Cost-effectiveness of Respiratory Syncytial Virus Prophylaxis in Various Indications

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**Objectives:** To evaluate the cost-effectiveness of immunoprophylaxis against respiratory syncytial virus (RSV) infections with palivizumab based on actual cost and observed incidence rates in various pediatric risk groups.

**Design:** Decision tree analysis comparing children with various combinations of the following indications: chronic lung disease, congenital heart disease, or pre-maturity (<32 weeks gestation), and children with none of these indications. One-way sensitivity analyses and Monte Carlo simulations were used to quantify parameter uncertainty.

**Setting:** Florida during the 2004-2005 RSV season.

**Participants:** A total of 159,790 Medicaid-eligible children aged 0 to 2 years.

**Intervention:** Palivizumab prophylaxis compared with no prophylaxis.

**Outcomes Measure:** Incremental cost (2010 US dollars) per hospitalization for RSV infection avoided.

**Results:** The mean cost of palivizumab per dose ranged from $1661 for infants younger than 6 months of age to $2584 for children in their second year of life. Among pre-term infants younger than 6 months of age without other indications, immunoprophylaxis with palivizumab cost $302,103 (95% confidence interval, $141,850-$914,798) to prevent 1 RSV-related hospitalization. Given a mean cost of $8910 for 1 RSV-related hospitalization in this subgroup, palivizumab would be cost-neutral at a per-dose cost of $47. Incremental cost-effectiveness ratios for the other subgroups ranged from $361,727 to more than $1.3 million per RSV-related hospitalization avoided in children up to 2 years of age with chronic lung disease and no additional risk factors. Younger age and multiple indications were associated with improvements in the incremental cost-effectiveness ratio.

**Conclusions:** The cost of immunoprophylaxis with palivizumab far exceeded the economic benefit of preventing hospitalizations, even in infants at highest risk for RSV infection.


**RESPIRATORY SYNCYTIAL VIRUS (RSV) infections are the common cause of hospitalization in early childhood, accounting for 57,000 to 120,000 hospitalizations each year in the United States.**

1. Immunoprophylaxis for RSV infection is limited by the high cost of the prophylactic agent, palivizumab (Synagis; MedImmune, Inc, Gaithersburg, Maryland). Dosed at 15 mg/kg body weight, one 50-mg vial is necessary to immunize a newborn child (3 kg) for 1 month at an average wholesale price (AWP) of $1145.47.

2. Depending on a child’s underlying risk, the American Academy of Pediatrics recommends prophylaxis during 5 months of the RSV season for children up to 2 years of age. With increasing body weight, older children require higher doses of palivizumab. Consequently, the cost of prophylaxis for a child in the second year of life (>10 kg) can exceed $3000 per month or $15,000 per RSV season, amplifying the financial burden of prophylaxis against RSV infection.

An array of economic analyses on prophylaxis against RSV infection with palivizumab has been conducted. The findings include a cost-benefit ratio of 6.76:1 in infants younger than 10 months who were premature or had chronic lung disease (CLD), incremental cost-effectiveness ratios (ICERs) of more than $200,000 per quality-adjusted life-year for all premature children without CLD and $1,855,000 per quality-adjusted life-year for children born at 32 weeks’ gestation, and a cost of prophylaxis and RSV care of $5117.
with palivizumab vs $372 without prophylaxis. Studies with more favorable results showed cost-effectiveness estimates ranging from $3459 incremental expenses to $39 107 incremental savings per immunized child, and a prophylaxis cost of $10 000 per hospitalization for RSV infection avoided.9

The wide variation in results was related to study methodology and to underlying assumptions in the economic model, including estimates of cost, effectiveness of prophylaxis, and incidence of RSV-related hospitalization.10 The incidence of RSV hospitalization differs by risk group (as defined in the guidelines for immunoprophylaxis), geographic latitude and coastal proximity, and age.11 Thus, the choice of study setting and population can significantly influence cost-effectiveness.

