Clinical Implications of Aging in Heart Failure Management

Regional Geriatrics Rounds
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Case for Action

- Heart Failure is...
  - Progressive disease affecting more than 1.5 million Canadians
  - Leading cause of morbidity and mortality
  - Leading cause of hospitalizations among adults > 65 years
  - Major contributor to increasing health care costs
  - Growing burden with the incidence and prevalence expected to double by 2030
HF Prevalence in Canada

Projected number of incident hospitalizations for CHF patients, using high, medium and low population growth projections in Canada 1996-2050

HF Admissions in the Elderly are a Growing Concern
Outline of Discussion

• Diagnostic challenges in HF and the elderly

• Medical management of HF
  – Diastolic dysfunction
  – Diuretic strategies
  – Role of devices in HF
  – Home Monitoring for HF
  – Transitional care
  – Issues in palliative care
The Prevalence of HF Increases with Age

- 40-59 years: 1.4% women and 1.9% men
- >80 years: 13% women and 15% men

Why?
- Increased risk factors
  - Diabetes, HTN
- Increased incidence of MI with age
- Increased survival from incident MI
Heart Failure Mortality Increases Significantly with Age

- Canada’s average annual in-hospital mortality rate is:
  - 9.5 deaths/100 hospitalized patients >65 years of age
  - 12.5 deaths/100 hospitalized patients >75 years of age

- HF patients have a poor prognosis, with an average 1-year mortality rate of 33%

<table>
<thead>
<tr>
<th>Age</th>
<th>Median Survival</th>
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</thead>
<tbody>
<tr>
<td>67-74</td>
<td>2.3-3.6 years</td>
</tr>
<tr>
<td>75-84</td>
<td>1.7-2.6 years</td>
</tr>
<tr>
<td>&gt;85</td>
<td>1.1-1.6 years</td>
</tr>
</tbody>
</table>

Croft JD; Arch Int Med 1999; 159:505
Hospitalization changes the Natural History of HF

- CMS data on 423,000 HF discharges
  - 30 day mortality: 11.1%
  - 1 year mortality: 30%
- Ambulatory FC III patient
  - 1 year mortality: 10%
Diagnosis of heart failure
Why is my elderly cardiac patient short-of breath?

**Cardiac**
- Left heart failure (pulmonary edema)
  - Left ventricular dysfunction
  - Exercise induced worsening valve disease
- Poor cardiac output and contractile reserve
- Pulmonary hypertension
- Ischemia equivalent

**Non-cardiac**
- Deconditioning
- Anemia
- Pulmonary disease
- Etc. Etc.
Diagnosis of HF

Increased filling pressures

Congestion

• Orthopnea
• S3
• Ascites, abnormal HJR
• Elevated JVP
• Edema
• Rales (uncommon)

Poor Cardiac Output

• Narrow pulse pressure
• Pulsus alternans
• Cool extremities
• Mental confusion
• ACE-related hypotension
• Worsening renal function
• Decreasing serum sodium

Poor Perfusion
Symptoms of congestion – Tip of the iceberg

- Shortness of breath
- Fluid retention
- Increased filling pressures
- Pulmonary hypertension
- Increased wall stress
- Worsening valvular regurgitation

- Increased filling pressures
- Pulmonary hypertension
- Increased wall stress
- Worsening valvular regurgitation
Special Attributes of HF Symptoms in the Elderly

- Dyspnea on exertion
- Dyspnea at rest
- Orthopnea
- Cough – may be only early symptom
- Edema – less sensitive in elderly
- Weight gain
- Nocturia – rule out prostate disorder, DM, UTI
- Angina – may be atypical or absent
- Mental status changes – more challenging to determine
HF Presentations in Elderly

- Elderly HF patients in DIG Trial (mean age 73 yrs)
  - >95% had dyspnea on exertion
  - >65% dyspnea at rest

- Dyspnea at rest – high sensitivity (92%) and low specificity (19%) for HF diagnosis in elderly

- Most common early HF symptom:
  - Dyspnea or fatigue on exertion
  - Edema
Clinical Presentation of Decompensated HF

- Hypertension and acute pulmonary edema: 10-20%
- Hypotension and markedly low CI: <10%
- Gradual worsening of symptoms: 60-80%
  - less pulmonary congestion and more edema or weight gain
  -> 70% ADHF is worsening chronic HF
  - 50% of these patients may have SBP > 140
Etiology: Variations in HF in the Elderly

>65 yrs of age

Hogg, JACC 2004; 43:317
Etiology of HF in Elderly

- HTN and CAD
  - Most common cause of HF at all ages
  - Cohort of patients >65 yrs
    - Incidence of HF over 5 yrs
    - 87% increased risk if CAD and 37% if HTN

- Evaluate for other cardiac co-morbidities
  - DM
  - CKD
  - Valvular disease
  - Atrial fibrillation
HF is not a stand-alone disease

- 2/3 of HF patients have >2 noncardiac comorbidities
- 25% have greater than 6 diseases
- Concomitant disease in the elderly
  - Renal dysfunction
  - Anemia
  - COPD
  - Depression
  - Arthritis
  - Sensory and nutritional disorders
Higher LVEF decreases the risk of death

Data derived from CHARM patients (n=7599). Median follow-up of 38 months.
Mortality in HF Increases With Worsening NYHA Classification

- Worse NYHA classification associated with an increased risk of death

Adjusted Hazard Ratios for All-Cause Mortality

<table>
<thead>
<tr>
<th>NYHA Class</th>
<th>Adjusted HR</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class II</td>
<td>1.54</td>
<td>0.042</td>
</tr>
<tr>
<td>Class III</td>
<td>2.56</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Class IV</td>
<td>8.46</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

P vs Class I HF.
Data derived from DIG patients (n=988). Median follow-up of 38.5 months.
Ahmed A et al. *Am Heart J* 2006;151:444-50
Biomarkers in Prognosis

