

## Therapeutic Pathways for Antimicrobial Use: Pediatric Issues

*Based on a presentation by James McCarty, MD; and Lorna Dyk, RN, MBA*

### *Presentation Summary*

This presentation details Dr. McCarty's experience with the development and implementation of antimicrobial clinical pathways at Valley Children's Hospital in Fresno, California, where he is the Medical Director of Infectious Diseases. The hospital has several hundred beds, serves 700,000 children in central California, and has recently developed a physician's association including 250 physicians. The first capitated contract was received in 1997 covering 12,000 patients, and it is expected that capitated contracts

covering up to 200,000 patients will be secured by the end of 1999.

The first therapeutic pathway was developed as part of the new managed care organization's utilization management strategic plan, and substantial cost savings were realized while outcomes were maintained. Physician cooperation with the therapeutic pathway concept has increased, and plans are underway to develop therapeutic pathways that will be equally as effective for other disease states commonly encountered in this specialized patient population.

“**M**anaged care is likely here to stay, and institutions are under increasing pressure from both managed care organizations and regulatory agencies to improve the quality of care, decrease the cost, and to guarantee access. We call this the triple mantra of managed care,” said James McCarty, MD, Medical Director of ChildNet Medical Associates and Medical Director of Infectious Diseases at Valley Children's Hospital in Fresno, California. “As clinicians, improving quality should be our main thrust, and of course, a managed care organization is useless if people can't get the care they need. At the same time, we are under a lot of

pressure to contain costs. So, we need to practice smarter medicine,” he said.

Historically, utilization management meant dealing with only a few patients a month who were denied payment because they were hospitalized for too long. Now, there is a new healthcare environment, and most managed care organizations have developed comprehensive utilization management programs that have become an important part of many institutions, Dr. McCarty explained.

### **Strategic Plan Goals**

The strategic plan for Valley Children's Hospital and its 250 physician as-

sociation, ChildNet, revolved around five goals. The first task was to develop the infrastructure for full delegation of utilization management. "We wanted to be able to do this ourselves, and we are trying to carve out pediatric lives from our insurance companies and managed care organizations," Dr. McCarty said.

The second goal was to improve quality of care while lowering cost. Maximization of patient-provider-employee satisfaction, a guarantee of access to care for all children, and to position the hospital to become a nationally recognized center of excellence for pediatric managed care were the other identified goals.

To accomplish these goals, several changes were needed. "One of the main things we planned is the development of a full complement of managed care tools to support the management of referrals, authorizations, and standard billing practices," said Dr. McCarty. The tools needed include guidelines for referral to specialists and for authorizing services that require prior authorization.

Also on the list of needed managed care tools were condition-specific treatment guidelines for physicians to use in managing their patients and clinical pathways for various disease states that would encompass medication recommendations. A plan to provide frequent feedback to staff and providers regarding quality indicators, resource consumption results, and need for additional change was also developed at this time to help modify physician behavior regarding treatment guidelines and clinical pathway adherence when needed.

The new quality of care and utilization management efforts were first applied to the hospital's inpatient workings and later will be expanded to both the ambulatory and primary care settings.

#### Identifying Problem Areas

Dr. McCarty explained that quality improvement and resource consumption indicators were used with specific

diagnoses to identify the need to develop a clinical pathway for a certain disease state. He then elaborated on how a pathway was developed and what the results were by using the example of bronchiolitis, which is a very common pediatric illness.

"Bronchiolitis is primarily caused by respiratory syncytial virus (RSV), and it occurs in annual epidemics. We can have as many as 1000 hospital admissions due to bronchiolitis during one winter," Dr. McCarty said. "As we all know, antibiotics don't treat viruses very well," he said, however, literature reports indicate that a large number of pediatric RSV patients are treated with antibiotics.<sup>1</sup>

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Other studies bring the use of antibiotics in RSV into question, Dr. McCarty said. An older, prospective, randomized study of antibiotic treatment in bronchiolitis showed no improvement.<sup>2</sup> In addition, a study of 565 patients with RSV bronchiolitis in a New York hospital evaluated antibiotic usage. "The antibiotic usage was usually based on the prescribing practices of the individual physicians, and some put all of their RSV patients on antibiotics while some didn't use antibiotics at all," he explained. The researchers were able to show that only 0.6% of the patients had a systemic bacterial infection beyond otitis media, which is fairly common with RSV, but that 4.5% of the patients who were placed on parenteral antibiotics developed complications from therapy. "So antibiotic treatment was actually harmful in many of these patients," Dr. McCarty said.<sup>3</sup>

### Clinical Pathway Development

"Data from our own hospital indicated that before 1997, 60% of RSV bronchiolitis inpatients with no secondary diagnoses were receiving intravenous doses of cephalosporins. Most pediatric infectious disease specialists would agree that cephalosporins are generally not needed, so we identified this

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— James McCarty, MD

as a problem," Dr. McCarty said. Otitis media should be treated with oral amoxicillin as first-line therapy, and if there is too much respiratory distress, intravenous ampicillin can be used. Also, Pediatric Health Information System data from 30 children's hospitals throughout the country indicated that as few as 19% of RSV bronchiolitis patients received cephalosporins at some children's hospitals.

