

Improving the quality of telephone-delivered health care: a national quality improvement transformation initiative

Sherri L LaVela^{a,b,*}, Jeffrey Gering^{c,d}, Gordon Schectman^{e,f}, Sara M Locatelli^a, Frances M Weaver^{a,g} and Michael Davies^h

^aDepartment of Veterans Affairs, Center for Management of Complex Chronic Care, Edward Hines Jr. VA Hospital, Hines, IL, ^bCenter for Healthcare Studies, Institute for Public Health and Medicine, Feinberg School of Medicine, Northwestern University Chicago, IL, ^cChillicothe Veterans Affairs Medical Center, Chillicothe, OH, ^dOhio University, Chillicothe, OH, ^ePrimary Care, Office of Patient Care Services, Veterans Affairs Central Office, Washington DC, CO, ^fDepartment of Medicine, Medical College of Wisconsin, Milwaukee, WI, ^gProgram in Health Services Research, Stritch School of Medicine, Loyola University, Maywood, IL and ^hOffice of Systems Redesign, Veterans Affairs Central Office, Washington DC, CO, USA.

*Correspondence to Sherri L LaVela, Department of Veterans Affairs, Center for Management of Complex Chronic Care, 5000 S. Fifth Avenue (151H), Hines, IL 60141, USA; E-mail: Sherri.LaVela@va.gov

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Background. Many Veterans Affairs (VA) primary care (PC) patients prefer telephone-delivered care to other health care delivery modalities.

Objective. To evaluate PC patients' telephone experiences and outcomes before and after a national telephone transformation quality improvement (QI) collaborative.

Methods. Cross-sectional surveys were conducted pre- and post-collaborative. We used bivariate analyses to assess differences in pre/post outcomes and multivariate regression to identify variables associated with patients' perceptions of poor quality care.

Results. Patients from 13 VA facilities participated ($n = 730$; pre-intervention = 314, post-intervention = 416); most of them were males (90%) with a mean age of 62 years. After the collaborative (versus pre-collaborative), few experienced transfers (52% versus 62%, $P = 0.0006$) and most reported timely call answer (88% versus 80%, $P = 0.003$). Improvements in staff understanding why patients were calling and providing needed medical information were also found. There were measurable improvements in patient satisfaction (87% versus 82% very/mostly satisfied, $P = 0.04$) and perceived quality of telephone care (85% versus 78% excellent/good quality, $P = 0.01$) post-collaborative. The proportion of veterans who reported delayed care due to telephone access issues decreased from 41% to 15% after the collaborative, $P < 0.0001$. Perceptions of poor quality care were higher when calls were for urgent care needs did not result in receipt of needed information and included a transfer or untimely answer.

Conclusions. The QI collaborative led to improvements in timeliness of answering calls, patient satisfaction and perceptions of high-quality telephone care and fewer reports of health care delays. Barriers to optimal telephone care 'quality' include untimely answer, transfers, non-receipt of needed information and urgent care needs.

Keywords. Health communication, health care delivery, primary health care, patient preference, patient-centred care, quality improvement.

Introduction

The USA is among the wealthiest nations in the world, but it is far from the healthiest. Relative to other countries, several health disadvantages have been reported, owing, in part, to limited primary care (PC) resources and patient inaccessibility.¹ The largest integrated health care system in the USA is the Veterans Health Administration (VHA), serving over 8.3 million veterans each year at 152 medical centres and outpatient clinics.² To improve PC access,

international health experts suggest designing health care processes that are responsive to multiple venues of health care access beyond face-to-face, including telephone options.¹ Despite advances in health technology, the majority of veteran PC patients prefer telephone-delivered care to other modalities of health care delivery.³ As the VHA continues to advance health technology, attention must be given to patient preferences for health care delivery. PC should be coordinated in ways that positively impact health care quality and the patient experience.

Patients seek health care through a variety of venues beyond in-person visits^{4,5}; a commonly used alternative is the telephone. For many veteran patients, telephone-delivered care is preferred to in-person visits for several of their health care needs (preferred for 6 of 10 medical reasons including general medical questions, medication questions and refills, preventive care reminders, scheduling and test results).³ Internationally, studies have found that timely and responsive telephone care is a key driver for patient satisfaction^{6–8} and well-coordinated, integrated high-quality PC. From a patient's perspective, telephone access to Veterans Affairs (VA) health services has historically been challenging, often involving lengthy time-to-answer, dropped calls, extended hold times and complicated pathways involving multiple transfers to reach a staff member able to resolve their inquiry.

