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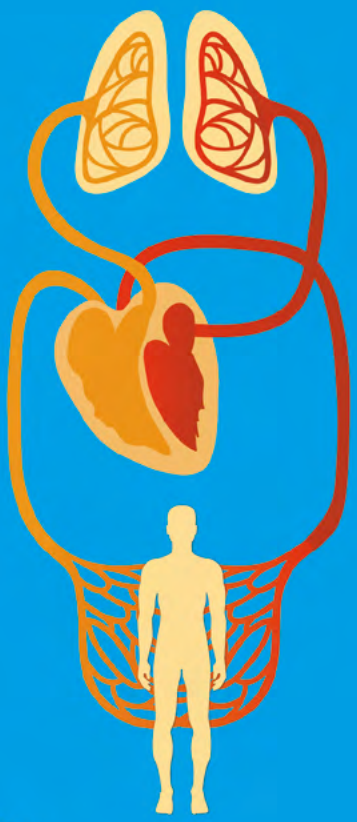
Framework of Nursing Action in Cardiovascular Health Care



Consejo General de Colegios Oficiales de Enfermería de España

INSTITUTO ESPAÑOL DE INVESTIGACIÓN ENFERMERA

NURSING PRACTICE FRAMEWORK IN THE FIELD OF CARDIOVASCULAR HEALTH CARE

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Definitions

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1. DEFINITIONS

- **Patient-centred care:** A model of care that respects the patient's experience, values, needs, and preferences in the planning, coordination, and delivery of care.[1]
- **Professional training**: Training and awareness of health care professionals throughout their training cycle in health promotion and prevention, from a comprehensive and multidimensional perspective.
- **Cardiology**: A Discipline or medical specialty responsible for the prevention, diagnosis, and treatment of cardiovascular diseases.[2]
- **Cardiovascular surgery (CVS)**: A medical specialty that deals with the prevention, diagnosis, and surgical treatment of disorders and diseases of the cardiocirculatory system.[3]
- **Professional competence**: The ability of the health care professional to integrate and apply the knowledge, skills, and attitudes associated with the good practice of their profession, to solve the problems that arise.
- **Continuity of care**: Nursing interventions to improve cardiovascular risk factors, maintain or improve functional capacity, and prevent CVD relapses, enhancing quality of life, self-efficacy, and self-care capacity.[4]
- **Cardiovascular disease (CVD)**: Disorders of the heart and blood vessels, including: ischemic heart disease (acute coronary syndrome and chronic ischemic heart disease), heart failure (acute and chronic), arrhythmias (atrial fibrillation, sudden death...), valvular heart disease, familial cardiomyopathies and heart disease, adult congenital heart disease, pulmonary hypertension, aortopathies, pericardial disease, cerebrovascular disease, and peripheral arterial disease.[5]
- **Cardiovascular Health Strategy (CHS)**: A set of interventions to improve the cardiovascular health of the Spanish population, increasing the lifespan with the highest possible level of health and quality of life of people, as well as reducing the prevalence and/or incidence of CVD and improving their health care.[6]
- **Percutaneous coronary intervention (PCI)**: A minimally invasive procedure to revascularise the coronary arteries and restore blood supply to the heart.[7]
- **Remote monitoring**: Acquisition and transmission of data from implantable cardiac electronic devices in an automatic, unprogrammed way, triggered by alerts related to the operation of these devices (technical alerts) or clinical.[8]

- **NANDA-I**: Known until 2002 as the *North American Nursing Diagnosis Association*, it is currently called according to its official brand NANDA International or NANDA-I. It is an international organisation whose mission is to facilitate the development, improvement, dissemination, and use of standardised diagnostic nursing terminology.
- **Advanced Practice**: An advanced level of professional practice that maximises the use of specialised competencies and disciplinary knowledge to meet the needs of individuals in the health domain. This practice uses a model of care based on theoretical, empirical, and experiential knowledge of the domain of practice, with the aim of offering comprehensive and complete care. Evidence-based practice is the central element of Advanced Practice competencies.[9]
- **Cardiac Prehabilitation**: Programs to optimise the functional status of patients scheduled for cardiac surgery and improve postoperative outcomes.[10]
- **Cardiac rehabilitation (CR)**: A set of activities necessary to ensure that people with heart problems have optimal physical and emotional conditions that allow them to occupy, by their own means, as normal a place as possible in society.[11]
- **Cardiovascular risk (CVR)**: Probability of suffering CVD within a given period, as a result of personal circumstances or habits that are associated with a higher probability of suffering CVD (cholesterol, high blood pressure, diabetes mellitus, smoking, obesity, and sedentary lifestyle) or potential risk modifiers (psychosocial aspects, family history, ethnicity, sex, coronary arterial calcium, frailty, socioeconomic level, body composition, biomarkers...).[12]
- **Cardiovascular health**: Presence of optimal values in the seven main cardiovascular risk factors: not smoking, maintaining a body mass index below 25 kg/m2, following current recommendations for physical activity, and diet, as well as having untreated blood pressure <130/80 mmHg, untreated blood glucose <100 mg/dl, and untreated total cholesterolaemia <200 g/dl.[6]
- **Transition (from adolescence to adulthood)**: Process of preparation, adaptation, and gradual integration by which a young patient with a chronic pathology develops the skills and has the necessary resources for their health care during the passage from adolescence to adulthood.[13, 14]
- **Transfer**: Time of patient transfer along with clinical and administrative information.
- **Telecardiology**: Administration of telemedicine to the prevention, diagnosis, and treatment of CVD to interact with the different levels of care in real time or on an outpatient basis, to avoid transfers and/or resolve emergencies.[15]

- **Telerehabilitation**: Use of information and communication technologies to afford patient education, behaviour change counselling, remote exercise monitoring, cardiovascular risk factor modification, and psychosocial support, all fully provided outside of the traditional CR model in medically supervised facilities.[16]

Scope of the resolution and the framework document

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2. SCOPE OF THE RESOLUTION AND THE FRAMEWORK DOCUMENT

Since the approval of the Spanish Constitution and its article 36, a legal reserve has been established regarding the regulation of the exercise of qualified professions. This constitutional provision has not entailed a modification of the purposes and functions that the Law on Professional Associations attributes to these associations and their general councils. However, it does imply that the Association's regulatory function must respect the essential regulatory framework of the profession. This regulatory framework is reserved by law and encompasses the existence of a qualified profession, the requirements and qualifications necessary for its exercise, and its content, understood as the formal set of activities that comprise it.

