ORIGINAL RESEARCH

Potential Cost-Savings with Once-Daily Aminomethylcycline Antibiotic versus Vancomycin in Hospitalized Patients with Acute Bacterial Skin and Skin Structure Infections

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BACKGROUND: Omadacycline is an oral and intravenous (IV) once-daily aminomethylcycline antibiotic that was recently approved by the US Food and Drug Administration for the treatment of patients with acute bacterial skin and skin structure infections (ABSSSI). In 2 phase 3 clinical trials, IV-to-oral switch and oral-only administration of omadacycline achieved the primary end points of noninferiority compared with linezolid in treating patients with ABSSSI.

OBJECTIVE: To estimate the potential cost-savings with bioequivalent IV-to-oral antibiotics, such as omadacycline, compared with the standard of care with IV vancomycin by avoiding hospitalizations and reducing hospital stays in patients presenting from the emergency department for ABSSSI treatment.

METHODS: We used hospital avoidance models to examine the potential cost-savings of managing patients with ABSSSI and no or limited comorbidities and without life-threatening conditions by using omadacycline in the outpatient setting compared with the current standard of care. Early hospital discharge models were used to evaluate the hospital stay reduction that would be required to be achieved with omadacycline treatment relative to IV vancomycin to confer cost-savings compared with standard of care among patients with ABSSSI and ≥2 comorbidities but no life-threatening conditions.

RESULTS: In the hospital stay avoidance models, cost-savings may be realized by using therapeutically bioequivalent IV-to-oral antibiotics, such as omadacycline, compared with inpatient treatment with IV vancomycin. Based on a sensitivity analysis, further savings could be possible with outpatient administration of omadacycline, even if 20% of omadacycline outpatients were subsequently admitted and incurred the full inpatient cost, with no reimbursement penalties. Of more than 300 patients, only 1 was admitted to the hospital after a full course of omadacycline in the oral-only clinical trial. In the early hospital discharge models, the maximum cost-minimizing daily expense of omadacycline varied from $173 to $936, depending on the presence of active comorbidities or systemic symptoms, hospital stay reduction, and model perspective.

CONCLUSION: These results suggest that the targeted use of antibiotics with bioequivalent IV-to-oral formulations, such as omadacycline, for select patients with ABSSSI may lead to cost-savings compared with inpatient IV vancomycin treatment by shifting care to the outpatient setting or by facilitating earlier hospital discharge among hospitalized patients.

KEY WORDS: acute bacterial skin and skin structure, aminomethylcycline, antibiotics, cost-savings, economic modeling, hospitalized patients, hospital stay, infections, inpatient cost, intravenous, omadacycline, outpatient cost, skin infections, vancomycin

Acute bacterial skin and skin structure infections (ABSSSI) are among the most common infections observed in the emergency department. More than 15% of patients who present to the emergency department with an ABSSSI are admitted to the hospital, and the average hospitalization costs per patient range from $6300 to $13,000, with multiday room and board expenses comprising 50% of the total costs of care. Although patients with ABSSSI have historically received care in the hospital, many of these patients have few or no active comorbidities and can be effective-

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KEY POINTS

- Many patients with skin infections have few or no active comorbidities and can be effectively and safely managed in the outpatient setting.
- This retrospective study used hospital discharge data to compare potential cost-savings with IV-to-oral antibiotics, such as newly approved omadacycline, versus IV vancomycin.
- Using 2 decision models, switching from inpatient IV vancomycin to outpatient omadacycline at the beginning of treatment resulted in cost-savings.
- The maximum cost-minimizing with omadacycline was from $173 to $936 daily, depending on patient comorbidities or systemic symptoms and hospital stay reduction.
- The most cost-reducing regimen was oral omadacycline at discharge to home from the emergency department.
- The potential cost-savings with omadacycline versus the current standard of care can be applied to any antibiotic formulation with IV-to-oral capabilities.
- The use of omadacycline should be based on the individual patient health status and treatment-related risks versus benefits.

ly and safely managed in the outpatient setting.³

Data suggest that as many as 40% of patients with ABSSSI are admitted to the hospital solely for the administration of intravenous (IV) antibiotics.⁶ Because inpatient ABSSSI care is approximately 2 to 4 times more costly than outpatient care,⁷ it is imperative that clinicians identify appropriate patients for outpatient therapy at emergency department presentation and develop a treatment plan that can safely and effectively shift care from the inpatient to the outpatient setting among hospitalized patients.

