

Improving Patient Satisfaction with Warfarin Management

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Abstract

Warfarin therapy must be monitored closely, as patient response varies and the drug has the potential for significant drug and food interactions. Anticoagulation clinics have been developed to meet the strict monitoring needs of patients taking warfarin. Although research provides evidence that the clinics improve patient outcomes, few investigators have reported on patients' satisfaction with these services. Patient satisfaction is a continuum lacking a defined point at which satisfaction ends and dissatisfaction begins. If outcomes data are to be used to provide the best healthcare, then biologic indicators must be supplemented with data on patients' experiences with the delivery process. We therefore conducted a survey to approximate the point on that continuum identifying patient satisfaction with current anticoagulation monitoring, and to determine whether patients managed in our anticoagulation clinic are more satisfied than patients managed by traditional means. The survey, which assessed patient satisfaction with arranging, understanding, and receiving warfarin therapy, was distributed to a group of patients receiving anticoagulation therapy in the clinic (n = 217), and to a comparison group (n = 128), who received this therapy through their physicians' offices. A significantly higher percentage of clinic patients were more often "very satisfied" with all items on the survey, with the exception of the item on financial value, and a significantly higher percentage of patients in this group "strongly agreed" that their overall experience was excellent. These findings showed that clinic patients were more satisfied than were the nonclinic patients, indicating that traditional warfarin management can be improved by facilitating patient access, providing continuous patient education, and offering efficient feedback.

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Oral anticoagulants are an integral component of therapy in the treatment and prevention of thromboembolic diseases. Warfarin (Coumadin[®], DuPont Pharma, Wilmington, DE) is the most widely used oral anticoagulant in North America, because its onset and duration of action are predictable, and because it has excellent bioavailability.¹

Owing to warfarin's narrow therapeutic index and potential for significant drug and food interactions, frequent monitoring is required.² Unlike the case with other drugs having narrow therapeutic indices, optimal warfarin dosing cannot be achieved through measurement of serum drug concentrations. Rather, dose efficacy is evaluated indirectly, by measuring warfarin's effect on the prothrombin time (PT). A PT is the time, in seconds, required for a sample of blood to coagulate, in vitro, after activation with tissue thromboplastin and calcium. Because the sensitivity of tissue thromboplastin varies among manufacturers, PT results are reported as the International Normalized Ratio (INR).^{1,3}

Patients who undergo traditional monitoring visit an outpatient laboratory or physician's office for a PT test. They later are informed of the results and of any necessary dose adjustments. This process may take from 1 to several days, potentially leaving patients at risk for bleeding complications or recurrent thromboses.^{4,5} Although literature supports the development of anticoagulation clinics on the basis of improved clinical outcomes (fewer bleeds and failures)^{6,7} and cost savings,^{7,8} few investigators have reported on patient satisfaction with these clinics.

A quality assurance audit of Lutheran General Hospital, a part of Lutheran General Health System (LGHS, now Advocate Health Care), identified a lack of consistent management practices and poor documentation of patient education and compliance with warfarin therapy. A multidisciplinary team, formed to improve these processes, implemented a system-wide guideline for warfarin use. Subsequent review failed to demonstrate the anticipated improvements in war-

farin management, leading to the creation of an anticoagulation clinic. The clinic is staffed by a full-time clinical pharmacist, overseen by a physician medical director, and managed by the LGH pharmacy department. The Anticoagulation Center (ACC) was designed to improve outcomes in patients receiving warfarin by focusing on accessibility, patient education, turnaround time, and patient satisfaction with the monitoring process.

Accessibility

The clinic's location, in a strip mall near the hospital, provides close, free parking, but with little congestion from hospital traffic. Patients may make appointments 5 days per week, and evening hours are available.

Patient Education

All patients are scheduled for an initial education session that includes review of written materials with the clinic pharmacist. In addition, patients may check out audio and video materials, for use at home. Education is documented on a checklist, which is maintained in the patient's file.

During subsequent visits, any noncompliance, bleeding complications, symptoms of recurrent events, and changes in diet or medications are documented in the patient's chart. The dose regimen is reviewed, and all patients receive a dosage/appointment card to help them to improve their compliance with the regimen.

