Varicella rev Jan 2016

BASIC EPIDEMIOLOGY

Infectious Agent
Human (alpha) herpesvirus 3 (varicella-zoster virus, VZV) a member of the *Herpesvirus* group

Transmission
Direct contact with patient with varicella (chickenpox) or zoster (shingles); droplet or airborne spread of vesicle fluid (chickenpox and zoster) or secretions of the respiratory tract (chickenpox); indirectly by contaminated fomites. Scabs are not infectious.

Incubation Period
Usually 14-16 days but can be as short as 10 or as long as 21 days. May be prolonged after receipt of Varicella-Zoster Immune Globulin (VariZIG) and in the immunodeficient.

Communicability
Communicable 5 days before rash onset (especially 1-2 days before rash onset) and for up to 5 days after onset of lesions (until crusting). Communicability may be prolonged in persons with altered immunity.

Clinical Illness
Varicella, the primary infection with VZV, is an acute, generalized disease that occurs most commonly in children and is characterized by a maculopapular rash (few hours), then vesicular rash (3-4 days), often accompanied by fever. Lesions are typically more abundant on trunk; but sometimes present on scalp, mucous membranes of mouth and upper respiratory tract. Lesions commonly occur in successive crops, with several stages of maturity present at the same time. Lesions are discrete, scattered and pruritic. Mild, atypical and unapparent infections also occur.

Vaccinated persons with varicella may not have fever and may only have a few lesions that may resemble bug bites. Successive crops of lesions are unusual in vaccinated individuals. "Breakthrough" varicella which can be seen in previously vaccinated persons, is usually a mild illness characterized by few lesions, most of which are papular or papulovesicular.

DEFINITIONS

Clinical Case Definition
An illness with acute onset of diffuse (generalized) maculopapulovesicular rash without other apparent cause. In vaccinated persons who develop varicella more than 42 days after vaccination (breakthrough disease), the disease is almost always mild with fewer than 50 skin lesions and shorter duration of illness. The rash can also be atypical in appearance (maculopapular with few or no vesicles).

Laboratory Confirmation

- Isolation of VZV from a clinical specimen, OR
- Varicella antigen detected by direct fluorescent antibody (DFA), OR
- Varicella-specific nucleic acid detected by polymerase chain reaction (PCR), OR
- Significant rise in serum varicella immunolglobulin G (IgG) antibody level by any standard serologic assay.

Case Classifications

- **Confirmed**: A case that meets the clinical case definition AND is either laboratory confirmed OR epidemiologically linked to another probable or confirmed case.
- **Probable**: A case that meets the clinical case definition **without** epidemiologic linkage or laboratory confirmation.

Note: Two or more patients that meet clinical case definition and are epidemiologically linked to one another meet the confirmed case definition. See Varicella case status classification flow chart.

SURVEILLANCE AND CASE INVESTIGATION

Case Investigation

Local and regional health departments should **investigate most laboratory reports** of varicella. Confirmation of clinical case definition and ascertainment of vaccine history is needed for patients reported via lab result only. However, the following lab results do not require any follow up as they are almost always indicative of immunity or shingles.

- Any VZV lab result for people over 50 years of age.
- VZV IgG results for patients over 20 years of age.

Reports made via the varicella reporting form generally do not need investigation, unless the jurisdiction chooses to do so. There are some exceptions, however.

- Investigation into vaccination status should be done for any patients that are reported without vaccination history, especially for those that are school age.
- Deaths from varicella should be investigated**.**
- Hospitalized cases of varicella should be investigated.
- Outbreaks of varicella should be investigated.

Providing education to patients to prevent further spread of disease and encouraging timely vaccinations are also worthwhile activities. And discussing reporting requirements and exclusion criteria with healthcare providers, schools, and daycares is always encouraged.

Outbreak Investigation

In general, the threshold for an outbreak investigation should be 3 or more cases related in location (e.g., school, church, etc.) within a 3-week period. In the presence of nosocomial varicella of known or suspected concurrent streptococcal infections, or among populations at high risk for complications (e.g., immunocompromised or susceptible adolescents or adults), the threshold for response should be 2 cases.

Case Investigation Checklist

- ☐ Confirm that laboratory results meet the case definition.
- ☐ Confirm clinical case definition.
- ☐ Review medical records or speak to an infection preventionist or physician to verify case definition and vaccination status.
    - The Varicella (Chickenpox) Reporting Form can be used to record information collected during the investigation.
- ☐ Determine vaccination status of the case. Sources of vaccination status that should be checked include:
    - Case (or parent), ImmTrac, school nurse records, primary care provider, etc.
- ☐ Identify close contacts and ensure appropriate control measures are implemented (see control measures below).
- ☐ In the event of a death, copies of the hospital discharge summary, death certificate, and autopsy report should also be faxed to DSHS EAIDB.
    - The Varicella Death Investigation Form must also be completed and submitted to EAIDB.
- ☐ The Varicella (Chickenpox) Reporting Form does not need to be submitted to EAIDB.
- ☐ All confirmed and probable case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

Control Measures

If VariZIG is indicated, it will need to be purchased by the provider. VariZIG can be ordered from one of two distributors: FFF Enterprises (California), 800-843-7477 www.fffenterprises.com and ASD Healthcare (Texas), 800-746-6273, www.asdhealthcare.com. DSHS does not stock variZIG.

