Supplementary Online Content


eTable 1. Details of active change that occurred in response to the transthoracic echocardiogram (TTE) result and impact rating

This supplementary material has been provided by the authors to give readers additional information about their work.
eTable. Details of active change that occurred in response to the transthoracic echocardiogram (TTE) result and impact rating

<table>
<thead>
<tr>
<th>Active Change Subcategory</th>
<th>Description of Active Change</th>
<th>Impact Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic testing</td>
<td>Patient with chest pain with normal resting TTE who was then ordered a stress TTE.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Patient with acute myelogenous leukemia status post chemotherapy and bone marrow transplant, diabetes, ESRD with new-onset cardiomyopathy documented one month prior, acute CHF earlier in the month, and continued low LVEF on the current TTE who is referred for outpatient TTE after recovery from her acute illness.</td>
<td>1</td>
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<tr>
<td></td>
<td>Patient with cyanotic toes concerning for cardioembolic source. Her TTE was normal so she was referred for a transesophageal echocardiogram to evaluate for proximal aortic plaque or abnormality as well as left atrial appendage thrombus.</td>
<td>2</td>
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<td>Patient with low LV systolic function while in atrial fibrillation postoperatively. The ordering provider recommended another TTE in 6 months and if LVEF remained low, to add ACEI therapy. Patient received second TTE but had already been started ACEI therapy before the second TTE was performed.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Patient with dizziness, palpitations, and viral prodrome with lower limits of normal LVEF and mild mitral valve prolapse. She was referred for a second TTE in 6 months to reassess her heart function.</td>
<td>2</td>
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<td></td>
<td>Patient came for possible vegetation seen on the aortic valve on an outside TTE; on current TTE did not have a vegetation but had a questionable mass in the intra-atrial septum and was referred for additional outpatient imaging to further evaluate it.</td>
<td>2</td>
</tr>
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<td></td>
<td>Patient with bacteremia and found to have thickened mitral and aortic valves on TTE but they were thickened on a previous TTE as well. The patient was referred for transesophageal echocardiography.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Patient with 7 beats of nonsustained VT after extensive pelvic surgery and was asymptomatic. Her TTE was normal so cardiology recommended no further workup or therapy.</td>
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<td>Patient with nonsustained VT and hypotension in the setting of β-blocker therapy and volume depletion. Patient had a normal TTE so no further workup except for holding her β-blocker therapy was recommended.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>TTE with no vegetation but persistent bacteremia after central line removal so infectious disease consulted and transesophageal echocardiogram ordered.</td>
<td>2</td>
</tr>
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<td></td>
<td>Patient with worsening shortness of breath and lower-extremity edema with known aortic stenosis and mitral stenosis who continues to have severe aortic and mitral stenosis on current TTE and is referred for left and right heart catheterization and ultimately valve surgery for rheumatic heart disease.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Patient with normal TTE and Holter monitor so ordered brain MRI for further workup of dizziness/fainting.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Patient with interstitial pulmonary fibrosis and dyspnea and chest pain. TTE was technically difficult so a nuclear stress test was ordered to further evaluate his chest pain given his inadequate TTE windows.</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Patient with chest pain but resting TTE with grossly normal LV systolic function but poor endocardial definition so nuclear stress test ordered.</td>
<td>3</td>
</tr>
</tbody>
</table>
Patient with nonischemic cardiomyopathy with low LV systolic function on TTE that prompted ordering provider to order a cardiac MRI and ultimately referred for AICD, which the patient refused.

Patient with lower-extremity edema who has a normal TTE, so the ordering provider orders lower-extremity Doppler scans, with negative findings.

Patient with acute lymphocytic leukemia and new pericardial effusion with tamponade physiology status post pericardiocentesis and drain placement. The drain was removed and this TTE revealed reaccumulation of a small pericardial effusion a day later. The ordering physician recommended a second TTE in 1 week to follow up effusion once chemotherapy was initiated.

Patient with stable pericardial effusion after pericardial drain. Patient referred for limited second TTE in 1 week.

Patient with pulmonary hypertension with increased RV size on TTE so referred for cardiac MRI.

Patient with lower-extremity edema with TTE showing evidence of potentially elevated right-sided pressures (shortened pulmonary artery acceleration time) so ordering physician referred the patient for a sleep study.

Patient with congenital spinal issues and a Chiari malformation who had syncope of unknown etiology. The TTE was normal so it was recommended that the patient undergo evaluation with further imaging for evidence of subclavian steal or thoracic outlet obstruction.

