infected by you may become hospitalized or even die from the flu.
- People infected by you will pay an average of $115 for medical care.

“It’s just the flu. What’s the big deal?”
- ~36,000 people die every year from the flu.
- ~200,000 people are hospitalized with the flu each year.
- Native Americans are 4 times more likely to die from the flu than other races.
- $10.6 billion dollars are spent annually to treat the flu.

“It’s expensive”
- All health insurance plans cover flu vaccines with no copay.
- Indian Health Services also offers free flu vaccines for eligible people.
- Treating the flu is much more expensive than preventing the flu.

“The flu shot will give me the flu”
- The flu shot cannot give you the flu because the flu vaccine does not contain live or infectious components of the flu virus.
- It takes 1-2 weeks for the vaccine to be effective at preventing the flu. The vaccine will not give you the flu, but you may get the flu before the vaccine can provide protection.

“I don’t like shots”
- A shot is not the only way to receive a flu vaccine.
- Ask for the FluMist® vaccine. FluMist® is a needle-free nasal spray for ages 2-49 that is as effective as traditional injected vaccines.

“I never get the flu”
- Your risk of contracting the flu is higher if you have not had the flu before.
- The average adult contracts the flu once every 5 years.
- An annual flu vaccination reduces your risk of getting the flu to about once every 23 years.

“If I get the flu, I will just stay at home so I don’t infect anyone else”
- You were probably spreading the flu virus before you even knew you were sick.
- People start to spread the flu at least one day before they first feel sick.
- Others in your household can spread the flu from you to other people.

“I got a flu shot last year, so I don’t need it again this year”
- You need to get a flu vaccine each year because flu types vary from year to year.
- The flu vaccine is designed for the types of flu that are expected to be spread for that year’s flu season.
- Protection provided by the flu vaccine does not last longer than a year.

“I avoid sick people, so I don’t need the flu vaccine”
- You can get the flu without going near a person with the flu.
- The flu virus can “hang” in the air for hours after an infected person coughs in that spot.
- The flu virus can survive on all sorts of surfaces for 2 to 3 days.
- People can spread the flu virus before they look or feel sick.

Continued on Page 2
“Only older people and babies need the flu vaccine”

✔ If you get the flu, you may spread the virus to people in high risk groups.
✔ Some of the people who get infected from you may be hospitalized or even die.
✔ 60% of people who are hospitalized with the flu are between 18 and 65 years old.

“There are unnatural ingredients in the flu vaccines that harmful to me”

✔ The flu vaccine and all of its ingredients are carefully evaluated and tested for safety and purity.
✔ Flu vaccine safety is monitored by the Centers for Disease Control and Prevention.
✔ Natural medicines and supplements are often unsafe and cause around 23,000 emergency room visits every year.

“I am busy and I can’t find the time”

✔ Flu vaccines are offered at most pharmacies and do not require a doctor visit.
✔ Most pharmacies do not require appointments for vaccinations.
✔ Lots of pharmacies are located in convenient places like grocery stores.

By Kyle Ann Spinner, PharmD Candidate

REFERENCES:

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Leishmaniasis is a parasitic disease transmitted by sand flies. It is rare in developed countries and is usually imported to the US by travelers and members of the military. Impavido™ (miltefosine) is the first FDA-approved drug to treat leishmaniasis. Miltefosine can be used to treat the three main types of leishmaniasis: visceral leishmaniasis (affects internal organs), cutaneous leishmaniasis (affects the skin) and mucosal leishmaniasis (affects the nose and throat). Miltefosine is intended for patients 12 years of age and older.

The mechanism of action of miltefosine against leishmania is unknown. Miltefosine is thought to interfere with lipids and inhibit of mitochondrial function, leading to cell death of the Leishmania parasite.

Miltefosine should not be used in patients with Sjögren-Larsson syndrome, due to their inability to metabolize miltefosine. Although miltefosine is pregnancy category D, it should not be used during pregnancy due to the potential for fetal harm. However, leishmaniasis may also result in poor fetal outcomes, so the risk/benefit of treatment with miltefosine should be considered for individual patients.

Due to the concerns with fetal harm during pregnancy, both male and female patients should use contraception during miltefosine therapy and for 5 months after therapy. Because vomiting and diarrhea are commonly reported with miltefosine, oral contraceptive may not be effective. Women on oral contraceptives should use additional or alternative forms of contraception if they experience vomiting and/or diarrhea with miltefosine. Miltefosine may affect fertility in both males and females, based on animal studies. Patients should be advised that the effects of miltefosine on human fertility have not been evaluated.