- **Healthy Persons**
    - Varicella vaccine is recommended for post-exposure administration for unvaccinated persons, 12 months of age or older, without other evidence of immunity.
    - The varicella vaccine should be administered within days after exposure in order to be effective.
    - Persons who have not received 2 doses should be brought up to date.
    - VariZIG is not recommended for healthy, full-term infants who are exposed post-natally, even if their mothers have no history of varicella.

- **Pregnant women**
    - Evidence of varicella immunity should be obtained as soon as possible. If no varicella antibody is detectable, VariZIG should be strongly considered for pregnant women who have been exposed.
    - VariZIG should be given as soon as possible and within 10 days of exposure.
    - Administration of VariZIG to these women has not been found to prevent viremia, fetal infection, congenital varicella syndrome, or neonatal varicella.
    - The primary indication for VariZIG in pregnant women is to prevent complications of varicella in the pregnant mother rather than to protect the fetus. Susceptible pregnant women are at risk for associated complications when they contract varicella. Varicella causes severe maternal morbidity, and 10%-20% of infected women develop varicella pneumonia, with mortality reported as high as

40%. Their babies may also develop Congenital Varicella Syndrome, which may lead to severe complications, even death of the newborn.
    - Women known to be pregnant or attempting to become pregnant should not receive a varicella-containing vaccine.

- **Newborn infants:**
    - CDC recommends VariZIG to newborns infants whose mothers develop chickenpox with 5 days before delivery up to 48 hours after delivery.

- **Premature neonates exposed post-natally:**
    - CDC recommends VariZIG to hospitalized premature infants born at greater or equal to 28 weeks of gestation, whose mothers do not have evidence of immunity to varicella.
    - VariZIG is also recommended for hospitalized premature infants born less than 28 weeks of gestation or who weigh $\leq$ 1,000g at birth, regardless of their mother's evidence of immunity to varicella.

- **Health-Care Personnel (HCP):**
    - Nosocomial transmission of varicella is well recognized. To prevent disease and nosocomial spread, vaccination is recommended routinely for all health care personnel without evidence of immunity and is the preferred method for preventing varicella in health-care settings. Preferably, HCP should be vaccinated when they begin employment. Routine testing for varicella immunity after 2 doses of vaccine is not recommended for the management of those fully vaccinated.
    - HCP who have received 2 doses of vaccine and who are exposed should be monitored daily during days 10-21 after exposure through the employee health program or by an infection control nurse to determine clinical status.
    - HCP who have received 1 dose of vaccine and who are exposed should receive the second dose with single-antigen varicella vaccine within 3-5 days after exposure.
    - Unvaccinated HCP who have no other evidence of immunity who are exposed to VZV are potentially infective from days 10-21 after exposure and should not have patient contact during this period. They should receive post-exposure vaccination as soon as possible.

- **Immunocompromised patients:**
    - This category is comprised of persons who have primary and acquired immune-deficiency disorders, neoplastic diseases and those who are receiving immunosuppressive treatment. Most immunocompromised persons should not receive varicella vaccine.
    - Patients receiving monthly high-dose ($\geq$ 400 mg/kg) Immune Globulin Intravenous (IGIV) are likely to be protected and probably do not require VariZIG if the most recent dose of IGIV was administered $\leq$ 3 weeks before exposure.
    - CDC recommends VariZIG to immunocompromised patients without evidence of immunity.

- **Child-care facility setting:**
  - Varicella vaccine (or history of prior disease) is required for all children (≥ 12 months of age) to enroll in any licensed child-care facility in Texas, and vaccine is recommended for all susceptible children (≥ 12 months of age).

- **Persons who have contraindications to vaccination:**
  - Persons with a severe allergic reaction to a vaccine component or following a prior dose of vaccine should not receive varicella vaccine. Women known to be pregnant or attempting to become pregnant should not receive a varicella-containing vaccine. Vaccinations of persons with moderate or severe acute illness should be postponed until the condition has improved.

Exclusion

- Exclude from work, school and health care facilities until vesicles become dry OR until 24 hours pass without new lesions.
- In the hospital, strict isolation is appropriate because of the risk of serious varicella complications in immunocompromised susceptible patients.

