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EVIDENCE-BASED MEDICINE

# Assessing Clinical Pathways Use in a Community Hospital: It Depends on What “Use” Means

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Clinical pathways are multidisciplinary tools that outline activities to be carried out in a timely fashion to maximize quality of care and efficient use of resources. They were adapted from project network techniques used in industrial engineering and were first used in health care in the 1980s.<sup>1</sup> They often are developed as a component of quality improvement (QI) programs and typically incorporate evidence-based practice guidelines. They continue to be used in inpatient and outpatient settings for a wide variety of patient conditions.<sup>1-6</sup> Recently published evaluations of clinical pathway use

have shown that pathways are effective in standardizing treatment and reducing variability,<sup>1,4</sup> eliminating unnecessary and redundant diagnostic testing,<sup>1,7</sup> decreasing delays in treatment<sup>3</sup> and length of stay,<sup>1-4,7</sup> and reducing costs of care.<sup>2-4</sup> They also have been shown to improve patient education.<sup>3</sup> The process of developing and implementing pathways fosters interdisciplinary collaboration and camaraderie<sup>2,5</sup> and promotes staff education.<sup>1,3</sup>

Despite these benefits, developing and implementing pathways can involve many staff members and take considerable time. One university health

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### Article-at-a-Glance

**Background:** Many benefits have been associated with the use of clinical pathways, yet developing them can be costly, and implementing them is not always successful. A 300-bed Midwestern community hospital began a clinical pathways program in 1995, and by fall 1998, 15 pathways were in various stages of implementation, with 3 under development. Many challenges had been encountered, but hospital leaders were eager to find ways to increase pathway use.

**Methods:** A qualitative case study design was used to investigate four clinical pathways, two perceived as being “used” and two that were perceived as “not used.” Each pathway was analyzed as a separate case, followed by cross-case analysis. Qualitative data were collected in 65 semistructured interviews with administrators, physicians, physicians’ office staff, nurses, and allied health professionals at the hospital. Data were also collected through observation and document analysis.

**Results:** The two used pathways had been introduced as part of a larger change in care, whereas the two pathways not used had been introduced as stand-alone innovations. Confusing and inadequately developed aspects of the hospital’s clinical pathways program included its purposes, the definition of pathway use, pathway procedures, accountability, education, and incentives. A new case management department, ongoing administrative support, and a sophisticated medical information system were viewed as supports for continued growth in the program.

**Conclusions:** Implementation of clinical pathways was delayed and complicated by the varied perceptions of the program among stakeholders. Lack of clarity and consistency in how information about the program was communicated made it difficult for clinicians to develop a shared understanding of clinical pathways.

center formed 70 clinical pathway teams in a 3½-year period.<sup>8</sup> Others have described efforts to develop a number of clinical pathways for use by many services.<sup>5,9</sup> Even authors who reported their experience with implementing a single pathway have described processes that take several months’ time.<sup>2,4,10</sup> Such an investment of staff time and resources demands full use of the products. Yet, Little and Whipple’s survey of 19 hospitals to assess clinical pathway implementation showed that introduction of pathways often met obstacles.<sup>11</sup> Lack of physician support was encountered in 54% of the 14 responding hospitals, and lack of nursing/staff support was reported in 38%.

Development of a clinical pathways program represents an innovation decision process. According to Rogers,<sup>12</sup> an organization’s decision to employ an innovation involves five stages, clustered into two phases: initiation and implementation (Table 1,

p 169). The degree of uncertainty (technical, financial, and social) associated with an innovation affects the implementation process. Highly uncertain innovations will be more difficult to introduce. Van de Ven<sup>13</sup> challenged the simple linear innovation sequence proposed by Rogers and asserted that the innovation process is a messy and complex progression of events that occurs over time. To illustrate the complexity, he proposed six elements common to all organizational innovations (Table 1).

This article describes a study conducted at a 300-bed community hospital that began introducing clinical pathways in 1995 as part of its continuous quality improvement program. At the time the study was planned—fall 1998—15 pathways were in various stages of use and 3 others were in development. The hospital was still in Rogers’s third (redefining and restructuring) and fourth (clarifying) stages. Clinicians from many ser-

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**Table 1. Models of Organizational Innovation**