Omadacycline is an oral and IV once-daily aminomethylcycline antibiotic with broad-spectrum activity, including for methicillin-resistant Staphylococcus aureus, that was recently approved by the US Food and Drug Administration for the treatment of patients with ABSSSI.⁸⁹ To date, omadacycline has been shown to be noninferior to linezolid for patients with ABSSSI in 2 clinical trials.¹⁰¹¹ The first study, Omadacycline in Acute Skin and Skin Structure Infections Study (OASIS), was an IV-to-oral treatment-switch trial demonstrating that patients in both treatment arms could be safely and effectively transitioned from IV treatment in the inpatient setting to outpatient treatment with an oral formulation.¹² The second study, OASIS-2, was an oral treat-

ment–only trial, and therapy in both arms was initiated in the outpatient setting.¹¹

Recognizing the financial burden that the treatment of patients with ABSSSI places on the healthcare system, we developed conceptual healthcare decision models to examine the potential cost-savings of treatment with antibiotics that have bioequivalent IV-oral formulations, such as omadacycline, because of avoidable hospitalizations and hospital stay reductions among patients who present to the hospital from the emergency department for the treatment of ABSSSI.

We first examined the potential cost-savings associated with treating adults with ABSSSI who had no or only limited comorbidities and no life-threatening conditions with omadacycline in the outpatient setting compared with managing patients in the hospital with IV vancomycin—the hospital avoidance, or the Stay Home model. We also developed models to determine the reduction in hospital stay required with omadacycline therapy to confer cost-savings compared with the current standard of inpatient care for patients with ABSSSI who had ≥2 comorbidities and no life-threatening conditions—the hospital discharge, or the Go Home model.

Although no clinical studies have compared omadacycline and vancomycin head-to-head, vancomycin was selected for this study as the comparator rather than linezolid, because vancomycin is the most widely prescribed antibiotic for hospitalized adults with ABSSSI.¹² Recent hospital prescribing data indicate that vancomycin prescriptions comprised 26% of all first-course antibiotic prescriptions for ABSSSI, which is more than 20 times the volume of linezolid prescriptions.¹³ Furthermore, our model assumptions for omadacycline were based on several studies across various infection types, which demonstrated that antibiotics with IV and oral formulations can shorten a hospital stay compared with treatment with antibiotics with IV-only formulations, such as vancomycin.¹⁴¹⁵

Methods

The assumptions used in the Stay Home and the Go Home models are described in the Supplemental Table (see Appendix at www.AHDBonline.com). The Go Home model has the additional assumption that all patients receiving IV vancomycin or IV omadacycline were initially treated in the inpatient setting and were discharged to the outpatient setting using IV vancomycin or a generic oral antibiotic to complete treatment.

Because studies comparing omadacycline with vancomycin have not been performed, treatment nonresponse and rehospitalization rates were excluded from the models.¹⁰¹¹ Patients with life-threatening conditions were also excluded, because omadacycline has not yet been
studied in that population. Here, the models solely focused on ABSSSI severity and site of care.

**Hospital Avoidance: Stay Home Model**

The first model compared the costs of inpatient IV vancomycin versus outpatient omadacycline for the treatment of patients with ABSSSI who had few or no comorbidities (Charlson Comorbidity Index [CCI] score of 0 or 1) and no life-threatening conditions among patients with ABSSSI presenting to the emergency department (Figure 1). All patients who received vancomycin were assumed to be admitted as inpatients.

