Diastolic Dysfunction

Apstein, Carl. “The diagnosis, treatment, and prognosis of diastolic dysfunction.” UpToDate v11.2.
Foster and Schiller. “Echocardiographic assessment of left ventricular diastolic dysfunction.” UpToDate v11.2.

Key Points:
- Diastolic dysfunction is difficult to define clinically
- Sensitivity of the test depends on the question, particular with uncertain gold standard

- Definition: “CHF due to increased resistance to diastolic filling of part or all of the heart”
  - Myocardial
    - Impaired relaxation
      - Ischemia (epicardial or microvascular)
      - Hypertrophy
      - Cardiomyopathies
      - Hypothyroidism
      - Aging
    - Increased passive stiffness
      - Diffuse fibrosis
      - Post-infarct scarring
      - Hypertrophy
      - Infiltrative (amyloid, hemochromatosis, Fabry’s)
  - Endocardial:
    - Fibroelastosis
    - Mitral / tricuspid stenosis
  - Epicardial / pericardial
    - Constriction
    - Tamponade
  - Coronary microcirculation
    - Capillary compression
    - Venous engorgement
  - Other
    - Volume overload of contralateral ventricle
    - Extrinsic compression (tumor)
- Clinical definition: 35-40% of men with CHF, 65-75% of women with CHF
  - Cardiac dysfunction with normal EF (>50%) or with findings of diastolic dysfunction on echo/cath
  - Difficulties: timing of echo in relation to treatment, mixed etiologies
  - Asymptomatic diastolic dysfunction: Mayo Clinic study -> of those without symptoms, 27% with DD (7% moderate to severe) on echo; increased hazard ratio for all-cause mortality (8.3 and 10.2)
- Diagnosis: uncertain gold standard for determining sensitivities, as tests are used for clinical diagnosis
  - Echocardiography: can also show LVH, RWMA, pericarditis, infiltrative diseases
    - Indirect measurements of relaxation, dependent on ventricular loading and heart rate
    - E:A ratio and inflow patterns (E: early filling; A: atrial filling); Normal: >1
      - With age >60 or early diastolic dysfunction: A>E wave with deceleration of E wave
      - Later: E= or >A with rapid E deceleration
    - Pulmonary vein flow representing LA filling in systole > diastole
      - Impaired atrial filling -> impaired descent during ventricular systole -> flow mostly during diastole when mitral valve is open
  - Catheterization: decline in LVP early diastole, rise in diastolic pressure with atrial contraction, LVEDP, pressure-volume relationship
  - BNP: can diagnose CHF from diastolic dysfunction, but does not distinguish systolic from diastolic
- Treatment
  - Avoid exacerbating factors: atrial fibrillation, tachycardia, ischemia, HTN, fluid overload
  - Rate slowing: CCB, BB, digoxin
  - ACE inhibitors / ARB: regression / remodeling
  - Aldosterone?