Introduction: Paieon’s C-THV system is a real-time image acquisition and processing system designed to facilitate Edwards-SAPIEN TAVI. This is a computer based workstation that connects to operating room through a DICOM interface. It processes and quantitatively analyzes two standard imaging views performed by conventional cine-angiography. The system focuses on three aspects of TAVI - optimal valve positioning, selection of ideal prosthetic valve diameter and post implantation measurements. The aim of this study was validation and performance evaluation of Paieon C-THV system.

Method: Patients who underwent Edward-SAPIEN TAVI between October 1, 2008 and April 30, 2009 at St Paul’s Hospital, Vancouver, were assessed retrospectively using the Paieon C-THV system. Patients who did not have two aortic root angiograms obtained with sufficient angular separation were excluded. The offline measurements, obtained using this system, were compared with the cine angiography and transesophageal echocardiography measurements done at the time of TAVI.

Results: Twenty one patients (age 78.5 +/- 9.9, 52% males) were included in the study. 14 patients had transfemoral TAVI while 7 had transapical TAVI. The suggested optimum projection for valve deployment was within +/- 100 of our valve deployment projection in 19/21 patients. The target line for optimal valve positioning was correct in 17/21 patients when compared with the transesophageal echocardiography guided position at valve implantation. Paieon C-THV system was able to predict correct prosthesis diameter in all the patients based on aortic sinus diameter measurements. Post deployment measurements of inner, mid and outer diameters of the valve prosthesis were within +/- 1 mm in all the patients when compared with cine angiographic measurements.

Conclusions: Paieon C-THV system accurately predicts optimal valve positioning in many patients and is of clinical value during TAVI.