

Heart Failure Association of the European Society of Cardiology heart failure nurse curriculum

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Abstract:

Recent advances in care and management of heart failure have improved outcome, largely as a result of the developing evidence-base for medications, implantable devices and the organisation of heart failure follow-up. Such developments have also increased the complexity of delivering and coordinating care. This has led to a change to the way in which heart failure services are organised and to the traditional role of the heart failure nurse.

Nurses in many countries now provide a range of services that include: providing care for patients with acute and with chronic heart failure: working in and across different sectors of care (inpatient, outpatient, community care, the home and remotely): organising care services around the face-to-face and the remote collection of patient data; and liaising with a wide variety of healthcare providers and professionals. To support such advances the nurse requires a skill set that goes beyond that of their initial education and training.

The range of nurses' roles across Europe is varied. So too is the nature of their educational preparation. This heart failure nurse curriculum aims to provide a framework for use in countries of the ESC. Its modular approach enables the key knowledge, skills and behaviours for the nurse working in different care settings to be outlined and so facilitate nursing staff to play a fuller role within the heart failure team.

Introduction:

Heart failure is a global health problem possibly affecting as many as 26 million adults.¹ Across much of the world, this prevalence is rising. Although the reason for this increase is multifactorial, it is influenced by the aging of the population in many countries and by improvements in the management and survival from cardiovascular disease. Recent advances in the care and management of heart failure have improved outcome.² Yet patients remain at increased risk of hospitalisation and death and many experience a poor quality of life. Additionally the patient with heart failure is frequently elderly and frail with multiple comorbid conditions. These add to the complexity of managing the bio-medical as well as psychological and social response to illness and complicate self-care behaviours.

In response there has been a change to the way in which heart failure services are organised and to the delivery of structured out-patient monitoring. Early studies reported a reduction in the risk of hospitalisation when a heart failure nurse played a central role within a multidisciplinary heart failure management programme.⁴⁻⁶ In such programmes the nurse supported the management of patients in the vulnerable period following hospital discharge. Their role included: providing the patient and family with education, optimising medication and monitoring for early indicators of clinical decompensation.⁴⁻⁷ Building on these early studies, heart failure nurses are now seen as essential players in a successful service.^{2,7} Indeed the European Society of Cardiology (ESC) goes further to suggest that each acute hospital should employ one heart failure nurse per 100,000 of the population.⁷ A more recent emphasis on optimising care for the patient admitted with acute heart failure has led to discussions about key roles for the heart failure nurse during the inpatient admission. Again, the Heart Failure Association (HFA) of the ESC make clear recommendations.⁸ These include the nurse's responsibility in objective patient monitoring and triage, communication

between and within the heart failure team, the patient and or family, reducing anxiety and in coordinating discharge planning.⁸ The high mortality and symptom burden of living with heart failure has also led to a developing interest in how to integrate palliative care approaches with heart failure management. Whilst there is currently insufficient evidence to suggest any one model, examples of good practice exist in which heart failure nurses, cardiologists and palliative care specialists work together.^{9,10} Such level of care is supported in European guidelines² and practical guidance discussed in a position paper of the HFA.¹¹ More detailed descriptions of these nursing roles and responsibilities are reported in detail elsewhere.^{7,8 12-14}

Heart failure nurses are not available in all countries of the ESC.¹⁵ However where such roles exist then heart failure nurses generally provide care for patients with acute and with chronic heart failure: work in and across different sectors of care (inpatient, outpatient, community care, the home and remotely): organise care services around the face-to-face and the remote collection of patient data; and liaise with a wide variety of healthcare providers and professionals.⁷ To support such developments, the nurse requires a skill set that goes beyond that of their initial education and training. Heart failure specialist nurses working within the acute hospital or community setting provide some of the care. However the optimal care of the patient with heart failure also requires the up-skilling of nurses working in all areas where heart failure patients may receive care and this includes acute high dependency areas and in-patient wards. Against this background the HFA of the ESC set up a task force to develop a contemporary nurse curriculum.

Newer avenues are under development such as cardio-oncology¹⁶ and the prevention of heart failure.¹⁷ Such services are not yet routine and the specific contribution of the nurse remains unclear. We recognise these developments may require additional knowledge and skills.

However until there is greater clarity on the effective components of nurses roles within such services they are not included in this curriculum.

