



**Bournemouth  
University**

# Specialist Nursing Improves Outcomes in Heart Failure

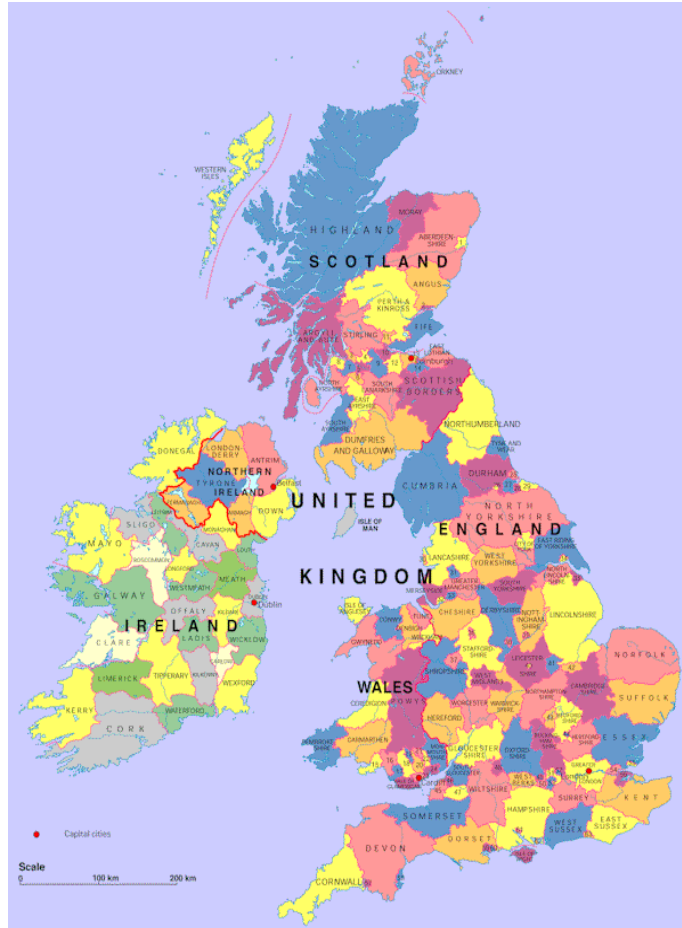
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# Where are we from?



# Chichester



# Outline

- ▶ Part 1: What is Heart Failure?
  - ▶ Incidence
  - ▶ Interventions
  - ▶ Impact of the specialist practice role
- ▶ Part 2: Case studies



# The healthy heart

Beats 100,000 times a day; 3,600,000 times a year; and 2.5 billion times during a lifetime.

Begins beating at four weeks after conception and does not stop until death

The heart creates enough energy to drive a truck 20 miles. In a lifetime, that is equivalent to driving to the moon and back.

Weighing 11 ounces a healthy heart daily pumps 2,000 gallons of blood through 60,000 miles of blood vessels

The heart pumps blood to almost all of the body's 75 trillion cells.

A kitchen tap would need to be turned on all the way for at least 45 years to equal the amount of blood pumped



# What is Heart Failure?

Heart failure means that the heart is not pumping as effective as it normally would be.

Often due to problems with the heart muscle (such as weakening) or mechanical problems in the heart (such as damaged valves)

It affects around 26 million people worldwide.

Around 900,000 people in the UK have heart failure.

Approx 4.2 million patients with heart failure in China

The outlook for people with heart failure can be very poor - 30 to 40% of people die within a year of diagnosis

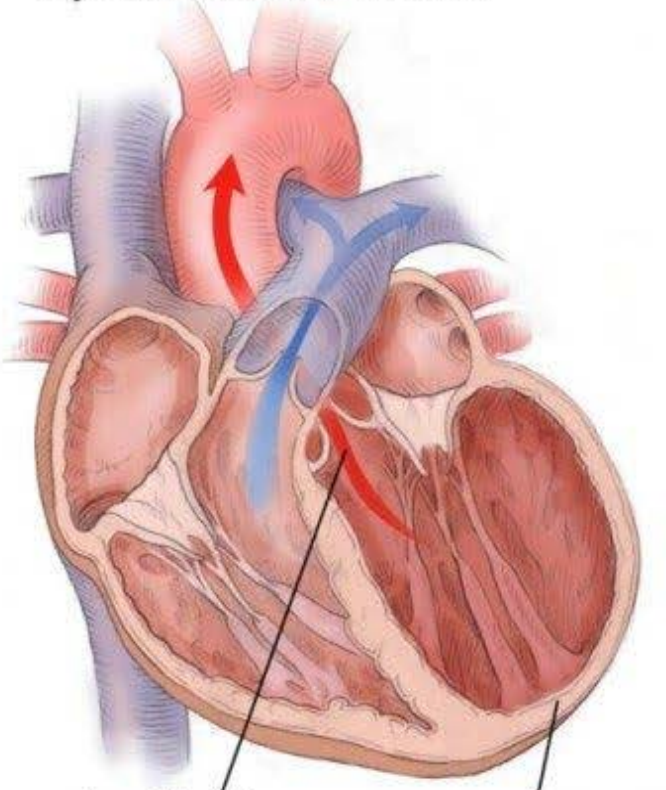
# Heart Failure with Reduced Ejection Fraction (HFREF)

- ▶ Ejection fraction is the percentage of blood which leaves the heart each time it contracts
- ▶ Normal ejection fraction is 55% or above
- ▶ Definition- The heart is unable to pump sufficiently to maintain blood flow to meet the body's needs
- ▶ Left ventricular systolic dysfunction (LVSD)



