

# Barriers to Tdap Vaccination in Pregnancy: Perspectives from Obstetricians and Patients

## Abstract

The CDC recommends Tdap (tetanus, diphtheria, acellular pertussis) vaccination during pregnancy as a strategy to protect infants against pertussis. Optimal time for the vaccination is between 27 and 36 weeks gestation. This project looks at the providers' as well as the patients' perspectives as to why some women are not receiving the vaccine. An 8-question survey was sent out to obstetricians to assess physician's perceptions on barriers to patients receiving the Tdap vaccination in pregnancy. A second survey was then administered to postpartum patients prior to discharge from the hospital. In the survey of obstetricians, 83% universally offered the Tdap vaccination to patients in the third trimester, and 71% of respondents stated that over half of all patients accepted the vaccine. Over half (56%) of physicians answered that they encounter barriers in trying to offer Tdap in their practice, and identified the lack of point of care availability (70%) as the most common barrier. Differences in vaccination rates of women based on different insurance types were noted, and 59% of providers answered that Medicaid patients were less likely to receive Tdap due to reimbursement issues. The patient survey revealed that 65% of patients were offered the vaccine in the third trimester, but only 37% received the vaccine. The reasons cited for not accepting the vaccine were lack of availability of vaccine in the physician's office (44%), lack of patient understanding as to why the vaccine was important (36%), and concerns about vaccination safety (20%). This project illustrates the differences in obstetricians and patients perception on barriers for Tdap vaccination in pregnancy. This observed difference in the acceptance rates between statements by MD's and those made by patients is statistically significant (Fisher's Exact Test,  $p=0.0002$ ). Strategies to improve vaccination rates must address barriers on both sides.

**Keywords:** Tdap; Obstetrician; Vaccination in Pregnancy; Pertussis

## Research Article

Volume 4 Issue 1 - 2018

**Julie Zemaitis DeCesare\*, Kay Roussos Rossm, Samantha Vidrine, Hannah Peterson, Mary Ashby, Elizabeth Floyd and Raid Amin**

*University of Florida College of Medicine, USA*

**\*Corresponding author:** Julie Zemaitis DeCesare, MD, Associate Professor Obstetrics & Gynecology, University of Florida, Florida 32563, USA, Email: [jdecasare@ascension.org](mailto:jdecasare@ascension.org)

**Received:** January 09, 2018 | **Published:** January 18, 2018

## Introduction

Pertussis is a respiratory illness, also known as whooping cough, which is caused by the bacteria *Bordetella Pertussis*. It is highly contagious and can spread from person-to-person through airborne droplets. The group with the highest morbidity and mortality from pertussis is infants. In 2014, there were 3,330 cases of pertussis in children younger than 6 months, and 8 deaths due to pertussis in infants younger than 3 months of age in the United States [1]. In infants, the bacteria can travel from the upper to the lower respiratory tract. It has the potential to cause severe complications including necrotizing bronchitis, alveolar damage, intra-alveolar hemorrhage, fibrinous edema, macrophage rich alveolar infiltrates, lymphangiectasia, neutrophilic bronchopneumonia, and fibrin thrombi. In the most severe cases, it can lead to pulmonary hypertension, respiratory failure, and death [2].

The recommended immunization schedule released by the CDC recommends that infants do not receive the first Tdap vaccination until 2 months of age [3]. This leaves infants at a vulnerable state during the first two months of life, before they are able to get vaccinated. Previously, cocooning was recommended to help protect infants. Cocooning is an approach

that involves administering the Tdap vaccine to all women in the immediate postpartum period along with all other family members and caregivers who had not previously received the vaccine. The idea is to provide a protective cocoon of immunity around the newborn. This approach has proved to be difficult and insufficient when used alone [4]. Currently, the CDC recommends vaccination during pregnancy in order to help increase infants' protection against pertussis. Health care providers should administer a dose of Tdap during each pregnancy, regardless of the patient's prior history of receiving Tdap. The optimal time to vaccinate pregnant women is between 27 and 36 weeks gestation in order to maximize the maternal antibody response and transfer to the infant, however it may be administered at any time in her pregnancy. If a woman has not been vaccinated, and Tdap is not given during pregnancy, it should be given immediately post partum [5].

