What is the current focus of your research efforts?
Over the past few years, I’ve begun to focus my research on the costs and safety of percutaneous coronary (PCI) and vascular interventions (PVI). Currently, I’m conducting an observational study evaluating the in-hospital costs associated with post-PCI BARC (Bleeding Academic Research Consortium) bleeding and serving as principal investigator for the Blue Cross Blue Shield of Michigan Foundation–funded SOCRATES trial (Study Of Costs Realized After percutaneous coronary intervention Employing Same day discharge), a single-center, randomized trial comparing 30-day costs of same-day discharge versus overnight hospital stay after elective or low-risk urgent PCI.

With respect to safety, I recently coauthored an observational study using data from the ACC National Cardiovascular Data Registry’s (NCDR) CARE (now known as PVI) registry relating the use of bivalirudin and unfractionated heparin to bleeding complications after carotid artery stenting. I will soon publish the results of an observational study on the impact of middle-of-the-night PCI on next-day procedural outcomes, and I am on the executive committee of ENDOMAX, a multicenter, randomized trial comparing bleeding outcomes with bivalirudin versus unfractionated heparin after carotid artery stenting and lower extremity PVI. Last, I am in the midst of studying the ability of incident BARC bleeding after cardiac surgery to predict short-term adverse cardiovascular events using, among other data sources, our hospital’s Society of Thoracic Surgery registry.

Which new communication technologies do you think are most important for interventional cardiologists to become familiar with and utilize (ie, Google Glass, Twitter, smartphone apps, etc.)? Have you found these to be most helpful at meetings, for physician advice and opinions, communicating with patients and the public, or something else?
I would categorize these health care technologies into decision-aid and communication apps. At the most basic level, it is essential that interventional cardiologists develop a facility with determining procedural risk. Such information can help facilitate provision of personalized patient consent and may allow for mitigation of risk through the institution of prophylactic measures and/or by altering subsequently employed therapies. In partnership with the Blue Cross Blue Shield of Michigan PCI registry and the Society for Cardiovascular Angiography and Interventions (SCAI), I helped develop an app that simultaneously estimates the risk of death, contrast-induced nephropathy, and transfusion with PCI. At my center, we are using this PCI risk calculator to help identify patients who are at very low risk of procedural complications and thus may be potential candidates for same-day discharge.

The American College of Cardiology (ACC) and SCAI have led the way in developing a quality-driven health care system, in part through development and application of appropriate use criteria (AUC) that help limit overuse of diagnostic and therapeutic technologies. SCAI has developed a free AUC app for diagnostic catheterization and coronary revascularization. Both the risk score calculator and AUC apps are available for smartphones and tablet devices through iTunes and Google Play stores.

Communication tools can generally be grouped into those that are provider-patient and provider-provider in nature. Facebook may serve as a platform whereby cardiovascular programs can provide online information for their current or prospective patients; it can also be used to establish closed discussion groups among cardiovascular professionals. Twitter allows a cardiovascular program or provider to create a social media presence by initiating or contributing to health care conversations and through provision of medical information to the masses; it can also be used to direct patients to services offered locally. With the support of SCAI, I have helped to develop and record a series of social media tutorials with a focus on Twitter; these are available for viewing at SCAI.org. YouTube may be used to post patient educational videos (eg, what to expect during a cardiac catheterization) or video blogs on issues of interest. Pinterest could be employed to create informational boards on which providers or programs might “pin” information to educate their patients; similarly, training programs might use these boards to post information (eg, most relevant articles) on a particular condition. Apps such as Doximity, docbookMD, QuantiaMD, and Sermo allow for provider-provider communication, some in an HIPAA-compliant manner, whereas others such as HealthTap allow for provider-patient communication.

One pipeline technology that has gained a lot of

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attention is Google Glass, a tool that might ultimately be employed in a widespread fashion to facilitate performance of PCI procedures and to allow for remote live case transmission and education.

Are you working on any AUC projects in the realm of peripheral vascular disease? How might these kinds of measures be implemented/used more effectively and ubiquitously?

In collaboration with other vascular specialists through SCAI, we worked to develop a series of expert consensus documents (ECDs) for renal artery, iliac, femoropopliteal, and below-the-knee intervention. Although they are not formal AUCs, these documents provide guidance to endovascular operators on current procedural best practices. I am also involved in my capacity as ACC Peripheral Vascular Disease Section Chair in an ongoing effort to develop a formal multisociety PVI AUC.

It seems there is quite a bit of variance in or lack of adherence to protocols for administering optimal medical management for patients undergoing invasive coronary and peripheral vascular procedures. What is your preprocedure medical management protocol, and is it utilized consistently throughout your hospital system?