The jurisprudence considers that the General Councils are empowered to regulate "aspects of a secondary or auxiliary nature", that is, when "neither the professional competences nor the essence of the activity is affected", such that matters "that have not been regulated by rules issued by other bodies of public power with higher competence" fall within the auxiliary or secondary matters, provided that it is regulated without extending beyond the aforementioned "essential" limits.

Both this framework document and the resolution approving it respond precisely to this purpose, such that neither of them constitutes any regulation of professional competences in any way. Furthermore, the document is articulated in a totally respectful manner, not only with regard to the nursing competences established by the reference regulations, but also with respect to the competences of other health care professions.

In this way, this document is linked to the field of professional ethics and deontology, offering a framework of action that enables the control of deviations in professional practice, based on the expertise and experience of the professionals who constitute its corporate core.

Therefore, based on these premises, this framework document includes a professional profile of a field of nursing practice that already exists today, in order to establish professional, deontological, and training criteria to guarantee quality and professional competence, and consequently, the development of the right to health and the improvement of health care, according to current scientific criteria.

Theoretical framework

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3. THEORETICAL FRAMEWORK

Cardiovascular diseases (CVD) include all disorders of the heart and circulatory system, such as ischemic heart disease (IHD), cerebrovascular diseases, peripheral artery disease (PAD), heart rhythm disorders, heart failure (HF), valvular heart disease, familial cardiomyopathies and heart disease, aortopathies, congenital heart disease, and pericardial disease. [6]

Cardiovascular health (CV) encompasses everything from genetic predisposition, physical environment, socioeconomic level, psychological and emotional environment, lifestyle, and biological factors, as well as CVD itself, including those that appear without symptoms (subclinical) and those that later manifest as acute events and chronic diseases.

CVD is the leading cause of morbidity and mortality worldwide. According to 2023 data from the World Health Organization (WHO)[17], it is estimated that 17.9 million people die each year from CVD, surpassing tumour diseases.

Achieving and maintaining CV health is a social and health challenge of the first order. The high prevalence of CVD and cardiovascular risk factors (CVRF) has a large impact on health, quality of life, and social and health costs, both in terms of direct expenses derived from income, diagnostic and therapeutic methods, and indirect costs caused by incapacity for work.

CVD affects all stages of life and can be prevented through the promotion of healthy lifestyles and environments, as well as specific prevention measures.

In Spain, there is a worrying increase in the prevalence of obesity and diabetes mellitus (DM), as well as high levels of blood pressure (BP) and LDL cholesterol, the main modifiable CVRFs.[18] For those at risk of developing CVD or those with subclinical disease, systems must be in place to facilitate early detection, training both the population and health care professionals.[6]

On the other hand, up to 47% of the decrease in mortality could be attributed to better management of coronary heart disease in its acute phase, better and more effective secondary prevention, and optimised treatment of CVRFs.[18] Once CVD was introduced, published studies indicate that health education (HED), self-care, and the involvement of family members in care are part of the strategies to increase the efficiency of health care and reduce costs. These strategies are essential in the management of diseases such as HF.[19]

In short, it is necessary to improve clinical care and optimise the management of

health resources, adopting an integrated and people-centred approach that guarantees equity, efficiency, quality, safety, and continuity of care within the National Health System (NHS).

The Spanish Association of Nursing in Cardiology (AEEC) is the scientific society that represents nurses in the field of care for patients with CVD. The AEEC was founded in 1977 and is today made up of more than 1500 nurses working in different areas of CV health.

Its objective is to train nurses who perform their role in the CV field for efficient care management, encouraging their participation in multidisciplinary teams (MDTs) in order to improve the health of the population and offer quality care that reduces health inequalities, whether due to differences in quality, organisational, and management aspects of the health care model, clinical variability, or unequal distribution of resources. To achieve these objectives, the AEEC develops a broad and complex programme of scientific activities that include training, research, and scientific dissemination (ANNEXE 1).

Along the same lines, the AEEC collaborates with different national and international scientific societies to establish links that allow the exchange of evidence that improves care for the population with CVD. Of note are the links with the Spanish Society of Cardiology (SEC), which brings together more than 7000 members and 14 subsidiary societies; the A*ssociation of Cardiovascular Nursing & Allied Professions (*ACNAP), which brings together 69 national nursing societies and associations in 62 European countries; the European Society of Cardiology (ESC), which brings together more than 100,000 scientists, doctors, nurses, and allied professionals in all subspecialties and professional stages of cardiology; and the *American Heart Association* (AHA), an American association with 43,000 members, a scientific reference in cardiology for the United States and the rest of the world.

Communication links have also been established with patient organisations, such as those grouped by Cardioalianza and the platform of patient associations of the Spanish Heart Foundation (FEC).

The need for chronic disease management, the development of new drugs, rising health care costs, new organisational developments, and an increase in professional advancement require a shift in the role of nurses towards more specialised models.

CV health care nurses must have professional autonomy and accredited skills to respond to the needs demanded. They collaborate in the performance of tests and treatments by providing individualised, holistic, transversal, and quality care. They integrate the best evidence into decision-making, actively participate in research projects, and are

a reference in their work environment, both for fellow nurses and for the rest of the team. Both the AHA and WHO recognise the critical role of nurses and other professionals in the multidisciplinary team in achieving a 25% reduction in CVD mortality and disability by 2025. [20]

Currently, it is crucial that the General Nursing Council (CGE) regulates the scope of nursing action in CV health care, to guarantee patient safety and the professional development of the nursing collective.

