Management of Advanced Heart Failure in Elderly: where we are

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Tuen Mun Hospital
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Heart Failure in Elderly

- Prevalent, 10% or more among patients 70 years of age or older

- Double risk of death from all causes

- Quadruple cardiovascular death in 4 years

- 5% of patients have Stage D HF
Mr Chan

- 80 years old, walks with frame indoor for few steps, limited by shortness of breath
- Diagnoses:
  - Hypertension, Diabetes mellitus
  - Chronic Obstructive Pulmonary Disease
  - History of anterior myocardial infarct in 2005 with Heart Failure
    - Echocardiogram: Ejection fraction 30%, mid-moderate mitral regurgitation, akinetic anterior wall, global hypokinesia
    - Declined cardiac catheterisation
Mr Chan

Medications:
- Aspirin 80mg Daily
- Pepcidine 20mg BD
- Lasix 60mg BD
- Acertil 8mg Daily
- Diltiazem CR 30mg TDS
- Ventolin 2 puffs Q4H prn
- Atrovent 2 puffs QID
- Protaphane HM 20 units OM SC
Mr Chan

- In Stage III since 2005
- Repeated admissions for CHF (4 times)
- Admitted again for CHF on 1\textsuperscript{st} Jan 2008
- P/E: RR 26 bpm, BP 170/80, SpO2 95% on 100% O2 mask. Warm periphery. Elevated JVP, Bilateral crepitation at lung base, LL oedema up to mid-shin
ECG
Mr Chan

Peak Troponin I: 13
Peak Creatine Kinase: 800

Dx:
NSTE-AMI. IHD. HF.
Mr Chan

- Bi-level Positive Airway Pressure (BiPAP)
- IV Lasix
- IV nitrates infusion
- Urine output ~800 ml/day, despite increasing IV Lasix
- Renal function deteriorated, Cr 250 umol/L (baseline) to 300 umol/L
Mr Chan

- Still dyspnoeic and on and off chest pain
- Mentally capable all along
- Progress note documented all vital signs and laboratory results
- Not touch on any advanced directives
- No communication between caring team and family members documented
Mr Chan

- On day 7, desaturation despite BiPAP
- Intubated
- Cardiac arrest after intubation
- Cardiopulmonary resuscitation (CPR) commenced
- Regained of spontaneous circulation (ROSC) 20 mins later
- Fixed and dilated pupils
Mr Chan

- Relatives contacted, declined the option of Do-Not-Resuscitate
- Dopamine started
- Complicated by nosocomial pneumonia
- Tazocin started
- Cardiac arrest on day 11, ROSC 50 min
- Cardiac arrest again 50 min later. Refractory to 60 mins of CPR.
- Succumbed on day 11
Time line for the events

Multiple admissions for CHF

Index admission

MI

NYHA Class III HF

BiPAP, IV Nitrates and Lasix

D7
Cardiac arrest, Intubation

Nosocial pneumonia

D11
Succumbed after repeated CPR
Have we done our best for Mr Chan?
Evaluation of Acute Heart Failure

- Search for potentially reversible factors
  - Atrial fibrillation
  - Coronary artery disease
  - Thyroid abnormalities
  - Heavy alcohol consumption
  - Drugs
Evaluation of Acute Heart Failure

- Search for potentially reversible factors
  - Anaemia
    - *Does higher Hb level improve heart failure?*
      - No study done in acute heart failure and anaemia
        - Single blinded RCT, 26 patients, use EPO, Hb from 11g/dL increased to 14g/dL, improved exercise tolerance.
      - Anemia and Its Relationship to Clinical Outcome in Heart Failure, *Circulation.* 2004;110:149-154
        - Retrospective Observational study, 912 patients only, Subjects: 15-55 years old
        - every 1-g/dL of Hb drop from 12 g/dL, the risk of mortality or hospitalization for heart failure was 14.2% higher (*P*<0.0001)
    - Problem: increases hypertension, increase thrombosis. Expensive.
    - The benefit of enhancing erythropoiesis in patients with HF and anemia is not established.

