

## Best Evidence Statement (BESt)

**Date published/posted: 11-10-10**

**Topic:** Due to the effect of pneumococcal infection among children with Sickle Cell Disease (SCD), The Comprehensive Sickle Cell Center makes immunizing these children a priority. This evidence review was undertaken to identify any research/evidence determining best practice aimed at maximizing immunization rates in this population.

**Clinical Question:** Among children with SCD does providing a structured process of confirming immunization status at each healthcare provider encounter and immunizing appropriately, compared to standard care, increase immunization rates of the influenza and pneumococcal vaccines?

**Target:** All Children with Sickle Cell Disease, ages newborn through 21 years

**Recommendation:** It is recommended that a combined provider and system based approach is used to improve immunization against influenza and pneumococcal infection in children with SCD (Ndiaye, 2005 [1a]; local consensus [5]).

**Note:** Provider based approaches include checking immunization records at each encounter (including inpatient admissions), calling community based primary care physicians to obtain immunization records as indicated, and patient reminder calls and flyers (Hambridge, 2009 [2a]; Verani, 2007 [4a]; Ndiaye, 2005 [1a]). System based approaches include the use of a single State registry and community based coalitions (Findley, 2006 [4a]; Irigoyen, 2006 [2a]; Kempe, 2004 [4a]).

**Discussion/summary of evidence:** Immunization registries are frequently used. The evidence demonstrates that they can be effective when children see multiple providers but are hampered by systems issues, such as incomplete vaccination data, incorrect patient contact information, and provider missed opportunities (Irigoyen, 2006 [2a]; Kempe, 2004 [4a]).

Multiple studies demonstrated that provider or systems based approaches were effective in improving childhood immunization rates. Interventions such as case management in combination with home visits, reminder cards, provider use of immunization registries, phone calls, and a community based coalition demonstrated the ability to increase immunization rates in healthy children (Verani, 2007 [4a]; Wood, 1998 [2a]; Hambridge, 2009 [2a]; Findley, 2006 [4a]; Hawe, 1998 [2a]).

A systematic review of 35 studies provided strong evidence that provider or system based approaches are effective both when used alone or in combination to improve immunization rates of medically high risk adults (Ndiaye, 2005 [1a]).

No studies were found that addressed influenza and pneumococcal vaccination in children with SCD or in any other medically high risk children.

Grade of body of evidence is moderate (due to no direct evidence about the specific population).

**Health Benefits, Side Effects and Risks:** protection against pneumococcal infection. Side effects: fever, soreness. Risks: standard risks of getting immunizations (fever, soreness, rash)

**References:**

- Bundy, D., Strouse, J., Casella, J., & Miller, M. (2010). Burden of influenza-related hospitalizations among children with sickle cell disease. *Pediatrics*, 125(2), 234-241. [4a]
- Findley, S., Irigoyen, M., Sanchez, M., Guzman, L., & Mejia, M. (2006). Community-based strategies to reduce childhood immunization disparities. *Health Promotion Practice*, 7(3), 191-200. [4a]
- Hambidge, S., Phibbs, S., Chandramouli, V., Fairclough, D., & Steiner, J. (2009). A stepped intervention to increased well-child care and immunization rates in a disadvantaged population. *Pediatrics*, 124(2), 455-463. [2a]
- Hawe, P., McKenzie, N., & Scurry, R. (1998). Randomised controlled trial of the use of a modified postal reminder card on the uptake of measles vaccination. *Archives of Disease in Childhood*, 79, 136-140. [2a]
- Irigoyen, M., Findley, S., Wang, D., Chen, S., & Chimkin, F. (2006). Challenges and successes of immunization registry reminders at inner-city practices. *Ambulatory Pediatrics*, 6(2), 100-104. [2a]
- Kempe, A., Beaty, B., Steiner, J., Pearson, K., & Lowery, E. (2004). The regional immunization registry as a public health tool for improving clinical practice and guiding immunization delivery policy. *American Journal of Public Health*, 94(6), 967-972. [4a]
- Mehta, S, Afenyi-Annan, A, Byrns, P, & Lottenberg, R. (2006). Opportunities to improve outcomes in sickle cell disease. *American Family Physician*, 74(2), 303-310. [5]
- Ndiaye, S.M., Hopkins, D.P., Shefer, A.M., Hinman, A.R., Briss, P.A., Rodewald, L., & Willis, B. (2005). Interventions to improve influenza, pneumococcal polysaccharide, and hepatitis B vaccination coverage among high-risk adults: A systematic review. *American Journal of Preventive Medicine*, 28(5S), 248-279. [1a]
- Verani, J., Irigoyen, M., Chen, S., & Chimkin, F. (2007). Influenza vaccine coverage and missed opportunities among inner-city children aged 6 to 23 months: 2000-2005. *Pediatrics*, 119(3), 580-586. [4a]
- Wood, D., Halfon, N., Donald-Sherbourne, C., Mazel, R., & Schuster, M. (1998). Increasing immunization rates among inner-city, African American children. *Journal of the American Medical Association*, 279(1), 29-34. [2a]

