

Management of Advanced Heart Failure in Elderly: where we are

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24 Sep 2010



Heart Failure in Elderly

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

Jessup M. Heart Failure. *N Engl J Med* 2003;351:1097-105

- Double risk of death from all causes
- Quadruple cardiovascular death in 4 years

Kupari M, Lindroos M, Iivanainen AM, Heikkilä J, Tilvis R. Congestive heart failure in old age: prevalence, mechanisms and 4-year prognosis in the Helsinki Ageing Study. *J Intern Med* 1997;241:387-94.

- 5% of patients have Stage D HF

Costanzo MR, Mills RM, Wynne J. Characteristics of "stage D" heart failure: insights from the Acute Decompensated Heart Failure National Registry Longitudinal Module (ADHERE LM). *Am Heart J*. 2008;155: 339–347.



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

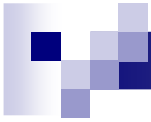
■ Medications:

- 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

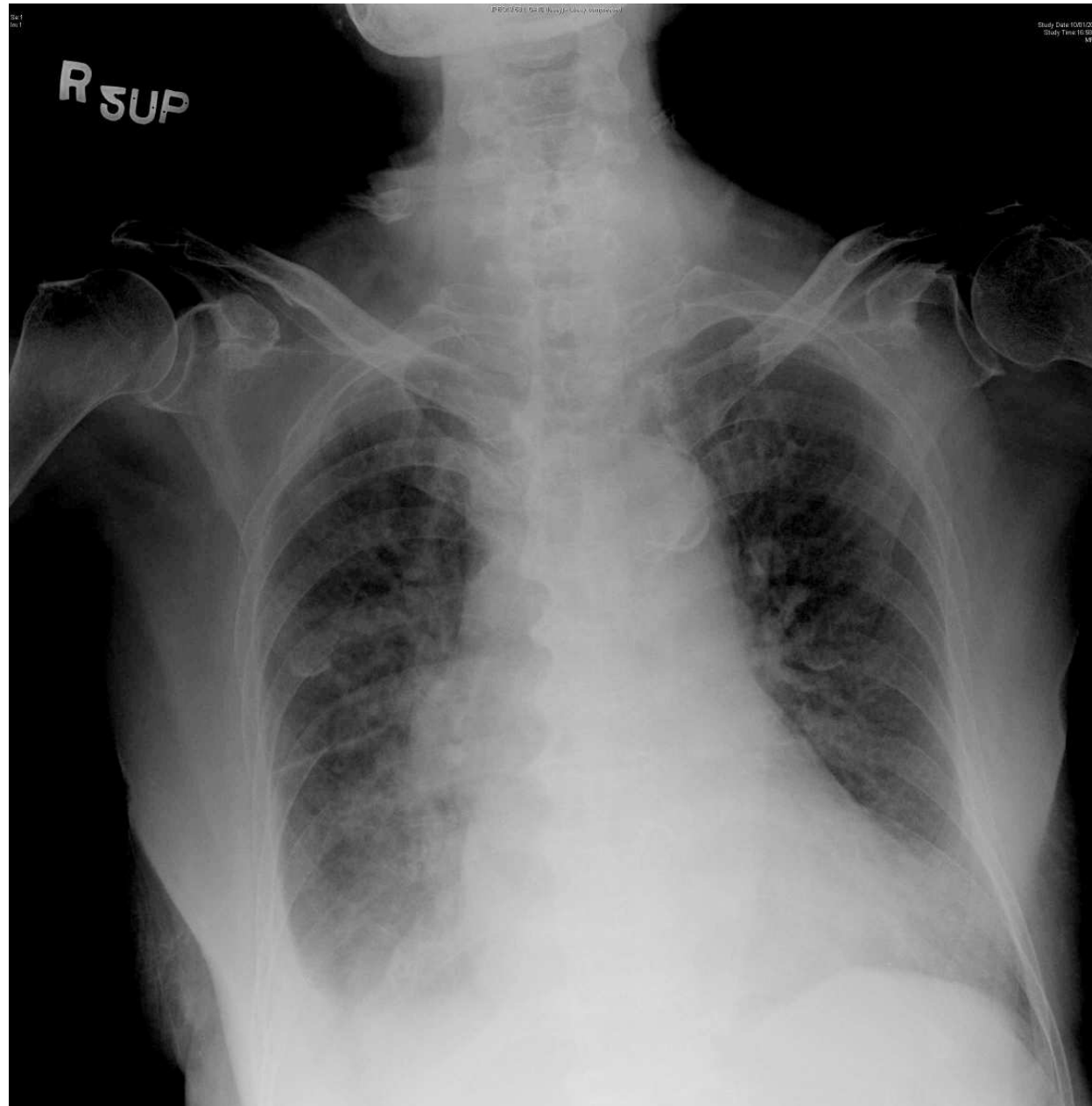


Mr Chan

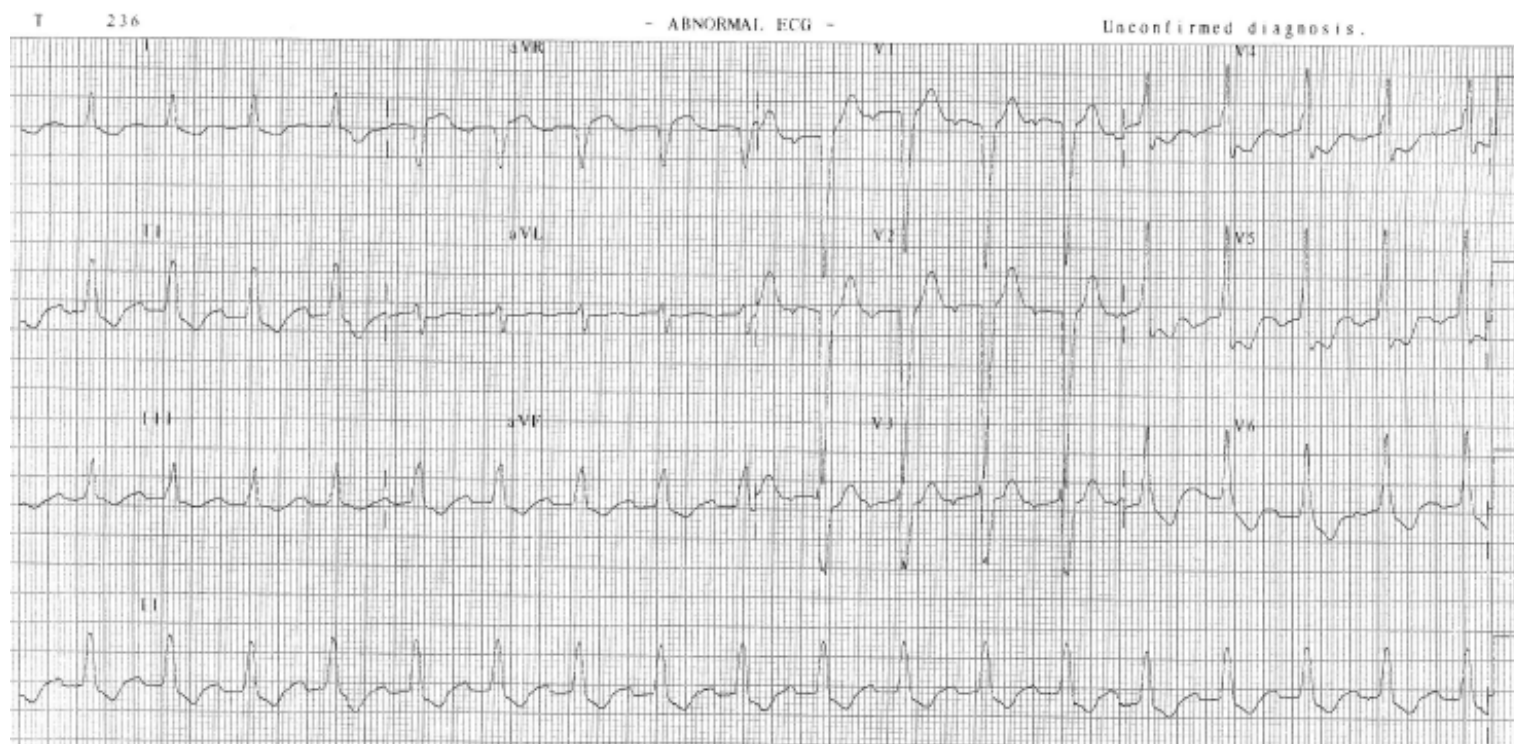
- In Stage III since 2005
- Repeated admissions for CHF (4 times)
- Admitted again for CHF on 1st Jan 2008
- P/E: RR 26 bpm, BP 170/80, SpO2 95% on 100% O2 mask. Warm periphery. Elevated JVP, Bilateral crepitation at lung base, LL oedema up to mid-shin



