Chickenpox (Varicella)
Clinician Fact Sheet

Agent: Varicella-zoster virus, belonging to the *Herpesvirus* group.

Symptoms:
Chickenpox often starts with a mild prodrome of low-grade fever and malaise. After a day or two of prodrome or as the first evidence of illness, the generalized, pruritic (itchy) rash begins along with constitutional symptoms (anorexia, listlessness).

The rash initially appears on the face and trunk, and then spreads to the arms and legs. It may also infect mucous membranes of the oropharynx, respiratory tract, vagina, conjunctiva, and the cornea. It develops into superficial, delicate vesicles that break, leaving open sores that dry and crust over into brown scabs. Chickenpox sores appear in crops, with lesions in several stages of development (maculopapules, vesicles, scabs) present at the same time.

Severity:
Adults generally have more severe disease and a higher incidence of complications than children. Certain high risk persons including immunocompromised children, susceptible pregnant females, and premature infants of less than 28 weeks gestation are also prone to severe complications of the disease.

Differential Diagnosis:
The differential diagnosis includes smallpox, herpes simplex virus, coxsackie viruses, and impetigo. Smallpox lesions start on the extremities, whereas chickenpox lesions start on the trunk. Smallpox lesions are all in the same stage of development (crop) versus chickenpox lesions that are in different stages of development.

Clinical case definition:
An illness with acute onset of diffuse (generalized) maculo-papulovesicular rash without other apparent cause.

Laboratory criteria for diagnosis
- Positive polymerase chain reaction for Varicella-zoster virus
- IgM serology
- Direct fluorescent antibody to Varicella-zoster virus

Case classification
Confirmed:
- An illness with acute onset of diffuse (generalized) maculo-papulovesicular rash without other apparent cause. AND
- Laboratory confirmed OR
- Epidemiologically linked to a confirmed or probable case

Probable:

- An illness with acute onset of diffuse (generalized) maculo-papulovesicular rash without other apparent cause. AND
- Not epidemiologically linked to a confirmed or probable case.

Two ***probable*** cases that are epidemiologically linked can be considered ***confirmed***, even in the absence of laboratory testing.

Epidemiology:

Chickenpox can occur sporadically year-round, however outbreaks occur most frequently in winter and early spring. Chickenpox affects males and females equally, and people of all races are susceptible.

Before the availability of a vaccine, chickenpox mainly affected children, with at least 90% of the population acquiring chickenpox by the age of 15 years. The highest age-specific incidence was among children 1-4 years of age, followed by children 5-9 years of age. Since the introduction of the vaccine, the incidence of chickenpox and disease-related hospitalizations has decreased by 70-80%. Cases have declined across all age groups, but mostly in children 1-4 and 5-9 years of age.
Reye syndrome is a rare complication that occurs in children with chickenpox or influenza that have taken aspirin. The etiology of Reye syndrome is unknown.

Since 2004, 60% of all chickenpox cases reported to the Utah Department of Health are in children 5-9 years of age, followed by 23% in children 10-14 years of age. Since 2004, an average of 48 cases of chickenpox are reported each month, with the most cases being reported February – May, and October and November. The average number of cases each month remains the same for persons less than 4 years of age and 15 years of age and older. During the summer months (June, July, and August) the average number of cases reported in children 5-14 years of age decreases dramatically, suggesting that transmission primarily occurs in schools.

Diagnostic Testing:

Chickenpox is generally diagnosed clinically. Laboratory testing may be appropriate if the presentation is unusual. Lab test methods include:

- Serology (IgM) – this is the lowest cost alternative, but results early in the disease may be equivocal and require additional testing in 10-14 days.
- PCR – this is the method of choice for laboratory diagnosis, but may have limited availability and the cost may be prohibitive.
- DFA – a lower cost alternative to PCR, somewhat less sensitive.

PCR/DFA specimens should be collected by unroofing a vesicle and collecting the fluid on a polyester swab. Crusts from lesions may also be used.

