Health Benchmarks® Program
Clinical Quality Indicator Specification 2011

Measure Title	CHILDHOOD IMMUNIZATION: VARICELLA-ZOSTER VIRUS (VZV)
Disease State	Varicella
Indicator Classification[1]	Prevention
Strength of Recommendation[2]	A
Organizations Providing Recommendation	Centers for Disease Control and Prevention American Academy of Pediatrics
Clinical Intent	To ensure that all eligible children receive at least 1 VZV vaccine by their second birthday.

Background

Disease Burden

- Prior to the introduction of the varicella vaccine in 1995, the Centers for Disease Control and Prevention (CDC) estimated the yearly incidence of chickenpox in the United States at approximately 4 million cases with nearly 11,000 admissions and 100 to 150 deaths.[1, 2]
- At least 90% of the cases occurred in children less than 15 years of age.[3]

Reason for Indicated Intervention or Treatment

- Despite recommendations starting in 1995 by the American Academy of Pediatrics and 1996 by the Advisory Committee on Immunization Practices to use the varicella vaccination, underutilization of the vaccine is still leading to hospitalizations, serious complications, and death.[4]
- In an average household, a child with varicella-zoster virus (VZV) misses 8 or 9 days of school, and adult caretakers lose up to 2 days of work.[5] Infection in high-risk children can lead to serious complications and death.[3, 6-8]
- When breakthrough infections occur, patients who have been vaccinated have milder disease than those with natural disease.[9-11]

Evidence Supporting Intervention or Treatment

- A randomized, double-blind, placebo-controlled trial demonstrated that the live attenuated varicella-zoster vaccination was 98% effective in preventing chickenpox in healthy children between the ages of 1 and 14 over two varicella seasons, and 95% effective after 7 years.[9, 10] At 10 years post-vaccination, the vaccine efficacy for patients who received one varicella injection was 94.4%.[11] The varicella cases that did occur were considerably milder than the natural disease.[9-11]
- The varicella-zoster vaccination has also been shown to be effective during outbreaks (i.e. characterized by intense exposure). In a

	retrospective cohort study conducted at a child care center in Georgia, the frequency of varicella was significantly reduced (14% vs. 88%) in children who had received the vaccine versus unvaccinated children. When the disease did occur in the vaccinated children it was much less severe and resulted in fewer days of absence from the child care center.[12] • Other non-randomized studies estimated the varicella vaccine efficacy at 86-98% [13-17], with breakthrough infections resulting in milder disease than natural varicella.[18, 19] • After the introduction of the varicella vaccine, the incidence of chickenpox between 1999 and 2001 in four states with consistent reporting of the disease was 0.3 to 1.0 per 1,000 people, compared to 1.1 to 3.8 per 1,000 people from 1990 -1994, the pre-varicella-vaccine era. The reductions were associated with steadily increasing vaccination rates in those states.[1] • A similar decrease in varicella related hospitalizations and death was seen after the introduction of the varicella vaccine.[20, 21] • A review of 19 studies found that single does varicella vaccine was 84.5% (44%-100%) effective in preventing all varicella and 100% effective in preventing severe varicella.[22]
Clinical Recommendations	• In 2007 the Advisory Committee on Immunization Practices (ACIP) from the Centers for Disease Control and Prevention and the American Academy of Pediatrics Committee on Infectious Diseases recommend, as part of routine childhood vaccination schedule, 2 doses of varicella vaccine – 1st dose at age 12-15 months and a 2nd dose at age 4-6 years.[20, 21]
Source	Healthcare Effectiveness Data and Information Set (HEDIS®) 2011 Technical Specification for Physician Measurement

Denominator	
Denominator Definition	Continuously enrolled children who had their 2nd birthday during the measurement year.
Denominator Index Date	Date of 2nd birthday
Denominator Encounters/Claims Criteria	N/A

Denominator Exclusion	
Denominator Exclusion Definition	Members with contraindications for VZV at any time on or before the index date. *Note: Children who had a contraindication for a specific vaccine should be*

	excluded from the denominator for all antigen rates and combination rates. The denominator for all rates must be the same. A user organization that excludes contraindicated children may do so only if the electronic data do not indicate that the contraindicated immunization was rendered. The exclusion must have occurred by the 2nd birthday. (HEDIS®, 2011) *If the organization uses the same sample as for the Lead Screening in Children measure, the same children will be excluded from the Lead Screening in Children measure. (HEDIS®, 2011)*
Denominator Exclusion Claims Criteria	ICD-9 diagnosis code(s): 042, 200.xx-202.xx**,** 203.xx, 204.xx-208.xx, 279.xx, 999.4, V08

Numerator	
Numerator Definition	Members with at least 1 VZV vaccination any time on or before the index date. Alternatively, members with a history of chickenpox any time on or before the index date.
Numerator Claims Criteria	CPT-4 code(s): 90710, 90716 ICD-9 diagnosis code(s): 052.xx, 053.xx

Physician Attribution	
Physician Attribution Description	If child meets numerator criteria, score all physicians that saw the member from 11 months of age through the index date. Likewise, if child does not meet numerator criteria, score all physicians that saw the member from 12 months of age through the index date.