Justification

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4. JUSTIFICATION

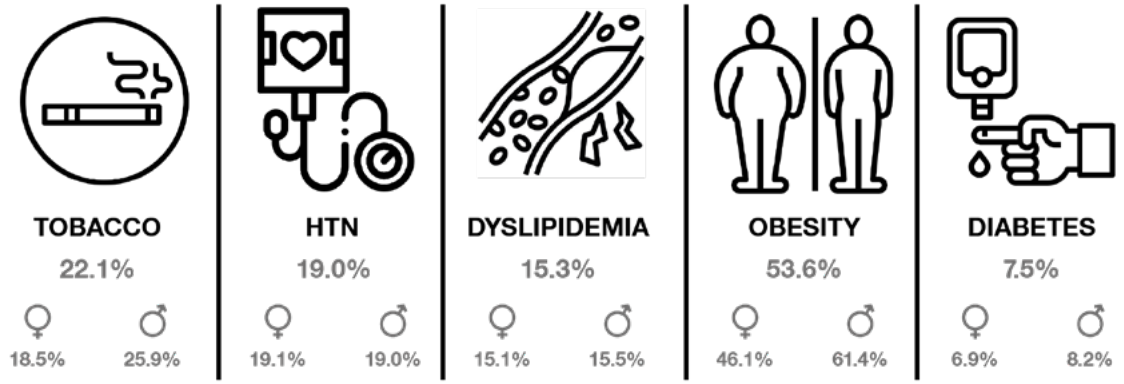
In Spain, CVD is a problem of great magnitude, severity, and complexity, and is currently the second leading cause of mortality globally behind tumour processes. CVD can affect all stages of life and can be prevented, to a large extent, through the promotion of healthy lifestyles and environments, as well as through specific prevention measures, which should be initiated from childhood.[6,21]

The development of CVD and the occurrence of CV events are conditioned by various individual, social, and cultural health determinants. Structural determinants, such as socioeconomic context or gender inequalities, cause differences in intermediate factors, which in turn generate disparities in health[6]:

- Material resources, such as a low socioeconomic level, working conditions (employment status and precariousness), and certain environmental factors, such as environmental pollution and access to information through technology, have a direct impact on CVD, increasing the risk of CV mortality.[6]
- Psychosocial factors and access to health services also have a direct influence. For example, the care network developed in the "infarction code" has improved accessibility to the health care system for patients with Acute Coronary Syndrome (ACS), thus improving health outcomes.[6]
- Biological CVRFs can be of metabolic origin, such as arterial hypertension (HTN), hypercholesterolaemia, overweight/obesity, or DM, or non-modifiable, such as age, sex, family history, and/or genetic factors.[6, 18]

CVRFs associated with lifestyles include smoking (the leading cause of CV morbidity and mortality), unhealthy diet, sedentary lifestyle, lack of physical activity, and alcohol consumption (Fig. 1).[6]

Figure 1. Self-reported prevalence of more prevalent CVRFs. Source: INE, 2020. Own elaboration.



Icons: Surang on Flaticon.

According to the *Global Burden of Disease* Project (2019-2021)[22], the CVRFs that contributed the most to total mortality and total disability in 2021 in the world population were, in order of importance: smoking, hyperglycaemia, hypertension, unhealthy diet, high cholesterol, certain occupational risk factors, kidney dysfunction, air pollution, and rising temperatures.

In Spain, there are important and specific public health problems that directly affect the CV health of the population, hindering effective prevention of CVD. These problems include a high proportion of smokers, especially young people and women, and a growing prevalence of obesity, both among children and young people as well as adults. For this reason, it is necessary to continue improving the levels of detection and control of CVRFs, such as DM and HTN.[6] Overweight and obesity in childhood and adolescence are determinants of future cardiovascular risk (CVR) in adulthood. Both conditions are causal risk factors for CVD, HTN, T2DM, fatty liver, and multiple cancers, in addition to affecting mental health and contributing to the person's disability.[23]

Age is the most important determinant of CVD morbidity and mortality. The prevalence of CVRFs, with the exception of smoking, in most CVDs increases significantly with age, peaking in people over 75 years of age.

It is estimated that, by 2040, more than 155 million Europeans will be over 65 years of age, and with the current trend of survival in CVD patients, the number of people alive with stroke is expected to increase by 35% by that year.[18]

According to the 2023 NHS Annual Report[24], 22.7 cases of IHD per 1,000 inhabitants

were registered in 2022. The same source reports the increase in the prevalence of IHD with age, exceeding 100 cases per 1,000 inhabitants in men aged 70 years or older. In adulthood, the prevalence is higher in men than in women, reaching three times the rate in the population aged 40 to 74 years. The report also highlights that the age-adjusted prevalence is 21.7 cases per 1,000 inhabitants, about three times more in men than in women (32.8 vs 11.9), remaining at values similar to those of 2021 but increasing by 5.9% compared with 2016.[24]

The same report shows that people with CVD visit primary care (PC) centres 2.5 times more than the general population, and it considers CVD to be the most frequent cause of hospitalisation, representing 13.4% of admissions to the NHS, with a rate of 10.3 admissions per 1,000 inhabitants per year. In 2022, IHD resulted in approximately two annual admissions per 1,000 inhabitants, with three out of every four admitted individuals being men. In the emergency setting, 498,954 hospital emergencies were attended for CVD, of which 35,846 corresponded to IHD. The average stay is approximately eight days in the hospitalisation unit and four days in the intensive care unit, with a higher percentage of admissions among men (57.3%) than women (42.7%).[24]

According to the National Statistics Institute (INE), in 2023 the total number of global deaths due to diseases of the circulatory system was 83,942, registering a decrease of 5.6% between 2019-2023.21 By pathologies of the circulatory system (Table 1), the increase in mortality related to HF and HTN between 2019 and 2022 must be highlighted, although the **provisional data for 2023 show a slight decrease in them.**

TABLE 1. EVOLUTION OF MORTALITY DUE TO CARDIOVASCULAR DISEASE ACCORDING TO PATHOLOGY BETWEEN THE YEARS 2019-2023. *PROVISIONAL DATA 2023 (INE JUNE 2024)[21]. Own elaboration.

