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# Telephone Care as an Adjunct to Routine Medical Follow-up

## A Negative Randomized Trial

**CONTEXT.** In 1992, a randomized trial at one outpatient clinic demonstrated that making telephone appointments part of routine medical follow-up could save money and reduce hospitalization.

**OBJECTIVE.** To ascertain the effects of telephone care in other clinics.

**DESIGN.** Consenting patients of 20 physicians were randomly assigned to receive telephone care or usual care.

**SETTING.** Veterans Affairs General Medical Clinics in Denver, Colorado, and Sioux Falls, South Dakota.

**PATIENTS.** 512 predominately male elderly veterans (mean age, 68 years) who had a broad range of chronic medical conditions.

**INTERVENTION.** At the intake clinic visit, the recommended revisit interval (e.g., return in 3 months) for telephone care patients was doubled (e.g., return in 6 months) and three intervening telephone appointments were scheduled. Three telephone appointments were also scheduled at all subsequent clinic visits.

**MAIN OUTCOME MEASURES.** Utilization of services and self-reported health status.

**RESULTS.** More than 2000 calls were made during the 2-year study period. Although the revisit interval was longer for telephone care patients after the intake visit (as was expected), it was the same for both telephone care and usual care patients after all subsequent visits, despite the scheduling of three telephone appointments for telephone care patients. The intervention had no effect on self-reported health status, hospital admission, or number of deaths. The intervention also had no effect on the total number of clinic visits, outpatient laboratory tests, or radiologic tests. Telephone care patients had fewer unscheduled visits than did usual care patients (2.0 vs. 2.8 visits/patient;  $P = 0.01$ ).

**CONCLUSION.** Telephone care had little effect in this study. Instead of providing a way to maintain contact with patients without requiring them to appear in clinic frequently, telephone appointments became simply an additional service.

**P**rimarily care providers and patients often communicate with one another by telephone. Approximately 15% to 20% of all ambulatory care contacts in the United States have been estimated to involve this medium.<sup>1</sup> The widespread use of the telephone reflects its simplicity, convenience, and economy—characteristics that also make it a particularly appealing topic for clinical investigation. A recent review identified 80 clinical trials that specifically tested the effect of telephone communication on health care processes and patient outcomes.<sup>2</sup> Most of these studies, however, involved patients communicating with nursing staff, nonmedical personnel, or vol-

*The abstract of this paper is available at [ecp.acponline.org](http://ecp.acponline.org).*

unteers. The use of the telephone by primary care providers remains largely unexplored.

A prominent exception, however, is the randomized trial by Wasson and colleagues<sup>3</sup> that investigated provider-initiated telephone calls as a substitute for selected routine clinic visits. In this 2-year study involving about 500 male veterans attending a general medical clinic, study providers recommended the revisit interval (e.g., return in 3 months) before the patient was randomly assigned to receive usual care or telephone care. Usual care patients were scheduled for follow-up visits according to the recommended revisit interval; telephone care patients were scheduled at twice the recommended interval and had three intervening “telephone appointments” scheduled with their provider. At all subsequent visits, the providers were urged to lengthen their recommended revisit interval, knowing that an additional three telephone calls would be scheduled.

Telephone care patients were pleased with the telephone contact and, as expected, had fewer general medical visits. Less expected was the finding that telephone care patients had no corresponding increase in the number of specialty visits or urgent care and emergency room visits (in fact, both were nominally lower). In addition, telephone care patients underwent fewer laboratory tests, received fewer medications, and were admitted to the hospital less often. Furthermore, not only did telephone care save money, evidence also indicated that the increased contact may have improved self-reported health status and reduced mortality.

Because these results were so encouraging, there was strong interest on the part of the Department of Veterans Affairs (VA) to study telephone care further. There were some concerns about generalizability of the original study: It took place at a single institution and involved highly motivated providers who were actively encouraged by study personnel to lengthen visit intervals for telephone care patients at subsequent visits. Consequently, the committee planning our study argued for a pragmatic design, one that exerted minimal influence over the current practice environment. This second study also would not keep special appointment slots open for study patients (and thus would not provide enhanced access) and research personnel would not try to influence the visit interval. This paper reports on the second study and its failure to replicate the results of the first.

