

## Letters

### Initial Results of a Cardiac E-Consult Pilot Program



In the United States, health care costs have outpaced improvements in outcomes (1). One component in cost growth is intensification of specialist care (2). New payment policies, such as shared savings programs, have created the incentives and flexibility to rethink how specialty services, including cardiology consultative services, are delivered (3). Building on prior efforts to restructure the services that are now delivered almost exclusively in face-to-face visits and via informal curbside consults (4), and in response to new accountable care organization risk contracts, we created a cardiology electronic consult (e-consult) pilot at the Massachusetts General Hospital, with the goal of both improving care and reducing unnecessary visits. We hypothesized that a well-executed e-consult option would be well received by patients, cardiologists, and referring primary care physicians and would reduce requests for traditional face-to-face outpatient consultation.

In our e-consult pilot, cardiologists reviewed the electronic data and images in the shared electronic medical record (EMR) and then provided detailed clinical recommendations in the EMR without a cardiology office visit. Referring physicians chose between traditional in-person consults (“visits”) and e-consults. We encouraged referring physicians to engage patients in deciding appropriate referral type (visit or e-consult). The hospital paid cardiologists for completed e-consults using a method that provided roughly equivalent reimbursement to fee-for-service for a cardiologist’s time.

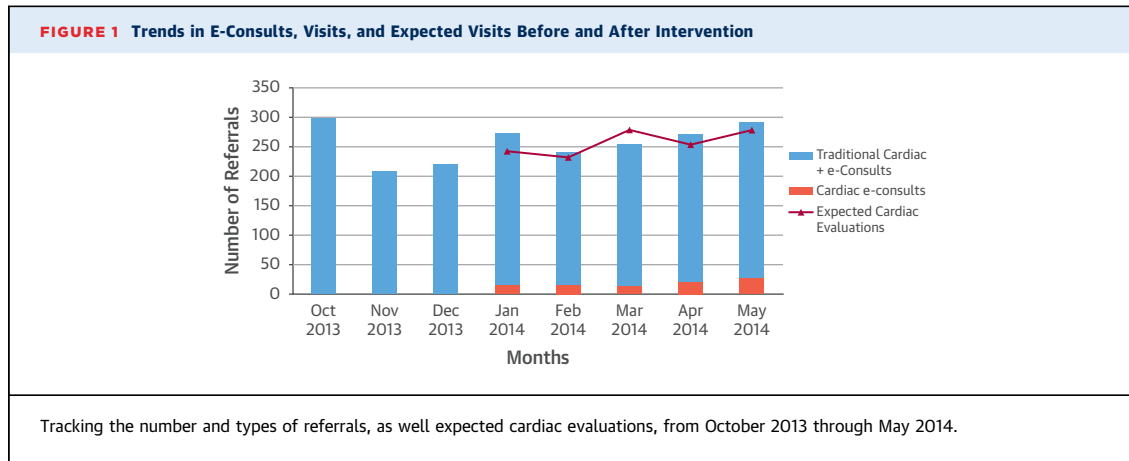
We counted requested visits to cardiologists resulting from referrals from our primary care physicians before the pilot and compared this with the number of e-consults and visits after the pilot started. We then applied that ratio prospectively after the cardiac e-consult intervention to calculate the number of expected cardiac visits. This method allowed us to compare the actual evaluations (e-consults plus in-person visits) to the expected number of visits had no intervention occurred.

To understand the preliminary effect of e-consults on resource utilization, we counted testing after e-consult. We also determined whether a traditional cardiology visit occurred after e-consult and if the referring clinician complied with e-consult recommendations. To assess satisfaction, we conducted interviews with a convenience sample of 30 patients and surveyed a convenience sample of 41 participating referring providers.

From January through May 2014, referring providers requested 78 e-consults. Of the 78 requests, 11 (14.1%) resulted in visits because the question was unanswerable by e-consult, and 67 e-consults were performed. In the 15 weeks before the intervention, the baseline ratio of cardiology/gastroenterology consults was 0.352. Over the 16 weeks of the pilot, 859 cardiology visits were requested and 2,746 gastroenterology visits were requested. Using the baseline ratio, we would have expected 961 cardiology visits requested. The sum total of visits and e-consults requested (937) did not exceed the calculated expected cardiology visits requested (Figure 1).