Rationale for Heart Failure Nurse Curriculum:

As outlined above, the ESC has developed recommendations for the care that patients with heart failure should receive.² The HFA of the ESC has identified the standards of care that all patients with heart failure should access.⁷ This necessitates a team of highly knowledgeable and skilled medical and nursing staff.

The association between the competence of nurses and quality of care has long been recognised. Most recently this has been confirmed in a study of patients in nine European countries that reported a reduction in the risk of death where academically prepared nurses cared for patients.¹⁸ Whilst this study reports on the care and outcomes of patients in an acute hospital setting it is highly likely that similar results will be found more widely. It is also recognised that patients value care provided by a nurse with a level of knowledge and skills sufficient to support compassionate care and provide them with a knowledge of their treatment that includes medication and potential side effects.¹⁹ In addition the responsibilities of nurses in many countries are increasing. In some countries the nurse up-titrates prescribed medication. Where this is happening then it has been reported to provide patients with safe, timely and clinically effective care.^{20,21} However, such improvements in both outcomes and processes of care can only be achieved through appropriate education and training of the nursing workforce.

Roles and responsibilities of nurses are influenced by the geographical location in which they work (acute hospital or community) and by the professional regulations of the country in which they practice. Expanded roles are not currently in the remit of all nurses in all countries. Therefore all learning objectives must be interpreted locally. The nature of educational preparation for nurses working in Europe is varied.²² The purpose of this heart failure nurse

curriculum therefore is to provide a framework for use in countries of the ESC to enable nurses to work within the heart failure team and collaboratively deliver evidence based, guideline derived standards of care.

Consistent with other curricula of the ESC^{23,24} we have identified the knowledge and skills required for competent practice within each learning objective. We have used the term ‘professionalism’ to include the professional attitudes and behaviours that acknowledge the context in which care is delivered. This context will vary in line with the local and national organisation of healthcare and professional responsibilities, the place in which care is provided (such as hospital or community) and individual patient characteristics.

The curriculum includes both core and optional modules (see table 1). The core modules are considered necessary for heart failure nurses. Optional modules of ‘identifying the need for and understanding the management of advanced heart failure (such as mechanical circulatory support and transplantation)’ can be undertaken by nurses who wish to develop knowledge in this specialist area. Whilst the optional module on ‘leadership in heart failure nursing’ will likely be undertaken by those nurses who wish to develop leadership skills in clinical practice.

Conclusion:

We have outlined the need for a curriculum for heart failure nurses. When placed alongside the newly developed curriculum for cardiologists with a special interest in heart failure it will support nurses to work collaboratively with their medical colleagues and other members of the multidisciplinary heart failure team to deliver high quality care to patients with heart failure.

We encourage individual countries to consider how this curriculum can be used as a framework in the development of national courses and study days. We also encourage health

service managers to consider locally how competence in the learning objectives can demonstrate that nurses are 'fit for practice'. Such competence can then provide a metric of high quality care to purchasers, commissioners and users of their services. Specialist professional organisations, both at National and European level, can support the development of such roles as they seek ways to raise standards of heart failure care.

Overall aims of the curriculum:

1. To provide a knowledge of heart failure and its management to underpin clinical nursing skills
2. To support the development of expert clinical skills to undertake specialist heart failure nursing roles: in-hospital, out-patient, community, home or remotely
3. To provide the knowledge and skills necessary to function as an integral member of a multi-disciplinary heart failure team
4. To support the nurse to develop skills for life-long-learning
5. To practice within their scope of practice and regulatory framework

Specific Learning Objectives:

Recognise patients with suspected heart failure and have a critical awareness of triggers for clinical deterioration

Knowledge:

- Define heart failure using ESC criteria
- Knowledge of the epidemiology and aetiology of heart failure in general and in the local area of clinical practice
- Describe the common causes, presentation and trajectory of heart failure.

- Understand that heart failure frequently develops as a consequence of the treatment of other illnesses or of other health conditions.
- Knowledge of the strengths and limitations of common diagnostic tests including intracardiac and pulmonary pressures

Skills:

- Monitor and document the presenting symptoms and signs using objective assessment tools where possible
- Undertake a focused clinical history and examination and identify probable causes and triggers for the symptoms and signs. Take a family history where appropriate.
- Explore with the patient their understanding of the cause of their symptoms
- Interpret and take action on simple diagnostic tests (to include Electrocardiogram (ECG), chest XRay, echocardiography, vital signs and heart failure biomarkers)

Professional behaviours:

- Recognise the importance of an accurate diagnosis as the basis for further investigation and treatment
- Recognise the impact of a heart failure diagnosis on the patient and their family
- Respect patient choice around prognostic information
- Work within scope of role, own limitations and refer appropriately to the multidisciplinary heart failure team and wider healthcare team

Assess and monitor common symptoms and signs

Knowledge:

- Knowledge of the causes of common symptoms

- Detailed knowledge of the monitoring and follow-up necessary for optimal treatment and symptom management
- Knowledge of the advantages and limitations of different methods of monitoring including: face-to-face, remote with external equipment and remote using implantable devices.