## Methods

### Sites, Providers, and Patients

This study was a pilot study administered by the VA Cooperative Studies Program. It was conducted at two VA general medical clinics (Denver, Colorado, and

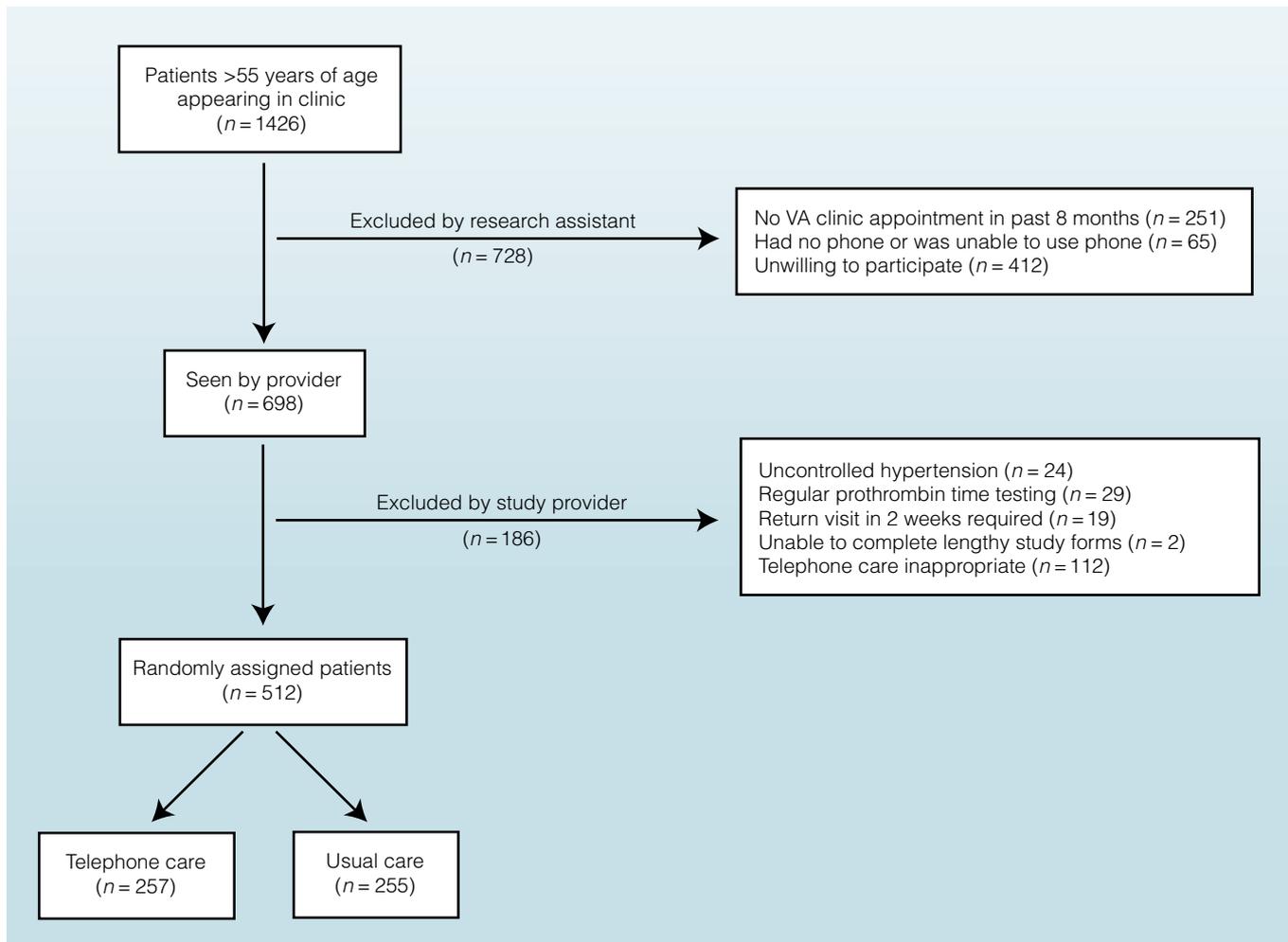
Sioux Falls, South Dakota) from October 1995 to October 1998. At both sites, continuity of care is emphasized (over 90% of scheduled primary care visits in this study occurred with the primary provider). Ten providers were selected at each site (five staff physicians, two medical residents, and three nurse practitioners in Denver; four staff physicians, two medical residents, three physician assistants, and one nurse practitioner in Sioux Falls). The distribution of provider type at each site was selected to reflect the relative contribution of each provider to outpatient workload.