DISEASES OF THE CIRCULATORY SYSTEM	2019	2020	2021	2022	2023*	Variation 2022-2023
- Ischemic heart disease	29,247	29,654	28,852	29,068	27,203	-6.4 %
- Cerebrovascular diseases	25,712	25,817	24,858	24,688	23,173	-6.1 %
- Heart failure	19,040	19,358	20,173	20,584	19,107	-7.2 %
- Hypertensive disease	11,854	14,271	14,149	14,865	14,459	-2.7 %

By sex, the leading cause of death in men is IHD and cerebrovascular disease in women, with higher mortality rates in HF and hypertensive heart disease also standing out (Table 2).[21] These data are associated with underdiagnosis and undertreatment in women, a greater delay in emergency response, diagnosis, and revascularisation times compared with men, and scant participation in clinical trials, which support the need for a better approach to CVD in women and further research in this field.

TABLE 2. DEATHS DUE TO DISEASES OF THE CIRCULATORY SYSTEM IN 2023. ACCORDING TO PATHOLOGY AND SEX. INE. *PROVISIONAL DATA 2023 (INE JUNE 2024)[21]. Own elaboration.

DEATHS CIRCULATORY SYSTEM DISEASES 2023*	TOTAL	MEN	WOMEN
- Ischemic heart disease	27,203	17,038	10,165
- Cerebrovascular diseases	23,173	10,356	12,817
- Heart failure	19,107	7,849	11,258
- Hypertensive disease	14,459	4,839	9,620

Fortunately, the efforts and investments made, both in Spain and Europe, to improve CV care, together with the improvement of preventive strategies and acute care infrastructures (coronary and stroke units), have led to a substantial reduction in CVD mortality over the last 50 years.[18]

CVD is not limited to older adults, but also significantly affects all adult age groups. Around 20% of all premature deaths (before the age of 65) in the European Union are caused by CVD (24% in men and 17% in women).[18] Childhood CVD is a heterogeneous

group of congenital and acquired conditions that represent a major cause of paediatric morbidity and mortality if not treated promptly. Advances in diagnosis and the administration of new treatments have increased survival, and currently, more than 85% of patients with congenital heart disease reach adulthood.[25]

In Spain, significant changes in the demographic pattern are expected throughout this century, with a substantial increase in the number of older adults compared with young people, and a very significant reduction in the total population (only 23 million people at the end of the 21st century).[26] Approximately 58% of people diagnosed with a pathology of the circulatory system are 65 years of age or older, of whom 63.3% have at least two CVRFs.[6]

An ageing population and increased survival after acute CVD have led to an increase in the number of older adult patients with CVD and multimorbidity. This evolution is associated with high costs for health services, worse outcome indicators, and higher rates of readmission and mortality.

The predominant diseases in patients over 60 years of age are hypertension, hyperlipidaemia, IHD, arrhythmias, and DM. Osteoarthritis, chronic obstructive pulmonary disease (COPD), depression, and cancer are some of the most common non-CV comorbidities in patients with CVD.12 Early identification and appropriate treatment of these comorbidities are essential to combat CVD and reduce the resulting health care costs.[6,27]

CVD is also the most frequent cause of comorbidity in hospitalisation, with hypertension (38%) and cardiac arrhythmias (13%) being the most frequent, along with DM, lipid alterations, and smoking.[24]

Unfavourable changes in CV health are attributed to insufficient awareness among middle-aged adults of the severity of CVD, reduced investments in CVD prevention and control in some countries, and the increasing prevalence of obesity and its associated comorbidities such as DM, HTN, dyslipidaemia, and atherosclerosis. all of them high-impact CVRFs.[18]

CVD represents the third leading cause of disease burden and accounts for 12.5% of disability-adjusted years of life lost. In 2019, in Spain, the rate of disability-adjusted years of life lost was 3,986 per 100,000 inhabitants, of which 14.56% corresponded to CVD (15.35% in men and 13.75% in women).[6] In 2021, in Europe, CVD accounted for 35% of the total potential years of life lost in men and 40% in women, surpassing cancer, which accounted for 24% in men and 25% in women.[28]

The AHA's *Life's Essential* 8 model, which considers classic CVRFs and the social and neuropsychological determinants that may favour the development of CVD, allows

for the evaluation and improvement of CV health. Its application in Spain has shown that 13% of the population has a low level of CV health and higher mortality rates.[29] Nurses are in a privileged position to coordinate comprehensive patient care, ensuring a holistic approach that includes both clinical and psychosocial aspects. This is vital to improve health outcomes, reduce CVD burden and health care cost, and increase the health-related quality of life (HRQoL) of these patients.

The impact of CVD extends beyond the field of health, negatively affecting the economic, occupational, and psychosocial levels of the population. CVD increases patients' dependence, deteriorating their HRQoL, and generating important socioeconomic and occupational consequences. They represent more than 8.31% of total public spending on health, with an impact on the economy that reaches 0.7% of the gross domestic product (GDP). Furthermore, CVD is a frequent cause of temporary disability, causing more than 70,000 sick leaves for this reason, with an economic impact of more than 145 million euros a year.[6]

In Spain, different studies have found that socioeconomic level, gender, territory, and immigration are axes of inequality that significantly affect the health of the population. A low socioeconomic level, defined as a low income, low level of education, and precarious employment, is a predictor of increased risk of CVD. People with fewer socioeconomic resources have more CVRFs and have less access to health benefits and treatments. A correlation has been found between low socioeconomic status and the presence of subclinical atherosclerosis. In addition, a lower level of education is associated with greater inequality in CV mortality, especially marked in young women.[6,18]

Human, sociocultural, and/or demographic vulnerability, characterised by a lack of security and defencelessness, aggravates health conditions, worsening the prognosis for future CVD. The burden of CVD is not just a health problem; it entails costs that have grown continuously in recent decades and are expected to continue to do so.[6]

The economic cost of CVD includes direct health care costs, indirect costs of premature mortality, and premature morbidity costs. A report by the Centre for Economic and Business Studies6 has estimated that in 2020, the economic impact of CVDs could reach 10,892 million euros, representing 0.87% of the GDP. The direct cost would amount to €8.8 billion, the cost of premature mortality to €2 billion, and the cost of morbidity-related loss of productivity would be close to €92 million. This increase was mainly due to the ageing of the population and the associated evolution of mortality and morbidity.