AHA/ACC 2009 guideline on management of chronic heart failure
Evaluation of Advanced Heart Failure

Elucidation of Symptoms

- Reasons for admission: related to symptoms of congestion instead of low cardiac output
  

- High left-sided filling pressures: dyspnoea (at rest or exertion), coughing when lying down or orthopnoea

- Elevated right-sided filling pressures: oedema, ascites, anorexia or early satiety

- Low cardiac output: lack of energy and fatigue
Evaluation of Acute Heart Failure
Definition of haemodynamic profiles

- Evidence for Congestion (Elevated Filling Pressure)
  - Orthopnea
  - High Jugular Venous Pressure
  - Increasing S₃
  - Loud P₂
  - Edema
  - Ascites
  - Rales (Uncommon)
  - Abdominoljugular Reflux
  - Valsalva Square Wave

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<th>Low Perfusion at Rest?</th>
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- Warm and Dry: A
- Warm and Wet: B
- Cold and Dry: L
- Cold and Wet: C
Definition of haemodynamic profiles

Therapy for haemodynamic profiles

- Profile B (wet and warm, i.e. congestion with adequate perfusion)
  - 67% of heart failure patients with decompensation
  - Dry them out (enhancement of the diuretic regimen)
  - Loop diuretics, +/- Metolazone and/or Intravenous vasodilators
Definition of haemodynamic profiles

- Therapy for haemodynamic profiles
  - Profile C (wet and cold, i.e. congestion with inadequate perfusion)
    - 28% of heart failure patients with decompensation
    - Warm up in order to dry out
    - Withdraw Beta-blocker and ACEI till stabilisation
    - Inotropic infusion
      - May increase risk of mortality
      - Until therapy: Until diuresis, Until resolution of transient condition e.g. pneumonia, until transplantation, or until death
Definition of haemodynamic profiles

- Therapy for haemodynamic profiles
  - Profile L (cold and dry, i.e. inadequate perfusion without congestion)
    - 5% of heart failure patients with decompensation
  - Clinically stable
  - Inotopic infusion: Risk of dependence
  - Gradual introduction of Beta-blockers or amiodarone may be associated with later clinical improvement
Cardiorenal Syndrome

- Most common reason for treatment failure
- 26.5 umol/L rise in Cr
- Aggravated renal dysfunction occurs in 25-45%
- Mechanism unknown – not *prerenal*
  - 37% to 55% have left ventricular ejection fractions >40%
  - Filling pressure enough to provide adequate CO for renal perfusion
  - Greater proportion of these patients present with elevated blood pressure


Cardiorenal Syndrome

**Management**
- Inotropic infusion
- Aggressive Diuresis Dilemma
  - Associated with worsening of renal function and increased mortality
  - Marker but not mechanism of poor outcomes
  - When diuresis is inadequate to relieve congestion, the diuretic regimen should be intensified using either:
    - a. higher doses of loop diuretics;
    - b. addition of a second diuretic (such as metolazone, spironolactone or intravenous chlorothiazide); or
    - c. continuous infusion of a loop diuretic.

- +/- Dialysis

*AHA/ACC Guideline 2009. Class 1 recommendation, Level of Evidence: C*
Diastolic Heart Failure

Heart Failure with Preserved Ejection Fraction (EF >45%)

Pathophysiology:
- Impaired active relaxation
- Passive stiffness of myocardium

Common, 50% HF population

Prevalence increases with Age

Diastolic heart failure

- **Management:**
  - Limited trials
  - Treat hypertension
    - Class 1 recommendation from AHA/ACC guideline 2009
  - Control ventricular rate
    - Class 2 recommendation from AHA/ACC guideline 2009
  - Diuretics
    - GWK Yip et al. The Hong Kong diastolic heart failure study. *Heart* 2008;94:573-580
    - Diuretics alone improves QOL
    - Diuretics + ACEI (ramipril) or ARB (irbesartan) did not offer additional benefit
Management of Chronic Heart Failure
Stepped Therapy for Heart Failure

- Asymptomatic
- Symptomatic
- Advanced
- Refractory

Medications:
- ACE Inhibitor or Angiotensin II Receptor Blocker
- β-Blockers
- Diuretics to Treat Fluid Retention
- Digoxin for Persistent Symptoms
- Add Spironolactone if Normal Potassium-Handling
- Intermittent Metolazone
- Hospice
- Transplantation/Mechanical Assist Devices
- Reevaluate Diagnosis and Therapy to Relieve Persistent Congestion: More Diuresis? Nitrates ± Hydralazine?