Patient with embolic stroke and PFO on TTE so referred for lower-extremity Doppler scans to evaluate for venous source of embolism.

Patient with at least moderate mitral regurgitation and worsened LVEF so referred for cardiac MRI to better quantify mitral regurgitation and cardiac function.

Patient with dizziness and normal TTE so referred for tilt table test by the ordering provider.

Patient with lower-extremity edema and dyspnea and chest pain who had a normal TTE so was ordered a nuclear stress test to rule out inducible ischemia as the cause of his chest pain.

Patient with hypotension after a vascular procedure. A TTE ruled out LV systolic dysfunction and tamponade so underwent a CT scan to evaluate for a retroperitoneal bleed.

Patient with new murmur suggestive of aortic stenosis whose TTE confirmed mild to moderate aortic stenosis. The ordering provider recommended another echocardiography in 1 to 2 years or earlier if symptoms developed to assess for progression of aortic stenosis.

Patient with septal hypokinesia on the TTE so exercise treadmill ordered to evaluate for ischemia.

Patient with pulmonary hypertension with a question of LV systolic function on an outside TTE but with normal LV systolic function on the current TTE with severe pulmonary hypertension. He started phosphodiesterase 5 inhibitor therapy and then referred for right heart catheterization to better understand if there is a left heart component to his pulmonary hypertension.

Patient with shortness of breath with normal TTE so gets PFTs and CT angiogram.

Patient admitted for syncope and palpitations and found to have elevated pulmonary artery pressures on TTE so referred for PFTs.
Patient with extreme dyspnea but low normal LV and RV systolic function and immeasurable RV systolic pressure so right heart catheterization and cardiopulmonary exercise testing performed to further evaluate dyspnea.

Patient with shortness of breath with dilated right atrium and RV on TTE so ordering provider recommended cardiac MRI.

Patient with CHF with right cardiac chambers more dilated than left cardiac chambers so ordering provider recommended right heart catheterization, bubble study, and cardiac MRI.

Patient with dyspnea, normal systolic function, and no evidence of pulmonary hypertension on TTE is referred for cardiopulmonary exercise testing given the exertional and intermittent nature of her complaints.

Patient with dyspnea and obstructive sleep apnea found to have a dilated RV on TTE so the ordering provider ordered a bubble study to evaluate for an intra-atrial shunt as well as CPAP titration.

Patient with fever of unknown origin and question of a Roth spot on ophthalmologic examination so referred for TTE, which was normal, and referred for CT to further evaluate for lymphadenopathy.

Patient with bacteremia and troponinemia with normal TTE so gets transesophageal echocardiogram to rule out endocarditis.

Lung transplant patient with bacteremia who has TTE negative for vegetations so referred for CT of the chest to look for source of bacteremia.

Patient with bacteremia and normal TTE so treated for line infection with 2 weeks instead of 6 weeks of antibiotics.

Patient with known CAD with chest pain in the setting of atrial fibrillation with rapid ventricular response postoperatively and mildly elevated troponin with normal wall motion and LVEF so treated medically for demand ischemia and inpatient cardiac catheterization was not pursued.

Patient with multiple risk factors for CAD and nuclear stress test with mildly depressed LV systolic function being evaluated for kidney transplant but not yet undergoing dialysis. Patient's LVEF and wall motion were normal on the TTE so cardiac catheterization was canceled.

Patient with sarcoidosis for whom the ordering physician specifically notes that he will cancel the cardiac MRI and reduce the patient's corticosteroid dose because the TTE showed no cardiac manifestations of sarcoid and the lung manifestations were well controlled.

Patient with worsening mitral regurgitation and LV systolic function on TTE prompted left heart catheterization and ultimately surgery for MVR.

Patient awaiting liver transplant with at least moderate mitral regurgitation and pulmonary hypertension on TTE so referred for right and left cardiac catheterization that revealed mild mitral regurgitation and no significant pulmonary hypertension so patient allowed to proceed with liver transplant.

Patient with acute kidney failure, lower extremity edema, fevers, and hypotension who has worsening LV systolic function and new severe tricuspid regurgitation and was therefore referred to right heart catheterization to determine if her hypotension is cardiogenic, septic, or mixed in nature.