I agree that there is significant variability in prescription of evidence-based medications both before and after PVI and PCI. Failure to pretreat patients may increase their risk of adverse procedural complications, and failure to prescribe such agents at discharge may lead to a poorer long-term prognosis. Medication prescription can also be problematic after the procedure because we now practice in an era in which same-day discharge occurs more often; in this environment, there may be less opportunity to ensure prescription of evidence-based medical therapies and to provide critical patient education.

Given that electronic health record use has become so common, it would be ideal to automate the process through means such as provider prompts when procedures are ordered and again at the time of hospital discharge during the medication reconciliation. Newer outpatient registries, such as the NCDR’s PINNACLE, could be used to query pre- and postprocedure prescription rates and identify areas in need of improvement. In my practice at Michigan Heart, we have customized our outpatient electronic health record (NextGen) so that providers are asked to confirm whether patients are on maximal medical therapy at the time that cardiac catheterization is ordered. Further initiatives are ongoing.

What is your take on the just-published SCAI recommendations for renal artery stenosis treatment? Do they adequately address the interventionist’s concerns?

Although the efficacy of stenting for renal artery stenosis has been studied in multiple randomized trials, limitations in trial design and patient selection have left critical questions about this approach unanswered. To help guide practitioners in this area, SCAI recently released an ECD on addressing renal artery stenosis. This ECD suggests that it is appropriate to treat patients with severe hypertension and cardiac disturbance syndromes (flash pulmonary edema or acute coronary syndromes), resistant hypertension (uncontrolled blood pressure despite maximal tolerated doses of at least three agents, one of which is a diuretic), or nephropathy in the setting of global renal ischemia (severe bilateral, or severe unilateral supplying a solitary kidney). This document outlines situations in which renal artery stenting may be appropriate and also those in which it is clearly not appropriate. I believe the ECD is well balanced and agree with the recommendations put forth. It provides much-needed direction in an arena characterized by so much inconclusive—and, at times, contradictory—data.

Do you foresee any way to assess the results of renal denervation in real time, or is the wait-and-see period an inherent obstacle preventing periprocedural adjustments and timely outcomes information?

The stories of device therapy for hypertension, in general, and renal artery sympathetic denervation (RSD), in particular, have been fascinating. After promising surgical denervation studies were published nearly half a century ago, there has been a groundswell of interest around catheter-based RSD after more recent animal studies demonstrating its safety and human uncontrolled and randomized, medication-controlled studies suggesting its efficacy.

Many in our field were surprised when the randomized, sham-controlled SYMPLICITY HTN-3 trial found that RSD was safe but no more effective than optimal medical therapy when treating resistant hypertension. There are manifold potential explanations for the lack of observed benefit in this trial, including the patient population enrolled, energy delivered, mode of energy delivery, operator procedural technique, inability to ascertain procedural success, medical treatment in the comparator group, outcome of interest chosen and its timing, etc. Subsequently published animal data have consistently demonstrated the efficacy of RSD in reducing blood pressure, so it is likely that a true benefit exists. That said, there is a clear
need to identify those with sympathetic overactivity who are potential candidates for RSD, as well as to ascertain procedural success among those who ultimately undergo these procedures.

Growing evidence supports the concept that the outcome is tied to the completeness of the ablation (eg, including ablation of main and accessory arteries), but development and validation of a metric for acute success remains elusive. Although an ideal animal model does not exist, it is clear that additional animal work is needed to refine relevant procedural aspects. For more on this, please see my video interview with the Society for Vascular Medicine (https://www.youtube.com/watch?v=IN6o6894y1g).

As one of 12 physicians chosen for the 2-year Fellows of the Emerging Leader Mentorship (ELM) Program, how has the first year gone, and what do you hope will come of this endeavor?

The ELM Program, a joint effort between SCAI, ACC, and the Cardiovascular Research Foundation, is now in its second go-round and, in my opinion, has been wildly successful. The brainchild of Srihari Naidu, ELM seeks to identify the next generation of interventional cardiology’s leaders, educators, and innovators and cultivate them over a 2-year period that includes mentorship (both one-on-one and through workshops on the US Food and Drug Administration, advocacy, coding/billing, AdvaMed, etc.), leadership development (eg, societal committee membership opportunities), educational (eg, scientific session program planning and speaking faculty opportunities), and networking opportunities.

It was an honor to have been selected, and I have appreciated the collaborative and supportive environment ELM has created. I have also enjoyed the camaraderie with my ELM co-fellows and mentors. ELM is truly a win-win endeavor, helping to professionally develop program fellows and fellowship applicants as well as the professional societies and organizations they serve. Whether 2 or 8 years out of fellowship, the ELM program has something to offer for everyone, and I would encourage anyone interested to apply by the November 1, 2015, deadline.

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