Rubella (Screening)

Clinical Preventive Service Recommendations

U.S. Preventive Services Task Force Recommendation

Not Applicable – The U.S. Preventive Services Task Force defers to the Advisory Committee on Immunization Practices and the CDC on recommendations surrounding immunization.

CDC Recommendation

Rubella vaccine is contraindicated during pregnancy. Because the vaccine contains live virus, it should not be administered to pregnant women.[1]

The Advisory Committee on Immunization Practices (ACIP) recommends that clinicians screen all women of childbearing age, including pregnant women, for rubella susceptibility during their first clinical encounter. A history of vaccination (proved by written documentation of receipt of $\geq$ 1 dose of a rubella-containing vaccine after the age of 1 year) or a serologic test for antibodies (offering laboratory evidence of immunity) can be used to document immunity against rubella. Susceptible, nonpregnant women should be vaccinated, and susceptible pregnant women should be vaccinated immediately after delivery or at the end of their pregnancies (such as following miscarriage). Nonpregnant women may be offered vaccination without serologic screening.[1]

A summary of guidelines for the immunization of pregnant women can be found online (www.cdc.gov/nip/publications/preg_guide.htm).

Evidence Rating:

Expert Consensus

Other Recommended Guidance

The American Academy of Family Physicians (AAFP) concurs with the ACIP recommendations.

Information Sources

The recommendations and supporting information contained in this document came from several sources, including the:

- Advisory Committee on Immunization Practices (ACIP)
- American Academy of Family Physicians (AAFP)
- Centers of Disease Control and Prevention (CDC)
- Peer-reviewed research

The background and supporting information contained in this document is a compilation of research findings. All information presented in this document should be attributed to its referenced source and should not be considered a reflection of other organizations cited in the text.

Condition/Disease Specific Information

Epidemiology of Condition/Disease

For most people, rubella is a mild illness. However, when contracted during early pregnancy, particularly during the first trimester, rubella can cause serious complications including miscarriage, stillbirth, and congenital rubella syndrome (CRS) – a constellation of birth defects that include hearing impairment, growth

retardation, developmental delays, and heart and eye defects.[2] Because rubella infection can affect all the organs of a developing fetus, the earlier a woman is infected with rubella during her pregnancy, the more severe the complications are for the developing fetus. Approximately 90% of infants born to women who contracted rubella during the first 11 weeks of pregnancy develop CRS and about 20% of infants born to women who contracted rubella during the first 20 weeks of pregnancy develop CRS.[2]

In 1964-1965, an epidemic of rubella hit the United States: over 12 million individuals were infected resulting in 11,000 fetal losses (as a result of miscarriage or abortion) and 20,000 cases of CRS.[3]

In 1969, rubella vaccines were licensed in the United States to protect individuals from rubella. Widespread vaccine use led to a 99% reduction in the number of rubella cases over 3 decades; this reduced the rubella caseload from a high of 57,686 cases in 1969 to only 271 cases in 1999.[2]

Since universal childhood immunization was initiated in 1969, there has not been another rubella epidemic, although isolated outbreaks do occur. The United States experienced a resurgence of rubella in the early 1990s with 1,124 cases reported in 1990 and 1,412 in 1991. During this time period 66 infants were born with CRS.[4]

In 2004, an expert panel convened by CDC concluded that rubella and CRS have been eliminated from the United States; however, continued vaccination of susceptible women and children is necessary to maintain this success.[3]

Because pregnant women are most susceptible to the complications of rubella, experts recommend the targeted screening and vaccination of childbearing-aged women. Such a practice would reach those individuals who were not vaccinated in childhood. The rubella vaccine is contraindicated for use during pregnancy due to the theoretical possibility that the live virus rubella vaccine could cause fetal infection and CRS; however, there have been no documented cases of CRS related to use of the rubella vaccine.[1]

Condition/Disease Risk Factors

Since the mid-1990s, rubella and CRS has disproportionately affected foreign-born ethnic minorities. In 1999, 73% of all rubella cases in the United States occurred among Hispanics, most of whom were from Mexico and Central America (CDC, unpublished data). Between 1998 and 2000, over 90% of all CRS cases occurred among infants of Hispanic women 96% of whom were foreign-born.[3]

