65 yo male with multiple myeloma develops dyspnea on exertion and peripheral edema. HR 80, BP 120/70. JVP > 15cm H2O. Echo notable for increased wall thickness, scintillation appearance, LVEF 50%, +1 MR and decrease E/A ratio with diastolic filling across mitral valve. What would you do first for this patient:

A. Begin diuretics  
B. Begin digoxin  
C. Begin B-blockers  
D. Endomyocardial biopsy  
E. None of the above
65 yo male with multiple myeloma develops dyspnea on exertion and peripheral edema. HR 80, BP 120/70. JVP > 15cm H2O. Echo notable for increased wall thickness, scintillation appearance, LVEF 50%, +1 MR and decrease E/A ratio with diastolic filling across mitral valve. What would you do first for this patient:

A. Begin diuretics
B. Begin digoxin
C. Begin B-blockers
D. Endomyocardial biopsy
E. None of the above
In heart failure all but the following have been associated with increased mortality.

A. Increased natriuretic peptides
B. Increased catecholamines
C. Increased angiotensin II
D. Increased sodium
E. Increased ADH
In heart failure all but the following have been associated with increased mortality.

A. Increased natriuretic peptides
B. Increased catecholamines
C. Increased angiotensin II
D. Increased sodium
E. Increased ADH
55 yo man with chronic heart failure (LVEF 35%) has gradually felt worse over last few weeks. Medications include digoxin 0.25 mg/day (digoxin level 1.1), lisinopril 2.5 mg daily, carvedilol 3.125 mg twice a day, and lasix 80 mg daily. On exam he has an intermittent dry cough but otherwise appears well. HR 60, BP 130/70. Lungs: clear to auscultation, JVP at clavicle at 90d, PMI displaced laterally, and no leg edema. What would you do first?

A. Increase digoxin to 0.375 mg/day
B. Increase coreg to 6.25 mg twice daily
C. Increase lisinopril to 5 mg daily
D. Increase lasix to 120 mg daily
E. Add metolazone 2.5 mg every other day
55 yo man with chronic heart failure (LVEF 35%) has gradually felt worse over last few weeks. Medications include digoxin 0.25 mg/day (digoxin level 1.1), lisinopril 2.5 mg daily, carvedilol 3.125 mg twice a day, and lasix 80 mg daily. On exam he has an intermittent dry cough but otherwise appears well. HR 60, BP 130/70. Lungs: clear to auscultation, JVP at clavicle at 90d, PMI displaced laterally, and no leg edema. What would you do first?

A. Increase digoxin to 0.375 mg/day
B. Increase coreg to 6.25 mg twice daily
C. Increase lisinopril to 5 mg daily
D. Increase lasix to 120 mg daily
E. Add metolazone 2.5 mg every other day
60 yo man was admitted 1 month ago for CHF and noted to have a cardiomyopathy (LVEF 20%). He was begun on digoxin 0.125 mg/day, lisinopril 10 mg/day and lasix 40 mg BID. He lost 15 pounds and markedly improved with less dyspnea on exertion. However, he now complains of an intolerable, persistent dry cough. On exam he appears well. BP 120/70, HR 80. JVP 6 cm, PMI laterally displaced, no crackles, and no edema. What would you do?

A. Increase lasix
B. Switch lisinopril to captopril
C. Switch lisinopril to candesartan
D. Begin B-blockers
E. Begin anti-tussive medication
60 yo man was admitted 1 month ago for CHF and noted to have a cardiomyopathy (LVEF 20%). He was begun on digoxin 0.125 mg/day, lisinopril 10 mg/day and lasix 40 mg BID. He lost 15 pounds and markedly improved with less dyspnea on exertion. However, he now complains of an intolerable, persistent dry cough. On exam he appears well. BP 120/70, HR 80. JVP 6 cm, PMI laterally displaced, no crackles, and no edema. What would you do?

A. Increase lasix
B. Switch lisinopril to captopril
C. Switch lisinopril to candesartan
D. Begin B-blockers
E. Begin anti-tussive medication
All of the following proteins below have been noted to be elevated in heart failure. Which one does not cause vasoconstriction?