Medicaid covers the majority of infants in the United States12 and a disproportionate number of infants at increased risk for RSV infection.13 Thus, Medicaid shoulders a large portion of the economic burden of RSV prophylaxis. Our study assumed the perspective of Florida Medicaid and used RSV incidence data as well as cost estimates for prophylaxis and RSV-related hospitalizations directly obtained from this population. We report cost-effectiveness estimates for children with CLD, premature infants, children with congenital heart disease (CHD), and children with various combinations of these risk factors, as well as children not meeting guideline-specific indications, to address the economic implications when palivizumab is used in "low-risk" populations in the absence of prior authorization requirements.14

METHODS

DATA SOURCE AND POPULATION

We obtained the following model input parameters from Florida Medicaid claims data: the cost of palivizumab and the cost and incidence rates of RSV-related hospitalization. To achieve valid estimates for gestational age, we included only subjects whose Medicaid records could be matched to Vital Statistics' birth certificates based on Social Security number.

Our data set was based on the RSV season from October 2004 to March 2005. The 6 months from October through March have shown consistently high infection rates over several seasons.15 Although the seasonality of RSV differs from region to region in Florida, separate prior authorization requirements instituted in 2008 for all regions of Florida have included these 6 core months.16 Subjects had to be eligible for the Medicaid fee-for-service program for at least 2 consecutive months between September 2004 and March 2005 and be out of the hospital for 30 days before each month that was considered in the analysis.

We created economic models for 8 categories of patients, including children 0 to 2 years of age, according to palivizumab guidelines: presence of CLD and no other indication; presence of CHD only; presence of CLD and prematurity (≤32 weeks gestation); presence of CHD and prematurity; presence of CHD and CLD; presence of CHD, CLD, and/or prematurity; and none of these indications.7 We also created a category for infants up to 6 months of age who were only premature (see eAppendix, http://www.archpediatrics.com, for operational definitions). Claims data analyses were conducted with SAS version 9.1.3 (SAS Institute, Cary, North Carolina), and the economic model was created in TreeAge Pro 2009 (TreeAge Software, Inc, Williams-town, Massachusetts).

ECONOMIC DATA

Cost of Palivizumab

Palivizumab is available in 50-mg and 100-mg vials. Depending on a child's weight, either a single vial or a combination of vials may be necessary to achieve the recommended total dose for a single palivizumab administration. We used actual Medicaid payment amounts for palivizumab based on National Drug Codes (eAppendix), which allowed for the most accurate and relevant estimate of cost for a single, weight-specific dose.

Because weight and total palivizumab charges correlate with age, we calculated the increase in palivizumab dose cost per month of age using ordinary least squares regression. Intercept and slope estimates derived from the regression model were then used in the economic model to calculate palivizumab cost for various age groups. We further calculated frequencies and percentages of the composition and cost of palivizumab doses (50-200 mg) for different age categories. All cost estimates were transferred into 2010 US dollars using the Medical Care Consumer Price Index.17

Cost of RSV-Related Hospitalizations

We identified RSV-related hospitalizations based on inpatient claims according to International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes (eAppendix). For each risk group, we calculated the mean total of paid amounts for hospital charges. These were extended to include every claim paid by Medicaid occurring between the day before hospital admission and the day after hospital discharge for the RSV-related hospitalization, to capture relevant charges such as transportation or outpatient pharmacy claims at hospital discharge.

Clinical Data

Efficacy of Palivizumab. We obtained efficacy parameters from clinical trials of palivizumab. The Impact-RSV Study Group18 found a relative risk reduction (RRR) of 39% in children with CLD, 78% in premature infants, and 55% in the combined group. In another study, Feltes et al19 reported a 45% RRR in children with CHD. We used indication-specific efficacy estimates whenever possible. For models of children with no indication or with any indication, we used a pooled RRR of 50%, the average of the 2 studies' global estimates. For models combining indications, we used either the efficacy estimate for CLD or CHD or, in their combination, the 45% estimate associated with CHD.