Three omadacycline treatment scenarios were considered, including (1) patients were sent home with oral omadacycline treatment, (2) patients received an IV loading dose of omadacycline and were sent home from the emergency department with oral omadacycline, and (3) patients were treated under observation status with IV omadacycline and were sent home from the emergency department with oral omadacycline.

Data from a retrospective, observational study that used hospital discharge data from the Premier Perspective hospital database were used to determine the average costs associated with hospital inpatient treatment of patients with ABSSSI receiving IV vancomycin. Patients were included in this study if they had a medical encounter with a primary diagnosis of ABSSSI between January 1, 2012, and December 30, 2012, and IV vancomycin use on day 1 or 2 of hospital admission. The presence of comorbid conditions was based on the CCI score noted during the qualifying admission. Patients were included in this analysis if they had a CCI score of 0 or 1 without any life-threatening conditions. The severity of the condition based on the CCI score is equally applicable to the vancomycin and omadacycline groups.

In the omadacycline arm, the daily costs of omadacycline varied from $0 to $1000 (US dollars), and all patients who received omadacycline received the drug orally to complete a 7-day course of therapy. We considered the daily acquisition costs to be the same for the IV and oral formulations. The costs associated with observation care for omadacycline were derived from Medicare national limitation amounts, which were also used as a proxy for the direct hospital costs of omadacycline IV therapy administration.

The key output was the per-patient cost differences between treatment with vancomycin and with omadacycline. As part of this analysis, we estimated the proportion of patients who initially receive oral omadacycline in the outpatient setting and can be subsequently admitted into the hospital while still conferring cost-savings compared with vancomycin therapy in the inpatient setting. For this, the acquisition cost of IV and oral omadacycline treatment varied from $0 to $1000 daily to estimate the upper end of daily omadacycline acquisition cost that still conferred cost-savings using outpatient omadacycline treatment with different hospital admission rates.

The admission rates were fixed at 0%, 10%, and 20%. We assumed that patients who received omadacycline had 7 days of oral omadacycline treatment, did not respond to this treatment, and were subsequently admitted to the hospital. The hospitalization costs for these patients were assumed to be identical to the inpatient treatment cost of patients with ABSSSI who received IV vancomycin in the Premier Perspective research database study.

For these analyses, we did not consider any reimbursement penalties that may occur. However, because patients were never admitted with omadacycline therapy in this hypothetical modeling exercise, there was no risk for readmission.

**Hospital Discharge: Go Home Models**

The second model compared the costs associated with inpatient current standard of care (ie, the reference condition) versus inpatient omadacycline therapy for the treatment of patients with ABSSSI with ≥2 comorbidities (CCI score ≥2) and no life-threatening conditions from a clinical (ie, hospital) perspective (Figure 2). For hospitalized patients, 4 categories of disease severity were examined, including a CCI score of 2 with and without systemic symptoms, and a CCI score of ≥3 with and without systemic symptoms.

The third model was identical to model 2 and included the cost of care for subsequent outpatient care. This model presented the costs for all treatment arms from the hospital and payer perspectives. All patients in this model were assumed to have received outpatient treatment after initial hospitalization to complete a 10-day course of therapy. Cost-savings could be diminished from a reimbursement perspective because of readmission penalties. However, the model was developed to consider only costs, not reimbursement. In addition, because no comparator data are available for readmission, we did not consider reimbursement in this model.

In the standard-of-care arm (ie, the reference case), the patients were assumed to have completed therapy after hospital discharge either with IV vancomycin in a hospital-based infusion suite (50%) or with a generic oral antibiotic (50%) in the outpatient setting. In the omadacycline arm, all patients were assumed to have received oral omadacycline after discharge to complete the 10-day course of therapy. A longer course of treatment (10 days vs 7 days) was assumed in the Go Home models to allow for the differences in severity (ie, higher CCI levels) than in the Stay Home model.

Data from a retrospective, observational study that...
used hospital discharge information from the Premier Perspective hospital database were used to determine the median hospital length of stay associated with the inpatient treatment of patients with ABSSSI in the standard-of-care arm. Patients from this analysis were included in the hospital avoidance study if they were (1) admitted, (2) had a CCI score of ≥2, and (3) had no life-threatening conditions. Different hospital lengths of stay were associated with levels of the CCI and whether patients had systemic symptoms.