The safety of the Tdap vaccine has been a concern for patients and providers. The Advisory Committee Immunization Practices (ACIP) concluded that available data does not suggest any increased frequency or unusual patterns of adverse events in pregnant women who received Tdap. The ACIP concluded that administration of Tdap after 20 weeks' gestation is preferred to

minimize the risk for any low-frequency adverse event and the possibility that any spurious association might appear causative [6]. Maternal Tdap immunization in any trimester results in higher pertussis antibody concentrations during the period between birth and the first vaccine dose. The presence of these antibodies can potentially provide pertussis protection before Tdap can be given to the infant [7].

In order to ensure that all infants are receiving the best possible protection from pertussis, the most common reasons for patients not receiving the Tdap vaccination during pregnancy need to be further investigated and addressed. Often times, patients and health care providers have different perceptions of health care. This project will investigate the compliance with the recommendation for all pregnant women to receive Tdap vaccination in pregnancy from both the patient and the providers

prospective and to identify reasons for noncompliance.

### Methods

This multi-site study received IRB approval from both institutional IRBs. The first part of the project was a questionnaire for obstetricians regarding Tdap vaccination in pregnancy. This survey was developed by members of the ACOG District XII Committee on Healthcare for Underserved Women, and distributed to all district members via email. ACOG District XII represents obstetricians in the entire state of Florida, as well as Columbia, South America. The survey was anonymous and consisted of 8 questions about Tdap and point of care barriers. Consent was implied on member's completion of the study. A copy of the survey is included as Figure 1. One hundred and thirty nine surveys were completed.

**1. Do you universally offer the Tdap to all pregnant patients in the third trimester weeks in your office?**

If Yes:

**What percent of your patients accept the vaccine?**

- A. Less than 25%
- B. 25-50%
- C. 51-75%
- D. 76-100%

**2. Why do patients not accept the vaccine? Choose all that apply:**

- a. Concerns for vaccination safety
- b. Concerns for cost
- c. Lack of understanding of importance
- d. Lack of point of care availability (Patients insurance will not reimburse in your office, and patient needs to be referred to another location- ie health department)

**Do you consider it a barrier to not offer tdap in your office?**

- a. Yes
  - b. No
- If Yes, please identify the barrier:
- a. too costly
  - b. too much
  - c. public health problem
  - d. other (please write in answer)

**Any comments:**

**If No:**

**Please identify why you don't offer the tdap in your office: choose all that apply**

- a. Concerns for vaccination safety
- b. Concerns for cost
- c. Lack of understanding of importance
- d. Lack of point of care availability (Patients insurance will not reimburse in your office, and patient needs to be referred to another location- ie health department)

**3. What percent of you practice is Medicaid?**

- A. Less than 25%
- B. 25-50%
- C. 51-75%
- D. 76-100%

**4. Are Medicaid patients in your practice less likely to receive TDaP in 3rd trimester due to reimbursement?"**

- Yes
- No

Figure 1: ACOG DXII Survey Quiz for ACOG Fellows.

The second survey was given to obstetric patients in the post-partum period prior to discharge home. Patients were asked to complete the questionnaire but were not required to do so, as it was a voluntary study. Results were recorded in an anonymous survey database. No patient identifiers were obtained as part

of the data collection, and all post-partum patients at each site were eligible for inclusion during the study period. The survey consisted of 8 questions, and is included as Figure 2. A total of two hundred and twenty surveys were completed by post-partum patients.