Patient with idiopathic pulmonary fibrosis with TTE showing severe pulmonary hypertension so referred for right heart catheterization in preparation for lung transplant evaluation.
Patient with pulmonary sarcoidosis with worsening edema and shortness of breath found to have new severely depressed RV systolic function and significantly elevated pulmonary pressures and is therefore referred to right heart catheterization to better define her hemodynamics.

Patient with lung disease who is found to have pulmonary hypertension on TTE out of proportion to his degree of lung disease so he is referred for right heart catheterization.

Patient with intracranial bleed and STEMI who had low LVEF on TTE so ACEI therapy started and referred for elective outpatient catheterization once recovered from intracranial hemorrhage.

Patient with bacteremia and possible mitral valve vegetation seen on TTE so referred for transesophageal echocardiogram.

Patient with systolic CHF with severe pulmonary hypertension so a right heart catheterization ordered.

Patient with COPD with elevated RV systolic pressure out of proportion to lung disease on TTE so referred for right heart catheterization.

Lung transplant patient referred for bronchoscopy for rejection based on normal TTE in the setting of new pleural effusions.

Patient with pulmonary hypertension whose RV systolic pressure has improved on TTE, so PFTs ordered to evaluate for other causes of worsening dyspnea.

Patient with d-transposition of the great arteries status post Senning procedure with intermittent spells of turning blue. Her TTE shows patent baffles so right heart catheterization is canceled and a cardiopulmonary exercise test and Holter monitoring are performed to evaluate for arrhythmia.

Patient with hypertension, head trauma, and CAD who presents with asymptomatic ST elevations in the anterior leads but negative cardiac enzyme and normal wall motion findings on stat TTE so no further ACS evaluation is pursued.

| Subspecialty Consultation | Patient status post lung transplant with new pulmonary edema whose TTE is a technically difficult study but has a Teichholz LVEF of 30% on the report although echocardiographer reported that LVEF could not be assessed. Cardiology is consulted to review the TTE and stated could not assess LVEF from the TTE and commented that because PADP was low on the patient's Swan and the patient was improving, cardiogenic pulmonary edema was unlikely. Patient with ESRD on PD presents with worsening dyspnea and LVEF that has decreased from 63% to 52% so cardiology was consulted who optimized medical therapy for his hypertension. Patient with TIA, ESRD, metastatic renal cell carcinoma, and chest pain who had a TTE that showed a thickened mitral valve with a question of an old vegetation and large pericardial effusion without tamponade. Cardiology was consulted who stated the patient was not an anticoagulation candidate owing to his comorbidities, his chest pain was unlikely ACS, and the effusion was chronic and likely due to his ESRD. No further intervention was needed but did suggest decreasing antihypertensives because of low normal blood pressures. Patient with known severe tricuspid regurgitation and RV dysfunction who again has severe tricuspid regurgitation on TTE in the setting of hypotension so cardiology is consulted. They state patient's operative risk is too high to fix his severe tricuspid regurgitation and that no new management is needed. | 5 | 1 | 2 |
Patient with refractory multiple myeloma and thrombocytopenia who develops hypotension and hypoxia and is found to have an elevated troponin and new wall motion abnormalities on TTE, so cardiology is consulted. Given patient’s acute renal failure and profound thrombocytopenia, cardiology recommends conservative management and no additional therapies.

Patient status post pericardial window with small residual pericardial effusion so cardiothoracic surgery is reconsulted. They recommend no change in current management.

Patient with worsening dyspnea and relative hypotension who has severely depressed RV systolic function, a dilated RV, and severe pulmonary hypertension on TTE although this was seen on a prior TTE. However, this TTE and difficulties with diuresing prompted a CHF consultation that resulted in tailored therapy for his heart failure.

Ordering physician consulted cardiology to consider closing PFO seen on TTE in patient with recurrent strokes; however IVC thrombus precluded the procedure.

Patient with a murmur who had a TTE that showed aortic sclerosis and impaired relaxation was sent to cardiology for further evaluation. They reassured the patient.

Patient with known severe aortic regurgitation and dilated aortic root who had been previously referred to CVTS but patient refused, so re-referred to CVTS after this TTE.

Patient with hypertension, high cholesterol levels, PTSD, and tobacco abuse with chest pain when having his panic attacks and had recent TIA. TTE was normal so cardiology was consulted to see if any other testing was indicated. Cardiology referred patient for outpatient stress test as well as maximized his antihypertensive regimen.

Patient with history of CHF with worsened LVEF on TTE so cardiology consulted. They stated patient clinically was optimized so no change in management.