# Heart Failure

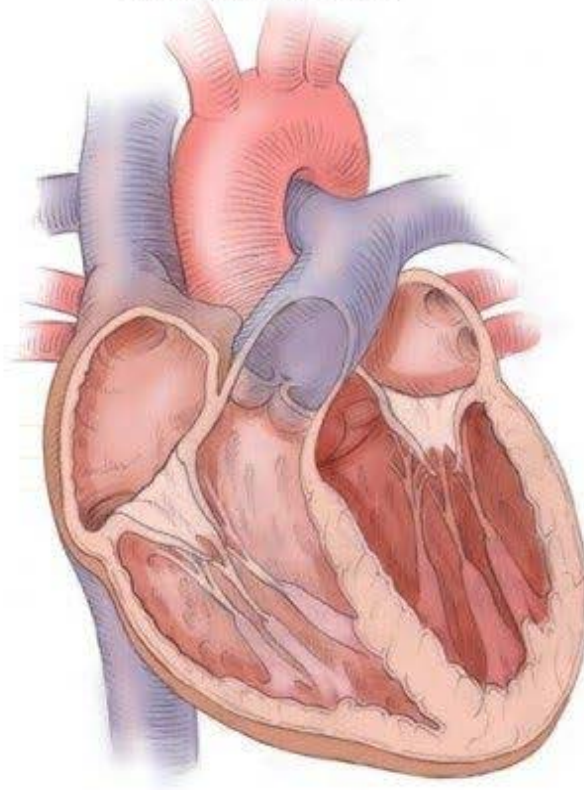
## Systolic Heart Failure



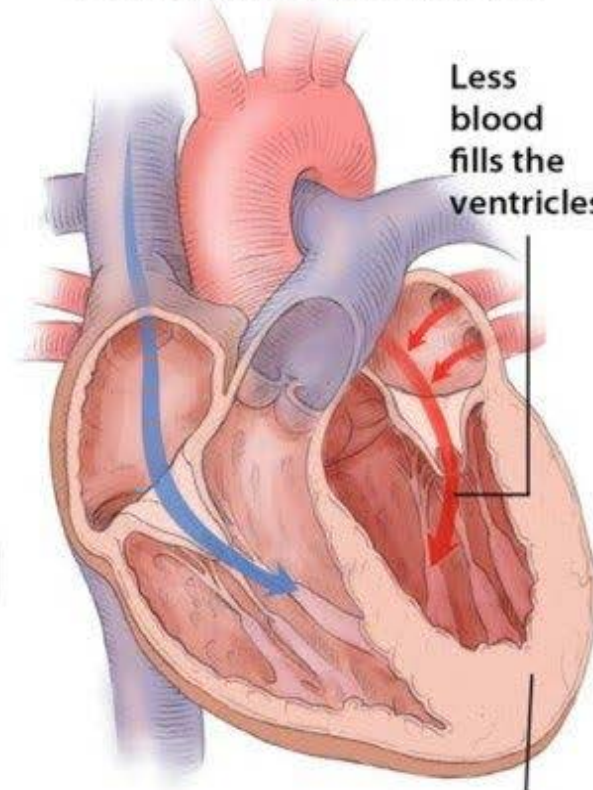
Less blood pumped out of ventricles

Weakened heart muscle can't squeeze as well

## Normal Heart



## Diastolic Heart Failure



Less blood fills the ventricles

Stiff heart muscle can't relax normally



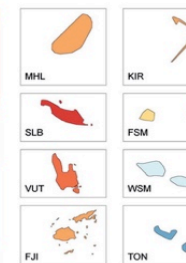
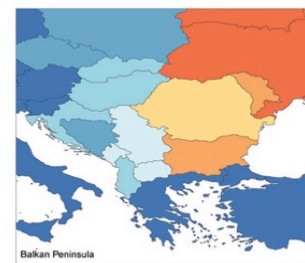
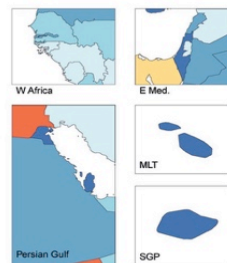
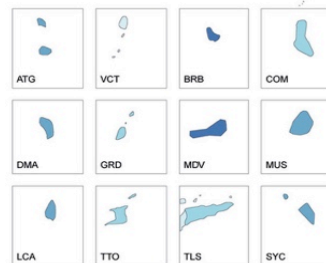
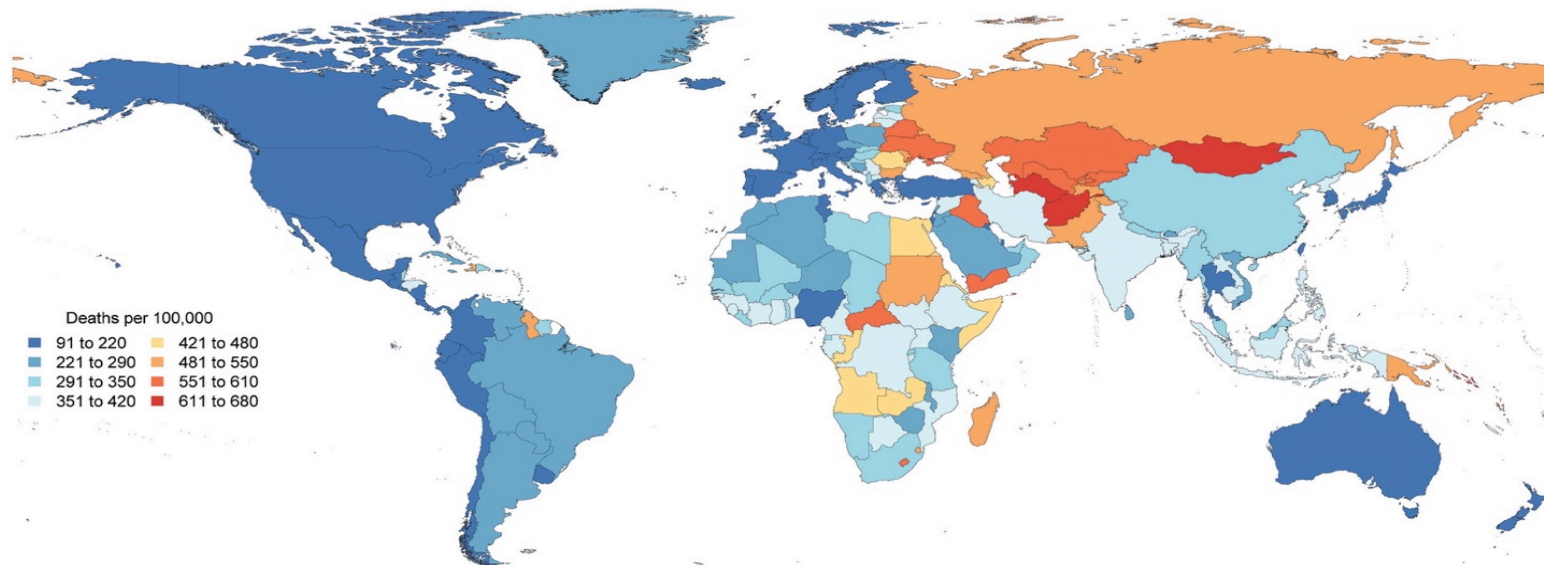


# Risk Factors

High blood pressure.	Coronary artery disease.	Heart attack.	Diabetes.
Some diabetes medications.	Certain other medications.	Sleep apnea.	Congenital heart defects.
Valvular heart disease.	Viruses.	Alcohol use.	Tobacco use.
	Obesity.	Irregular heartbeats.	

# Cardiovascular Disease Burden

**CENTRAL ILLUSTRATION: Global Map, Age-Standardized Death Rate of CVD in 2015**



Roth, G.A. et al. J Am Coll Cardiol. 2017;70(1):1-25.

# China facing epidemic of heart disease

- ▶ 2016 study found that:
  1. high blood pressure,
  2. high cholesterol,
  3. high blood glucose
- ▶ Accounted for most of the Cardiovascular Disease burden in China
- ▶ The three risk factors were associated, respectively, with 3.1, 1.4, and 0.9 million new cases of heart attack or stroke.
- ▶ Of 6.8 million Chinese over age 35 who died, about 3 million of the deaths—44%—were CVD-related.

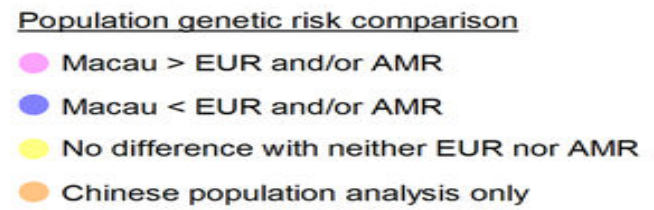
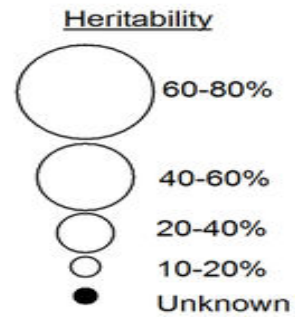
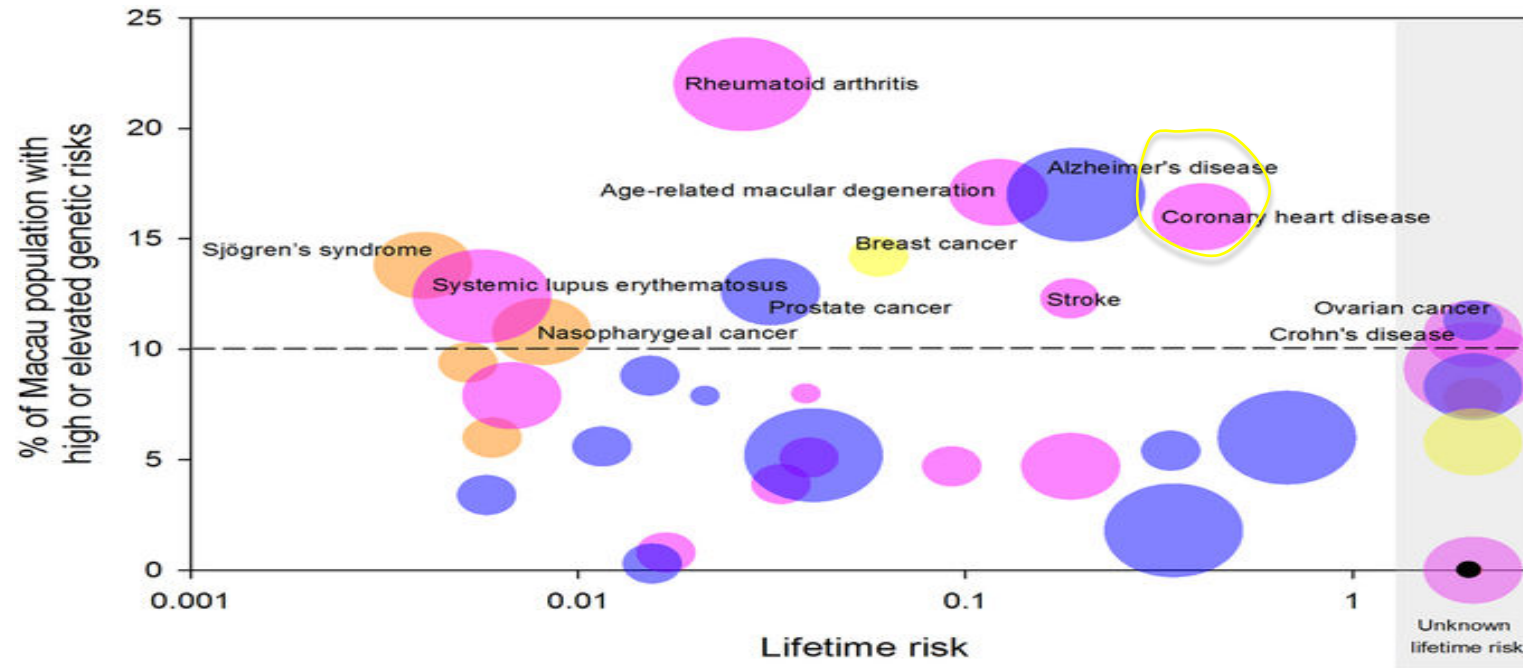


