Electronic Consults for Improving Specialty Care Access for Veterans

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For decades, physicians have provided outpatient medical care almost exclusively through clinic-based encounters. A typical encounter includes taking a history from the patient, reviewing the medical record, performing a physical examination, checking the vital signs, formulating a plan of care, writing any needed medical orders, and documenting the encounter. This model of care delivery has predominated because the rules and regulations governing reimbursement for care are built around a standard outpatient clinic encounter. Delivering care in the standard outpatient clinic encounter is comprehensive, but this model may include more than is actually necessary to answer certain clinical questions. Alternative models of care delivery, such as telemedicine and e-consults, are sometimes not reimbursed or rules and reimbursement rates are barriers to adoption.[1,2]

Problems with prompt access to healthcare have garnered substantial attention in both lay and medical publications recently.[3,4] Concerns about veterans' access are widely known, although many non–Veterans Health Administration (VHA) primary care and specialty care clinics around the country have long wait times as well. One potential solution that the VHA has adopted to improve access to care is encouraging the use of e-consults.[5] An e-consult is similar to a clinic visit in that both consist of reviewing the medical record, formulating a plan of care, and providing care guidance through notes in the electronic health record. They differ in that e-consults do not include taking a history directly from the patient or performing a physical examination. E-consults share some similarity with informal "curbside" consultations but differ in that they are documented within the medical record. Despite the limitations, many clinical questions can be adequately answered without these care elements.

At our VHA facility, wait times for cardiology clinic appointments were steadily increasing and threatened to limit timely access to care. We adopted the use of e-consults in a multiphase process and tracked the impact on clinic wait times. We hypothesized that, when clinically appropriate, diverting consult requests from providers away from in-person clinic appointments to e-consults would reduce wait times for clinic appointments.

ABSTRACT

OBJECTIVES: We adopted e-consults within an active referral management (ARM) process for our Veterans Health Administration (VHA) outpatient cardiology clinic to reduce clinic wait times.

STUDY DESIGN: Prospective multiphase cohort study.

METHODS: Our ARM process consisted of reviewing all incoming consult requests for our outpatient clinic and triaging the requests to either an e-consult or a clinic visit. The primary outcome was wait time for an appointment in our clinic.

RESULTS: Median wait time prior to the ARM process was 24 days. After implementation of the ARM process, wait times decreased to 13 days (46% reduction). Approximately 60% of incoming consults could be triaged into e-consults, predominantly by managing stable diseases or minor symptoms.

CONCLUSIONS: E-consults and ARM of clinical referrals were effective at reducing wait times for our outpatient VHA cardiology clinic. The majority of clinical referrals could be handled through an e-consult and did not require an in-person clinic visit.

METHODS

Our facility provides comprehensive cardiology care for veterans in the north Florida/south Georgia region in the outpatient, inpatient, and critical care settings. Specific services include implanted cardiac device monitoring and management, echocardiography, nuclear cardiology, cardiac computed tomography and magnetic resonance imaging, evaluation and management of coronary disease and heart failure, telemedicine, home-based cardiac rehabilitation, and electrophysiology management of dysrhythmias including complex ablation, percutaneous coronary intervention, and transcatheter structural procedures. This comprehensive suite of cardiovascular services places a high demand on access to our outpatient clinic for evaluation and management of heart disease. Any clinician in our system is capable of ordering cardiology consultation either as an in-person clinic visit or as an e-consult.

We studied the implementation of a 2-phase active referral management (ARM) process in a pre–post observational design. The goals of the ARM process were to perform more e-consults and reduce wait times. In phase 1, all incoming clinic consult requests from providers were reviewed by a cardiologist. The cardiologist reviewed the medical record and all available relevant results, such as cardiac stress testing, electrocardiograms, echocardiograms, coronary angiography, and recent laboratory findings, applying their individual judgment to determine if the patient should be seen in person or if an e-consult would be sufficient to provide direction for the consulting provider. If an e-consult was sufficient, the physician would complete the consult immediately; otherwise, the patient would be referred to the clinic scheduler to come for an in-person appointment. Responsibility for consult review was shared by all staff physicians (n = 10). Phase 1 was conducted from November 1, 2015, to October 31, 2016. During phase 1, we monitored the types of clinical questions that physicians felt were appropriate for e-consults. These clinical judgments were used to develop clinical consult triage recommendation tables directing incoming consults toward either e-consults or clinic visits (**eAppendix** [available at **ajmc.com**]). Phase 2 was conducted from November 1, 2016, to March 1, 2017. In phase 2, nurse practitioners and physician assistants (NPs/PAs) with full-time assignment in the cardiology section performed the initial review of consult requests and referred a subset of requests to a physician for further review.

