PANEL DISCUSSION

Where Will the Vascular Interventions of the Future Be Performed in the US?

Insights into the evolving landscape of care locations and facility types.

With Ehrin J. Armstrong, MD, MSc, MAS, FACC, FSCAI, FSVM; Sonya Noor, MD, FACS; Mary Costantino, MD; and David M. Mauro, MD

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First, what are the unique advantages of performing cases in hospitals? What do you see as the biggest disadvantages?

Dr. Armstrong: Performing cases in the hospital has a number of advantages. The hospital setting includes a robust infrastructure and ancillary services, including anesthesia, consulting services in case of an emergency, and advanced radiologic imaging. Many hospitals may also have a greater inventory of devices compared to office-based labs (OBLs). An additional advantage is of course the ability to keep patients overnight or for multiple days if there is an unexpected procedural complication.

Dr. Mauro: Multidisciplinary support that occurs within a hospital cannot be recreated. This allows the envelope to be pushed and for vascular interventions to be performed on the sickest and most unstable populations. But, this atmosphere brings inherent inefficiencies of the hospital settings and potential internal competition.

Dr. Noor: Contemporary vascular surgeons can treat complex patients with traditional open, hybrid, and endovascular techniques, customizing the treatment to the patient. Hospitals uniquely provide the appropriate infrastructure to support a well-staffed hybrid operating

room with adequate devices, intensive care unit/step-down units, and the supportive care required prior to discharge for many disease states. The hospital is also a great venue for multispecialty consultation during the admission stay, which allows for efficient, high-quality, cost-effective care. Additionally, the hospital can purchase and stock more expensive equipment and devices because of its negotiating power and budget.

The hospital is a great venue for us to teach the surgical residents, fellows, medical students, and physician assistant students. Training the future generation with complex open and endovascular cases is important, and especially with the simpler cases going to the outpatient setting, it becomes more important for residents and fellows to have rotations in the outpatient setting to get the full spectrum of training.

However, the recent COVID-19 pandemic brought to the surface the disadvantages that come with the hospital providing this care. With the "Great Resignation" came the exodus of skilled workers. At our hospital, close to 20% of our highly experienced nurses, techs, and physicians resigned. We staffed the rooms with the help of traveling nurses, but the hospital could not retain staffing due to huge wage discrepancies. This created a further skilled-workforce loss of nurses and techs and a huge shortage of the staffing required for the operating room, cath lab, and floor. With poor union negotiations, even more staff was lost. We are currently in an acute critical shortage of skilled staff in our hospital system, with no solution in the near future. Hospital administration is often unable to make quick pivots in anticipation of these problems due to multiple levels of management and lack of agility to quickly respond to the problem.

Dr. Costantino: Full disclosure, I have not done procedures in the hospital in quite a while, but in my opinion, the first advantage is that systems, processes, accreditations, employees, devices, workflow, human resources (HR), and payroll are all handled for you. It's nice to not need to figure out or implement these services or pay for them out of your own income, as is the case in an OBL. You don't need to worry about preauthorizations or contract negotiations or develop a strategy to survive the competing forces of patient need versus insurance payors versus device manufacturers. The disadvantages are lack of control over process and staff, especially in a dysfunctional system. When hospital administration drives away good staff and good doctors or continues to implement more paperwork and processes that bury you in nonphysician-level work, there's nothing you can do other than get on the leadership teams and create change.

Second, you don't need to worry whether more patients will come your way. The disadvantage of this is that if you want to deliver a service line (or even practice clinical medicine!), you may have to build it, with or without internal support. In an OBL, you can pivot into any service line without having to manage internal obstacles such as administrative buy-in.

A third advantage is the multidisciplinary camaraderie. There is nothing like working with a group of smart and talented specialists. It's very hard to recreate this in an outpatient setting, and I have found these collaborative discussions to be one of the most fun parts of the job.

And, in office-based settings, what are the most significant advantages and downsides?

Dr. Noor: Office-based settings allow for an alternate site of service for busy surgeons to easily book and schedule cases, allowing for efficiency and scheduling of urgent routine patients without a long waiting time and with a quicker service. This allows the operator to be more competitive compared to those without this site of service. Most OBLs and ambulatory surgical centers (ASCs) have a well-trained, stable cohort of staff—without the "rotating door" seen in some hospitals.

Patients love walking into a cozy, welcoming, familiar environment where they have already been seen for an appointment. There is usually free parking and a short walk to the holding area, the family can visit soon after the procedure, and the patient can go home after a short stay. Many patients will request the patient-centric treatment whenever possible.