RSV-Related Hospitalization Rates. Because prophylaxis with palivizumab reduces the incidence of RSV-related hospitalization, we created an adjusted incidence rate for each risk group that would be observed in the absence of prophylaxis. An adjusted monthly incidence rate (IC) for each group was calculated from the number of cases among the unexposed (AU) and a corrected (1/RRR) case number among the exposed (AE) divided by the total person time (T): IC = (AU + AE · 1/RRR)/(TU + TE). The RSV-related hospitalization rate for an entire 6-month RSV season was calculated as 6 times the monthly incidence rate. We calculated numbers needed to treat as the inverse absolute risk reduction.

Cost-effectiveness Analysis. The incremental cost-effectiveness ratio was calculated as the incremental cost associated with palivizumab prophylaxis divided by the incremental effectiveness. Incremental effectiveness was measured as the absolute reduction in the risk of RSV-related hospitalizations associated with immunoprophylaxis compared with...
no prophylaxis. The model did not include the expected cost of RSV-related hospitalizations to avoid double counting. However, these costs were estimated to serve as a benchmark for evaluating the ICERs.

One-way sensitivity analyses varied parameters beyond their distributions to illustrate how changes in these parameters would affect cost-effectiveness estimates. To account for uncertainty in the parameter estimates, we conducted a probabilistic sensitivity analysis using a Monte Carlo simulation with 1000 trials each sampling 1000 times from the input distributions. We entered gamma distributions for proportions and for palivizumab cost to avoid negative estimates in the probabilistic simulation. Palivizumab effectiveness estimates were entered as normal distributions, and hospitalization costs were entered lognormally to allow for outliers. Age was entered as a uniform distribution to equally represent every age category (Table 1).

The institutional review boards of the University of Florida and the Florida Department of Health approved the study protocol.

### RESULTS

#### COST OF PALIVIZUMAB

In the 2004-2005 Florida RSV season, 159,790 children met study inclusion criteria and contributed a total of 611,451 subject-months to the analysis. During this time, the Florida Medicaid program reimbursed a total of 9805 palivizumab claims for 2985 children. Ninety-seven percent of these claims (n=9518) were clustered around 4 values: $803.24 corresponding to a 50-mg dose, $1512.09 corresponding to a 100-mg dose, $2016.32 corresponding to a 150-mg dose, and $2520.48 corresponding to a 200-mg dose.

### Table 1. Model Input Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mean Value (95% CI)</th>
<th>Source and Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palivizumab cost, $</td>
<td>1415.56 (1396-1435)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>Intercept</td>
<td>68.88 (67.69-70.64)</td>
<td>FL Medicaid claims data</td>
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<tr>
<td>Slope (per age by month)</td>
<td>0.40 (0.24-0.56)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>Age range</td>
<td>50 (26-72)</td>
<td>FL Medicaid claims data</td>
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<tr>
<td>Any indication</td>
<td>1-24 mo (1-6 mo for premature infants only)</td>
<td></td>
</tr>
<tr>
<td>CLD only</td>
<td>11.04 (8.57-13.51)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>CHD only</td>
<td>9.92 (9.09-10.7)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>Premature only</td>
<td>24.04 (23.35-24.73)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>No Indication</td>
<td>0.57 (0.57-0.57)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>Palivizumab effectiveness</td>
<td>0.39 (0.17-0.61)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>Relative effectiveness of palivizumab, %</td>
<td>1.07 (0.21-1.43)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>Monthly incidence of RSV infection for recipients of palivizumab, %</td>
<td>1.01 (0.44-1.58)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>Subject-months with palivizumab claims, %</td>
<td>45 (23-67)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>Monthly incidence of RSV infection for nonrecipients, %</td>
<td>55 (38-72)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>Subject-months with palivizumab claims, %</td>
<td>45.67 (43.57-47.77)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>Relative effectiveness of palivizumab, %</td>
<td>54.95 (52.48-57.42)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>Monthly incidence of RSV infection for recipients of palivizumab, %</td>
<td>52.45 (50.61-54.29)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>Subject-months with palivizumab claims, %</td>
<td>54.95 (52.48-57.42)</td>
<td>FL Medicaid claims data</td>
</tr>
<tr>
<td>Relative effectiveness of palivizumab, %</td>
<td>52.45 (50.61-54.29)</td>
<td>FL Medicaid claims data</td>
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<tr>
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<td>FL Medicaid claims data</td>
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<tr>
<td>Relative effectiveness of palivizumab, %</td>
<td>52.45 (50.61-54.29)</td>
<td>FL Medicaid claims data</td>
</tr>
</tbody>
</table>