Skills:

- Use objective monitoring tools (where available) to monitor effectiveness and side effects of symptom management
- Accurately interpret and manage monitoring data and escalate appropriately to a more senior member of the heart failure team
- Gain patient acceptance of advanced healthcare technology (such as remote monitoring devices) and teach the patient and family how to effectively use it.

Professional behaviours:

- Understand that patients interpret and express symptoms differently
- Understand that a variety of factors affect individual attitudes to healthcare technology
- Understand the need to closely integrate monitoring data from implantable devices with heart failure management
- Appreciate that devices are being developed that monitor surrogate markers of heart failure severity

Apply educational theory to develop, implement and evaluate effective patient and family heart failure education

Knowledge:

- Have a detailed knowledge of education theories that inform adult learning
- Define the term health literacy and have a critical awareness of its impact on learning²⁵

Skills:

- Assess for and identify barriers to patient learning
- Develop an individualised patient education plan

Professional behaviours:

- Adopt an inclusive approach to patient education that includes communicating with the family and the multi-disciplinary team

Provide self-care and lifestyle advice (including diet, exercise and travel)**Knowledge:**

- Knowledge of the key topics for effective self-care
- Knowledge of the common barriers and facilitators to effective self-care
- Knowledge of strategies for self-care support including telehealth and remote monitoring
- Understand the physiological and clinical benefits of exercise in heart failure
- Detailed knowledge of advice on diet and fluid intake
- Knowledge of key safety issues related to travel

Skills:

- Undertake a formal assessment of key self-care barriers using validated assessment tools where available (such as for assessment of cognitive function, anxiety, depression)
- Provide individualised self-care support and advice to the patient and family
- Evaluate the effectiveness of self-care supportive interventions
- Demonstrate use of Ratings of Perceived Exertion (RPE) scales with patients
- Provide individualised patient support for an exercise regimen

Professional behaviours:

- Recognise that the patient is central to self-monitoring of symptoms
- Recognise the impact of symptoms on self-care ability.
- Appreciate the availability and usual practice of exercise training and/or cardiac rehabilitation in heart failure in locality
- Be aware of need to provide culturally sensitive information around diet and fluid intake
- Appreciate the country specific legislation regarding driving regulations

Manage the effective use of pharmacological and device therapies (including implantable cardio-defibrillators (ICD), and Cardiac resynchronisation therapy (CRT)).

Knowledge:

Pharmacological

- Knowledge of the indications, contraindications, action and potential side effects of common drugs.

- Knowledge of the optimal dose of common heart failure medication and factors influencing individual susceptibility to side effects
- Knowledge of how patients develop their beliefs in their medication and how these beliefs influence adherence

Implantable CRT/ICD Devices

- Knowledge of the effective use of devices (including CRT and ICD), their actions and potential risk.
- Knowledge of the follow-up required for optimal device functioning (including remote monitoring)

Respiratory Support

- Knowledge of the effective use of respiratory support (to include Oxygen therapy and continuous positive airway pressure (CPAP)), their side effects and contraindications.
- Be aware of the different devices available for delivering oxygen and ventilator support

Skills:

Pharmacological

- Record and take appropriate action on altered monitoring data
- Effectively discuss with the patient their medication, the action plan for optimising dose, medication side effects and important interactions with other medication, herbal remedies or foods
- Identify individual patient's barriers and facilitators to medication self-care and adapt information

Implantable ICD/CRT Devices

- Monitor for effectiveness and side effects/adverse events related to ICD/CRT function in immediate phase and longer-term
- Integrate monitoring (including data from remote monitoring) for optimal device functioning with heart failure follow-up
- Provide education around specific therapies that includes issues such as effects of electromagnetic fields, ICD shocks, infection
- Identify changes in physical and emotional functioning resulting from ICD implantation. Take appropriate action to optimise quality of life.