Patient with atypical chest pain and fibromyalgia. TTE was normal so referred to pain management for further treatment.

Young patient with ulcerative colitis and recent pulmonary embolism with dilated RV, low normal LVEF, and impaired relaxation without evidence of hypertension or LVH who is referred to cardiology for further evaluation.

Patient presented with worsening shortness of breath and pneumonia and was found to have reduced LVEF from baseline on TTE and was therefore referred for follow-up with cardiology as an outpatient.

Patient with previous episode of pyogenic pericarditis status post window with echodense material seen in the pericardial space 3 weeks post drainage so cardiothoracic surgery was consulted. They did not think any further intervention was needed.

Patient with chest pain with normal TTE and stress test so referred to GI for workup of GI cause of chest pain.

Patient with dizziness and history of diastolic dysfunction and exercise-induced pulmonary hypertension who has a normal TTE on follow-up so referred to ENT for further evaluation of dizziness.

Patient with dizziness, shortness of breath and chest tightness who had a normal TTE so neurology was consulted for further evaluation. They believed the patient was having panic attacks and reassured the patient.

Patient with atypical chest pain and negative enzymes with normal TTE so GI consulted to work up GI causes of the pain.
Patient with PFO on TTE and TIA. Patient requested that cardiology be consulted about need for closure and cardiology said no need for closure.

Patient undergoing evaluation for renal transplant with PFO on TTE and low normal LV systolic function who was referred to cardiology for further evaluation. After stress TTE, cardiology states no cardiovascular contraindication for renal transplantation. Patient with recurrent CHF who was referred to EP for biVAICD upgrade given persistently low LVEF.

Patient with moderate aortic regurgitation and dilated aortic root on TTE. Ordering provider recommended blood pressure management, monitoring size in 1 year, and cardiology consult for suggestions on medical management.

Patient with new right hilar mass, pneumonia, and chest pain with a moderate pericardial effusion seen on TTE without echocardiographic signs of tamponade. Cardiology consulted who diagnoses the patient with pericarditis and determines he clinically is not in tamponade and that effusion is not accessible percutaneously. They recommend a second TTE in 2 to 4 weeks to assess stability of the effusion if clinically indicated.

Patient with sickle cell trait, profound anemia, and edema who on TTE had severe tricuspid regurgitation and pulmonary hypertension and was referred to cardiology who recommended transfusion to hemoglobin closer to 9 g/dL and then second TTE and if still with pulmonary hypertension on TTE, right heart catheterization.

Patient with acute diastolic CHF with restrictive mitral filling pattern on TTE so referred to cardiology for outpatient management given restrictive filling pattern and preserved LV systolic function.

Patient with dyspnea and mild pulmonary hypertension referred to pulmonary hypertension clinic.

Patient with atrial fibrillation and mitral regurgitation seen on TTE and referred to cardiology for cardioversion and management of mitral regurgitation.

Patient with dyspnea and pulmonary hypertension on TTE so referred to pulmonary hypertension clinic.

Patient with renal cell carcinoma invading IVC and entering the right atrium that was seen on CT. TTE confirms the findings as well as normal RV function so patient is referred to CVTS to consider thrombectomy.

Patient with LV systolic dysfunction and a new transaminitis for which the provider is concerned about hepatic congestion. TTE shows no worsening of heart function or evidence of elevated central venous pressure so patient referred to hepatology.

Patient with tachycardia but no chest pain or shortness of breath status post CSF patch for CSF rhinorhea and troponinemia with EKG concerning for LVH. Patient underwent a TTE which confirmed LVH and normal wall motion so cleared by cardiology for discharge home.

Patient with COPD and shortness of breath who was referred to cardiology for low LVEF (35%) and elevated RV systolic pressure.

Patient with tracheal stenosis, COPD, and worsening dyspnea on exertion found to have pulmonary hypertension on TTE and referred to the pulmonary hypertension clinic who optimize COPD medications.

Patient with severe COPD, hypertension, and nonobstructive CAD with newly diagnosed depressed LV and RV systolic function. Referred to cardiology for further management, which includes addition of ACEI, β-blocker.
Patient with CKD, diabetes, hypertension, bacteremia with new large posterior pericardial effusion and persistent tachycardia so cardiology consulted and patient sent to the operating room for pericardial window due to inaccessibility of fluid by pericardiocentesis and found to have pyogenic pericarditis.