Common side effects seen with miltefosine include vomiting, diarrhea, headache, abdominal pain, and somnolence. Miltefosine can elevate hepatic enzymes and creatinine, so these should be monitored during and after therapy. Serious adverse reactions include Stevens-Johnson syndrome, hyperbilirubinemia (≥10 times the upper limit of normal), and thrombocytopenia. In addition to monitoring creatinine and hepatic enzymes, bilirubin and platelet counts should also be monitored regularly during miltefosine treatment.

Miltefosine treatment resulted in a 93.2% cure rate for visceral leishmaniasis in India. This open-label, non-controlled study included 1135 patients aged 2 to 65 years. Six months after the 28-day treatment, 81.9% of the study patients were still free of the parasite. Vomiting and diarrhea were the only reported adverse events and occurred most commonly in the first 2 weeks of treatment. While this study evaluated miltefosine in a large population, the results may not be generalizable to populations outside of India.

By David Hernandez Angeles, PharmD Candidate

REFERENCES:

Miltefosine Dosing:

<table>
<thead>
<tr>
<th>Type of Leishmaniasis:</th>
<th>Causative agent</th>
<th>Dose by weight (30 to 44 kg)</th>
<th>Dose by weight (45 kg or greater)</th>
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<tbody>
<tr>
<td>Cutaneous</td>
<td>Leishmania braziliensis, L. guyanensis, and L. panamensis</td>
<td>50 mg by mouth twice daily for 28 days</td>
<td>50 mg by mouth three times daily for 28 days</td>
</tr>
<tr>
<td>Mucosal</td>
<td>Leishmania braziliensis</td>
<td>50 mg by mouth twice daily for 28 days</td>
<td>50 mg by mouth thrice daily for 28 days</td>
</tr>
<tr>
<td>Visceral</td>
<td>Leishmania donovani</td>
<td>50 mg by mouth twice daily for 28 days</td>
<td>50 mg by mouth thrice daily for 28 days</td>
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</table>
Tresiba® (insulin degludec injection)

Tresiba® is a long-acting insulin approved for use in adults with type 1 or type 2 diabetes to improve glycemic control. Insulin degludec is a once-daily subcutaneous injection. Insulin degludec’s long duration of action (42 hours) allows for more flexibility in daily dosing. It is available both as a single agent and in combination with insulin aspart. 1,3

Nine randomized, open-label, treat-to-target trials with active controls were performed for the approval of this agent (3 trials in type 1 diabetes and 6 trials in type 2 diabetes). Insulin degludec was non-inferior to insulin glargine and insulin detemir in patients with either type 1 or type 2 diabetes. These trials also found that administration of insulin degludec at different times each day did not affect glycemic control. Rate of nocturnal confirmed hypoglycemia was lower with insulin degludec compared to insulin glargine. The most common adverse effects from these trials included hypoglycemia, nasopharyngitis, URTI, headache, diarrhea, and gastroenteritis.1,3-5

**Type 1: Begin/Flex 1 Trial:**

Insulin degludec (IDeg) was non-inferior to insulin glargine (IGlar) in type 1 diabetes in a 52-week non-inferiority trial. This trial included 493 patients randomized in a 1:1:1 design (IDeg forced-flex=164, IDeg=165, IGlar=164). For the first 26 weeks, the IDeg forced-flex group was given a fixed dosing schedule with 8 to 40 hours between doses; IDeg and IGlar were given at the same time every day. During the last 26 weeks, all IDeg groups were allowed to administer injections any time during the day (free-flex). All 3 groups were given insulin aspart at meal times in addition to their basal insulin. 4

The time of daily administration of insulin degludec can vary without compromising glycemic control. Insulin degludec also showed lower incidence of nocturnal hypoglycemia when compared to glargine. Limitations of this study included the open-label study design which may increase reporting bias, the variability in conversion of the basal insulin dosage at the start of the study (IGlar group’s basal insulin regimen was reduced by 20 to 30% but the IDeg group had a 1:1 conversion), and the small population size. 4

**Type 2 Diabetes: Begin Once Long Trial:**

Insulin degludec was non-inferior to insulin glargine in a 52-week treat-to-target study evaluating efficacy and safety of insulin degludec plus oral antidiabetic drugs versus insulin glargine plus oral antidiabetic drugs in type 2 diabetes. This study enrolled 1030 patients (IDeg=773, IGlar=257). Limitations of this study included the open-label study design which increases the chance of reporting bias, the small population size, as well as the lack of racial diversity in the study population which limits the generalizability of the results to the population.5

**Products:**

*FlexTouch® Pens—Tresiba® (insulin degludec)* 1

- 100 U/mL (1-80 units per injection)
- 200 U/mL (2-160 units per injection)
- Pens display the number of units to be injected, no conversion necessary.