Of the 67 e-consults, 32 (47.7%) included recommendations for testing, including 1 of 67 (1.5%) electrocardiograms, 10 of 67 (14.9%) echocardiograms, 7 of 67 (10.4%) stress tests, 4 of 67 (5.9%) computed tomography scans, 7 of 67 (10.44%) Holter monitors/event recorders, and 1 of 67 (1.5%) laboratory tests. In 8 e-consults (11.9%), the cardiologist made medication recommendations, adjusting doses or adding new medications. In 26 of 32 cases (81.3%), all recommendations made during e-consult were implemented.

Of 62 referring providers, 41 were surveyed, and 27 completed the survey. All providers (100%) endorsed the helpfulness of e-consults, and all providers expressed intent to continue to use e-consults. A majority (77.8%) believed the e-consult averted the need for a traditional visit. Of 30 patients surveyed, 96.7% were “very satisfied” with the convenience of receiving clinical recommendations from a primary provider rather than a visit with a cardiologist, 100% were either “very satisfied” or “somewhat satisfied” with the experience, and 96.7% were either “very satisfied” or “somewhat satisfied” with their understanding of the plan and recommendations.



To enhance value, an e-consult program in cardiology needs to provide both high-quality provider and patient satisfaction. In a preliminary pilot study, we have shown that offering an e-consult option in cardiology does not appear to increase overall total referral volume, with referring providers requesting e-consults in lieu of traditional visits. Furthermore, e-consults appear to be associated with high rates of satisfaction among both providers and patients.

These preliminary findings from a single center should be interpreted with caution. A more definitive study would involve multiple sites; track visit volumes, total costs, and patient outcomes over a longer time period; and assess patient and physician experience and satisfaction in greater detail. This design would allow comparison of the saved cost of an avoided visit against the cost of any potential increase in testing.

E-consults in cardiology appear to reduce requests for traditional visits and appear to be associated with high levels of patient and physician satisfaction. E-consults have the potential to provide accountable care organizations with a value-enhancing mechanism for providing cardiology care.

\*Jason H. Wasfy, MD, MPhil  
 Sandhya K. Rao, MD  
 Melissa D. Chittle, PA-C  
 Kathleen M. Gallen, RN  
 Eric M. Isselbacher, MD  
 Timothy G. Ferris, MD, MPH

\*Massachusetts General Physicians Organization, BUL-205B  
 Massachusetts General Hospital  
 55 Fruit Street  
 Boston, Massachusetts 02114  
 E-mail: [jwasfy@mg.harvard.edu](mailto:jwasfy@mg.harvard.edu)  
<http://dx.doi.org/10.1016/j.jacc.2014.09.061>

Please note: This work was funded by the Massachusetts General Physicians Organization. Dr. Wasfy receives consultant fees (<\$1,000) from QPID Health. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

**REFERENCES**

1. Meyer GS, Demehin AA, Liu X, Neuhauser D. Two hundred years of hospital costs and mortality—MGH and four eras of value in medicine. *N Engl J Med* 2012;366:2147-9.
2. Barnett ML, Song Z, Landon BE. Trends in physician referrals in the United States, 1999-2009. *Arch Intern Med* 2012;172:163-70.
3. Nabel EG, Ferris TG, Slavin PL. Balancing AMCs' missions and health care costs—mission impossible? *N Engl J Med* 2013;369:994-6.
4. Chen AH, Kushel MB, Grumbach K, Yee HF Jr. Practice profile. A safety-net system gains efficiencies through "eReferrals" to specialists. *Health Aff (Millwood)* 2010;29:969-71.

## Long-Term Follow-Up of Elective Chronic Total Coronary Occlusion Angioplasty



Analysis From the U.K. Central Cardiac Audit Database

In a recent issue of the *Journal*, George et al. (1) conducted a multicenter registry study on 13,443 patients and found that, during a mean follow-up of 2.6 years, percutaneous revascularization of chronic total occlusions (CTO) was associated with improved long-term survival.

As correctly highlighted in the study limitation section and in the accompanying editorial by Mahmud (2), there were numerous potential biases with this retrospective observational analysis. For example, patients with "unsuccessful" CTO were older and had higher prevalence of other clinical risk factors, already known to adversely affect prognosis.