Salt and Fluid Intake:
- No Added Salt
- 2 g Na⁺

Aerobic Activity:
- As Tolerated
- Exercise Training

May Need to Withdraw

Stepped care approach based on disease severity with various interventions and decision points.
ACE inhibitors

- All stages of heart failure

- Improves symptoms and mortality

- Practical tips:
  - May need to be replaced by hydralazine + nitrates when Cr > 3mg/dL, i.e. 265 umol/L or Ur > 30 mmol/L
  - Cautious in Stage IV heart failure if newly started
  - Cough in Chinese up to 50% (10% in Whites), usually appears within the first months of therapy, disappears within 1 to 2 weeks of discontinuing treatment, and recurs within days of rechallenge

ACE inhibitors

- **Practical tips:**
  - *Not* contraindicated in any level of Creatitine
    - Patients with higher Cr level at baseline may benefit more
      
    
    - Stop only if 20-30% rise in Cr level after ACEI

  - Cough in Chinese up to 50% (10% in Whites), usually appears within the first months of therapy, disappears within 1 to 2 weeks of discontinuing treatment, and recurs within days of rechallenge

Beta-blockers

- Heart failure stage B or above (in pt with hx of MI, no IHD but reduced EF, or presence of HF)

- Improves symptoms and mortality

Practical tips:
- May exacerbate fluid retention on initialisation
- Never start in acute exacerbation as it reduces filling pressure and cardiac output when newly started
- Stable stage IV heart failure benefit

- Better to combine with ACEI instead of the use of either alone

- NOT contraindicated in COPD
  Frans H. Rutten, MD, PhD; Nicolaas P. A. Zuijhoff, MSc; Eelko Hak, MSc, PhD; Diederick E. Grobbee, MD, PhD; Arno W. Hoos, MD, PhD. β-Blockers May Reduce Mortality and Risk of Exacerbations in Patients With Chronic Obstructive Pulmonary Disease Arch Intern Med. 2010;170(10):880-887.
**Beta-blockers**

- **Practical tips:**
  - *What dosage is enough?*
    - No specific dosage has been recommended
    - Better to combine with ACEI instead of the use of either alone
  

  - *Is it contraindicated in COPD?*
    - Frans et al, $\beta$-Blockers May Reduce Mortality and Risk of Exacerbations in Patients With Chronic Obstructive Pulmonary Disease *Arch Intern Med.* 2010;170(10):880-887
    - 2230 patients in Netherlands, Mean Age 65 years old, with COPD
    - Over 7 years of FU, pt put on Beta-blocker was found to have a lower mortality (27.2% vs 32.3%), lower risk of COPD exacerbations (42.7% vs 49.3%)
Beta-blockers

Practical tips:

- Beta-blockers must be stopped in acute heart failure. True or False.

  - True, if the patient has profile C (wet and cold) HF or if Beta-blocker is newly started
  - False, if the patient has profile B (wet and warm) HF and on stable dose of beta-blocker

B-CONVINCED trial. Eur Heart J 2009 Sep;30(18):2186
AHA/ACC 2009 guideline for management of chronic heart failure, class 1 recommendation
Diuretics

- All patient with evidence (or history) of fluid retention
- Improves symptoms
- Spironolactone
  - All patients with recent or current symptoms at rest despite the use of digoxin, loop diuretics, an ACE inhibitor and a beta-blocker
  - Improves symptoms and mortality
  - Stop/Reduce dose if Hyperkalaemia or painful gynaecomastia
  - Not to start if Cr >2.5 mg/dL, i.e. 220 umol/L


Digitalis

- All patients remain symptomatic despite ACEI, Beta-blocker and diuretics
- Improves mortality (modestly) and symptoms

