Pediatric Heart Failure Management and Guidelines

Abbreviations and acronyms

1. Preamble
2. Introduction
3. Levels of Evidence/Strength of Recommendations
   3.1. Description of levels of evidence and strength of recommendations as used in guidelines across disciplines
4. Definition and diagnosis
   4.1. Definition of heart failure
   4.2. Classification of heart failure severity
      4.2.1. NYHA
      4.2.2. Ross
      4.2.3. AHA/ACC disease staging
   4.3. Epidemiology, aetiology, and pathophysiology of heart failure
      4.3.1. Systolic heart failure
      4.3.2. Diastolic heart failure
      4.3.3. Heart failure and Congenital Heart Disease
         4.3.3.1. Left to Right Shunting
         4.3.3.2. Obstructive Lesions
         4.3.3.3. Regurgitant Lesions
         4.3.3.4. Repaired CHD
            4.3.3.4.1. Right Heart Failure
            4.3.3.4.2. Left Heart Failure
            4.3.3.4.3. Single Ventricle Failure
               4.3.3.4.3.1. Post Norwood
               4.3.3.4.3.2. Post Cavo-pulmonary Shunt
               4.3.3.4.3.3. Post total cavo-pulmonary connection (TCPC, Fontan)
   4.3.4. Right heart failure (aspects not already addressed in CHD section, if any)
4.4. Diagnosis of heart failure (including the underlying etiology, if identifiable)
   4.4.1. Symptoms and signs
   4.4.2. Diagnostic Approach
      4.4.2.1. Initial investigations (CXR/ECG/Laboratory tests)
      4.4.2.2. Role of diagnostic tests in suspected HF
      4.4.2.3. Utility of natriuretic peptides in heart failure diagnosis
   4.4.3. Algorithm for the diagnosis of heart failure
5. Role of cardiac imaging in the evaluation of patients with suspected or confirmed heart failure
   5.1. Echocardiography
      5.1.1. Assessment of left ventricular systolic dysfunction
      5.1.2. Assessment of left ventricular diastolic dysfunction
      5.1.3. Assessment of right ventricular function
      5.1.4. Assessment of pulmonary vascular resistance
      5.1.5. Evaluation of associated cardiac problems (valvular dysfunction, wall motion, exclusion of alternative disease processes, etc)
   5.2. Cardiac magnetic resonance
      5.2.1. Indications
      5.2.2. Modalities
      5.2.3. Diagnostic utility
   5.3. Cardiac computed tomography (coronary anatomy mainly)
6. Additional investigations
   6.1. Exercise testing and walk distance
   6.2. Ambulatory electrocardiographic monitoring
   6.3. Cardiac catheterization and endomyocardial biopsy (focus on indications)
Pediatric Heart Failure Management and Guidelines

6.4. Positron emission tomography and SPECT imaging
6.5. Genetic testing

7. Prognosis: Natural history of heart failure
7.1. Heart failure due to CM
7.2. Heart failure due to failed congenital heart disease palliation

8. Pharmacological treatment of heart failure with reduced EF (systolic heart failure)
8.1. Objectives in the management of heart failure
  8.1.1. Symptom control
  8.1.2. Prolong survival
  8.1.3. Avoid specific secondary consequences of heart failure
    8.1.3.1. Pulmonary hypertension
    8.1.3.2. Cirrhosis

8.2. Chronic Systolic Heart Failure: Therapies with Class I Indication (this should include all treatments with at least 1 class I indication; if there are class II or III indications as well, those should be included in this section to avoid fragmentation. It will therefore be necessary to discuss specific patient populations and the indications for each therapy including strength of recommendation. This specifically includes the asymptomatic HF patient, and genetic and/or ethnic populations with specific pharmacologic recommendations)
  8.2.1. Diuretics
  8.2.2. Angiotensin-converting enzyme inhibitors
  8.2.3. Beta-blockers
  8.2.4. Mineralocorticoid/aldosterone receptor antagonists
  8.2.5. Angiotensin receptor blockers
  8.2.6. Ivabradine
  8.2.7. Digoxin and other digitalis glycosides
  8.2.8. Combination of hydralazine and isosorbide dinitrate
  8.2.9. Dietary modification
    8.2.9.1. Sodium restriction
    8.2.9.2. Fluid limitation
    8.2.9.3. Nutritional support
  8.2.10. Omega-3 polyunsaturated fatty acids