However, recent VHA system redesign efforts have impacted patient care experiences through the improvement and sustainability of telephone-delivered medical care. VHA undertook a national telephone transformation quality improvement (QI) collaborative to improve the quality of telephone care delivered to PC patients. In this article, we report patients' telephone experiences and outcomes before and after the QI collaborative was implemented. We also identify variables associated with patients' perceptions of poor quality telephone-delivered care.

Methods

Design

Cross-sectional surveys were conducted to assess patient telephone experiences before and after systems redesign QI collaborative to improve telephone medicine. The baseline survey was conducted in fall 2009 (pre-collaborative) and the follow-up survey was conducted in fall 2010 (post-collaborative). This work was done as part of QI efforts by VA facilities with the purpose of improving access to and quality of care.

The QI collaborative

The telephone collaborative QI activities took place over a 12-month period during 2009–10 (following the baseline survey and ending before the follow-up survey). The collaborative focused on timely and appropriate access to PC and included QI strategies that led to a greater spread of principles and practices aimed to improve the overall telephone experience of patients calling for various medical care reasons. Figure 1 describes key components of the collaborative.

Participants/setting

The participating VA PC facilities were selected by collaborative leadership (based on an application process)

that aimed to include facilities that were geographically dispersed across the nation (in both rural and urban areas) and met the following eligibility criteria: (i) had an automatic call distribution (ACD) system; (ii) managed telephone care through a clinic-based system or a call centre (on- or off-site); (iii) conducted telephone care during clinic operating hours and (iv) had at least 5000 PC patients. A stratified purposive sample of patients who utilized PC at 13 VA facilities [located in urban (62%), suburban (23%) and rural (15%) communities and geographically located in the Midwest (23%), Northeast (15%), South (46%) and West (15%)] participated in baseline and follow-up surveys. Of note, our sample is similar to the community type and geographic region of VA medical facilities overall. VA facilities collectively are in urban (59%), suburban (21%) and rural (20%) communities and are located in the Midwest (22%), Northeast (21%), South (38%) and West (19%).²

Because the collaborative focus was to understand patient's experiences regarding telephone calls placed to PC for medical purposes, patients who called 'only' for reasons such as scheduling were not included in the sample. Patient eligibility was determined by a brief set of screening questions asked by staff answering incoming telephone calls.

Data collection

Patients were asked for their permission to receive a telephone call to participate in a short interview regarding their experience. Names and telephone numbers of willing patients were recorded on a call log for 2 hours during each of four time periods (low volume day/peak hours, low volume day/slow hours, high volume day/peak hours and high volume day/slow hours). We sampled across the four time periods to ensure that a variety of patient callers and a range of active/busy (or not) times at the PC facility were represented. At pre- and post-intervention periods, each VA site was asked to conduct 32 interviews (eight interviews from each of the four time periods) by proceeding through each log consecutively until interviews were completed. At pre-implementation, several sites were unable to reach the quota of 32 and others collected incomplete, unusable interviews. At post-implementation, interviews were completed with the requested 416 participants (32 at all 32 sites). To reduce bias, all surveys were conducted by an employee (knowledgeable and previously trained in interviewing techniques) outside of the PC team within 24 hours of the telephone encounter.

Data collection instrument

A structured interview instrument, developed at a Flesch–Kincaid Grade Level of 6.5 (equivalent to an approximate reading age of 12), contained 18 questions in a variety of formats, e.g. multiple choice and rating scales. The instrument was pilot tested with a PC patient cohort to improve understanding and sequencing of