Respiratory support

- Accurately and promptly administer oxygen and non-invasive respiratory support within scope of practice.
- Facilitate the effective use of such therapies including gaining patient acceptance

Professional behaviours:

Pharmacological

- Ensure prompt communication of medication and action plan to patients and care providers (such as primary care)
- Aware of individual patient factors affecting the optimal medication dose for maximum effect and that minimises risk.
- Work within the legislation for safe medication prescription and titration in country of practice
- Recognise and respect patient choice regarding their medicines management

Implantable CRT/ICD Devices

- Recognise the role of remote monitoring
- Recognise the potential effect of inappropriate shocks from ICD Device
- Be aware of the regulations regarding fitness to drive in country of practice and recognise the potential impact of driving restrictions

Respiratory Support

- Recognise the need for appropriate community services to ensure ongoing use of oxygen and respiratory support following discharge home.

Competently and rapidly assess need and deliver care to the patient with acute heart failure

Knowledge:

- Knowledge of the different clinical manifestations of acute heart failure, their signs, symptoms
- Detailed knowledge of the common triggers and different trajectories
- Knowledge of pharmacological therapy specifically used in the management of acute heart failure
- Have an understanding of the non-pharmacological treatment such as non-invasive and invasive ventilation, Intra-aortic balloon pump and ventricular assist device

Skills:

- Undertake a focused clinical history and examination to identify potential causes/triggers of acute heart failure
- Assess the severity of symptoms (using validated tools where appropriate)

- Monitor and interpret patient data, including vital signs, level of consciousness, serum electrolytes, ECG, Echo, Chest X ray and biomarkers.
- Triage to appropriate level of care
- Safely administer medication in response to vital signs, blood chemistry and response to treatment
- Monitor and manage the care of the patient using non-invasive respiratory support

Professional behaviours:

- Arrange safe yet rapid transfer of the patient to the appropriate clinical setting

Identify the need for, co-ordinate and provide care at the end of life to the patient and their family

Knowledge:

- Knowledge of trajectory of heart failure and prognostic signs
- Knowledge of the emerging evidence for pharmacological and non-pharmacological management of symptoms specific to end-of-life
- Understand the need for the active management of device therapy at the end of life
- Understand that a palliative care approach addresses the physical, psychological, social and spiritual needs of patients and families

Skills:

- Respond honestly to questions about prognosis and refer to other professionals when appropriate
- Develop a management plan that includes preference for place of death

- Administer medication for symptom control and use objective assessment tools to monitor for symptom relief
- Assess emotional need and refer appropriately for specialist psychological, social and spiritual support

Professional behaviours:

- Communicate management plan to all healthcare sectors and charitable organisations (where appropriate)
- Be aware of local and country specific issues necessary to ensure smooth patient path and liaise appropriately across health and social care including palliative care specialists.
- Communicate effectively with specialists to provide psychological and spiritual care according to need
- Recognise country specific regulation regarding the deactivation of ICD devices at end-of-life

Recognise the importance of comorbidity in heart failure and plan and deliver individualised patient care

Knowledge:

- Knowledge of the prevalence of common non cardiac comorbidities in general and in local area of practice
- Knowledge of the impact of common comorbidities and their management on heart failure management and outcome

- Understand the challenges for diagnosis, clinical management and patient self-care
- Have an awareness of the increased risk associated with common heart failure medications in the presence of common comorbidities and their clinical presentation

Skills:

- Undertake a comprehensive assessment of comorbidities such as frailty, mental functioning and emotional state using objective measurement tools (where appropriate).
- Use the patient's interpretation of heart failure within the context of their overall health to inform their management plan
- Identify changes in cognitive and physical functioning indicative of electrolyte disturbance or dehydration

Professional behaviours:

- Recognise the importance of integrated care of comorbidities within the specialist heart failure setting
- Be aware of altered medication prescribing practices in the presence of comorbidities.
- Understand the impact of comorbidities on how the patient understands heart failure and on their self-care behaviours.

Identify the need for and understand novel strategies in the management of advanced heart failure such as mechanical circulatory support (MCS) and heart transplantation

This optional module is for nurses who wish to provide and manage the care of patients with advanced end-stage heart failure.