Abbreviations: CHD, congenital heart disease; CI, confidence interval; CLD, chronic lung disease; FL, Florida; RSV, respiratory syncytial virus.

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corresponding to a 100-mg dose, $2315.33 corresponding to a 200-mg dose. Table 2 shows the mean cost per dose and the use of different doses by age group. The most commonly reimbursed dose for infants 0 to 6 months of age was 150 mg. The expected 6-month prophylaxis cost ranged from $9939 for premature infants younger than 6 months to more than $1285 to $67 432, and 90% of hospitalizations at an aggregate cost of $872 526. Hospital claims for children with any indication showed the lowest incidence rate of 1.25% (95% CI, 0.6%-2.1%). The absolute risk reduction (incremental effectiveness) associated with prophylaxis was highest in prematurely born children who also had CHD (3.82%). The corresponding number needed to treat of 26 indicates that 26 children have to receive prophylaxis for 6 months to prevent 1 RSV-related hospitalization.

Table 3. Results Cost-effectiveness Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>CLD Only</th>
<th>Premature Only</th>
<th>CHD Only</th>
<th>CLD and Premature</th>
<th>CHD and CHD</th>
<th>Any Indication</th>
<th>No Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age range</td>
<td>0-2 y</td>
<td>0-6 mo</td>
<td>0-2 y</td>
<td>0-2 y</td>
<td>0-2 y</td>
<td>0-2 y</td>
<td>0-2 y</td>
</tr>
<tr>
<td>Cost of prophylaxis, $</td>
<td>13 621</td>
<td>9939</td>
<td>13 594</td>
<td>13 728</td>
<td>13 813</td>
<td>13 637</td>
<td>13 708</td>
</tr>
<tr>
<td>Incidence rate of RSV infection, %</td>
<td>1.52 (0.1-4.5)</td>
<td>0.92 (0.2-2.0)</td>
<td>1.98 (0-8-3.5)</td>
<td>2.85 (1.4-4.6)</td>
<td>4.22 (2.1-6.9)</td>
<td>3.06 (1.5-3.5)</td>
<td>1.43 (0.6-2.5)</td>
</tr>
<tr>
<td>With palivizumab</td>
<td>2.55 (0.2-7.6)</td>
<td>4.21 (1.6-8.5)</td>
<td>3.63 (1.7-6.1)</td>
<td>6.57 (3.4-11.2)</td>
<td>8.04 (4.3-13.8)</td>
<td>5.67 (2.7-9.6)</td>
<td>2.92 (1.4-4.7)</td>
</tr>
<tr>
<td>Without palivizumab</td>
<td>1.03 (0.3-3.4)</td>
<td>3.29 (1.1-7.0)</td>
<td>1.65 (0.4-3.6)</td>
<td>3.73 (1.4-7.5)</td>
<td>3.82 (1.1-8.1)</td>
<td>2.61 (0.7-5.6)</td>
<td>1.49 (0.4-3.4)</td>
</tr>
<tr>
<td>Number needed to treat</td>
<td>87</td>
<td>30</td>
<td>61</td>
<td>27</td>
<td>26</td>
<td>38</td>
<td>67</td>
</tr>
<tr>
<td>ICER, $ per RSV-related hospitalization avoided</td>
<td>1 322 422</td>
<td>302 103</td>
<td>823 868</td>
<td>368 048</td>
<td>361 727</td>
<td>522 490</td>
<td>920 033</td>
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<tr>
<td>(329 581-1 429 111)</td>
<td>(141 850-914 798)</td>
<td>(343 545-2 924 492)</td>
<td>(164 501-1 035 792)</td>
<td>(149 086-1 329 900)</td>
<td>(209 136-1 799 592)</td>
<td>(387 246-9 738 254)</td>
<td></td>
</tr>
<tr>
<td>Cost of RSV-related hospitalization, $</td>
<td>12 103</td>
<td>8910</td>
<td>10 236</td>
<td>11 498</td>
<td>10 910</td>
<td>11 166</td>
<td>8903</td>
</tr>
<tr>
<td>(10 979-13 226)</td>
<td>(4061-13 759)</td>
<td>(16 014-17 576)</td>
<td>(6422-16 455)</td>
<td>(6082-17 505)</td>
<td>(6874-17 505)</td>
<td>(4798-10 933)</td>
<td>(5340)</td>
</tr>
</tbody>
</table>