A. BNP
B. Arginine vasopressin
C. Endothelin
D. Angiotensin II
E. None of the above
All of the following proteins below have been noted to be elevated in heart failure. Which one does not cause vasoconstriction?

A. BNP  
B. Arginine vasopressin  
C. Endothelin  
D. Angiotensin II  
E. None of the above
Choose the best indication for endomyocardial biopsy

A. Suspected lymphocytic myocarditis
B. Suspected giant cell myocarditis
C. Heart failure with preserved systolic function
D. Consideration for heart transplantation
E. Diagnosis of heart failure of unclear etiology
Choose the best indication for endomyocardial biopsy

A. Suspected lymphocytic myocarditis
B. Suspected giant cell myocarditis
C. Heart failure with preserved systolic function
D. Consideration for heart transplantation
E. Diagnosis of heart failure of unclear etiology
A 45 yo African American man with hypertension, a non-ischemic moderately dilated cardiomyopathy (LVEF 30%), and biventricular PPM/ AICD is referred for further evaluation. He has NYHA class III symptoms. His medications are Lisinopril 40 mg daily, carvedilol 25 mg BID, lasix 40 mg BID, and spironolactone 25 mg daily. HR 66, BP 130/70. On exam he has no JVD, + S4 on cardiac exam, lungs clear, and trace lower extremity edema. What do you recommend?

A. Increase lasix
B. Increase spironolactone
C. Add hydrazine/nitrates
D. Add digoxin
E. Increase lisinopril
A 45 yo African American man with hypertension, a non-ischemic moderately dilated cardiomyopathy (LVEF 30%), and biventricular PPM/AICD is referred for further evaluation. He has NYHA class III symptoms. His medications are Lisinopril 40 mg daily, carvedilol 25 mg BID, lasix 40 mg BID, and spironolactone 25 mg daily. HR 66, BP 130/70. On exam he has no JVD, + S4 on cardiac exam, lungs clear, and trace lower extremity edema. What do you recommend?

A. Increase lasix
B. Increase spironolactone
C. Add hydrazine/nitrates
D. Add digoxin
E. Increase lisinopril
A 30 yo man has a nonischemic severely dilated cardiomyopathy (LVEF 30%) diagnosed 1 year ago. Functional NYHA class II symptoms. Medications are lisinopril 5 mg daily, metoprolol succinate (toprol XL) 25 mg daily, lasix 20 mg daily, and digoxin 0.125 mg daily. HR 68  BP 110/50. JVP 5 cm, lungs clear, PMI displaced laterally with normal S1S2, no S3, no edema. EKG QRS 100 ms. What do you recommend?

A. Biventricular PPM and ICD (CRT-D)
B. ICD only
C. Heart transplantation
D. Add spironolactone
E. Increase digoxin
A 30 yo man has a nonischemic severely dilated cardiomyopathy (LVEF 30%) diagnosed 1 year ago. Functional NYHA class II symptoms. Medications are lisinopril 5 mg daily, metoprolol succinate (toprol XL) 25 mg daily, lasix 20 mg daily, and digoxin 0.125 mg daily. HR 68  BP 110/50. JVP 5 cm, lungs clear, PMI displaced laterally with normal S1S2, no S3, no edema. EKG QRS 100 ms. What do you recommend?

A. Biventricular PPM and ICD (CRT-D)
B. ICD only
C. Heart transplantation
D. Add spironolactone
E. Increase digoxin
A 65 yo man with a dilated cardiomyopathy (LVEF 30%) has chronic CHF with functional NYHA class III symptoms. Medications are lisinopril 10 mg daily, metoprolol XL 100 mg daily, lasix 40 mg BID, and digoxin 0.125 mg daily. HR 68  BP 110/50. JVP 7 cm, lungs clear, PMI displaced laterally with normal S1S2, + S3, + 2 edema. Labs reveal K 3.5, Cr 1.4. What do you recommend?