Knowledge:

- Knowledge of indications and contraindications of heart transplantation
- An awareness of key drugs used specifically in managing adverse effects of transplantation
- Knowledge of MCS as destination therapy or bridge to transplant
- Have an awareness of current research into novel treatments for end-stage heart failure
- Have a detailed knowledge of the psychological impact of advanced heart failure treatments on the patient and family

Skills:

- Monitor and take appropriate action on signs and symptoms of rejection in the immediate post-operative period and over the longer term
- Provide individualised patient education around the safety issues involved in living with a MCS or heart transplant
- Provide psychosocial support in the pre and post-operative period

Professional behaviours:

- Recognise the social and psychological impact of MCS or transplant assessment
- Work collaboratively with and refer to specialists in the multi-disciplinary team when necessary

Leadership in heart failure nursing

This optional module is intended for nurses who wish to develop leadership skills.

Knowledge:

- Knowledge of the key components of effective heart failure nursing service
- Discuss different methods of health services evaluation (including audit)
- Understand the key issues in quality improvement
- Have an awareness of different methods and measures for patient-centred outcomes that include patient reported outcomes, patient experience and patient satisfaction and how to include these in research and quality improvement ²⁶

Skills:

- Contribute to the collection of data for national and /or international heart failure audit databases ²⁷
- Write a business case for the development of an effective multi-disciplinary heart failure service
- Select appropriate outcome measures including patient-centred outcomes for a defined patient population
- Design and undertake an audit

Professional behaviours:

- Recognise the roles of other members of the multi-disciplinary heart failure team such as; doctor, cardiac physiologist, general practitioner, care of the elderly team, manager and the impact of any change in service delivery

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References:

1. Bui AL, Horwich TB, Fonarow GC. Epidemiology and risk profile of heart failure. *Nat Rev Cardiol.* 2011 8: 30-41.
2. McMurray JJ, Adamopoulos S, Anker SD, Auricchio A, Böhm M, Dickstein K, Falk V, Filippatos G, Fonseca C, Gomez-Sanchez MA, Jaarsma T, Køber L, Lip GY, Maggioni AP, Parkhomenko A, Pieske BM, Popescu BA, Rønnevik PK, Rutten FH, Schwitter J, Seferovic P, Stepinska J, Trindade PT, Voors AA, Zannad F, Zeiher A; Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology, Bax JJ, Baumgartner H, Ceconi C, Dean V, Deaton C, Fagard R, Funck-Brentano C, Hasdai D, Hoes A, Kirchhof P, Knuuti J, Kolh P, McDonagh T, Moulin C, Popescu BA, Reiner Z, Sechtem U, Sirnes PA, Tendera M, Torbicki A, Vahanian A, Windecker S, McDonagh T, Sechtem U, Bonet LA, Avraamides P, Ben Lamin HA, Brignole M, Coca A, Cowburn P, Dargie H, Elliott P, Flachskampf FA, Guida GF, Hardman S, Jung B, Merkely B, Mueller C, Nanas JN, Nielsen OW, Orn S, Parissis JT, Ponikowski P; ESC Committee for Practice Guidelines. ESC guidelines for the diagnosis and treatment of acute and chronic heart failure 2012: The Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology. Developed in collaboration with the Heart Failure Association (HFA) of the ESC. *Eur J Heart Fail.* 2012 14:803-69.
3. Rich MW, Beckham V, Wittenberg C, Leven CL, Freedland KE, Carney RM. A multi-disciplinary intervention to prevent the readmission of elderly patients with congestive heart failure. *New England Journal of Medicine.* 1995 333: 1190 – 1195.
4. Blue L, Lang E, McMurray JJ, Davie AP, McDonagh TA, Murdoch DR, Petrie MC, Connolly E, Norie J, Round CE, Ford I, Morrison CE. Randomised controlled trial of a

