

Optimizing the Use of Telephone Nursing Advice for Upper Respiratory Infection Symptoms

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Telephone consultation services include the processes by which calls are received, assessed, and managed through advice for self-care at home or referrals to other clinically appropriate services.¹ These services are designed to help patients obtain optimal access—that is, “the right care at the right service in the right place”^{2,3}—and reduce demand on clinic-based services.^{4,5}

Safe telephone consultation requires that patients be directed to the level of service required to treat the seriousness of their conditions.⁶ Studies of the appropriateness of nurse telephone consultation in adult general medical populations have predominantly focused on the comparison of nurse and physician advice rates, audits and reviews of nurse triage decisions by expert panels, and timing of follow-up visits in relatively small samples.⁷⁻⁹ Most studies have addressed the quality of triage decisions in general, without specifically assessing the adequacy of self-care advice.

In a large-scale study, Munro surveyed 2748 calls to NHS Direct, the nurse-led telephone hotline serving England, Wales, and Scotland, and used an expert panel to assess the appropriateness of nursing triage in terms of whether the contacts were necessary and sufficient for the presenting symptoms. Healthcare contacts were deemed necessary if the patient could not have been treated at a “lower” level of service; they were considered sufficient if there were no follow-up contacts associated with a “higher” level of service within 48 hours following the initial contact. Self-care advice was considered to be the lowest level of service. Nurses gave self-care advice in about 26% of the cases, and about 80% of the care recommendations provided by nurses were judged by the patients and experts to be appropriate.¹⁰ A later study by Snooks of NHS Direct Wales evaluated the appropriateness of advice and contacts made after calls using the same methodology and found similar results.¹¹

We opted to study self-care advice for upper respiratory infection (URI) symptoms for 3 main reasons. First, URI symptoms are generally low-risk concerns amenable to treatment with self-care advice in lieu of a clinic appointment—coughs and colds are generally self-limiting, lasting from 3

ABSTRACT

Objectives: To describe efforts to optimize telephone self-care advice for upper respiratory infection (URI) symptoms by registered nurses in Kaiser Permanente Northern California’s Appointment and Advice Call Center, and to assess the sufficiency of this advice.

Study Design: Retrospective observational study.

Methods: The study sample included 279,625 calls from adults 18 years and older that resulted in self-care advice for URI symptoms in 2009. Utilizing electronic medical records of these calls and follow-ups, we determined the rate of return calls within 7 days and the clinical outcomes associated with these. Advice for self-care at home was considered sufficient if no return calls received within 7 days of the original call were associated with the need for a “higher” level of care, such as an appointment.

Results: Self-care advice was sufficient for 88% of index advice calls, with either no follow-up calls within 7 days associated with a higher level of care, or follow-up calls only for additional advice or nonmedical information.

Conclusions: Telephone advice for self-care by registered nurses can effectively manage URI symptoms for most otherwise healthy adults.

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to 10 days.¹² Second, URI is a high-volume concern all year long. The National Ambulatory Medical Care Survey has estimated that acute respiratory infections other than pharyngitis are consistently among the 5 leading diagnostic groups for ambulatory care visits.¹³ Likewise, at Kaiser Permanente Northern California's Appointment and Advice Call Center (AACC), URI symptoms are among the 5 most frequent types of calls received monthly. Finally, since URI symptoms are highly contagious, there are strong incentives to minimize appointments, thereby reducing the spread of infection at clinics and in the community.

Utilizing Munro's concept of sufficiency, our study considered nursing advice for self-care management of URI symptoms to be sufficient if callers receiving such advice did not call back within 7 days for URI symptoms and receive a higher-level call outcome, such as a clinic appointment.

METHODS

The study was reviewed and approved by the Kaiser Permanente Northern California Institutional Review Board.

Practice Setting

The AACC at Kaiser Permanente Northern California (KPNC) was introduced into a large integrated health-care system in 1997, and now serves more than 3.2 million patients. The AACC is open 24 hours a day, 7 days a week, and receives over 1 million calls monthly.