J Am Coll Cardiol 2004; 43:635
Key Prognostic Variables

- ADHERE registry
  - >65,000 ADHF discharges
- 32 key variables included in model
- Best single predictor of mortality
  - BUN > 15.3 mmol/L (43 mg/dL)
- Also
  - Admission SBP < 115 mmHg
  - Serum creatinine > 243 umol/L (2.75 mg/dL)

JAMA 2005; 293:572
Key Prognostic Variables

Low SBP
High BUN
High creatinine

Low SBP
High BUN
Low SBP
High BUN

JAMA 2005; 293:572
DIAGNOSIS OF HEART FAILURE

Screen high risk populations:
- Known CAD or previous MI
- DM (12% patients with DM have HF; 30% patients with HF have DM)
- Chronic Kidney Disease (CKD)
- Alcoholism
- Obesity (each 1-unit increase in BMI increases risk of HF by 5% (7% in women))
- Personal or family history of cardiomyopathy
- Recently discharged from hospital with HF or other cardiac reason for admission

Signs and symptoms of Heart Failure Include:
- Exertional dyspnea and/ or fatigue
- Dependent edema
- Orthopnea/ PND
- Crackles
- New or increased murmur
- Elevated JVP

If Heart Failure is suspected, consider the following diagnostic tests:
- ECG
- Chest x-ray
- CBC, Creatinine, Electrolytes
- Echocardiogram (include ejection fraction)
- BNP if available

It is unlikely to be HF if all of the following criteria are met:
- Normal echocardiogram
- Normal JVP
- No fluid retention: no peripheral edema, no abdominal bloating
- No crackles

It is probably HF if any of the following criteria are met:
- Any history of cardiomyopathy
- Orthopnea, PND
- Increased JVP
- Positive echo:
  - Abnormal EF, or
  - Grade II to IV diastolic dysfunction, or
  - Moderate to severe valve abnormality.
- Positive chest x-ray:
  - Evidence of pulmonary edema; or
  - Enlarged heart.

Diagnosis of HF needs further clarification if:
- Progressive, unexplained symptoms
- Patient has risk factors for HF (see box above) but does not meet other diagnostic criteria
- Credible alternative diagnoses exist
- Echocardiogram shows:
  - Grade I or mild diastolic dysfunction;
  - Wall motion abnormality; or
  - Any mild valve abnormality.

- Identify and manage risk factors
- Follow symptomatology at appropriate intervals.
- Patient education: monitor for symptoms, dietary sodium precautions

BNP = B-Type natriuretic peptides
CAD = coronary artery disease
CBC = complete blood count
DM = Diabetes Mellitus
Management Issues in the elderly patient with HF
The Heart Failure Continuum

Risk Factors
- Hypertension
- Dyslipidemia
- Diabetes
- Smoking
- Family History

Atherosclerosis
- CAD
- LVH
- Myocardial ischemia
- Myocardial infarction

Coronary thrombosis
- Arrhythmia
- Dilatation and remodeling
- HF Spectrum
- HF PSF
- Systolic HF
- End stage heart disease

Decreased QOL
Hospitalizations
Death
**STAGE A**
High risk but no structural heart disease

- HTN, ASCD
- DM, obesity
- FH
- Cardiotoxins
  - Treat HTN, lipids
  - Smoking cessation
  - ACE or ARB if appropriate

**STAGE B**
Structural heart disease but no symptoms

- Previous MI
- LVH, low EF
- Valvular disease
  - ACE or ARB
  - BB

**STAGE C**
Current or prior symptoms HF

- Structural disease plus symptoms
  - Routine: ACE, BB and diuretics
  - Selected: aldosterone agents, ARBs, dig, nitrates
  - Devices: CRT/ICD

**STAGE D**
Refractory HF

- Marked symptoms despite maximal meds
- Hospitalized
  - End of life
  - MCS
  - Transplant
ACC/AHA STAGES OF HEART FAILURE

STAGE A
• High risk for developing HF (diabetes, CKD, HTN)
• No structural disorder of the heart

STAGE B
• Structural disorder of the heart (e.g., Previous MI)
• Not yet developed symptoms of HF

STAGE C
• Past or current symptoms of HF
• Symptoms associated with underlying structural heart disease

STAGE D
• End stage disease
• Requires specialized treatment strategies

NYHA FUNCTIONAL CLASS

CLASS I
• No symptoms and no limitations in physical activity
• No shortness of breath when walking, climbing stairs etc.

CLASS II
• Mild symptoms and slight limitation during ordinary physical activity

CLASS III
• Marked limitation in activity due to symptoms (fatigue, shortness of breath) with less than ordinary activity (e.g., Short distances or ADL’s)

CLASS IV
• Severe limitation, may experience symptoms at rest

INCREASING SEVERITY OF HEART FAILURE
Severe symptoms: refer to specialist, ER or HF clinic

If EF > 40%: treat cause (HTN)

If EF < 40% intolerant

ACE I + Beta blocker

Titrate to target doses

Prescribe ARB
Consider nitrates

Clinically stable

NYHA III

• Add ARB
• Digoxin or nitrates

Class IIIb-IV

If QRS > 120, consider CRT

If EF < 35% consider ICD

• Combo diuretics
• Spironolactone

Education

Risk factor reduction

Fluid/salt regimen

Can J Cardiol 2007; 23
OPTIMIZATION OF MEDICAL THERAPY
### Aging Associated Physiological Changes that Affect Pharmacodynamics

<table>
<thead>
<tr>
<th>Physiological Change</th>
<th>Pharmacodynamic Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased cardiac reserve</td>
<td>Potential for HF with CCB</td>
</tr>
<tr>
<td>Decreased LV compliance from increased wall thickening, blood viscosity and aortic compliance</td>
<td>Decreased cardiac output with BB</td>
</tr>
<tr>
<td>Decreased baroreceptor sensitivity</td>
<td>Orthostatic hypotension with vasodilators such as nitrates and alpha blockers</td>
</tr>
<tr>
<td>Increased sensitivity to anticoagulants</td>
<td>Increased coumadin effect</td>
</tr>
<tr>
<td>Concurrent illnesses and associated usage of multiple drugs</td>
<td>Drug-disease and drug-drug interactions</td>
</tr>
<tr>
<td>Sinus and AV node dysfunction</td>
<td>Potential for heart block with CCB and BB</td>
</tr>
</tbody>
</table>