A. Increase metoprolol  
B. Increase lisinopril  
C. Add losartan  
D. Discontinue metoprolol  
E. Add spironolactone
A 65 yo man with a dilated cardiomyopathy (LVEF 30%) has chronic CHF with functional NYHA class III symptoms. Medications are lisinopril 10 mg daily, metoprolol XL 100 mg daily, lasix 40 mg BID, and digoxin 0.125 mg daily. HR 68  BP 110/50. JVP 7 cm, lungs clear, PMI displaced laterally with normal S1S2, + S3, + 2 edema. Labs reveal K 3.5, Cr 1.4. What do you recommend?

A. Increase metoprolol
B. Increase lisinopril
C. Add losartan
D. Discontinue metoprolol
E. Add spironolactone
75 yo WF with DM, HTN, hyperlipidemia presents with new dyspnea and elevated JVP, +rales, BNP 745. Denies prior MI or CP. EKG: NSR, LBBB. Echo: Moderately dilated LV with EF 30%, mod-severe MR, mod TR, estimated RVSP 65. Adenosine nuclear scan reveals large fixed defect anterior, anteroseptal, anterolateral, apical without ischemia. Which of the following statements is true:

A. No further testing is indicated.
B. PET scan is unnecessary given nuclear results.
C. Coronary arteriography should be considered.
D. Bi-ventricular pacer with ICD should be implanted as soon as possible.
75 yo WF with DM, HTN, hyperlipidemia presents with new dyspnea and elevated JVP, +rales, BNP 745. Denies prior MI or CP. EKG: NSR, LBBB. Echo: Moderately dilated LV with EF 30%, mod-severe MR, mod TR, estimated RVSP 65. Adenosine nuclear scan reveals large fixed defect anterior, anteroseptal, anterolateral, apical without ischemia. Which of the following statements is true:

A. No further testing is indicated.
B. PET scan is unnecessary given nuclear results.
C. Coronary arteriography should be considered
D. Bi-ventricular pacer with ICD should be implanted as soon as possible
A patient presents to the emergency room with recent onset shortness of breath. A BNP level in the ER is elevated at 650. Which of the following statements regarding the elevated BNP is correct:

A. The elevated BNP confirms the diagnosis of left ventricular dysfunction.
B. The age and gender of the patient is not particularly relevant to interpretation of the elevated BNP level
C. The elevated BNP effectively rules out COPD and pulmonary embolism as cause for dyspnea.
D. Cardiac output and cerebral perfusion are the major determinants of BNP
E. BNP levels predict outcome in pts with HF.
A patient presents to the emergency room with recent onset shortness of breath. A BNP level in the ER is elevated at 650. Which of the following statements regarding the elevated BNP is correct:

A. The elevated BNP confirms the diagnosis of left ventricular dysfunction.
B. The age and gender of the patient is not particularly relevant to interpretation of the elevated BNP level
C. The elevated BNP effectively rules out COPD and pulmonary embolism as cause for dyspnea.
D. Cardiac output and cerebral perfusion are the major determinants of BNP
E. BNP levels predict outcome in pts with HF.
A 50 yo caucasian woman with an ischemic moderately dilated cardiomyopathy (LVEF 20%) diagnosed 3 years ago remains symptomatic despite revascularization (PTCA/stent). She has dyspnea with minimal activity, + orthopnea, and + PND. Medications are lisinopril 40 mg daily, metoprolol XL 200 mg daily, lasix 60 mg BID, and spironolactone 25 mg daily. HR 70 BP 116/50. JVP 8 cm, bibasilar crackles, PMI displaced laterally, + S3, + 2 edema. EKG QRS 140 ms. What do you recommend?

A. Biventricular pacemaker with ICD (CRT-D)
B. ICD only
C. Transplantation
D. Increase spironolactone
E. Add hydralazine/isordil
A 50 yo caucasian woman with an ischemic moderately dilated cardiomyopathy (LVEF 20%) diagnosed 3 years ago remains symptomatic despite revascularization (PTCA/stent). She has dyspnea with minimal activity, + orthopnea, and + PND. Medications are lisinopril 40 mg daily, metoprolol XL 200 mg daily, lasix 60 mg BID, and spironolactone 25 mg daily. HR 70, BP 116/50, JVP 8 cm, bibasilar crackles, PMI displaced laterally, + S3, + 2 edema. EKG QRS 140 ms. What do you recommend?