CXR



ECG





Mr Chan

Peak Troponin I: 13

Peak Creatine Kinase: 800

Dx:

NSTEMI. 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

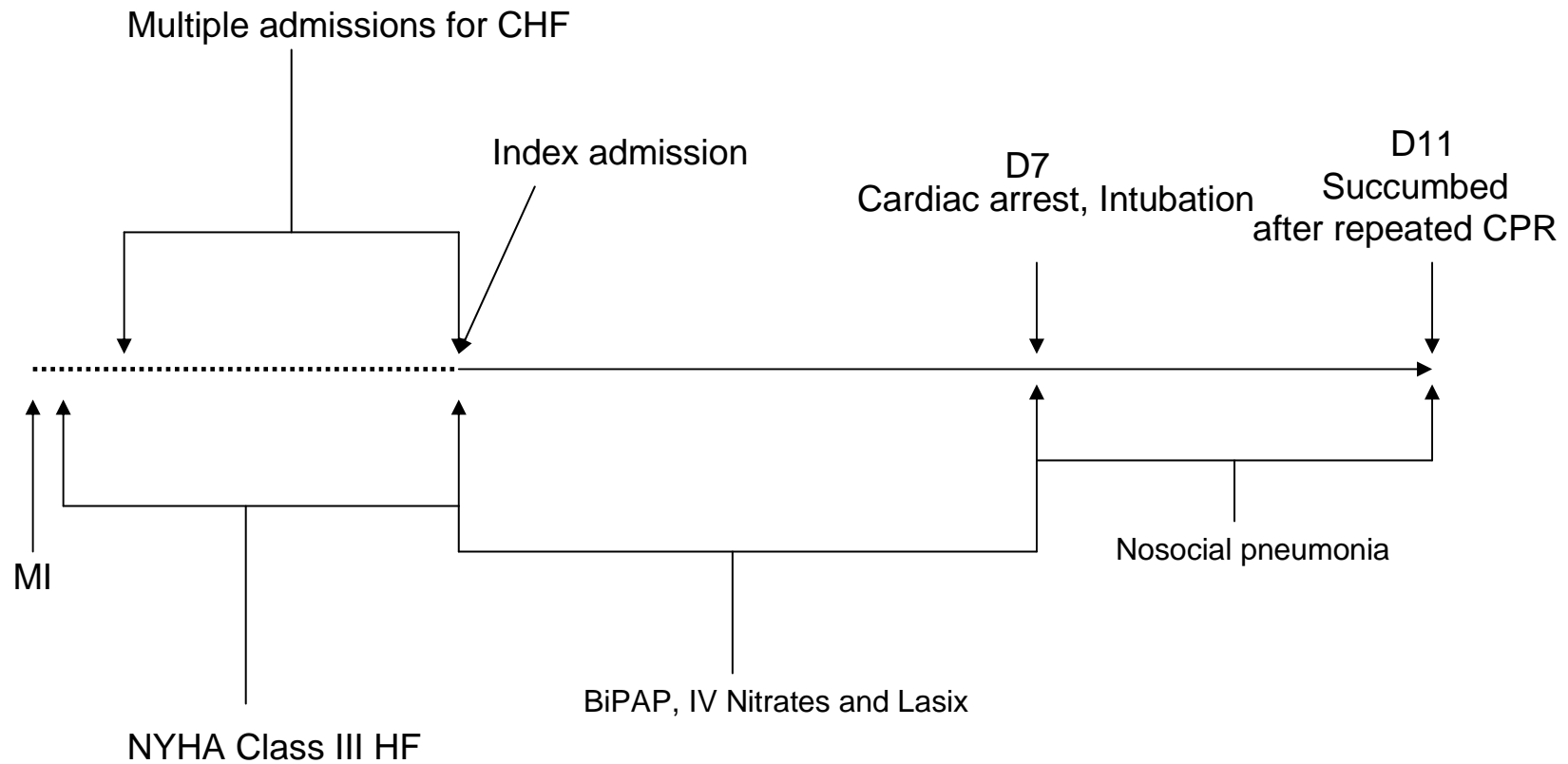
- On day 7, desaturation despite BiPAP
- Intubated
- Cardiac arrest after intubation
- Cardiopulmonary resuscitation (CPR) commenced
- Regained of spontaneous circulation (ROSC) 20 mins later
- Fixed and dilated pupils



Mr Chan

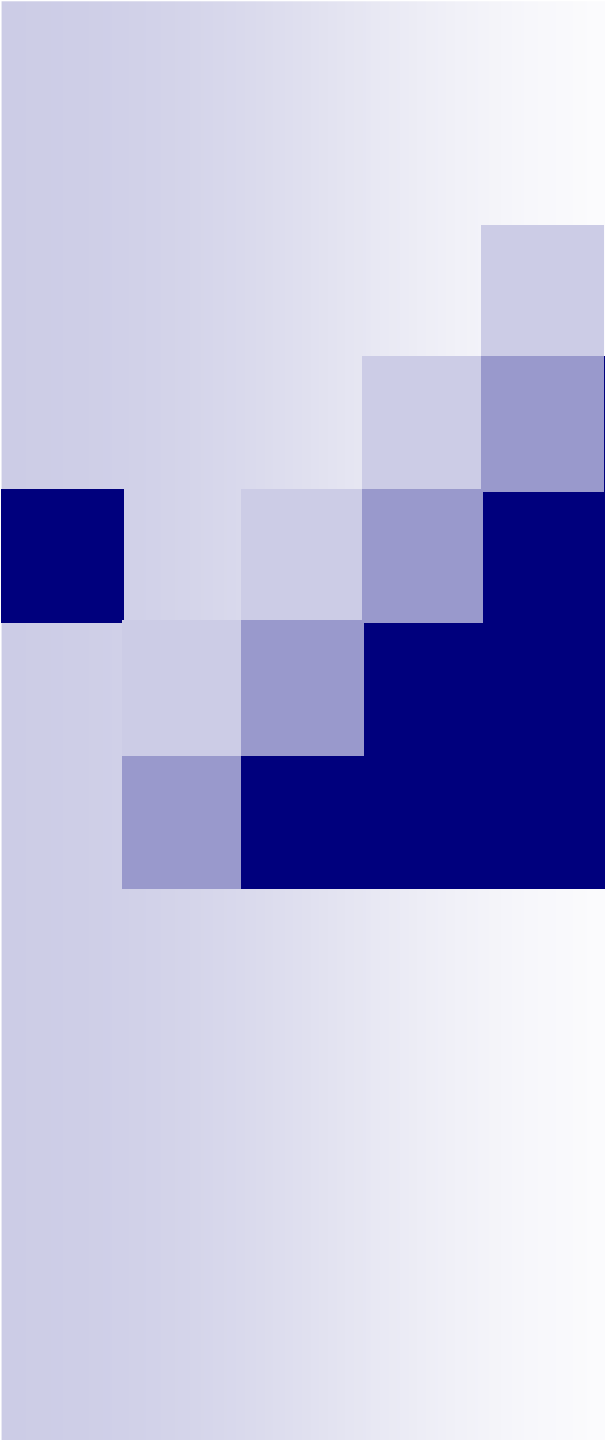
- Relatives contacted, declined the option of Do-Not-Resuscitate
- Dopamine started
- Complicated by nosocomial pneumonia
- Tazocin started
- Cardiac arrest on day 11, ROSC 50 min
- Cardiac arrest again 50 min later. Refractory to 60 mins of CPR.
- Succumbed on day 11