To calculate the cost of inpatient treatment from the median length of stay, each hospital day was estimated to cost $1346 in 2016 US dollars (the amount in the Premier database analysis inflated to July 2016 using the US Medical Care Consumer Price Index). The costs for healthcare utilization inputs are summarized in the Supplemental Figure 1.
plemental Table. For the model from the payer’s perspective, the patients completed a 10-day course of therapy with either IV vancomycin in a hospital-based clinic (50%) or a generic oral antibiotic (50%) in an outpatient setting in the standard-of-care arm. We used the wholesale acquisition cost of linezolid 600 mg orally twice daily, double-strength trimethoprim plus sulfamethoxazole 1 tablet orally twice daily, and vancomycin 1000 mg IV twice daily for drug cost.\textsuperscript{18} For vancomycin IV administration, we used the reimbursement rate for Current Procedural Terminology code 96365 as the cost associated with 1-hour infusions of vancomycin.\textsuperscript{16}

All the costs associated with standard-of-care inpatient treatment were also assumed to be the same for patients receiving omadacycline. All patients were assumed to receive a 10-day course of omadacycline, which was split between the inpatient (IV administration) and outpatient (oral administration) setting. The daily costs for omadacycline varied as described below.

The key output was the per-patient cost differences between treatment with standard-of-care inpatient treatment and with omadacycline. Oral antibiotic dosing formulation has been shown to shorten hospital stays across several disease states, including skin and soft-tissue infections.\textsuperscript{14} We determined the impact of 1- and 2-day hospital length of stay reductions with omadacycline compared with the current inpatient standard of care on the overall cost of care from the hospital and payer’s perspectives. Regardless of the hospital length of stay reduction put into the model, the minimum length of stay specified for omadacycline in the model was 3 days. The daily cost of omadacycline varied between $0 and $1000 to characterize the upper end of daily omadacycline acquisition cost that still conferred cost-savings with 1- to 2-day hospital stay reductions compared with inpatient standard-of-care treatment from the hospital and payer perspectives.

Results

Stay Home Model

The average cost associated with the hospital inpatient treatment of patients with ABSSSI who were receiving IV vancomycin was $6511.89 per course of treatment. Switching an individual patient from inpatient IV vancomycin to outpatient omadacycline at the beginning of treatment was estimated to result in cost-savings, the amount of which depended on receipt of a loading dose, the use of an observation unit, and an inputted daily cost of omadacycline. The most cost-minimizing regimen was discharge to home from the emergency department with oral omadacycline. The administration of a loading dose of IV omadacycline, followed by discharge to home, was slightly more expensive ($98 per infusion) as a result of the cost of infusion. Keeping the patient under observation for less than 48 hours (<2 midnights) was more expensive ($885 per patient) than the other omadacycline.
Regimens because of the added cost of using the observation facility and multiple infusions.

When admission rates after nonresponse to oral treatment were set at 0, the upper bounds of the cost-minimizing daily omadacycline drug acquisition costs ranged from $705 to $891, depending on the receipt of an IV loading dose in the emergency department and the use of an observation unit. The upper ends of the cost-minimization daily omadacycline acquisition costs ranged from $625 to $798 when the admission rates were set at 10%. At 20% admission rates, the maximum cost-minimizing daily omadacycline acquisition costs subsequently decreased by nearly $100 for each omadacycline treatment scenario and ranged from $525 to $708. The actual admission rates in the oral medication-only trial were <1%.

Assuming a net acquisition cost of $375, near the midpoint of the sensitivity range, pegged to the capability of omadacycline treatment to save 1 day in the hospital on average in the Go Home scenario, the Stay Home model projected considerable cost-savings per patient. As shown in the Table, per-patient cost reductions of $2000 were projected in this scenario.

