Integrating Palliative Care into Heart Failure Care

Definitions
HF – Heart failure is defined as the inability of the heart to deliver sufficient oxygenated blood to meet the metabolic demands of peripheral tissues both during rest and exercise. May involve abnormal diastolic or systolic left ventricular function.

Causes of Heart Failure
- Primary muscle disease
  - Ischemic disease: Most common in White Men, typically causes LVSD
  - Hypertension-Induced Cardiomyopathy; Diabetic Cardiomyopathy
  - Familial, Idiopathic Cardiomyopathy
- Valvular disease
- Congenital anomalies
- Obstructive disorders (incl. hypertrophic obstructive cardiomyopathy)
- Restrictive disorders (including pericarditis from various causes)
- Endocrine/metabolic disorders (including thyroid disease)

LVSD (systolic dysfunction) – Left Ventricular Systolic Dysfunction

HFrEF Heart Failure with LVEF <50%, usually includes systolic and diastolic dysfunction

HFpEF (or HF with Preserved Ejection Fraction) – Heart Failure with Normal Ejection Fraction, usually includes “diastolic dysfunction”

ICD – Implantable Cardioverter defibrillator - implanted device that paces or shocks to treat potentially life-ending rhythms.

CRT – cardiac resynchronization therapy – also known as “biventricular pacing”- paces both right and left ventricles to improve ejection fraction when the ventricles are dyssynchronous (not pumping simultaneously).

LVAD – Left-Ventricular Assist Device also called “mechanical circulatory support” an implanted device to take over the work of the ventricle; may be used as a “bridge” to heart transplant or as “destination therapy” for end-stage HF.

CPAP – Continuous positive airway pressure (ventilation) – Typically used for patients with obstructive sleep apnea, as diagnosed by polysomnography or sleep study. May also be used to reduce the work of breathing in moderate respiratory distress
## Comprehensive Heart Failure Care

<table>
<thead>
<tr>
<th>ACC/AHA Stage</th>
<th>Definition</th>
<th>NYHA Class</th>
<th>“Phases” of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Patients have structural heart disease without symptoms</td>
<td>None or I Asymptomatic with normal activity</td>
<td>None or I Asymptomatic with normal activity</td>
</tr>
<tr>
<td>C</td>
<td>Patients with underlying structural heart disease and symptoms of HF</td>
<td>I*-III Symptoms with ordinary physical activity or less</td>
<td>I*-III Symptoms with ordinary physical activity or less</td>
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<tr>
<td>D</td>
<td>Patients with refractory symptoms of HF or end-organ hypoperfusion who require specialized interventions such as continuous infusion of inotropes, mechanical assist devices, heart transplantation or hospice care.</td>
<td>(III⁺) IV Symptoms at rest</td>
<td>(III⁺) IV Symptoms at rest</td>
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Medical Management
These agents reverse remodeling, block renin-angiotensin-aldosterone system. For patients with HFrEF they are life-prolonging, and also improve function and decrease symptoms.

-Angiotensin-Converting Enzyme Inhibitors (ACE-I)
ACE Inhibitors are indicated in patients with HFrEF to reverses remodeling. They also reduce afterload. In patients who cannot tolerate an ACEI, an angiotensin receptor blocker (ARB) is an acceptable substitute (Level of evidence: B)

<table>
<thead>
<tr>
<th>ACE inhibitors</th>
<th>Or Angiotensin Receptor Blockers</th>
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<tbody>
<tr>
<td>Capoten (captopril)</td>
<td>Cozaar (losartan)</td>
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<tr>
<td>Vasotec (enalapril)</td>
<td>Diovan (valsartan)</td>
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<tr>
<td>Zestril, Prinivil (lisinopril)</td>
<td>Avapro (irbesartan)</td>
</tr>
<tr>
<td>Lotensin (benazepril)</td>
<td>Atacand (candesartan)</td>
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<tr>
<td>Altace (ramipril)</td>
<td>Teveten (eprosartan)</td>
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<tr>
<td>Accupril (quinapril)</td>
<td>Micardis (telmisartan)</td>
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<tr>
<td>Mavik (trandolapril)</td>
<td>Benicar (olmesartan)</td>
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-Aldosterone Blockade
Spironolactone & Eplerenone block Aldosterone, but cause potassium retention especially if renal function is impaired. Renal function and potassium must be monitored.

-Beta-blockers (ßB) slow or reverse remodeling
Certain beta blockers reduce mortality in LVSD and improve symptoms. Carvedilol, bisoprolol, and sustained release metoprolol succinate (level of evidence A).