Time line for the events





***Have we done our best for Mr
Chan?***



Management of Acute Heart Failure



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
- Mancini et al, Effect of erythropoietin on exercise capacity in patients with moderate to severe chronic heart failure. *Circulation* 2003; 107:294–299.
 - 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.



Evaluation of Advanced Heart Failure

■ Elucidation of Symptoms

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

O'Connor CM, Stough WG, Gallup DS, Hasselblad V, Gheorghiade M. Demographics, clinical characteristics, and outcomes of patients hospitalized for decompensated heart failure: observations from the IMPACT-HF registry. *J Card Fail* 2005;11:200–205.

- 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)
- Abdominojugular Reflux
- Valsalva Square Wave

Congestion at Rest?

Evidence for Low Perfusion

- Narrow Pulse Pressure
- Pulsus Alterations
- Cool Forearms and Legs
- May Be Sleepy, Obtunded
- ACE Inhibitor-Related
- Symptomatic Hypotension
- Declining Serum Sodium Level
- Worsening Renal Function

Low Perfusion at Rest?

	No	Yes
No	Warm and Dry A	Warm and Wet B
Yes	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

- Nohria A, Tsang S, Dries DL, Fang JC, et al. Bedside assessment of hemodynamic profiles identifies prognostic groups in patients admitted with heart failure. *J Card Fail.* 2000;6:64.

- 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

Nohria A, Tsang S, Dries DL, Fang JC, et al. Bedside assessment of hemodynamic profiles identifies prognostic groups in patients admitted with heart failure. *J Card Fail.* 2000;6:64.

■ Warm up in order to dry out

■ Withdraw Beta-blocker and ACEI till stabilisation

■ Inotropic infusion

□ May increase risk of mortality

Inotropic therapy for heart failure: An evidence based Approach, G. Michael Felker, MD, and Christopher M. O'Connor, MD *Durham, NC, Am Heart J* 2001;142:393-401.

□ 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

Nohria A, Tsang S, Dries DL, Fang JC, et al. Bedside assessment of hemodynamic profiles identifies prognostic groups in patients admitted with heart failure. *J Card Fail.* 2000;6:64.

■ Clinically stable

■ Inotropic infusion: Risk of dependence

■ Gradual introduction of Beta-blockers or amiodarone may be associated with later clinical improvement

Packer M, Coats AJ, Fowler MB, et al. Effect of carvedilol on survival in severe chronic heart failure. *N Engl J Med.* 2001;344:1651-1658.

Doval HC, Nul DR, Grancelli HO, Perrone SV, Bortman GR, Curiel R. Randomised trial of low-dose amiodarone in severe congestive heart failure. Grupo de Estudio de la Sobrevida en la Insuficiencia Cardiaca en Argentina (GESICA). *Lancet.* 1994;344:493-498.



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

Weinfeld MS, Chertow GM, Stevenson LW. Aggravated renal dysfunction during intensive therapy for advanced chronic heart failure. *Am Heart J.* 1999;138:285-290.

Forman DE, Butler J, Wang Y, Abraham WT, O'Connor CM, Gottlieb SS, Loh E, Massie BM, Rich MW, Stevenson LW, Young JB, Krumholz HM. Incidence, predictors at admission, and impact of worsening renal function among patients hospitalized with heart failure. *J Am Coll Cardiol.* 2004; 43: 61–67.



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.

AHA/ACC Guideline 2009. Class 1 recommendation, Level of Evidence: C

- +/- Dialysis



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

McCullough PA, Philbin EF, Spertus JA, Kaatz S, Sandberg KR, Weaver WD. Confirmation of a heart failure epidemic: findings from the Resource Utilization Among Congestive Heart Failure (REACH) study. *J Am Coll Cardiol.* 2002;39:60–9.