# Cardiovascular disease in Macau

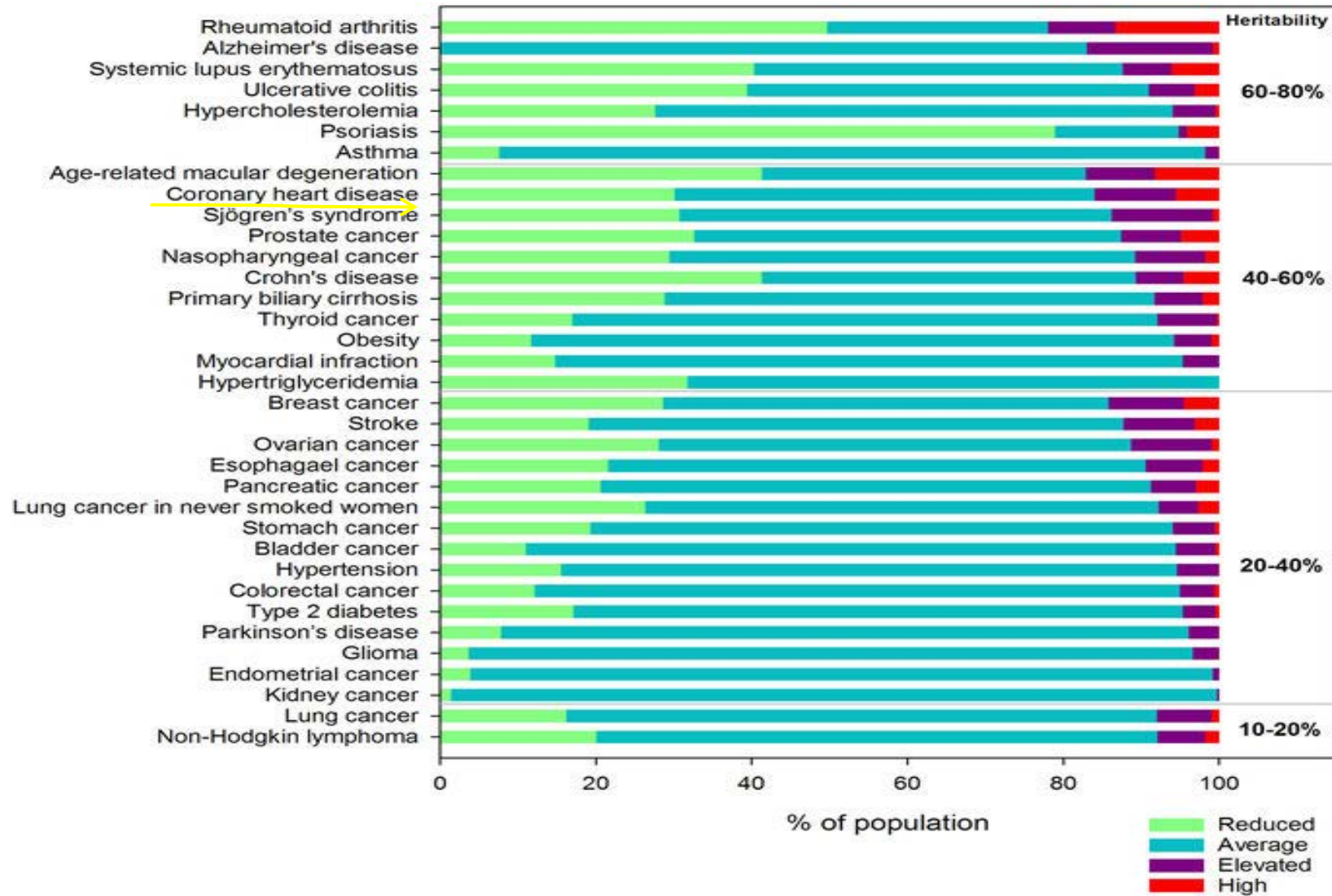
- ▶ 5,000 people die of cardiovascular diseases each year
- ▶ The second main cause of death in the territory, after cancer
- ▶ These diseases can be most common amongst the youth
  - ▶ Ref: Mário Évora and Ip Man Fai, from the Macau Cardiology Association



# Macau: Genetic Risks



# Macau: Disease risk and heritability





# Symptoms of Heart Failure

Shortness of breath on exertion or lying down

Fatigue and weakness

Swelling (edema) in legs, ankles and feet

Rapid or irregular heartbeat

Reduced ability to exercise

Persistent cough or wheezing with white or pink blood-tinged phlegm

Increased need to urinate at night

Swelling of abdomen (ascites)

Very rapid weight gain from fluid retention

Lack of appetite and nausea

Difficulty concentrating or decreased alertness

Sudden, severe shortness of breath and coughing up pink, foamy mucus

Chest pain if heart failure is caused by a heart attack



# Quality of Life

Patients with heart failure experience various physical and emotional symptoms such as:

- dyspnea,
- fatigue,
- edema,
- sleeping difficulties,
- depression
- chest pain

These symptoms limit patients' daily physical and social activities and result in poor QOL.

Poor QOL is related to high hospitalization rates.





# Hospital readmission rates

- ▶ More than 20% of patients are readmitted within 30 days and up to 50% by 6 months.
- ▶ Predicting who will be rehospitalized is difficult, and much is unexplained.
- ▶ Young more likely to have no readmissions or bed days - but if readmitted they were more likely to have multiple readmissions
- ▶ Older people more likely to be readmitted once but not more than once.
- ▶ More likely to be in high-use category, so they accrue bed days by one long readmission rather than several shorter ones

## Quiz: Q1

Why do some places in your body swell?

- a. Extra water in your blood
- b. Too much fluid in your tissues
- c. Pockets of air in your muscles



## Quiz: Q2

Symptoms of heart failure may include :

- a. Cough
- b. Fatigue
- c. Oedema
- d. All of the above





## Quiz: Q3

Too much of the following can also cause it:

- a. Fat
- b. Carbs
- c. Sodium





# Advanced Nursing Roles

- ▶ Recognised skills, knowledge and competencies that are beyond those normally expected from a nursing role
- ▶ Complex decision-making skills and clinical competencies for expanded practice, the characteristics of which are shaped by the context and/or country.
- ▶ In the UK there are broadly 3 types:
  1. Advanced Nurse Practitioner
  2. Clinical Nurse Specialist
  3. Nurse Consultant