REPORTING AND DATA ENTRY REQUIREMENTS

Provider, School, Child-Care Facility, and General Public Reporting Requirements
Confirmed and clinically suspected cases are required to be reported **within 1 week** to the local or regional health department or to DSHS EAIDB at **(800) 252-8239 or (512) 776-7676.**

Local and Regional Reporting and Follow-up Responsibilities
Local and regional health departments should:

- Enter the case into NBS and submit an NBS notification on all **confirmed and probable** cases to DSHS within 30 days of receiving a report of confirmed case.
  - Please refer to the *NBS Data Entry Guidelines* for disease-specific entry rules.
  - A notification can be sent as soon as the case criteria have been met. Additional information from the investigation may be entered upon completing the investigation.
- Fax (or mail) a completed investigation form within 30 days of completing the investigation.
  - **In the event of a death, copies of the hospital discharge summary, death certificate, autopsy report and death investigation form should also be sent to DSHS EAIDB. Please notify EAIDB when the death is reported.**
  - Investigation forms may be faxed to **512-776-7616** or mailed to:

    Infectious Disease Control Unit
    Texas Department of State Health Services
    Mail Code: 1960
    PO Box 149347
    Austin, TX 78714-9347

When an outbreak is investigated, local and regional health departments should:

- Report outbreaks within 24 hours of identification to the regional DSHS office or to EAIDB 512-776-7676

LABORATORY PROCEDURES

Specimens associated with varicella cases are not routinely submitted to the DSHS laboratory in Austin. However, PCR (preferred) and viral testing (not preferred) are available through the DSHS laboratory. Serology testing is not currently available at DSHS. Before shipping specimens, be sure to notify DSHS EAIDB VPD staff at **(512) 776-7676.**

The CDC also does varicella PCR testing and providers can usually ship directly to CDC for varicella (unlike other diseases). Information about submitting to CDC can be found here: http://www.cdc.gov/chickenpox/lab-testing/collecting-specimens.html

PCR Specimen Collection and Submission (preferred)

Specimen Collection

- The preferred specimens are scabs, vesicle fluids or skin scrapings.
- Specimens should be collected as close to onset date as possible and no later than 1 week from onset date.
- Do NOT use any media. Specimens should be submitted in a dry tube.
- Synthetic swabs should be used. Do not use cotton swabs for specimen collection. Instructions for how to collect different types of varicella specimens for PCR can be found here: http://www.cdc.gov/chickenpox/lab-testing/collecting-specimens.html

Submission Form

- Use Specimen Submission Form G-2V.
- Make sure the patient's name and date of birth/social security number match exactly what is written on the container.
- Mark the date of onset and date of collection. Write in VZV PCR as the test to be performed.

Specimen Shipping

- Specimens should be sent at ambient temperature.
- Specimens can be sent regular mail, but ensure they will not arrive on a weekend or holiday.
- Ship specimens to:

  Laboratory Services Section, MC-1947
  Texas Department of State Health Services
  Attn. Walter Douglass (512) 776-7569
  1100 West 49th Street
  Austin, TX 78756-3199

Causes for Rejection:

- Specimen submitted on a preservative such as formalin or submitted in viral transport media.

Viral Isolation Specimen Collection and Submission (not preferred)

Specimen Collection

- The preferred specimens are vesicle fluids or skin scrapings.
- Specimens should be collected as close to onset date as possible and no later than 1 week from onset date.
- Place swab in 1-2 mL of viral transport media. Synthetic swabs should be used. Do not use cotton swabs for specimen collection.

Submission Form

- Use Specimen Submission Form G-2V.
- Make sure the patient's name and date of birth/social security number match exactly what is written on the container.
- Mark the laboratory test requested (viral isolation), date of onset, and date of collection. List the suspected virus or disease in the Virology section.

Specimen Shipping

- Maintain specimens at 2-8°C immediately after collection. Specimens not received at the lab within 12 hours of collection should be frozen at -70ºC. Specimens should be shipped on dry ice.
- DO NOT mail on a Friday unless special arrangements have been pre-arranged with DSHS Laboratory.
- Ship specimens to:

Laboratory Services Section, MC-1947
Texas Department of State Health Services
Attn. Walter Douglass (512) 776-7569
1100 West 49th Street
Austin, TX 78756-3199

Causes for Rejection:

- Specimen submitted on a preservative such as formalin

UPDATES

- Updated case investigation section to highlight when investigations should be done (outbreaks, hospitalizations, deaths, missing vaccination history) and to highlight importance of provider/reporter and patient education.
- Deleted CDC information request for outbreak cases as the CDC no longer requests that information.
- Added link to CDC laboratory submission website.

Varicella:
Case Status Classification