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

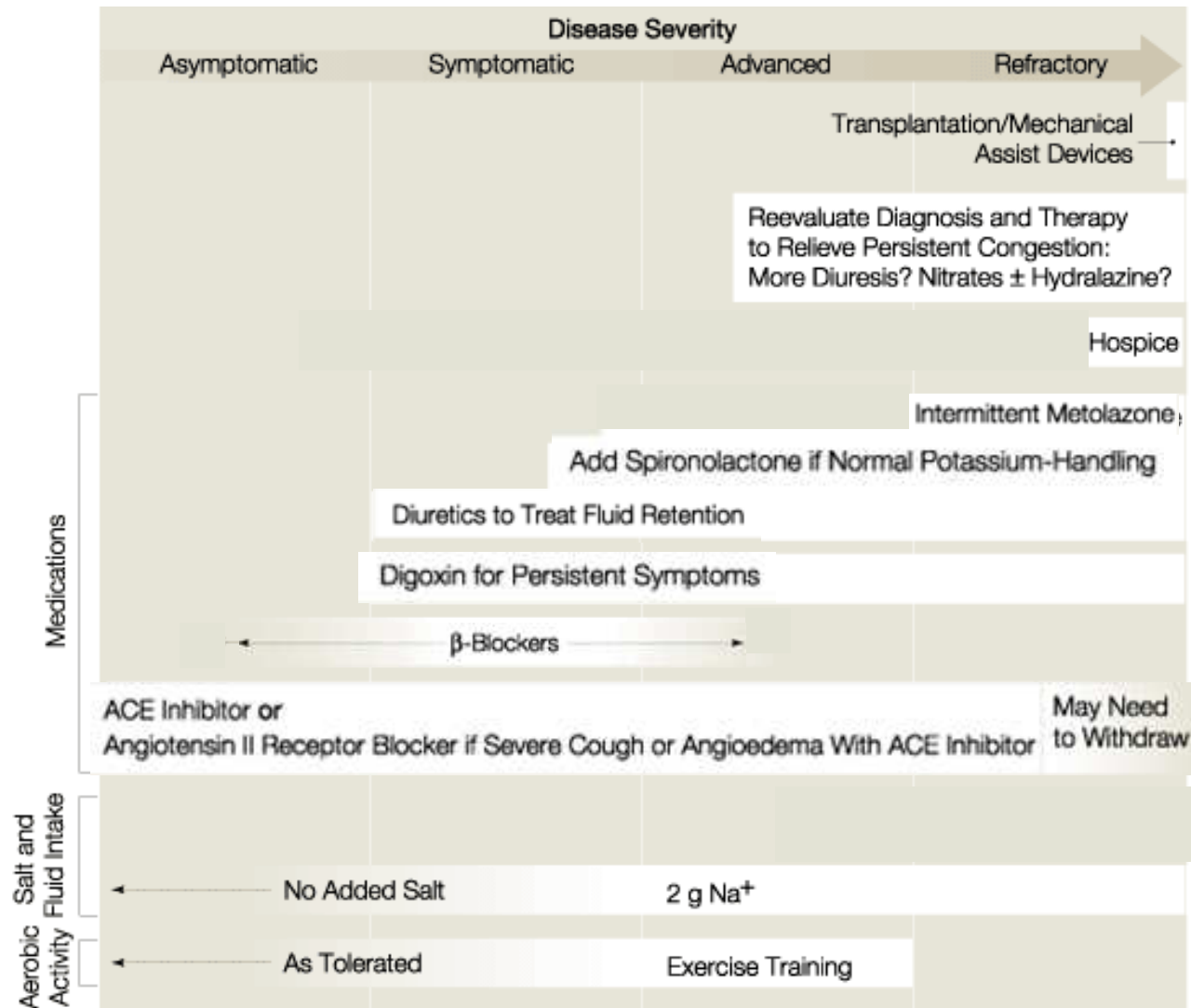
Diuretics

- 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





ACE inhibitors

- All stages of heart failure

Hunt SA, Baker DW, Chin MH, Cinquegrani MP, et al. ACC/AHA Guidelines for the Evaluation and Management of Chronic Heart Failure in the Adult. *J Am Coll Cardiol.* 2001;38:2101-2113.

- 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

Woo KS, Nicholls MG. High prevalence of persistent cough with angiotensin converting enzyme inhibitors in Chinese. *Br J Clin Pharmacol* 1995;40:141-4.



ACE inhibitors

- Practical tips:

- Not** contraindicated in any level of Creatinine

- Patients with higher Cr level at baseline may benefit more

Bakris GL, Weir MR. Angiotensin-converting enzyme inhibitor-associated elevations in serum creatinine. *Arch Intern Med.* 2000; 160: 685–693

- 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

Woo KS, Nicholls MG. High prevalence of persistent cough with angiotensin converting enzyme inhibitors in Chinese. *Br J Clin Pharmacol* 1995;40:141-4.



Beta-blockers

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

Hunt SA, Baker DW, Chin MH, Cinquegrani MP, et al. ACC/AHA Guidelines for the Evaluation and Management of Chronic Heart Failure in the Adult. *J Am Coll Cardiol.* 2001;38:2101-2113.

- 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

Packer M, Coats AJ, Fowler MB, et al. Effect of carvedilol on survival in severe chronic heart failure. *N Engl J Med.* 2001;344:1651-1658.

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

Hunt SA, Baker DW, Chin MH, Cinquegrani MP, et al. ACC/AHA Guidelines for the Evaluation and Management of Chronic Heart Failure in the Adult. *J Am Coll Cardiol.* 2001;38:2101-2113.

- NOT contraindicated in COPD

Frans H. Rutten, MD, PhD; Nicolaas P. A. Zuithoff, MSc; Eelko Hak, MSc, PhD; Diederick E. Grobbee, MD, PhD; Arno W. Hoes, 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

- Hunt SA, Baker DW, Chin MH, Cinquegrani MP, et al. ACC/AHA Guidelines for the Evaluation and Management of Chronic Heart Failure in the Adult. *J Am Coll Cardiol.* 2001;38:2101-2113.

- *Is it contraindicated in COPD?*

- Frans et al, β -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

Fonarow GC, Abraham WT, Albert NM, et al. Influence of beta-blocker continuation or withdrawal on outcomes in patients hospitalized with heart failure: findings from the OPTIMIZE-HF program. J Am Coll Cardiol. 2008;52:190–9.

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

Pitt B, Zannad F, Remme WJ, et al. The effect of spironolactone on morbidity and mortality in patients with severe heart failure. Randomized Aldactone Evaluation Study Investigators. N Engl J Med 1999;341:709-17.

Hunt SA, Baker DW, Chin MH, Cinquegrani MP, et al. ACC/AHA Guidelines for the Evaluation and Management of Chronic Heart Failure in the Adult. J Am Coll Cardiol. 2001;38:2101-2113.



Digitalis

- All patients remain symptomatic despite ACEI, Beta-blocker and diuretics

- Improves mortality (modestly) and symptoms

The effect of digoxin on mortality and morbidity in patients with heart failure. The Digitalis Investigation Group. N Engl J Med 1997;336:525-33.

- Practical tips:

- Low dose(125mcg daily or 62.5mcg daily) for age >70, renal impairment and lean body mass

Jelliffe RW, Brooker G. A nomogram for digoxin therapy. Am J Med 1974;57:63-8.

- Low dose is not inferior to high dose

Slatton ML, Irani WN, Hall SA, et al. Does digoxin provide additional hemodynamic and autonomic benefit at higher doses in patients with mild to moderate heart failure and normal sinus rhythm? J Am Coll Cardiol 1997;29:1206-13.

- Little relationship between serum digoxin concentration and the drug's therapeutic effect

Arnold SB, Byrd RC, Meister W, et al. Long-term digitalis therapy improves left ventricular function in heart failure. N Engl J Med 1980;303:1443-8.

- 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

Cohn JN, Johnson G, Ziesche S, et al. A comparison of enalapril with hydralazine-isosorbide dinitrate in the treatment of chronic congestive heart failure. *N Engl J Med* 1991;325:303-10.

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

Taylor AL et al, Combination of isorbide dinitrate and hydralazine in blacks with heart failure. *N Engl J Med* 2004; 351:2049-57
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

Elkayam U, Amin J, Mehra A, Vasquez J, Weber L, Rahimtoola SH. A prospective, randomized, double-blind, crossover study to compare the efficacy and safety of chronic nifedipine therapy with that of isosorbide dinitrate and their combination in the treatment of chronic congestive heart failure. *Circulation* 1990;82: 1954-61.