A. Biventricular pacemaker with ICD (CRT-D)
B. ICD only
C. Transplantation
D. Increase spironolactone
E. Add hydralazine/isordil
28 yo lady presents 6 weeks post-partum with new onset heart failure. Pregnancy was uncomplicated except for mild-moderate pedal edema which failed to resolve post-partum. Echo demonstrates dilated LV with EF 25%. No prior cardiac history. Which of the following statements is true:

A. Coronary angiography is indicated to rule out premature CAD—a reversible cause.
B. Endomyocardial biopsy should be performed to confirm the diagnosis of peripartum cardiomyopathy
C. The addition of ACE-inhibitors and beta-blockers to diuretics and digoxin can be safely delayed for 6-12 months since spontaneous improvement is likely.
D. The chance of recurrence with future pregnancies is high, even if LV function improves significantly.
28 yo lady presents 6 weeks post-partum with new onset heart failure. Pregnancy was uncomplicated except for mild-moderate pedal edema which failed to resolve post-partum. Echo demonstrates dilated LV with EF 25%. No prior cardiac history. Which of the following statements is true:

A. Coronary angiography is indicated to rule out premature CAD—a reversible cause.
B. Endomyocardial biopsy should be performed to confirm the diagnosis of peripartum cardiomyopathy
C. The addition of ACE-inhibitors and beta-blockers to diuretics and digoxin can be safely delayed for 6-12 months since spontaneous improvement is likely.
D. The chance of recurrence with future pregnancies is high, even if LV function improves significantly.
32 yo WF s/p cardiac transplant for peripartum CM six years earlier. She had one treated rejection episode 2.5 months post-transplant. Both she and the donor were CMV antibody positive. Presents with new onset dyspnea, diffuse pulmonary infiltrates and mild cardiomegaly on CXR, new pedal edema, increased JVP, tachycardia, afebrile with therapeutic cyclosporine and mycophenolate levels. Which of the following is the most likely cause for her dyspnea?

A. Acute allograft rejection
B. Pneumocystis pneumonia
C. Systemic cytomegalovirus
D. Coronary artery disease
E. Recurrent peripartum cardiomyopathy
32 yo WF s/p cardiac transplant for peripartum CM six years earlier. She had one treated rejection episode 2.5 months post-transplant. Both she and the donor were CMV antibody positive. Presents with new onset dyspnea, diffuse pulmonary infiltrates and mild cardiomegaly on CXR, new pedal edema, increased JVP, tachycardia, afebrile with therapeutic cyclosporine and mycophenolate levels. Which of the following is the most likely cause for her dyspnea?

A. Acute allograft rejection
B. Pneumocystis pneumonia
C. Systemic cytomegalovirus
D. Coronary artery disease
E. Recurrent peripartum cardiomyopathy
Which of the following has not been associated with improved survival in chronic (systolic) heart failure:

A. Angiotensin converting enzyme inhibitors  
B. Beta-adrenergic receptor blockers  
C. Digoxin  
D. Aldosterone antagonists  
E. Implantable cardioverter-defibrillators
Which of the following has not been associated with improved survival in chronic (systolic) heart failure:

A. Angiotensin converting enzyme inhibitors
B. Beta-adrenergic receptor blockers
C. Digoxin
D. Aldosterone antagonists
E. Implantable cardioverter-defibrillators
65 yo WM presents for cardiac transplant evaluation due to progressive heart failure. Outside left heart cath revealed non-significant CAD and EF 30%. On good HF medical regimen. No prior history of DM or HTN. Excellent family support and no other obvious medical conditions. Physical exam reveals marked biventricular failure. Echocardiogram reveals EF 25-30%, mildly dilated LV, moderate-severe LVH with septal and posterior wall thickness of 1.8cm, small pericardial effusion, mildly thickened MV with 1-2+MR, 3-4+TR, estimated RVSP 65. What would be the next step in the evaluation?

