Alberta

Prenatal Screening Guidelines

for Select Communicable Diseases

Alberta Health Services

Alberta Health

Ministry of Health, Government of Alberta

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Alberta Prenatal Screening Guidelines for Select Communicable Diseases

www.health.alberta.ca/professionals/notifiable-diseases-guide.html

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List of Acronyms

AHS	Alberta Health Services
Anti-HBs	Antibody to Hepatitis B surface antigen
CBS	Canadian Blood Services
CRS	Congenital Rubella Syndrome
CT	*Chlamydia trachomatis*
CVS	Congenital Varicella Syndrome
EIA	Enzyme immunoassay
EDD	Expected date of delivery
Fetus	An unborn human offspring up to time of birth
FNIHB	First Nations and Inuit Health Branch, Health Canada
GC	*Neisseria gonorrhoea*
HBIG	Hepatitis B Immune Globulin
HBsAg	Hepatitis B surface antigen
HBV	Hepatitis B virus
HIV	Human Immunodeficiency virus
Infant	A child under 1 year of age
MMR	Measles, Mumps, Rubella Vaccine
MTCT	Maternal to child transmission
NAAT	Nucleic Acid Amplification Test
MOH	Medical Officer of Health
Neonate	From birth to 1 month of age
Postpartum	The first 6 weeks after delivery
ProvLab	Provincial Laboratory for Public Health
RPR	Rapid Plasma Reagin test
STI	Sexually Transmitted Infections
STICS	STI Centralized Services-AHS

Purpose

- To outline general roles and responsibilities of the Ministry of Health, the Provincial Public Health Laboratory (ProvLab), Alberta Health Services (AHS), First Nations and Inuit Health Branch (FNIHB), and healthcare provider (HCPs) in the Alberta Prenatal Screening Program for selected communicable diseases.
- To describe the goal and screening targets of the Alberta Prenatal Screening Program for selected communicable diseases.

Scope

The intent of this guideline is to describe the prenatal screening program as it relates to the screening targets for selected communicable diseases in Alberta.

Goals

The broad goal of the prenatal screening program is to identify selected communicable diseases for which suitable interventions can be offered to protect and enhance the health of pregnant women and their infants.

Prenatal screening tests are recommended for seven communicable diseases to identify pregnant women who are infected with or susceptible to:

- human immunodeficiency virus (HIV),
- hepatitis B (HBV),
- syphilis,
- gonorrhea (GC),
- chlamydia (CT),
- rubella, and/or
- varicella.

The anticipated target for prenatal screening involves approximately 57,000 projected births in Alberta each year.[1] All pregnant women should be screened for these communicable diseases as part of their prenatal care.

Program targets for the prenatal screening of each communicable disease are located under the applicable disease section.

HCPs in Alberta should ensure that all pregnant women have had prenatal screening for these communicable diseases. If a pregnant woman has not been screened, the HCP should ensure that prenatal screening is ordered and the woman is provided with or referred for prenatal care.

Access the Alberta Prenatal Communicable Diseases Test Requisition

Background

- Prenatal screening tests in Alberta were implemented in stages:
  - Syphilis - 1950s
  - Rubella - 1970s
  - Hepatitis B - 1985
  - HIV - September 1, 1998
  - Varicella - August 1, 2002

- Prior to August 1, 2002, screening tests for hepatitis B and HIV were performed at Canadian Blood Services (CBS), and syphilis and rubella testing were available at regional laboratories and Provincial Laboratory for Public Health (ProvLab). After 2002, testing for these communicable diseases was consolidated at ProvLab.