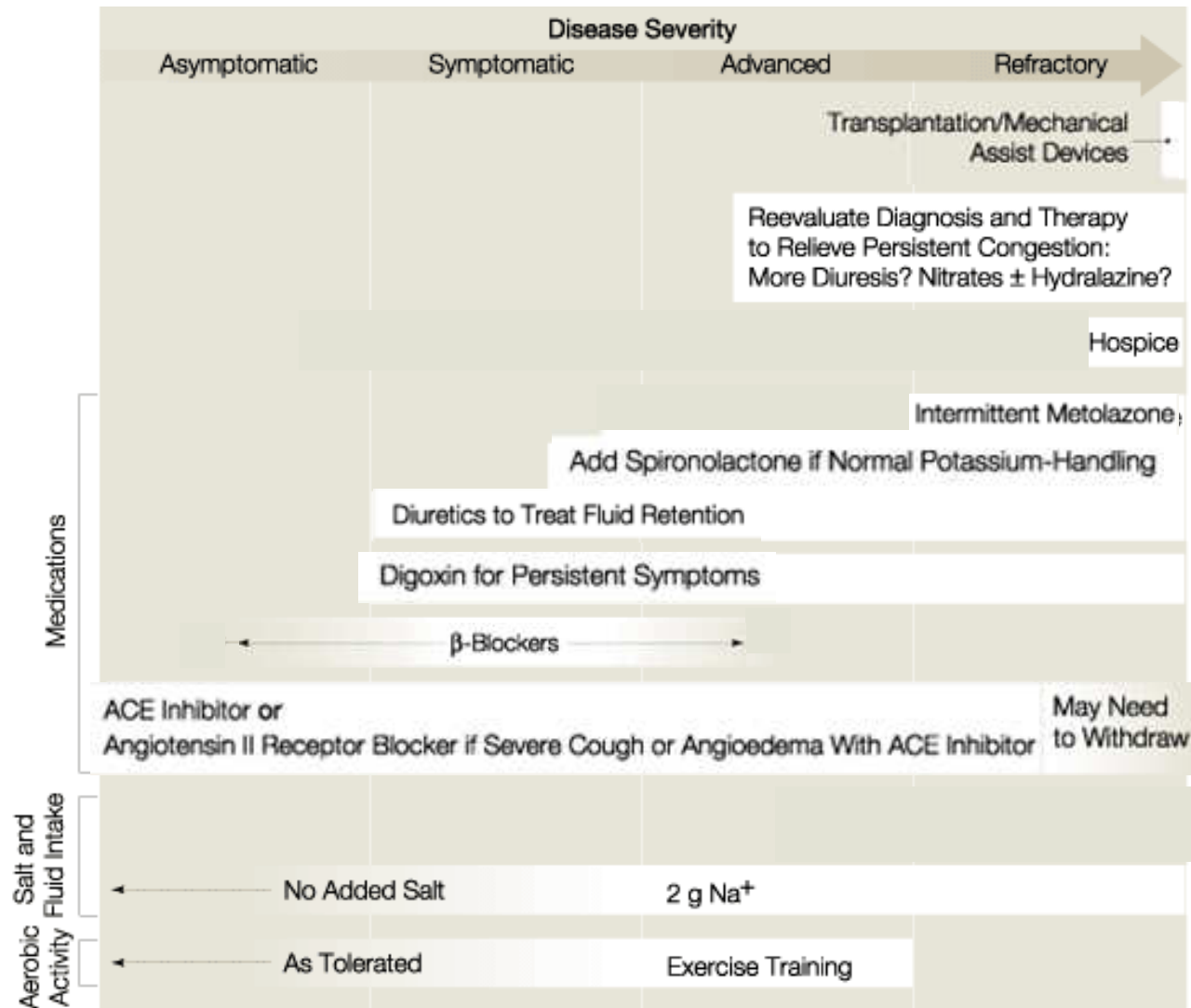
Cohn JN, Ziesche S, Smith R, et al, for the Vasodilator-Heart Failure Trial (V-HeFT) Study Group. Effect of the calcium antagonist felodipine as supplementary vasodilator therapy in patients with chronic heart failure treated with enalapril: V-HeFT III. *Circulation* 1997;96:856-63.

Packer M. Calcium channel blockers in chronic heart failure: the risks of "physiologically rational" therapy. *Circulation* 1990;82: 2254-7.

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

Packer M, O'Connor CM, Ghali JK, et al, for the Prospective Randomized Amlodipine Survival Evaluation Study Group. Effect of amlodipine on morbidity and mortality in severe chronic heart failure. *N Engl J Med* 1996;335:1107-14.

Stepped Therapy for Heart Failure





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 patient in HK from 1992 to 2006
- The oldest recipient is/was 65 years old

Hong Kong Society of transplantation, brief review article by Dr Elaine Chau in Apr 2007



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%

McAlister F, Ezekowitz J, Wiebe N, et al. Cardiac resynchronization therapy for congestive heart failure. Evid Rep. Technol Assess (Summ.). 2004 Nov;(106):1-8



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*

John G.F. Cleland, M.D., et al. The Effect of Cardiac Resynchronization on Morbidity and Mortality in Heart Failure. N Engl J Med 2005; 352:1539-1549 April 14, 2005



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**



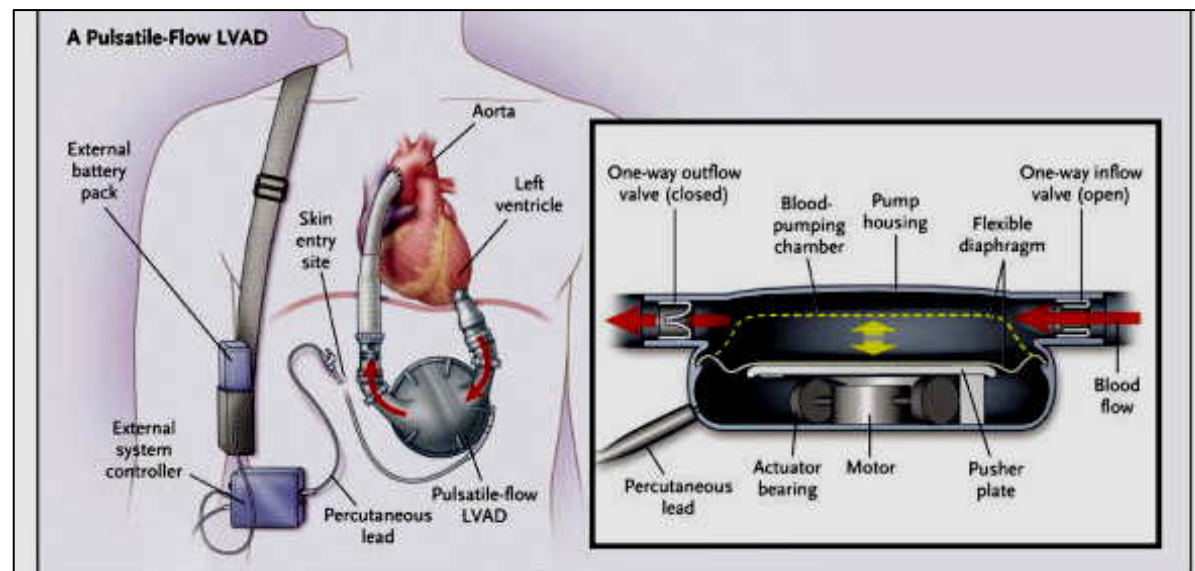
Other Treatments for Advanced Heart Failure

- 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

Rose EA, Moskowitz AJ, Packer M, et al. The REMATCH trial: rationale, design, and end points: Randomized Evaluation of Mechanical Assistance for the Treatment of Congestive Heart Failure. *Ann Thorac Surg* 1999;67:723-30.