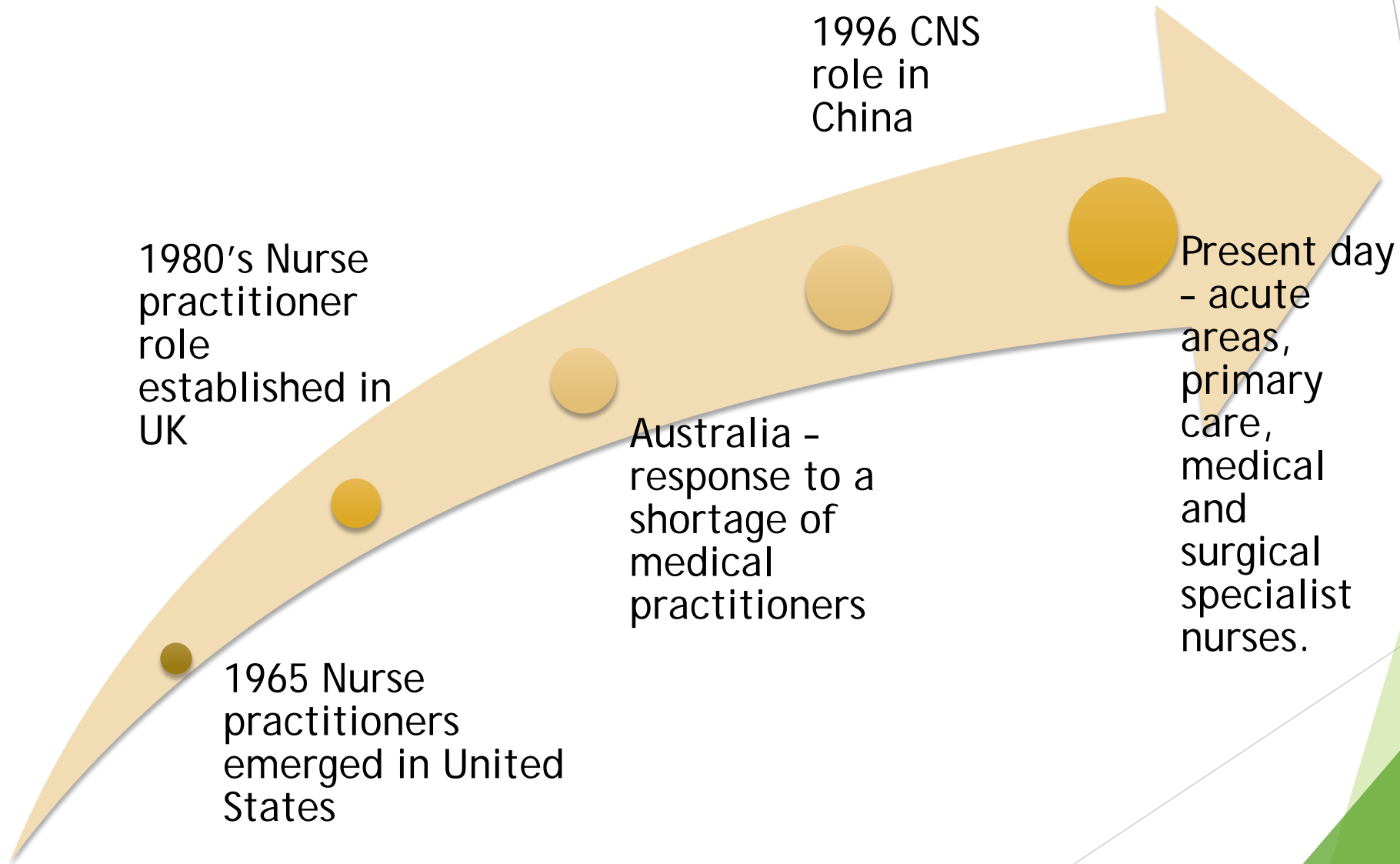
**Bournemouth  
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# Heart Failure Clinical Nurse Specialist





# Brief History



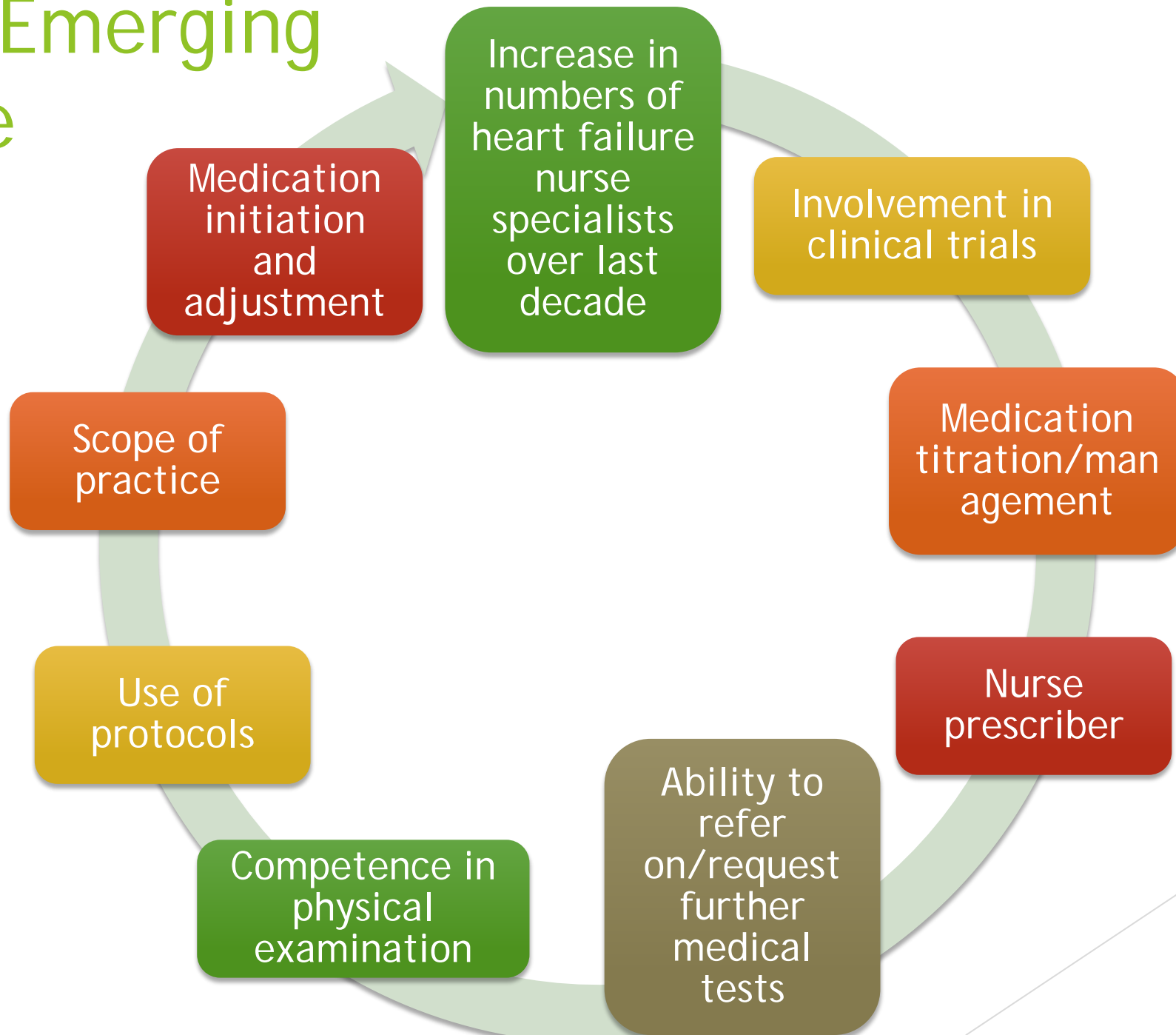


# Supporting Evidence

- ▶ 1995 Department of Health documentation
- ▶ Benefits of collaborative working
- ▶ Randomised trial published (Rich M. 1995) - 56% reduction in hospital readmission within 90 days - Improvement in quality of life scores
- ▶ Medical follow up only v MDT care with intervention from specialist nurse within 14 days (Stewart 1999)
- ▶ Preventable admissions (1998 Michalsen)
- ▶ British Heart Foundation funding