Outpatient settings often get high satisfaction scores from patients, who return to the primary care or referring doctor with a smile and high kudos for their care at the OBL. This grows a surgery practice quicker than anything else we do.

The OBL offers a less expensive option to payers and patients compared to the hospital outpatient or inpatient cost. However, OBLs cannot accept all insurances because of Centers for Medicare & Medicaid Services (CMS) payment policies. The OBL has also been faced with payment cuts for the last few years that will continue, allowing them to only perform certain procedures and use limited devices. Many single-session procedures currently performed in the hospital could be done safely in an outpatient-based setting, but CMS payment prohibits this. Almost no drug-eluting technology can be used in the OBL.

Good office-based settings participate in outcomes registries and have internal quality improvement initiatives so procedures are done safely, with constant quality improvement. However, this is not the case for all outpatient-based settings, and this unfortunately allows for inappropriate cases or case selection/management.

Dr. Mauro: Self-governance and control are truly at the maximum in office-based settings. The physician can opti-

mize every component of their practice to their preferences. However, this control also brings the responsibility of having to focus on components of the practice that those in a hospital setting can take for granted.

Dr. Costantino: Being 100% outpatient, I am likely biased; however, I see many advantages of the outpatient setting. These include full control over equipment, staff, process, and scheduling. These variables all lead to efficiency, which I believe leads to case success and prevents burnout among doctors and staff. This flexibility allows me to practice when and how I want, because I absorb all the expense and risk. For example, I bought a second ultrasound machine (not cheap!) for my lab and pay an ultrasound tech to be in the lab during cases because I've found that real-time ultrasound gives me a great advantage during challenging peripheral artery disease (PAD) cases. I can't see how any hospital system would allow that to happen. Many physicians have invested in learning about pedal acceleration time (PAT) to evaluate flow to the foot, but few are able to implement this in their home hospitals due to lack of dedicated resources and hospital buy-in.

The disadvantages of the outpatient setting are that for some, full responsibility over the business may not be appealing—with freedom comes responsibility. From the management side, one must keep current on all "governing bodies" (eg, accreditation, state and national insurance carriers). The owner/operator must manage billing, revenue cycle management, marketing, information technology/cybersecurity, personnel, taxes, invoices, inventory, disposable equipment (catheters, wires, etc), durable medical equipment (stretchers, monitors, etc), and facilities. Management companies can do this for the practicing physician, although I manage these areas myself using internal personnel and consultants. This is both exhilarating and exhausting, but I think the sweat equity has paid off. I now feel proficient in running an OBL, and this appeals to my "constant learner" side.

Clinical disadvantages to an OBL include (1) the inability to admit postoperative patients who are probably okay but would ideally be watched overnight; (2) solo management of unexpected events such as anaphylaxis, catastrophic rupture, or groin complication; and (3) lack of access to interesting complex or acute cases such as stroke, gastrointestinal bleeds, and trauma, as well as critically ill patients.

Dr. Armstrong: In the office-based setting, patients can arrive shortly before their scheduled procedure and don't have to navigate a sometimes-daunting hospital infrastructure. Typically, the patient has already been to the office in the same building, so they are familiar with the location. It is also easier to provide personalized care in the office-based setting. The recovery and discharge times can also be easier. When I perform procedures in an office-based setting, I find that I spend more time with my patients because there are fewer distractions compared to the hospital setting. A disadvantage of the office-based setting is that patients cannot typically spend the night, so it is important to identify cases where same-day discharge is feasible.

What is the future of interventions in academic centers? What challenges do OBLs pose to academia in the long term?

Dr. Mauro: For academic centers to not survive but flourish, they must embrace both settings. Certain procedures are optimal for the OBL setting and can allow flexibility to perform the most complex procedures in the hospital and continue to serve the hospital inpatient population, which was the original heart and backbone of our specialty. OBLs only pose a threat if the model is not embraced and included in operations of academic centers.