References

1. *Decline in annual incidence of varicella--selected states, 1990-2001.* MMWR Morb Mortal Wkly Rep, 2003. **52**(37): p. 884-5.
2. Marin M, Meissner HC, and J. Seward, *Varicella Prevention in the United States: A Review of Sucesses and Challenges.* Pediatrics, 2008. **122**(3): p. e744-e751.
3. Preblud, S.R., *Varicella: complications and costs.* Pediatrics, 1986. **78**(4 Pt 2): p. 728-35.
4. *Varicella: The Chickenpox Vaccine. .* American Academy of Pediatrics, 2000.
5. Jackson, M.A., V.F. Burry, and L.C. Olson, *Complications of varicella requiring hospitalization in previously healthy children.* Pediatr Infect Dis J, 1992. **11**(6): p. 441-5.
6. Guess, H.A., et al., *Chickenpox hospitalizations among residents of Olmsted County, Minnesota, 1962 through 1981. A population-based study.* Am J Dis Child, 1984. **138**(11): p. 1055-7.
7. Fleisher, G., et al., *Life-threatening complications of varicella.* Am J Dis

Child, 1981. **135**(10): p. 896-9.
8. Kuter, B.J., et al., *Oka/Merck varicella vaccine in healthy children: final report of a 2-year efficacy study and 7-year follow-up studies.* Vaccine, 1991. **9**(9): p. 643-7.
9. Weibel, R.E., et al., *Live attenuated varicella virus vaccine. Efficacy trial in healthy children.* N Engl J Med, 1984. **310**(22): p. 1409-15.
10. Kuter, B., et al., *Ten year follow-up of healthy children who received one or two injections of varicella vaccine.* Pediatr Infect Dis J, 2004. **23**(2): p. 132-7.
11. *Varicella-related deaths among children--United States, 1997.* Can Commun Dis Rep, 1998. **24**(13): p. 108-11.
12. Izurieta, H.S., P.M. Strebel, and P.A. Blake, *Postlicensure effectiveness of varicella vaccine during an outbreak in a child care center.* Jama, 1997. **278**(18): p. 1495-9.
13. White, C.J., et al., *Varicella vaccine (VARIVAX) in healthy children and adolescents: results from clinical trials, 1987 to 1989.* Pediatrics, 1991. **87**(5): p. 604-10.
14. Johnson, C.E., et al., *Live attenuated varicella vaccine in healthy 12- to 24-month-old children.* Pediatrics, 1988. **81**(4): p. 512-8.
15. Arbeter, A.M., S.E. Starr, and S.A. Plotkin, *Varicella vaccine studies in healthy children and adults.* Pediatrics, 1986. **78**(4 Pt 2): p. 748-56.
16. Arbeter, A.M., et al., *Varicella vaccine trials in healthy children. A summary of comparative and follow-up studies.* Am J Dis Child, 1984. **138**(5): p. 434-8.
17. Vazquez, M., et al., *The effectiveness of the varicella vaccine in clinical practice.* N Engl J Med, 2001. **344**(13): p. 955-60.
18. Watson, B.M., et al., *Modified chickenpox in children immunized with the Oka/Merck varicella vaccine.* Pediatrics, 1993. **91**(1): p. 17-22.
19. White, C.J., et al., *Modified cases of chickenpox after varicella vaccination: correlation of protection with antibody response.* Pediatr Infect Dis J, 1992. **11**(1): p. 19-23.
20. Marin, M., et al., *Prevention of varicella: recommendations of the Advisory Committee on Immunization Practices (ACIP).* MMWR Recomm Rep, 2007. **56**(RR-4): p. 1-40.
21. *Prevention of varicella: recommendations for use of varicella vaccines in children, including a recommendation for a routine 2-dose varicella immunization schedule.* Pediatrics, 2007. **120**(1): p. 221-31.
22. Seward, J.F., M. Marin, and M. Vazquez, *Varicella vaccine effectiveness in the US vaccination program: a review.* J Infect Dis, 2008. **197 Suppl 2**: p. S82-9.

[1] **Indicator Classification** (Adapted from HEDIS® technical specifications)