Abbreviations: CLD, congenital heart disease; CHD, chronic lung disease; ICER, incremental cost-effectiveness ratio; RSV, respiratory syncytial virus.

The mean cost for a RSV-related hospitalization ranged from $5069 (95% CI, $4798-$5340) for children without indication for prophylaxis to $12 103 (95% CI, $10 979-$13 226) for children with CLD (Table 3). The mean hospital claim for children with any indication was $8903 (95% CI, $6874-$10 933). In total, children with any indication experienced 98 RSV-related hospitalizations at an aggregate cost of $872 526. Hospital claims ranged from $1285 to $67 432, and 90% of hospitalization claims were less than $20 609. Half of the hospitalizations were associated with claims less than $5588.
COST-EFFECTIVENESS

Incremental cost-effectiveness ratios for each subgroup resulting from the probabilistic Monte Carlo simulations are listed in Table 3, denoting the dollar amount necessary for immunoprophylaxis to prevent 1 RSV-related hospitalization. Incremental cost-effectiveness ratios ranged from $302,103 (95% CI, $141,850-$914,798) for premature infants up to 6 months of age without any other indication to $2,138,870 (95% CI, $812,678-$9,758,254) for children without indication.

SENSITIVITY ANALYSES

The tornado diagram in Figure 1 shows the effect of variation in a single model parameter on the ICER for the patient category with the lowest ICER: premature infants up to 6 months of age. Variation in palivizumab effectiveness from 90% to 20% resulted in a change of the ICER from $274,246 to $1,234,109 per RSV-related hospitalization avoided. The model was sensitive to the incidence rate of RSV-related hospitalization: a 20% incidence rate resulted in an ICER of $63,870, and an incidence rate of 1% required $1,277,397 to avoid 1 RSV-related hospitalization.

Figure 2 provides further details on the effect of variation in cost for 1 dose of palivizumab on the ICER, again for premature infants younger than 6 months of age. To illustrate at what dose cost palivizumab prophylaxis would be the economically preferred option, we magnified to a lower price range ($0-$60 per dose) in the same figure. For this patient category with the lowest ICER, only prophylaxis at a cost of less than $47 per dose would result in cost savings compared with expected hospitalization cost.

COMMENT

Our study showed that the cost of preventing RSV-related hospitalizations with palivizumab far exceeded the savings associated with prevented hospitalizations in the Florida Medicaid population. Even for the most cost-effective subgroup in our study (ie, premature infants <6 months of age), a mean of $302,103 would have to be expended to prevent 1 hospitalization costing a mean of $8,910. In other words, every dollar spent on prophylaxis returned only 2.9 cents in avoided hospitalization costs.