Coreg (carvedilol)
Toprol (metoprolol succinate)
Zebeta (bisoprolol)
atenolol
metoprolol tartrate

The following agents improve symptoms without changing underlying pathology and without extending length of life:

Loop Diuretics reduce fluid overload; may be combined with Thiazide diuretics
Lasix (furosemide)  Zaroxolyn (metolazone),
Demedex (torsemide) hydrochlorothiazide
Bumex (bumetanide)

-Nitrates were initially used to pre-and after-load the left ventricle in combination with vasodilators. Some HF specialists use nitrates when patients do not tolerate other HF medications such as ACEI/ARB and BB.
Nitrates in combination with hydralazine improved mortality in patients who were self-identified as African American.

Digoxin: benefits patients with advanced HF( Increases contractility) or atrial fibrillation (controls rate).
Special Considerations for HFpEF
Perindopril (and possibly all ACEI) improves symptoms, and candesartan reduces HF hospitalization and worsened symptoms.
-Hypertension management is particularly important.

Non-pharmacologic, Non-Invasive Therapies
-CPAP (if indicated for Obstructive Sleep Apnea)
-Supplemental overnight oxygen (for Cheyne-Stokes breathing) or nocturnal hypoxia

Advanced HF therapies, including device-related treatments
Intravenous Inotropes-Positive Inotropic agents
milrinone
dobutamine
Natriuretic peptides (nesiritide): promote natriuresis & diuresis
Afterload reduction: intravenous nitrates
-Cardiac resynchronization Therapy (CRT)
  -Dysynchrony between Right Ventricle and Left Ventricle contractions
  -LBBB or QRS prolongation on ECG

Prevent sudden death
-Implantable Cardioverter Defibrillators (LVEF ≤35%)
+-/- antiarrhythmic drugs (amiodarone, others)

Other Advanced technologies
-Cardiac Transplantation (2000/year)
-Destination Left Ventricular Assist Device

-Exercise (improves QOL, dyspnea, fatigue and endurance)
-Sodium and fluid management
Erythropoetin (Procrit, Epo, Epogen) or darbepoetin (Aranesp)- for anemia

IV. Communication and Prognosis Development
Framework for Patient-centered Communication
• Ask - Tell & Partner - Ask
• Name emotions
• Empathize & Listen
• Hope for the best & Plan for the worst
• Identify Goals, Priorities & Plans

End of Life Care for the patient with Heart Failure
Current Hospice Criteria for HF:
-NYHA Class IV Symptoms despite optimal medical management, or refuses/does not tolerate optimal medical management
-NYHA Class III Symptoms with co-morbidities
-Physician estimate that death likely in 6 months
### Determining Prognosis in the HF patient

**Stevenson LW, Rose EA, Circulation 2003**

<table>
<thead>
<tr>
<th>Potential Populations for Support</th>
<th>Estimated 50% Mortality</th>
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<tbody>
<tr>
<td>• Acute cardiogenic shock</td>
<td>Imminent</td>
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<tr>
<td>• Chronic CHF into low output state with organ dysfunction</td>
<td>1 month, without reversible factors</td>
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<tr>
<td>• CHF Class IV inotrope-dependent</td>
<td>3-6 months</td>
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<tr>
<td>• CHF IV ACEI-intolerant due to symptomatic hypotension or progressive renal dysfunction</td>
<td>About 6 months</td>
</tr>
<tr>
<td>• Class IV on ACEI therapy Plus additional risk factors, e.g.</td>
<td>? 6-12 months</td>
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<tr>
<td>- Cachexia</td>
<td></td>
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<td>- Peak oxygen uptake &lt; 10 ml/kg/min</td>
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<tr>
<td>- Hyponatremia</td>
<td></td>
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<tr>
<td>- Progressive renal dysfunction</td>
<td></td>
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<tr>
<td>• CHF IV on oral therapy including ACEI</td>
<td>± 12 months</td>
</tr>
<tr>
<td>• Class IV stabilized to Class III</td>
<td>&gt; 24 months</td>
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**Prognosis Approximately 6-12 months or less:**
Symptomatic HF (NYHA III) WITH:
- frailty (walking speed 5m/ >6sec)
- >3 ADL deficits or decline in 1 ADL/past year
- HF Hospitalizations: 4 age <65 or >3 age >85
- Cancer
- COPD+; Dementia+; Chronic kidney dis. +

**Ventricular Assist Device with:**
- Device Malfunction & replacement inadvisable
- Sepsis
- Stroke (disabling)
- Patient chooses to discontinue VAD at home
- High Surgical Risk
- Adverse outcome of VAD or other cardiac surgery