Key components:
<ul style="list-style-type: none"> • Participating sites developed multidisciplinary teams and evaluated the current state (e.g. strengths and weaknesses) of telephone systems in PC. • The collaborative included a pre-work organizing call, multiple in-person learning sessions, with action periods, conference calls, and formal reporting with coach feedback between sessions. Guided by Collaborative leadership, each team determined what changes to make at their facility to address the problems identified. • Using PDSA cycles, teams tested and implemented QI strategies intended to improve clinic delivery system function including telephone response timeliness, reliability and patient experience. • Teams pursued many strategies to improve timeliness of answering incoming calls and responsiveness to the caller's needs. <ul style="list-style-type: none"> ○ Strategies included analyzing the specific reasons for patients' telephone calls; enhancing call center staff orientation, training, monitoring and supervision; and deploying well-designed scripts for PC staff use to reduce variation in guidance provided. • Automatic call distribution (ACD) systems were implemented and used as a necessary tool to effectively manage and distribute incoming calls and to monitor call volume. • The multidisciplinary teams pursued structured improvement initiatives focused on optimizing the efficiency and responsiveness of processes established to route incoming calls, such as simplifying telephone call trees. <ul style="list-style-type: none"> ○ To more efficiently manage incoming calls, teams modified and improved telephone design infrastructure and systems (protocols, call trees, resource allocation and shaping demand). • As the collaborative matured, the teams focused on improving the coordination and management of incoming calls. The engagement of front line PC teams was explored and teams worked to deploy health care staff in an efficient manner, minimizing the amount of re-work (e.g., call transfers) and non-value added work (e.g., calls that provide no value to the patient) to facilitate first call resolution. • Throughout the VHA telephone QI collaborative process, teams applied system redesign principles to develop models of care and strong practices in providing appropriate, accessible, reliable telephone-delivered care.

FIGURE 1 *The VHA national telephone transformation QI collaborative*

questions and overall interview flow. The instrument included questions (variables defined below) to assess patient demographic and other characteristics and items about patient experiences with the PC telephone encounter.

Variables

Patient characteristics included gender, age (continuous), general health status (excellent, very good, good, fair and poor), health care source (VA only, VA and non-VA), transportation method (drive self, caregiver drives, public transportation, VA-provided transportation, other, e.g. walk) and travel time to the VA PC clinic (continuous).

Regarding PC calls, we assessed call reason(s) (questions about medication, next care steps, test results, clarification on what was said at last visit, concerns about an ongoing condition or urgent condition); perceptions of staff response and timeliness (yes/no): (phone was answered in a timely manner, staff who answered was courteous, helpful, understood reason for call and facilitated getting the needed medical information); call logistics (transferred, disconnected or hung-up or placed on hold), patient satisfaction (very or mostly satisfied; mildly or quite dissatisfied), quality of telephone care experience rating (excellent, good, fair, poor) and care delays (if a delay in care was experienced due to telephone access).

Analyses

Bivariate analyses were used to assess differences in baseline and follow-up demographics and outcomes regarding PC telephone experiences (call reasons, logistics, perceived staff response, patient satisfaction and telephone experience quality) and delays in care.

A multivariate logistic regression model was used to generate odds ratios (ORs) and 95% confidence intervals (CIs) to identify variables associated with patients' perceptions of fair/poor telephone care quality. The dependent variable 'fair/poor' quality was modeled as 1 and 'good/excellent' quality was modeled as 2. Several variables were considered for inclusion in the model based on statistically significant bivariate associations (between the dichotomized quality variable) and important associations according to literature to attain the best fit model. Covariates in the final model included post-collaborative, age, called for urgent issue, called for clarification on something told at last visit, experienced call transfer, placed on hold, untimely answer, did not receive needed information from staff and staff did not understand reason for call. Across all variables, of the overall sample of 730, a total of 98 cases were excluded from the model due to missing values of one or more model covariates. A subset analysis was conducted to assess statistical differences in demographic and health care use variables for individuals included in the model compared with those not in the model.

Statistical significance was determined by an α level of 0.05 and analyses were performed with SAS 10.1 (SAS Institute Inc., Cary, NC).

Results

Characteristics of PC patients

A total of 730 unique patients from 13 VA facilities participated: pre-intervention ($n = 314$) and post-intervention ($n = 416$). Most participants were male; a slightly larger proportion of males participated in the baseline survey than the follow-up (94.10% versus 90.10%, $P = 0.05$). There were no age differences in participants at baseline and follow-up. No differences in travel time to the VA existed, but a greater proportion of participants got to the VA by self/family driving at baseline versus follow-up (95.07% versus 89.59%, $P = 0.008$). Of participants, 70.37% used VA health care only. Overall, general health status was self-reported as excellent (6.04%), very good (18.84%), good (32.13%), fair (28.02%) and poor (14.98%) (Table 1).

PC calls and patient experience

Overall, the largest proportion of calls was for medication questions/concerns. Reasons for calling were similar at baseline and follow-up, with one exception; significantly fewer patients reported calling because they needed clarification on something the nurse/doctor said at the last visit after the collaborative than

before (5.77% versus 12.74%, $P = 0.001$). The proportion of patients who reported being transferred was significantly lower after the collaborative than before (51.83% versus 62.29%, $P = 0.006$).