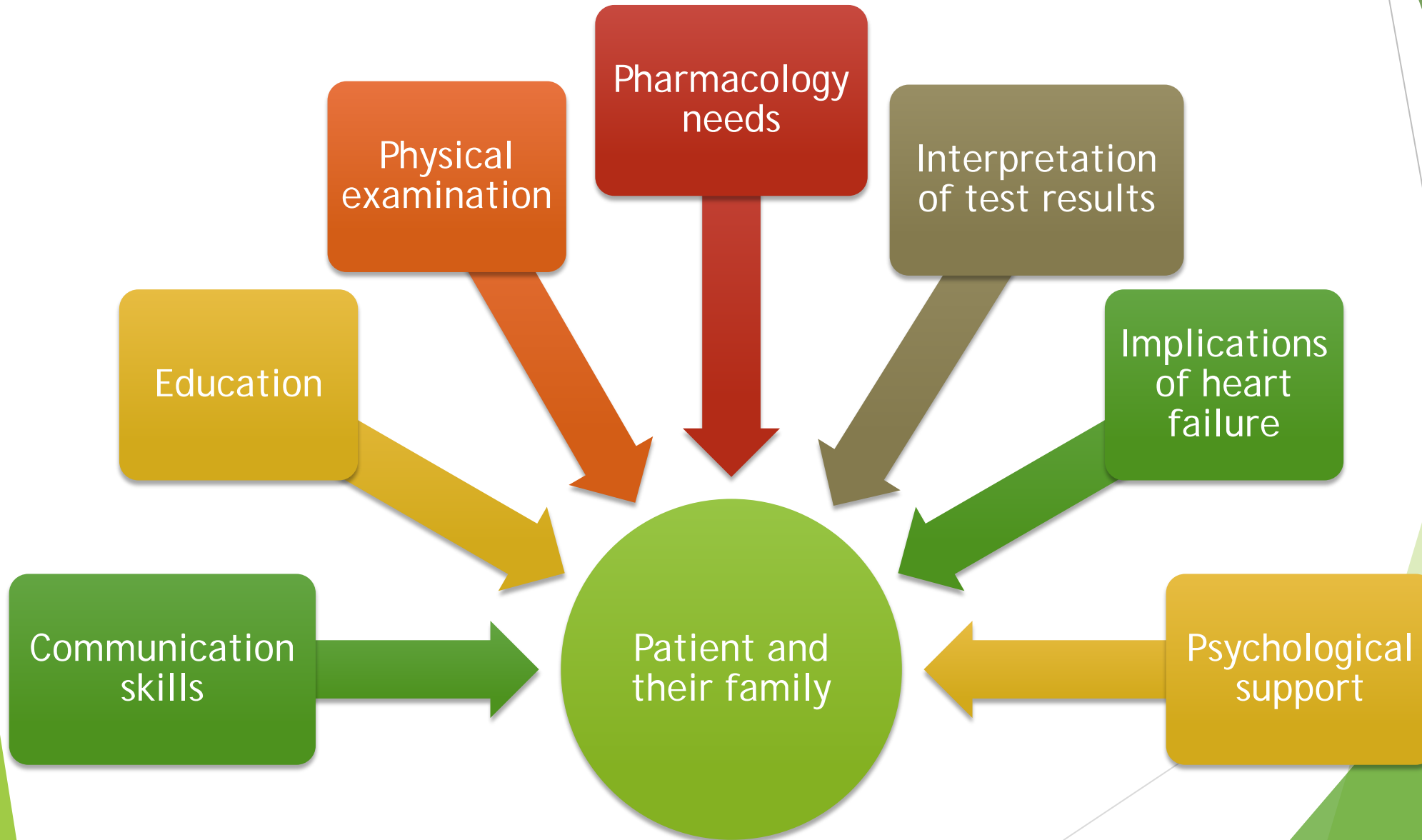
# The Emerging Role



# NICE

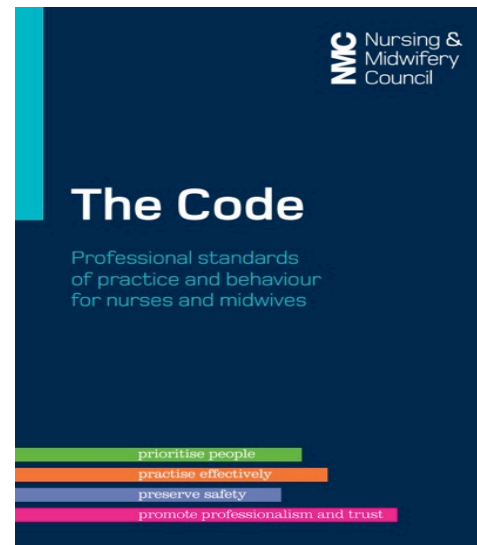


# Patient and family focus of the role:



# Accountability

- ◆ Registered nurses are accountable for their practice
- ◆ Education to degree level with specialist focus
- ◆ Nursing and Midwifery Council (NMC) Code:
  - Practice in line with best available evidence
  - Recognise and work within the limits of competence.
- ◆ MDT meetings





# Specific interventions

- ❖ Understanding of diagnosis
- ❖ Underlying cause
- ❖ Symptoms/NYHA functional class
- ❖ Treatment - pharmacological, non pharmacological, device therapy
- ❖ Self monitoring
- ❖ Physical examination

# NYHA Functional Class

Class I (mild)	No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea (shortness of breath), or angina pain.
Class II (mild)	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, palpitation, dyspnea, or angina pain.
Class III (moderate)	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes fatigue, palpitation, dyspnea, or angina pain.
Class IV (severe)	Unable to carry out any physical activity without discomfort. Symptoms of cardiac insufficiency at rest. If any physical activity is undertaken, discomfort is increased.



# Referral to Heart Failure Nursing Service

- ▶ Symptomatic heart failure with reduced ejection fraction (HFREF), EF less than 45%
- ▶ Informed of diagnosis
- ▶ Likely to have prognostic benefit from treatment
- ▶ Cognitively competent

# Case Studies

1. Non-Ischaemic Viral
2. Non-Ischaemic alcohol
3. Ischaemic heart disease



# Patient 1

84 year old female  
NYHA class 2-3

Admitted with chest  
pain & pulmonary  
oedema

Recent viral  
infection

No significant PMH

ECG - LBBB

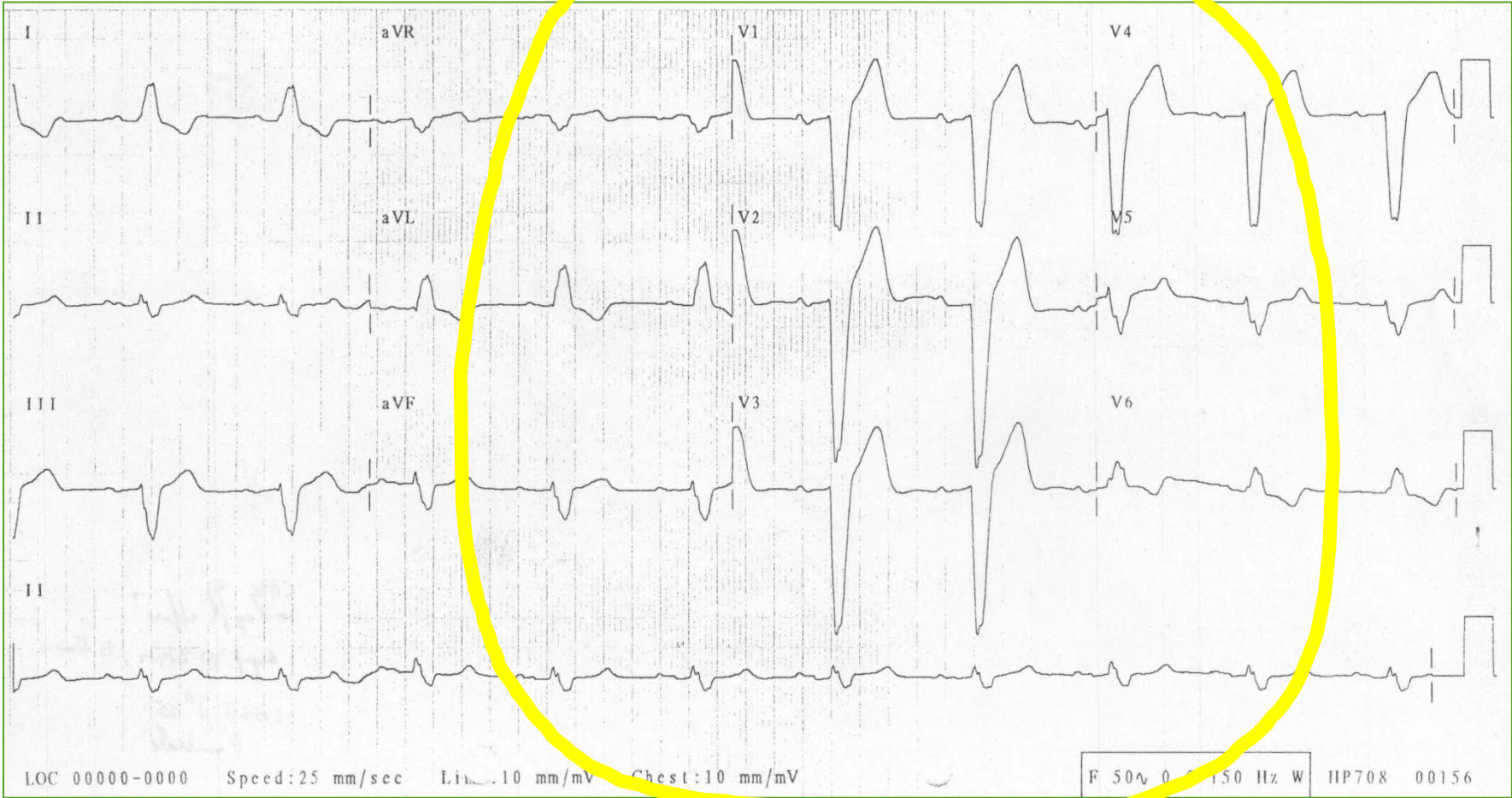
Angiogram findings-  
Mild coronary artery  
irregularities, no  
obstructive disease