Advanced Directive



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

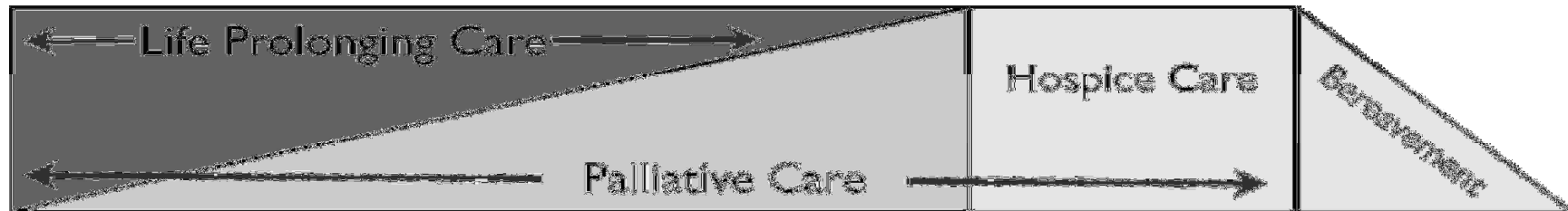
- Importance of Advance directives



End-of-life Care in Advanced Heart Failure

Palliative Care Integrative Model

Advance Directives, appoint health care proxy decision maker

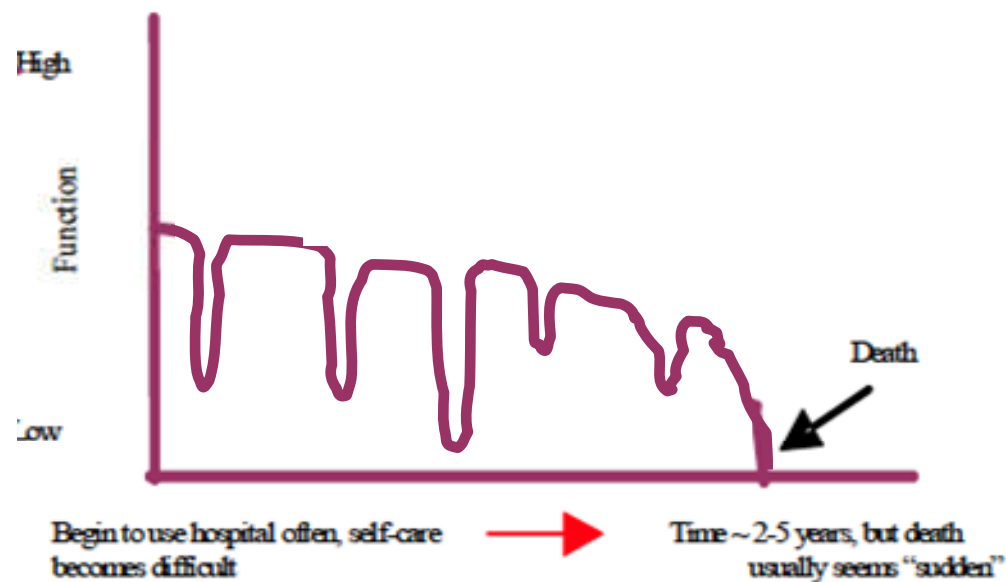


Diagnosis of any serious diseases



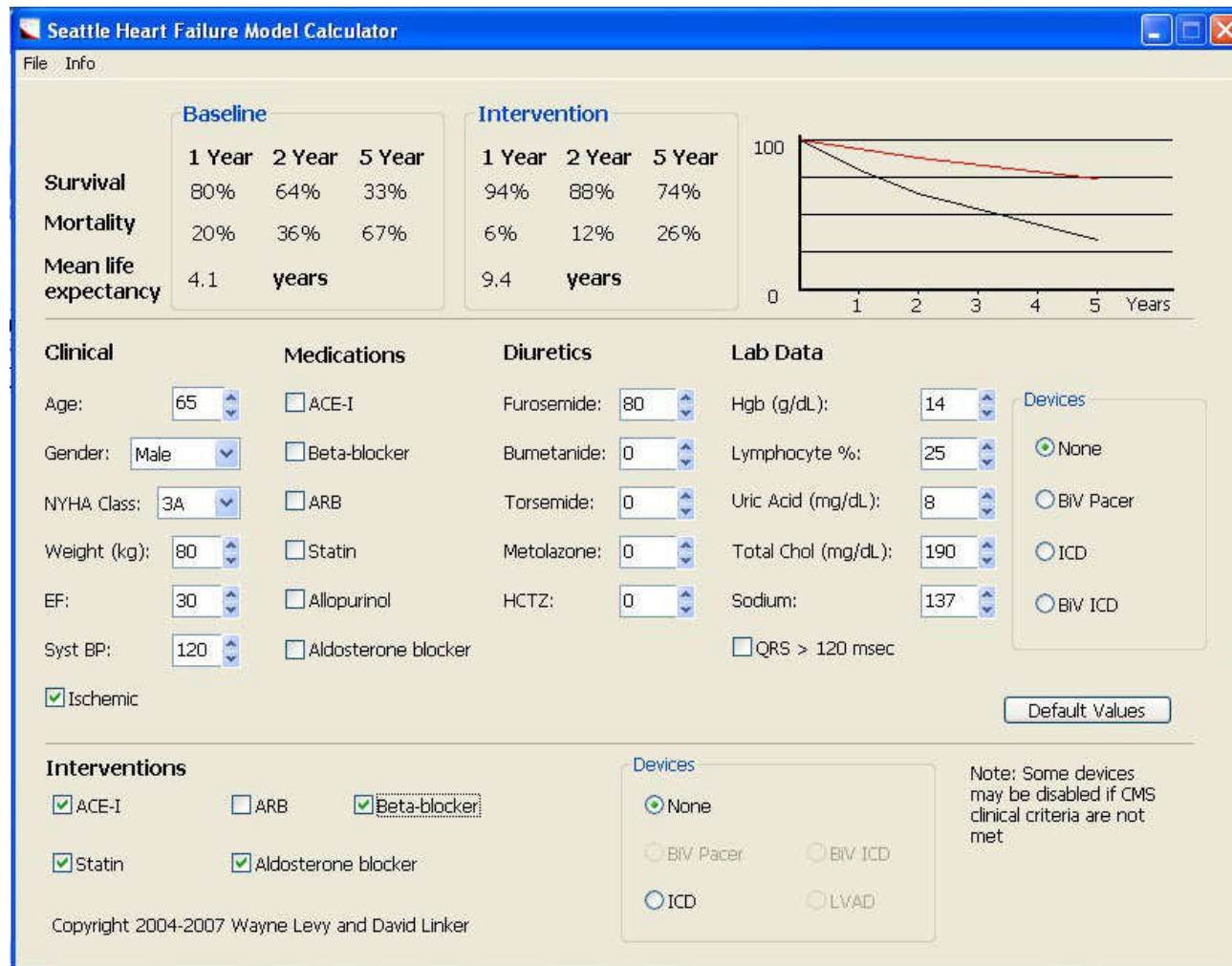
Practical Difficulty

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



- Always one more things to try

Seattle Heart Failure Model





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 6-12months’
 - **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

