Implementing Clinical Pathways for Patients Admitted to a Medical Service: Lessons Learned

Robert C. Goldszer, MD, MBA, Anna Rutherford, MD, Peter Banks, MD, Kelly H. Zou, PhD, Maureen Curley, RN, MSN, Patricia Brita Rossi, RN, MBA, Terry Kahlert, MS, RN, Dorothy Goulart, RN, MS, Katherine Santos, and Michael Gustafson, MD, MBA

Abstract: In an attempt to improve quality of care for patients admitted to our medical service we have implemented the use of pathways. These are printed standards of care and a mechanism for daily multidisciplinary documentation (Fig. 1). The goals of our pathways are to: improve quality using printed standards of care; improve documentation of the care delivered; improve communication about daily goals between all team members, patients and families; standardize our in-patient chart format throughout the hospital; and increase efficiency of care. Pathways were designed to provide physicians and nurses with the standards for care and provide a mechanism for multidisciplinary documentation on our in-patient charts. We now have 2 pathways in use on our medical service. One is a clinical care plan (CCP) and the other is a Pancreatitis Pathway (PP) for patients admitted with acute pancreatitis and the other a guideline for care for all patients. The pathways were developed by teams including attending physicians (General Internists and Gastroenterologists), medicine house officers, nurses, and care coordinators. The pathways are used for all patients admitted to our medical service if they are admitted to one of 2 floors. This paper includes a comparison of outcomes for our first 9 patients who were managed using the pancreatitis pathway versus 7 patients cared for without the pathway. Significant differences in the pancreatitis pathway treated patients included: 1) less intense pain on day 2, ($P = 0.04$); 2) less pain on day of refeeding ($P = 0.004$); and 3) less IV fluids administered ($P = 0.05$). We also describe several lessons we have learned about using pathways for in-patients on a medical service in an academic medical center. We have learned the following lessons. Nursing documentation is improved. Physicians need ongoing encouragement and education about the value of pathways. There is considerable work involved for unit coordinators, care coordinators, and nursing in using pathways on a medical-surgical floor. There must be physician and nurse champions. There must be ongoing feedback to users. There must be input from users and edits. We believe the use of pathways as a process to remind clinicians of quality standards will improve the care of our patients by decreasing variation, improving team communication, and enhancing patient and family education.

Key Words: clinical pathways, multidisciplinary documentation, pancreatitis, length of stay, improving communication

(*Crit Pathways in Cardiol* 2004;3: 35–41)

From Brigham and Womens Hospital, Boston, MA.

Reprints: Robert C. Goldszer, MD, MBA, Department of Medicine, Brigham and Womens Hospital, 75 Francis St., PB-4 Boston MA 02115. E-mail: rgoldszer@partners.org

Copyright © 2004 by Lippincott Williams & Wilkins

ISSN: 1535-282X/04/0301-0035

DOI: 10.1097/01.hpc.0000116587.99026.27

Pathways have been used in health care since the 1980s.[1,2] The initial focus was to reduce length of stay (LOS) with an emphasis on nursing care. Goals of pathways include 1) defining standards for expected LOS and for use of specific tests and treatments, 2) giving all team members a plan and specific roles, 3) decreasing nursing and physician documentation burdens, 4) providing a framework for collecting data, and 5) educating and involving patients and families in their care.[3] By using pathways others have documented improved nurse—physician interactions, LOS reductions of 5 to 40%, cost reductions of 33%, and better adherence to standards of care.[4,5] Some studies have shown no improvements in costs or clinical outcomes.[6] In acute coronary syndromes a recent review reported the potential to improve care and reduce costs by increasing use of guideline recommended medications.[7] Recently, the use of multidisciplinary documentation and clinical care plans has decreased LOS in ICU patients.[8] We have used pathways for care planning, documentation of utilization, and patient education. Many of our surgical services and our Orthopedics service have used pathways for 9 years. Based on these prior experiences in the literature and in our hospital and based on a desire to continuously improve quality of care for our patients we developed and implemented pathways for patients admitted to our medical service.

PROCESS

We began development of the Clinical Care Plan (CCP) and the Pancreatitis Pathway (PP) in winter of 2002 and implemented their use in February 2003. Between February

Copyright © Lippincott Williams & Wilkins. Unauthorized reproduction of this article is prohibited.