**Go Home Models**

The upper bounds of cost-minimizing daily omadacycline drug acquisition costs with hospital length of stay reductions of 1 to 2 days from the hospital perspective are shown in Figure 3.

From the hospital perspective, omadacycline would be associated with cost-savings if the omadacycline cost was ≤$383 daily, with a 1-day hospital length of stay reduction, and ≤$936 daily with a 2-day hospital length of stay reduction. From a payer perspective, omadacycline would be associated with cost-savings if the omadacycline cost was ≤$173 daily with a 1-day length of stay reduction, and ≤$317 daily with a 2-day length of stay reduction.

**Discussion**

Because hospital reimbursement and antimicrobial stewardship programs are increasingly tied to quality, efficiency, and cost of care, this study developed conceptual healthcare decision models to assess the potential cost-saving opportunities with antibiotics that have bioequivalent IV-to-oral formulations, such as omadacycline, compared with the current standard of care for the treatment of patients with ABSSSI. We opted to evaluate patients who presented to the hospital for the treatment of ABSSSI, because studies have demonstrated that more than 75% of these patients present to the emergency department for initial treatment.

The hospital avoidance (Stay Home) model considered managing patients in the outpatient setting with oral omadacycline compared with inpatient treatment with IV vancomycin. Despite the availability of newer agents, vancomycin is used in the overwhelming majority of hospitalized adults with ABSSSI. More than 60% of admitted patients with ABSSSI who receive vancomycin have 0 or 1 comorbid condition and limited systemic symptoms. Data show that these patients have an extremely low mortality risk (0.08%) and can be effectively and safely managed in the outpatient setting.

The results of the OASIS-2 study indicate that it may be possible to treat some patients who have ABSSSI and no life-threatening conditions completely in the outpatient setting. No patients were hospitalized for skin infections at the start of the OASIS-2 study; however, hospitalization for worsening of ABSSSI from the first dose through the follow-up visit occurred in 2 (0.6%) patients in the omadacycline group and 1 (0.3%) patient in the linezolid group. Therefore, 99.4% of patients were treated with omadacycline as outpatients by the end of the study.

In this model, cost-savings for the payer for patients with ABSSSI may be realized with outpatient oral omadacycline compared with inpatient IV vancomycin. This conclusion holds when the costs of infusing an initial IV dose of omadacycline and an observation stay are added to the outpatient omadacycline drug acquisition cost.

For various omadacycline outpatient treatment scenarios considered, the models estimated the upper bounds of daily omadacycline costs that still conferred cost-savings to be $725 to $900. Although this hospital avoidance approach is intuitive, one of the major reservations among clinicians is the perception that patients will not respond to treatment in the outpatient setting and will return to the hospital for subsequent care, negating all the potential cost-savings associated with outpatient treatment.

Recognizing this, we considered a few different sce-
scenarios that allowed for a proportion of patients to be readmitted after a 7-day course of omadacycline in the outpatient setting and incur the full costs associated with inpatient management. Even with 20% subsequent admissions among omadacycline outpatients, the daily cost with omadacycline could still be upwards of $600 to $800 daily, and the total patient cost-savings could still be realized.

The second set of models (Go Home) considered 1- or 2-day hospital stay reductions with omadacycline compared with inpatient treatment with IV vancomycin among patients who had ≥2 comorbid conditions, with and without systemic signs of infections.

The rationale for hospital stay reductions with omadacycline in this conceptual model is based on the OASIS-1 trial and previous studies among patients with various infection types, including skin and soft-tissue infections, which demonstrated that antibiotics with IV and oral formulations, such as omadacycline, can effectively facilitate earlier hospital discharge compared with agents with only IV formulations, such as vancomycin.\(^{10}\)

In fact, any antibiotic, regardless of the type of antibiotic, that has IV and oral formulations should have the capability to help patients transition to oral dosing, provided that the same antibiotic treatment that is effective in the inpatient setting is continued after the IV-to-oral switch.\(^{21}\) It should be noted, however, that patients should be able to meet certain clinical criteria and continue maintenance treatment with the same antibiotic that has demonstrated effectiveness during the inpatient stay.\(^{23}\)

In this model, the maximum cost-minimizing daily omadacycline cost from the hospital perspective varied between approximately $400 to approximately $1000, depending on the number of active comorbidities or systemic symptoms, and the reduction in hospital length of stay. Adding outpatient treatment options, which are the liability of the payer, significantly reduced the maximum cost-minimizing daily omadacycline acquisition cost compared with the hospital perspective. However, the upper threshold of the cost-minimizing daily omadacycline acquisition cost from the payer perspective was still substantial, especially with a 2-day hospital length of stay reduction.