At the time of this program, our cardiology service used "wait time" as defined later in this paragraph. Since that time, VHA has adopted definitions of wait times that are applied more universally across facilities and services. On a weekly basis, we reviewed the number of open clinic appointments and calculated the number of days necessary in order to fulfill the number of currently unscheduled clinic appointments. We use the term "days" to refer to clinic days (ie, Monday through Friday). For example, if 100 patients needed an appointment and each clinic day had 10 open slots to accommodate patients, our calculated wait time would be 10 days. Wait times were tracked on a continuous weekly runchart. We applied accepted rules of runchart analysis for determining when a significant change had occurred.[6] We also tracked the number of clinic consult referrals. A subset of consult requests (from October 1, 2016, to November 15, 2016) was reviewed secondarily as an estimate of the source, clinical questions, and results of the ARM process. D.E.W. had full access to the study data and takes responsibility for data integrity and analysis. We did not perform any formal assessment of patient, cardiology provider, or referring provider satisfaction with the ARM process. The University of Florida Institutional Review Board approved the use of these data and waived the requirement for informed consent.

TAKEAWAY POINTS

‣ E-consults are an efficient healthcare delivery strategy.
‣ Active management of incoming consults improves triage of electronic and in-person consultations.
‣ When combined, these strategies can reduce wait times for outpatient specialty clinics.
‣ Triage of consults can be performed by advanced practice providers as well as physicians.

RESULTS

During this project, 4662 consult requests were evaluated. Phase 1 included 3116 total consults; 60.6% were clinic consults (n = 1887) and 39.4% were e-consults (n = 1229). Phase 2 included 1546 total consults; 70.4% were clinic consults (n = 1089) and 29.6% were e-consults (n = 457). The median number of weekly total (phase 1: n = 59; interquartile range [IQR], 17; phase 2: n = 66; IQR, 20.75; P = .006) and clinic (phase 1: n = 33; IQR, 15; phase 2: n = 49; IQR, 15.25; $P \leq .0001$) consults increased from phase 1 to phase 2; however, the median number of e-consults (phase 1: n = 24; IQR, 16; phase 2: n = 20.5; IQR, 9.75; P = .61) did not increase. At the beginning of phase 1, the median wait time was 24 days. Data on wait times prior to our intervention were not available to include in this report. After implementation of phase 1 of the ARM process, we observed 20 consecutive weeks in which wait times fell below the median, suggesting a statistically significant and sustained decrease (**Figure 1**). At this point, the median was recalculated (13 days) based on the newly achieved steady state of wait times. After implementation of phase 2 of the ARM process, we observed 17 consecutive weeks in which wait times exceeded the second calculated median, suggesting a statistically significant and sustained increase.

During the 2-phase ARM implementation, the total number of consult requests was tracked in a separate runchart (**Figure 2**). The weekly number of consult requests exhibited substantial volatility (median, 29; SD, 4.78). Starting in May 2016, we observed 35 consecutive weeks in which the number of consults exceeded the median, suggesting a statistically significant and sustained increase.

A review of a subset of consult requests (n = 332) found that the primary source of consults was primary care (42%), followed by other

FIGURE 1. Weekly Calculated Wait Times[a]
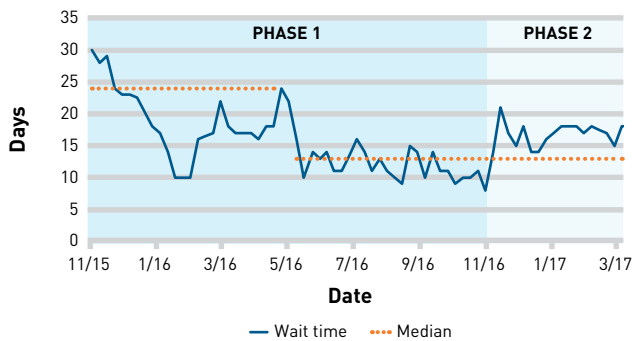
[a]A runchart (blue line) depicts the wait times for our cardiology clinic on a weekly basis. The orange dotted line indicates the first and second calculated median wait times. The blue box on the left represents the first phase of our active referral management process, in which physicians were responsible for consult triage; the lighter box to the right represents the second phase, in which a nonphysician provider performed an initial review, followed by physician review if necessary.