The document "Objective 2025: Heart Failure" estimates that the cost of HF in Spain is approximately 2,500 million euros per year, which represents 3.8% of global health expenditure. In Europe, one in four adults is expected to suffer from atrial fibrillation (AF),

with 30% of these patients admitted to hospital at least once a year and 10% at least twice. The direct cost of AF is estimated at 1% of total health expenditure.[6]

Within the different levels, hospital discharge is a complex moment that involves a comprehensive and structured education, with interventions that guarantee continuity between the different levels of health care.[30]

Integrated CV care requires a systemic, transdisciplinary, and multi-organisational, person-centred approach to prevent fragmentation of health services and ensure a continuum of care.30 This care must be evidence-based and adapted to individual needs and circumstances from diagnosis and throughout the progression of the disease. Up to 80% of CVDs are caused by modifiable CVRFs, so an integrated approach to prevention in life is fundamental.[30,31]

Integrated care by nurses who provide CV care contributes to the reduction of CVRFs, improved self-care and therapeutic adherence, decreased hospitalisations, and reduced morbidity and mortality in patients with established CVD.[30,31]

The increase in life expectancy and advances in new therapies for CVD have generated a demand for more complex care, which justifies the development of this framework of nursing action in the care of patients with CVD.

In addition, in terms of the multidisciplinarity in which the nurse is included in CV health care, it must be based on trust and knowledge in the competencies of each health care professional involved in the health care process, as imposed by the current Law 44/2003, of 21 November, on the regulation of health care professions.

Name of the professional profile

5

5. NAME OF THE PROFESSIONAL PROFILE

Given the above, this working group proposes calling the Nurse in the CV field, Cardiovascular Health Care Nurse.

Definition of the professional profile

6

6. DEFINITION OF THE PROFESSIONAL PROFILE

The profile of the Cardiovascular Health Care Nurse offers an advanced level of care, with specific training and knowledge. This nurse can make complex decisions and has the clinical skills necessary to work in a multidisciplinary team, responding to the needs of patients with CVD. They are professionals capable of providing technical health care appropriate to health needs in the areas of the CV field. This requires specific competence development, related to the complexity of health processes, advanced technology, the specificity of the services provided, and the organisational needs of health systems.

Over the years, the cardiology field has undergone significant technical and technological advancements, driven by continuous clinical trials and efforts in research, development, and innovation (R+D+I). With the emergence of new diagnostic and therapeutic modalities, the human and technical requirements have increased substantially, as has the level of training and competence of the staff.

This requires nurses to acquire skills and knowledge in pathophysiology, specific techniques, scientific methodology and management of material and human resources, through solid and specialised training.

The Cardiovascular Health Care Nurse is highly trained to provide safe and efficient care to patients with CVD. They are key in the care continuum, with competencies in CV health promotion, prevention, evaluation, and evidence-based planning. Their role, defined by professional standards and in coordination with other health disciplines, seeks to ensure suitable practice to offer clinical safety to patients, their families, and caregivers.

In this health field, the following areas of Nursing Action in Cardiovascular Health Care are recognised (Fig. 2), as detailed in Table 3[19,32–34]:

Figure 2. Areas of Nursing Action in Cardiovascular Health Care. Own elaboration.