*Fleg, Nature Reviews Cardiol 2011;8:13*
Principles of Initiating Medical Therapy

Control fluid balance

**EF <40%**
- Elevated resting heart rate?
- Atrial fibrillation?
- Angina?
  - Start with beta blocker
  - Add in ACE inhibitor
  - Still symptomatic? (FC III or greater)
    - Referral to HFC/cardiology
    - Addition of digoxin or spironolactone

**EF >40%**
- Elevated blood pressure?
- Symptomatic vascular disease?
- Concerns with beta blockers?
  - Start with ACE inhibitor
  - Add in beta blocker
  - Management diastolic HF
Beta Blockers

MERIT HF Study

Beta Blockers and Functional Class

SOLVD-P

US CARVEDIOL TRIAL

Evaluating the Evidence for the Elderly

- Most BB trials included patients up to 80 years of age
- Meta analysis of 5 studies with focus on mortality in elderly
  - Similar mortality benefit when <65 yrs compared to >65 years
- One RCT of patients >70 years\(^1\)
  - Nebivolol (B1 selective)
  - Reduced death or CV hospitalization by 14%
- Caution for CI
  - Conduction system, obstructive lung disease
  - Initiate slow with gradual titration

Flather M, Eur Heart J 2005;215; Dulin Am J Cardiol 2005; 95:896
Are beta blockers used less in elderly?

Multiple registries report use in elderly of 34-57% (compared to 50-80%)

Less use with GP management
Beta Blocker use in Elderly

- Are elderly patients less likely to tolerate BB?
- MERIT-HF
  - Subgroup of elderly patients tolerated well
- SENIORS
- Caution:
  - Randomized elderly patient vs. Real world
New Therapy for HF?: SHIFT: Hazard ratios for primary and individual outcomes, ivabradine vs placebo groups

<table>
<thead>
<tr>
<th>Outcomes in SHIFT</th>
<th>Ivabradine, n=3241 (%)</th>
<th>Placebo, n=3264(%)</th>
<th>HR (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV death or HF hospitalization</td>
<td>24</td>
<td>29</td>
<td>0.82 (0.75–0.90)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Death from heart failure</td>
<td>3</td>
<td>5</td>
<td>0.74 (0.58–0.94)</td>
<td>0.014</td>
</tr>
<tr>
<td>HF hospitalization</td>
<td>16</td>
<td>21</td>
<td>0.74 (0.66–0.83)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>CV death, HF hospitalization, or admission for nonfatal MI</td>
<td>25</td>
<td>30</td>
<td>0.82 (0.74-0.89)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

ACE Inhibitors and Survival

CONSENSUS Trial Study Group, N Engl J Med 1987; 316:1429
meta-analysis of five trials involving 12,763 patients

Evaluating the Evidence for the Elderly

• Mortality benefit seen in those above and below 70 years of age

• Favorable effects demonstrated in elderly

• Should be initiated in all patients with systolic HF
  – Unless advanced CKD or other CI

• Practical Tips
  – Do not initiate when decompensated or volume deplete
  – Lower doses may be as effective as higher doses
  – Essential to monitor cr and K
When to Use Aldosterone Blockers?

Patients with LVEF $\leq 30\%$ and severe symptoms despite optimized other therapies (Class I, Level B)


Eplerenone in Patients with Systolic Heart Failure and Mild Symptoms

- 2737 patients with FC II HF, EF <35%
- Eplerenone 50 mg vs. Placebo
- Median 21 month f/u

<table>
<thead>
<tr>
<th>Device therapy — no. (%)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Implantable cardioverter–defibrillator</td>
<td>178 (13.0)</td>
<td>184 (13.4)</td>
</tr>
<tr>
<td>Cardiac-resynchronization therapy</td>
<td>38 (2.8)</td>
<td>22 (1.6)</td>
</tr>
<tr>
<td>Implantable cardioverter–defibrillator with cardiac resynchronization</td>
<td>74 (5.4)</td>
<td>99 (7.2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medication — no. (%)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Diuretic</td>
<td>1150 (84.3)</td>
<td>1176 (85.7)</td>
</tr>
<tr>
<td>ACE inhibitor</td>
<td>1068 (78.3)</td>
<td>1057 (77.0)</td>
</tr>
<tr>
<td>ARB</td>
<td>262 (19.2)</td>
<td>267 (19.4)</td>
</tr>
<tr>
<td>ACE inhibitor, ARB, or both</td>
<td>1282 (94.0)</td>
<td>1275 (92.9)</td>
</tr>
<tr>
<td>Beta-blocker</td>
<td>1181 (86.6)</td>
<td>1193 (86.9)</td>
</tr>
<tr>
<td>Digitalis glycosides</td>
<td>363 (26.6)</td>
<td>377 (27.5)</td>
</tr>
<tr>
<td>Antiarrhythmic drug</td>
<td>196 (14.4)</td>
<td>192 (14.0)</td>
</tr>
<tr>
<td>Antithrombotic drug (antiplatelet or oral anticoagulant)</td>
<td>1205 (88.3)</td>
<td>1214 (88.4)</td>
</tr>
<tr>
<td>Lipid-lowering agent</td>
<td>857 (62.8)</td>
<td>856 (62.3)</td>
</tr>
</tbody>
</table>

Zannad et al NEJM 2010
EMPHASIS-HF: Major results

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Eplerenone (%)</th>
<th>Placebo (%)</th>
<th>Adjusted hazard ratio (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular death/heart-failure hospitalization</td>
<td>18.3</td>
<td>25.9</td>
<td>0.63 (0.54–0.74)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cardiovascular death</td>
<td>10.8</td>
<td>13.5</td>
<td>0.76 (0.61–0.94)</td>
<td>0.01</td>
</tr>
<tr>
<td>Heart-failure hospitalization</td>
<td>12.0</td>
<td>18.4</td>
<td>0.58 (0.47–0.70)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hospitalization for hyperkalemia</td>
<td>0.3</td>
<td>0.2</td>
<td>1.15 (0.25–5.31)</td>
<td>0.85</td>
</tr>
</tbody>
</table>

- 37% reduction in composite endpoint
- 24% reduction in CV death
- 42% hospitalization for HF

Zannad; New Engl J Med 2010
Figure 1. Rate of Prescriptions for Spironolactone among Patients Recently Hospitalized for Heart Failure Who Were Receiving ACE Inhibitors.