**1. Did your doctor or nurse practitioner recommend you receive the Tdap vaccine during your third trimester in clinic?**

- Yes
- No
- Unsure
- Not applicable

**2. If yes, did you receive Tdap during the third trimester?**

- Yes
- No
- Unsure
- Not applicable

**3. If no, why did you not receive the vaccine? Choose all that apply:**

- a. The vaccine was not available in clinic
- b. My insurance would not cover it
- c. I was concerned that the vaccine might not be safe for me and/or the baby
- d. I was not sure why the vaccine was recommended and therefore did not want it
- e. I had to go to the health department for the vaccine and therefore did not receive it
- f. Other:

**4. If you did not receive Tdap in clinic during the third trimester, were you offered Tdap during the post-partum period in the hospital?**

- Yes
- No
- Unsure
- Not applicable

**5. If yes, did you receive Tdap at that time?**

- Yes
- No
- Unsure
- Not applicable

**6. If no, why did you not receive the vaccine? Choose all that apply:**

- a. The vaccine was not available in the hospital
- b. My insurance would not cover it
- c. I was concerned that the vaccine might not be safe for me and/or the baby
- d. I was not sure why the vaccine was recommended and therefore did not want it
- e. Other:

**7. In clinic, did your doctor or nurse practitioner recommend that all adult family members receive Tdap prior to baby's arrival?**

- Yes
- No
- Unsure
- Not applicable

**8. What is your insurance status?**

- a. Private insurance (BCBS, United, Etc)
- b. Government Insurance (Tricare, Medicare, VA)
- c. Medicaid

**Figure 2:** Tdap (Tetanus, diphtheria, and pertussis) Vaccine Questionnaire for Postpartum patients.

**Results**

One hundred and thirty nine obstetricians and gynecologists replied to the survey. Of respondents, 83 % (116) answered that they offered the Tdap vaccine to all pregnant patients in the third trimester. 71% (87) of the respondents stated that over half of all patients accepted the vaccine. Figure 3 outlines the reasons why

physicians identified as reasons why patients were declining the vaccine. Safety concerns were the most common response, selected by 70% (89) of the respondents. This was followed by 43% (55) selecting lack of understanding of the importance, 35% (55) cited lack of vaccine availability 35% and 27% (30) identified concern for cost (27%).

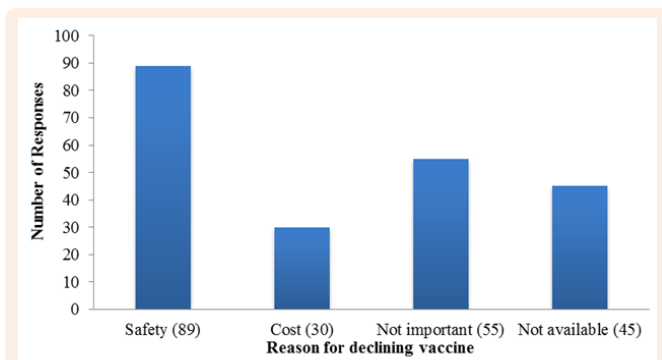


Figure 3: Obstetrician-identified reasons why patients decline the Tdap vaccine (n=116).

Over half, 56% (71) of all physician respondents answered that they encounter barriers to offering Tdap in their office. When asked to identify the barrier, 19% (15) reported that it was a public health problem, 19% (15) responded it was too costly, and 56% (44) selected other. Thirty seven respondents completed the free text response option regarding additional barriers to vaccination in their practice. Of those, seventeen identified insurance coverage as an issue and eight respondents of those specifically mentioned Medicaid as a barrier for vaccination administration. An additional seven respondents reported difficulty with stocking the vaccine and storage.

Out of all of the physician respondents, 16% (35) did not universally offer Tdap to patients in the third trimester. Seventy percent (19) of those physicians reported the lack of point of care availability in their office was due to insurance reimbursement issues preventing office vaccination. Over half, 59% (71) of the providers answered that Medicaid patients are less likely to receive Tdap during the third trimester due to lack of reimbursement and inability to pay out of pocket.

A total of two hundred and twenty two patient surveys were completed. Sixty five percent (143) of patients reported that they were offered the Tdap vaccine during their third trimester, but only 37% (81) of patients actually received it. Thirty-six percent (79) patients had private or government-sponsored insurance (TriCare, Medicare, VA), 60% (131) patients had Medicaid, and 3% (7) patients were uninsured. 3 patients did not have insurance status recorded. Figure 4 of private/government insured patients, 69.2% (54) received Tdap in the 3rd trimester compared to 18.6% (23) of patients with Medicaid. Of the patients with private insurance who did not receive Tdap in the third trimester, 56% (5) cited education-related reasons, 30% (3) cited access reasons, and 22% (2) cited safety concerns. Of the patients with Medicaid insurance, 47% (25) cited lack of access, 40% (19) cited education reasons, and 19% (9) cited safety concerns (Figure 5).