**Figure 1** shows the patient selection process. Patients were recruited when they met with a study provider for a clinic visit. The entry criteria were broad to ensure that the sample represented the range of elderly, ambulatory patients with chronic diseases. Patients had to be at least 55 years of age, be literate, own a phone and know how to use it, have had at least one visit within the previous 8 months, and be willing to participate. Patients were ineligible if they had uncontrolled hypertension (blood pressure > 170/100 mm Hg), required regular testing of prothrombin time to monitor anticoagulation, required a return clinic visit within 2 weeks, were deemed inappropriate for telephone care by the provider, or were unable to complete lengthy study forms.

### Study Design

This study basically replicated the design of the original study.<sup>3</sup> After patients consented to participate in the study and before random assignment to treatment, study providers documented their recommended revisit interval (e.g., return in 3 months). Patients were then randomly assigned to one of two groups. In the telephone care group, the recommended revisit interval was doubled (e.g., to 6 months) and three telephone appointments were scheduled at 0.25, 0.75, and 1.5 times the originally recommended interval (e.g., 3, 9, and 18 weeks). Another three telephone appointments were scheduled at each subsequent visit until the end of 2 years of follow-up. In the usual care group, the recommended revisit interval was not altered and no telephone calls were scheduled.

Using a balanced randomization scheme, we were able to ensure that each provider cared for a similar number of telephone care and usual care patients and thus acted as his or her own control. To facilitate the telephone appointments, providers had scheduled “telephone clinics,” which generally consisted of a 1-hour block at the beginning of clinic in which four 15-minute phone calls could be scheduled. Providers had access to the same information that they would ordinarily have in a conventional clinic visit (medical record, computer access to laboratory and radiology results, and a medication list). **Figure 2** shows the study design.



**FIGURE 1. Flow of patients into the study.** VA = Veterans Affairs.

In contrast to the original study, we tried to minimize the study's influence on the practice environment.<sup>4</sup> Specifically, special clinic slots were not held open for study patients (for new appointments or scheduling errors), and the study personnel did not actively encourage providers to lengthen visit intervals for telephone care patients at subsequent visits.