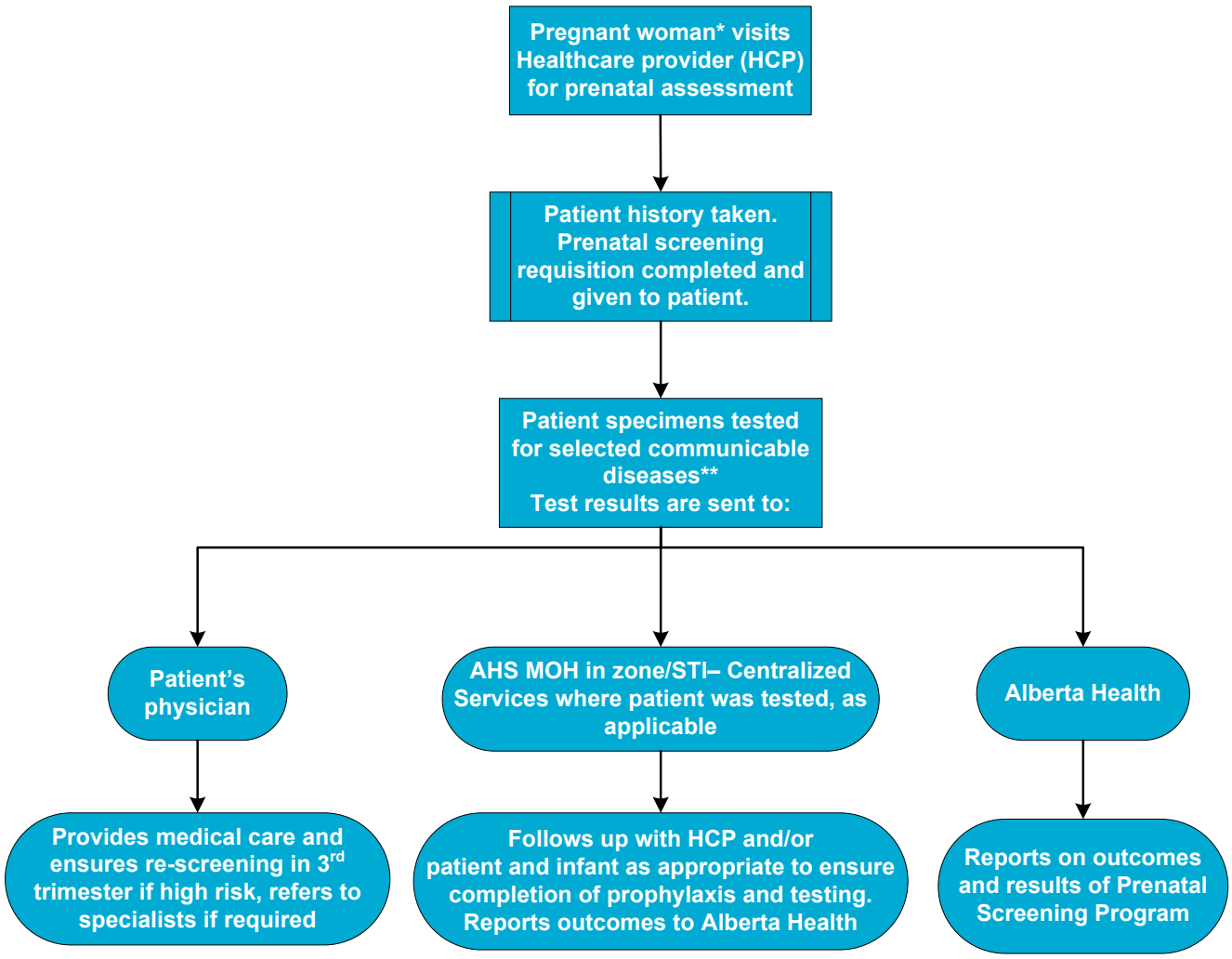
- In 2006, the Ministry of Health developed and released the *Alberta Prenatal Screening Program for Selected Communicable Diseases Public Health Guidelines* that combined the testing of all five communicable diseases under one program. Alberta Health coordinated the prenatal screening program in partnership with physicians providing prenatal care, the hospitals providing obstetrical services, the ProvLab, CBS, regional laboratories, the local Medical Officers of Health (MOHs) or designates, STI Centralized Services (STICS) and, ultimately, pregnant women seeking care.

- In the fall of 2017, the Office of the Chief Medical Officer of Health sent a letter to laboratories indicating that GC and CT testing were to be added to the prenatal screening program.

- Refer to *Figure 1: Prenatal Screening Process* for a summary of the current prenatal screening process in Alberta.

- Refer to *Table 1: Summary of Roles in the Alberta Prenatal Screening Program* for a high-level overview of the roles of the different partners involved in this prenatal screening program.