Dr. Costantino: There will always be a role for interventions in both academic centers and OBLs. The future of interventions in academic centers is strong. Nothing replaces the academic clinician or the academic center. I believe an academic center and OBL could function well together, with complementary services. Throughout my time in leadership, I was surprised by the "us and them" mentality over the "we" mentality. I'm happy to say that over a few short years, I have seen this vibe improve, at least at Society of Interventional Radiology (SIR) meetings. We are always stronger together, and we have bigger fish to fry in interventional radiology: proving our value to hospital systems, collecting data on our cutting-edge procedures, fighting preauthorizations and "medical necessity," ensuring our residents and fellows get trained in PAD, advancing diversity, supporting small and rural practices—the list goes on and on. We are a small subspecialty, and the only way we can thrive is to work together. In my opinion, SIRPAC (the SIR political action committee to protect reimbursements) and the VIRTEX registry are critically important to all IRs, regardless of practice type.

One challenge that OBLs pose to academia is the loss of interventional radiologists (IRs) to the outpatient space. For every person working in an OBL without a hospital presence, there is one less IR available to provide hospital coverage. I'm afraid that this will lead to a shortage of hospital-based IRs. The only way to solve this is to increase residency positions or merge the OBL-academic practice when possible. A second challenge is the lack of research stemming from OBLs. For me, the barriers are lack of expertise, lack of internal support (institutional review boards, statisticians) found in academic centers, and lack of time, with volunteer

work and running the practice filling any out-of-office hours. We need to capture data from the large number of uterine artery embolization, venous disease, PAD, and drug-eluting bead/yttrium-90 cases performed annually in the outpatient setting. I think registries are one answer to this problem. The second would be academic physicians thinking a little outside the box and reaching out to OBL physicians on specific projects. I think most of us would love to contribute.

Dr. Armstrong: Academic centers will remain an integral part of interventions. Some vascular procedures must be addressed in the impatient setting, such as acute limb ischemia and pulmonary embolism. Academic centers also provide training for the next generation of physicians, so providing adequate case exposure is paramount to effective training.

Dr. Noor: Large academic centers and hospitals will continue to perform complex procedures that require infrastructure like the hybrid room, expensive devices, postoperative high-level care, blood bank, and pharmacy support. Acutely ill, high-acuity patients will need hospital support for their care, including ventilation, critical care, management, extracorporeal membrane oxygenation, etc.

More routine, less complex procedures will be able to be done as an outpatient in the OBL (not requiring overnight stay or hospital admission), and it'll likely cost the health system less, which may become a threat to hospitals. Most patients prefer not going to the hospital, especially after the pandemic, and the efficiency and ease of use of OBLs/ASCs is obvious to a patient who has been treated at both sites. Patients often will convince their referring physicians to send them to an outpatient setting rather than the hospital as well.

What might the impact of case migrations to OBLs mean for research?

Dr. Armstrong: In my opinion, the movement of cases to the OBL setting actually facilitates research. Clinical trials are much easier to conduct in the OBL setting compared to a large hospital, and the follow-up is generally excellent.

Dr. Noor: With less routine patients coming into the hospital, the hospital will be a site of service only for acutely ill or complex patients. Resident training, medical student training, and physician assistant student training will all suffer because of this. Research will also need to be conducted in an outpatient-based setting, and partnerships allowing that will need to be considered in the future. OBL and hospital system partnerships are important for patient retention, research, and training and also save health care dollars as patients are treated efficiently and safely in an outpatient setting. This partnership should include outcomes registries and quality surveillance and improvement initiatives.

Many hospital systems are looking for acquisitions of OBLs/ASCs; however, partnership may be a better option as most hospitals are unionized and most outpatient settings have well-trained staff and efficient systems and procedures that the hospital lacks.

Recruitment to outpatient vascular labs is also easier as they are often open Monday through Friday, with regular hours and no weekend or on-call requirements.

Mental health and stress management should also be considered. Our practice has the privilege to work at a large hospital with access to the cath lab, hybrid operating rooms, and an outpatient-based lab. One thing that has drastically changed in the last few years is hospital culture. With the exodus of previous tenured members, it is difficult to perform procedures due to lack of a teamwork culture. There seems to be burnout-related poor behavior among physicians and other members of the team. It is simply not "fun" to work in the operating room or cath lab, and it becomes increasingly difficult to work even regular hours with longer turnover times. Bad attitudes, bad interactions at the hospital, and on-call and overnight emergencies can be very challenging. The OBL presents a much better work culture in an environment with teamwork at the center of it.

Most physicians who work at an OBL/ASC will tell you that they look forward to going to work because of the patient-centric work culture. In general, staff are happier and friendlier, allowing for a better patient and staff experience. Because of this, they are more efficient, and despite doing many more cases in the OBL/ASC compared to an outpatient cath lab/operating room, you can still go home at a decent time to do things with your friends, family, or yourself. Nowadays, that work-life balance is priceless.