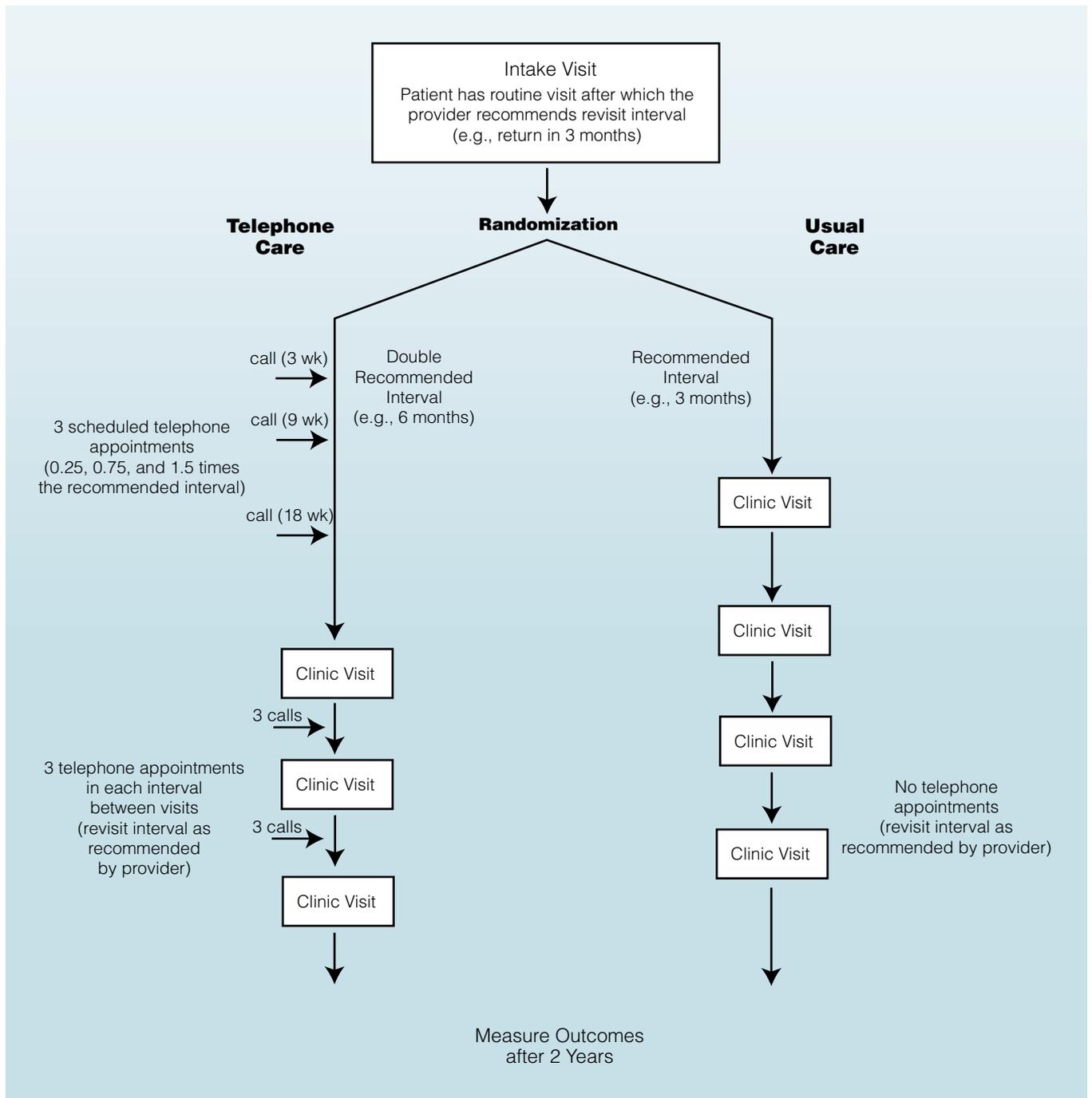
### Outcome Measures

Our primary outcome measures were self-reported health status and health care utilization. In addition, we collected data on mortality, general satisfaction with medical care (by using 13 items developed by Ware and colleagues<sup>5</sup>) and satisfaction with telephone care (by using 5 items from the original telephone care study<sup>3</sup>). Self-reported health status was measured by using the Short Form-36 Health Survey at baseline and after 2 years of follow-up.<sup>6</sup> The eight subscales were summarized by using the physical component score and mental component score.

We included several measures of resource use. Inpatient utilization for the 2-year study period was obtained from the VA national database in Austin, Texas. Using the Decentralized Hospital Computer Program at each site, we tracked the number of outpatient visits, outpatient laboratory tests, and outpatient radiology tests (with an average follow-up of 18 months for each patient). Outpatient visits were subdivided into scheduled and unscheduled visits (i.e., emergency room or urgent care). Scheduled visits were further subdivided into four categories: visits with the patient's regular primary care provider, medical subspecialty or surgical visits, visits to ancillary providers (e.g., dental, mental health, or physical or occupational therapy), and all other. Finally, at each clinic visit, the research assistant queried patients about any clinic visits or hospital admissions at other facilities.

