Specialist Nursing Improves Outcomes in Heart Failure

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Where are we from?
Outline

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

Part 2: Case studies
The healthy heart

- Weighing 11 ounces, a healthy heart daily pumps 2,000 gallons of blood through 60,000 miles of blood vessels.
- Begins beating at four weeks after conception and does not stop until death.
- Beats 100,000 times a day; 3,600,000 times a year; and 2.5 billion times during a lifetime.
- The heart pumps blood to almost all of the body’s 75 trillion cells.
- The heart creates enough energy to drive a truck 20 miles. In a lifetime, that is equivalent to driving to the moon and back.
- 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?

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
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<tr>
<td>Heart failure means that the heart is not pumping as effective as it</td>
<td>normally would be.</td>
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<td>Often due to problems with the heart muscle (such as weakening) or</td>
<td>mechanical problems in the heart (such as damaged valves)</td>
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<td>It affects around 26 million people worldwide.</td>
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<td>Around 900,000 people in the UK have heart failure.</td>
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<td>Approx 4.2 million patients with heart failure in China</td>
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<td>The outlook for people with heart failure can be very poor - 30 to 40% of</td>
<td>people die within a year of diagnosis</td>
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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

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

[Diagram showing various genetic risks with bubble sizes indicating prevalence and lifetime risk, with heritability levels indicated by circle sizes.]
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
Heart Failure Clinical Nurse Specialist
Brief History

1965 Nurse practitioners emerged in United States

1980’s Nurse practitioner role established in UK

Australia - response to a shortage of medical practitioners

1996 CNS role in China

Present day - acute areas, primary care, medical and surgical specialist nurses.
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

- Increase in numbers of heart failure nurse specialists over last decade
- Involvement in clinical trials
- Medication titration/management
- Nurse prescriber
- Ability to refer on/request further medical tests
- Competence in physical examination
- Use of protocols
- Scope of practice

Medication initiation and adjustment
NICE

Outcomes based approach to improving quality and consistency

National Institute for Health and Care Excellence - 1999

Clinically and cost effective treatments

Independent organisation

Evidence based
Patient and family focus of the role:

- Physical examination
- Pharmacology needs
- Interpretation of test results
- Implications of heart failure
- Communication skills
- Education
- Psychological support

Patient and their family
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

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

- Aspirin 75mg
- Atorvastatin 40mg
- Furosemide 20mg
- Ramipril 1.25mg
- Bisoprolol 2.5mg

Bournemouth University
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 years, high alcohol intake
Medications

- Bisoprolol 1.25mg (following respiratory function test)
- Ramipril 5mg
- Furosemide 40mg morning / 20mg lunchtime
- Seretide Salbutamol inhalers
- Co-codamol
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

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

- Aspirin 75mg
- Clopidogrel 75mg
- Atorvastatin 40mg
- Bisoprolol 5mg
- Ramipril 2.5mg
8 months later.....

- Medications fully titrated, including Spironolactone
- Back to work after cardiac rehabilitation exercise classes
- Repeat echo 30%
- NYHA class 1
- Discharged
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- 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.


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


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.


Thank you
Steve and Andrea