8.3. Chronic Systolic Heart Failure: Therapies with Class II Indication (including any with both II and III indications, as per above)
  8.3.1.3. Hydroxy-3-methylglutaryl-coenzyme A reductase inhibitors (‘statins’)
  8.3.2. Renin inhibitors
  8.3.3. Oral anticoagulants
  8.3.4. Nesiritide
  8.3.5. Physical activity

8.4. Chronic Systolic Heart Failure: Therapies with Class III Indication (any therapy with at least 1 Class II indication will appear above)
  8.4.1. Pulse or Chronic inotropic support (other than as bridge to transplant or palliation)

8.5. Therapies under Active Investigation (since focus of this manuscript is on guidelines, this section should be a very brief overview of those therapies that may become viable in next few years)
  8.5.1. Respiratory Support
  8.5.2. Vasopressin Receptor Antagonists
  8.5.3. Implantable hemodynamic monitors
  8.5.4. Stem cell therapy

9. Pharmacological treatment of heart failure with ‘preserved’ EF (diastolic heart failure)
9.1. Therapies with Class I indications
Pediatric Heart Failure Management and Guidelines

9.1.1. Diuretics
9.1.2. Dietary modification
9.1.3. Control of secondary factors
  9.1.3.1. Hypertension
9.2. Therapies with Class II Indications
  9.2.1. Angiotensin converting enzyme inhibitors
  9.2.2. Calcium channel antagonists
9.3. Therapies with Class III Indications
10. Device treatment of heart failure
  10.1. Cardiac Pacemakers
    10.1.1. Class I, II and III indications
  10.2. ICD’s
    10.2.1. Class I, II, and III indications
10.3. Cardiac resynchronization therapy
  10.3.1. Class I, II and III indications
10.4. Mechanical Circulatory Support
  10.4.1. End-stage heart failure
  10.4.2. Acute heart failure

11. Importance and management of other co-morbidities in HF
  11.1. Metabolic syndrome
  11.2. Anaemia
  11.3. Asthma
  11.4. Cachexia
  11.5. Depression
  11.6. Renal dysfunction
  11.7. Fatigue
  11.8. Cognitive and Social Development

12. Acute heart failure
  12.1. Initial assessment and monitoring of patients
  12.2. Treatment of acute heart failure
    12.2.1. Pharmacological therapy
    12.2.2. Non-pharmacological/non-device therapy eg ventilation
    12.2.3. Fluid management
  12.3. Invasive monitoring
    12.3.1. Intra-arterial line
    12.3.2. Pulmonary artery catheterization
  12.4. Monitoring after stabilization
  12.5. Other in-patient assessments
  12.6. Readiness for discharge
  12.7. Special patient populations
    12.7.1. Isolated right ventricular failure
    12.7.2. Perioperative acute heart failure
    12.7.3. Adult congenital heart disease

13. Heart Transplantation
  13.1. Current Outcomes
  13.2. Indications for Heart transplantation
  13.3. Referral for Heart transplantation
  13.4. Heart Transplantation evaluation process

14. Health Care Delivery
  14.1. Exercise training and activity recommendations
  14.2. Organization of care and multidisciplinary management programmes
Pediatric Heart Failure Management and Guidelines

14.2.1. Role of Pediatrician and Pediatric cardiologist
14.3. Remote monitoring (using an implanted device)
14.4. Remote monitoring (no implanted device)
14.5. Structured telephone support
14.6. Palliative/supportive/end-of-life care

15. Implementation of Practice Guidelines
15.1. Isolated Provider Interventions
15.2. Disease Management Systems
15.3. Performance Measures

Considerations/questions:

1. A section on specific diagnoses eg. DMD, anthracycline where screening, preventative therapies and early intervention have a role??
2. Are we covering HCM at all? Is it going to be within sections? I don’t feel strongly but we need to proactively decide to tell the section authors
3. Do we need a section on pulmonary hypertension in HF or will we include it in the relevant sections?
4. As we make up our list of section editors (split between us and involve others), need to proactively decide about the document reviewers