A. List promptly for cardiac transplantation given advanced stage
B. Perform metabolic exercise tolerance test to better assess functional limitation and help predict need for transplant
C. Perform right heart catheterization to assess presence of reversible pulmonary artery hypertension
D. Perform endomyocardial biopsy
65 yo WM presents for cardiac transplant evaluation due to progressive heart failure. Outside left heart cath revealed non-significant CAD and EF 30%. On good HF medical regimen. No prior history of DM or HTN. Excellent family support and no other obvious medical conditions. Physical exam reveals marked biventricular failure. Echocardiogram reveals EF 25-30%, mildly dilated LV, moderate-severe LVH with septal and posterior wall thickness of 1.8cm, small pericardial effusion, mildly thickened MV with 1-2+MR, 3-4+TR, estimated RVSP 65. What would be the next step in the evaluation?

A. List promptly for cardiac transplantation given advanced stage
B. Perform metabolic exercise tolerance test to better assess functional limitation and help predict need for transplant
C. Perform right heart catheterization to assess presence of reversible pulmonary artery hypertension
D. Perform endomyocardial biopsy
40yo WM non-ischemic DCM (EF 20%) with CRT-D now presents with persistent severe DOE on lisinopril 40mg/d, carvedilol 25mg bid, digoxin .125mg/d, furosemide 80mg bid, aldactone 25mg/d, metolazone 2.5-5.0 mg prn. PE reveals BP 95/60, HR 68, JVP 10 cm H2O in RA, no rales, +S3, +MR, no edema. The next best step for his management would be:

A. Increase aldactone to 50mg/d.
B. Increase digoxin to 0.25mg/d
C. Change furosemide to bumetanide
D. Refer for cardiac transplant evaluation
E. Repeat echocardiogram
40yo WM non-ischemic DCM (EF 20%) with CRT-D now presents with persistent severe DOE on lisinopril 40mg/d, carvedilol 25mg bid, digoxin .125mg/d, furosemide 80mg bid, aldactone 25mg/d, metolazone 2.5-5.0 mg prn. PE reveals BP 95/60, HR 68, JVP 10 cm H2O in RA, no rales, +S3, +MR, no edema. The next best step for his management would be:

A. Increase aldactone to 50mg/d.
B. Increase digoxin to 0.25mg/d
C. Change furosemide to bumetanide
D. Refer for cardiac transplant evaluation
E. Repeat echocardiogram
35 yo AAF with non-ischemic DCM (EF < 35%) and ongoing symptoms. She is being evaluated for advanced HF therapies including cardiac transplantation. Which of the following tests would be most useful for predicting the likelihood of survival over the next year?

A. Cardiac index at rest measured by right heart catheterization
B. LVEDD as measured by echocardiogram
C. Plasma norepinephrine
D. LV EF as measured by MUGA
E. Peak oxygen uptake by cardiopulmonary exercise testing
35 yo AAF with non-ischemic DCM (EF < 35%) and ongoing symptoms. She is being evaluated for advanced HF therapies including cardiac transplantation. Which of the following tests would be most useful for predicting the likelihood of survival over the next year?

A. Cardiac index at rest measured by right heart catheterization
B. LVEDD as measured by echocardiogram
C. Plasma norepinephrine
D. LV EF as measured by MUGA
E. Peak oxygen uptake by cardiopulmonary exercise testing
37 yo WM with HCM diagnosed at age 35. Despite high dose beta-blockers he remains with marked DOE. Denies syncope or near syncope. Exam notable for systolic ejection murmur and murmur of MR. Echo reveals HOCM with septal thickness of 3.0 cm, PW 1.8 cm, resting LVOT gradient of 35 mmHg increasing to 110 mmHg with provocation, structurally normal MV with SAM and severe MR. Which of the following is true regarding treatment options?