Dr. Mauro: We have seen quality research come out of OBLs, both those that are associated with academic centers and those that are not. Researchers will continue to advance our science regardless of atmosphere.

Both in the news and at interventional congresses, the discussion surrounding OBL practices often includes discussion of decision-making based on financial incentives, including the lack of formal oversight in these settings. What do you see as potential realistic solutions to inappropriate procedures in OBLs?

Dr. Armstrong: Regardless of practice site, we as physicians have an obligation to do what is best for the patient. In my opinion, the development and dissemination of registries for vascular procedures will help provide benchmarks for patient care and outcomes. Similar to the coronary

interventional space, the field would also benefit from formal development of appropriate use criteria to ensure that any case has a firm rationale and indication.

Dr. Mauro: This is not a new problem in medicine and is not unique to OBLs; optimal patient care and optimal profits are frequently at odds within medicine. Solutions will lie in legislation and change within our reimbursement model to incorporate patient outcomes, utilization metrics, and underlying patient baseline characteristics to not penalize practices from helping the most at-risk/unwell patients.

Dr. Costantino: There is a notion that OBLs will perform atherectomy on anyone. The Department of Justice has stepped in on the most egregious of cases, and we are now seeing insurance policies excluding atherectomy. We are now encountering payors who will not preauthorize atherectomy codes. In the last 8 weeks, I have spent hours on the phone appealing these preauthorizations to allow me to use the tools I think are best. Sometimes I'll get the doctor on the other end to listen, but often a doctor who has never practiced in the vascular space will read the policy and deny the atherectomy codes. My hands are tied. Of course, there are several great options: drug-eluting balloons, intravascular lithotripsy, and stenting, and I'm sensing plain old balloon angioplasty will make a comeback. Time will tell whether the next wave will be increased stenting due to diminished atherectomy. Insurance companies have clamped down, and they will continue to do so. Personally, if I think a patient needs atherectomy, I'll do it, knowing that not only will I not get paid on these codes but that I will pay for the device myself. We do not have the luxury of self-oversight. That ship has sailed, and the insurance companies will lead what we can and cannot do. Hospital folks will probably still use atherectomy for a long time, until the administration reviews and sees a trend of nonreimbursed atherectomy codes and compares that to device cost. We are definitely in the midst of a reset.

Certain states with high numbers of high-use doctors have led us to this place. Most OBL owners don't lead with a cash-grab mentality, but we are all likely to go down with the ship on this one. I still see the OBL as a very cost-effective site of service. Even compared to the most expensive OBL procedure, the cost of any vascular procedure in the hospital is a factor of 2 to 4 times as high.

There is a certain irony in the OBL space: The harder the case, the less one makes. I can work incredibly hard to get across a lesion (antegrade and retrograde access, burning through catheters, wires, support catheters, sheaths, and time) to only bill for a diagnostic angiogram if the chronic total occlusion crossing fails. I then pay for the equipment myself and lose money on the case. These are usually the most intellectually and physically challenging cases. I still do them, but if I was leading with a financial mind, I wouldn't be accepting these tough cases. My first deep venous arterialization case probably cost me $15,000 and was very challenging as a single operator, but I did it and I'm happy to say the patient avoided amputation. I decided early on: medicine first. I am clear on that mentality. An OBL is not the cash cow that everyone seems to think it is. Reimbursements are down, expenses are up, and the margin isn't always there.

Dr. Noor: Most physicians want to do the right thing regardless of practice, site, or hospital or outpatient setting. There are bad actors in every specialty who take advantage no matter what the site is. Lately, some non-OBL physicians view physicians working in the OBL with disdain, and speculate that their decision-making is based on financial incentives; while that may be true for a very small subset of bad actors, it is unfortunate that all physicians are getting lumped in. We cannot disregard that patients can be treated with efficient access and high-quality care in an OBL/ASC that is less expensive than going to the hospital. What we need to do is evaluate quality with reporting metrics, similar to what we do in the hospital. When there is oversight, there is less variation in standard of care or guidelines.

Another disturbing phenomenon is interspecialty blaming and shaming amongst physicians. I think this is a dangerous trend; physicians already tend to be targets. So, this is not the time to fight amongst ourselves—this is the time to stand united so we can be stronger together.

What do you see as the ideal collaboration between academic and other hospitals and OBLs? What kinds of creative solutions will ultimately provide the best patient care and most sustainable models?