Out of the 139 responses from MD's regarding vaccination, in 79 cases (or 56%) it is claimed that the patients accepted the vaccinations, while out of 220 patients only 81 (or 37%) stated that they accepted to receive the vaccinations. This observed difference in the acceptance rates between statements by MD's and those made by patients is statistically significant (Fisher's Exact

Test,  $p=0.0002$ ). This implies that there exists a large difference in the views of MD's and patients regarding the vaccination. There is only a 2 in 10,000 chance that this difference is due to chance.

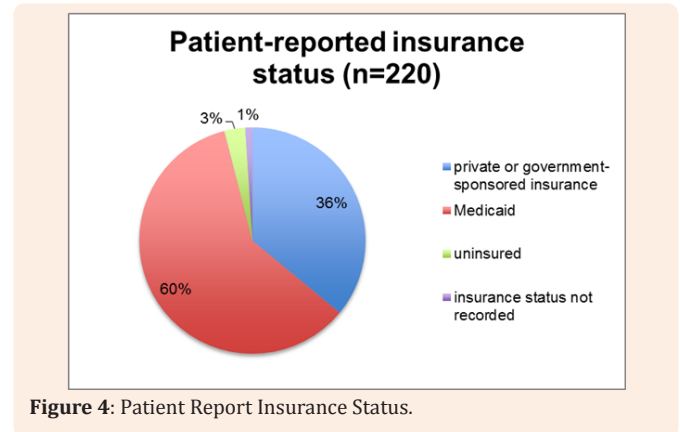


Figure 4: Patient Report Insurance Status.

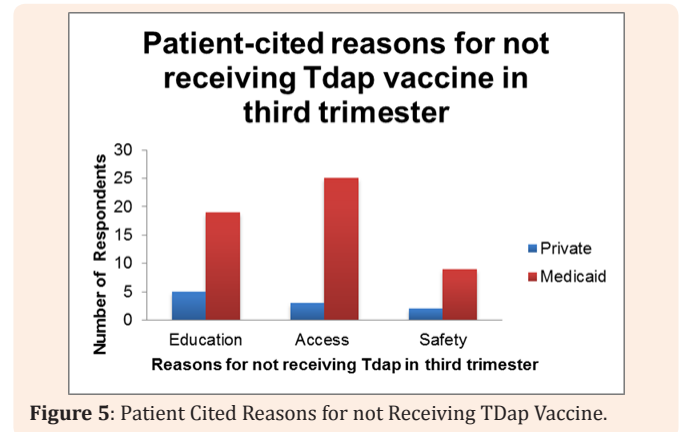


Figure 5: Patient Cited Reasons for not Receiving Tdap Vaccine.

## Discussion

Our Survey showed that from the provider's perspective, the biggest barriers to administering Tdap vaccinations in the third trimester were insurance coverage, problems with storage and/or stocking vaccinations in their clinics, and patient concern for vaccination safety. The patients' perspective was different from the providers' perspective in that (lack of) access was the most common reason cited for not receiving the Tdap vaccination, followed by not understanding why the vaccine is recommended and finally concern for health safety of the vaccine.

Insurance coverage is often a barrier to vaccination during pregnancy. Our data shows that only 18.6% of Medicaid patients received the Tdap vaccination in the third trimester. When offered the vaccination in the postpartum period, 55% of Medicaid patients received the vaccine, illustrating that when the vaccine is immediately available Medicaid patients are more likely to receive the vaccine. When providers were asked if Medicaid patients were less likely to get the vaccine due to coverage, 59% answered yes. In the comments section of the survey, 17 providers mentioned insurance coverage as a barrier, and 8 of those specifically mentioned Medicaid. Several forms of Florida Medicaid do not cover the Tdap vaccination in pregnancy or only

covers it at certain locations such as the state health department. This lack of point of care availability places barriers to vaccination in front of patients, making it difficult to be compliant with the recommendation. The cost of the vaccine ranges from \$40 to \$100, which is unaffordable for some patients.