Figure 2. Rate of Hospital Admission for Hyperkalemia among Patients Recently Hospitalized for Heart Failure Who Were Receiving ACE Inhibitors.
Risks of Hyperkalemia

- Addition of spironolactone
  - One third patients labs followed
  - 24% incidence in hyperkalemia (>5.2)
  - 12% incidence in severe hyperkalemia (>6)

- Recommendations
  - No double therapy if Cr>178 umol/l or eGFR<30 mls/min or K>5
  - Caution if GFR 30-45 ml/min or K 4.5-4.9
  - Patients at highest risk – elderly, history of hyperkalemia or DM

*J Am Coll Cardiol 2003;41*
Evaluating the Evidence for the Elderly

- Trials excluded patients with creatinine > 180 or k > 5.0

- Elderly may be more susceptible to effects of over diuresis
  - prerenal azotemia, hypotension and dehydration
HF with Preserved Ejection Fraction
Case #1: The Diastolic Dilemma

- Mr JD 82 year old male
- History of angina
- DM, HTN, chronic AF
- Chronic kidney disease (Cr 140-170)
- PVD
- Active smoker – history of COPD
- Progressive SOB over 6 months, 15 pound weight gain
Case #1: Mr. JD

- **Exam:**
  - Weight 102 kg
  - BP 180/70 HR 90
  - JVP 9 cm
  - Chest clear
  - Peripheral edema to knees

- **Medications**
  - Coumadin
  - ASA
  - Norvasc 5 mg daily
  - NTG patch 0.4 mg/hr
  - Lasix 40 mg bid
  - Metoprolol 25 mg bid
Case #1: Mr. JD

- **CXR:**
  - Mild vascular redistribution

- **Labs:**
  - Cr 170, K 3.8, Hb 115

- **Echo:**
  - Normal LV systolic function, mild TR and MR, biatrial enlargement

- **What are options?**
  - Increase lasix
  - Increase beta blocker
  - Add digoxin
  - Add diltiazem
Case #1: Mr. JD

- Lasix increased
- 10 pounds weight lost initially then plateau
- Persistent SOB
- Cr now 190
- Admit for further diuresis
- Refer to nephrology
- Repeat CXR
- Increase beta blocker
Case #1: Mr. JD

- Repeat Exam
  - Difficult to see JVP
  - Edema slightly improved
- Lasix dose maintained
- Beta blocker increased

* Returns to office one month later
  - Rate now 70-80
  - SBP 170
  - SOB improved
  - Persistent mild edema
HF with Preserved Ejection Fraction (HF-PEF)

- Diabetes
- CKD
- HTN
- Obesity
- Sleep apnea
Managing HF with Preserved Systolic Function

- Control systolic and diastolic BP
- Control ventricular rate
- Rhythm control if persistent symptoms
- Rule of precipitating causes
  - diet indiscretion
  - Worsening HTN
  - Ischemia
- Medical therapy
  - ACE I and ARB
  - Beta blockers
  - Cautious diuretics
Beta Blockers in Elderly Diastolic HF

- Prospective observational study
- Mean age 78 yrs (56% female, 33% FC IV)
- Propensity matched analysis: BB use had 43% reduction in mortality

Dobre Eur J Heart F 2007; 9:280
Diuretic Strategies

- IV Essential for ADHF (Class I level B)
- Restore volume by increasing excretion of Na and water
- Loop diuretics are first line
- Rapid reduction in fluid overload and relief of symptoms
Intravenous Diuretics

- Initial dose should be double maintenance dose
- Continuous infusions may be more effective than large bolus doses
- Associated with hypotension, renal dysfunction and neurohormonal abnormalities
Diuretic Dose and Outcome

Eshaghian, Am J Cardiol 2006;97:1759
Practical Issues with Diuretics

- Active patient involvement essential
  - Daily weights and fluid/Na restriction
  - Refer challenging cases to HF clinic

- Develop titration guides
  - Criteria for increasing dose (>3 pounds)
  - Re-check electrolytes and creatinine within a week of any adjustment
  - Attempt short-term increases
How do I manage diuretic resistance?

- Re-evaluate patient compliance
- Sparing use of thiazide diuretics
- Double doses to maximum of 120 mg bid
  - Re-consider diagnosis
  - Consider admission for IV therapy
  - Evaluate level of ‘perfusion’
Device based therapy
Case 2: Device Based Therapy in the Elderly

- 74 year old male
- Advanced CAD – CABG in 1989, multiple PCIs, last 3 years ago – nonoperable CAD
- DM
- PVD
- CKD with baseline CR 150-180
- EF 20% with moderate MR and TR
- FC III with 2 admissions for HF last 6 months
Case 2: Mr. BL

At presentation:

- Admitted for progressive SOB
- Responded to IV diuresis
- Creatinine now 190
- Systolic BP 90
- Current medications
  - Metoprolol 12.5 mg bid
  - Lasix 80 mg bid
  - NTG patch 0.4 mg/hr
  - ASA, plavix
  - ACE I on hold

ECG
- Sinus with 1st degree AVB
- LBBB with QRS duration 160 msec

Echo
- Severe LV dysfunction, akinetic anterior wall
- Mod MR and TR with moderate pulm HTN
Case 2: Mr. BL

What are the options?