*FlexTouch® Pen—Ryzodeg®* 3

- 70% insulin degludec and 30% insulin aspart
- 100 U/mL

**Dosing:** 1

*Type 1 insulin-naïve patients:*

- One-third to one-half of the total daily insulin dose.
- Additional insulin should be from a short acting insulin administered with meals.
- As a rule, use 0.2 to 0.4 units per kilogram to calculate the starting dose.

*Type 2 insulin-naïve patients:*

- Starting dose of 10 units per day.

*Type 1 or Type 2 patients already on insulin therapy:*

- Same number of units as the total number of long or intermediate-acting insulin from previous regimen.
- Patients should be monitored more stringently for hypoglycemia when making changes to insulin regimen or changing type of insulin.

At least 8 hours must elapse between consecutive doses of insulin degludec. The dose should not be increased sooner than every 3-4 days. To reduce the chance of lipodystrophy, the injection site should be rotated. 1,2

Insulin degludec should not be used during hypoglycemic episodes or to treat diabetic ketoacidosis. It is not meant to be administered IV, IM, or via insulin infusion pump. Insulin degludec should not be mixed with other insulin solutions. Pens should not be used by more than one patient, even after changing needles. Insulin degludec solution should not be transferred from the pen to a syringe. 1,2

By Mary Van Allen, PharmD Candidate

REFERENCES:


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Pertussis References


Bone Health References


PATIENT INFORMATION: Boning Up On Calcium, Vitamin D, and General Bone Health

Why Do I Need Calcium?
 Calcium is most famous for its role in bone health. Your bones store 99% of your body’s calcium. Low levels of calcium can lead to more falls, more broken bones, and osteoporosis (a disease of low bone density which leads to fragile bones).

Why Do I Need Vitamin D?
 Vitamin D is required for your body to absorb calcium. Getting enough vitamin D may help slow the rate of cognitive decline and reduce the risk of some cancers and other diseases.

What are Some Sources of Calcium and Vitamin D?
 It’s better to get as much calcium as you can through your diet. Dietary sources of calcium include dairy products (milk, yogurt, cheese), leafy green vegetables (broccoli, kale, brussel sprouts), and calcium-enriched or fortified foods (orange juice, soy milk, cereals, and breads).

Vitamin D is made by the body using UV light absorbed by the skin from the sun. On average, 10-30 minutes of mid-day sun on your face, arms, and legs will produce enough vitamin D. However, most Americans do not get enough vitamin D from the sun alone. For example, places far from the equator have large seasonal variations in sunlight and some people are often unable to spend enough time in the mid-day sun to absorb enough UV light. Also, sunscreen use (even as low as SPF 8) can reduce the skin’s production of vitamin D.

Because of the reasons mentioned above (and because using sunscreen is important to prevent damage to the skin and skin cancer), most people require either dietary intake or supplementation to get enough vitamin D. Foods that contain vitamin D include fatty fish (mackerel, salmon, tuna) and vitamin D-fortified milk, orange juice, and cereals.

How Do I Know if I’m Getting Enough Calcium/Vitamin D?

Use the table below to figure out how much calcium and vitamin D you should be getting. Use information on nutrition labels to calculate how much of each nutrient you’re getting from your food.

Most food labels base the “% Daily Value” of calcium on a total daily intake of 1000 mg.

Example: 25% of your daily calcium requirement = 250 mg of calcium

Most food labels base the “% Daily Value” of vitamin D on a total daily intake of 400 IU.

Example: 25% of the daily value of vitamin D = 100 IU vitamin D

If you find that you are not consuming enough calcium or vitamin D, either increase your dietary intake or take a daily supplement with calcium, vitamin D, or both.

What’s the Best Way to Increase My Calcium/Vitamin D Intake?

Take calcium supplements with a variety of foods, as some foods can reduce calcium absorption. You should get your calcium in many small doses throughout the day because your body has trouble absorbing more than 600 mg of calcium at a time. You can also add a tablespoon of non-fat powdered milk to foods to add around 50 mg of calcium. About 2-4 tablespoons of powdered milk can usually be added to most recipes without noticeably changing the final product.