This call center uses 3 types of representatives. During daytime and evening hours, calls are initially answered by unlicensed teleservice representatives (TSRs) who follow structured scripts to give information, schedule appointments, or send messages to medical providers at 1 of over 50 clinics. Callers with symptoms that require further assessment are transferred to registered nurses (RNs) who use more than 350 computer-based, symptom-specific decision support protocols as guides to manage callers within their primary care specialties of medicine, pediatrics, or obstetrics and gynecology. Between 12 AM and 6 AM, RNs receive calls directly. Board-certified emergency medicine physicians are also available to serve as call center consultants for registered nurses.

A single call may involve multiple scripts or protocols related to the caller's symptoms and may involve multiple

Take-Away Points

- Multiple work flow adjustment and quality assurance strategies, supported by electronic medical records, help ensure that registered nurse (RN) management of upper respiratory infection (URI) symptoms for otherwise healthy adults is safe and feasible.
- Service demand is expected to increase with implementation of the Affordable Care Act. Diverting some lower-risk concerns such as URIs to RN-managed self-care advice can reduce appointment demand and improve clinic access for more acutely ill patients.
- Future research can assess the sufficiency of self-care nursing advice for additional lower-risk symptoms.

referrals to different levels of healthcare service. In decreasing order of clinical urgency, these referral outcomes are:

- Emergency department (ED) referral by RNs via ambulance or other means of transport, after consultation with a physician.
- Booking by TSRs or RNs for a clinic appointment, or sending the clinic a message asking the clinic to contact the caller to schedule an appointment. A telephone consultation with a call center physician can also be booked under this outcome. Bookings and appointment request messages utilize symptom-specific "booking guidelines" and script and protocol identifiers indicating the reason for the appointment.
- Sending a message from TSR or RN to the caller's physician for non-appointment reasons such as providing feedback about treatment plans, requests for changes in medications, or referrals to other services.
- Advice by RNs only for self-care of the caller's URI symptoms.
- Other outcomes, such as providing non-clinical information (eg, information about facility hours of operation or directions) by TSRs only.

For selected symptoms, RNs may employ telephone treatment protocols (TTPs). Nurses screen callers through inclusion and exclusion criteria, and call center physicians prescribe medication electronically if eligibility requirements are met. For URI symptoms, physicians select cough suppressant medications and antibiotics only for patients matching strict criteria for bacterial sinusitis. During flu season, an antiviral medication may be ordered for patients who call within 48 hours of the onset of symptoms and who meet the strict criteria indicating influenza. Patients can pick up the medications at any pharmacy within 4 hours and start their treatment promptly.

Nurses managing URI calls also have computer access to electronic medical records incorporating demographic information, prior diagnoses, call history, visit history, and prescribed medications. This information allows nurses

to identify patients with chronic conditions, review the frequency and history of prior calls, and determine if telephone treatment was recently prescribed for URI symptoms. Before the winter flu season, nurses are also given extensive education about URI symptom management by physicians and nurse educators, as well as through online training. The AACC issues reports that rank-order nurses based on their call outcomes in order to identify those with the highest advice rates for URI symptoms, and those with the highest rates are encouraged to manage URI calls in a separate “flu queue” when URI call volumes begin to rise. The AACC also provides taped and Web-based information about home cold and flu management for patients, along with information about where to obtain flu shots.

The scripts and protocols used by AACC TSRs and RNs are based on evidence-based research and the results of feedback from medical care providers, as well as practice guidelines from the CDC, public health authorities, state laws, and internal quality reviews. The AACC digitally records all calls, and the recordings are the basis for random retrospective monitoring of the RN triage process. Physician representatives from the chiefs of Medicine, Obstetrics/Gynecology, Pediatrics, and Emergency Services departments at KPNC oversee the development of the scripts and protocols, with support by RNs who are content experts in medicine, pediatrics, or obstetrics/gynecology. The content revision process is supported by detailed reports on monthly frequencies for all scripts and protocols and their associated rates of call outcomes. These reports enable the content oversight committees to examine the impact of the calls on AACC performance and facility operations, and to make revisions to improve quality.