### Analysis

All analyses were conducted on an intention-to-treat basis; patients were therefore analyzed in the group



**FIGURE 2. Study design.**

to which they were randomly assigned. Simple parametric (chi-square and *t*-tests) and nonparametric (Wilcoxon rank-sum test) methods were used to compare patient characteristics, process and intervention monitoring, patient health status, patient health care utilization, and satisfaction with medical care and telephone care. The 95% CIs for the utilization ratios (shown in Table 3) were calculated empirically, as follows. We first used the bootstrap method to select 2000 independent random samples (with replacement) for

each group in this study.<sup>7</sup> For each sample, the ratio between the groups was recalculated. The 95% CIs represent the range in which 95% of the ratios fell.

## Results

**Table 1** shows that randomization produced comparable groups and lists the characteristics of the study population at baseline. Of the 512 patients entered into the study, 27 died in the ensuing 2 years (13 telephone care

TABLE 1

**Baseline Patient Characteristics\***

CHARACTERISTIC	TELEPHONE CARE PATIENTS (n = 257)	USUAL CARE PATIENTS (n = 255)
<b>Demographic</b>		
Mean age, yr	68.3	68.7
Male	97%	98%
White	87%	87%
High-school graduate	58%	54%
Retired	65%	69%
Living with spouse	71%	64% <sup>†</sup>
<b>Active medical conditions</b>		
Angina	19%	18%
Cancer	9%	9%
Congestive heart failure	5%	5%
Degenerative arthritis	43%	42%
Diabetes	19%	22%
Hypertension	65%	64%
Anxiety or depression	14%	14%
Peripheral vascular disease	10%	9%
Respiratory disease (COPD, asthma, bronchitis)	26%	30%
<b>Self reported health status:</b>		
"In general, would you say your health is..."		
Excellent	6%	4%
Very good	17%	19%
Good	46%	51%
Fair	28%	23%
Poor	4%	4%
<b>Utilization</b>		
Mean hospitalizations in past 2 years, <i>n</i>	0.4	0.5
Clinic visits in past 8 months, <i>n</i>	3.7	4.0
Mean revisit interval recommended at intake visit, <i>wk</i>	18.3	17.6

\*Unless otherwise noted,  $P > 0.2$  for each comparison. COPD = chronic obstructive pulmonary disease.

<sup>†</sup> $P = 0.08$ .

patients and 14 usual care patients). An additional 24 patients were lost to follow-up (8 telephone care patients and 16 usual care patients). Complete follow-up was therefore available for 461 patients.

### Implementation of the Intervention

More than 2000 telephone calls were made to telephone care patients over the 2-year period, an average of about 9 calls per patient. Most calls were brief: 80% were less than 10 minutes, and 38% were less than 5 minutes. Between the intake visit and the first follow-up visit, 71% of telephone care patients received all three scheduled phone calls (89% received at least two calls). Between the first and second follow-up visit, 35% of telephone care patients received all three scheduled phone calls (57% received at least two calls).

Table 2 shows the effect of the intervention on the revisit interval (the time between primary care clinic vis-

its). As expected, the average revisit interval between the intake and first follow-up visit was longer for telephone care patients than for usual care patients. This reflects an integral part of the intervention, in which the recommended interval for telephone care patients was doubled. The observed ratio is less than 2 because telephone care patients were often rescheduled to be seen earlier during a telephone call. Despite the continued scheduling of telephone calls, the average revisit interval between the first and second follow-up visit was the same for the two groups.

### Health Status

The intervention had little effect on self-assessed health status. Over 2 years, the average physical component summary score decreased by about 1 point (1.2 for telephone care patients and 0.9 for usual care patients;  $P > 0.2$ ) and the mental component summary score decreased by

TABLE 2

**Effect of the Intervention on the Revisit Interval for Primary Care Clinic Visits**

TIME INTERVAL	REVISIT INTERVAL (DAYS)		RATIO* (95% CI)
	TELEPHONE CARE	USUAL CARE	
Intake to first follow-up visit†	7.7	4.9	1.55‡ (1.4–1.7)
First to second follow-up visit	4.6	4.6	1.01 (0.91–1.1)
Second to third follow-up visit	4.1	4.3	0.96 (0.86–1.06)

\*Ratio of telephone care interval to usual care interval.

†Although the recommended interval was doubled for the telephone care group, patients were often rescheduled to be seen earlier.