Practical tips:
- Low dose (125mcg daily or 62.5mcg daily) for age >70, renal impairment and lean body mass
- Low dose is not inferior to high dose
- Little relationship between serum digoxin concentration and the drug’s therapeutic effect
- Digoxin Level for monitoring toxicity
**Hydralazine and Isosorbide Dinitrate**

**In what situation should we use this combination?**

- For patient can’t tolerate ACEI
- Reduce hospitalisation and mortality, less compared with ACEI


- Can be considered as add-on therapy on top of ACEI, Betablocker +/- Spironolactone


ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult. Circulation 2005;112:e154-e235 (Class IIA evidence)
Calcium Channel Blockers

- Theoretical benefit of coronary vasodilatation *not* observed in clinical trials
- *Not* improve exercise tolerance
- *Increase* risk of HF


- Amlodipine is the only CCB shown to have no adverse effect on survival

Stepped Therapy for Heart Failure

Disease Severity
- Asymptomatic
- Symptomatic
- Advanced
- Refractory

Transplantation/Mechanical Assist Devices

Reevaluate Diagnosis and Therapy to Relieve Persistent Congestion: More Diuresis? Nitrates ± Hydralazine?

Hospice

Intermittent Metolazone

Add Spironolactone if Normal Potassium-Handling

Diuretics to Treat Fluid Retention

Digoxin for Persistent Symptoms

β-Blockers

ACE Inhibitor or Angiotensin II Receptor Blocker if Severe Cough or Angioedema With ACE Inhibitor

May Need to Withdraw

Salt and Fluid Intake
- No Added Salt
- 2 g Na+

Aerobic Activity
- As Tolerated
- Exercise Training
Other Treatments for Advanced Heart Failure

- Cardiac Transplantation
- Cardiac Resynchronisation Therapy
- Mechanical Assistive Devices
Other Treatments for Advanced Heart Failure

- Cardiac Transplantation
  - Started in 1992 in HK
  - Paucity of numbers: 77 patients in HK from 1992 to 2006
    
    Hong Kong Society of transplantation, brief review article by Dr Elaine Chau in Apr 2007
  
  - The oldest recipient is/was 65 years old
Other Treatments for Advanced Heart Failure

- Cardiac Transplantation
- Cardiac Resynchronisation Therapy
- Mechanical Assistive Devices
Cardiac Resynchronisation Therapy

- Significant improvements in quality of life, functional class on HF patient refractory to optimal medical treatment
- Reduces HF hospitalisation and all-causes mortality
- Peri-implant Mortality 0.4%

Cardiac Resynchronisation Therapy

Eligible patients:

- NYHA class III or IV despite receipt of standard pharmacologic therapy
- left ventricular ejection fraction of no more than 35%
- QRS interval of at least 120 msec
- Age: 59-73, Median 67

CRT in NTWC

- **CRT-P (pacemaker only)**
  - $55000/unit
  - About 60% of the patients responded to the therapy
  - Not eligible for Samaritan fund

- **CRT-D (pacemaker + ICD)**
  - $150 000/unit
  - Concomitant indication: SSS or advanced heart blocks
  - Eligible for Samaritan fund

- 20 patients in NTWC have received CRT

- UNDER-REFERRAL
Other Treatments for Advanced Heart Failure

- Cardiac Transplantation
- Cardiac Resynchronisation Therapy
- Mechanical Assistive Devices
Mechanical Assistive Devices

- Randomized Evaluation of Mechanical Assistance for the Treatment of Congestive Heart Failure (REMATCH) trial
  - 2-year survival: 23% in the 68 patients treated with the device and 8% in the 61 patients who received medical therapy

Mechanical Assistive Devices in HK

- $1$ million (device + operation)
- Only 1 operation done in HK (paediatric patient)
Mechanical Assistive Devices

- Median LOS 27 days
- More effective than CRT
  - 90 m improvement in 6 min walking test and 35 points improvement in QOL scores
  - 45 m improvement in 6 min walking test and 25 points improvement in QOL scores

Effects of cardiac resynchronization therapy with or without a defibrillator on survival and hospitalizations in patients with New York Heart Association class IV heart failure. Circulation 2007