Decreased Turnaround Time

During each visit, a portable PT monitor is used to measure capillary whole blood INR.⁹ Using a treatment guideline, the clinic pharmacist makes necessary dose adjustments and schedules a return visit. The visit lasts 15 minutes, including 3 minutes for the INR test. Results are faxed to the referring physician on the same day.

Because patient satisfaction is a continuum, there is no defined point at which satisfaction ends and dissatisfaction begins.¹⁰ Therefore, we conducted a survey in order to approximate where, on the patient-satisfaction continuum, satisfaction with current anticoagulation monitoring lies, and to determine whether patients managed in our anticoagulation clinic are more satisfied than are patients managed traditionally.

... METHODS ...

To participate in the study, patients must have received warfarin therapy within 6 months of the

survey date. Warfarin therapy, as discussed in this paper, encompasses provider visits, testing, and dose adjustments. Study participants were divided into an ACC group, consisting of patients managed through the Anticoagulation Center, and a non-ACC group, comprising patients managed traditionally by 1 of 17 physician offices (drawn from an ongoing LGH atrial fibrillation outcomes study comparing the ACC management to traditional management).

The survey was designed to assess patient satisfaction with arranging, understanding, and receiving anticoagulation therapy. Each dimension consisted of several items about which patients were asked to indicate their level of satisfaction (from "very satisfied" to "very dissatisfied"). Patients also were asked the degree to which they agreed with statements relating to their overall satisfaction with the process of care (from "strongly agree" to "strongly disagree"). In addition, patient age group, gender, number of visits to receive therapy, and comments were requested (Figure 1). Comments were used for quality control and qualitative analysis but were not analyzed statistically.

A pilot test of the survey was given to patients in each group. Interviewers, who were present during the pilot study, assessed the patients' comprehension of the questions. After analyzing the results of the pilot study, the survey was modified to maximize patient understanding.

Surveys were coded to facilitate group classification. However, respondents' identities were not disclosed to care providers.

Each patient was mailed a survey packet containing a cover letter, postage-paid return envelope, and one survey. After 1 week, a follow-up letter was mailed to all patients to increase response rates. Data collection took place from September 27, 1995, to November 7, 1995.

Only surveys received during the data collection period were considered for inclusion in the study. Patients failing to answer a particular question were excluded from the analysis of that question. Surveys returned with no responses, or with a response only to the comments portion of the survey, were excluded from all statistical analyses.

The chi-square test was used to compare dichotomous data (for individual items), and the Spearman rank-order correlation test was used to evaluate relationships between individual items. Scales were derived through factor analysis, using a varimax rotation and an eigenvalue of 1 or higher as a cut-off value. Only items that had a factor loading of 0.4 or better on one scale were included in the final scales. Final scales were compared using Student's two-tailed *t*-test. *P* values ≤ 0.05 were considered statistically significant.

... RESULTS ...

Of the 128 surveys mailed to patients in the non-ACC group, 66 (52%) were returned. However, 10 (15%) of the 66 respondents answered only the com-

ments section; their responses therefore were excluded from the statistical analyses. Of the 217 patients in the ACC group who were mailed surveys, 156 (72%) responded. All ACC responses satisfied the inclusion criteria and were analyzed.

Figure 1. Patient Satisfaction Survey

Arranging for and Getting Care	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied	Does Not Apply
1. Ease in obtaining Coumadin therapy	VS	S	D	VD	N/A
2. Ease in parking	VS	S	D	VD	N/A
Understanding Your Therapy					
3. Explanation of the blood test to track Coumadin	VS	S	D	VD	N/A
4. Learning the possible side-effects of Coumadin	VS	S	D	VD	N/A
5. Learning what medications NOT to use when taking Coumadin	VS	S	D	VD	N/A
6. Your directions regarding follow-up care	VS	S	D	VD	N/A
7. The opportunity to get questions answered during your visit	VS	S	D	VD	N/A
8. The opportunity to get questions answered between visits	VS	S	D	VD	N/A
Receiving Therapy					
9. Promptness of obtaining blood test results and follow-up directions	VS	S	D	VD	N/A
10. Friendliness and courtesy shown to you by the staff	VS	S	D	VD	N/A
11. A feeling of safety about taking Coumadin	VS	S	D	VD	N/A