**Limitations**

Several limitations should be noted when evaluating

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**Figure 3** Sensitivity Analysis of the Omadacycline Daily Drug Cost from the Hospital Perspective in the Go Home Model\(^a\)

\(^a\)Omadacycline is always administered intravenously during a hospital admission.
these findings. This modeling exercise was conducted to understand the potential cost-savings opportunities with antibiotics that have bioequivalent IV-to-oral formulations, such as omadacycline, compared with current ABSSSI inpatient treatment practices among patients who present to the hospital for initial care. Several assumptions were made for this study, and the results should be interpreted with caution until these assumptions are validated by appropriate clinical studies; a comparative, prospective cost-effectiveness study with economic and healthcare utilization end points is being considered to validate these findings.

We were conservative with model assumptions and limited data inputs to the critical healthcare resource components. For the standard-of-care arm, the model inputs were largely derived from previous studies of the Premier Perspective Hospital Database, which contains coding and billing information for approximately 50 million admissions from approximately 500 US acute-care hospitals.\textsuperscript{5,24} Despite its size, it may not be generalizable to all other US hospitals, and hospitals should rely on institution-specific costs when deriving the costs associated with inpatient treatment of patients with ABSSSI at their institutions.

Similarly, we relied on Medicare national limitation payment amounts to represent the observation and drug administration costs, which may not be reflective of the cost associated with these healthcare resource components at a given facility.\textsuperscript{17} We purposefully excluded parameters such as peripherally inserted central catheter (PICC) line placement and subsequent PICC-line infections, outpatient laboratory and vancomycin assay costs, and physician and nursing time in outpatient antibiotic infusion suites, to provide a conservative estimate of cost-savings opportunities with omadacycline.

We also did not include treatment response rates, adverse events, or rehospitalization occurrence, because phase 3 comparator ABSSSI studies have not been conducted between omadacycline and vancomycin.\textsuperscript{10}

Finally, the proposed potential cost-savings opportunity with omadacycline compared with the current standard of care can be applied to any antibiotic that has IV-to-oral formulation capabilities. The use of omadacycline compared with these other antibiotics should be guided by the individual patient and the potential risks versus benefits.

Conclusion
We are living in a rapidly evolving US healthcare environment, in which hospital reimbursement is increasingly tied to quality and efficiency of care. In the recent value-based hospital payment model, it is important to develop new therapies and treatment approaches that maintain or improve outcomes at the lowest overall cost. The concept of high-quality care at the lowest cost is congruent with the goals of antibiotic stewardship programs, which have a dual responsibility to optimize clinical outcomes and minimize healthcare utilization and costs without adversely affecting quality of care. Given that IV-to-oral antibiotics have been shown to reduce hospitalization length of stay in various studies, the findings from these economic models are in keeping with previous research and suggest that targeted prescribing of antibiotics with bioequivalent IV-to-oral formulations, such as omadacycline for the treatment of select patient populations with ABSSSI, could result in cost-savings compared with the current standard of care.

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Dr LaPensee is an employee of, and Dr Lodise is a consultant and scientific advisor to Paratek Pharmaceuticals.