A. Dual-chamber pacing is the best next therapeutic option.
B. Mitral valve replacement will be required
C. Percutaneous ethanol-induced septal ablation is the preferred option
D. The addition of disopyramide will likely delay or alleviate the need for surgical myomectomy or septal ablation
E. Surgical myomectomy alone may provide relief of outflow obstruction, MR and symptoms
37 yo WM with HCM diagnosed at age 35. Despite high dose beta-blockers he remains with marked DOE. Denies syncope or near syncope. Exam notable for systolic ejection murmur and murmur of MR. Echo reveals HOCM with septal thickness of 3.0 cm, PW 1.8 cm, resting LVOT gradient of 35 mmHg increasing to 110 mmHg with provocation, structurally normal MV with SAM and severe MR. Which of the following is true regarding treatment options?

A. Dual-chamber pacing is the best next therapeutic option.
B. Mitral valve replacement will be required
C. Percutaneous ethanol-induced septal ablation is the preferred option
D. The addition of disopyramide will likely delay or alleviate the need for surgical myomectomy or septal ablation
E. Surgical myomectomy alone may provide relief of outflow obstruction, MR and symptoms
64 yo WM with non-ischemic CM (EF 25%) and severe HF. Progressive symptoms of DOE now with only \( \frac{1}{2} \) block. Exam reveals weight 72kgs, BP 100/60, HR 60, JVP 10cm H2O in RA, bibasilar crackles, +S3, +MR murmur. EKG: NSR, LBBB. Meds include carvedilol 25mg bid, lisinopril 40 mg/d, digoxin 0.125mg/d, furosemide 120mg bid, aldactone 50mg/d, candesartan 8mg/d. What is the best next therapeutic step?

A. Increase digoxin to 0.25mg/d
B. Increase carvedilol to 50mg bid
C. Start once-twelce a week infusions of dobutamine or milrinone
D. Start once-twelce a week infusions of nesiritide
E. Place biventricular pacemaker-ICD
64 yo WM with non-ischemic CM (EF 25%) and severe HF. Progressive symptoms of DOE now with only ½ block. Exam reveals weight 72kgs, BP 100/60, HR 60, JVP 10cm H2O in RA, bibasilar crackles, +S3, +MR murmur. EKG: NSR, LBBB. Meds include carvedilol 25mg bid, lisinopril 40 mg/d, digoxin 0.125mg/d, furosemide 120mg bid, aldactone 50mg/d, candesartan 8mg/d. What is the best next therapeutic step?

A. Increase digoxin to 0.25mg/d
B. Increase carvedilol to 50mg bid
C. Start once-twelce a week infusions of dobutamine or milrinone
D. Start once-twelce a week infusions of nesiritide
E. Place biventricular pacemaker-ICD
35 yo WF with recently diagnosed pulmonary hypertension and progressive dyspnea and right heart failure. PE remarkable for elevated JVP, clear lungs, loud S2, +TR murmur. RHC: PA 90/50, RA 10, PCWP 18, CO 2.9. Therapy with flolan (epoprostenol) is begun. Within one week she reports worsening dyspnea. Exam now reveals bibasilar crackles and CXR reveals interstitial edema. Which of the following is the most likely explanation?

A. Inadequate dose of flolan  
B. Unappreciated left ventricular dysfunction  
C. Allergic interstitial pneumonitis due to flolan  
D. Pulmonary venocclusive disease  
E. Eisenmenger’s physiology with right to left shunting
35 yo WF with recently diagnosed pulmonary hypertension and progressive dyspnea and right heart failure. PE remarkable for elevated JVP, clear lungs, loud S2, +TR murmur. RHC: PA 90/50, RA 10, PCWP 18, CO 2.9. Therapy with flolan (epoprostenol) is begun. Within one week she reports worsening dyspnea. Exam now reveals bibasilar crackles and CXR reveals interstitial edema. Which of the following is the most likely explanation?

A. Inadequate dose of flolan
B. Unappreciated left ventricular dysfunction
C. Allergic interstitial pneumonitis due to flolan
D. Pulmonary venocclusive disease
E. Eisenmenger’s physiology with right to left shunting