Overall Satisfaction	Strongly Agree	Agree	Disagree	Strongly Disagree
12. My overall experience in receiving Coumadin therapy was excellent	SA	A	D	SD
13. Coumadin therapy is a good value for what I and my insurance were charged	SA	A	D	SD
14. I would recommend the place I came for Coumadin therapy to my family and friends	SA	A	D	SD

General Information

15. What is your age category? Please circle your response.
 1. Under 50 2. 50-59 3. 60-69 4. 70-79 5. 80 or Older
16. What is your sex? 1. Male 2. Female
17. Approximately how many visits have you made to receive Coumadin therapy during the past year?
 1. 1-5 visits 2. 6-10 visits 3. 11-15 visits 4. 16 or more 5. Can't remember

Additional Comments/Suggestions:

Table 1. Respondent Demographics

	ACC		Non-ACC	
	(n = 156)		(n = 56)	
	No.	(%)	No.	(%)
Age (yr)				
<50	15	(10)	—	—
50–59	13	(8)	2	(4)
60–69	52	(33)	9	(16)
70–79	53	(34)	27	(48)
≥80	18	(12)	15	(27)
Unreported	5	(3)	3	(5)
Gender				
Male	88	(56)	32	(57)
Female	68	(44)	24	(43)
Visits				
1–5	7	(4)	6	(11)
6–10	40	(26)	8	(14)
11–15	54	(35)	23	(41)
≥16	44	(28)	5	(9)
Unreported	11	(7)	14	(25)
Primary Indication				
Atrial Fibrillation	55	(35)	56	(100)
DVT/PE	33	(21)	—	—
Mechanical Valve	32	(21)	—	—
LV Dysfunction	9	(6)	—	—
CVA/TIA	9	(6)	—	—
Cardiomyopathy	7	(4)	—	—
Other	11	(7)	—	—

ACC = managed by LGHS Anticoagulation Center; non-ACC = traditional management; DVT/PE = deep vein thrombosis/pulmonary embolism; LV = left ventricular; CVA/TIA = cerebral vascular accident/transient ischemic attack

Respondent demographics are summarized in Table 1. The gender distribution of the two groups was similar, but members of the non-ACC group were older.

Analysis of the survey responses indicates overall satisfaction (obtained by combining “very satisfied” and “satisfied” responses) with both methods of warfarin management (overall satisfaction in ACC group = 95%; non-ACC group = 80%–100%). However, a significantly higher percentage of patients in the ACC group was “very satisfied” with all items with the exception of number 13 (“Coumadin therapy is a good value for what I and my insurance are charged”) ($P < 0.05$; Table 2). After controlling for gender, diagnosis (atrial fibrillation vs other diagnosis), age (younger than age 70 years vs 70 years of age or older), and number of clinic visits during the preceding year (1 to 10, 11 to 15, and 16 or more), the differences between the percentages in the ACC and non-ACC groups who were “satisfied” were not statistically significant.

When the results from the ACC and non-ACC groups were combined, the Spearman rank-order test showed a strong correlation ($r_s = .61$) between overall experience (item 12) and willingness to recommend the place of therapy (item 14). This test also indicated that perceived value (item 13) and willingness to recommend the place of therapy (item 14) were strongly correlated ($r_s = .64$).

Table 2. Frequency Distribution of Very Satisfied Results

Item*	Very Satisfied		P†		
	ACC	Non-ACC			
	No.	(%)	No.	(%)	
Arranging for Getting Care					
1 Ease in obtaining Coumadin therapy	129	(83)	32	(63)	0.002
2 Ease in parking	128	(85)	25	(54)	0.001
Understanding Coumadin Therapy					
3 Explanation of blood test	116	(77)	28	(55)	0.002
4 Learning possible side effects of Coumadin	99	(64)	19	(37)	0.001
5 Learning what medication not to use when taking Coumadin	91	(61)	21	(40)	0.011
6 Directions about follow-up care	107	(71)	28	(56)	0.045
7 Opportunity to have questions answered during visit	129	(83)	31	(56)	0.001
8 Opportunity to have questions answered between visits	95	(71)	28	(53)	0.019
Receiving Therapy					
9 Promptness of obtaining test results and follow-up directions	133	(86)	35	(63)	0.001
10 Friendliness and courtesy shown by staff	141	(91)	39	(70)	0.001
11 Feeling of safety about taking Coumadin	104	(68)	22	(41)	0.001
Overall Satisfaction					
			Strongly Agreed		
12 My overall experience in receiving Coumadin therapy was excellent	117	(79)	27	(55)	0.001
13 Coumadin therapy is a good value for what I and my insurance are charged	80	(57)	21	(48)	0.275
14 I would recommend the place I came for Coumadin therapy to family and friends	117	(79)	24	(52)	0.001

ACC = managed by LGHS Anticoagulation Center; non-ACC = traditional management.