BRIGHAM AND WOMEN'S HOSPITAL

Clinical Care Plan

addressograph

Date:	Anticipated Date of Discharge:
EVENTS:	

PROBLEMS	EXPECTED DAILY OUTCOMES	MET	NOT MET
Risk for Falls	Patient remains safe from harm		
Pain/Discomfort	Adequate pain control as verbalized by patient or no physical/clinical objective criteria for pain		
Patient/Family Education	Patient/family understands reason for hospitalization and planned diagnostics or treatments (RN)		
Discharge Planning	Patient/family can state anticipated LOS & discharge plan (CC/RN)		
Additional Problems:	**Additional Goals:**		

		N	D	E	VAR	NOTES
RN	NEURO MANAGEMENT:					
	Optimal neurological function maintained					
	Mental status clear or at patient baseline					
	No identified problems					
	Interventions:					
	CARDIOVASCULAR MANAGEMENT:					
	Adequate perfusion as evidenced by:					
	Baseline EKG rate and rhythm ☐ N/A					
	BP at patient baseline or established goal of treatment					
	Peripheral pulses present or at patient baseline ☐ DP ☐ PT ☐ Other					
	DVT prophylaxis					
	No identified problems					
	Interventions:					
	PULMONARY MANAGEMENT:					
	Evidence of adequate oxygenation					
	Head of bed greater than 30 degrees					
	O2 sat greater than or equal to 92% or at established goal of treatment					
	Breath sounds clear or at patient baseline					
	Effective cough and secretion clearance					
	Aspiration precautions ☐ N/A					
	No identified problems					
	Interventions:					

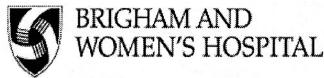
Initials	Signature, Credentials, Beeper #	Shift	Initials	Signature, Credentials, Beeper #	Shift

PLEASE SEE NEXT PAGE (OVER)

FIGURE 1. An example of one day of our clinical care plan pathway for multidisciplinary documentation.

© 2004 Lippincott Williams & Wilkins

Copyright © Lippincott Williams & Wilkins. Unauthorized reproduction of this article is prohibited.



Clinical Care Plan

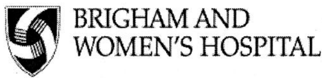
addressograph

Date:						
		N	D	E	VAR	NOTES
RN	**WOUND AND SKIN MANAGEMENT:**					
	Integumentary system intact					
	Preventative skin care measures maintained					
	Therapeutic mattress ☐ N/A					
	No identified problems					
	Interventions:					
	Wound sites/dressing care (specify): ☐ N/A					
	Drains/tubes (specify): ☐ N/A					
	GI MANAGEMENT:					
	Evidence of optimal GI function					
	Presence of bowel sounds					
	Absence of N/V/distention					
	Adequate nutritional requirements met					
	Tolerating ___________ diet ☐ NPO					
	Last bm:					
	No identified problems					
	Interventions:					
	RENAL MANAGEMENT:					
	Evidence of adequate renal perfusion					
	Urine output greater than ______ ml/hr					
	I & O at established goal					
	No identified problems					
	Interventions:					
	PAIN MANAGEMENT:					
	Adequate pain control as verbalized by patient or no physical/clinical objective criteria for pain					
	Pain Management Therapy (specify): ☐ N/A					
	Interventions:					
	ACTIVITY PROGRESSION:					
	Optimal level of mobility maintained					
	Ambulation per diagnosis standard of care					
	Bedrest per patient diagnosis or condition ☐ N/A					
	Activity progression per patient diagnosis or condition					
	No identified problems					
	Interventions:					

Initials	Signature, Credentials, Beeper #	Shift	Initials	Signature, Credentials, Beeper #	Shift

FIGURE 1. Continued.

Copyright © Lippincott Williams & Wilkins. Unauthorized reproduction of this article is prohibited.



Clinical Care Plan

addressograph

Date:

		N	D	E	VAR	NOTES
RN	**PATIENT SAFETY:**					
	Free from harm					
	Falls risk level _______________ protocol					
	Restraint per MD order ☐ N/A					
	No identified problems					
	Interventions:					
	PATIENT/FAMILY EDUCATION:					
	Patient/family learning needs assessed and demonstrates readiness for learning					
	Patient/family demonstrates and verbalizes understanding of:					
	- Medical equipment being used ☐ N/A (specify):					
	- Diagnostic and interventional procedures (specify): ☐ N/A					
	- Rationale for treatment					
	- Medications: Name, Purpose, Dose/Frequency, Possible side effects, Food/Drug interactions, Drug/Drug interactions					
	- Lifestyle changes needed (specify): ☐ N/A					
	Care Notes sheet provided for each new medication					
	Interventions:					
	DISCHARGE PLANNING:					
	Anticipated LOS reinforced with patient/family					
	Page 2 initiated or updated					
	Post-discharge needs and follow-up care identified (specify):					
	DAY OF DISCHARGE: ☐ N/A					
	Care Notes sheet reviewed for each medication					
	Medication calendar developed ☐ N/A					
	"Resuming Your Activity" sheet in Information & Resources packet reviewed					
	"What to Watch Out For..." sheet in Information & Resources packet reviewed					
	Telephone contact numbers reviewed					

Initials	Signature, Credentials, Beeper #	Shift	Initials	Signature, Credentials, Beeper #	Shift

PLEASE SEE NEXT PAGE (OVER)

FIGURE 1. Continued.