- Continue with current regimen
- Refer for transplant
- Refer for device?
  - ICD
  - CRT
  - ICD/CRT
- Consult palliative care
Devices in Heart Failure

ICD

- Class I:
  - Patients with *ischemic heart disease* with or without mild-to-moderate heart failure symptoms and LVEF of 30% or less, measured at least one month postmyocardial infarction and at least three months post coronary revascularization procedure (CABG or PCI).

- Class IIa:
  - *Nonischemic cardiomyopathy* with EF <30% after 9 months

- Class IIb:
  - Ischemic or nonischemic cardiomyopathy with EF 30-35%

Cardiac Resynchronization

- Class I:
  - Ischemic or nonischemic cardiomyopathy with following:
    - LVEF <35%
    - QRS duration >130 msec
    - FC III or greater despite adequate medical therapy
ICD Therapy

Continuous arrhythmia monitoring
Provides anti-tachycardia pacing
Cardiac defibrillation
Atrial-ventricular pacing
Shock Only ICD Trials – Mortality Benefits

MADIT II

Shock Only ICD Trials – Mortality Benefits

<table>
<thead>
<tr>
<th>Mortality Rate</th>
<th>Hazard Ratio (97.5% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amiodarone vs. placebo</td>
<td>1.06 [0.86-1.30]</td>
<td>0.53</td>
</tr>
<tr>
<td>ICD therapy vs. placebo</td>
<td>0.77 [0.62-0.96]</td>
<td>0.007</td>
</tr>
</tbody>
</table>

SCD HeFT
Death from any cause

Amiodarone (240 deaths, 5-yr event rate, 0.340)

ICD therapy (182 deaths, 5-yr event rate, 0.289)

Placebo (244 deaths, 5-yr event rate, 0.361)

Do Elderly Patients Benefit from an ICD?

- 1395 primary prevention ICD patients
- Mean EF 28%
- 68% ischemic and 79% male
- 14% were >75 years

vanRees; Europace 2011
ICD Therapy and Age

**Follow-up (Years)**

<table>
<thead>
<tr>
<th>Age group</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &lt;65 years</td>
<td>705</td>
<td>597</td>
<td>428</td>
<td>320</td>
<td>228</td>
<td>143</td>
</tr>
<tr>
<td>Age 65-74 years</td>
<td>493</td>
<td>389</td>
<td>267</td>
<td>171</td>
<td>109</td>
<td>69</td>
</tr>
<tr>
<td>Age ≥75 years</td>
<td>197</td>
<td>158</td>
<td>97</td>
<td>65</td>
<td>42</td>
<td>21</td>
</tr>
<tr>
<td>Total population</td>
<td>1395</td>
<td>1143</td>
<td>790</td>
<td>554</td>
<td>377</td>
<td>231</td>
</tr>
</tbody>
</table>

**Death (%)**

- Age <65 years
- Age 65-74 years
- Age ≥75 years
- Total population

**Follow-up (Years)**

<table>
<thead>
<tr>
<th>Age group</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &lt;65 years</td>
<td>705</td>
<td>546</td>
<td>377</td>
<td>275</td>
<td>193</td>
<td>113</td>
</tr>
<tr>
<td>Age 65-74 years</td>
<td>493</td>
<td>368</td>
<td>242</td>
<td>151</td>
<td>92</td>
<td>25</td>
</tr>
<tr>
<td>Age ≥75 years</td>
<td>197</td>
<td>145</td>
<td>86</td>
<td>58</td>
<td>36</td>
<td>17</td>
</tr>
<tr>
<td>Total population</td>
<td>1395</td>
<td>1056</td>
<td>703</td>
<td>482</td>
<td>318</td>
<td>183</td>
</tr>
</tbody>
</table>
Do Elderly Patients Benefit from an ICD?

<65 years old cohort

- Cumulative incidence of appropriate therapy 36%
- Shocks 19%
- Overall one year mortality 11%
- Following appropriate shock: 16% died at one year

>75 years old

- Cumulative incidence of therapy 28%
- Shocks 13%
- One year mortality 30%
- Following appropriate shock: 35% patients died at one year

vanRees; Europace 2011
Are ICD implants more risky in the elderly?

- No difference in rates of:
  - Infection (<5%)
  - Lead failure (10%)
  - Lead dislodgement (4%)

- Less inappropriate shocks in elderly (5 vs. 15%)

vanRees; Europace 2011
Cardiac Resynchronization Therapy
Cardiac Resynchronization Therapy

COMPANION — Time to Primary Endpoint

- Event-free survival (%)
- Days after randomization
- Pacemaker-defibrillator (414 events, $p=0.014$)
- Pacemaker (390 events, $p=0.010$)
- Pharmacologic therapy (216 events)

COMPANION — Death from/or Hospitalization for HF

- Event-free survival (%)
- Days after randomization
- Pacemaker-defibrillator (212 events, $p<0.001$)
- Pharmacologic therapy (245 events)
- Pacemaker (237 events, $p=0.002$)

CARE-HF — Percentage Free of Primary Endpoint

- Percentage of patients free of death from any cause or unplanned hospitalization for a major cardiovascular event
- Days
- $p<0.001$

CARE-HF — Unplanned Hospitalization Due to Worsening HF

- % of patients
- Medical Therapy alone
- Medical Therapy + Cardiac Resync.
- 33%
- 18%
- $p<0.001$

Cardiac-Resynchronization Therapy for Mild-to-Moderate Heart Failure

- CRT-D vs. ICD
- 1798 patients
  - 80% FC II
  - Mean EF 22%
  - QRSD>120 msec
- Mean f/u of 40 months