Echo - LVEF < 25%  
(severely impaired  
function) with  
dyssynchronous  
septum (April 2017)

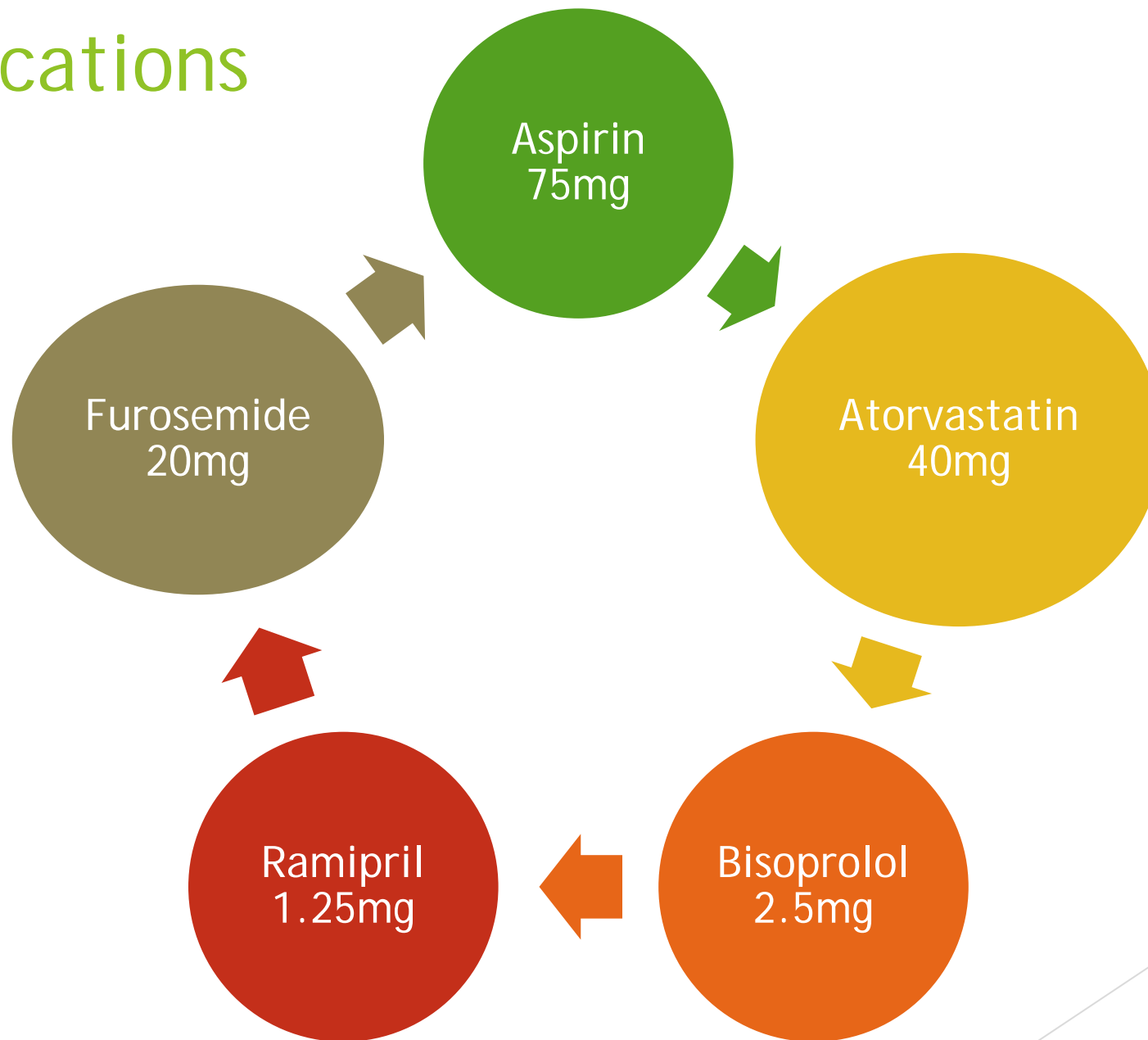
# Normal ECG



# ECG



# Medications



# Management

Education

2-3 weekly  
appointments

Titration of  
Ramipril and  
Bisoprolol

Stopped  
Furosemide

Consider  
Spironolactone

6 months later.....

Medications:  
Aspirin 75mg,  
Atorvastatin  
40mg,  
Bisoprolol  
10mg, Ramipril  
10mg .

Feels 'back to  
normal'

Repeat echo -  
LVEF 35-40%

No need to  
consider for  
CRT currently

Discharged



## Quiz 4

► Sudden swelling in your legs can be a sign of:

1. Heart attack
2. A blood clot
3. High cholesterol



## Quiz 5

- ▶ Swelling can be a side effect of which kind of medicine?
  1. Acetaminophen
  2. Ibuprofen
  3. Opioids





## Quiz 6

▶ A swollen belly may be a sign that you have a problem with which two of the following:

1. Liver
2. Lungs
3. Brain
4. Heart

# Patient 2

70 year old male

NYHA class 3

Admission with orthopnoea, PND, oedema to knee level, pulmonary oedema on chest x-ray