<p><b><u>Rogers's Diffusion of Innovations Model*</u></b></p> <p><b>Phase I: Initiation</b></p> <p>Stage 1. Agenda Setting – organizational problem is defined, and motivation to introduce innovation is developed.</p> <p>Stage 2. Matching – problem is “fit” with an innovation, innovation is planned and designed.</p> <p><b>Phase II: Implementation</b></p> <p>Stage 3. Redefining and Restructuring – innovation is adapted to fit context and needs of organization.</p> <p>Stage 4. Clarifying – meaning of the new idea is socially constructed as innovation is put into practice.</p> <p>Stage 5. Routinization – innovation is incorporated into regular operations.</p> <p><b><u>Van de Ven's Elements of Organizational Innovation†</u></b></p> <p>1. Innovation occurs as an accretion of events performed by many people over an extended time period.</p> <p>2. “Shocks,” internal or external to the organization, are needed to initiate action and allocation of resources to the innovation.</p> <p>3. Once begun the innovation diverges into many parallel and interdependent activities.</p> <p>4. Setbacks are frequent and signal either rejection or opportunities for learning.</p> <p>5. Adoption of the innovation is facilitated when the innovation is developed within the organization, but inhibited when users have no opportunity to tailor it to their needs.</p> <p>6. Management cannot ensure success but can influence its odds.</p> <p><small>* Source: Diffusion of Innovations, 4th Edition by Everett M. Rogers (pp 389–400). Copyright © 1995 by Everett M. Rogers. Copyright © 1962, 1971, 1983 by The Free Press, A Division of Simon &amp; Schuster. Adapted with the permission of the publisher.</small></p> <p><small>† Van de Ven AH: Managing the process of organizational innovation. In Huber GP, Glick WH (eds): Organizational Change and Redesign: Ideas and Insights for Improving Performance. New York: Oxford University Press, 1993, pp 269–294. Used/adapted with permission.</small></p>
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vices were working with the multidisciplinary clinical pathways steering committee to refine the innovation to meet the needs of the respective services. Although there

was reportedly excellent cooperation to develop pathways, implementation had been uneven. Some pathways were readily used, whereas others existed primarily on paper and were not ordered, even by physicians who had participated in their development.

Members of the clinical pathways steering committee approached the University of Kansas School of Nursing about conducting a qualitative study that would help them identify and overcome obstacles to full implementation of their clinical pathways program. Two faculty members [N.H., A.K.C.] agreed to work with the hospital to study the clinical pathways program. They worked with the steering committee to identify the focus and to secure external funding for the project. The aims of the investigation were to

- identify characteristics of clinical pathways that had been implemented successfully and to compare these with characteristics of clinical pathways that were not being used; and
- identify organizational factors that promoted or impeded the use of the clinical pathways.

The faculty selected a case study design with cross-case comparison as an approach that would enable them to describe and understand the implementation process.<sup>14–15</sup> The steering committee selected four clinical pathways for intensive investigation, including two that the steering committee perceived as successful (that is, being used) and two that it perceived as unsuccessful (not being used). The steering committee categorized the total hip/knee replacement, taken together as a single pathway, and the percutaneous transluminal coronary angioplasty (PTCA) pathways as successful. Data the committee had collected from January through October 1998 showed that these pathways had been used more frequently than any of the others—57 and 31 times, respectively. The steering committee selected two pathways that had been used only 8 and 11 times, respectively, to represent those “not used”: simple pneumonia and congestive heart failure (CHF). (The number of admissions in the 10-month period eligible to use these four pathways was not available to the research team.)

**Methods**

**Sample**

The purposefully selected sample<sup>16–17</sup> included

- members of the steering committee;
- hospital, physician, and nurse administrators;

- physicians who admitted patients to the hospital;
- staff nurses and allied health professionals; and
- physicians' office staff.

A total of 65 interviews were obtained from 34 nurses, 22 physicians, and 9 allied health professionals. Events and activities observed included steering committee meetings, staff meetings, and care-related activities on units where the four pathways had been introduced.

**Data Collection**

All data were collected by the two faculty in collaboration with 11 doctoral nursing students who were enrolled in qualitative coursework during the fall and spring semesters, 1998–1999. The faculty collected data from administrators and clinical pathways program leaders to describe the context and overall program design. The students were divided into 4 teams, with 2–3 investigators per team; each team collected and analyzed the data for one pathway.

Data were collected from February through April 1999. Semistructured interviews using open-ended questions were conducted with informants after informed consent was obtained. Interviews ranged from 10 minutes in length to more than an hour.

Most were conducted face-to-face, though some were telephone interviews. All interviews were audiotaped and given to a medical transcriber. The researchers who conducted the interviews verified the transcripts for accuracy. Data also included researcher-transcribed field notes from 34 hours of observation.

Each team analyzed documents relevant to its clinical pathway, including meeting minutes, mission statements, shared governance documents, organizational charts, clinical pathway forms, and standing orders. The final data set was composed of more than 2,500 pages of text. All data were available to and discussed by the entire research team.