Figure 1: Prenatal Screening Process



* HCPs in Alberta should ensure that all pregnant women have had prenatal screening for the communicable diseases listed below. If a pregnant woman has not been screened, the HCP should ensure that prenatal screening is ordered and the woman is provided with or referred for prenatal care. If at the time of delivery it is determined that a pregnant woman has not sought prenatal care nor had prenatal screening, then stat specimens should be collected. Rapid HIV testing should be completed where available.
** Testing is done for HIV antibody, hepatitis B surface antigen, syphilis, GC and CT testing, and rubella and varicella IgG antibody testing.

Table 1: Summary of Roles in the Alberta Prenatal Screening Program

	Healthcare Provider (e.g., physician, midwife, obstetrician, gynecologist, etc.)	Laboratories	AHS/STI Centralized Services (STICS)/FNIHB	Alberta Health
First Prenatal Visit	• Take patient history. Inform woman about prenatal screening and tests to be included. Complete all information on *Prenatal Screening Requisition* form including expected date of delivery (EDD) and gives to patient to test for the following infections: - HIV - Hepatitis B - Syphilis - Gonorrhea - Chlamydia - Rubella - Varicella • Once prenatal screening results received, provide medical follow-up as required. • Provide necessary information to AHS Zone (via Alberta Prenatal Record). • Re-screening for GC/CT in the 3rd trimester for high risk* women (e.g., at the time of GBS screening) • Re-screening at delivery for syphilis (all women)	• Complete testing as required and report results to ordering healthcare provider, Zone MOH, STICS and Alberta Health for the following, as applicable: - HIV antibody - Hepatitis B surface antigen - Syphilis EIA antibody, followed by rapid plasma reagin test (RPR), - Gonorrhea NAAT - Chlamydia NAAT - Rubella IgG antibody (will not be performed if previous testing indicates immunity) - Varicella IgG antibody (will not be performed if previous testing indicates immunity)	• Receive and review laboratory results. When notifiable diseases are identified will follow-up with healthcare provider and collect information on woman, including EDD. • Complete and submit the following forms in a timely fashion, where applicable, ensuring the expected date of delivery (EDD) is included: - Notification of STI form, - Notifiable Disease Report (NDR) form, - HIV/AIDS Case Report form	• Receive and review laboratory results. • Receive the NDR and HIV/AIDS forms.
Perinatal	• Follow recommendations for appropriate medical care to mother and baby. • Provide necessary information to local Zone MOH. • Screen high risk* women.	• Complete testing as ordered and report results to ordering healthcare provider, Zone MOH, STICS and Alberta Health.	• If required, ensure appropriate treatment and/or other follow-up for the mother and treatment or prophylaxis for the infant is provided as per current Alberta disease management guidelines.	• Prenatal report
Post-partum	• Follow disease-specific recommendations and provide appropriate medical care. • Provide information to Zone MOH on woman and infant. • Screen high risk* women and their babies.	• Complete testing as ordered and report results to ordering healthcare provider, Zone MOH, STICS and Alberta Health.	• Continue surveillance of the child until follow-up has been completed at 12–18 months of age as needed to complete public health follow-up. • Offer MMR and/or Varicella vaccine to seronegative woman, as appropriate.	• Prenatal report

**High risk: Individuals at higher risk for STI include but are not limited to: those previously positive with an STI during current pregnancy, those having sexual contact with person(s) with a known STI, sexually active under 25 years of age, a new sexual partner or >2 sexual partners in the past year, persons who inject drugs or use substances, persons who accept money or items for sex and their clients, street involved/homeless, anonymous sexual partnering, victims of sexual assault/abuse.*[1]

Human Immunodeficiency Virus (HIV)

Rationale for Prenatal HIV Screening

HIV transmission can be reduced in infants from 23–45% to less than 5% through screening of pregnant women and appropriate management of the HIV infected pregnant woman and infant in the pre-, ante- and post-partum periods.[2,3]

- Maternal-to-child transmission (MTCT) of HIV, which can occur during pregnancy, delivery or breastfeeding, is responsible for more than 90% of HIV infection in children worldwide.[4]
- The number of Canadian women living with HIV infection and becoming pregnant continues to increase.[4]
- The implementation of strategies, including prenatal screening, antiretroviral treatment and other appropriate interventions, can reduce the risk of maternal-to-child transmission to less than 5%.[2,3]
- HIV testing via the prenatal screening program helps to ensure that positive mothers are linked to appropriate pre- and post-partum care for themselves and their infants.