Angiogram - no significant coronary artery disease

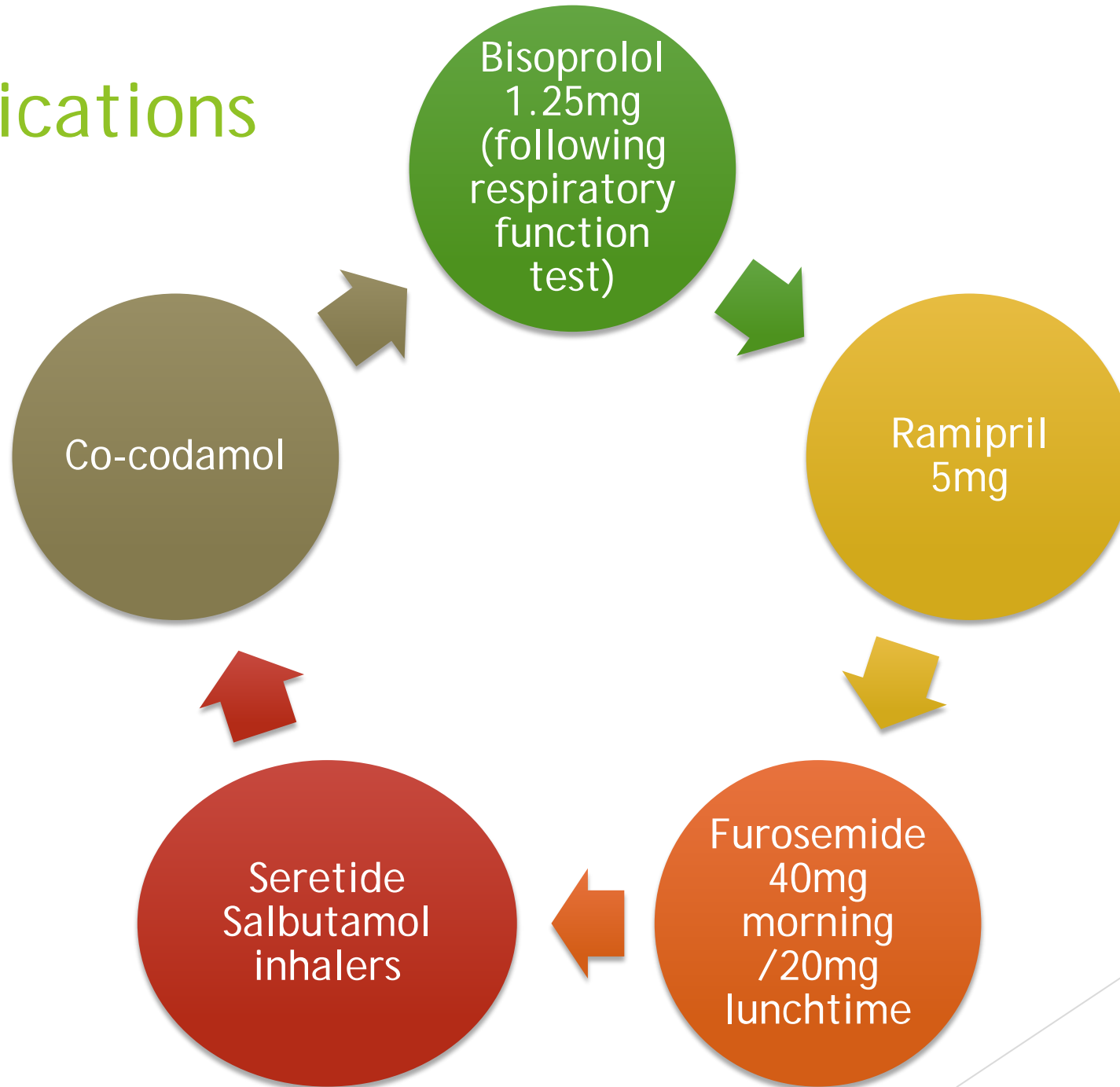
Echo - LVEF 10-15%

ECG LBBB, sinus rhythm

PMH Asthma, arthritis, type 2 diabetes

Smoker - 20-30/day for 55 year, high alcohol intake

# Medications



12 months later.....

Repeat  
echo -  
LVEF 20%

NYHA  
class 2-3

Implantation  
of CRT-D

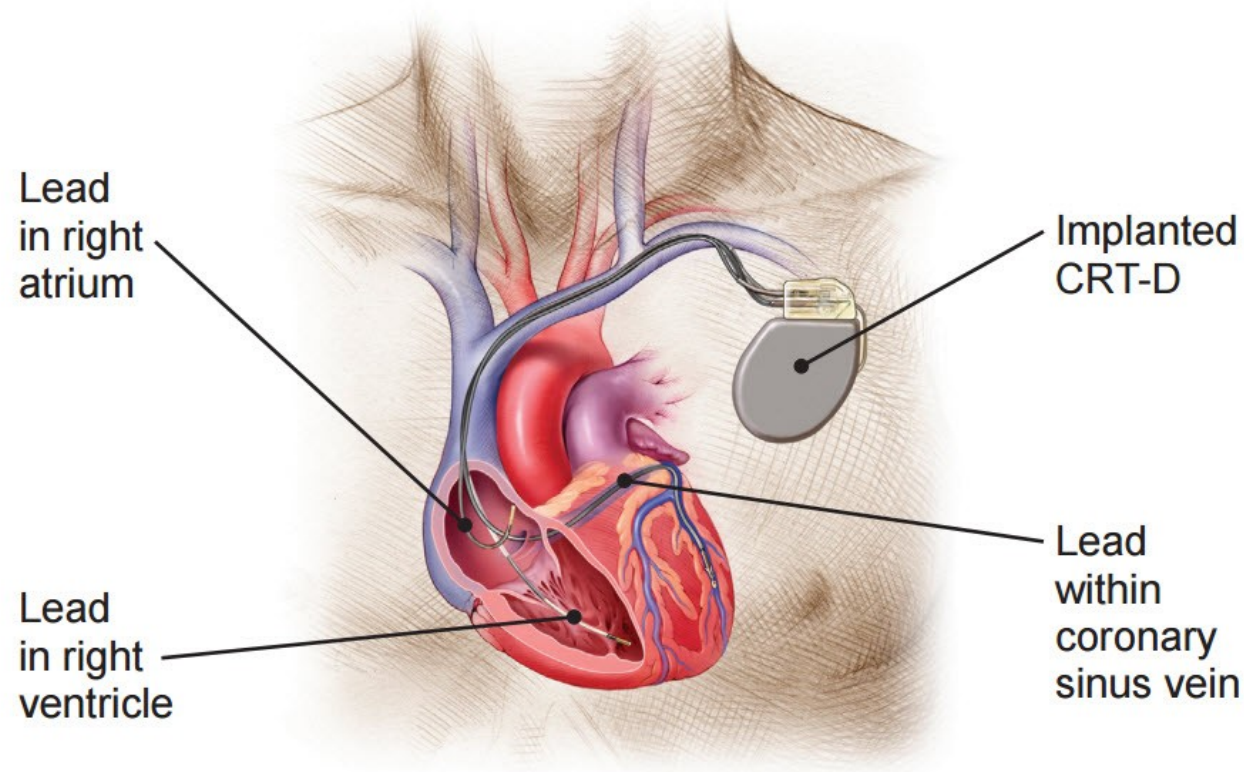
Repeat  
echo 20%

NYHA  
class 2  
increased  
exercise  
tolerance

Significant  
reduction  
in level of  
oedema  
and dose  
of  
diuretics

No further  
hospital  
admissions

# Cardiac Resynchronization Therapy



# Patient 3

68 year old male

PMH - Inferior myocardial infarction 20 years ago

Smoker

Admitted with sustained ventricular tachycardia

ICD implanted (does not fit criteria for CRT)