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provide the basis for informed implications for settings when a mix of inpatient and outpatient antibiotic therapy for ABSSSI is anticipated.5

**RESEARCHERS:** The gaps between establishing efficacy, effectiveness, and efficiency represent a limitation within clinical development programs. Yet, in an era when balancing care delivery with cost containment is mandatory,6 either trial-based studies using patient-level data or decision analytic modeling using secondary data are contributory. Trial-based approaches are laudable, but are difficult to complete before drug approval, and moreover have limitations given protocol structure, eligibility criteria, inability to capture outcomes based on trial duration and methods of analysis.7 A cost-minimization analysis provides comparisons of relative cost, assuming the outcomes for comparators are equal.

The conservative model assumptions with limited critical input data facilitate model interpretation and also suggest that estimates of cost-savings opportunities with omadacycline may be underestimated in some settings.

Identifying the portal of entry as emergency department presentation for adults with ABSSSI, 2 families of models were developed for the study, as described above. Both models proceed from a premise that shifting the location of care from hospital to an outpatient setting may yield cost benefits with no change in clinical effectiveness.5 Omadacycline provides a vehicle for examining this hypothesis, given its broad-spectrum activity and its oral and IV bioequivalence, which was established through IV to oral treatment switching studies.7,8

Risk stratification based on comorbidities (ie, the Charlson Comorbidity Index) and the patient journey within each model used clinically intuitive assumptions regarding states and the probability of transitions. The Stay Home model, with a cost-minimizing regimen that emphasizes discharge from the emergency department with oral omadacycline, produced maximal efficiencies.5

Although comparative data were not available for this study, the rationale for the control agent vancomycin is justified based on its widespread use for hospitalized adults with ABSSSI. Assumptions beyond the available data are avoided. For example, one Go Home model scenario considered the cost impact of initial hospitalization for a 10-day course of therapy without considering reimbursement. The cost implications could be confounded with diverse readmission policies and penalties, and comparative data addressing readmission were not available.5

The probability of movement between transition states at clinically relevant decision nodes mirrors techniques used within pharmacoeconomic modeling that are anchored in available clinical data.9 LaPensee and Lodise’s models did not include life-threatening conditions nor treatment response rates, adverse events, or rehospitalization, given the absence of comparator studies between omadacycline and vancomycin.5

**PAYERS:** Efficiency levels differ between payer and hospital perspectives in the study by LaPensee and Lodise.5 Nevertheless, savings from the payer perspective with the use of outpatient oral omadacycline remain, even when costs of an initial infusion of omadacycline with an observation hospital stay are included in the outpatient drug acquisition costs. The conservative model assumptions with limited critical input data facilitate model interpretation and also suggest that estimates of cost-savings opportunities with omadacycline may be underestimated in some settings.

The acknowledged study limitations include the use of cost data spanning a large geographic region within the United States, and amalgamating diverse institutional phenotypes with different policies for in-hospital parenteral antibiotic use versus outpatient oral antibiotic use. Healthcare systems responsible for a continuum of care also may balance cost-effectiveness and cost-minimization data in a different manner.10 The importance of institution-specific expenditures is key, and reinforce the sentiment, “I like your model, but send me my data.”

**PROVIDERS:** Physician sentiments regarding the equivalency of oral versus parenteral antibiotics do not always promote the adoption of new treatment pathways.11,12 Given host- and drug-related factors, variations in the adoption of new treatment pathways are expressed as sequential switching (conversion from parenteral to oral regimens of the same compound), switching therapy (conversion to a different compound with similar potency), or step-down approaches (transitions from higher potency to lower potency drugs), with sequential switching as the dominant approach.13,14

In addition, asymmetry exists between the valuation expressed by physicians (drug availability, staff experi-
Clinical studies and conceptual healthcare decision modeling that examine the impact of the partition between outpatient and inpatient antibiotic therapy for ABSSSI represent an acknowledgment of this mandate.

Major contributions of pharmacy management programs in promoting appropriate antibiotic use occur through teaching hospitals where recommendations are coupled with a strong educational component. A companion development program establishing value, as well as therapeutic novelty, is a universal requirement across treatment areas. Clinical studies and conceptual healthcare decision modeling that examine the impact of the partition between outpatient and inpatient antibiotic therapy for ABSSSI represent an acknowledgment of this mandate.