In general, more than 90% of patients thought staff was courteous, helpful and understood the reason for their call. A greater proportion of patients reported that staff answered their call in a timely manner after the collaborative (88.02%) than before (79.60%), $P = 0.003$. Likewise, a greater proportion reported receiving the medical information/help they needed as a result of their telephone call to PC.

Patients were very/mostly satisfied (84.65%) with their telephone experience and reported their PC telephone experience to be of excellent or good quality (82.08%). More patients were very/mostly satisfied with their PC telephone experience after the collaborative (87.11%) than before (81.55%), $P = 0.04$. There was a measureable improvement in patient perceived quality of telephone care after the collaborative than before (85.38% versus 77.96% rated quality as excellent or good, $P = 0.01$) (Table 2).

The proportion of patient PC users who reported a time during the past month that telephone access issues resulted in a delay in a primary health care concern being addressed significantly decreased from 41% before the collaborative to 15% after, $P < 0.0001$.

Variables associated with perceived fair/poor quality of care

In total, 632 individuals had complete data available on all variables and comprised the model sample. The comparison of individuals included in the model ($n = 632$) and those not in the model due to missing values ($n = 98$) showed that there were no statistically significant differences in average age (63 versus 61 years), male gender (92% versus 92%), fair/poor general health (42% versus 46%), proportion of users of only VA care (71% versus 65%), mean travel time between VA and home (48 versus 49 minutes) and main transportation to the VA is self/family drives (92% versus 87%), all P values were non-significant.

The odds of perceiving fair/poor quality of care were higher when the call was for urgent care needs (OR = 2.48, CI_{95%} 1.21–5.07, $P = 0.01$). The odds of reporting fair/poor quality care were higher if patients experienced transfer(s) (OR = 2.69, CI_{95%} 1.31–5.52, $P = 0.007$), did not receive the information they needed (OR = 13.64, CI_{95%} 6.40–29.08, $P \leq 0.0001$) and if their call was not answered in a timely manner (OR = 12.48, CI_{95%} 6.62–23.55, $P \leq 0.0001$) (Table 3).

Discussion

PC is often a patient's first point of contact with the health care system. International initiatives to improve health system performance, therefore, have worked to

TABLE 1 PC patient characteristics (n = 730)

	Overall (n = 730)	Pre (n = 314)	Post (n = 416)	P value
Gender: male (n = 719)	91.79%	94.10%	90.10%	0.05
Age (years) (n = 725), mean (SD)	62.56 (13.62)	63.31	62.00	0.20
Transportation to VA primary health care (n = 717), self/family drives ^a	91.91%	95.07%	89.59%	0.008
Time it takes to get to the VA hospital from home (minutes) (n = 720), mean (SD)	47.79 (38.71)	48.89	46.97	0.52
General health status: fair/poor (n = 414) ^{b,c}	NA	NA	43.00%	NA
Source of care: VA health care only (n = 378) ^{b,d}	NA	NA	70.37%	NA

NA, not applicable.

^aReference: VA-provided transportation, public transportation, walk, etc.

^bOnly assessed at post-collaborative time period.

^cReference: excellent, very good, good.

^dReference: receive health care from VA and non-VA health.

TABLE 2 PC telephone calls: reasons, logistics and perceptions of call response/outcome (n = 730)

	Overall (n = 730) (%)	Pre (n = 314) (%)	Post (n = 416) (%)	P value
Reasons PC calls were placed				
Information on test results	7.95	8.92	7.21	0.40
Question on next step in care	14.11	15.29	13.22	0.43
Question/concern about medication	35.75	38.85	33.41	0.13
Had an urgent medical issue	13.97	13.69	14.18	0.85
Concerns about a chronic/ongoing medical condition	12.88	12.42	13.22	0.75
Clarification on something nurse/doctor said last visit	8.77	12.74	5.77	0.001
Call logistics				
Transferred (n = 679)	56.41	62.29	51.83	0.006
Hung-up (n = 618)	8.09	8.33	7.91	0.85
Placed on hold (n = 676)	55.33	57.19	53.91	0.39
Disconnected by VA (n = 564)	8.51	5.91	10.17	0.08
Perceptions of staff and call outcome				
Staff answered in a timely fashion (n = 683)	84.33	79.60	88.02	0.003
Staff answering was courteous (n = 634)	93.38	92.08	94.31	0.26
Staff answering was helpful (n = 677)	93.35	92.81	93.77	0.62
Staff understood why patient was calling (n = 692)	93.93	92.18	95.32	0.09
Received needed medical information/help (n = 689)	88.24	85.81	90.16	0.08
Patient call experience				
Very or mostly satisfied ^a (n = 697)	84.65	81.55	87.11	0.04
Excellent or good quality care ^b (n = 703)	82.08	77.96	85.38	0.01

^aReference: mostly or quite dissatisfied.