‡ $P < 0.01$ ; all other comparisons were not significant.

about 2 points (2.0 for telephone care patients and 2.7 for usual care patients;  $P > 0.2$ ). Unlike in the original study, no significant differences in self-assessed health status were observed in the subgroup of patients in fair to poor health. The intervention also had no effect on provider-assessed health status (as reflected by the number of reported diagnoses and medications prescribed).

Some of our utilization data arguably reflect health status. Although the number of patients with unscheduled visits differed little between the groups (119 telephone care patients and 125 usual care patients;  $P > 0.2$ ), telephone care patients had fewer unscheduled visits (2.0 visits/patient in the telephone care group and 2.8 visits/patient in the usual care group;  $P = 0.01$ ). However, the groups did not differ in the number of hospital admissions (123 in both groups;  $P > 0.2$ ) or in the number of deaths (13 telephone care patients and 14 usual care patients;  $P > 0.2$ ).

### Patient Satisfaction

Overall satisfaction did not change during the 2-year period in either group. Telephone care patients were, however, significantly more likely than usual care patients to believe that telephone calls could be an important component of medical care (i.e., they were more likely to agree with such statements as, “I can telephone someone who will help me with my medical problems,” “Calls can help avoid visits,” or “Calls make me feel good”).

### Utilization of Services

As shown in Table 3, the intervention had no significant effect on health care utilization. Telephone care patients had nominally fewer face-to-face clinic visits with their study provider, but this decrement was more than offset by an increased number of visits to medical or surgical specialists and ancillary providers. The number of outpatient radiology and laboratory tests were similar, as

were the number of clinic visits and hospital admissions reported at outside facilities (data not shown).

## Discussion

Our failure to replicate the findings of the original telephone care study<sup>3</sup> warrants a consideration of conceivable explanations. As with any negative study, it is possible that our results represent a type II error (a finding of no statistically significant difference when, in fact, an important difference exists). We believe that this is unlikely. Our sample size was similar to that of the original trial, which detected substantial differences. Furthermore, the absolute differences observed here were small and were as likely to favor usual care as telephone care.

Another reasonable concern might be the comparability of the study populations. The patients in our study were slightly older than those in the original study (mean age, 68 vs. 66 years). On the other hand, the proportion of patients reporting fair or poor overall health in our study was slightly smaller (30% vs. 37%). Our patients were slightly more likely to have been hospitalized before study entry. The proportion of patients with diabetes, hypertension, and chronic obstructive lung disease differed little between the studies. In short, the two study populations seem to be fairly comparable.

Our failure to replicate the finding of a reduction in hospitalization was particularly disappointing and has no obvious explanation. It was hoped that the more frequent communication that telephone care patients received would lead to earlier intervention for exacerbations of chronic conditions (e.g., congestive heart failure or chronic obstructive pulmonary disease). Although we observed a reduction in the number of unscheduled visits, this finding may be an artifact. Because providers can schedule visits by telephone, the difference between scheduled and unscheduled visits may simply be the result of the phone call. More to the point, the difference in unscheduled visits did not translate into a difference in hospitalizations.

**TABLE 3**

**Effect of the Intervention on Service Utilization\***

SERVICE	UTILIZATION PER PATIENT		RATIO (95% CI)	
	TELEPHONE CARE	USUAL CARE	Less Utilization With Telephone Care	More Utilization With Telephone Care
<b>Clinic visits, <i>n</i></b>			0	2.0
<b>Total</b>	17.4	15.4		
<b>With study provider</b>	4.7	5.1		
<b>Medical/surgical subspecialist</b>	5.3	4.4		
<b>Ancillary providers<sup>†</sup></b>	5.2	3.1		2.7
<b>All other</b>	2.2	2.8		
<b>Outpatient radiology, <i>n</i></b>				
<b>Total</b>	2.0	2.0		
<b>Plain films</b>	1.5	1.5		
<b>Advanced imaging</b>	0.5	0.5		
<b>Outpatient laboratory tests, <i>n</i><sup>‡</sup></b>	23.9	26.6		
<b>Inpatient utilization</b>				
<b>Hospital admissions, <i>n</i></b>	0.5	0.5		
<b>Average length of stay, <i>d</i></b>	6.7	8.0		

\*Average follow-up was 18 months.