- specialist nurse intervention in heart failure. *British Medical Journal*. 2001 323: 715 – 718
5. Stewart S, Pearson S, Horowitz JD. Effects of a home-based intervention among patients on unplanned readmissions and survival among patients with congestive heart failure: a randomized controlled study. *Lancet*. 1998 354: 1077 – 1083.
 6. Strömberg A, Mårtensson J, Fridlund B, Levin L, Karlsson JE, Dahlström U. Nurse-led heart failure clinics improve survival and self-care behaviour in patients with heart failure. *Eur Heart J*. 2003. 24: 1014 – 1023.
 7. McDonagh TA, Blue L, Clark AL, Dahlström U, Ekman I, Lainscak M, McDonald K, Ryder M, Strömberg A, Jaarsma T; European Society of Cardiology Heart Failure Association Committee on Patient Care. European Society of Cardiology Heart Failure Association Standards for delivering heart failure care. *Eur J Heart Fail*. 2011 13:235-41.
 8. Mebazaa A, Yilmaz MB, Levy P, Ponikowski P, Peacock WF, Laribi S, Ristic AD, Lambrinou E, Masip J, Riley JP, McDonagh T, Mueller C, deFilippi C, Harjola VP, Thiele H, Piepoli MF, Metra M, Maggioni A, McMurray J, Dickstein K, Damman K, Seferovic PM, Fillippatos G. Recommendations on pre-hospital & early hospital management of acute heart failure: a consensus paper from the Heart Failure Association of the European Society of Cardiology, the European Society of Emergency Medicine and the Society of Academic Emergency Medicine. *Eur J Heart Fail*. 2015 17: 6. 544 - 558
 9. Johnson M, Nunn A, Hawkes T, Stockdale S, Daley A. Planning for end-of-life care in heart failure: experience of two integrated cardiology-palliative care teams *British J of Cardiology*. 2012. 19:71–5

10. Bränström M, Boman K. Effect of person-centred and integrated chronic heart failure and palliative home care. PREFER: a randomised controlled study. *Eur J Heart Fail.* 2014 16: 1142 – 115
11. Jaarsma T, Beattie JM, Ryder M, Rutten FH, McDonagh T, Mohacsi P, Murray SA, Grodzicki T, Bergh I, Metra M, Ekman I, Angermann C, Leventhal M, Pitsis A, Anker SD, Gavazzi A, Ponikowski P, Dickstein K, Delacretaz E, Blue L, Strasser F, McMurray J; Advanced Heart Failure Study Group of the HFA of the ESC. Palliative care in heart failure: a position statement from the palliative care workshop of the Heart Failure Association of the European Society of Cardiology. *Eur J Heart Fail.* 2009, 11(5):433-43.
12. Stromberg A. Educating nurses and patients to manage heart failure. *Eur J of Cardiovascular Nursing.* 2002 1: 33 - 40
13. Riley JP. The Role of the Heart failure Nurse. *Dialogues in Cardiovascular Medicine* 2016 (in Press)
14. Yu D, Thompson DR, Lee T. Disease management programmes for older people with heart failure: crucial characteristics which improve post-discharge outcomes. *Eur. Heart J.* 2006 27: 596-612
15. Seferovic PM, Stoerk S, Filippatos G, Mareev V, Kavoliuniene A, Ristic AD, Ponikowski P, McMurray J, Maggioni A, Ruschitzka F, van Veldhuisen DJ, Coats A, Piepoli M, McDonagh T, Riley J, Hoes A, Pieske B, Dobric M, Papp Z, Mebazaa A, Parissis J, Ben Gal T, Vinereanu D, Brito D, Altenberger J, Gatzov P, Milinkovic I, Hradec J, Trochu JN, Amir O, Moura B, Lainscak M, Comin J, Wikström G, Anker S; Committee of National Heart Failure Societies or Working Groups of the Heart Failure Association of the European Society of Cardiology. Organization of heart failure

- management in European Society of Cardiology member countries: survey of the Heart Failure Association of the European Society of Cardiology in collaboration with the Heart Failure National Societies/Working Groups. *Eur J Heart Fail.* 2013, 15:947-59.
16. Ewer M, Gianni L, Pane F, Sandri MT, Steiner RK, Wojnowski L, Yeh ET, Carver JR, Lipshultz SE, Minotti G, Armstrong GT, Cardinale D, Colan SD, Darby SC, Force TL, Kremer LC, Lenihan DJ, Sallan SE, Sawyer DB, Suter TM, Swain SM, van Leeuwen FE. Report on the International Colloquium on Cardio-oncology (Rome, 12-14 March 2014). *Ecancermedicalscience.* 2014 May 29;8:433. 1-10
17. Ledwidge M, Gallagher J, Conlon C, Tallon W, O'Connell E, Litt M, Dawkins I, Watson C, O'Hanlon R, Bermingham M, Patle A, Badabhagni MR, Murtagh G, Voon V, Tilson L, Barry M, McDonald L, Maurer B, McDonald K. Natriuretic Peptide–Based Screening and Collaborative Care for Heart Failure. The STOP-HF Randomized Trial. *JAMA* 2013; 310: 66 –74
18. Aiken LH, Sloane DM, Bruynell L, Van den Heede K, Griffiths P, Busse R, Diomidous M, Kinnunen J, Kózka M, Lesaffre E, McHugh MD, Moreno-Casbas MT, Rafferty AM, Schwendimann R, Scott PA, Tishelman C, van Achterberg T, Sermeus W; RN4CAST consortium. Nurse staffing and education and hospital mortality in nine European countries: a retrospective observational study. *The Lancet.* 2014 383:1824-1830
19. Albarran J, Jones I, Lockyer L, Manns S, Cox H, Thompson DR. Patients' perspectives on the educational preparation of cardiac nurses. *Eur J Cardiovascular Nursing.* 2013; 31(8):887-91.
20. Latter S, Blenkinsopp A, Smith A, Chapman S, Tinelli M, Gerard K, Little P, Celino N, Granby T, Nicholls P, Dorer G. *Evaluation of nurse and pharmacist independent*