Patient with severe coarctation seen on TTE so referred to congenital cardiology.

Patient with severe pulmonary hypertension and RV dysfunction who is referred to OB/GYN for pregnancy termination.

Patient with severe aortic stenosis and symptoms referred to cardiothoracic surgery.

Patient with persistent low LVEF despite medical therapy so referred to electrophysiology for primary prevention AICD.

Patient with history of ischemic cardiomyopathy but with recovered LV function who presents with a transudative pleural effusion and a TTE showing severely depressed LVEF so referred to cardiology who maximize her medical management of her heart failure and perform left and right heart catheterization to evaluate for revascularizable disease.

Patient with large transmural infarct and post-MI VSD seen on TTE in cardiogenic shock who is referred to CVTS for potential LVAD and VSD closure.

Patient with endocarditis seen on TTE with severe mitral regurgitation. CVTS consulted.

Patient with new onset systolic CHF so started ACEI/β-blocker therapy and referred to cardiology.

**Medication Change**

Patient with depressed LVEF on TTE. Patient receiving ACEI/β-blocker/diuretic/aldactone because of low LVEF on TTE but on outpatient cardiac MRI has normal LVEF so heart failure–specific medication therapy withdrawn. It appears that the TTE LVEF was inaccurate but did lead to the patient being treated like they had CHF inappropriately.

Patient with atypical chest pain, morbid obesity, with question of significant left main disease on outside catheterization. Patient had TTE that confirmed normal LV systolic function so patient referred to left heart catheterization to consider percutaneous options. Patient started aspirin and statin therapy given nonobstructive CAD and normal LV systolic function.

Ordering cardiologist states it is okay to start fingolimod therapy given normal EKG and TTE.

Patient with multiple sclerosis and an abnormal EKG and history of labile blood pressure and vasodepressor syncope with a normal TTE so allowed to start fingolimod therapy.

Patient with pulmonary hypertension on TTE and was recommended to start phosphodiesterase 5 inhibitor therapy although unable to afford it so the medication was not started.

TTE performed before starting chemotherapy and ordering provider notes normal LVEF so can start anthracycline chemotherapy.

Patient with visual changes with normal TTE so referred for carotid Doppler scans.

Patient with reported history of CHF but normal LV systolic and diastolic function on TTE so furosemide therapy stopped.

Patient with rising BUN and creatinine levels who is given gentle fluids given normal LV systolic function and diastolic dysfunction on TTE.

Ordering physician suggests switching to carvedilol therapy given low normal LVEF.

Patient given extra dose of intravenous furosemide given dilated IVC on TTE.
Patient with report of potential LV thrombus on outside TTE and severely depressed LV systolic function. TTE showed no definitive evidence of LV thrombus so heparin and warfarin (Coumadin) therapy discontinued.

Patient with diastolic CHF with TTE with decreasing LVEF and increasing LV volumes and examination findings consistent with increased volume so torsemide dose increased.

Patient presented with volume overload thought to be owing to ESRD given TTE-confirmed normal LVEF, no effusion; therefore no further cardiac evaluation and heart failure–specific medication therapy stopped.

Patient with bacteremia with negative TTE for vegetation so antibiotic course shortened from 6 weeks to 2 weeks.

Patient with bacteremia and negative TTE for vegetation so antibiotic course shortened to 2 weeks and patient discharged home.

Patient with history of LV thrombus but no LV thrombus seen on TTE so anticoagulation therapy held owing to nosebleeds.

Patient with bacteremia with negative TTE for vegetation so antibiotic course shortened from 6 weeks to 2 weeks.

Patient with hypertension who has LVH on TTE so started ACEI therapy.

Ordering provider notes starting ACEI therapy for low normal LVEF.

Patient with COPD found to have pulmonary hypertension on TTE started receiving oxygen because of her COPD and her pulmonary hypertension.

Patient with persistent pulmonary hypertension started on prostaglandin inhibitor therapy owing to continued pulmonary hypertension despite current regimen and right to left shunting on TTE.

Patient with bacteremia and negative TTE for vegetation so antibiotic course shortened to 2 weeks from 6 weeks.

Patient with volume overload who nephrologist notes that they will pull more fluid off at hemodialysis given elevated RV systolic pressure on TTE.

Patient with atrial fibrillation and previously low LV systolic function in whom current TTE shows improvement in LV function with β-blocker, ACEI, and aldactone therapy so ordering provider documents holding off on starting amiodarone therapy.