If you want to try a calcium or vitamin D supplement, look for the ones with the “USP” label (USP = United States Pharmacopeia). Products with this label are tested to make sure they contain the ingredients and amounts on the label.

Always ask your healthcare provider or a pharmacist about potential interactions between supplements and your medications.

What Else Can I Do to Keep My Bones Healthy?

♦ Try to reach/maintain a healthy body weight

♦ Eat a balanced diet that includes dairy and leafy green vegetables

♦ Get regular, varied exercise which includes impact exercises (like running), balance exercises (tai chi, yoga, or dancing), and strength/resistance training (like lifting weights). Aim for 30-40 minutes per session, 3-4 times per week.

♦ Limit your daily alcohol intake to no more than 1 drink for women and 2 drinks for men.

♦ Quit smoking

By Curtis Johnson, PharmD Candidate

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<table>
<thead>
<tr>
<th>How Much Calcium and Vitamin D Do I Need?</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td><strong>Recommended Calcium</strong></td>
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<tr>
<td><strong>Recommended Vitamin D</strong></td>
</tr>
<tr>
<td><strong>Amount</strong></td>
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<tr>
<td><strong>Amount</strong></td>
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<td>Adults ≤50 years of age</td>
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<tr>
<td>Men ages 51–70</td>
</tr>
<tr>
<td>Women ≥51 years of age</td>
</tr>
<tr>
<td>Men ≥71 years of age</td>
</tr>
<tr>
<td>Pregnant/breastfeeding women</td>
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</tbody>
</table>
Pertussis (Whooping Cough)

Pertussis, or “whooping cough” has been hitting the news again in recent years. As recently as 2014, the United States has seen outbreaks of pertussis. An outbreak in California in 2014 resulted in a statewide reported rate of 26.0 infections per 100,000 people.\(^1\) Clinical cases of pertussis last at least 14 days and the local health department must be notified. States then report to the National Notified Diseases Surveillance System so the disease can be geographically monitored and interventions can be made.\(^2\)

Pertussis is caused by a gram-negative bacteria \(\textit{Bordetella pertussis}\) and transfers from person-to-person by respiratory droplets.\(^3\) The bacteria produce toxins that keep the cilia in the respiratory tract from clearing the normal secretions, which leads to bouts of uncontrollable coughing.\(^3\) The first of three stages of infection have symptoms similar to the common cold. The second stage (usually present after one to two weeks) is notable for thick mucus production that is not easily expelled by the bursts of coughing. The coughing fits may end with high-pitched inspiration (or “whoop”) and may be followed by exhaustion and vomiting. Attack frequency peaks with an average of 15 attacks per day (mostly at night) and will slowly decrease after 2-3 weeks. The third stage of the infection sees the coughing fits decrease even further in frequency, however, any respiratory infection during this time of convalescence will see a similar cough redevelop.\(^3\)

The pertussis vaccine is available in pediatric formulations (DTaP) and for older populations (Tdap). These vaccines have component amounts that will change with recommended age range. The vaccine does not make the patient immune to infection, but it will shorten the duration and the intensity of sickness. It also makes the infected person less contagious to spread the disease to others. Pregnant women should get the vaccination twenty weeks after gestation, ideally between 27-36 weeks from gestation.\(^1\) Elderly people and newborns are most susceptible to complications of disease (including death), and the best way to prevent such infection is to insure all contacts of these patients have also been immunized.\(^1\) Consult the Pink Book, a publication of the Centers for Disease Control, for the most up-to-date schedules for vaccines.

For patients that suspect that they have been exposed to the infection, prophylactic antibiotics should be used to prevent its spread. A person who suspects that they have come in contact with infected individuals should seek prophylaxis if they are in contact with susceptible, at-risk populations (elderly and newborn). Azithromycin is the recommended treatment for patients exposed to the infection. For patients over one month old, erythromycin or clarithromycin are alternative prophylactic treatments. For patients over two months old, an alternative treatment is trimethoprim/sulfamethoxazole. Resistance, cost, and age of patient should be considered when choosing the most appropriate antibacterial to use.\(^4\)

Pertussis is a recordable infection that is nationally monitored for its prevalence in the population. Though cyclical outbreaks have been historically seen, the intensity and length of a patient’s infection can be decreased by adhering to vaccination schedules. Newborns and the elderly are particularly susceptible to complications of infection, and herd immunity will help minimize the changes of these populations becoming infected. Antibiotics are available for prophylactic infection avoidance, but they are not effective in controlling the patient that is already sick.

\textit{By Tim Polacheck, PharmD Candidate}\n
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