- 30-day mortality rate for implantation was 5.9%

Low Operative Mortality With Implantation of a Continuous-Flow Left Ventricular Assist Device and Impact of Concurrent Cardiac Procedures, Circulation. 2009;120 S215-219

- Importance of Advance directives
End-of-life Care in Advanced Heart Failure
Palliative Care Integrative Model

Advance Directives, appoint health care proxy decision maker

Diagnosis of any serious diseases
Practical Difficulty

- Notoriously difficult to predict prognosis
- "roller-coaster ride" of heart failure

Always one more things to try
Seattle Heart Failure Model

Circulation 2006 Mar 21;113(11):1424
Gold Standard Framework

- Three triggers for Supportive/ Palliative Care:
  - **The surprise question** ‘Would you be surprised if this patient were to die in the next 6-12 months’
  - **Choice/ Need** - The patient with advanced disease makes a choice for comfort care only, not ‘curative’ treatment, or is in special need of supportive / palliative care
  - **Clinical indicators** – at least two of the following:
    - NYHA class III or IV
    - Yes to the surprise question
    - Repeated admissions for heart failure
    - Difficult physical or psychological symptoms despite optimal tolerated therapy
End-of-life Care for Advanced Heart Failure

- Communication
- Symptom palliation
- Therapy discontinuation
End-of-life Care for Advanced Heart Failure

- Late referrals to hospice correlate with
  - lower overall family satisfaction
  - more unmet needs
  - lack of awareness about what to expect at time of death
  - lower confidence in participating in patient care at home

End-of-life Care for Advanced Heart Failure

Why is communication important?

- Bereaved family members reported minimal communication
- Only 37% were aware of poor prognosis
- 8% of patients and 44% of family members were told by a physician that time was short
- 36% died alone

End-of-life Care for Advanced Heart Failure

Communication

- Discussion of specific intervention is less useful
- Better to show what they consider to be worse than death
- “Some of my patients tell me that if they were permanently comatose or severely brain injured and unable to recognize with loved ones, they would want care focused only on making sure they were comfortable. Other patients of mine tell me they would want all life-prolonging technologies, no matter how brain damaged they were. Which would you choose?”
End-of-life Care for Advanced Heart Failure

- Communication
- Symptom palliation
- Therapy discontinuation
Symptoms palliation

- Management of Dyspnoea
End-of-life Care for Advanced Heart Failure

Symptom palliation

- Dyspnoea
  - Morphine
  - More effective than placebo in relieving dyspnoea
  - AHA/ACC 2009 guideline in management of chronic heart failure: Class I recommendation
  - Heart rate/Respiratory rate >5
  - If patient is unable to swallow, parenteral morphine (e.g. subcutaneous route) may be given at 1/3 of oral dose
The Use of Opioids

5. Management of Dyspnoea
Management of Dyspnoea (normal renal function)

**DYSPNOEA**

Present

Is the patient already taking oral morphine for breathlessness?

**YES**
Consider converting to sc route if patient unable to take oral.
Consider the use of CSCl titrate to patient’s need.

**NO**

Absent

Morphine 1-2.5mg sc q4h prn
If ≥3 doses required in 24hr, consider morphine CSCl 5mg q24h

Morphine 1-2.5mg sc q4h prn
The Use of Opioids

Management of Dyspnoea (ESRD GFR < 30ml/min)

Dyspnoea

Present

Is patient already taking oral opioids for breathlessness?

YES

If patient is already taking strong opioids. Contact the Specialist Palliative Care Team for Advice, if they are not available then please see conversion chart on page 6

NO

Fentanyl 12.5 mcg sc q3h prn

Absent

Fentanyl 12.5 mcg sc q3h prn

If ≥3 doses are required over 24hr
Consider CSCI Fentanyl 50-100mg q24h
End-of-life Care for Advanced Heart Failure

- Symptom palliation
  - Dyspnoea
    - Benzodiazepines
      - Dyspnoea associated panic attacks
      - Lorazepam 0.5 mg SL prn to max 4mg daily, 2nd line: Diazepam 2mg PO
End-of-life Care for Advanced Heart Failure