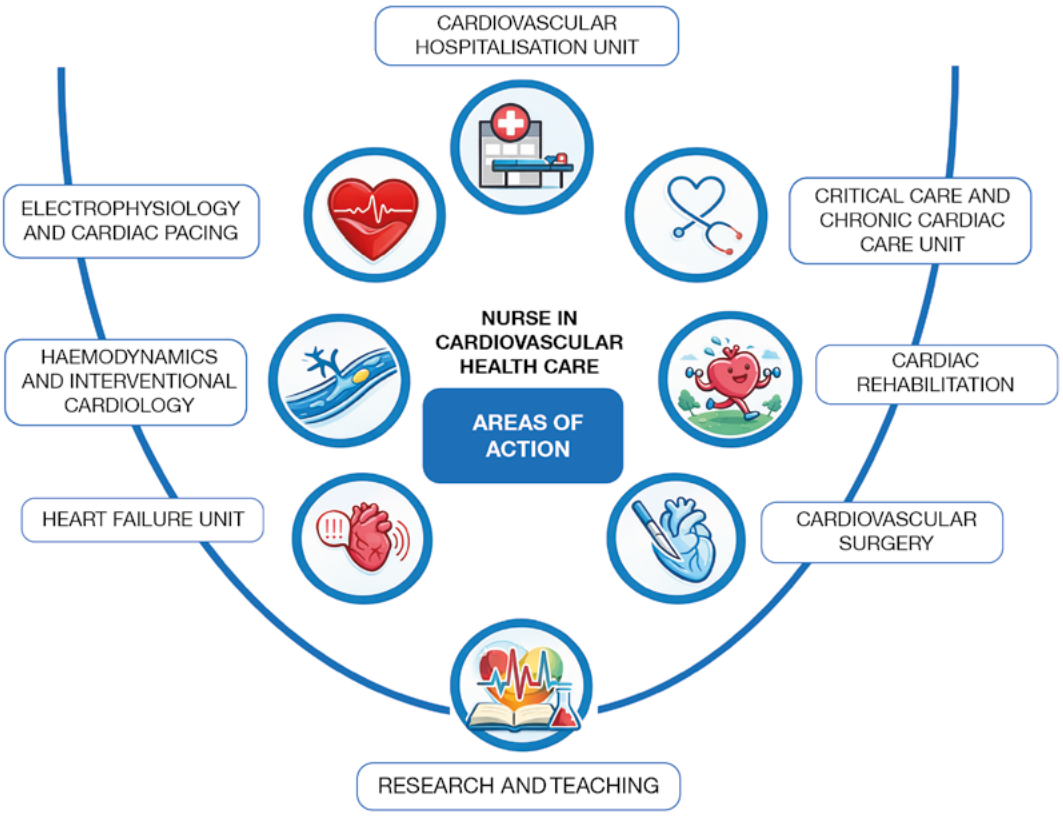


TABLE 3. AREAS OF NURSING ACTION IN CARDIOVASCULAR HEALTH CARE

Research and teaching transversally in all areas	**Cardiovascular Hospitalisation Unit** • Provide specific care to patients admitted with CVD. • Coordinate the diagnostic and therapeutic process, detect and minimise complications, and plan hospital discharge. • Advise on the prevention and management of CVRFs.
	Haemodynamics and interventional cardiology • Play an essential role in percutaneous coronary intervention (PCI) and the management of the infarct and cardiogenic shock code. • Participate in structural interventionism, from the role of the Cardiovascular Health Care Nurse, facilitating the continuity of care and the improvement of the quality of care in this area of health. • Collaborate in the implantation of mechanical circulatory support devices.
	Electrophysiology and cardiac pacing • Implant subcutaneous cardiac monitors and collaborate in implants of cardiac implantable electronic devices (CIEDs), electrophysiological studies, and ablations. • Providing care based on the empowerment of patients with AF: Nurse-Led Multicomponent Behavioural Activation Program (N-MBA). • Develop and implement remote monitoring and tracking programs for implanted devices and E-Health programs.
	Heart Failure • Carry out specific self-care interventions that have been shown to be effective in reducing mortality and readmissions. • Guarantee continuity of care between levels. • Perform drug titrations and coordinate patient follow-up.
	Cardiovascular Critical Care • Apply therapies early and actively while maintaining the quality and safety of care in critical CV patients. • Develop care plans in critical, complex, and rapidly changing circumstances, providing an efficient and safe response to the needs of the critical CV patient.
	Prevention and Cardiac Rehabilitation • Lead CVRF management programs, structured exercise, and patient education to increase functional capacity and HRQoL, decreasing mortality, morbidity, and CV disability. • Efficiently coordinate care in the different phases of cardiac rehabilitation (CR), depending on the needs of patients and taking into account their preferences.
	Cardiovascular Surgery • Assess perioperative risks and optimise the patient in the preoperative period. • Apply and coordinate protocols, circuits, and established clinical routes that guarantee the biosafety of Cardiovascular Surgery (CVS). • Monitor, detect, and address complications in the postoperative period at an early stage, involving the patient and/or family in the recovery of their autonomy and functional capacity.

Objectives of the cardiovascular health care nurse

7

7. OBJECTIVES OF THE CARDIOVASCULAR HEALTH CARE NURSE

7.1 General Objective

To guarantee comprehensive and efficient nursing care, aimed at prevention, improvement of care, and restoration of cardiovascular health, to minimise functional deterioration and loss of autonomy, improving the quality of life and well-being of people and their environment, at all stages of life.

7.2 Specific objectives

7.2.1. To determine the professional profile of the Cardiovascular Health Care Nurse that allows the development of accreditation and recognition at the national level.

7.2.2. Promote CV health and improvement in acute and chronic care, in order to reduce the incidence, prevalence, and complications of CVD, through participation and leadership in multidisciplinary teams.

7.2.3. Lead the design, implementation, and development of care models aimed at chronicity in patients with CVD.

7.2.4. To promote research and teaching to generate scientific knowledge and obtain health results, taking into account the perspective and equality of gender and social determinants in relation to CV health.

Determination of the professional profile

8

8. DETERMINATION OF THE PROFESSIONAL PROFILE

Both Annexe VIII of Royal Decree 1093/2010, of 3 September, which approved the minimum set of data for medical reports in the NHS, and Royal Decree 572/2023, of 4 July, which amends it, define the context in which the nursing act must be carried out using profession-specific terminology, expressly including the classifications of diagnoses, related to this area.[35-38]

We highlight the most common NANDA-I diagnoses of the twelfth and latest edition in Castilian (2021-2023) in the professional practice of Nurses in the field of Cardiovascular Health Care.[35] These NANDA-I diagnoses are the declaration of a need requiring nursing care, which is also perceived by the patient and their family; some are not exclusive to CVD, so they do not differ from those developed in care management, being the situation of complexity that determines addressing them from CV care.

Throughout the professional practice of nurses, in all care settings and age groups, patients who are at risk or have problems related to the course of CVD or its treatment are cared for, requiring specific training and education that allows them to provide the best care based on the best available evidence.

The following are the most characteristic NANDA-I diagnoses of advanced care for people with CVD. This list of diagnoses is not exhaustive; there are many others related to the care of people with CVD, usually provided by general care nurses and which are not the subject of this definition of the profile of nurses who provide advanced care.

Using the standardised nursing language NANDA–I, NOC and NIC,[35-37] we present the nursing diagnoses, outcomes, and nursing interventions to be applied to the person at risk or with problems related to CVD, their caregivers, and/or family. This presentation is based on the habitual problems faced by these patients, and considers the need for comprehensive and individualised assessment of each specific situation, which involves the specific planning of each situation and the diagnosis of other responses in addition to those described below. As a result of this comprehensive assessment, the physiological problems derived from the disease are considered, as well as the psychosocial and behavioural aspects that accompany these processes. As there are many nursing outcomes and interventions common to the various diagnoses proposed, these are presented in a generic way, avoiding excessive repetition of these elements.

According to the type of affinity with CVD, NANDA diagnoses have been classified into two groups:

- Diagnoses with direct, consistent, and complete affinity with CVD (primary diagnoses).
- Diagnoses with direct, consistent, and shared affinity with other clinical situations (secondary diagnoses).

Tables 4 and 5 show the two groups of nursing diagnoses, which can be consulted in detail in ANNEXE 2.