© 2004 Lippincott Williams & Wilkins

Copyright © Lippincott Williams & Wilkins. Unauthorized reproduction of this article is prohibited.

Clinical Care Plan

addressograph

Date:						
		N	D	E	VAR	NOTES
RN	Discharge instructions reviewed w/ patient/family					
	Prescriptions given					
	Patient/family demonstrates understanding of discharge plan					
	Appropriate follow-up confirmed					
	Referral completed and faxed ☐ N/A					
	Interventions:					

		Initials	VAR	NOTES
CC RN	Review LOS with patient/family			
	Discharge plan reviewed with team			
	Discharge plan Screening Request ☐ N/A Home Care Referral ☐ N/A			
	Patient/family agrees with plan			
	Page Three Referral ☐ N/A			

Initials	Signature, Credentials, Beeper #	Shift	Initials	Signature, Credentials, Beeper #	Shift

PROGRESS NOTES:

FIGURE 1. Continued.

© 2004 Lippincott Williams & Wilkins

Copyright © Lippincott Williams & Wilkins. Unauthorized reproduction of this article is prohibited.

and September 2003 we have edited and revised the pathways 4 times based on feedback from nurses, physicians, care coordinators, rehab services, and dietary clinicians. A steering committee meets every other week to assess current practice, make revisions, and discuss implementation plans and challenges. We have used the CCP in approximately 1000 patients. The pathways were initially developed by a multidisciplinary team of nurses, attending physicians, care coordinators, and medical house officers. One of our Gastroenterologists (PB) provided input for our PP. The pathway design was based on currently used pathways in our hospital. Pathways are currently in place for 20 procedures or diagnoses. The physician and nurse champions for this project have administrative roles in the department of Patient Care Services (TK), Department of Medicine, and Brigham and Women's Hospital (RCG). Support for the project was provided by senior leadership of the hospital, with the Chief Medical Officer and Vice President of Patient Care Services serving as executive sponsors.

For the pancreatitis pathway, we measured specific clinical variables for our first 9 patients and compared these with 7 patients with pancreatitis admitted to other floors of our hospital that were not using pathways. We conducted a 2 arm prospective study to compare the usefulness of the PP compared with care provided without a pathway. The medical attending physicians and house staff caring for the 2 pancreatitis cohorts were from the same medical house staff and attending groups and levels of training. Statistical methods included summary statistics, Student *t* test, and Fisher exact test.

The clinical care plan is a pathway that can be used for all patients. We are using it for patients who do not have a major admitting diagnosis that is covered by one of our current pathways. For example patients admitted with pancreatitis are placed on the pancreatitis pathway; patients admitted for specific procedures are placed on the specific pathway. The pathways include a physician note, some of which are templates, a daily problem list with outcomes, event note, nursing notes that are organized by anatomic system and contain outcomes, and sections for care coordination, nutrition therapy, physical therapy, pharmacy, and chaplains.

CONCLUSIONS

There has been considerable discussion and work on the pathways since their implementation. Many physicians and nurses have provided feedback. Many have been critical and have raised concerns. The project leaders, the steering committee and the nurse managers have discussed these concerns. Changes to the pathways have been made based on this feedback.

For the initial 9 patients we evaluated on the pancreatitis pathway there has been no difference in LOS. Statistical significant differences based on one sided Student *t* tests between the pancreatitis pathway and routine care were found in only the following variables: 1) less intravenous fluid administered on day 1 in the first 8 hours ($P = 0.05$); 2) less intense pain on the second hospital day ($P = 0.04$), and 3) less pain on the first day of feeding ($P = 0.004$). In subsequent analysis by our care coordinators we have evaluated 29 patients who completed the pathway and twelve who did not. In these patients the LOS for patients on the pathway was 4.0 days. Those that could not stay on the pathway had an average LOS of 14.2 days (see Table 1). Eight patients were able to be discharged before their expected LOS. The most common reasons for extra patient days were pain, ongoing gastrointestinal issues such as nausea, and medication adjustments.

LESSONS LEARNED

We have learned many lessons from our experience implementing clinical pathways.