Patient had an LV apical thrombus noted on the TTE and heparin drip therapy started.

Patient with hypotension and anemia who was given blood given normal LVEF and low central venous pressure by TTE.

Patient came in with STEMI and acute systolic CHF. Aldactone therapy was started because LV function was low on TTE.

Patient with pulmonary hypertension started endothelin receptor antagonist therapy because of signs of RV dysfunction on TTE.

Patient with pulmonary hypertension started endothelin receptor antagonist therapy despite improved symptoms because of persistent RV dysfunction seen on TTE.

Patient with new LV thrombus seen on TTE so started anticoagulation therapy.

Patient with breast cancer, CHF, pulmonary arterial hypertension out of proportion to her left-sided CHF who had LV compression due to severe RV dilation and failure so dobutamine hydrochloride therapy started to try to unload the RV and improve diuresis.

Patient with acute respiratory distress and Takotsubo cardiomyopathy with recovery of her LV function on the current TTE. Ordering physician stopped dopamine therapy and gave gentle fluids given recovery of LVEF on TTE.
<table>
<thead>
<tr>
<th>Change in Level of Care</th>
<th>Score</th>
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<tbody>
<tr>
<td>Patient status post subarachnoid hemorrhage with frequent premature atrial contractions after craniotomy and aneurysm clipping for which the ordering provider ordered the TTE and specifically cites that, because the TTEs are normal, patient can be transferred to the floor.</td>
<td>1</td>
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<tr>
<td>Patient admitted for vasodilator therapy to help with pulmonary hypertension before AVR. TTE helped confirm severe aortic stenosis known from outside TTE.</td>
<td>2</td>
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<tr>
<td>Patient with atypical chest pain, dyspnea, and symptoms of gastroenteritis who ordering physician stated that he would check a TTE and if normal, discharge home with treatment for gastroenteritis. TTE was normal so patient was discharged home.</td>
<td>2</td>
</tr>
<tr>
<td>Patient with diabetes, hypertension, high cholesterol level, and presyncope who ordering provider stated that if TTE was normal, the patient could be discharged. The TTE was normal so the patient was discharged.</td>
<td>3</td>
</tr>
<tr>
<td>Patient with nonischemic cardiomyopathy and severe tricuspid regurgitation and RV failure status post TVR. Ordering physician cites normal TVR function on postoperative TTE as reason for patient transfer to the floor.</td>
<td>3</td>
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<tr>
<td>Patient with atypical chest pain. Ordering provider stated that if TTE was normal, patient could be discharged home. It was normal so patient was discharged home.</td>
<td>3</td>
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<tr>
<td>Patient with hypertensive urgency whose blood pressure came down and then ordering physician stated that because TTE was normal patient could be discharged home.</td>
<td>3</td>
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<tr>
<td>Patient with increasing shortness of breath admitted to cardiology for CHF but with normal TTE, examination findings inconsistent with CHF, and x-ray consistent with pneumonia, so the patient was treated for pneumonia and discharged home.</td>
<td>3</td>
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<tr>
<td>Patient with known prior tricuspid valve endocarditis with fevers and bacteremia, CHF, and increased gradients across bioprosthetic aortic valve previously so the ordering provider was considering CVTS consult if aortic valve vegetation or further increase in aortic valve gradients were seen on the current TTE. The current TTE did not show a change in the aortic valve velocities, so CVTS was not consulted.</td>
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<tr>
<td>Patient in cardiogenic shock being considered for LVAD who is not an LVAD candidate due to severe RV dysfunction seen on TTE.</td>
<td>4</td>
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<tr>
<td>Patient with sarcoidosis with an outside TTE with reduced LV EF but a recent cardiac MRI and the current TTE with low normal LV systolic function and an endomyocardial biopsy with no evidence of cardiac sarcoidosis. Because of the normal LVEF, the pulmonologist and cardiologist decided against treating with corticosteroids.</td>
<td>4</td>
</tr>
<tr>
<td>Patient with history of peripartum cardiomyopathy with reverse remodeling who then presented with volume overload and fevers when initiating peritoneal dialysis. She was admitted to the advanced CHF service, but when her TTE revealed normal EF she was transferred to the hospitalist service.</td>
<td>4</td>
</tr>
<tr>
<td>Patient status post atrial fibrillation ablation who presented with chest pain and had normal TTE without an effusion so was discharged home.</td>
<td>4</td>
</tr>
<tr>
<td>Patient with dyspnea, getting TTE for biVAICD optimization but also found to have worsening LV systolic function and elevated pulmonary pressures so admitted for expedited transplant workup.</td>
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| Surgical or Invasive Procedure | Patient who is elderly, bed bound, with CKD who is transferred from an outside hospital for consideration of AVR and MVR and ascending aneurysm repair. TTE confirms severe aortic regurgitation, severe mitral regurgitation, depressed LVEF, and ascending aortic aneurysm but provider determines that patient is too high-risk for Bentall/AVR/MVR so patient transitioned to medical therapy and palliative care. Patient with known CAD with chest pain, shortness of breath, and labile blood pressure. TTE showed normal LV systolic function without wall motion abnormalities so patient's blood pressure was treated aggressively and plans for cardiac catheterization were canceled. Patient with moderate aortic stenosis and severe aortic regurgitation with a bicuspid aortic valve although this had been seen on a prior TTE but now with worsening fatigue and dyspnea so went for valve surgery. Patient with subaortic membrane and minimal aortic stenosis as a child who is allowed to proceed with ENT surgery because of normal TTE without any significant LVOT gradient. Patient with tetralogy of Fallot status post repair and history of pulmonic and TVR with known severe pulmonic regurgitation in 2010 who presents with worsening dyspnea on exertion and chest pain and severe pulmonic regurgitation on TTE so patient was referred for left heart catheterization and had 2-vessel coronary disease and then went to surgery. Patient with pulmonary hypertension and new RV dysfunction seen on TTE who is pregnant and has history of pulmonary embolism so referred for IVC filter. Patient with CHF and persistently low LVEF on TTE so receives biVAICD upgrade. Patient with nonischemic cardiomyopathy and continued severely depressed LV systolic function on optimal medications so got primary prevention AICD. Patient with tamponade on TTE and underwent pericardiocentesis. Patient with lung cancer and extrinsic compression of the right atrium by lung mass. TTE confirms compression of right atrium but no cardiac invasion so patient proceeds to surgery. Patient had a TTE as part of his work-up for stroke and was found to have depressed LVEF and was referred for AICD placement. Patient with recurrent enlarging pericardial effusion who is referred to CVTS for pericardial window. Patient with cancer with recurrent pericardial effusion on TTE so pericardial window performed. Patient with CHF and continued depressed LV systolic function so received AICD. Patient with persistent lower extremity edema and ascites on diuretics who is taken to the operating room for pericardial stripping given TTE of pericardial constriction. Patient with examination findings consistent with severe mitral regurgitation and CHF. TTE documents severe mitral regurgitation so patient undergoes mitral valve surgery. Patient with ESRD being considered for renal transplant with pericardial thickening. |
seen on prior CT. TTE without signs of constriction and patient with negative ischemic workup so allowed to proceed with renal transplantation.