- **Symptom palliation**
  - *Is inotopic infusion useful to help dyspnoea?*
    - **Intermittent inotopic infusion**
      - Not recommended
      - The *only* placebo-controlled trial terminated early because of little efficacy and increased mortality
        

    - **Continuous inotopic infusion**
      - Palliate symptoms and allow patient to die at home
      - Major burden to the family and health services
      - May increase the risk of death

End-of-life Care for Advanced Heart Failure

- Symptoms palliation
  - Constipation
    - Ageing, physical inactivity and fluid restriction
    - Laxatives should be given regularly with opioid
    - Combination of stimulant and stool softener often needed
      - Stimulant: Senna i.e. Senokot ® (natural fibres), Bisacodyl, i.e. Dulcolax ® (synthetic fibres)
      - Stool softener: Docusate
    - Osmotic laxatives are not preferred e.g. Lactulose
Symptoms palliation

- Management of Pain
End-of-life Care for Advanced Heart Failure

- Symptom palliation
  - Pain
    - Angina:
      - nitrates, beta-blockers, long acting cardio-selective calcium channel-blockers
    - Moderate to severe pain
      - Use opioids
        - short-acting: morphine
        - Long-acting: methadone associated with QT prolongation
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<th>Symptom</th>
<th>Condition</th>
<th>Starting regimen</th>
<th>Recommended Medications</th>
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<tr>
<td>Pain</td>
<td>Usual</td>
<td>Morphine sc 2.5mg q4h pm</td>
<td>If ≥3 doses in 24hr: CSCI morphine 10-15mg q24h</td>
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<td>ESRD</td>
<td>Fentanyl 12.5-25microgram q3h pm</td>
<td>If ≥3 doses in 24hrs: CSCI Fentanyl 100-200mcg q24h</td>
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<td>Agitation</td>
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<td>Haloperidol sc 1.5mg q12h pm</td>
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<td>Death rattle</td>
<td>Usual</td>
<td>Buscopan 20mg sc q8h pm</td>
<td>If ≥2 doses in 24hrs: CSCI Buscopan 40-120mg q24h</td>
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<td>CHF</td>
<td>Furosemide 10-20mg sc q4h pm</td>
<td>If ≥2 doses in 24hrs: CSCI Furosemide 20-40mg q24h</td>
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<td>Nausea/vomting</td>
<td>Usual</td>
<td>Maxolon 10mg iv q8h pm</td>
<td>If ≥2 doses in 24hrs: CSCI Maxolon 10mg q24h</td>
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<td>Alternative</td>
<td>Haloperidol 1.5mg sc q8h pm</td>
<td>If ≥2 doses in 24hrs: CSCI Haloperidol 5-10mg q24h</td>
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<td></td>
<td>ESRD</td>
<td>Haloperidol 0.5-1.5mg sc q8h pm</td>
<td>If ≥2 doses in 24hrs: CSCI Haloperidol 1.5-3mg q24h</td>
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<td>Dyspnoea</td>
<td>Usual</td>
<td>Morphine sc 1mg q4h pm</td>
<td>If ≥3 doses in 24hr: CSCI morphine 5mg q24h</td>
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<td>Fentanyl 12.5microgram q3h pm</td>
<td>If ≥3 doses in 24hrs: CSCI Fentanyl 50-100mcg q24h</td>
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Symptoms palliation

- Management of Depression
End-of-life Care for Advanced Heart Failure

- Symptom palliation
  - Depression
    - 21% to 36%
    - Associated with higher death and readmission rate
    - 1st line: Serotonin reuptake inhibitors
      - Co-prescription of Aspirin with SSRI double the risk of Gastrointestinal bleeding
    - Tricyclic antidepressants: antimuscarinic side effects (QT prolongation)
End-of-life Care for Advanced Heart Failure

- Communication
- Symptom palliation
- Therapy discontinuation
End-of-life Care for Advanced Heart Failure

- Therapy Discontinuation
  - Stop ACEI/ARB/BB only if symptomatic hypotension
  - Deactivation of ICD
    - Activation of ICD causes significant pain and anxiety