Note: Full tables of evidence grading system available in separate document:

- [Table of Evidence Levels of Individual Studies by Domain, Study Design, & Quality](#) (abbreviated table below)
- [Grading a Body of Evidence to Answer a Clinical Question](#)
- [Judging the Strength of a Recommendation](#) (abbreviated table below)

**Table of Evidence Levels** (see note above)

<i>Quality level</i>	<i>Definition</i>
1a† or 1b†	Systematic review, meta-analysis, or meta-synthesis of multiple studies
2a or 2b	Best study design for domain
3a or 3b	Fair study design for domain
4a or 4b	Weak study design for domain
5	Other: General review, expert opinion, case report, consensus report, or guideline

†a = good quality study; b = lesser quality study

**Table of Recommendation Strength** (see note above)

<i>Strength</i>	<i>Definition</i>
“Strongly recommended”	There is consensus that benefits clearly outweigh risks and burdens (or visa-versa for negative recommendations).
“Recommended”	There is consensus that benefits are closely balanced with risks and burdens.
No recommendation made	There is lack of consensus to direct development of a recommendation.

**Dimensions:** In determining the strength of a recommendation, the development group makes a considered judgment in a consensus process that incorporates critically appraised evidence, clinical experience, and other dimensions as listed below.

1. Grade of the Body of Evidence (see note above)
2. Safety / Harm
3. Health benefit to patient (*direct benefit*)
4. Burden to patient of adherence to recommendation (*cost, hassle, discomfort, pain, motivation, ability to adhere, time*)
5. Cost-effectiveness to healthcare system (*balance of cost / savings of resources, staff time, and supplies based on published studies or onsite analysis*)
6. Directness (*the extent to which the body of evidence directly answers the clinical question [population/problem, intervention, comparison, outcome]*)
7. Impact on morbidity/mortality or quality of life

## Supporting information

### Introductory/background information

Local quality improvement data at a large Midwest tertiary academic pediatric facility indicated that immunization rates among children with SCD were not optimal (Bundy, 2010 [4a]; Mehta, 2006 [5]).

The process currently in use at the Cincinnati Children’s Hospital Medical Center Sickle Cell Clinic is that of comprehensive chart review, no missed opportunity, and the use of a state registry for vaccinations. This combined method has increased our influenza and pneumococcal vaccination rates significantly. Perhaps our most significant results were found in the 14-21 years age group where, in 2006, only 28% of patients were up to date in their immunizations. After the above process was initiated, 95% of the children in that age group were immunized (2009 data).

This evidence summary was performed to see if there were any other strategies that may help us continue to improve our process.

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**Search strategy (database & keywords used)** Cinahl, Medline, Cochrane. Search terms: Sickle Cell Disease, chronic illness, pediatrics, adherence, compliance, pneumococcal, influenza, case management, immunization, vaccination, immunization registry. (Most recent search done in September 2010 and limited to the previous 15 years)

#### Applicability issues

Inconsistent use of Impact (state registry) among hospitals and community based providers. Providers recognizing that every patient encounter is an opportunity to immunize. Patient and provider awareness of the importance of immunizations among children with SCD.

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- copies may be provided to anyone involved in the organization's process for developing and implementing evidence based care;
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#### **Note**

**This Best Evidence Statement addresses only key points of care for the target population; it is not intended to be a comprehensive practice guideline. These recommendations result from review of literature and practices current at the time of their formulation. This Best Evidence Statement does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the recommendations to meet the specific and unique requirements of individual patients. Adherence to this Statement is voluntary. The clinician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.**

Reviewed against quality criteria by 2 independent reviewers