**Advanced HF based on True NYHA IV on all appropriate treatments WITH:**
- BNP>500 compensated/>1000 decompensated
- Na+ <135
- Cachexia (BMI<22.5 w/ 5% wt loss/6mos)
- On Continuous Home Inotropes
<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
<th>Phase 5</th>
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<tbody>
<tr>
<td><strong>NYHA classification</strong></td>
<td>II-III</td>
<td>II-IV</td>
<td>III</td>
<td>IV</td>
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<tr>
<td><strong>Heart Failure Care &amp; Interventions</strong></td>
<td>• Identify Etiology of HF</td>
<td>• Spironolactone if NYHA Class III-IV</td>
<td>• Reevaluate medication and compliance</td>
<td>• Evaluate for Heart transplant</td>
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<td></td>
<td>• Eliminate precipitating factors and causative conditions</td>
<td>• Digoxin if NYHA Class III-IV &amp; LVEF&lt;35%</td>
<td>• Reevaluate for precipitating factors, &amp; coexistent conditions²</td>
<td>• Evaluate for destination LVAD</td>
</tr>
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<td></td>
<td>• Diuretics→euvoemia</td>
<td>• Hydralazine-nitrates?</td>
<td>• Diuretics→euvoemia</td>
<td>• Metilculous fluid management</td>
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<td></td>
<td>• ACE Inhibitor</td>
<td>• Evaluate &amp; treat for sleep-disordered breathing</td>
<td></td>
<td>• Inotrope trial if hypotensive &amp; volume-overloaded (LVSD)</td>
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<td></td>
<td>• B-blocker</td>
<td>• ICD if EF&lt;35% &amp; defibrillation desired for SCD</td>
<td></td>
<td>• Intravenous nitrates-hydralazine?</td>
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<tr>
<td></td>
<td>• Evaluate for coexistent conditions ¹</td>
<td>• CRT or CRT/D?</td>
<td></td>
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<td><strong>Decision-making</strong></td>
<td>• Preferences for CPR /defibrillator</td>
<td>• Defibrillator for primary prevention of SCD?</td>
<td>• Urgent care decisions using MD best judgment or clear patient preferences</td>
<td>• Candidate for transplant or destination VAD?</td>
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<td>• Durable power of attorney for health care or proxy</td>
<td>• Durable power of attorney for health care or proxy decision-maker</td>
<td>• Are advanced or invasive therapies indicated?</td>
<td>• Is Palliative care appropriate?</td>
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<td>• General goals for care, preferences for unacceptable health states</td>
<td>• Are advanced therapies consistent with patient preferences?</td>
<td>• Does patient benefit from inotrope infusion?</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• Review Preferences for CPR /defibrillator</td>
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<td><strong>Supportive Care Communication</strong></td>
<td>• Understand patient concerns and fears</td>
<td>• Elicit symptoms and assess QOL</td>
<td>• Elicit symptoms &amp; QOL</td>
<td>• Elicit symptoms</td>
</tr>
<tr>
<td></td>
<td>• Identify life-limiting nature of HF</td>
<td>• Elicit symptoms and assess QOL</td>
<td>• Elicit symptoms &amp; QOL</td>
<td>• Acknowledge present status</td>
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<td></td>
<td>• Elicit preferences for care in emergencies or sudden death &amp; for information and role in decision-making</td>
<td>• Reevaluate resuscitation preferences for care in emergencies</td>
<td>• Elicit values &amp; reevaluate preferences</td>
<td>• Elicit preferences and re-set goals of care</td>
</tr>
<tr>
<td></td>
<td>• Elicit symptoms and assess QOL</td>
<td>• Set goals for care</td>
<td>• Identify present status &amp; likely course(s)</td>
<td>• Identify worries</td>
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<td>• Identify coping strategies</td>
<td>• Re-evaluate goals of care</td>
<td>• Review appropriate care options &amp; likely course with each</td>
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<td>• Re-Educate about sodium, weight and volume status</td>
<td>• Re-Educate about sodium, weight and volume status, medication compliance</td>
<td>• Explore suitability and preferences about surgery or devices</td>
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<td>• Plan after death (care of the body, notifications, memorials, burial)</td>
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² Coexistent conditions: Atrial Fibrillation with uncontrolled rate, Sleep-disordered breathing, Anemia, Physical frailty, Co-existent pulmonary disease
### B. Education

- Patient & family self-management (sodium, weight and volume)
- Diet, exercise
- HF course including sudden death & options for management
- What to do in an emergency
- Review self-management
- Review what to do in an emergency
- Symptom management
- Eliminate NSAIDs
- Optimal management for given care approach
- Interventions for deterioration in status
- What to do in an emergency
- Likely course & plans for management of events
- Symptom management
- What to do for worsened or change in status
- What to do when death is near & at the time of death

### C. Psychosocial issues and spiritual issues

- Coping with illness
- Insurance and financial resources:
  - medications and regarding loss of income
  - Emotional and spiritual support
- Roles and coping for patient and family
- Emotional support
- Spiritual support
- Social interaction
- Evaluate both patient & family anxiety, distress, depression, impaired cognition
- Family stresses and resources
- Reevaluate patient & family needs
- Caregiver education & assistance with care
- Evaluate Cognition & initiate compensation
- Insurance coverage
- Reevaluate stresses, needs & support patient & family
- Address spiritual & existential needs
- Support coping with dying
- For both patient & family:
  - Address anxiety, distress, depression
  - Address spiritual & existential needs, concerns regarding dying
  - Anticipatory grief support
  - Assist in care provision
  - Post-death bereavement