<table>
<thead>
<tr>
<th>Variable</th>
<th>ICD (N=904)</th>
<th>ICD-CRT (N=894)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication — no. (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta-blocker</td>
<td>805 (89.0)</td>
<td>808 (90.4)</td>
</tr>
<tr>
<td>ACE inhibitor or ARB</td>
<td>878 (97.1)</td>
<td>859 (96.1)</td>
</tr>
<tr>
<td>Spironolactone</td>
<td>378 (41.8)</td>
<td>372 (41.6)</td>
</tr>
<tr>
<td>Digoxin</td>
<td>339 (35.5)</td>
<td>301 (33.7)</td>
</tr>
<tr>
<td>Aspirin</td>
<td>622 (68.8)</td>
<td>584 (65.3)</td>
</tr>
<tr>
<td>Warfarin</td>
<td>298 (33.0)</td>
<td>110 (14.7)</td>
</tr>
<tr>
<td>Clopidogrel</td>
<td>145 (16.0)</td>
<td>134 (15.0)</td>
</tr>
<tr>
<td>Statin</td>
<td>618 (68.4)</td>
<td>607 (67.9)</td>
</tr>
<tr>
<td>Diuretic</td>
<td>756 (83.6)</td>
<td>757 (84.7)</td>
</tr>
<tr>
<td>Calcium-channel blocker</td>
<td>81 (9.2)</td>
<td>101 (11.3)</td>
</tr>
<tr>
<td>Amiodarone</td>
<td>124 (13.7)</td>
<td>140 (15.7)</td>
</tr>
<tr>
<td>Other antiarrhythmia drug</td>
<td>8 (0.9)</td>
<td>12 (1.3)</td>
</tr>
<tr>
<td>Distance on 6-minute walk test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of patients</td>
<td>765</td>
<td>789</td>
</tr>
<tr>
<td>Mean — m</td>
<td>354.9±130.1</td>
<td>351.3±106.7</td>
</tr>
<tr>
<td>Estimated glomerular filtration rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of patients</td>
<td>897</td>
<td>885</td>
</tr>
<tr>
<td>Mean — %</td>
<td>60.8±21.9</td>
<td>59.5±19.8</td>
</tr>
</tbody>
</table>

Tang et al NEJM 2010
1 life saved for every 14 patients treated with CRTD over 5 years
1 HF hospitalization prevented for every 11 patients treated

<table>
<thead>
<tr>
<th>Table 2. Risk of Death or Hospitalization for Heart Failure among All Patients and According to New York Heart Association (NYHA) Category.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome</td>
</tr>
<tr>
<td>All patients</td>
</tr>
<tr>
<td>Primary outcome: death or hospitalization for heart failure</td>
</tr>
<tr>
<td>Secondary outcomes</td>
</tr>
<tr>
<td>Death from any cause</td>
</tr>
<tr>
<td>Death from cardiovascular cause</td>
</tr>
<tr>
<td>Hospitalization for heart failure</td>
</tr>
<tr>
<td>Patients in NYHA class II</td>
</tr>
<tr>
<td>No. of patients</td>
</tr>
<tr>
<td>Primary outcome: death or hospitalization for heart failure</td>
</tr>
<tr>
<td>Secondary outcomes</td>
</tr>
<tr>
<td>Death from any cause</td>
</tr>
<tr>
<td>Death from cardiovascular cause</td>
</tr>
<tr>
<td>Hospitalization for heart failure</td>
</tr>
<tr>
<td>Patients in NYHA class III</td>
</tr>
<tr>
<td>No. of patients</td>
</tr>
<tr>
<td>Primary outcome: death or hospitalization for heart failure</td>
</tr>
<tr>
<td>Secondary outcomes</td>
</tr>
<tr>
<td>Death from any cause</td>
</tr>
<tr>
<td>Death from cardiovascular cause</td>
</tr>
<tr>
<td>Hospitalization for heart failure</td>
</tr>
</tbody>
</table>
Do Elderly Patients from CRT?

Penn; J Cardiovasc Elect; 2011:892
How applicable are HF Clinical Practice Guidelines to elderly patients?

- Treatment of elderly mentioned
  - No specification of age

- Comorbidities addressed
  - Delirium, psychosocial issues, caregiver stress

- Indication of time needed to treat to benefit in the context of life expectancy

- Discussed barriers to implementation

- Discussed quality of evidence

Mutasingwa et al. Can Fam Physician 2011;57:253
Telehome Monitoring

- Patient care devices
- Vitals and weights sent daily to trained HF nurses
- Goal to identify and treat impending decompensation
### Clinical outcomes at six months, hazard ratio (HR, 95% CI) for telemonitoring-guided HF care vs usual care in Tele-HF

<table>
<thead>
<tr>
<th>End point</th>
<th>Telemonitoring, n=826 (%)</th>
<th>Usual care, n=827 (%)</th>
<th>HR (95%CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>All-cause readmission/death*</td>
<td>52.3</td>
<td>51.5</td>
<td>1.04 (0.91–1.19)</td>
<td>0.75</td>
</tr>
<tr>
<td>All-cause readmission</td>
<td>49.3</td>
<td>47.4</td>
<td>1.06 (0.93–1.22)</td>
<td>0.45</td>
</tr>
<tr>
<td>All-cause mortality</td>
<td>11.1</td>
<td>11.4</td>
<td>0.97 (0.73–1.30)</td>
<td>0.88</td>
</tr>
</tbody>
</table>

*Primary end point

### Hazard ratio (95% CI) for 24-month outcomes, telemonitoring-guided management vs usual care in TIM-HF

<table>
<thead>
<tr>
<th>End point</th>
<th>HR (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>All-cause mortality*</td>
<td>0.97 (0.67–1.41)</td>
<td>0.87</td>
</tr>
<tr>
<td>CV death/HF hospitalization</td>
<td>0.89 (0.67–1.19)</td>
<td>0.44</td>
</tr>
</tbody>
</table>

New Engl J Med 2010
Completing the Circle of Care

Desai, NEJM 2010
Is There a Role for Home Monitoring?