*Impact Rating: A consensus rating on a scale of 1 to 5 of the usefulness of the active change in care was as follows: 1 indicates misused; 2, not useful; 3, neutral; 4, useful; and 5, very useful.

Abbreviations: ACEI, angiotensin-converting enzyme inhibitor; ACS, acute coronary syndrome; AICD, automatic implantable cardiac defibrillator; AML, acute myelogenous leukemia; AVR, aortic valve replacement; bivAICD, biventricular AICD; BUN, blood urea nitrogen; CAD, coronary artery disease; CHF, congestive heart failure; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary disease; CPAP, continuous positive airway pressure; CSF, cerebrospinal fluid; CT, computed tomography; CVTS, cardiovascular thoracic surgery; EF, ejection fraction; EKG, electrocardiogram; ENT, ear nose and throat; EP, electrophysiology; ESRD, end-stage renal disease; GI, gastrointestinal tract; IVC, inferior vena cava; LV, left ventricle; LVAD, LV assist device; LVH, LV hypertrophy; LVOT, left ventricular outflow tract; MI, myocardial infarction; MRI, magnetic resonance imaging; MVR, mitral valve replacement; OB/GYN, obstetrics/gynecology; PADP, pulmonary artery diastolic pressure; PD, peritoneal dialysis; PFO, patent foramen ovale; PFTs, pulmonary function tests; PTSD, posttraumatic stress disorder; RV, right ventricle; STEMI, ST elevation MI; TIA, transient ischemic attack; TVR, tricuspid valve replacement; TTE, transthoracic echocardiogram; VSD, ventriculoseptal defect.