**Data Analysis**

Qualitative data analysis is an interpretive process that includes identifying meaning units in the data, coding the text by assigning labels to the meaning units, clustering the coded text into categories, and then reading and rereading each category of data to identify themes and patterns to answer the research questions.<sup>18–20</sup> Each team of students was responsible for initial analysis of the data and preparation of a case report that identified the factors that influenced (either positively or negatively) implementation of its pathway (Table 2, below). The fac-

Table 2. Data Analysis Steps

	Pathway Data: CHF, Pneumonia, PTCA, and Total Joint Replacement	Administrative and Context Data
Step 1: Data analysis about individual pathways	a. Code text b. Sort units of text by code c. Cluster coded data into categories d. Analyze text by category e. Prepare descriptive case report for each pathway	a. Code text b. Sort units of text by code c. Cluster coded data into categories d. Analyze text by category e. Prepare description of organizational context and administrators' perceptions of the pathways program
Step 2: Cross-case comparison of pathways	Address Aim 1: Compare case reports to identify common themes and patterns	—
Step 3: Integration of findings	Address Aim 2: Integrate thematic analysis from cross-case comparison with findings about organizational context and administrators' perceptions	

ultly jointly coded and analyzed the data they had collected to describe the context and to identify administrators' perspectives of the clinical pathway program. Then the entire research team met to conduct cross-case comparison of the data about the four pathways and integrate them with data collected about the hospital context.

**Trustworthiness**

The collective amount of time in the field by the research team helped ensure persistent observation of the clinical pathway implementation process, meeting one of the criteria that Lincoln and Guba<sup>21</sup> established for trustworthiness of qualitative research. Use of several investigators and a variety of data sources (clinicians [nurses, physicians, and allied health professionals] and administrators) and data collection methods (interviews, observation, and document analysis) helped confirm the findings. Weekly team conferences during data collection were used to foster bias recognition by individual team members and helped in the identification of leads for further exploration. The analysis and interpretation of the data were verified through a member check, a process of reviewing study findings with those from whom data were collected to assess credibility.<sup>21-22</sup> We presented and provided copies of the findings to the steering committee and the hospital's medical executive committee.

**Results**

**Clinical Pathway Characteristics**

Findings of the comparison of the characteristics of the clinical pathways are presented in Table 3 (below). The two pathways that were perceived as used were designed for patient populations with predictable care; these two patient populations were admitted to only one or two hospital units. In contrast, the populations for the two pathways perceived as not used were described by informants as having a less predictable course of illness and were admitted to several hospital units. Although the treatment of simple pneumonia might be predictable, one

physician explained that he treated patients with simple pneumonia on an outpatient basis and noted that the pneumonia pathway was not appropriate for the more complex patients who were admitted. The PTCA and total joint pathways had been introduced as part of a larger change effort. The PTCA pathway was introduced when the hospital began admitting patients directly from the cardiac catheterization laboratory to a medical stepdown unit, rather than to the intensive care unit. The nursing staff on the stepdown unit had received in-service education that incorporated use of the PTCA clinical pathway into the routine care of these patients. The total joint replacement pathway was introduced when the hospital began using a commercially designed program to streamline care for this patient population. The program included admission, preparation, and rehabilitation of joint replacement patients in small groups. Clinical pathways and case management were components of the program. Interviews revealed that staff recognized the value of introducing pathways within the context of other changes. A nurse involved with the CHF pathway posited that additional programmatic changes might increase the use of the CHF pathway: "If we had a case manager for CHF . . . then we could really do these things . . . like a 'phone home' team that calls the CHF patients after discharge or before they need to be admitted from the doctor's office."

**Organizational Factors**

The study revealed numerous other aspects of the organization that affected implementation. Physicians,

Table 3. Differences in Characteristics of the Clinical Pathways

Pathways Used	Pathways Not Used
Patient population has: <ul style="list-style-type: none"> <li>■ predictable course</li> <li>■ few comorbidities</li> </ul>	Patient population has: <ul style="list-style-type: none"> <li>■ less predictable course</li> <li>■ many comorbidities</li> <li>■ repeated episodes of care for same condition</li> </ul>
Patients cared for: <ul style="list-style-type: none"> <li>■ on a limited number of units</li> <li>■ by a limited number of physicians, typically specialists</li> </ul>	Patients cared for: <ul style="list-style-type: none"> <li>■ on several units</li> <li>■ by many physicians, both specialists and generalists</li> </ul>
Pathway part of a larger program of care or broad change process	Pathway introduced as a stand-alone innovation

nurses, and allied health professionals who were using pathways, as well as those who chose not to use the pathways, identified components of the clinical pathways program that were unclear, inadequately developed, and incompatible with other hospital programs and care delivery processes. Features of the organization that were supportive to pathway implementation were identified also.

**Lack of Clarity**

**Program purpose.** Three purposes of the clinical pathway program had been outlined in policy by the medical executive committee and the hospital:

1. To improve coordination and efficiency of care;
2. To improve the quality of care in terms of patient satisfaction and outcomes; and
3. To reduce overall costs of care.

Among the clinical staff (physicians, nurses, and allied health professionals) a variety of purposes were perceived, some of which were consistent with those adopted by program leaders. Yet clinicians expressed skepticism that clinical pathways were being implemented to improve quality of care. As one physician noted, “A lot of physicians probably still see them as primarily cost-cutting proposals, with a suspicion toward a drop in quality.”