Treatment:

Several antivirals are active against VZV, including acyclovir, valacyclovir, famciclovir, and foscarnet. Valacyclovir and famciclovir are approved for use only in adults. These drugs may be beneficial if given within 24 hours of onset of rash. Studies suggest that they may result in a reduction in the severity of disease and the number of days in which

new lesions appear. Antiviral drugs have **not** been shown to decrease transmission of chickenpox, reduce the duration of absence from school, or reduce complications. Antivirals are not recommended for routine treatment of otherwise healthy infants and children. Antivirals may be considered for:

- Persons older than 13 years
- Persons with a chronic cutaneous or pulmonary disorders
- Persons receiving long-term salicylate therapy
- Children receiving short, intermittent or aerosolized courses of corticosteroids
- Immunocompromised children and adults with viral-mediated complications should receive intravenous administration

Management of People Exposed to Chickenpox:

Vaccination:

Vaccination is the primary method of prevention. A live, attenuated vaccine has been available since 1995. It is recommended that the following groups be vaccinated:

- All children <13 years of age should routinely be given two doses of varicella-containing vaccine. The first dose should be given at 12-15 months of age and the second at 4-6 years of age. The second dose can be given at an earlier age provided it has been at least 3 months since the first dose. However, if the second dose is given at least 28 days after the first, the second dose does not need to be repeated.
- A second dose catch-up varicella vaccination is recommended for children and adolescents who previously had received one dose. Catch-up second dose can be administered at any interval longer than 3 months after the first dose.
- All other individuals ≥13 years of age without evidence of immunity should be vaccinated with two doses of varicella vaccine separated by 4-8 weeks.

Prophylaxis:

Varicella-zoster immune globulin (VariZIG) can prevent chickenpox if given within 72 hours of exposure. It is recommended for use in high-risk persons including:

- Immunocompromised patients.
- Neonates whose mothers have signs and symptoms of chickenpox around the time of delivery (i.e., 5 days before to 2 days after).
- Premature infants born at ≥28 weeks of gestation who are exposed during the neonatal period and whose mothers do not have evidence of immunity.
- Premature infants born at <28 weeks of gestation or who weigh ≤1,000 g at birth and were exposed during the neonatal period, regardless of maternal history of chickenpox disease or vaccination.
- Pregnant women.

VariZIG is available under an investigational new drug application submitted to the FDA (as of March, 2006). It can be acquired for prestocking or immediate use through a single distributor, FFF Enterprises. For additional information on acquiring VariZIG, please visit http://www.fffenterprises.com/web_pages/varizig_protocol.html. For dosage and administration recommendations, please reference MMWR 55(08);209-210 http://www.cdc.gov/mmwR/preview/mmwrhtml/mm5508a5.htm.

If VariZIG is unavailable, IGIV (intravenous immunoglobulin) can be used. Vaccination within 3 days, and possibly 5 days, of exposure has been shown to prevent or reduce the severity of disease.

Antiviral Treatment:
Several antivirals are active against VZV, however, they are not recommended for routine treatment of otherwise healthy infants and children.

Exclusion from School or Daycare:
Persons with symptoms should be excluded from school/childcare until all lesions have scabbed over, even if no laboratory confirmation is performed or an outbreak is not recognized.

Vaccine/ Immunization:

For up to date information on chickenpox vaccine, including possible adverse events and reporting, please consult www.immunize-utah.org or www.cdc.gov/nip.

References:

1. Centers for Disease Control and Prevention. *Epidemiology and Prevention of Vaccine-Preventable Diseases*. Atkinson W, Hamborsky J, McIntyre L, Wolfe S, eds. 9th ed. Washington DC: Public Health Foundation, 2006.
2. Centers for Disease Control and Prevention. *Manual for the Surveillance of Vaccine-Preventable Diseases*. Wharton M, Hughes H, Reilly M, eds. 3rd ed. Centers for Disease Control and Prevention, 2002.
3. Control of Communicable Diseases Manual (18th Edition), David L. Heymann MD, Ed., 2004.
4. Centers for Disease Control and Prevention. *Public Health Response to Varicella Outbreaks – United States, 2003-2004*. MMWR 2006; 55(36):993-995.
5. ACIP. *ACIP Provisional Recommendations for Prevention of Varicella*. 2005.
6. Red Book: 2003 Report of the Committee on Infectious Diseases (26th Edition), Larry K. Pickering MD, Ed. 2003.
7. Centers for Disease Control and Prevention. *A New Product (VariZIG™) for Postexposure Prophylaxis of Varicella Available Under an Investigational New Drug Application Expanded Access Protocol*. MMWR 2006; 55(8): 209-210.

Utah Department of Health
Office of Epidemiology

May 4, 2007