Perinatally-acquired HIV

- Untreated infants who acquire infection via MTCT, who have high viral loads and severe suppression of CD4+ T-lymphocyte counts have a poor prognosis for survival.[2]
- Symptoms include unexplained fevers, enlarged lymph nodes, failure to thrive, enlarged liver/spleen, persistent oral/diaper thrush, chronic parotitis, neurological dysfunction and recurrent bacterial/other opportunistic infections.[2]

- For more information refer to the following:
  - *HIV Public Health Notifiable Disease Management Guidelines*
  - *Alberta Treatment Guidelines for STIs in Adolescents and Adults 2018*
  - *Canadian Guidelines on STIs*

Screening Targets

Overall: No transmission of HIV infection to infants born to HIV-positive women in any given year.

- All pregnant women will be screened for HIV at the first prenatal visit and, if there is on-going risk, in the third trimester and at birth.
- All pregnant women who test HIV-positive will be informed of the positive test by an appropriate healthcare provider and referred to an Infectious Disease/HIV Specialist for appropriate care.
- All infants born to HIV-positive women will receive HIV prophylaxis.
- All infants born to HIV-positive women will have serology at or after 18 months of age.
- All infants born to HIV-positive women will test negative for HIV serology at or after 18 months of age.

Hepatitis B

Rationale for Prenatal Hepatitis B (HBV) Screening

Mother-to-child transmission (MTCT) of hepatitis B can be reduced from 90% to 9% via HBV screening of pregnant women and appropriate follow-up of the infant after delivery.[5]

- Maternal-to-child transmission (MTCT) of HBV can occur during pregnancy or at delivery depending on maternal viral load.[10,11]
- One dose each of Hepatitis B immune globulin (HBIG) and Hepatitis B vaccine, administered within 12 hours after birth, followed by two more doses of vaccine at 1 and 6 months are 95% effective in preventing both Hepatitis B infection and the chronic carrier state.[12]
- For more information, refer to the following:
  - *Hepatitis B (Chronic Carrier) Public Health Disease Management Guidelines*
  - *Alberta Immunization Policy*
  - *Alberta Treatment Guidelines for STIs in Adolescents and Adults 2018*
  - *Canadian Immunization Guide*
  - *Canadian Guidelines on STIs*

Perinatally-acquired HBV

- Infants and young children are usually asymptomatic.[6]
- 90% of infants who become infected with HBV will become chronic carriers.[7–9]
- 25% of these will eventually die from chronic liver disease.[10]
- Carriers can spread HBV even when they do not have symptoms.

Screening Targets

Overall: No transmission of HBV infection to infants born to HBV-positive mothers in any given year.

- All pregnant women will be screened for hepatitis B surface antigen (HBsAg). All women who test positive for HBsAg will be informed of the positive test by an appropriate healthcare provider[A].
- All infants born to HBsAg-positive women will receive prophylaxis.
- All infants born to HBsAg-positive women will have hepatitis B serology submitted at least one month[B] after completing prophylaxis.
- All infants born to HBsAg-positive women will test negative for HBsAg at least one month[A] after completing prophylaxis.

[A] In Alberta, HBsAg-positive pregnant women are monitored by public health from the moment the positive laboratory report is received until the time the infant's antibody status is determined. Each mother and infant is accounted for including those cases lost to follow-up, multiple births or resulting in fetal loss.
[B] Post-immunization serological testing may be done as early as 9 months of age, but no sooner than 1 month after the last dose of vaccine is administered. Testing should take place no more than 4 months after the final dose of vaccine is administered.[12]

Syphilis

Rationale for Prenatal Syphilis Screening

Infants can develop congenital syphilis when exposed to syphilis during pregnancy or delivery. Congenital syphilis can be prevented by screening pregnant women for syphilis, appropriately treating those who are infected, and/or preventing re-infection.[14]