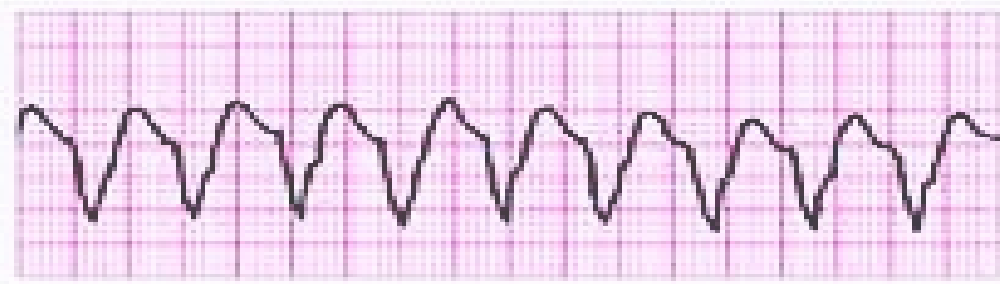
Echo- LVEF less than 30%

Angiogram-significant LAD stenosis

Scar related VT

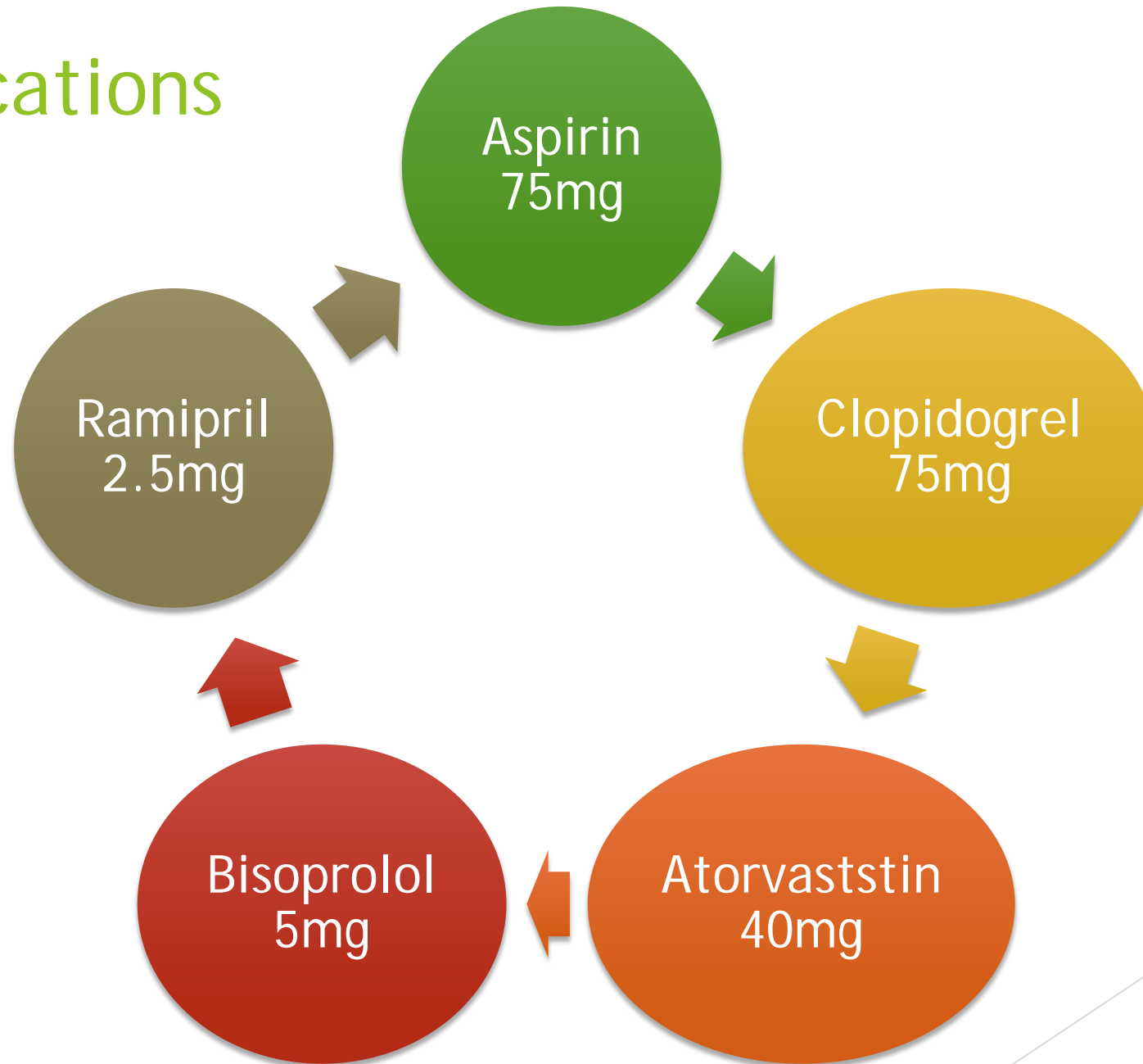
# Monomorphic Ventricular Tachycardia

## Monomorphic Ventricular Tachycardia



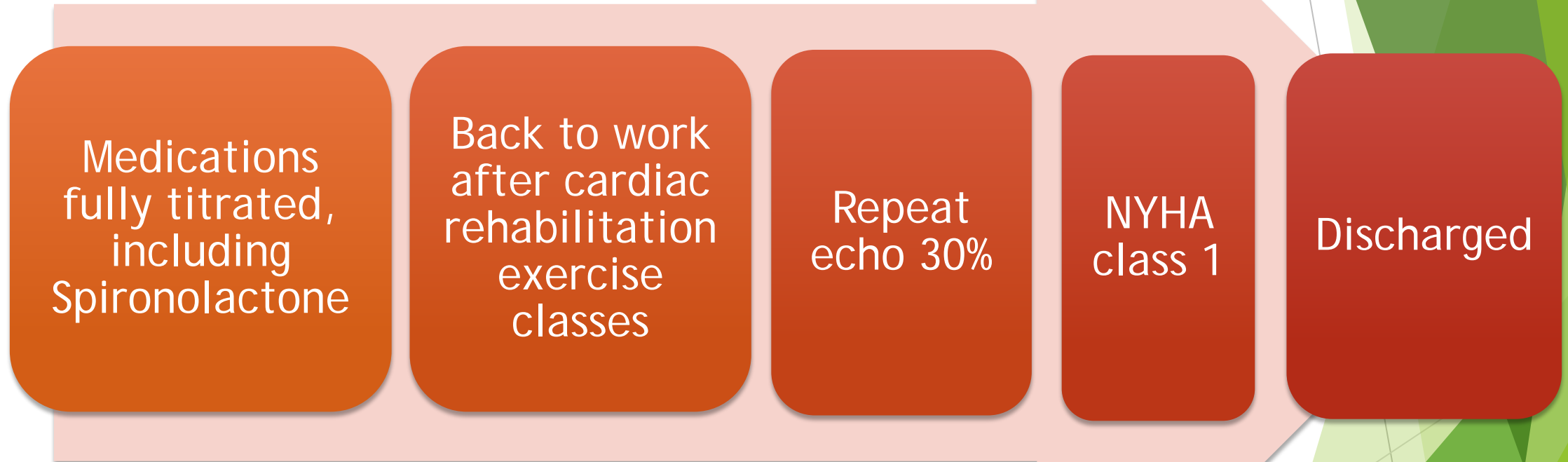
With ventricular rhythms, QRS is usually wide. V tach is more organized electrical activity than v fib, but v tach often deteriorates into v fib so both are very bad!

# Medications





8 months later.....





# Specialist Nursing Improves Outcomes in Heart Failure

- ▶ British Heart Foundation - National Heart Failure Audit 2013 recommends specialist input for all people with heart failure
- ▶ Evidence from BHF - Specialist input - mortality 7.5%  
No specialist input - mortality 14.4%

Clearly the ability for heart failure nurses to make an impact on the management of patients with heart failure is considerable.

# Ten reasons to appoint a heart failure specialist nurse (HFSN):

1. Work across primary, secondary and tertiary care teams, improving communication and resulting in a more integrated care
2. Help improve access and achieve quality and outcome targets by organising careful initiation and titration of heart failure medications.
3. Extend knowledge in primary care of how to educate, support and manage stable patients, including up titration of medications.
4. Co-ordinate care and clinically assess patients
5. Help patients understand and manage their condition

# Ten reasons to appoint a heart failure specialist nurse (HFSN) (cont):

6. Community HFNS can rapidly access patients and ensure referral on
7. Improve health-related quality of life in both patients and carers.
8. Assess the mental health of patients and refer on appropriately.
9. Reduce all cause admissions by an average of 35%.
10. Co-ordinate a shared care approach to end of life care

# References

- ▶ Price A (2012) Specialist nurses improve outcomes in heart failure patients. *Nursing Times*; 108: 40, 22-24.
- ▶ Advancing Quality (2011) [\*Measures\*](#). Salford: Advancing Quality.
- ▶ Blue L et al (2001) Randomised controlled trial of specialist nurse intervention in heart failure. *British Medical Journal*; 323: 715-718.
- ▶ Department of Health (2000) [\*The National Service Framework for Coronary Heart Disease\*](#). London: DH.
- ▶ Department of Health (2011) *The Health and Social Care Act*. London: DH.
- ▶ Jaarsma T, Dracup K (2001) *Determinants of health-care utilisation by patients with chronic heart failure*. In: Stewart S, Blue L (2001) (eds) *Improving Outcomes in Chronic Heart Failure: a Practical Guide to Specialist Nurse Intervention*. London: BMJ Books: 16-31.
- ▶ Kim M et al (2000) Development and testing of the Hill-Bone Compliance to High Blood Pressure Therapy Scale. *Progress in Cardiovascular Nursing*; 15: 3, 90-96.
- ▶ National Institute for Cardiovascular Outcomes Research (2012) [\*National Heart Failure Audit. April 2010-March 2011\*](#). London: NICOR.
- ▶ National Institute for Health and Clinical Excellence (2010) [\*Chronic Heart Failure: Management of Chronic Heart Failure in Adults in Primary and Secondary Care\*](#). London: NICE.
- ▶ NHS Improvement, NHS National End of Life Care Programme (2010) [\*End of Life Care in Heart Failure. A Framework for Implementation\*](#). London: NHS Improvement.
- ▶ Pattenden et al 2008 The Development and Impact of the British Heart Foundation and Big Lottery Fund Heart Failure Specialist Nurse Services in England. University of York
- ▶ Polit D, Beck C (2006) *Essentials of Nursing Research: Appraising Evidence for Nursing Practice*. Philadelphia PA: Lippincott Williams & Wilkins.
- ▶ Rector T et al (1987) Patients' self assessment of their Congestive Heart Failure. Part 2. Content, reliability and validity of a new measure - the Minnesota living with heart failure questionnaire. *Heart Failure*; 3: 198-209
- ▶ Sisk J et al (2006) Effects of nurse management on the quality of heart failure care in minority communities: a randomised trial. *Annals of Internal Medicine*; 145: 4, 273-283.
- ▶ Stewart S, Blue L (2001) *Improving Outcomes in Chronic Heart Failure. A Practical Guide to Specialist Nurse Intervention*. London: BMJ Books.
- ▶ Strömberg A et al (2003) Nurse-led heart failure clinics improve survival and self-care behaviour in patients with heart failure: results from a prospective, randomised trial. *European Journal of Heart Failure*; 24: 11, 1014-23.
- ▶ Thompson D et al (2005) Effects of a nurse-led, clinic and home-based intervention on recurrent hospital use in chronic heart failure. *European Journal of Heart Failure*; 7: 3, 377-384.

Thank you

Steve and Andrea