prescribing. Department of health policy research programme project 016 0108. 2011.

Department of Health. England.

21. Nursing and Midwifery Council (UK). <http://www.nmc-uk.org/Nurses-and-midwives/Regulation-in-practice/Medicines-management-and-prescribing/> (20 December 2015)
22. Astin F, Carroll DL, De Geest S, Martensson J, Jones I, Hunterbuchner L, Jennings C, Kletsiou E, Serafin A, Timmins F on behalf of The Working Group of the Education Committee of the ESC Council on Cardiovascular Nursing and Allied Professions. Education for nurses working in cardiovascular care: A European survey. *Euro J Cardiovascular Nursing*. 2013 13:532-40
23. McDonagh TA, Gardner RS, Lainscak ML, Nielsen OW, Parissis J, Filippatos G, Anker SD. Heart Failure Association of the European Society of Cardiology Specialist Heart Failure Curriculum. *Eur J Heart Fail*. 2014 16: 151-162
24. Astin F, Carroll DL, De Geest S, Fernandez-Oliver A, Holt J, Hinterbuchner L, Jennings C, Jones I, Ketchell A, Kletsio E, Ruppert T, Sanchez Bustelo A, Serafin A, Uchmanowicz I. Curriculum for the continuing professional development of nurses: Developed by the Education Committee of the Council on Cardiovascular Nursing and Allied Professions (CCNAP) on behalf of the European Society of Cardiology. *Euro J Cardiovascular Nursing*. 2015 14: S2: S1 – S17
25. World Health Organisation. Health literacy and Health Behaviour. WHO <http://www.who.int/healthpromotion/conferences/7gchp/track2/en/>. (February, 9th 2016)
26. Anker SD, Agewall S, Borggrefe M, Calvert M, Jaime Caro J, Cowie MR, Ford I, Paty JA, Riley JP, Swedberg K, Tavazzi L, Wiklund I, Kirchhof P. The importance of

patient-reported outcomes: a call for their comprehensive integration in cardiovascular clinical trials. *Eur Heart J*. 2014 35:2001-2009.

27. Maggioni AP, Dahlstrom U, Filippatos G, Chioncel O, Crespo Leiro M, Drodz J, Fruhwald F, Gullestad L, Logeart D, Fabbri G, Urso R, Metra M, Parissis JM, Person H, Poikowski P, Rauchhaus M, Voors AA, Nielsen OW, Zannad F, Tavazzi L. Heart Failure Association of the European Society of Cardiology (HFA) EURObservational Research programme: regional differences and 1-year follow-up results of the Heart failure Pilot Survey (ESC-HFPilot). 2013 *Eur J Heart Fail*. 15: 808-817.

Table 1. Specific learning objectives of the heart failure nurse curriculum

1. Recognise patients with suspected heart failure and have a critical awareness of triggers for clinical deterioration
2. Assess and monitor common symptoms and signs
3. Apply educational theory to develop, implement and evaluate effective patient and family heart failure education
4. Provide self-care and lifestyle advice (including diet, exercise and travel)
5. Manage the effective use of pharmacological therapies and device therapies
6. Competently and rapidly assess need and deliver care to the patient with acute heart failure
7. Identify the need for, co-ordinate and provide care at the end of life to the patient and their family
8. Recognise the importance of comorbidity in heart failure and plan and deliver individualised patient care
9. Identify the need for and understand novel strategies in the management of advanced heart failure, such as ventricular assist devices and heart transplantation
10. Leadership in heart failure nursing