**Pathway definition and use.** A major finding was confusion about what constituted the pathway and what it meant to “use” a pathway. This confusion made it essentially impossible to accurately count how often the pathways were being used. Four different interpretations of what it meant to use a pathway were found.

First, the steering committee defined a clinical pathway as “a tool of multidisciplinary patient care that is a process flowchart of the activities that must occur in a timely fashion to achieve the anticipated outcomes within an appropriate length of stay and resource utilization.” To the steering committee, “use” of a clinical pathway meant that the form and its associated standing orders and variance form were placed in the patient’s medical record. This was not what use meant to clinicians. In fact, during interviews some informants said they were using a pathway, but during the 3-month data collection period, no one on the research team was able to locate a pathway in a patient chart.

Second, many physicians used only the standing orders component of the clinical pathway. One physician remarked, “These are just a group of standing orders . . . and you’re free to add to them or take away from them or whatever.” One nurse leader commented on the problems created when the pathway was interpreted as a set of standing orders:

Standing orders is [sic] just a set of medical orders for how to get this person in gear, whereas a pathway is how their complete care is going to follow through the system . . . . Everybody is involved, not just “these are the medical orders.” So, to me they aren’t the same thing at all.

Some physicians and their office nurses interpreted the pathway in a third way—as a guideline for writing orders. One office nurse noted, “They told me just order what’s on the [pathway].” A physician explained the benefits of using pathways as guidelines: “They help . . . get things done that ordinarily might not be done.” One staff nurse found it confusing when pathways were used as guidelines: “I don’t know whether [the doctors] use it as a reference or what, but sometimes I have seen where they place it on the chart but do not follow it.”

A fourth interpretation of clinical pathway was to use it as a standard of care. One clinician noted that pathways “ensured that patients wouldn’t fall between the cracks and not receive a very important part of care.” However, a directive included in an educational packet distributed to nurses cautioned them not to use the pathways as a standard of care: “Clinical pathways do not represent a standard of care. They are guidelines for consideration which may be modified according to the individual patient’s needs.”

Regardless of how pathway program leaders or clinicians defined clinical pathways, pathways were not always perceived as useful and often carried a negative connotation. Some staff nurses resisted using the three-part pathways, saying, “Oh no, one more thing to do.” Some nurses were glad physicians didn’t order pathways; as one nurse said, “Thanks. I’m glad I don’t have to worry about that because it’s another piece that I have to document on that has no meaning for me.” Finally, during a field observation one staff nurse indicated that using pathways created bad feelings among disciplines: “The pathway is actually using nursing to get the [physicians] to do their job.”

**Pathway procedures.** Clinicians were unsure about who was supposed to initiate pathways—admit-

ting physicians, physicians in the emergency room, physicians' office staff, or unit staff nurses. One physician's comment indicated that pathways were not consistently initiated in the emergency room:

My pneumonia [patient] that came in through the emergency room, they didn't put her on a pathway there. So I put her on a pathway. Now . . . the nurses have to take her off all these orders, re-enter all this stuff, put her on the pathway. Why didn't the ER doc who was seeing her for the community-acquired pneumonia go to the pathway?

One nurse commented that the biggest problem for her unit "is getting the [physicians'] offices to know about them and for the physicians to actually use them."

Nurses were confused about what to do when the physician orders didn't match the pathway, as conveyed by this statement: "Sometimes we will get a set of regular orders with the standing orders and the pathway, then have to call and clarify, 'Which do you want?'" Another difficulty was represented on the CHF pathway. The clinical pathway was divided into three phases, but the standing order form included orders for phase 1 only; none of the items of care outlined for phases 2 and 3 were on the order form. There were even different interpretations of how the standing order form was to be filled out. A member of the steering committee explained that physicians check the pathway items they want ordered, so if something on the standing orders is not checked, it is not ordered. But another member of the steering committee said, "If things you don't want done are on the pathway, you would have to cross off the things you don't want." If steering committee members had different interpretations, it is not surprising that others were confused also.

Another point of confusion related to who was responsible for monitoring patients after they were put on a pathway—physician, case manager, staff nurse, or utilization review coordinator. A nurse leader's opinion was that it was "case management's role to provide that length of stay 'driver.'" A department head used the term "pathway police" when referring to the monitoring responsibility and asked, "Should it be up to the case management nurse to make sure that the docs are doing the pathway orders or keeping them on the pathways, or is it the staff nurse role?" She responded, "That hasn't been worked out yet."

Finally, there was confusion about the definition and meaning of *variance analysis*. For the steering com-

mittee, variance meant "the difference between what is expected and what actually happens," which carried a positive connotation because it was a way to identify the need to evaluate and possibly revise aspects of the pathway or the hospital system. For clinicians, however, variance carried a negative connotation, and they were confused about what to do when a variance occurred. A clinical nurse specialist (CNS) explained, "[They] think if they fill that out they're admitting to bad care. They feel like they're going to have to turn around and make out an incident report."