Dr. Noor: We have a pretty good scenario, as we are able to work at a hospital, academic center, as well as an OBL and provide services to our patients. Ideally, if resident and fellow trainees have access to learning at both the hospital and OBL, it would improve the quality of training. Research could be improved with collection of data from both sides as well. Health systems that partner with physicians or groups that own OBLs/ASCs would benefit from patients having access to both sites, as it would provide less expensive care.

Dr. Armstrong: There are a number of creative solutions that could benefit from collaboration between hospitals and OBLs. For example, some hospitals have recently created joint ventures with physicians to develop new OBL locations. This move reflects the fact that ambulatory

procedures may be best performed in the outpatient, out-of-hospital setting.

Dr. Mauro: In an ideal scenario, there would be practices that can participate in both environments. Academic centers cannot carry the responsibility of training our future practitioners, advancing our science, and caring for the most vulnerable patients only to see OBLs cherry-pick optimal patients and lucrative procedures. Collaboration must occur to create sustainable systems for the future.

Staffing challenges came to the forefront during and after the onset of the COVID-19 pandemic, bringing to light the cumulative effects of moral injury and burnout that had been building. How can hospitals and OBLs alike better serve the people delivering the care at their facilities?

Dr. Costantino: My OBL didn't miss a beat with COVID. I have a small but mighty team that has worked together now for years and seem to actually like each other. Managing employees is hard work, and our small size has allowed me to invest in everyone. I recognized the strength of my front desk person; one day, I gave her a raise and title adjustment on the spot. She doesn't know this yet, but I'm going to invest in her education in health care management, as my wish is that she can rise to the level that meets her capabilities. My nurse came to me with no administrative experience, and she now runs accreditation and all clinic administration. I have invested in her leadership style and clinical knowledge, and she is posed to be a strong nurse manager. I create pathways for advancement that fit each person. I can do this because I make all the decisions, I believe in my people, and I want them to be positioned to be the happiest and best they can be in life, and that includes making as much money as possible. Hopefully that is with me, but if not, one thing I can give them is to be positioned for success should they ever make a move.

If you say you "love your team," you have to take care of them, both in salary and training. This is much harder to do in a big environment, particularly when the physician has no say over hospital employee management. Unfortunately, you're stuck with what you have, and I'm not sure there is a lot a hospital-based physician can do in this area. This can be painful for the physician when salary is tied to relative value unit production; the physician will pay the price for poor hospital employee management. In our second center located about 2 hours away, our entire staff came from the local hospital. They were very experienced and tired of the hospital management and the call. The no-call aspect of OBLs will likely be appealing to experienced staff, and the hospital will need to get creative with hours/salary and call to combat this benefit. In our state, hospitals have stopped hiring travelers, which I think in the next few years will reestablish the equilibrium we had pre-COVID. Unfortunately, I think the health care system is driving away doctors as well. We can save that for another edition.

Dr. Noor: The pandemic taught me one really good lesson and that is people can be your greatest asset. I don't think I valued our staff both at the hospital or the OBL as much as I do today. Recognizing stress, burnout, and challenging situations for our teams and learning how to personally address them is something I continue to work on. A kind word, a good gesture, a handshake, or a hug goes a long way with respect, forgiveness, and kindness. Health care workers are resilient, and the only way to work through these challenges is by doing it together.

Dr. Mauro: One of the very few benefits of the pandemic has been the realization of the importance of wellness. Not only is it a moral duty for organizations to appropriately value their practitioners but it has also been well proven that there is a fiscal benefit as well. Organizations need to reset expectations and realize that this is no longer 1990, or even 2010, and that work-life balance and career expectations have changed. Optimizing workflow, allowing practitioners to work at the top of their license, and supporting quality in-house support staff are crucial steps to optimize wellness at work, while also equalizing paid time off differences between different employment options as much as possible.

Dr. Armstrong: Staffing remains a major challenge at all times. It is important to keep in mind that all staff face the challenges of delivering the highest-quality care while balancing other aspects of their lives. Both hospitals and OBLs can help address these challenges with novel staffing models that allow schedule flexibility and open discussion with staff about the challenges they face in the daily delivery of outstanding patient care. ■

Disclosures
Dr. Armstrong: Consultant to Abbott, Boston Scientific, Gore, Medtronic, Philips, and Shockwave Medical.
Dr. Noor: Consultant and advisor to Janssen, Abbott, Boston Scientific Corporation, Shockwave Medical, Endologix, and Silk Road Medical.
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