^bReference: poor or fair quality.

enhance the effectiveness and efficiency of PC delivery. One of the most pressing efforts is enhancing access to care, including telephone delivery, e.g. after-hours consultations. In an examination of PC delivery across several countries, it was reported that PC providers in the USA are among the least likely to offer after-hours care options.⁹ Further reports indicated that the USA, in particular, has multiple inefficiencies in health care delivery, including errors and care coordination difficulties,⁹ and would benefit from QI efforts to improve care access and coordination through system redesign effort to build new models of care.

Efforts to implement new models of health care such as the patient-centred medical home model¹⁰ have focused on methods of care delivery beyond traditional face-to-face visits. This has included improving access

to remote medical encounters such as telephone-delivered care (to align with their preferred mode of health care delivery³ and to support participation in their care management). Telephone triage and consultation systems have become an integral component of health care systems throughout the world.^{10,11} However, efforts are needed to overcome barriers to effective telephone care delivery (e.g. long time-to-answer, complex pathways/transfers and lack of call resolution) to meet primary health care needs. Our national telephone transformation QI collaborative provided a better understanding of (i) PC patients' perceptions of barriers and facilitators to quality telephone care and (ii) effective testing and implementation of QI strategies and redesign principles to optimize the delivery of PC by telephone. Our study findings demonstrate measurable impacts on

TABLE 3 Variables associated with patients' perceptions of fair/poor^a quality of telephone-delivered PC (n = 632)^b

	Odds ratio	95% Wald confidence limits		P value
Post-collaborative (reference: pre-collaborative)	0.94	0.53	1.68	0.84
Age (continuous)	1.00	0.98	1.02	0.99
Call for urgent needs (reference: calling for other reasons)	2.48	1.21	5.07	0.01
Call for clarification on what the doctor/nurse told them at the last visit (reference: calling for other reasons)	2.28	0.94	5.56	0.07
Call transferred (reference: not)	2.69	1.31	5.52	0.007
Call placed on hold (reference: not placed on hold)	1.45	0.73	2.91	0.29
Untimely answer by staff (reference: timely answer)	12.48	6.62	23.55	<0.0001
Did not receive needed information from staff during call (reference: needed information provided)	13.64	6.40	29.08	<0.0001
Staff did not understand reason for call (reference: understood call reason)	1.80	0.55	5.88	0.33

^aPatient reported 'poor' or 'fair' quality telephone-delivered care (versus excellent or good).

^bThe regression analyses included 632 cases with complete data on all variables in the model. From overall sample of 730, response values were available for covariates as follows: quality (dependent variable) (n = 703), age (n = 725), transferred (n = 679), on hold (n = 676), untimely answer (n = 683), did not receive needed information (n = 689) and staff did not understand call reason (n = 692). There were no missing values for pre/post, urgent needs or clarification variables.

telephone-delivered quality of care in VA PC patients that may be applicable to other PC and general practice patient groups within health care systems around the world.

Our collaborative system redesign efforts led to improvements in time-to-answer, frequency of transferred incoming calls and a trend towards improvement in receipt of needed information as a result of the call. Eighty-five percent of patients rated the quality of their care as excellent/good after the collaborative, representing a significant improvement from pre-collaborative. Variables independently associated with patients' perceptions of fair/poor quality of telephone care included not receiving needed information, untimely answer, transfers and calling for urgent care needs.