*From the Patient Satisfaction Survey

† $P < 0.05$ statistically significant.

Table 3. Factor Loadings for Anticoagulation Satisfaction Survey Scales*

Item (No. and Description)	Factor I (Understanding Therapy)	Factor II (Overall Satisfaction)	Factor III (Delivery of Care)
4 Learning About Side Effects	0.86		
5 Learning Medication Interactions	0.80		
6 Directions About Follow-Up	0.71		
8 Opportunity To Have Questions Answered Between Visits	0.63		
11 Feeling of Safety About Coumadin	0.57		
12 Excellent Overall Experience		0.80	
13 Therapy Is a Good Value		0.86	
14 Recommend Place of Therapy		0.81	
1 Ease in Obtaining Therapy			0.76
2 Ease in Parking			0.73
10 Friendliness and Courtesy of Staff			0.72
Cronbach's Alpha	0.85	0.86	0.70

*Only items loading ≥ 0.4 on a single factor are listed.

Factor analysis by varimax rotation identified three scales: (1) understanding therapy; (2) delivery of care; and (3) overall satisfaction. Three items failed to load ≥ 0.4 on only one scale and were excluded from the final scales (Table 3). Standardized scores were calculated for each scale, by group (Table 4). The ACC patients scored significantly higher than did the non-ACC patients on all scales ($P < 0.001$).

... DISCUSSION ...

With the growth of managed care, increasing emphasis is being placed on the combination of clinical outcomes and patient satisfaction. Thus, biologic indicators must be supplemented with patient experiences with the delivery process if we are to use outcomes data to provide the highest-quality health-care.¹¹ Patient satisfaction surveys such as this one will play an important role in understanding the patient's point of view.

As the majority of responses to our survey were positive ("very satisfied" or "satisfied") and our purpose is to maximize satisfaction, only responses indicating that patients were very satisfied with an item were used in the analyses. Although patients in both groups were generally satisfied (ie, were "very satisfied" or "satisfied") with their anticoagulation management, those in the ACC group were more often very satisfied with all items. However, we must dissect the individual dimensions to elucidate patient attitudes about specific processes.

Arranging for Care

The location of the ACC (away from hospital congestion) and nature of clinic operations (patient visits by appointment) were specifically designed to decrease the inconveniences and delays that patients undergoing traditional monitoring often encounter. Our finding that ACC patients have greater satisfaction with obtaining therapy and gaining access to services reflects the success of this design philosophy. The importance of this finding is exemplified by Avis and Arthur,¹² who found patients more likely to be satisfied with a service if they had reason to believe that the clinic offering that service was well organized.

Understanding Therapy

Our findings show that, relative to non-ACC patients, ACC patients were more often very satisfied with aspects of care pertaining to their understanding of therapy (explanation of blood test, side effects, and medication interactions). This finding can be attrib-

Table 4. Standardized Scores, by Scale*

Factor	Scale	ACC (n = 156)	Non-ACC (n = 56)	p†
I	Understanding Therapy	90	82	<0.001
II	Overall Satisfaction	92	83	<0.001
III	Delivery of Care	97	88	<0.001

ACC = managed by LGHS Anticoagulation Center; non-ACC = traditional management

*Range = 0 to 100.

† $P < 0.05$ statistically significant.

uted to the ACC's commitment to continuous patient education. It also is consistent with the conclusion of Bertakis¹³ that patient satisfaction rises as the amount of information provided by a healthcare provider increases.

Receiving Therapy

The finding that patients in the ACC group were significantly more often very satisfied with receipt of care (courtesy, friendliness, promptness of results and instructions) is consistent with the research of Avis and Arthur.¹² These researchers concluded that friendliness and informativeness of staff were essential inputs to patient satisfaction with care.