"We addressed the problem with educational campaigns, which we found had no effect. We are a private hospital with more than 300 physicians on staff, and trying to change physician behavior is very difficult," said Dr. McCarty. "Therefore, we decided to develop a clinical pathway for RSV bronchiolitis," he said.

"A clinical pathway is a clear map of the expected care strategy for the average patient with a high-volume, routine disease. It outlines the treatment strategy for all disciplines involved in a patient's care, including nurses, respiratory therapists, physicians, case managers, and pharmacists. It should represent the most cost-effective route to the best quality of care," Dr. McCarty said.

Development of the pathway should be approached by a team representing the various disciplines involved with pa-

tient care. It should be based on current literature data regarding the disease state and should have predefined outcome goals. A clinical pathway should also target a predefined length of stay. Preprinted order sets made available to physicians are helpful, and nursing directives that allow nursing staff to decide when to advance patients to the next phase of treatment after certain parameters have been met help facilitate the treatment plan.

Using literature data, Valley Children's Hospital decided that the main treatment for bronchiolitis should be oxygen, and that antibiotic use should be avoided. Traditionally, most patients were given continuous oximetry, but since most of the children require only 24 to 48 hours of oximetry before being discharged, the use of spot oximetry was encouraged. With this guideline in place, the hospital was able to decrease the use of continuous oximetry from 60% to 33% of cases, which translated into significant cost savings.

"We wanted to improve the quality of care, look for an appropriate length of stay, decrease the cost, and improve communication throughout the institution and with the family so that everyone was on the same page in managing the patient," Dr. McCarty said.

### Pathway Adherence

During the half year after the bronchiolitis clinical pathway was first instituted, hospital data showed that of the 434 patients admitted, 29% were placed on the pathway and 71% were not. "Some physicians were just unwilling to use the pathway," Dr. McCarty noted.

"Length of hospital stay was not dramatically different and was only slightly shorter for the pathway patients," he said. However, differences in antibiotic usage were realized with 26% of pathway patients receiving intravenous cephalosporins versus 48% of nonpathway patients for a 22% decrease. Results for use of any intravenous antibiotic were even better, with 36% of pathway patients receiving them compared to

62% of nonpathway patients, for a 26% decrease.

In addition, spot oximetry was used in 95% of pathway patients versus a hospital average of 18% prior to having the clinical pathway in place. As far as cost savings, rough estimates indicate that if all 434 bronchiolitis patients had been placed on the clinical pathway there would have been a potential savings of \$221,774 for the year. With the 29% who were on the pathway, a savings of \$63,364 was realized, according to Dr. McCarty.

"One of the things physicians often forget is that 90% of a clinical pathway has nothing to do with medications or doctors' orders. It has more to do with the process of care. Errors of misadministration are decreased, oversights are decreased, and much of the savings relates to the process itself," Dr. McCarty explained.

"We are going to now provide patient profiles to the physicians and feed our results back to them and are hoping that next year we will have 70% or more of them using the pathway for their otherwise healthy bronchiolitis patients," Dr. McCarty said. Plans are underway to develop similar clinical pathways for various other common ailments including gastroenteritis, asthma, and appendectomies.

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... DISCUSSION ...

*After his presentation, Dr. McCarty answered questions from participants.*

**Question:** *When you use amoxicillin, what is the correct pediatric dosage?*

**Dr. McCarty:** That is controversial right now. Currently the recommended dose is 40 mg per kilo per day but some people advocate 80 mg because of the incidence of drug-induced pneumococci. It's a moving target right now.

**Question:** *Since you demonstrated some significant changes with respect to*

*the use of antibiotics and oximetry, have you looked at outcomes to determine if there was an effect?*

**Dr. McCarty:** We reviewed mortality, transfers to the intensive care unit, and readmission within 14 days of discharge and there was no difference between the patients who were on the clinical pathway and those who were not.

**Question:** *What kind of cooperation have you received from the medical staff?*

**Dr. McCarty:** It has actually been fairly good. There is a moderate amount of resistance among the staff to "cookbook medicine," and some physicians are very threatened by the thought of the hospital telling them how to manage their patients. It took a little doing on the part of physicians but there was very little reluctance on the part of the nurses. The respiratory therapists, case managers, and pharmacists welcomed it as well.

Once we start disseminating the data to physicians showing them that there is no difference in mortality, morbidity, and so forth, I think they will see that quality of care is actually improved with clinical pathway use, and that we will have much more adherence.

**Question:** *What kind of reaction did you receive from specialty physicians?*

**Dr. McCarty:** The subspecialists were actually involved in the development of this clinical pathway, and so they used it almost universally. The pediatric pulmonologists who were part of the task force ended up managing patients for some general pediatricians who didn't want to manage the bronchiolitis patients.

**Question:** *Would it help if your physicians were taught to recognize that*

*clinical pathways are a dynamic, ongoing process that will undergo changes with time?*

**Dr. McCarty:** Yes. And in fact, we learned a few things. For example, we found that some physicians want to put the wrong patients on the clinical pathway. It will be a process of continued quality improvement. We found that there is a need to build inclusion and exclusion criteria into the pathways to keep everyone on track.

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... REFERENCES ...

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