The highest odds of reporting poor quality care was seen in those who reported not receiving the information they needed as a result of their call (14×). It is possible that the staff answering the phone did not direct the call to the correct place or did not take time to or know how to answer the patient. As part of the continued telephone improvement efforts, trained staff, dedicated to answering phones, should be given clear decision trees to direct where specific inquiries should go and/or should be provided with time and guidance on how to address the questions as they are asked. It is also possible that information was provided, but due to poor communication and/or misunderstanding, e.g. literacy issues or language barriers, it was not understood by patients. Recent literature suggests that health care staff taking incoming telephone calls should spend more time ensuring that callers have understood the information provided, perhaps by asking the caller to repeat the advice given.¹² Other literature has reported that the content of information recalled by patients is rather accurate and that recall is equivalent for face-to-face and telephone-based encounters.¹³ Along with not receiving needed

information, the large odds associated with poor quality of care ratings for untimely call answer (12×) emphasize the importance of these factors to patients. Similarly, Long *et al.*¹⁴ found that patients who had participated in a general practice telephone call within the prior 24 hours identified better communication and timely service as areas of importance in telephone-delivered care. Our collaborative efforts 'did' improve time-to-answer, transfers and receipt of needed information.

Furthermore, substantially fewer patients reported that telephone access issues resulted in delays in health care following the collaborative. Although our QI efforts yielded considerable improvements, further research is needed to understand the implications of delays in care in PC populations (e.g. how did this impact utilization patterns? health outcomes?). Literature suggests that many PC facilities are unable to meet the demand of telephone calls,¹⁵ which may result in care delays or inattention to urgent care needs.¹⁶ This may place patients at risk for hospitalizations or emergency room visits that could have been avoidable.¹⁶

Additional efforts are warranted to optimize the handling of incoming calls for urgent care issues; in this study, nearly 15% of incoming calls to PC were for urgent issues. Patients calling for urgent care issues were 2.5 times more likely to report poor/fair quality care. When PC teams are inaccessible by telephone, many patients turn to hospital emergency rooms.¹⁷ In fact, more than one-half of all emergency department visits are for non-emergency health problems.¹⁸ Better accessibility by phone is needed, as in many cases merely speaking to the PC team by phone avoids an unnecessary emergency department visit.¹⁸ Nearly a third of emergency department visits have been described as inappropriate or not urgent.¹⁹ Patient's desire for enhanced access to care [after-hours

availability, expanded telephone options/hours and information technology (IT) alternatives] appears to be universal across countries. However, the USA is lagging behind several countries in both access to care and IT,⁹ which may contribute to inappropriate use of emergency rooms in the USA (and in this study ratings of poor/fair quality for perceived urgent care issues).

Limitations

Use of a non-probability sample may not be representative of veteran patients in general; however, our inclusion of patients from 13 nationally dispersed facilities located in rural and urban communities is likely to have broadened our patient selection. Further, our stratified purposive sampling technique, in which cases are purposefully selected to provide a representative sample of specific predefined categories has been shown to provide reasonable estimates of population values.²⁰ A further limitation is not having the general health status data available at the baseline measure. However, the proportion of veterans who reported fair or poor health in this study is in line with other research in this population. Large studies have shown 21–55% of veteran users of VHA care report being in fair/poor health.^{21,22} Also, self-reported data are subject to recall bias; however, patients were contacted within 24 hours, which likely reduced recall difficulty.

Conclusion

Our findings showed greater odds of patients' perceptions that their care was of fair/poor quality when calls involved transfers, needed information was not received, when calls were not answered in a timely manner and when calls were for urgent medical issues. After the collaborative QI efforts, we saw measureable improvements in transfers and timeliness of answering incoming calls of PC patients, fewer delays in PC as a result of inadequate telephone responsiveness or access, greater proportions of patients who were highly satisfied with their telephone experience and more who viewed their telephone care as high quality.

The telephone systems and call resolution processes in a PC facility have a direct impact on patient outcomes, such as quality of care, and inefficiencies may result in delays in care receipt. The VHA telephone QI collaborative engaged front-line PC teams and facility system redesign efforts to deliver more accessible, reliable care by telephone. Though this study was performed in the US VHA health care system, the findings can be applied to other health care systems in implementing or improving telephone consultation and triage. This project demonstrated measureable improvements in outcomes after improvement strategies were implemented in VA PC clinics as part of a national QI collaborative. Several areas improved as a result of the

QI transformation efforts and factors most important to patients' perceptions of telephone-delivered care quality that may be further targeted for improvement were identified. Efficient telephone-delivered care can enhance access to health care, facilitate continuity, respect patient preferences and save time and travel for patients.²³ International and US-specific research shows an association between PC accessibility with both better health outcomes and lower health care costs.⁹ Relative to other high-income countries, problems ensuring access to the health system and providing quality care have been long-standing concerns in the USA,²⁴ suggesting that lessons may be drawn from international strategies and models of care to counteract some of the apparent disadvantages experienced in the USA, both within and outside of the VHA.

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Declaration

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