TABLE 4. DIAGNOSTIC LABELS WITH DIRECT AND CONSISTENT AFFINITY WITH CVD (PRIMARY DIAGNOSES) NANDA-I [35]

CODE	Diagnostic label
00276	Ineffective health self-management
00435	Inadequate health literacy
00421	Inadequate fluid volume
00298	Decreased activity tolerance
00442	Readiness for enhanced self-care abilities
00262	Readiness for enhanced health literacy
00184	Readiness for enhanced decision-making
00026	Excessive fluid volume
00204	Ineffective peripheral tissue perfusion
00028	Risk for deficient fluid volume
00492	Risk for imbalanced fluid volume
00311	Risk for Impaired cardiovascular function
00425	Risk for impaired peripheral neurovascular function
00240	Risk for decreased cardiac output
00004	Risk for infection
00201	Risk for ineffective cerebral tissue perfusion
00374	Risk for excessive bleeding
00205	Risk for shock
00362	Risk for imbalanced blood pressure
00291	Risk for thrombosis
00353	Elder frailty syndrome

TABLE 5. DIAGNOSTIC LABELS WITH DIRECT AND CONSISTENT AFFINITY WITH CVD AND CROSS-SECTIONAL TO OTHER CLINICAL SITUATIONS (SECONDARY DIAGNOSES) NANDA-I [35]

CODE	Diagnostic label
00405	Maladaptive coping
00386	Impaired sexual function
00293	Readiness for enhanced health self-management
00499	Readiness for enhanced health literacy
00355	Excessive sedentary behaviours
00477	Excessive fatigue burden
00032	Decreased breathing abilities
00465	Impaired surgical recovery
00491	Risk for impaired hydro-electrolyte balance
00299	Risk for decreased activity tolerance
00228	Risk for ineffective peripheral tissue perfusion

Framework of nursing action in cardiovascular health care

9

9. FRAMEWORK OF NURSING ACTION IN CARDIOVASCULAR HEALTH CARE

The actions and interventions of nurses in this field are carried out within their scope of competence, in accordance with their *lex artis*, within the framework of the principles and values contained in the legal and deontological system and with absolute respect for the competences of the other professionals involved in the health care process.

It is essential to consider interdisciplinarity with other health care professionals involved in the care of patients with CVD, given that there are shared competencies, recognised by current regulations. Therefore, the nurse providing care to people with CVD develops their practice in a multidisciplinary and interdisciplinary context, sharing core principles to provide excellent care.

According to Patricia Benner's model[39], nurses acquire their skills throughout their professional development, becoming increasingly expert in a specific area of their professional competence. In this case, these are nurses who have achieved the highest level of competence in the care of people with CVD, based on scientific evidence, clinical judgment, and critical thinking. First, ten specific competency domains that nurses must develop are described (Fig. 3), as well as the skills necessary for these competencies.[40-42]

Figure 3. Competencies of the Cardiovascular Health Care Nurse. Own elaboration.

Aptitudes are the different behavioural capacities that a person possesses, and that allow them to develop a specific action satisfactorily and completely.

1-Critical and self-critical capacity: Attitude to develop and use critical thinking based on scientific evidence of cardiovascular care.

2-Empathy: Cognitive ability to put oneself in the place of the person with CVD and understand their feelings.

3-Active listening: Ability to communicate and listen attentively to patients in the health-cardiovascular disease process to positively influence their lifestyle habits.

4-Resilience: Nursing competence in routine clinical practice that allows for the improvement of the ability to successfully face professional challenges despite adverse circumstances in the prognosis of patients with CVD.

5-Accessibility: Nurses caring for people with CVD must be accessible to people's needs and provide agile responses in accordance with the quality and sustainability of the health system.

6-Teamwork: Encourage joint work where all members of the multidisciplinary team are important for CV health.

7-Interpersonal skills: Acquire skills for care, such as dexterity, self-confidence, the ability to establish a relationship of trust between people, and the ability to work together to increase the effectiveness of CV health outcomes in transcultural nursing with diversity of people.43-45

8-Ethical commitment: Work on the rational study of morality and well-being by offering cardiovascular care according to people's needs and beliefs.

9-Organisational capacity: Planning work time is necessary to increase efficiency in CV health among the population.

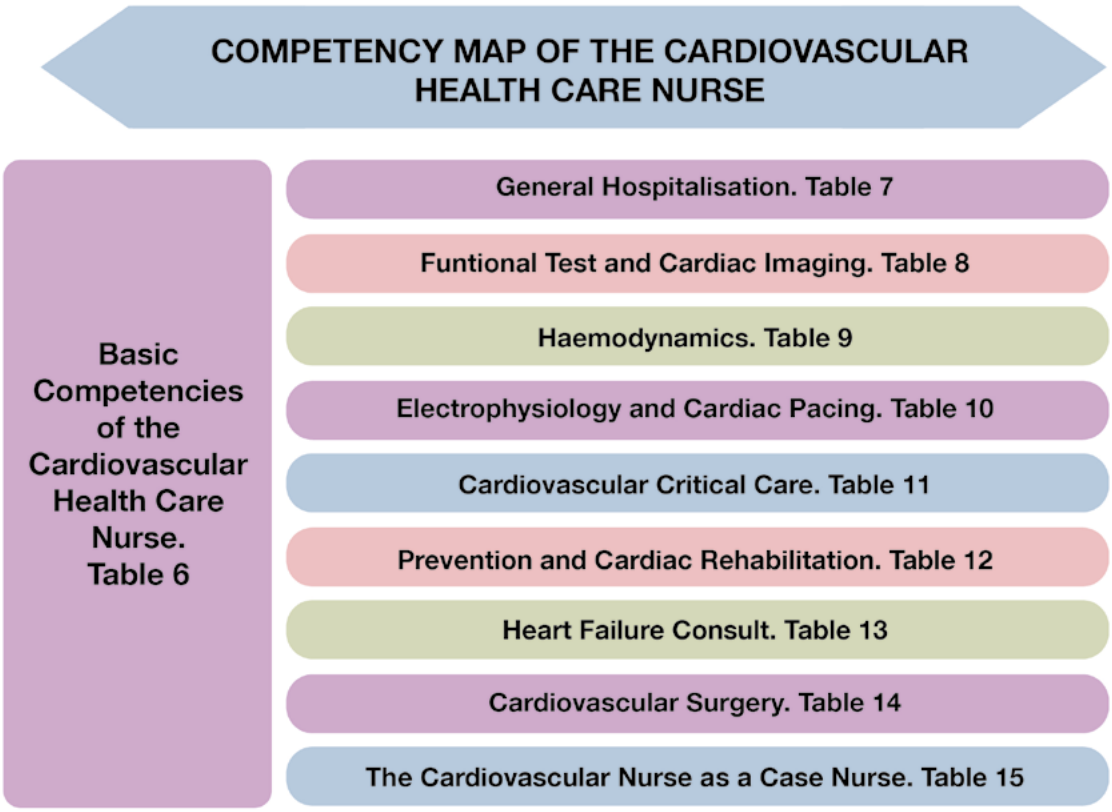
The Cardiovascular Health Care Nurse, in the health care field, develops their activity based on a biopsychosocial model that integrates individual vision with the family and personalises advanced care. This requires developing educational interventions tailored to the health needs of individuals with high care complexity, optimising resource allocation to enhance HRQoL, and providing holistic care to the person. The contribution of professionals must be aimed at empowering the person and their families, as well as improving their health outcomes, satisfaction, and quality of life. Nurses in the field of CV health care must have specific knowledge, skills, and aptitudes to provide and manage