**Effect on Morality**

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Telemonitoring</th>
<th>Control</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Events</td>
<td>Total</td>
<td>Events</td>
</tr>
<tr>
<td>Antonicelli 2008</td>
<td>3</td>
<td>28</td>
<td>5</td>
</tr>
<tr>
<td>Balk 2008</td>
<td>9</td>
<td>101</td>
<td>8</td>
</tr>
<tr>
<td>Cleland 2005</td>
<td>36</td>
<td>188</td>
<td>28</td>
</tr>
<tr>
<td>Dar 2009</td>
<td>17</td>
<td>91</td>
<td>5</td>
</tr>
<tr>
<td>Giordano 2008</td>
<td>21</td>
<td>230</td>
<td>32</td>
</tr>
<tr>
<td>Goldberg 2003</td>
<td>11</td>
<td>138</td>
<td>26</td>
</tr>
<tr>
<td>Soran 2008</td>
<td>11</td>
<td>160</td>
<td>17</td>
</tr>
<tr>
<td>Wakefields 2008</td>
<td>15</td>
<td>52</td>
<td>11</td>
</tr>
<tr>
<td>Weintraub 2005</td>
<td>1</td>
<td>95</td>
<td>4</td>
</tr>
<tr>
<td>Woodend 2008</td>
<td>5</td>
<td>62</td>
<td>4</td>
</tr>
</tbody>
</table>

Total (95% CI) 1125 / 1046 = 100.0% 0.77 [0.61, 0.97]

Total events 129 / 140

Heterogeneity: Chi² = 18.39, df = 9 (P = 0.03); I² = 51%

Test for overall effect: Z = 2.25 (P = 0.02)

**Effect on HF Admission**

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Telemonitoring</th>
<th>Control</th>
<th>Risk Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Events</td>
<td>Total</td>
<td>Events</td>
</tr>
<tr>
<td>Cleland 2005</td>
<td>38</td>
<td>168</td>
<td>23</td>
</tr>
<tr>
<td>Dar 2009</td>
<td>10</td>
<td>91</td>
<td>17</td>
</tr>
<tr>
<td>Giordano 2008</td>
<td>43</td>
<td>230</td>
<td>73</td>
</tr>
<tr>
<td>Mortara 2009</td>
<td>53</td>
<td>301</td>
<td>28</td>
</tr>
<tr>
<td>Soran 2008</td>
<td>30</td>
<td>160</td>
<td>37</td>
</tr>
<tr>
<td>Wakefields 2008</td>
<td>21</td>
<td>52</td>
<td>29</td>
</tr>
</tbody>
</table>

Total (95% CI) 1002 / 770 = 100.0% 0.73 [0.62, 0.87]

Total events 195 / 207

Heterogeneity: Chi² = 4.83, df = 5 (P = 0.44); I² = 0%

Test for overall effect: Z = 3.52 (P = 0.0004)

Clarke; J of Telemedicine 2011; 17;7
## Utilization of THM in elderly

<table>
<thead>
<tr>
<th>Age &lt;75 years</th>
<th>Age &gt;75 years</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>350 patients</td>
<td>244 patients</td>
<td></td>
</tr>
<tr>
<td>126 days</td>
<td>125 days</td>
<td>ns</td>
</tr>
<tr>
<td>Diuretic titrations</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Cardiac medication titration</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Number of interventions for abnormal vitals</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Number of calls</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>ER visits/hospitalizations/deaths</td>
<td>ns</td>
<td></td>
</tr>
</tbody>
</table>

*Lemay et al. J Telemed Telecare, 2013; feb*
Readmission Rates

- After initial hospitalization for HF, patients experience...
  - 15 day readmission rate of 13%
  - 30 day readmission rate of 25%
  - 6 month readmission rate of 50%

- Half of all readmissions are preventable and a result of...
  - Inadequate discharge teaching
  - Non-adherence
  - Failure to follow-up with primary care
Potential Impact

- 2010 Champlain LHIN:
  - >1300 discharges from hospital with HF
- Average readmission rate 22% (range 11-36%)
  - 25-50% greater than predicted probability of readmission
- Average length of stay
  - 10.4 days
- Excess cost of $750 k to $1.2 m per year
Causes of Readmission

- Factors contributing to poor transitional care outcomes...
  - Delayed transfer of the discharge summary
  - Failure to follow-up with patient in a timely manner
  - Unknown or unreported test results
  - Problems with medication interaction and adverse effects
- Recent study: 71% of discharges had at least one problem
  - Inadequate/incomplete transfer of information = quality and safety risks; duplication of tests and unnecessary use of acute care services
Influence of Cognitive Impairment on Outcomes

- Estimated prevalence of 25% in HF patients
- Recognition may facilitate targeted interventions
  - Medication regimen simplification
  - Tailored education
  - Home assistance
- Prospective study of 282 patients
  - 47% had cognitive impairment (21% was mod-severe)
  - Only 23% of impairment was documented at time of discharge

Dodson. Am J Med 2013;126:120
Patients with cognitive impairment more likely to experience mortality or readmission at 6 months

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted HR</th>
<th>P</th>
<th>Adjusted HR</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive impairment documented</td>
<td>1.42</td>
<td>0.17</td>
<td>1.27</td>
<td>0.41</td>
</tr>
<tr>
<td>Cognitive impairment not documented</td>
<td>1.60</td>
<td>&lt;0.01</td>
<td>1.53</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Adjusted for age, race, CKD, aldosterone antagonist

*Dodson. Am J Med 2013;126:120*
Guiding principles...
- Early contact (Day 2)
- Regular follow-up
- Timely Intervention
- Access to specialized care
- Monitoring points of transition
- Enabling self-care strategies
Implementation Plan: 3 Components

1: Transitional Care Planning
   - Hospital visit
     - Education, support
     - Assess risk
   - Standardized care plans (GAP tool)
   - Transition to primary care physician
     - Contact with primary care provider for details of admission and planned follow-up

2: Post-Discharge Management Phase
   - Use of telehealth technology to monitor patients and provide support

3: PCP Support Strategies
   - Detailed discharge summary
   - Access to specialized services
   - Rapid re-entry
Structure of Transitional Care Program for HF

Presented by the University of Ottawa Heart Institute

All Admitted Acute HF Patients

Site Coordinator Visit

GAP Tool

Stable, non-congested patients

High-risk cohort requiring fluid management and medication titration

IVR F/U (6 months)

THM (3 months) + IVR (3 months)