Revisions are set up on a revolving schedule according to body systems and frequency of use, but in response to urgent and rapidly emerging needs in the community, these tools can be revised and deployed within a matter of hours. For example, during the 2009 H1N1 influenza pandemic, the CDC issued new guidelines for the management of H1N1 influenza,¹⁴ and KPNC clinics rapidly modified their isolation procedures, necessitating frequent updates in protocol triage instructions and specific appointment booking instructions for each medical clinic.

The scripts and protocols specific to URI address cough, cold, sinusitis, and influenza symptoms. Per protocol instructions during the study period, callers reporting URI symptoms and who had certain chronic conditions (eg, history of asthma, chronic obstructive pulmonary disease, or emphysema) but reported only sinus symptoms were triaged under protocols specific to those chronic conditions. Callers reporting URI symptoms who receive self-care

advice get a robust set of recommendations for managing their symptoms, information about the safe use of medications, suggestions about lifestyle and preventive measures, course of illness expectations, and instructions to call back if symptoms worsen or new symptoms develop.

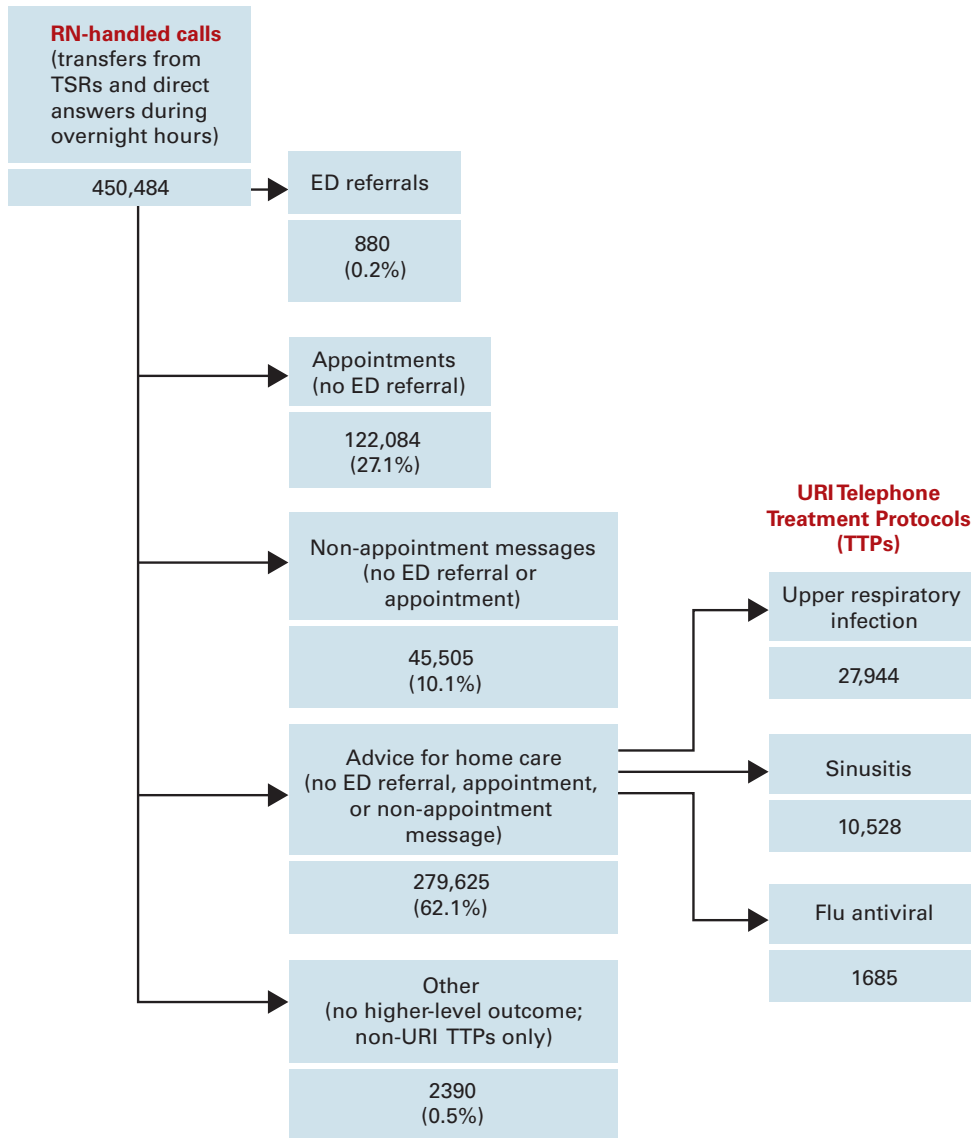
Data Collection and Analysis

The study population included all KPNC members 18 years and older calling about cough, cold, influenza, or sinus symptoms in 2009. URI symptom calls were retrieved from the AACC’s computerized databases, which capture all outcomes associated with each call. Because a call outcome may be associated with the use of multiple scripts or protocols, an algorithm was used to identify those outcomes that could be linked to a URI script or protocol, and identified the highest level of call outcome associated with that script or protocol. Thus, if a call resulted in both a clinic appointment and self-care advice, the call was considered to have an appointment outcome, since that represents a higher level of care.

The type of call center representative (RN, TSR, or physician) associated with the highest URI-related outcome was also identified. If a call was associated with both an appointment by a TSR and RN advice for self-care, “appointment” was assigned as the highest level outcome and the TSR was identified as the representative associated with that outcome. “Index” advice calls were identified as calls with RN self-care advice as the highest level outcome, with no URI advice calls in the prior 7 days.

