Aortic stenosis is the #1 valve disorder treated in United States. Currently, aortic valve replacement is the #1 valve procedure done surgically in the United States and is second only to coronary artery bypass in the number of each procedure performed. In 2011, the surgical results are very good with expected mortalities of only 1% to 2% in most patients, and the prosthetic valves available, both tissue and mechanical have been studied and found to be excellent in quality and remarkably durable. Unfortunately as many as 40% to 60% of patients, diagnosed by echo criteria with significant aortic valve stenosis, go untreated. The primary reason is concomitant co-morbidities such as; advanced age, pre-existing diseases, previous surgical procedures, and in many cases the feeling of the referring physician that the patient would not tolerate cardiac surgery. The Society of Thoracic Surgeons (STS) Risk Calculator and the Logistic EuroSCORE accurately can estimate the associated risk of surgical aortic valve replacement. It is well known that concomitant coronary disease significantly increases this risk. For decades, surgeons have primarily owned aortic valve disease and its treatments with a very small percentage of patients who are not felt to be surgical candidates undergoing balloon aortic valvuloplasty in the catheterization lab.

Percutaneous heart valve (PHV) offers a new treatment choice for the group of patients who are felt not to be surgical candidates, primarily due too high risk. Both transfemoral and transventricular approaches offer different access points for patients to undergo procedures to replace stenotic aortic valve. Currently, two prostheses are available in this percutaneous market, The Medtronic Core valve and the Edwards Sapien (newer valves are being introduced regularly). Both valves are currently available in Europe and have been used extensively. Both prostheses have excellent post-procedural success rates and 30-day mortality rates and continue to be used predominantly in patients who are deemed too higher risk for standard surgical aortic valve surgery. Surgeons and Cardiologists throughout Europe and the remainder of the world have become comfortable with these prostheses and are actively engaged in their deployment. At this time, there is no percutaneous valve available for the open market, although both valves have been used and continued to be used in FDA-controlled trials. It is anticipated that the Edwards Sapien valve will be released in the latter part of 2011, for general commercial use to centers who have demonstrated an ability and adequate facilities to perform these technically challenging procedures. The United States will be the 43rd country to have these devices available to the physicians and patients.

It has required surgeons to undergo an extensive evolution to become part of the percutaneous valve world. New techniques and new skill sets are needed among the CV Surgery community as well as an understanding of new technologies to perform procedures with catheter-based valves. Thoracic aortic endograft procedures (TEVAR) have been available in the United States for almost a decade and many thoracic surgeons have become comfortable placing thoracic endografts along with the associated catheter skills needed for placement. Those surgeons involved in TEVAR procedures will have a distinct advantage, when it comes to the TAVR procedures. Significant new technology is also required of the institutions. Hybrid operating rooms will be required to have a successful TAVR program. These specialized operating rooms combine the fluoroscopy and hemodynamic monitoring of the cath lab with the functionality of an open heart operating room. They are essential to the use of the new PHV devices.

Team work is essential in developing a successful percutaneous heart valve program. Cardiothoracic surgeons will need to partner with structural and interventional cardiologist as well as imaging

cardiologists to provide the best possible care to the majority of patients. In addition, skilled anesthesiologist with transesophageal echo training can help with the management and the perioperative care of these sickest of sick valvular heart disease patients. A multidisciplinary clinic with the above-mentioned specialists participating actively will help allow accurate risk stratification and selection of those who would best undergo a catheter-based valve procedure versus and a standard open valvular heart procedure. Within this integrated clinic, most patients can be treated with the lowest possible risk to gain the most desirable outcomes. It is our hope that in the near future these catheter-based treatments will continue to advance, and it could perhaps be rolled out in other scenarios such as the treatment of mitral valvular heart disease and multivalve disease.

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October 22, 2011