FIGURE 2. Weekly Consult Requests[a]
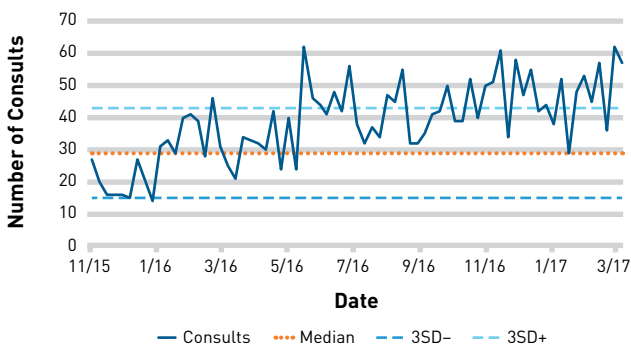
3SD– indicates 3-SD lower boundary; 3SD+, 3-SD upper boundary.

[a]A runchart (blue line) depicts the weekly consult volume for our outpatient cardiology clinic. The orange dotted line indicates the initial calculated median, and the blue dashed lines indicate the boundaries of 3 SDs from the median. After June 2016, the consult volume was consistently above the median, suggesting a significant increase in the consult volume.

specialties (34%), emergency medicine (13%), inpatient requests for follow-up (7%), and other cardiologists in our network (4%). The largest identifiable categories of referrals were for arrhythmia management (19%), stable heart disease management (12%), and preoperative assessment (10%). Overall, it was determined that 60% of consults could be converted to e-consults. A substantial portion (30%) of the converted consults were administrative in nature (eg, request for non-VHA care, request for follow-up in already established/scheduled patient, referred to another cardiologist within our regional care network). Without ARM, many of these patients would have been scheduled into the clinic without any need to be seen in person. Of the 60% that could be converted, approximately

half (28%) were for questions about minor symptoms or stable disease and were managed as e-consults.

DISCUSSION

E-consults are an emerging form of care delivery that offer a number of potential advantages over traditional face-to-face clinic visits. Although clinicians at our facility are able to order e-consults directly, by using an ARM process, we observed an increase in the number of patients managed via e-consult that translated into a sustained improvement in wait times. This improvement was tempered when we implemented a process based on initial review by a nonphysician provider, but it remained an improvement over not using an ARM process at all. These findings are informative toward the adoption of e-consults and ARM processes.

The direct measure of our program was limited to wait times for the outpatient cardiology clinic, but we also observed a number of secondary benefits, beyond improvements in access to care. For example, we had a surplus of clinic appointments that allowed us to reserve 1 same-day appointment per day for walk-ins or urgent referrals. Another potential efficiency was in perioperative care; by eliminating the wait for an outpatient visit and evaluating preprocedural cardiac risk via e-consult, patients could reduce their time to the operating room by 2 to 3 weeks. The referral base for our facility stretches over roughly 200 miles from south Georgia to north Florida; handling outpatient referrals via e-consult substantially reduces travel burden for some of our veterans. In an early evaluation of e-consults, Kirsh et al found that the average travel avoided was 72.1 (IQR, 17.1-108) miles.[5] Although we did not assess patient and provider satisfaction with e-consults, others have found high satisfaction in both groups.[7,8]

We observed a sustained reduction in wait times during phase 1 of our ARM process (cardiologist review). During phase 2 (nonphysician review), wait times increased again and then leveled off. There are a number of potential explanations for this observation. First, it is possible that our nonphysician providers did not have the same level of comfort with converting to e-consults as did our cardiologists. Second, we observed an increase in consult requests overall during phase 1; this may have taken time to manifest in an increase in the wait times. Third, we experienced a shortage of clinic coverage for our electrophysiology services due to loss of staffing, but no other staffing issues occurred during the observational period. Because we could not distinguish general from electrophysiology appointments within our clinic, this may have contributed to the increase in wait times. We should also note that cardiologists were skeptical of the design of our ARM process due to the potential for variation among cardiologists as they reviewed the consults. Although this is a possible downside to our ARM process, it did not appear to manifest in the wait times, possibly because of the substantial volatility in the weekly volume of consult requests (Figure 2).