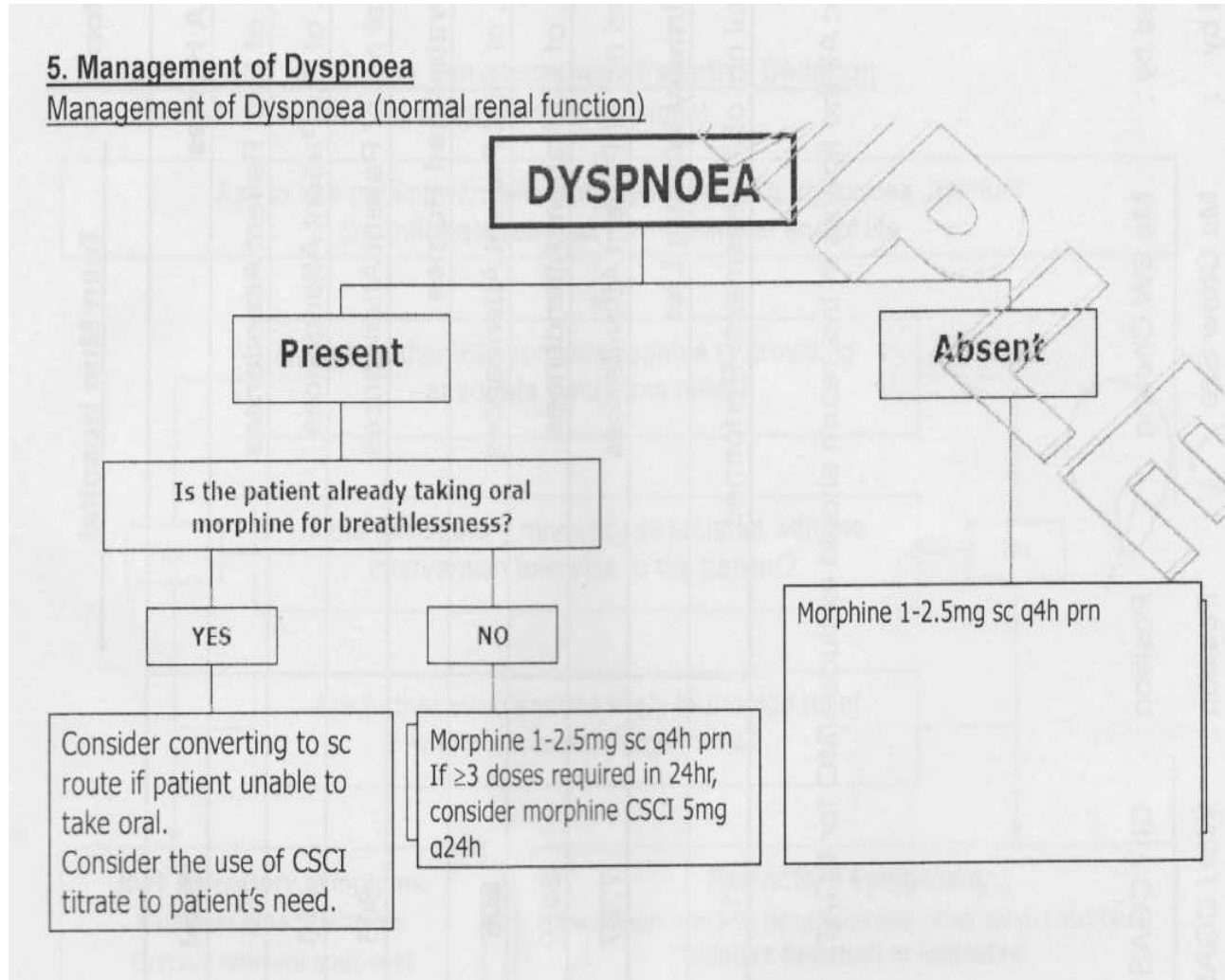
Jennings AL et al. A systematic review of the use of opioids in the management of dyspnea. Thorax 2002;57:939-44

- 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

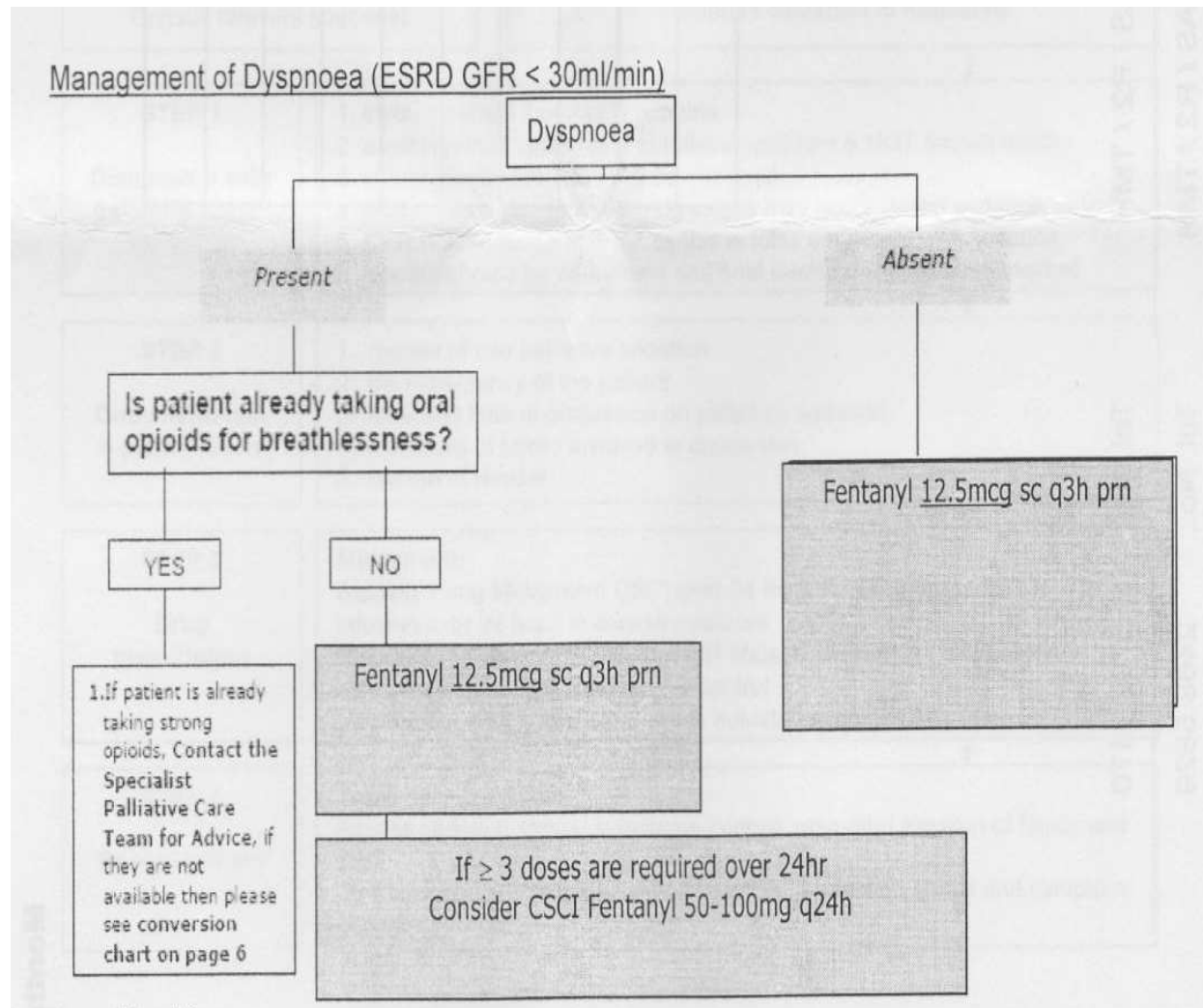
The Use of Opioids

5. Management of Dyspnoea

Management of Dyspnoea (normal renal function)



The Use of Opioids





End-of-life Care for Advanced Heart Failure

■ Symptom palliation

□ Dyspnoea

■ Benzodiazepines

□ Dyspnoea associated panic attacks

Currow DC, Abernethy AP. Pharmacological management of dyspnoea. *Curr Opin Support Palliat Care.* 2007;1:96–101.

□ 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 inotropic infusion useful to help dyspnoea?*

■ *Intermittent inotropic infusion*

□ Not recommended

□ The *only* placebo-controlled trial terminated early because of little efficacy and increased mortality

Elis A, Bental T, Kimchi O, Ravid M, Lishner M. Intermittent dobutamine treatment in patients with chronic refractory congestive heart failure: a randomized, double-blind, placebo-controlled study. Clin Pharmacol Ther 1998;63:682-5.

■ *Continuous inotropic infusion*

□ Palliate symptoms and allow patient to die at home

Sindone AP, Keogh AM, Macdonald PS, McCosker CJ, Kaan AF. Continuous home ambulatory intravenous inotropic drug therapy in severe heart failure: safety and cost efficacy. Am Heart J 1997;134:889-900.