### Inadequate Development of Program Components

**Accountability.** Particularly troublesome was the difference in perceptions of who was accountable for the clinical pathways program. According to policy and as one administrator explained, accountability resided with the medical executive committee, which delegated responsibility and accountability to a physician and CNS who co-chaired the steering committee. Although the policy did not list the co-chairs' responsibilities, the CNS co-chair estimated that she spent 40%–45% of her work time on the clinical pathways program. She described her role as

- working with each pathway development committee to develop new pathways and revise old pathways;
- educating staff about pathways;
- serving as the central information source and point of contact for the clinical pathways program, and
- establishing the agendas for and running the steering committee meetings.

The physician co-chair described his responsibilities as "encouraging other physicians to use the pathways," noting that the CNS co-chair "did 99% of the work." Each pathway development was also co-chaired by a physician "champion" and a nurse. Although hospital policy assigned program accountability to physicians, data collected during interviews and observations showed that physicians did not consistently assume accountability for the program or for pathway development, as indicated previously. A physician champion of one pathway development committee said, "I was contacted, but I don't have time to be on the committee, [the nurse co-chair] showed me the path and I said, 'Looks okay to me.'" Perhaps one physician champion's comment best conveyed that most physicians champions did not assume

accountability for developing pathways: “[The physician champions] are the token physicians. . . . I’m a figurehead. We do PR.” The PTCA physician co-chair was the exception. He led the development and truly championed the use of that pathway.

Data further showed that physicians had not assumed accountability for initiating use of pathways. According to policy, pathways could be used only when ordered by a physician, but physicians were not ordering them. One physician’s comment indicated that he did not believe the pathways were intended for his use: “I think it is good for the interventions for physical therapy, occupational therapy, and nursing. The nursing interventions are good.” A nurse on the orthopedic unit confirmed the problem: “Doctors have to order it for us to use it. . . . But the problem is getting the doctors to use it.” One nurse leader’s comment captured what appeared to be the discrepancy in accountability:

Maybe the people who are committed to it aren’t the people who work it, if you know what I mean. Maybe administration is committed to pathways, but maybe the medical staff has got to be totally committed to the pathways in their area, or you’re just not going to have it.

**Challenges with education.** The educational component of the clinical pathway program was perceived by many to have been inadequate. Pathway program leaders used several approaches to educate physicians about the pathways, including informational letters, distribution of new pathways, formal (but sometimes as brief as 10-minute) presentations by physician champions at department and quarterly staff meetings, an hour-long continuing medical education (CME) presentation by a national speaker, and ad hoc presentations, as opportunities arose. Still, we heard this comment from one physician:

But [we] haven’t had in-servicing or ‘Here’s what the pathway is and here’s how it should run, here’s what we hope the benefits to be and we will try to quantify those benefits.’ . . . We’ve seen the forms and I know we’ve seen what’s on them but I can’t tell you how we got that.”

Another physician commented, “I didn’t think the congestive heart failure pathway got advertised very well.”

Pathway leadership and nurses described numerous nursing educational activities. However, for almost every educational activity a nurse described, someone mentioned its limited impact. Furthermore, it appeared that the education for allied health professionals was spo-

radic or absent. A pharmacist commented on the CHF pathway: “I never saw it marketed or ‘sold.’” During an interview, when asked if she had used the pneumonia pathway, one respiratory therapist replied, “I didn’t know we had one for respiratory use.” A unit clerk explained, “I’ve had no formal education as to use of the pathway.”

**Incentives.** Although the steering committee had developed incentives to recognize contributions to development of pathways and to encourage their use, once again, this component of the program was perceived as inadequate. A variety of incentives to motivate physicians to order pathways were described. The associate medical director stated, “The biggest incentive for any physician to use [the pathway] is if . . . we have data to show them it works.” A staff physician concurred:

To gather enthusiastic support, there’s gotta be some benefit for the physicians . . . whether it is in financial fashion, quality of care for their patients, or an improvement in their ability to manage patients effectively.

Another physician stated:

There really isn’t [any benefit] for now, other than the efficiency and then indirectly I think we perceive there is a benefit because we can say to our patients, to the hospital, to the insurance companies that we have a very efficient total joint program.

Physicians who ordered pathways were recognized by being entered into a monthly drawing for a gift certificate and into an annual drawing for a \$2,000 CME scholarship. The program did not appear to be working; the use of pathways had not increased. One physician summed up the incentive program this way: “There were some perk-type of incentives but nothing with any teeth.” One administrator posited, “Maybe if there was some way it was tied to their credentialing or their privileging. I hate to see it be a financial incentive.”