Potential downsides to the use of e-consults include recidivism and patient safety. After a patient is seen electronically, they may

still have a standard outpatient clinic visit within a short time frame. In some cases, this could provide the specialist an opportunity to review the chart beforehand and preorder diagnostic tests or laboratory tests that would improve efficiency of the visit. In other cases, the resources put into the e-consult may be squandered if the in-person visit readdresses the same problem. Wasfy et al found that 11.6% of the e-consults in their study had an unrecommended in-person visit within 6 months of the initial consult.[9] Although it is difficult to say what would be a "right" proportion of patients to have in such a scenario, it seems reasonable that some proportion of patients would benefit from an in-person visit even if initial review of their chart suggested otherwise. Although safety may be an initial concern with the adoption of e-consults, both Wasfy et al and Olayiwola et al studied e-consult use within cardiology and found no signal of harm.[9,10]

Despite the evidence of benefit, e-consults face a multitude of barriers to adoption. First and foremost is that in many care settings, the effort is unfunded or not reimbursed. In some health systems with salaried physicians and providers, such as the VHA and accountable care organizations, the use of e-consults has been supported with protected time for providers.[8,11] Formal assessments of ARM productivity were beyond the scope of our investigation; however, e-consults are recognized as clinical care within the VHA (each e-consult yields 0.64-1.38 relative value units). Episode-based payment bundles and other government-led payment reforms may accelerate the implementation of e-consults.[12] The VHA is specifically supporting the widespread adoption of e-consults and ARM processes through the Diffusion of Excellence initiative.[13] This initiative is based on implementation science that has shown that e-consults are more likely to be successful in environments with physician champions, high-quality communication among providers, and an engaged management team.[14] Another substantial barrier is a lack of guidance from clinical thought leaders on what constitutes a safe and responsible e-consult. Anticipating greater adoption of e-consults, it would seem prudent for professional societies to develop principles and best practices for the use of e-consults.

Limitations

Our report is limited by the absence of balancing measures such as increases or decreases in consult levels as a result of our program. Conceivably, clinicians frustrated with our e-consults could have avoided requesting cardiology care or they might have requested more in order to address what they perceived as incomplete care. We did not formally track satisfaction, but we have not received negative feedback on the ARM process during the 2 years after implementation. Data from phase 2 are limited to 5 months. We used a metric for wait times that differs from more commonly used metrics, such as the third next available appointment, out of a desire for a metric that better captures the total unmet demand on our clinic.

CONCLUSIONS

In this investigation, we have shown that e-consults are an effective strategy for providing specialty medical care services, particularly when incoming consult requests are actively managed by the receiving service. This investigation adds to the existing literature by demonstrating that the strategy can be adopted using physicians or NP/PA team members when facilitated by documented standards of what care can be provided electronically. E-consults and ARM may be a solution for resource-limited environments experiencing care shortages, such as the VHA. ∎

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eAppendix. Cardiology Section Consult Review Process

On a daily basis, a provider will compile a list of both consults and E-consults to GNV Cardiology service. All referrals will be reviewed with the following consult topics and recommended dispositions. If appropriate, consults may be converted to E-consults by the provider.

Advanced Practice Provider Review:

Consult Request	Confirm Finding	Disposition	Sample response to ordering provider
Consult from area outside Gainesville	Patient Location	Forward consults as appropriate to Lake City, Jacksonville, or the Villages	No specific reply needed
Consult request for a patient seen by Cardiology in the last 60 days		<u>Clarification in plan</u>: Discontinue consult, addend patient note to the Cardiology provider/physician for management or return visit <u>New/change in plan</u>: Convert to e-consult and complete as new request	No specific reply needed
Request for services already provided: • Patient already seen by cardiology • Duplicate referral		Discontinue duplicate consultation	No specific reply needed