Although Medicaid recipients cited lack of access as the primary reason for not receiving Tdap, those with private/government insurance cited lack of education as the primary reason for not receiving the vaccination. This is further evidenced by previous research which indicates that education can improve the uptake of this vaccination [8].

Our data illustrates that Tdap vaccination rates in pregnancy can be increased by improving both education and access to patients. Offering patients informational handouts or pamphlets explaining Tdap and the reasons to vaccinate could be helpful in increasing a patient's knowledge regarding the importance of vaccination. Likewise, re-offering the vaccination, even after a patient initially declines will open the door for more conversations between the physician and patient and possibly increase the likelihood of vaccination. The CDC has many resources for education about the Tdap vaccination during pregnancy including patient handouts, provider education articles, posters for clinics, and videos [9]. In regards to access, advocating for insurance coverage for this vaccination is paramount. Medicaid reimbursement will allow patients to receive this vaccination in clinic as is the case for privately insured patients, thus increasing compliance with administration of the vaccine.

There are limitations in this study. The study was conducted in Florida, so some of the barriers such as stocking and insurance may not be generalizable to other states. It was estimated that in 2010, 48% of US births were covered by Medicaid. This patient population was 60% Medicaid, which may have bias due to socioeconomic status of patients. The biggest strength to this study is that it shows two perspectives on the issue, the providers' and the patients'.

## Conclusion

There are multiple reasons as to why there is poor adherence to the recommendations on Tdap vaccination in pregnancy. Based on our results, lack of access and lack of understanding of the importance of the vaccine are the two most common reasons patients offered for declining the vaccine. Further research is needed to determine if more education about the vaccination will improve patient acceptance rates of the vaccine. It is possible that using educational tactics could improve adherence to the recommendation that all pregnant women should receive the Tdap vaccination in the third trimester. Finally, advocating for universal coverage of Tdap by all insurance companies will greatly improve compliance with Tdap administration in the third trimester of pregnancy.

## Highlights

- I. Obstetricians have different perceptions of their patients regarding the Tdap Vaccine.
- II. The optimal time to vaccinate is during pregnancy.
- III. Lack of patient understanding of vaccination importance leads to patients declining the vaccine.

## Acknowledgment

We would like to acknowledge the assistance ACOG DXII Committee on HUW work.

## Conflict of Interest

None.

## References

1. Pertussis (2015) Surveillance and Reporting. Centers for Disease Control and Prevention.
2. Kilgore PE, Salim AM, Zervos MJ, Schmitt HJ (2016) Pertussis: microbiology, disease, treatment, and prevention. *Clin Microbiol Rev* 29(3): 449-486.
3. Centers for Disease Control and Prevention (2013) Recommended immunization schedule for persons aged 0 through 18 Years-United States. Advisory Committee on Immunization Practices (ACIP), Atlanta (GA), Georgia.
4. American College of Obstetricians and Gynecologists Committee Opinion (2013) Update on immunization and pregnancy: tetanus, diphtheria, and pertussis vaccination. *Obstet Gynecol* 121: 1411-1414.
5. Centers for Disease Control and Prevention (2013) Updated recommendations for use of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) in pregnant women-Advisory Committee on Immunization Practices (ACIP), 2012. *MMWR Morb Mortal Wkly Rep* 62(7): 131-135.
6. Centers for Disease Control and Prevention (2013) Updated recommendations for use of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) in pregnant women-Advisory Committee on Immunization Practices (ACIP), 2012. *MMWR Morb Mortal Wkly Rep* 62: 131-135.
7. Hardy-Fairbanks AJ, Pan SJ, Decker MD, Johnson DR, Greenberg DP, et al. (2013) Immune Responses in Infants Whose Mothers Received Tdap Vaccine During Pregnancy. *Pediatr Infect Dis J* 32(11): 1257-1260.
8. Payakachat N, Hadden KB, Ragland D (2016) Promoting Tdap immunization in pregnancy: Associations between maternal perceptions and vaccination rates. *Vaccine* 34(1): 179-86.
9. <http://www.cdc.gov/pertussis/pregnant/index.html>