- Approximately 40% of pregnancies will result in fetal demise for women with infectious syphilis.[15]
- The majority of infants with congenital syphilis are infected during pregnancy, however, they can also be infected at the time of delivery by contact with an active genital lesion.[12]
- The risk of transmission is much greater when the mother has untreated primary (100%), secondary (100%) or early latent syphilis (40%) in pregnancy than if she has late latent syphilis (10%).[12]
- For more information refer to the following:
  - *Syphilis Public Health Disease Management Guideline*
  - *Congenital Syphilis Public Health Disease Management Guideline*
  - *Alberta Treatment Guidelines for STIs in Adolescents and Adults 2018*
  - *Canadian Guidelines on STIs*

Congenital Syphilis

- 2/3 of children may be asymptomatic and will likely develop symptoms within 2 years.[12]
- Manifestations of early CS include necrotizing funisitis, syphilitic rhinitis ("snuffles"), mucocutaneous lesions, osteochondritis, and anemia.[13]
- Manifestations of late CS include Hutchinson triad (Hutchinson teeth, interstitial keratitis, and sensorineural hearing loss), intellectual disabilities, interstitial keratitis, bone involvement, and anemia.[13]
- Lymphadenopathy and hepatosplenomegaly are possible but non – specific.

Screening Targets

Overall: No cases of congenital syphilis will occur in any given year.

- All pregnant women will be screened for syphilis in the first trimester. If there is on-going risk, women will be re-screened throughout pregnancy.
- All pregnant women will be re-screened for syphilis at delivery.
- All pregnant women who test reactive for new syphilis infection will be informed of the positive test and be provided with appropriate counselling and management according to disease status by STI specialists.
- All pregnant women reactive for syphilis will be offered treatment for infectious or newly diagnosed syphilis as per the Alberta Treatment Guidelines for STIs in Adolescents and Adults 2018.
- All infants born to syphilis-reactive women will be assessed by a Paediatric Infectious Diseases (Peds–ID) specialist[A].

[A] In general, there is no need to recommend a Peds–ID consult for women treated for late latent syphilis during pregnancy.

- All infants with reactive syphilis results at birth will test negative at the recommended interval as determined by STI specialists.

Gonorrhea

Rationale for Prenatal Gonorrhea (GC) Screening

Perinatally-acquired GC can be prevented by screening pregnant women for GC, appropriately treating those who are infected, and/or preventing reinfection.

- MTCT of GC occurs as a result of passage through an infected cervix and/or the birth canal.
- A diagnosis of GC in a person is strongly associated with co-infection of CT.[12]
- Test of cure is recommended for all cases of GC.[21]
- For more information refer to the following:
  - *Gonococcal Infections Public Health Disease Management Guidelines*
  - *Alberta Treatment Guidelines for STIs in Adolescents and Adults 2018*
  - *Canadian Guidelines on STIs*

Perinatally-Acquired GC

- The most severe manifestations are ophthalmia neonatorum, conjunctivitis, sepsis and disseminated gonococcal infection.[12]
- Without preventive measures gonococcal ophthalmia can occur in up to 50% of infants exposed during delivery, leading to permanent visual impairment or blindness.[16–20]

Screening Targets

Overall: No cases of perinatally-acquired GC will occur in any given year.

- All pregnant women will be screened for GC in first trimester.
- All pregnant women who test positive at first trimester screen or are at high risk[A] for GC at first screen will be re-screened in the third trimester.
- All women screening positive for GC during pregnancy will be offered treatment and tested to ensure treatment was effective (test of cure) as per the Alberta Treatment Guidelines for STIs.
- All infants born to untreated GC-positive women will receive treatment and be referred to a Peds-ID specialist.

[A] High risk: Individuals at higher risk for STI include but are not limited to those previously positive with an STI during current pregnancy, those having sexual contact with person(s) with a known STI, sexually active under 25 years of age, a new sexual partner or >2 sexual partners in the past year, persons who inject drugs or use substances, persons who accept money or items for sex and their clients, street involved/homeless, anonymous sexual partnering, victims of sexual assault/abuse.[1]

Chlamydia

Rationale for Prenatal Chlamydia (CT) Screening

Perinatal-acquired CT can be prevented by screening pregnant women for CT, appropriately treating those who are infected, and/or preventing reinfection.