TABLE 1. Comparison of Results in Patients Admitted With Acute Pancreatitis and Managed Using the Pancreatitis Pathway With Patients Admitted and the Pancreatitis Pathway was Not Used

	Pathway Patients n = 9	**Non Pathway Patients n = 7**	**p Value**
IV fluid in Hours 0–8, Day 1	1788.9	2735.7	0.05
Maximum Pain, day 2	4.1	7.3	0.04
Pain on refeeding day	2.9	6.9	0.004
Hematocrit Increasing first 24 hours	1	0	1
G1 consulted day 1	2	3	0.5
Abd Ct Day 1	5	1	0.2
	Patients completing Pathway n = 29	Patients not completing Pathway n = 12	
Average Length of Stay	4	14.2	

© 2004 Lippincott Williams & Wilkins

Copyright © Lippincott Williams & Wilkins. Unauthorized reproduction of this article is prohibited.

1. *Senior leadership support is essential*. Our Chief Medical Officer and Chief Nursing Officer are key executive sponsors.
2. *There must be physician and nurse champions.* The associate chief medical officer (RCG) and Director of Medical Nursing (TK) are the project champions. They continue to receive feedback and provide education to nurses and physicians.
3. *Involve all stakeholders in development of pathways.* The pathways content has been developed by nurses, attending and house staff physicians, care coordinators, physical therapy, dietary, and pharmacy staff.
4. *Nursing documentation is improved.* Nurses are documenting specific goals and outcomes on an every 8 hour basis. Our documentation is based on specific outcomes by system and includes specific standards of care.
5. *Physicians need ongoing encouragement and education about the value of pathways*. Our physicians are eager to provide best quality care to our patients. There is also great pressure for efficiency and comprehensive documentation. The current pathways permit physicians to use pre printed template notes or traditional progress notes paper. It is essential to have physician and nurse leaders to interact with clinicians.
6. *There is considerable work involved for unit coordinators* in using pathways on a medical surgical floor. Charts must be reviewed and updated on a regular basis. Progress notes need to be placed in the proper location. This is done when all charts are reviewed each day.
7. *There must be ongoing feedback to users*. Our steering committee meets every 2 weeks to review the process, feedback, and plans. Members of the steering committee discuss feedback and plans with their colleagues. The physician and nurse champions meet with physician and nursing leadership. We provide articles for the medical staff and nursing newsletters.
8. *Continuous input from users and edits improve the product.* We have made many changes in response to users input. The pathway has been printed double sided rather than single sided to decrease the number of pages. An events box to highlight daily activities is now included. Areas on the documentation for care coordination, dietary, pharmacy, and chaplains, have been reduced in size.

Our patient care goals include providing excellent care to all our patients and being sure that all physicians and nurses are working on the same set of daily goals and problems. Another goal is to have similar documentation for all our patients throughout our facility. Pathways can provide daily reminders to physicians, nurses, and all members of the clinical care team. They provide a process for multidisciplinary clinical documentation, are based on goals for each day, and include expected outcomes. These daily goals and outcomes can be communicated to patients and families. Our expectation is to use our clinical care plans throughout our hospital for all our patients.

REFERENCES

1. Velasco FT, KO W, Rosengart T, et al. Cost containment in cardiac surgery: results with a critical pathway for coronary bypass surgery at the New York Hospital-Cornell Medical Center. Best Pract. *Benchmarking Healthcare*. 1996;1:21–28.
2. Shiffman R, Shekelle P, Overhage JM, et al. Standardized reporting of clinical practice guidelines: a proposal from the conference on guideline standardization. *Ann Intern Med*. 2003;139:493–498.
3. Grimshaw JM, Rusell IT. Effect of clinical guidelines on medical practice: a systematic review of rigorous evaluations. *Lancet*. 1993;342:1317–1322.
4. Pearson SD, Goulart-Fisher D, Lee TH. Critical pathways as a strategy for improving care: problems and potential. *Ann Intern Med*. 1995;123:941–948.
5. Falconer JA, Roth EJ, Sutin JA, et al. The critical path method in stroke rehabilitation: lessons from an experiment in cost containment and outcome improvement. *Qual Rev Bull*. 1993;19:8–16.
6. Woolf SH, Grol R, Hutchinson A. Clinical Guidelines: potential benefits, limitations, and harms of clinical guidelines. *BMJ* 1999;318:527–530.
7. Cannon C, et al. Critical Pathways for management of patients with acute coronary syndromes: an assessment by the National Heart Attack Alert Program. *Am Heart J*. 2002;143:777–789.
8. Pronovost P, Bernholtz S, Dorman T, et al. Improving Communication in the ICU Using Daily Goals. *J Crit Care*. 2003;18:71–75.Key Words:

© *2004 Lippincott Williams & Wilkins*

Copyright © Lippincott Williams & Wilkins. Unauthorized reproduction of this article is prohibited.