End-of-life Care for Advanced Heart Failure in TMH
TMH Data

- Total 2375 deceased patients in M&G TMH in 2008
- 600 patients randomly selected and reviewed
- Identified 19 patients (out of the 600 patients) who need EOL care for advanced heart failure according to the GSF criteria
- Excluded 2 patients (Age 47 and 30)
TMH data

- Male : Female = 7 : 10
- Mean Age: 81.6 (65 to 97)
- 10 out of 17 (59%) were institutionalised
- Co-morbidities
  - Chronic Renal Failure (eGFR < 30ml/min by Crockcoft-Gault equation): 6 (35%)
  - Stroke: 4 (24%)
  - Dementia: 2 (12%)
  - Malignancy: 2 (12%)
  - COPD: 2 (12%)
TMH Data

- Functional status:
  - ECOG Grade 3: 11 (65%)
  - ECOG Grade 4: 6 (35%)

ECOG performance status*

Grade 0: Fully active, able to carry on all pre-disease performance without restriction
Grade 1: Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light housework, office work
Grade 2: Ambulatory and capable of all selfcare but unable to carry out any work activities. Up and about more than 50% of waking hours
Grade 3: Capable of only limited selfcare, confined to bed or chair more than 50% of waking hours
Grade 4: Completely disabled. Cannot carry on any selfcare. Totally confined to bed or chair
Grade 5: Dead

TMH Data

Medication:

- ACEI/ARB: 12 (70%)
- Beta-blockers: 4 (26%)
- Furosemide: 15 (88%)
- Spironolactone: 4 (26%)
- Hydralazines + Nitrates: 1 (6%)
TMH Data

- Causes of Heart Failure
  - IHD: 14 (82%)
  - Hypertension: 2 (12%)
  - Chronic Rhematic Heart Disease: 1 (6%)
- Heart Failure with Preserved Ejection Fraction (EF > 45%): 5 (30%)
- NYHA (6 months prior to death)
  - Class III: 15 (88%)
  - Class IV: 2 (12%)
TMH Data

Causes of Death

- Heart Failure: 9 (53%)
- Acute Myocardial Infarction: 6 (35%)
- Pneumonia: 6 (35%)
- CAPD peritonitis: 2 (12%)
- Urinary Tract Infection: 1 (6%)
## TMH Data

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Mean number of hospitalisation: 4.4
# TMH Data

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<tr>
<td>61 - 90</td>
<td>3</td>
</tr>
<tr>
<td>91 - 120</td>
<td>1</td>
</tr>
</tbody>
</table>

Mean duration of hospitalisation: 47.8 days
TMH Data

- Intubation: 5 (30%)
- No DNR: 1 (6%)
- Advance Directive: NONE
Conclusion

- Early Aggressive Medical Treatment for CHF to delay disease progression is of *utmost* importance
- Huge room for improvement in EOL care in advanced heart failure
- Appropriate patients should be selected for *EOL care* when medical treatment is refractory to prevent unnecessary suffering for our patients
What should we do for Mr Chan?
Time line for the events

- **Multiple admissions for CHF**
  - Index admission
  - MI
  - NYHA Class III HF

- **Cardiac arrest, intubated**
  - BiPAP, IV Nitrates and Lasix
  - Consider adding Beta-blockers
  - Add Aldactone
  - Off Diltiazem
  - Communicate AND Formulate Advanced Directive
  - Try Metolazone (Diulo®) / Aldactone
  - Or continuous loop diuretic infusion
  - Refer cardiologist for CRT

- **Succumbed**
  - Taken care of every thing in his mind
  - Rest in peace one day without suffering from futile Rx

- **Discharged**
The End

Thank you
ACC/AHA stages A-D

- stage A - persons with risk factors that predispose toward development of heart failure (coronary artery disease, hypertension, diabetes mellitus, prior treatment with cardiotoxic drugs, rheumatic fever, or family history of cardiomyopathy) but who do not yet have impaired left ventricular function, hypertrophy or geometric chamber disorientation

- stage B - asymptomatic patients with left ventricular hypertrophy and/or impaired left ventricular function

- stage C - patients with current or past symptoms of heart failure associated with underlying structural heart disease

- stage D - patients with refractory heart failure