The protocols are designed to direct callers to a level of care considered to be necessary and sufficient for the presenting symptoms. For this study, index advice calls were deemed “necessary” because they represented the “lowest” level of clinical urgency outcome for calls managed by RNs. A call was considered “sufficient” if the caller did not call back with URI symptoms within 7 days and subsequently receive an outcome associated with a higher level of care. Follow-up calls with a self-care advice outcome did not represent a higher level of care, nor did “other” outcomes involving only provision of nonmedical information. When patients called back within 7 days of the index call and received an appointment, provider message, or ED referral, the self-care advice at the initial call was judged to be necessary but insufficient for the care required. A period of 7 days was selected, because acute URI symptoms typically improve within this time frame in otherwise healthy adults. The length of this follow-up period exceeds the 48-hour period used by Munro to assess sufficiency of initial contacts and provides additional sensitivity in identifying follow-up calls associated with referral to a higher level of care.

■ **Figure.** Highest Outcomes of RN-Managed Calls for URI Symptoms by Callers Aged ≥18 Years, 2009



ED indicates emergency department; RN, registered nurse; TSR, teleservice representative; URI, upper respiratory infection.

Frequency distributions were calculated for monthly call volumes by AACC staff type, highest level outcomes, and URI-related TTP prescriptions completed. For index advice calls, we identified the highest level outcome within 7 days. All data retrieval and analysis were conducted using SAS software, version 9.1 for Windows (SAS Institute, Cary, North Carolina).

RESULTS

AACC received a total of 780,811 incoming calls for URI symptoms in 2009 from KPNC members 18 years and older. Of these, 450,484 were either transferred

to RNs from TSRs in the daytime or evenings, or were answered directly by RNs during overnight hours. The majority of these RN-managed calls (279,625, or 62.1%) resulted in advice as the highest outcome; another 122,084 (27.1%) resulted in an appointment or an appointment request message. Of the advice calls, a total of 40,157 (14.4%) were associated with prescriptions using TTPs. Only 880 RN-managed calls (0.2%) resulted in referral to the ED after consultation with a physician. Distribution of call outcomes is shown in the **Figure**.

