

Q-METRIC Sickle Cell Disease Measure 2: Timeliness of Antibiotic Prophylaxis for Children with Sickle Cell Disease

Graphics for Section V. Evidence or Other Justification for the Focus of the Measure

Table 4: Evidence Supporting Timely Antibiotic Prophylaxis in Children with Sickle Cell Disease

Type of Evidence	Key Findings	Level of Evidence (USPSTF Ranking*)	Citations
Clinical guidelines	<p>“The goal [of newborn screening] is to identify all newborns with SCD and start them on prophylactic penicillin as early as possible. The recommended regimen is:</p> <ul style="list-style-type: none"> • Newborn to 3 years: Penicillin VK, 125 mg orally twice daily • 3 to 5 years: Penicillin VK, 250 mg orally twice daily” (NHLBI, p.75). 	III	National Heart Lung and Blood Institute. The Management of Sickle Cell Disease. National Institutes of Health. Bethesda, MD, 2002.
Consensus guidelines	<p>In 1987, multiple branches of the NIH convened a consensus panel to discuss newborn screening for SCD. The panel notes that, “Because babies with sickle cell disease may develop sepsis as young as 4 months of age, early provision of comprehensive care coupled with prophylactic penicillin therapy beginning prior to age 4 months is now recommended” (Consensus Conference, pg. 1206).</p>	III	Consensus conference. Newborn screening for sickle cell disease and other hemoglobinopathies. <i>JAMA</i> 1987; 258(9):1205-1209.
Comprehensive literature review	<p>In a comprehensive review of the literature on the management of children with sickle cell disease by Kavanagh et al., the authors searched for articles on this topic published between 1995 and 2010. They found eight articles related to penicillin prophylaxis for the prevention of life threatening infection in children with SCD. Of these articles, three provided level I evidence, one provided level II evidence and four provided level III evidence rated using the USPSTF scale.</p>	I	Kavanagh PL, Sprinz PG, Vinci SR, Bauchner H, Wang CJ. Management of children with sickle cell disease: a comprehensive review of the literature. <i>Pediatrics</i> 2011;128(6):e1552-1574.
Meta-analysis	<p>A meta-analysis of three randomized trials found that initiation of penicillin prophylaxis for children with SCD under age 5 years significantly reduced the incidence of pneumococcal infection (OR: 0.37 [95% CI 0.16 – 0.86]) (Hirst et al., 2010).</p>	I	Hirst C, Owusu-Ofori S. Prophylactic antibiotics for preventing pneumococcal infection in children with sickle cell disease. <i>Cochrane Database of Systematic Reviews</i> 2010; 1-21.

Randomized controlled trial	In a randomized, double-blind, placebo controlled trial, Gaston et al. studied whether daily administration of oral penicillin reduced the incidence of life-threatening infection in children with SCD. In the trial, 215 children under the age of 3 were randomly assigned to receive either 125 mg penicillin or placebo twice daily. The study was ended early because of an 84% reduction in incidence of infection among the intervention group.	I	Gaston MH, Verter JI, Woods G, et al. Prophylaxis with oral penicillin in children with sickle cell anemia. A randomized trial. <i>N Engl J Med</i> 1986;314(25):1593-1599.
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Note: USPSTF criteria for assessing evidence at the individual study level are as follows: I) Properly powered and conducted randomized controlled trial (RCT); well-conducted systematic review or meta-analysis of homogeneous RCTs. II) Well-designed cohort or case-control analytic study. III) Opinions of respected authorities, based on clinical experience; descriptive studies or case reports; reports of expert committees.