Our cost-effectiveness estimates are higher than the estimates from other studies for several reasons. First, the AWP for a 50-mg vial was sometimes used to represent the cost of a single dose of palivizumab.20,21 Our study showed that only a small proportion of very young infants received a 50-mg dose. In fact, across all age categories, the mean reimbursement amount was $2,099.36 per dose, nearly twice the AWP of a 50-mg vial. Second, our observed RSV incidence rate was lower than what was found in the pivotal clinical trials whose estimates were used in other cost-effectiveness studies. The Impact-RSV Study Group18 found an RSV-related hospitalization incidence rate of 12.8% for children with CLD during a 5-month period. Even our combined category of children with CLD who were also premature exhibited only half of the clinical trial’s incidence rate (6.57%). This may be related to a careful selection of high-risk patients in the trial, which would lead to an overestimate of actual incidence in practice. The Impact-RSV Study Group18 enrolled children up to 24 months of age; however, the mean age at entry was only 6 months. Thus, the clinical trials represented a younger patient population at higher risk, and their incidence rates may not be applicable to older children.
Other cost-effectiveness analyses included asthma or wheezing as a possible consequence of RSV infections. Although a number of studies have shown an increase in asthma diagnoses in children with a history of RSV infection, these findings contrast with a study reporting that RSV infections increased the incidence of asthma up to 8-fold only during the first 2 months after RSV-related hospitalization, without an increased risk 1 year after the infection, whereas another study concluded that RSV infections can indicate a genetic predisposition but are not a cause of asthma.

Some cost-effectiveness studies included mortality estimates in their models; however, a significant reduction in RSV-related mortality has never been reported for palivizumab. In addition, the number of RSV-related pediatric deaths in the United States has been decreasing and is estimated to be between 171 and 510 deaths per year, nationwide.

A limitation to our study is the possibility that some RSV-related hospitalizations were not coded as such and therefore not represented in our data set. To examine the possible extent of this misclassification, we investigated the use of ICD-9-CM codes for bronchiolitis and pneumonia. We divided these codes into 3 categories: (1) RSV-related codes (see eAppendix for ICD-9 codes); (2) codes specific to other organisms, including bacterial infections; and (3) unspecified codes. Of the 2502 hospitalizations for bronchiolitis or pneumonia occurring during the 2004-2005 season, 44.6% (n=1116) were associated with RSV, 31.4% (n=785) were due to specified organisms other than RSV, and 24.0% (n=601) were unspecified. Even if all hospitalizations due to unspecified diagnoses represented true RSV infections, the RSV incidence rate in our sample would increase only by a factor of 1.5. Increasing the underlying incidence estimate for premature infants from 4.21% to 6.32% (a 1.5-fold increase) still yielded an ICER exceeding $190 000 per RSV-related hospitalization avoided.

Our cost-effectiveness results have implications for the different risk groups. An ICER of $2 138 870 for children who were not premature and did not have CLD or CHD should be a sufficient argument to actively discourage palivizumab use outside treatment guidelines, and Florida Medicaid has instituted a prior authorization requirement after the study period. The most favorable ICER was shown for premature infants without other indications, which can be explained by several factors. This indication was limited to infants up to 6 months of age, for whom the cost of palivizumab is lower and the incidence of RSV infection is higher. A higher incidence, combined with a comparably high effectiveness estimate (78% RRR), resulted in smaller numbers needed to treat for this subgroup. Notably, we showed more favorable ICERs in children with multiple indications compared with children with a single indication. This was pronounced in the case of CLD and CHD, for which ICERs were improved by more than $900 000 and $450 000, respectively, when these children were also premature. Similar findings have led to stricter guidelines for prematurely born infants in Sweden and New Zealand, where prophylaxis is only recommended for infants born before 26 or 28 weeks' gestational age, respectively. Others have argued that palivizumab use is not justified in preterm infants with-
out additional risk factors and have recommended that prophylaxis only be given to preterm infants if they also have CLD and are younger than 1 year.