There were few or no incentives for other clinicians. One member of the steering committee thought there was an incentive program for nurses: “It’s my assumption that the nursing staff on a unit that helped with implementation also get in a drawing.” But others told a different story: “[The physicians] had monetary incentives to utilize the pathway. . . . Nursing didn’t have that.” The steering committee co-chair tried to make up for the lack of a formal incentive program for nurses: “My thing is to make sure that it gets on [the nurse’s] evaluation.” No one spoke of incen-

tives to recognize allied health professionals who contributed to pathway development or use.

### Incompatible Systems

**Duplicate documentation.** Less than 2 years before implementing clinical pathways, the nursing department began using a new nursing clinical practice model to guide nursing care delivery and documentation. Using clinical pathways as a documentation tool was perceived as incompatible with this model, for it violated the contract with the model developer. As a result, nurses were required to document on both the clinical pathway and the practice model documentation form. One nurse summarized the issue: "They can document on the clinical pathway, but it doesn't take the place of other documentation tools."

**Physicians' offices.** Another incompatibility was due to the hospital's loose coupling with the physicians' offices. One nurse leader pointed out that physicians' office staff, who routinely called or telefaxed admission orders to the hospital, had received little education:

One of the biggest things that kept it from being successful is lack of education on the office staff's part. . . . You work very hard to get this group together, including physicians, and they don't take the information back to their offices.

### Summary

Lack of clarity, program inadequacies, and incompatibilities meant that clinicians were not able to make sense of the clinical pathways program. They had not developed shared meaning about the program, their role in it, or its potential benefits. Despite what might appear to be formidable odds against ever having a successful clinical pathways program, respondents identified small successes and noted hospital features that supported further implementation.

### Pathway Progress and Institutional Strengths

**Program success.** Two views of program success emerged from the data. The first was that care delivery had been changed. One administrator felt that the program had been partially successful because he "hadn't heard the physicians complaining" about the pathways. Clinical pathways were also changing care delivery by ensuring multidisciplinary care; as a physician

commented, "It's probably more positive for the patient because automatically these people are going to get drawn in . . . and . . . it's going to add more consistency to the patient in terms of education, which is very important." A nurse case manager noted, "The nurses are more prone to get things done." Another nurse described PTCA pathway success: "The elements of the pathway are happening. . . . We educated the staff on the pathway, . . . [on] the process they are to follow when the patient first comes out [of the cath lab]." These practice activities were occurring without placing pathways in charts. Yet, one occupational therapist disagreed that the program had succeeded: "I can't say I do anything different with the patient that is on the clinical pathway than the patient that is not on the clinical pathway . . . To me, it's just . . . one more piece of double documentation."

The second view of success was that the desired goals had been attained. The goals of the project were to improve efficiency and quality of care and to reduce costs of care. The policy outlined that "lengths of stay, costs, and patient satisfaction would be evaluated . . . every 3–6 months." Most of those interviewed thought it was too early to assess outcomes; as someone stated, "We just haven't had enough time, enough volume . . . to draw those conclusions yet." A department director noted, "Implementation hasn't really happened yet." A physical therapist had the same perception: "I don't know whether it's been successful or not. I think my measure of success would be whether the patients left the hospital and went home according to the schedule on the pathway."

Some respondents were able to list pathway outcomes. The total hip/knee replacement pathway "cut our length of stay." An outcome of the PTCA pathway was that "patients used to stay in four or five different beds . . . use four or five different laundry loads from staying in different rooms. Now . . . they have a room, they go out, they come back, it's very efficient. So that was really a success." Another comment about the success of the PTCA pathway was, "We've definitely had a decreased length of stay." Yet when the co-chair reported PTCA pathway outcomes to the steering committee—"a cost avoidance of \$131,000 for 6 months in 1998"—an administrator cautioned that it was difficult to determine what the savings meant. No indicators of program success were noted for the CHF and pneumonia pathways.

**Favorable clinician attitudes.** Some, but not all, clinicians had favorable attitudes about the pathways. A staff nurse explained, "They are great, provide us with outlines for patient care. . . . I've seen two in the last 6 months. They worked well when they were used." An orthopedic surgeon remarked:

I think the thing that makes it most successful was the input of everybody that's involved with it. . . . There's not one person telling you how you have to do it, but everybody agreeing on what's best to get the task done, and with good efficiency and good outcome.

A nurse leader for the orthopedic unit agreed: "There's commitment from everybody, from the medical staff and the nursing staff both, to keep [the pathways] up to date, keep them current . . . and therefore to use them." A physical therapist said, "I think it's been accepted well. . . . It helps with the team approach and everyone knows what the other person is doing or supposed to be doing." One physician who had used the pneumonia pathway was also positive: "It gets the doctors ordering stuff. And the pathway lists proper follow-up. . . . There should be a pathway for every diagnostic category. . . . These should have been implemented a long time ago."