<sup>†</sup>Includes dental, mental health, social work, podiatry, and physical/occupational therapy visits.

<sup>‡</sup>Even if performed at a single visit, the following combination would constitute 5 outpatient laboratory tests: prothrombin time, serum cholesterol, electrolyte panel, glycosylated hemoglobin, and fecal occult blood.

The biggest difference we observed was that telephone care patients had more visits to ancillary providers (dental, mental health, social work, podiatry, and physical and occupational therapy) than did usual care patients. Telephone care patients also had more visits to subspecialist physicians. Although neither difference was statistically significant, we suspect that these findings reflect a fundamental reality: Regular phone contact begets more referral. When discussing certain symptoms over the phone, primary care providers may see direct referral as more efficient for both the patient and themselves.

We did not observe any differences in use of laboratory or radiology testing, perhaps because the intervention did not change the frequency of face-to-face clinic visits. In the original study, the telephone appointments in fact became a substitute for routine clinic visits. Telephone care patients came to clinic less frequently and consequently had fewer laboratory and radiology tests. In our study, telephone appointments were a substitute for routine clinic visits only after the intake visit, when the lengthened revisit interval was an integral part of the randomization. After the first follow-up visit, the telephone appointments seemed to supplement routine clinic visits. In other words, the two studies differed in

scheduling at follow-up visits: In the original study, telephone care patients were given longer revisit intervals, whereas in our study, telephone care and usual care patients were given the same revisit intervals.

This difference may reflect differences in the study providers but is more likely to be the result of differences in level of engagement of study personnel. In the original study, the principal investigator was both on site and a study participant. Furthermore, study personnel actively encouraged providers to lengthen visit intervals for telephone care patients at subsequent visits. In contrast, in our study, the principal investigator was more than 1000 miles from either site and the study personnel were not instructed to try to influence provider behavior. Thus, the original study could be considered a trial of the efficacy of telephone care, whereas our study might be considered a trial of effectiveness.

The most practical implication of our study is the need to separate the two components of telephone care in future work. As originally conceived, the intervention would both enhance communication (i.e., patients would talk with their provider more frequently) and diminish the number of visits to the clinic (and associated interventions). Unfortunately, we were unable to implement

the second component in this study. Consequently, the question of how frequently physicians should see patients with chronic disease needs to be studied more directly.

## Take-Home Points

- In 1992, a randomized trial at a VA general medical clinic demonstrated that making telephone appointments part of routine medical follow-up could both save money and reduce hospitalization.
- To test the effectiveness of telephone care in other settings, we performed a similar trial involving 512 patients and 20 providers at two other VA general medical clinics.
- Although more than 2000 calls were made to patients randomly assigned to telephone care, the intervention had no effect on self-reported health status, hospital admission, or mortality during the 2-year study period.
- The intervention also had no effect on the total number of clinic visits or outpatient laboratory or radiologic tests.
- Instead of providing a way to maintain contact with patients without requiring them to appear in clinic frequently, telephone appointments became simply an additional service.

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## Appendix

The institutions and individuals participating in the pilot phase of the Telephone Case Study were as follows: Participating Department of Veterans Affairs Medical Centers: Denver, Colorado: T.J. Meyer (local PI), B. Martin, C. Steinbrunn. Sioux Falls, South Dakota: K.D. Whittle (local PI), J. Gednalske, K. Van Voorst. Chairman's Office, White River Junction, Vermont: H.G. Welch, D. Johnson. Coordinating Center (study initiation), Seattle,

Washington: M. Chapko, K. James. Coordinating Center (study closure), Menlo Park, California: R. Edson, L. Sheridan, B.M. Ou, C. Pibbs, P. Lavori.

Data monitoring board: J. Tonascia (*Chair*), S.J. Bernstein, R.S. Kington, K. Rask. Executive Committee: B. Edson, T. Koepsell, T.J. Meyer, C. Pibbs J. Wasson, H.G. Welch, K.D. Whittle.