We observed that the price of palivizumab had a large effect on the ICER, yet resulting in high ICERS even over wide ranges of drug costs. Immunoprophylaxis with palivizumab would have been cost-saving only at a monthly dose cost less than $47 in our cohort of premature infants younger than 6 months of age; unfortunately, these cost estimates are far from reality. The cost for a 100-mg vial, the most common dose in this age cohort, increased since the study period by 34% after adjusting for medical care inflation: from an AWP of $1311.56 in 2004 ($1617.15 in 2010 US dollars) to $2162.99 in 2010.

During the year 2009, Florida Medicaid reimbursed more than $27 million in palivizumab claims.

Our study assumed the perspective of Florida Medicaid; thus, we considered only the direct medical costs associated with palivizumab exposure and RSV-related hospitalizations. Other, important aspects of pediatric hospitalizations not captured by the third-party payer perspective include caregivers’ time away from work, parents’ emotional burden, and patients’ pain and suffering. These factors need to be given consideration in determining how much society is willing to spend to avoid 1 RSV-related hospitalization.

Our study reported the ICERS of prophylaxis with palivizumab compared with no prophylaxis in the prevention of RSV-related hospitalizations. Incremental cost-effectiveness ratios for palivizumab were found to be very high, with the cost of prophylaxis far exceeding the economic benefit of prevented hospitalizations in any risk group. We were able to identify factors associated with more beneficial ICERS, including young age and the requirement for combined indications. Recommendations for the use of palivizumab should be reconsidered, especially with regard to prophylaxis in children with CLD or CHD who are not premature. In addition, decision makers must weigh the increased cost of prophylaxis beyond infancy against the opportunity cost of not having these funds available for other, more cost-effective interventions.

Accepted for Publication: December 1, 2010. Published Online: February 7, 2011. doi:10.1001/archpediatrics.2010.298. This article was corrected on February 8, 2011.

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Author Contributions: Dr Hampp had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Hampp, Kauf, and Winterstein. Acquisition of data: Hampp and Winterstein. Analysis and interpretation of data: Hampp, Kauf, Saidi, and Winterstein. Drafting of the manuscript: Hampp. Critical revision of the manuscript for important intellectual content: Hampp, Kauf, Saidi, and Winterstein. Statistical analysis: Hampp, Kauf, and Winterstein. Obtained funding: Hampp and Winterstein. Administrative, technical, and material support: Hampp, Kauf, and Winterstein. Study supervision: Winterstein.

Financial Disclosure: None reported.

Funding/Support: The study received funding from the Florida Agency for Healthcare Administration and was conducted in collaboration with the University of Florida Center for Medicaid and the Uninsured.

Disclaimer: The views expressed are those of the authors and do not necessarily express the opinions of the US Department of Health and Human Services or the US Food and Drug Administration.


Additional Information: Research was conducted and completed while Dr Hampp was a graduate student and postdoctoral associate at the University of Florida.

AdditionalContributions: Office of Vital Statistics, Florida Department of Health, provided birth certificate data.

REFERENCES

16. Pharmacy prior authorization forms. Florida Agency for Healthcare Administra-


Announcement

Trial Registration Required. In concert with the International Committee of Medical Journal Editors (ICMJE), Archives of Pediatrics and Adolescent Medicine will require, as a condition of consideration for publication, registration of all trials in a public trials registry (such as http://ClinicalTrials.gov). Trials must be registered at or before the onset of patient enrollment. This policy applies to any clinical trial starting enrollment after July 1, 2005. The trial registration number should be supplied at the time of submission.

For details about this new policy, and for information on how the ICMJE defines a clinical trial, see the editorials by DeAngelis et al in the September 8, 2004 (2004;292:1363-1364) and June 15, 2005 (2005;293:2927-2929) issues of JAMA. Also see the Instructions to Authors on our Web site: www.archpediatrics.com.