Request to evaluate patients not yet seen or evaluated by primary care (as per service agreement) • Dyspnea • Fatigue • Atypical chest symptoms • Palpitations • Murmur • ASx sinus brady • Syncope/near syncope • Edema	Confirm appropriate testing (echo, stress, etc.) has not yet been performed	Discontinue consult, refer provider to the PC-CV service agreement with test recs Dyspnea → Echo, Stress Fatigue → Stress Chest Sx → Stress Palpitations → ECG/Holter/Event Murmur → Echo ASx sinus brady → no testing Syncope → ECG, Holter, Echo Edema→ Echo	"Per the primary care-cardiology service agreement, primary care will manage the evaluation of [enter complaint]. Suggested testing may include: [enter test suggestions]. Please let us know if the tests reveal any abnormalities which require further evaluation in our clinic.
Request for services clearly in need of CV management • New onset atrial fibrillation • New onset LV dysfunction	Confirm diagnosis is true and new (ECG read may be incorrect)	Receive consult, refer to HF, EP, or interventional clinic dates, if appropriate	No specific reply needed
Request for advanced CV services from other CV providers (Jax, LKC, Villages): • TAVR Evaluation • ICD Evaluation • CHF management • AFib/rhythm management	Confirm relevant diagnostics (echo, cath, hospital records) are complete and available	Receive consult, refer to HF, EP, or interventional clinic dates, if appropriate	No specific reply needed
Request for post-hospitalization or post-PCI follow-up	Confirm request was suggested by Cardiology or is clinically relevant	1. Receive consult, refer to HF, EP, or interventional clinic dates if appropriate 2. Stable patients on adequate meds *may* be managed without visit 3. Consider referral to Home-Based Cardiac Rehab	No specific reply needed

Request for coronary angiography from CT surgery	Order cardiac catheterization, order appropriate pre-procedural labs if not current, clinic visit GENERALLY not necessary	No specific reply needed

Physician Review

After review by the provider, a physician will review the remainder of consults for patient care questions which could be reasonably managed through an e-consult or to clarify questions regarding the directions above.

Consult Request	Confirm Finding	Disposition	Sample response to ordering provider
Incidental finding of coronary calcium on XR, CT, or other imaging test	Confirm patient has no symptoms	Convert to E-Consult and recommend medical management for primary prevention of CAD	"Coronary calcium indicates the presence of atherosclerosis. In the absence of symptoms this can typically be managed with medical therapy (aspirin and statin) and risk factor modification"
ECG Interpretation	Review ECG	Convert to E-Consult and review ECG	No specific reply needed
Preoperative Evaluation	Review for evidence that referring provider used the Preop template	• Discontinue or convert to E-consult for asymptomatic patients, low risk procedures, patients without known heart disease (as per pre-op template) • Patients with unknown METs can be referred for testing, if appropriate	"Based on the information provided, a face to face visit with cardiology is not necessary for this low risk procedure. Please complete the pre-op consult request template in CPRS and reconsult if questions remain"
Anticoagulation prior to procedures	Confirm low risk of stroke: • No history of stroke AND • No mechanical valve AND • No other indication for anticoagulation AND • CHADS<4, CHADS2VASC<5	Convert to E-consult if possible, recommend anticoagulation may be briefly interrupted without heparin bridging if low risk	"Based on the patient's CHADS2VASc score of XX and no prior history of stroke, anticoagulation may be interrupted for the procedure. Please continue ASA through the perioperative period"

Request to hold aspirin or clopidogrel/ticagrelor/ prasugrel/etc. for procedures	Review chart for indication for drugs. (ACS, prior PCI, stroke, PAD)	• Convert to E-consult if Neuro or Vascular indication and needs to be reviewed by their service • Patients without Hx of ACS/PCI/CABG may interrupt all antiplatelet therapy • Patients with prior PCI for ACS or with DES should remain on DAPT for 1 year without interruption • Patients with prior BMS PCI > 1 month ago or DES PCI > 6 months ago for stable angina may interrupt DAPT but must remain on ASA • Restart antiplatelet therapy as appropriate for the planned procedure	"Based on patient history of PCI over one year ago, XXX may be interrupted for the planned procedure. ASA needs to be continued through the perioperative period. "Given the elapsed time since the last coronary stent, dual antiplatelet therapy does not need to be restarted after the procedure."
Other clinical questions		Respond as appropriate either receiving the consult request or converting to E-consult	Response as appropriate

Abbreviations
ACS   acute coronary syndrome
CAD   coronary artery disease
CV   cardiovascular
DAPT dual antiplatelet therapy
DES   drug eluting stent
ICD   implanted cardioverter-defibrillator
LV   left ventricle
PCI   percutaneous coronary intervention
TAVR transcatheter aortic valve replacement

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