

# FPIN's Help Desk Answers

## Maternal Pertussis Vaccination During Pregnancy

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### Clinical Question

How effective is prenatal maternal administration of the tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis (Tdap) vaccine in preventing pertussis in infants?

### Evidence-Based Answer

Women should receive the Tdap vaccine during pregnancy regardless of previous immunization history. Infants whose mothers received prenatal immunization had 50% fewer cases of pertussis compared with those whose mothers received postpartum immunization. (Strength of Recommendation: B, based on cohort and case-control studies.) Prenatal maternal Tdap vaccination is 91% effective in preventing pertussis during the first three months of life and 93% effective in preventing pertussis in the first eight weeks.

### Evidence Summary

A 2017 cohort study reviewed records of California mothers 14 to 44 years of age who received the Tdap vaccine during pregnancy or up to 14 days after delivery to determine which infants were at lower risk of pertussis during the first eight weeks of life.<sup>1</sup> Infants born before 27 weeks' gestation and with birth weights less than 500 g were excluded. Of the 74,504 women included in the study, 58% were vaccinated during pregnancy, and 42% were vaccinated postpartum.

Of those vaccinated during pregnancy, 77% received the Tdap vaccine at 27 to 36 weeks' gestation; the remaining 23% received the vaccine after 36 weeks' gestation. Of the infants born to mothers who were vaccinated during pregnancy, 0.02% contracted pertussis in the first eight weeks of life compared with 0.05% of those whose mothers were vaccinated postpartum (number needed to treat = 3,333;  $P = .01$ ). The incidences of pertussis in infants younger than 12 weeks were 0.03% and 0.08%, respectively (number needed to treat = 2,000;  $P = .01$ ). The incidences of pertussis in the first year of life were similar between groups: 0.14% for infants of mothers vaccinated prenatally and 0.19% for infants of mothers vaccinated postpartum ( $P = .11$ ).

A 2016 British cohort study evaluated the effectiveness of a vaccination program using the diphtheria, tetanus, five-component acellular pertussis, and inactivated polio vaccine in pregnant women at 28 to 38 weeks' gestation.<sup>2</sup> Vaccination rates in infants born from 2012 to 2015 ( $n = 72,781$ ) were determined from national databases and ranged from 60% to 78%. There were 243 cases of pertussis in infants younger than 93 days: 35 cases in infants of mothers vaccinated at least seven days before delivery and 208 cases in infants of unvaccinated mothers. Comparison of the risk of pertussis in infants of vaccinated vs. unvaccinated mothers showed that the vaccine

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## HELP DESK ANSWERS

was 91% effective in preventing pertussis in infants younger than three months.

A case-control study in Wales compared 58 infants younger than eight weeks in whom real-time polymerase chain reaction testing showed *Bordetella pertussis* infection with 55 control infants without a diagnosis of pertussis.<sup>3</sup> The authors reviewed records to determine whether the mothers had been vaccinated with a pertussis vaccine. Of the 58 infants with pertussis, 10 of the mothers (17%) were vaccinated at a median gestational age of 31.5 weeks (range: 28 to 38 weeks). In infants without pertussis, 39 mothers (71%) were vaccinated at a median gestational age of 33 weeks (range: 26 to 38 weeks). The unadjusted vaccine effectiveness was 91% (95% confidence interval, 77% to 97%). After adjusting for sex, geographic area, and birth period, the vaccine effectiveness was 93% (95% confidence interval, 81% to 97%).

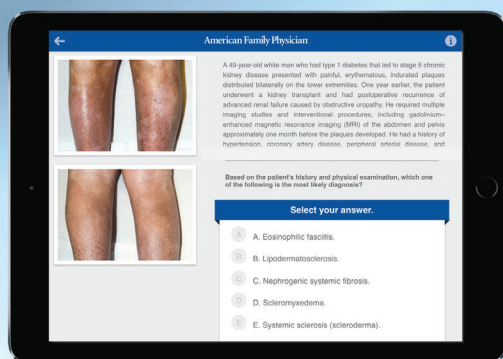
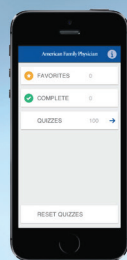
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