Of the 279,625 URI-symptom calls with advice as the highest outcome, 189,703 were index calls that were not associated with URI-related follow-up calls in the follow-

Table 1. Index Advice Calls and Outcomes of Follow-up Calls Within 7 Days

	Index Advice Sufficient?	Volume	% of All Index Advice Calls	% of Index Advice Calls With Follow-up Calls
All index advice calls		237,824		
A. Index advice calls, no follow-up calls	Yes	189,703	79.8%	
Index advice calls with follow-up calls		48,121	20.2%	
Highest outcomes of follow-up calls				
B. Advice for self-care	Yes	17,684	7.4%	36.7%
Emergent referral	No	138	0.1%	0.3%
Appointment or appointment request	No	23,159	9.7%	48.1%
Non-appointment messages	No	5168	2.2%	10.7%
C. Other	Yes	1972	0.8%	4.1%
Sufficiency calculation: (A + B + C) / all index advice calls		209,359	88.0%	

ing 7 days. There were an additional 48,121 index advice calls with single or multiple follow-up calls—including multiple follow-up calls for advice—within 7 days, representing 20.2% of all index advice calls. Of these, RNs referred only 138 (0.3%) calls to the ED for URI, and 23,159 (48.1%) were associated with appointments booked with physicians by TSRs or RNs as the highest level outcome. In these cases, the initial advice call was not considered “sufficient” to meet the caller’s medical needs.

As shown in **Table 1**, of the 48,121 index advice calls with follow-up calls, 38.6% (17,684) involved advice as the highest level outcome in the following 7 days, and 4.1% (1972) resulted in “other” (nonmedical information or TTPs unrelated to URI). Of the total 237,824 index advice calls with and without follow-up calls within 7 days, 88% were associated with either no follow-up calls or with follow-up calls that did not involve an outcome higher than advice. Thus, RN self-care advice was determined to be sufficient for 88% of index calls.

To assess the sensitivity of our model to changes in the length of time in which follow-up call outcomes were observed after index advice call, the distribution of highest outcomes and rates of advice sufficiency were calculated for follow-up intervals of 3, 5, 10, and 14 days, in addition to 7 days (**Table 2**). The number of index advice calls decreased as the follow-up time lengthened, and rates of follow-up calls with highest outcomes of “advice” or “other”—with no higher level of call outcome—decreased from 44.6% associated with a 3-day interval, to 39% when the follow-up time frame was extended to 14 days. Accordingly, the advice sufficiency rate decreased to 85.9% for a 14-day follow-up period from the 88% rate in our 7-day model.

On April 26, 2009, HHS declared H1N1 a national public health emergency.¹⁵ Although the volume of URI calls increased sharply after that date, the rate of advice as a percentage of all RN-handled calls changed little: the advice rate prior to April 26 was 61.2%, compared with 62.5% after this date through the end of 2009. The rate of index advice calls with follow-up calls was 20.5% prior to the H1N1 outbreak, and 20.4% after.

DISCUSSION

Self-care advice without referral to hospital or clinic-based services was sufficient in 88% of index advice calls; there were either no follow-up calls (nearly 80%) or calls only for additional advice or information. Of the index calls that were followed by second calls within 7 days, nearly half resulted in appointments and one-third were managed by self-care advice again. Even when the window of time for follow-up calls was extended to 14 days, the sufficiency of advice decreased only slightly (to 85.9%).