PCP SUPPORT STRATEGIES

D/C Summary
Detailed plan of care

Access to acute care services
HFC/Specialist

Rapid re-entry strategy for quick & timely intervention

One-number to call

Ongoing education and support
IVR Follow-up

- Low-risk patients...
- Delivers a set of automated questions
- Day 2 call
- Medication compliance
- Self-care education
- Phone assessment and intervention
Step 1: Standardized Discharge Summary

Key project components...
- Discharge summary template
- Expediting discharge summary to primary care physician (72 hours)
- Provide contact for further advice/questions

Key steps...
- Design guided by best practices and extensive consultation (Regional Integrated HF Strategy Expert Task Group and Primary Care Leadership Table)
- Automation of template with built-in educational components
- Audit and evaluation
Draft Template

Date of admission:

Date of Discharge:

Discharge Diagnosis:

Other Relevant Past Medical History:

Course in Hospital:
- Summary of treatment received in hospital
- Response to treatment (total weight loss, symptom status improvement)
- Procedures/tests performed
- Complications in hospital (infection, falls, acute kidney injury etc)

Status at discharge:
- Current weight (target dry weight)
- Renal function/K/INR at discharge
- Pending tests or procedures

Medications at discharge:

Medications stopped or changed:
List reason for discontinuation or change

Follow-up plans:
1. Lasix titration schedule
2. Frequency and timing of blood work at discharge
3. Home care supports if needed (home care, home monitoring etc.)
4. Appointments
   a. Family doctor (when?)
   b. Specialist
   c. Other
5. When to call
   a. Number to call for HF related questions/concerns
BUILT IN-TEMPLATE (To be added in all summaries)

10 Bullet Points about Heart Failure Management

- Maintain your patient on a 2 gram/day sodium restricted diet.
- All patients should restrict their fluids to 2 l/day
- Patients should be counseled to weigh themselves daily and report to MD if they gain >2 pounds day for two days OR >5 pounds a week OR if they develop worsening symptoms of congestion
- Use loop diuretics to manage congestion – the dose can be doubled as needed to achieve an adequate response up to a maximum of 100-120 mg bid
- Additional synergistic diuretics (thiazides) should only be used sparingly with close monitoring of renal function
- If your patient has low EF HF (EF<40%), unless there is an absolute contraindication or intolerance:
  - ACE inhibitors or ARB should be used in all patients
  - Beta blockers should be used in all patients
  - Spironolactone can be considered in symptomatic patients
- Serum creatinine and electrolytes should be measured any time:
  - Lasix dose is changed
  - ACEi /ARB are added or increased
  - Spironolactone is added or increased
- Avoid all nonsteroidal anti-inflammatory drugs
- Encourage a graded exercise program
- Consult with a cardiologist /HF specialist if:
  - Patient fails to respond to diuretic management
  - Rapidly progressive HF symptoms
  - EF<30-35% and possible candidate for ICD or resynchronization pacemaker
  - HF complicated by cardiorenal syndrome or other multisystem disease
  - New onset (unexplained) HF
End of Life Issues in HF

- Preparedness planning
  - Advanced care planning and patient education about disease course and prognosis

- Symptom management in HF
  - Attention to often overlooked symptoms
  - Understanding of medical management of HF as a palliative treatment
  - Collaboration between disciplines

- End of life and hospice care
  - Parallel use of life-prolonging and palliative therapies
  - Understanding appropriate HF medication at end-of-life
  - Collaboration
Informed decision making for device based treatments

- ICD
  - Patients frequently do not understand purpose or alternatives to treatment
  - More discussion of when to consider deactivation needed
  - Discussion of trade-off between sudden death and pump failure
  - Process for elective defibrillation deactivation needed
Informed decision making for device based treatments

- **CRT**
  - Options for pacing without ICD
  - Discussion of symptomatic worsening if device inactivated

- **LVAD**
  - Substantial risk of complications
  - Ethics of destination therapy
Palliative Care in End Stage Heart Failure

Chronic Heart Failure
Supportive Care Screening Tool
Day of Admission 4 or ___

1) Cardiologist to ASK...

 Would I be surprised if this patient died in the next 6-12 months? Yes or No
   If No, check indicators below

2) Indicators

- Performance status poor (limited self-care, in bed or chair over 50% of the day)
- 2 or more readmissions for any reasons in the past 6 months
- 2 or more episodes needing IV diuretics and/or inotropes in the last 6 months
- Persistent symptoms (SOB or chest pain) despite optimal tolerated therapy
- Abnormal lab values (Please circle all that apply) Hb < 100 eGFR < 30
  creatinine at admission > 200
- Cardiac cachexia (progressive loss of lean body mass, reduced muscle strength,
  anorexia, fatigue)
If would not be surprised if patient meets 2 or more criteria, consider assessment below

3) Assessment/consider... (Time required to complete ___ min.)

- Symptoms of advanced HF: dyspnea, pain, fatigue, constipation, anorexia, nausea, dry
  mouth, delirium, dizziness, itch, anxiety, depression, insomnia (circle all that apply)
- Function & QOL? Very Poor Poor Satisfactory Very Good Other
- Level of patient and caregiver distress? Very high High Moderate Low Very low
- Information needs:
  “Tell me what you understand about your illness?” Poor Fair Good Other
  “Are you the type of person who likes all the information and details about your condition
  including details about what will happen in the future?” Yes No

- Decision-making:
  “Do you prefer to make healthcare decisions on your own or are there family or friends
  who you wish to be involved?” (Circle one) “…on your own” or “involve family/friends” Other

- Ask re: advance care planning
  “If you become too sick to speak for yourself who would make decisions for you?”
  “Have you discussed your thought about the future with your family or ever put them down
  in writing?” Yes No POA Advanced directives Other

FAX BACK TO: 1458
Heart Failure in the Elderly

- Incidence of HF increases with age
- Significant proportion of HF in elderly is HF with preserved systolic function
- High clinical index suspicion needed as signs and symptoms vague
- Optimization of medical therapy key
- Collaboration with geriatrics, family physicians, palliative care team essential in management of elderly HF patient