A number of clinicians who had used pathways at other institutions were enthusiastic about clinical pathways but disappointed with the program at this hospital. One commented:

When they said pathways my eyes lit up, 'Yeah, pathways!' I was disappointed when I saw what they were. . . . To me, pathways are very outcome driven . . . and I feel our pathways, I'm just not sure what they do. I'm not sure where they fit in. I'm not sure what influence the nurse has on them.

Another clinician summarized her experience with pathways at another institution: "I really believe the pathway is wonderful if you use it right. . . . The outcome is great. The pathway is almost the nursing practice."

**Case management department.** A few months before data collection began, the hospital had reformulated its social work department into a case management department, adding personnel with varied professional backgrounds to function in the case manager role. This provided an opportunity to enhance pathway implementation. The department director described the department's current position:

At this point I don't think they feel like they even know what a pathway looks like or what to do with it. So, it's

going to take some education on my part to take this back to them and help them understand.

Others also were seeing the potential for case manager involvement; for example, "I wonder if case management will [push the pathways]? . . . That might be a way that it would make a difference." One nurse was hopeful: "I think having case managers there will help patients who fall between the cracks. And that may be one way, too, for them to see if there is a pathway on the chart."

**Administrative support.** There was strong administrative support for the program, as one respondent noted: "It seems [the hospital] is committed to it, administration is committed to pathways." The CNS co-chair of the steering committee devoted about 40% of her time to this project, and other personnel, including clerical staff, also devoted considerable time to the effort. Financial resources were designated to underwrite the incentive and educational programs.

**Information system.** Several respondents commented on the hospital's sophisticated medical information system. Already this system was being used to generate a semiannual summary of patient outcomes with comparative data for each physician. The medical director described the outcome reporting system as follows: "I don't know if any other institution in town mails out outcomes information at the sophisticated level that we do. . . . We have a reputation for setting standards." Another physician praised the medical information system:

The medical staff office has the best severity adjustment software in the city and they're producing reports. So I'm hopeful that we're going to get some data to actually show that, 'Gee, doctor, these pathways, it's faster.' They also have a good computer system at the hospital, a lot better than a lot of the other hospitals. So I think it makes things like generating a customized report . . . a lot more possible.

## Discussion

Implementation of clinical pathways in this community hospital had not progressed in the linear fashion posited by Rogers.<sup>12</sup> Although some pathways were being used, difficulties had been encountered with all four pathways. The innovation had not been redefined and restructured to fit the context. This was most evident relative to documentation. Nurses and allied health professionals voiced their dissatisfaction because double documentation was required when

using pathways. Pathway leaders concurred, yet they did not resolve the problem. One other problem was noted with the format of pathways, but the concern—discrepancy in the number of phases of care listed on the pathway and the associated physician order form—was limited to the CHF pathway. No concerns were expressed about the format or content of the other three pathways.

Confusion persisted into the clarifying stage, the point at which shared meaning about an innovation is usually socially constructed. Clinicians had different and sometimes conflicting interpretations of what it meant to use a pathway, who was supposed to initiate a pathway, the purpose of variance analysis, and so on. For some, the pathways carried a negative connotation—more work with no tangible outcome. For others, the connotation was positive—an opportunity to improve clinical or cost outcomes. Perhaps some of the inconsistency in meaning was related to the high degree of uncertainty about pathway accountability, how pathways fit in with other patient care procedures, and whether pathways would have the desired outcomes. In light of these problems, it is not surprising that routinization (that is, regular use of the pathways) had not been attained.

Van de Ven's<sup>13</sup> characterization of the innovation process as a messy, complex progression of events was borne out in the implementation of the clinical pathways program at this hospital. Many people were engaged in the program, but not all of them were at the same place in their understanding or commitment. Some stated that the care processes outlined in the pathways were being used, even though they did not place paper copies of the forms on the patients' charts. Comments indicated that nurses and physicians on the obstetrics unit found a way to adapt the innovation to their preferences and overcome constraints that negatively affected use of the four pathways we studied.

One ingredient of successful innovations described by Van de Ven<sup>13</sup> was an internal or external shock to the organization. This ingredient appeared to be missing in this setting. Although the executive team of the hospital had proposed the program in response to a challenge to save \$3 million in 3 years, this impetus was not perceived to be of shock status among clinicians and maybe not even among the executive team. Another finding consistent with Van de

Ven's study of innovation was that no matter how supportive they were, hospital administrators had not been able to ensure program success. Nonetheless, they continued to allocate resources to the clinical pathways program and to be interested in the program's progress.