□ Major burden to the family and health services

□ May increase the risk of death

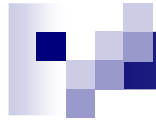


End-of-life Care for Advanced Heart Failure

■ 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

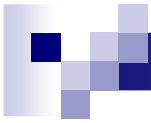
■ Angina:

- 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



Pocket Card of Drug Prescribing in EOL Care (to be used together with the EOL care pathway)

Symptom	Condition	Recommended Medications	
		Starting regimen	Maintenance
Pain	Usual	Morphine sc 2.5mg q4h prn	If ≥ 3 doses in 24hr: CSCI morphine 10-15mg q24h
	ESRD	Fentanyl 12.5-25microgram q3h prn	If ≥ 3 doses in 24hrs: CSCI Fentanyl 100-200mcg q24h
Agitation		Haloperidol sc 1.5mg q12h prn	If ≥ 2 doses in 24hrs: CSCI Haloperidol 5-10mg q24h
Death rattle	Usual	Buscopan 20mg sc q8h prn	If ≥ 2 doses in 24hrs: CSCI Buscopan 40-120mg q24h
	CHF	Furosemide 10-20mg sc q4h prn	
Nausea/vomiting	Usual	Maxolon 10mg iv q8h prn	If ≥ 2 doses in 24hrs: CSCI Maxolon 30mg q24h
	Alternative	Haloperidol 1.5mg sc q8h prn	If ≥ 2 doses in 24hrs: CSCI Haloperidol 5-10mg q24h
	ESRD	Haloperidol 0.5-1.5mg sc q8h prn	If ≥ 2 doses in 24hrs: CSCI Haloperidol 1.5-3mg q24h
Dyspnoea	Usual	Morphine sc 1mg q4h prn	If ≥ 3 doses in 24hr: CSCI morphine 5mg q24h
	ESRD	Fentanyl 12.5microgram q3h prn	If ≥ 3 doses in 24hrs: CSCI Fentanyl 50-100mcg q24h



Symptoms palliation

- Management of Depression



End-of-life Care for Advanced Heart Failure

- Symptom palliation

- Depression

- 21% to 36%

- Faris R, Purcell H, Henein MY, Coats AJ. Clinical depression is common and significantly associated with reduced survival in patients with non-ischaemic heart failure. *Eur J Heart Fail.* 2002;4:541–551.

- Associated with higher death and readmission rate

- 1st line: Serotonin reuptake inhibitors

- Co-prescription of Aspirin with SSRI double the risk of Gastrointestinal bleeding

- Paton C et al, SSRIs and gastrointestinal bleeding. *BMJ* 2005; 331: 529-30

- 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

Sears SF Jr, Conti JB. Quality of life and psychological functioning of ICD patients. *Heart*. 2002;87:488–493.

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 house work, 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

* As published in Am. J. Clin. Oncol.: Oken, M.M., Creech, R.H., Tormey, D.C., Horton, J., Davis, T.E., McFadden, E.T., Carbone, P.P.: Toxicity And Response Criteria Of The Eastern Cooperative Oncology Group. Am J Clin Oncol 5:649-655, 1982.



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 Rheumatic 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

No. of hospitalisation	No. of patients
1	1
2	2
3	4
4	2
5	3
6	2
7	1
8	2

Mean number of hospitalisation: 4.4



TMH Data

Duration of hospitalization (days)	No. of patients
1 - 30	3
31 - 60	10
61 - 90	3
91 - 120	1

Mean duration of hospitalisation: 47.8 days



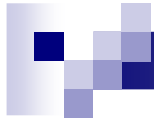
TMH Data

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



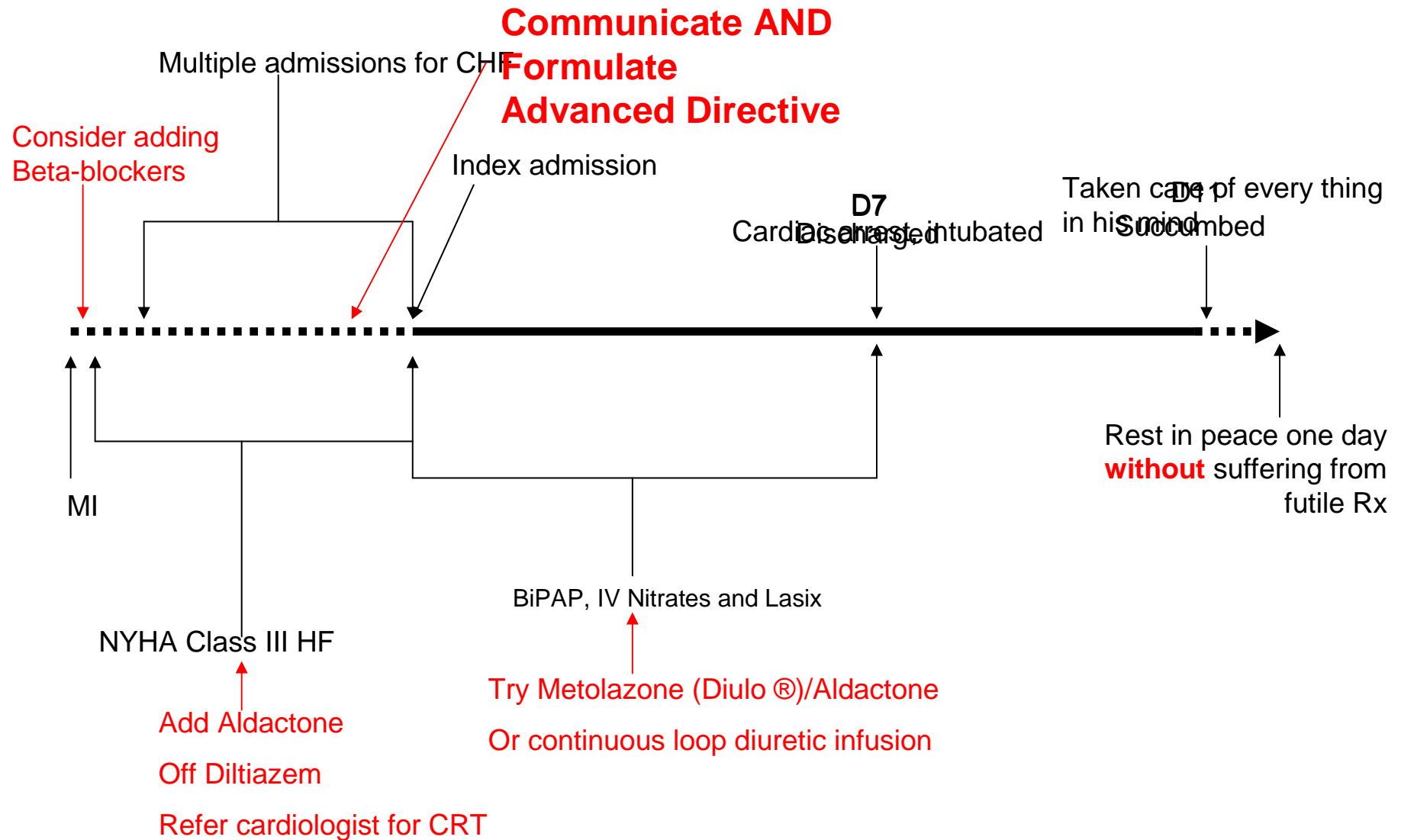
Conclusion

- 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?***

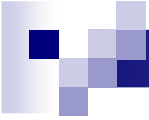
Time line for the events





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