The true rate of RN advice in our setting is represented by the proportion of calls handled by RNs in which advice is the highest level outcome, including calls transferred to RNs following appointing or messaging by a TSR. Operational data for 2009 shows that RNs provided advice in 47% of URI calls they handled, including calls transferred by TSRs following appointing or messaging. However, our study examined RNs only, so calls handled by TSRs resulting in appointments or messages, followed by RN transfers for self-care advice, were not counted in the denominator of calls managed by RNs. As a result, the advice rate in our study was higher: 62.1% of all RN-man-

Table 2. Comparative Sufficiency of RN Advice Calls With Varying Follow-up Time Frames

	3 Days	5 Days	7 Days	10 Days	14 Days
Index advice calls without follow-up	208,010 (84.4%)	197,238 (81.6%)	189,703 (79.8%)	184,643 (78.3%)	179,609 (76.9%)
Index advice calls with follow-ups	38,557 (15.6%)	44,409 (18.4%)	48,121 (20.2%)	51,208 (21.7%)	53,898 (23.1%)
Highest level of follow-up call (% of all index calls with follow-up calls)					
Advice	15,529 (40.3%)	16,936 (38.1%)	17,684 (36.7%)	18,375 (35.9%)	18,871 (35.0%)
“Other” (informational)	1670 (4.3%)	1850 (4.2%)	1972 (4.1%)	2060 (4.0%)	2132 (4.0%)
Total follow-up: highest outcome no higher than advice (advice + “other”)	17,199 (44.6%)	18,786 (42.3%)	19,656 (40.8%)	20,435 (39.9%)	21,003 (39.0%)
Outcome higher than advice					
Emergent referral	114 (0.3%)	135 (0.3%)	138 (0.3%)	142 (0.3%)	146 (0.3%)
Appointment/appointment request	17,361 (45.0%)	20,844 (46.9%)	23,159 (48.1%)	25,052 (48.9%)	26,844 (49.8%)
Non-appointment message	3883 (10.1%)	4644 (10.5%)	5168 (10.7%)	5579 (10.9%)	5905 (11.0%)
Sufficiency (follow-up outcome no higher than advice + index calls without follow-up)	225,209 (91.3%)	216,024 (89.4%)	209,359 (88.0%)	205,078 (87.0%)	200,612 (85.9%)
RN indicates registered nurse.					

aged URI calls resulted in self-care advice without referral to ED, appointing, or provider messaging.

This is the first large study to our knowledge to assess the sufficiency of telephone-based nursing self-care advice specifically for adults reporting URI symptoms. Our findings are similar to those of Munro’s study of NHS Direct in the United Kingdom, in which 80% of call outcomes were found to be both necessary and sufficient. However, the NHS study addressed all types of contacts—including referral to EDs, to pharmacies, and to the caller’s own doctor, in addition to self-care advice. It was not restricted to an adult population, and was not specific to URI. In our study, the 62.1% of all calls triaged to self-care advice (including antiviral treatment) exceeded the 28% to 43% reported by North and colleagues in their study of telephone triage for influenza during the 2009 to 2010 H1N1 pandemic, although that study also included a pediatric population.¹⁶

Limitations

First, callers may have used channels other than the AACC to book appointments following receipt of RN advice; these include interactive voice recognition and the Internet-based platform KP.org. Records of such self-service bookings are maintained in a database separate from that used to capture data on calls managed by the AACC, and do not include consistent information on the chief complaint of the patient booking an appointment; thus, it is not possible to reliably identify URI-related follow-up

appointments through these platforms. (In 2010, the first year for which such data are available, 72.6% of bookings for adults were conducted through live agent contact at the AACC.) Second, this study could not assess compliance with self-care instructions and the effect that non-compliance may have had on frequency of follow-up calls and rate of escalation to higher levels of care. Finally, this study was a cross-sectional sample of a single healthcare organization. The generalizability of our findings may be assessed by a longitudinal study involving multiple sites or a national sample, with comparison of clinical outcomes between callers provided with RN self-care advice and controls receiving clinic-based care.

CONCLUSIONS

Telephone advice for self-care by registered nurses can effectively manage URI symptoms for most otherwise healthy adults. Our findings may inform more large-scale efforts to provide self-care advice for adults with URI symptoms, such as the CDC initiative to investigate the feasibility of a national call center model to support self-care of contagious illness during a pandemic, including over-the-phone prescription of antiviral medications.¹⁷

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