Diagnosis	Measures applicable to patients receiving diagnostic workups for a symptom or condition that delineate appropriate laboratory or radiological testing to be performed (e.g., evaluation of thyroid nodule; pregnancy test in patients with vaginal bleeding or abdominal pain).
Effectiveness of Care	
Prevention	Measures applicable to asymptomatic individuals that are designed to prevent the onset of the targeted condition (e.g., immunizations).
Screening	Measures applicable to asymptomatic patients who have risk factors or pre-clinical disease, but in whom the condition has not become clinically apparent (e.g., pap smears; screening for elevated blood pressure).
Disease Management	Measures applicable to individuals diagnosed with a condition that are part of the treatment or management of the condition (e.g., cholesterol reduction in patients with diabetes; radiation therapy following breast conserving surgery; appropriate follow-up after acute event).
Medication Monitoring	Measures applicable to patients taking medications with narrow therapeutic windows and / or potential preventable significant side effects or adverse reactions (e.g., thyroid stimulating hormone (TSH) testing after levothyroxine dose change; hepatic enzyme monitoring for patients using antimycotic pharmacotherapy).
Medication Adherence	Measures applicable to patients taking medications for chronic conditions that are designed to assess patient adherence to medication (e.g., adherence to lipid lowering medication).
Utilization	Measures applicable to patients receiving treatment for a symptom or condition that advocate appropriate utilization of laboratory and pharmaceutical resources (e.g., conservative use of imaging for low back pain; inappropriate use of antibiotics for viral upper respiratory infection).

[2] **Strength of Recommendation**

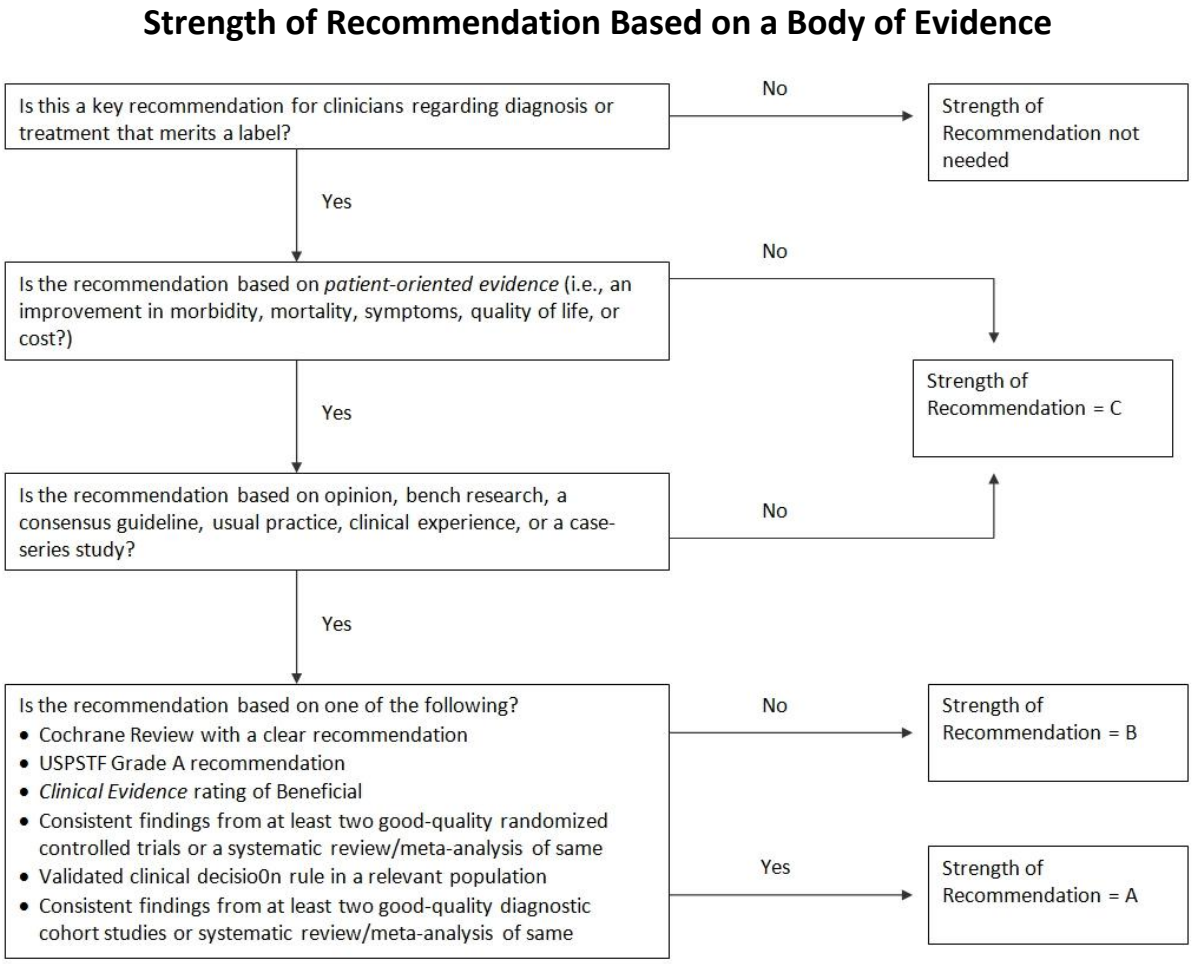

FIGURE 2. Algorithm for determining the strength of a recommendation based on a body of evidence (applies to clinical recommendations regarding diagnosis, treatment, prevention, or screening). While this algorithm provides a general guideline, authors and editors may adjust the strength of recommendation based on the benefits, harms, and costs of the intervention being recommended. (USPSTF = U.S. Preventive Services Task Force)