Overall Satisfaction

By asking patients the extent to which they agreed with statements pertaining to overall satisfaction, we sought to gain a broad understanding of the patients' level of satisfaction with the overall process. As would be expected, responses to these statements mirrored responses to specific items. In particular, a higher percentage of ACC patients than non-ACC patients "strongly agreed" that their overall experience was excellent. The strong correlation between an excellent overall experience and the willingness to recommend the place of therapy illustrates the importance of overall satisfaction.

The only item that failed to yield a higher percentage of "very satisfied" responses pertained to the financial value of therapy (item 13). This finding was unexpected, as the ACC group was more often very satisfied with all other items than was the non-ACC group. However, because most patients are covered by insurance, they may be less sensitive to the cost of providing therapy than they would be if they lacked such coverage.

Study Limitations

Review of the comments revealed that some respondents did not consider their routine blood tests to be "Coumadin therapy" (1 in 156 [0.6%] in ACC group, 6 of 56 [10.7%] in non-ACC group). Consequently, these respondents failed to answer the survey, thereby affecting the number of useful surveys.

Although this study was based primarily on patients with atrial fibrillation who were given warfarin for anticoagulation therapy, differences in results by diagnosis were not statistically significant. Therefore, we believe that these results can be generalized to our entire population of patients who are receiving warfarin.

... CONCLUSION ...

Improved clinical and financial outcomes have been documented for warfarin patients managed in anticoagulation clinics. However, there is little documentation to indicate that patients are more satisfied with clinic management than with traditional office-based management by physicians.

Our clinic was designed to improve warfarin management by facilitating patient access, providing continuous education, and offering efficient feedback. Evaluation of the survey results revealed that patients generally were satisfied with their warfarin monitoring. However, a higher percentage of ACC patients than non-ACC were more often very satisfied, suggesting that the traditional process can be improved.

Additional research on patient satisfaction is warranted to assess fully the impact of process improvements, and to determine whether results are consistent among anticoagulation clinics. Our findings, coupled with outcomes research on anticoagulation clinics, support the continued development and refinement of these programs.

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... REFERENCES ...

1. Hirsh J, Dalen JE, Deykin D, et al. Oral anticoagulants: Mechanism of action, clinical effectiveness, and optimal therapeutic range. *Chest* 1995;108(suppl):231S-246S.
2. Wells PS, Holbrook AM, Crowther NR, Hirsh J. Interactions of warfarin with drugs and food. *Ann Intern Med* 1994;121:676-683.
3. Hirsh J, Poller L. The International Normalized Ratio, a guide to understanding and correcting its problems. *Arch Intern Med* 1994;154:282-288.
4. Landefeld CS, Beyth RJ. Anticoagulant-related bleeding: Clinical epidemiology, prediction, and prevention. *Am J Med* 1993;95:315-328.
5. Levine M, Raskob GE, Landefeld CS, Hirsh J. Hemorrhagic complications of anticoagulant treatment. *Chest* 1995;108(suppl):276S-290S.
6. Errichetti AM, Holden A, Ansell J. Management of oral anticoagulation therapy—experience with an anticoagulation clinic. *Arch Intern Med* 1984;144:1966-1968.
7. Wilt VM, Gums JG, Ahmed OI, et al. Outcome analysis of a pharmacist-managed anticoagulation service. *Pharmacotherapy* 1995;732-739.

8. Gray DR, Garabedian-Ruffalo SM, Chretien SD. Cost-justification of a clinical pharmacist managed anticoagulation clinic. *Drug Intell Clin Pharm* 1985;19:575-580.
9. Anderson DR, Harrison L, Hirsh J. Evaluation of a portable prothrombin time monitor for home use by patients who require long-term oral anticoagulant therapy. *Arch Intern Med* 1993;153:1441-1447.
10. Ware Jr JE. How to survey patient satisfaction. *Drug Intell Clin Pharm* 1981;15:892-899
11. Ware J. Conceptualizing and measuring generic health outcomes. *Cancer* 1991;67(suppl):774-779.
12. Avis M, Arthur A. Exploring patient satisfaction with out-patient services. *J Nurs Manag* 1995;3:59-65.
13. Bertakis K. The communication of information from physician to patient: A method for increasing patient retention and satisfaction. *J Family Pract* 1977;5(2):217-222.