Value of Prevention

Economic Burden of Condition/Disease

CRS and its complications have substantial health consequences and economic costs. A large rubella outbreak in 1964-1965 cost an estimated $840 million.[5] In 2006, the estimated *lifetime* cost of treating a child born with CRS exceeded $200,000.[5]

Workplace Burden of Condition/Disease	Rubella and CRS result in excess direct medical costs. Indirect costs constitute the major workplace burden of rubella, however. Indirect costs include permanent disability caused by CRS as well as productivity losses associated with the missed work time of employed caregivers attending to their sick children.
Economic Benefit of Preventive Intervention	The economic benefits of immunization result from reducing hospitalizations and outpatient visits and by avoiding productivity losses caused by rubella or CRS-related disabilities.
Estimated Cost of Preventive Intervention	In 2004, the private-sector cost of screening for rubella antibodies averaged $21; approximately 95% of paid claims fell within the range of $0 to $50.[6] The cost of the rubella vaccine averaged $20 and approximately 95% of all paid claims fell within the range of $0 to $40 per dose (1 to 2 doses are required for protection against rubella).[6]
Estimated Cost of Treatment	In 2006, the *lifetime* cost of treating a child born with CRS exceeded $200,000.[5]
Cost-Effectiveness and/or Cost-Benefit Analysis of Preventive Intervention	Although there is a lack of economic evidence about the cost-effectiveness of screening pregnant women, one study that investigated the current 2-dose MMR vaccination program for children through a decision-tree-based analysis demonstrated that the program resulted in substantial cost-savings and high benefit-to-cost ratios. The estimated total cost savings to society of $7.6 billion (in year 2001 dollars) included a savings of $549 million from rubella and CRS prevention.[7]

Preventive Intervention Information

Preventive Intervention: Purpose of Screening	Screening allows clinicians to identify childbearing-age women who are at risk for rubella and to immunize them before they become pregnant. Screening pregnant women allows clinicians to identify at-risk women and to encourage them to be immunized immediately after delivery, thereby offering protection during subsequent pregnancies.
Benefits and Risks of Intervention	Screening for rubella susceptibility involves minimal risk, although false-positive test results may lead to unnecessary treatment. The rubella vaccine is very effective; more than 90% of individuals vaccinated show long-term protection from the illness.[1] Adverse reactions to the rubella vaccine may include pain at the injection site or temporary rash, which are usually mild in both children and adults, although adults — particularly women — commonly complain of temporary joint pain after vaccination.
Initiation, Cessation, and Interval of Screening	All women of childbearing age, including pregnant women, should be screened for rubella susceptibility during their first clinical encounter. All women of childbearing age who are not pregnant should be vaccinated at their first clinical encounter if not immune to rubella. A susceptible pregnant woman should be vaccinated immediately after delivery or at the end of her pregnancy (e.g., miscarriage).

Intervention Process Screening

Screening is conducted by ascertaining an individual's risk for rubella. Immunity to rubella can be documented by 1) a history of immunization (proved by written documentation of receipt of ≥1 dose of a rubella-containing immunization after the age of 1 year), or 2) a serologic test for antibodies (offering laboratory evidence of immunity). Individuals who cannot document immunity are considered at risk for rubella.

Immunization

Rubella immunization is administered via an injection.

Treatment Information

Health benefits should include provisions for treatment services.

Strength of Evidence for the Clinical Preventive Service

The level of evidence supporting the recommendations contained in this section is described below.

Recommended Guidance:

Advisory Committee on Immunization Practices (ACIP)
Strength of Evidence: Expert Consensus

> The ACIP recommends that clinicians screen all women of childbearing age, including pregnant women, for rubella susceptibility during their first clinical encounter. Susceptible non-pregnant women should be vaccinated and susceptible pregnant women should be vaccinated immediately after delivery or at the end of their pregnancy (e.g., miscarriage).[1]

This recommendation is supported by the:

- U.S. Preventive Services Task Force (USPSTF)

Authored by:

Campbell KP, Lindley MC, Bhatt A, Chattopadhyay S. Rubella evidence-statement: screening. In: Campbell KP, Lanza A, Dixon R, Chattopadhyay S, Molinari N, Finch RA, editors. *A Purchaser's Guide to Clinical Preventive Services: Moving Science into Coverage*. Washington, DC: National Business Group on Health; 2006.

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