It is interesting to consider our findings in light of a growing body of literature about the influence of organizational context and organizational change processes on clinical guideline implementation. Authors have recently noted that use of clinical practice guidelines depends not only on changing individual clinician behavior but also on differences in hospital environments, impact of organizational structure and dynamics, and use of formal change processes.<sup>23-25</sup> Roberts reported that within one 18-hospital health system that promoted the use of clinical practice guidelines, only 3 hospitals successfully integrated guidelines into their care processes.<sup>26</sup> His analysis of these 3 hospitals revealed the importance of financial, physician, and management culture to the probability of success. In our study the degree of success in using clinical pathways (a type of clinical practice guideline) varied across clinical units, even within one hospital. And it is worth noting that this community hospital had employed several change processes that have been suggested in the literature. These included multidisciplinary teams, physician champions, educational programs, and pilot testing of pathways.<sup>23,26-28</sup> Yet the hospital was unable to achieve the desired level of pathway use.

## Recommendations

The findings of this study suggest several approaches to enhance clinical pathway implementation. First, sufficient representation from clinicians and physicians' office staff is needed as pathways are developed and pilot tested, as pathway educational activities are planned and provided, and as implementation problems are analyzed and solved. Deliberate engagement of clinicians to determine the who, what, where, when, and how of pathway use can help ensure that the pathways are useful for and usable by all disciplines. A step-by-step walk-through of each pathway, even before it is tested with patients, can be used to foster interaction and understanding about the pathway. Subsequent pilot testing will provide more information to enhance pathway use. A steering committee

member in our study explained that this approach helped increase use of the vaginal delivery pathway in the study hospital: "We had so much involvement with the [physician and nursing] staff in creating [the vaginal delivery] pathway that I thought, 'Boy! That was time well spent.'" Focus groups to generate discussion might be useful during pilot testing and early use of pathways. This medium provides a forum for people to hear about one another's experiences and ideas and could generate information about how well pathways are working and how their use could be supported further. It might also be helpful to seek input from clinicians who have worked at other agencies, where pathways were successful, to assess their perceptions of why the pathways were successful there and consider similar approaches.

Educational efforts that foster engagement with the new information will support use and provide repeated opportunities to enhance clarity of a clinical pathways program. In today's leanly staffed hospitals and physician offices, standard in-service approaches may not work. Instead, posters, handouts, and other self-paced learning packets might be effective alternatives. Those hospitals that have developed a presence on the Web can develop interactive Web-based learning modules. Asynchronous discussion groups and chat rooms can also be used to promote problem solving about the pathways. But even then, there must be opportunities for repeated learning and reinforcement. Swain's description of a comprehensive approach for education when implementing clinical pathways is an excellent example to follow.<sup>28</sup> He identified four educational program components—audience, content, format, and assessment—and offered specific suggestions for involving all stakeholders throughout the implementation process.

Careful attention must be given to how the clinical pathways program fits into other organizational programs and initiatives. If using clinical pathways is not compatible with current care protocols and practices, the pathways are less likely to be used. Similarly, after the clinical pathways program has been implemented, as subsequent new initiatives are launched, care must be taken to link the clinical pathways program with them and ensure compatibility.

Implementation of a clinical pathways program is, as suggested by Van de Ven, "an accretion of numerous events performed by many people over an

extended period of time."<sup>13(p 275)</sup> Thus, the implementation plan and time frame should be flexible, allowing for setbacks and for different organizational units to modify the innovation to fit their circumstances. An iterative approach to implementation can foster organizational learning and shared meaning about clinical pathways and, ultimately, long-term success.

In the study hospital, pathways introduced as part of a larger effort to improve care were more readily received. Focusing on how pathways help "improve care for patients" rather than teaching "how to use a new form" will most likely be more meaningful for clinicians. Taking better care of patients does make sense to them.

Finally, feedback, recognition, and rewards are part of the material from which individuals make sense of organizational activities. It is common knowledge that feedback is an essential component of behavior change. Detailed and factual feedback about implementation progress (positive and negative) and solicitation of clinicians' perceptions of the pathways is important, particularly when difficulties have been encountered and dissatisfaction with the pathways has been voiced. As pathway use increases, feedback about the outcomes achieved will further support implementation and routinization. If incentives are used to encourage or reward pathway use, it will be important to determine in advance what incentives are meaningful to clinicians and what incentive mechanism is consistent with the facility's usual compensation and reward systems.

### Postscript

About 15 months after study findings and recommendations were presented to the clinical pathways steering committee and the medical executive committee, we received an e-mail from a steering committee member. She began as follows: "I am so happy to let you know that administration really did look at your study and your recommendations. We have radically changed our process of developing and implementing pathways." She went on to explain that they had disbanded the clinical pathways steering committee. It was replaced with four service-based interdisciplinary clinician teams that became champions for the pathways. Old clinical pathways were revised and new ones were developed; all were put online, and even the pneumonia and CHF pathways were being used. Computeri-

zation enabled staff to complete their documentation online and also provided a database so that costs and reimbursement for care could be analyzed for pathway patients. She summarized the program's status at that

time: "We were able to save the hospital \$900,000 in the last 6 months by using pathways . . . we still have some hurdles and roadblocks to get through, but it seems to be clicking better now." **J**

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