- Infants born to women with untreated CT infection at delivery have a 50% risk of acquiring CT.[23]
- The Public Health Agency of Canada recommends testing conjunctival and nasopharyngeal secretions of symptomatic infants and treating those who show positive results.[12]
- Test of cure is recommended for all cases of CT after 3–4 weeks.[21]
- For more information refer to the following:
  - *Chlamydia trachomatis* Infections Public Health Notifiable Disease Management Guidelines
  - *Alberta Treatment Guidelines for STIs in Adolescents and Adults 2018*
  - *Canadian Guidelines on STIs*

Perinatally-Acquired CT

- The most common clinical manifestations of CT in infants is conjunctivitis (inclusion blennorrhea). This will occur in 30–50% of infants born to a mother with active, untreated infection. Treatment of conjunctivitis usually results in healing without complications.[20]
- About 5–30% of infants born to mothers with cervical CT infection develop pneumonia.[22]

Screening Targets

Overall: No cases of perinatal-acquired CT will occur in any given year.

- All pregnant women will be screened for CT in first trimester.
- All pregnant women who test positive or are at high risk for CT at first trimester screen will be re-screened in the third trimester.
- All pregnant women screening positive for CT will be offered treatment for CT and tested to ensure treatment was effective (test of cure) as per the *Alberta Treatment Guidelines for STIs in Adolescents and Adults 2018*.
- All infants born to untreated CT-positive women will be closely monitored at birth for symptoms of perinatally-acquired CT.

Rubella

Rationale for Prenatal Rubella Screening

Congenital rubella syndrome (CRS) can be prevented by screening all pregnant women with no documented history of immunity and immunizing those with negative serology, if eligible, to prevent CRS in future pregnancies.

- Rubella is a highly infectious rash illness. An infected pregnant woman has approximately a 90% chance of transmitting rubella virus to her fetus in the first trimester, resulting in CRS.[26]
- Canada has not reported an locally-acquired case of rubella since 2005.[30]
- For more information refer to the following:
  - *Congenital Rubella Infection/Syndrome Public Health Notifiable Disease Management Guidelines*
  - *Alberta Immunization Policy*
  - *Canadian Immunization Guide*

Congenital Rubella Syndrome

- Fetal infections with rubella, especially within the first 20 weeks of pregnancy can result in fetal demise or fetal malformations such as: congenital heart disease, cataracts, deafness and mental retardation.[24–27]
- Children that survive infancy may face serious disabilities such as visual, hearing, autism and type I diabetes mellitus.[28]
- A small number of congenitally infected infants may shed the virus in the urine and nasopharyngeal secretions for 1 year or more.

Screening Targets

Overall: No cases of congenital rubella syndrome will occur in a given year.

- All women who seek prenatal care will be screened for rubella IgG antibody unless previously reported as positive.
- All women with negative (≤10 IU/mL) IgG serology for rubella will be assessed and, if eligible, be offered a rubella-containing vaccine (e.g., MMR) after delivery.

Varicella

Rationale for Prenatal Varicella Screening

Congenital varicella syndrome can be prevented by ensuring all women of childbearing age have immunity to varicella and by screening all pregnant women, with no documented history of immunity or immunization, for varicella antibodies.

- If a woman contracts varicella during the 1st or 2nd trimester, there is up to a 0.4–2% risk that the virus will infect the fetus, causing congenital varicella syndrome.(30)
- Severe neonatal varicella may occur in up to 30% of infants when the onset of maternal varicella was from five days before to two days after birth. The mortality rate of these infected infants can be 20–30%.(30)
- For more information refer to the following:
  - *Alberta Immunization Policy*
  - *Canadian Immunization Guide*

Congenital Variella Syndrome

- May be mild or severe.
- Manifestations may include low birth weight, skin scarring, ocular abnormalities, limb hypoplasia and microcephaly as well as a variety of other anomalies.(31)
- Almost one-third of affected infants die by the time they reach the second year of life.(32)

Screening Targets

Overall: No cases of congenital varicella syndrome will occur in any given year.

- All women who seek prenatal care will be screened for varicella IgG antibody unless previously reported as positive.
- All women with negative or indeterminate serology for varicella will, if eligible, be offered varicella vaccine after delivery.

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