### D. Symptom management

- HF medications for dyspnea
- Exercise / endurance training for fatigue
- Antidepressant for depression (check Na+ with SSRIs)
- Local treatment &/or opioids for pain
- Identify new or worsened symptoms
- CPAP/O2 for sleep-disordered breathing
- Exercise program (Lower Extremity strengthening)
- Local treatment &/or opioids for pain
- SSRI or tricyclic or stimulant for depression
- Oxygen for dyspnea; consider opioids for acute relief of dyspnea
- Lower Extremity strengthening for dyspnea/fatigue
- CPAP/O2 for sleep-disordered breathing
- Local treatment &/or opioids for pain
- SSRI or tricyclic or stimulant for depression
- Oxygen for dyspnea
- Opioids for dyspnea
- Lower Extremity & inspiratory strengthening
- CPAP/O2 for sleep-disordered breathing
- Local treatment &/or opioids for pain
- Benzodiazepines/counseling for anxiety
- Stimulant for depression
- Oxygen for dyspnea
- Opioids for dyspnea & pain
- Oxygen for dyspnea
- Stimulants for fatigue
- Benzodiazepines/counseling for anxiety
- Lower extremity strengthening for fatigue & dyspnea
- CPAP/O2 for sleep-disordered breathing
- Stimulant for depression
## Practical Terminology and Approaches to Discussing Goals of Care with Symptomatic HF Patients

Questions confronted in talking with heart failure patients about prognosis and dying From Goodlin, Quill & Arnold JCF 2008

<table>
<thead>
<tr>
<th>Questions</th>
<th>Approaches</th>
<th>Examples of language</th>
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<tbody>
<tr>
<td>How should topic be initiated?</td>
<td>Follow a “bad news” conversation; ask the patient or family for their impression</td>
<td>“I’d like to talk with you about your HF. How do you feel you’re doing right now?”</td>
</tr>
<tr>
<td>How should uncertain prognosis be presented?</td>
<td>Uncertainty should be identified and normalized</td>
<td>“Like many things in life, we don’t know what will happen”</td>
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<td></td>
<td>Present average lengths of life, with the possibility for exceptions in both directions.</td>
<td>“The average person with your degree of HF will live 6-12 months. Some will live longer, and we will do all we can so that you will, but some live shorter, so we need to make sure you have made preparations for that possibility.”</td>
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<td></td>
<td>Make recommendations in a “hope for the best, prepare for the worst” form.</td>
<td>“What do you hope for at this point?… but in case things don’t go as we both hope, what things should you do now to prepare yourself and your family?”</td>
</tr>
<tr>
<td>How should a clinician talk about dying with a patient?</td>
<td>1. Early in care, HF should be acknowledged as a disease people die from, but a dichotomy should be set up that allows hope for good quality of life with good management of diet and treatments.</td>
<td>“People do die from HF or from other illnesses while they have HF, but with medications and careful management of your diet and fluids we hope you will feel well and live many years”</td>
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<td></td>
<td>2. Patient’s fears and concerns should be addressed and normalized.</td>
<td>“What are your concerns and fears?” “Many people would worry about what to expect” “If you were to die sooner rather than later, would there be things you would regret not having done?”</td>
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<td></td>
<td>3. When death is likely, this bad news should be presented to the patient and family with a plan or options for care.</td>
<td>“I am afraid I have bad news. Your heart failure has worsened At this point many people die within the next year or two. We can offer you treatment which won’t prolong your life, but may help you feel better. We need to make plans about your care, so we need to understand what is important to you now....”</td>
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<td>4. Acknowledge emotions encountered</td>
<td>“This is a sad topic”; “I can see you are upset”</td>
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<tr>
<td>Should information be framed as ‘length of life’ or ‘time to death’ or both?</td>
<td>Patients should be asked what information is important to them. To be best prepared, most people eventually need to hear both parts of this equation.</td>
<td>“I’d like to talk with you about your HF and what to expect. What information would you like to know?”</td>
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<td></td>
<td>For patients who wish specific information provide an estimate in a range of time, or data from relevant clinical trials</td>
<td>“Although no one knows for sure, I can make some estimates about averages, though there are exceptions in both directions…”</td>
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<td></td>
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<td>“days to weeks”, “weeks to months” “months to a year or more”</td>
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<td>“in one recent study of advanced HF patients, over one year five percent (1/20) died suddenly, 1/20 died from problems not related to their HF, and another 1/12 died from worsened HF”</td>
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