care in the clinical field;[42,46,47] moreover, they must also possess a deep understanding, professional identity, and practical competence.

In order to describe the competencies and develop this profile, the *Core Curriculum* guide, published by ACNAP in 2023, has been taken into account.[1]

The competency map of the Cardiovascular Health Care Nurse includes a wide range of fields in the approach to the care of people with CVD (Fig. 4).

Figure 4. Competency Map of Nurses in Cardiovascular Health Care. Own elaboration.



First, the specific basic competencies that the Cardiovascular Health Care Nurse must perform in any area of work are listed (Table 6): clinical care/evaluator, educator/advisor, rehabilitator, psychosocial, coordinator, researcher, and care leadership.

Next, their capacities are developed for each role, where the knowledge to be acquired or possessed, the skills to be performed, and professional behaviours related to clinical skills and attitudes with the patient, their social environment, and the health team are detailed.

Similarly, cardiovascular health care nurses plan cross-sectional interventions in all areas, participating and collaborating in diagnostic and therapeutic procedures (Fig. 5).

Figure 5. Cross-Sectional Interventions of Nurses in Cardiovascular Health Car. Own elaboration.

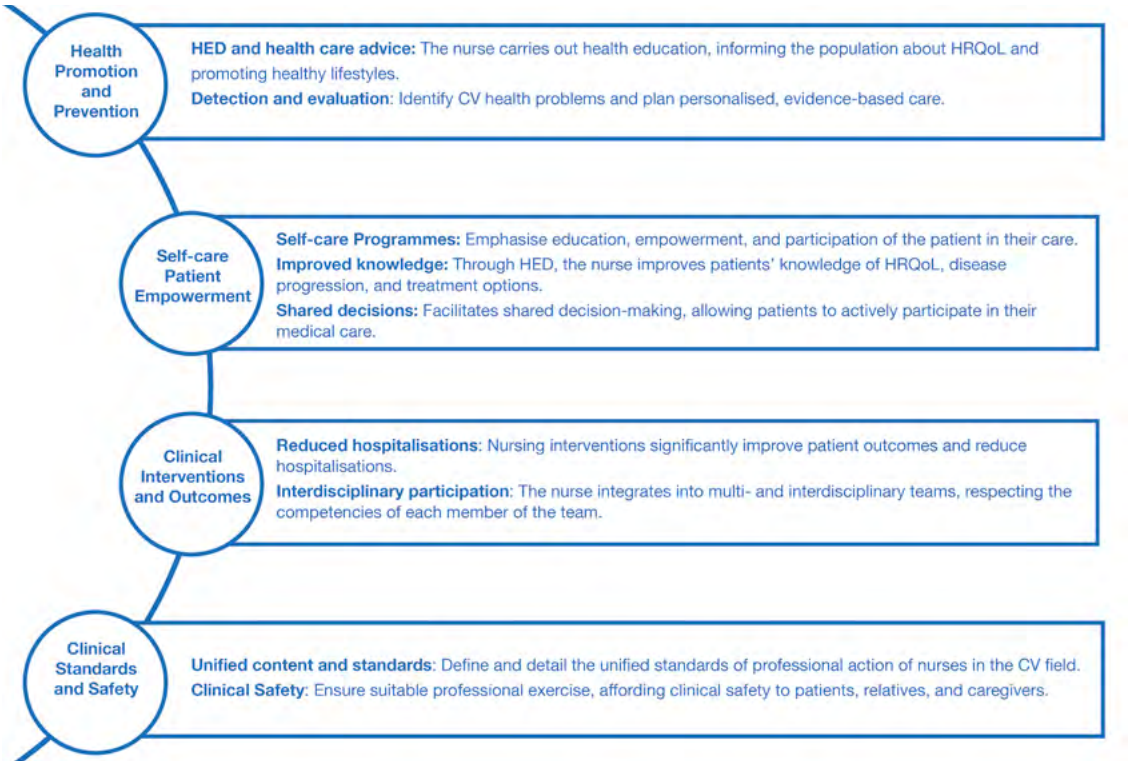


TABLE 6. BASIC COMPETENCIES OF THE CARDIOVASCULAR HEALTH CARE NURSE[1,4,12,48–53]

Domain 1. Clinical Activity
Knowledge of
CV anatomy, physiology, and pathophysiology.
Foetal and postnatal circulation: adaptation of the newborn's heart to postnatal life.
Normal heart rhythm, ischemic abnormalities, rhythm and cardiac conduction disorders (tachy/brady-arrhythmia, conduction defects).
Basic Life Support (BLS) and Advanced Life Support (ALS) protocols.
Knowledge and use of electromedical equipment: electrocardiograph and defibrillator.
Follow-up required for optimal operation of the CIED (including remote monitoring) and registration of effective use, its actions, and potential risk: effectiveness and side effects/adverse events related to the function of the device.

The health care process of CV pathology and the potential complications derived from it.
Presentation, evaluation, and management of common CV symptoms: pain (acute and chronic, chest pain/pain from surgical wounds/intermittent claudication/limb contractures), respiratory distress (acute and chronic), gastrointestinal symptoms (hepatic), fatigue, tiredness and sleep disturbances, palpitations and syncope, oedema, loss of appetite and cachexia, and drug side effects.
Complications of congenital heart disease such as HF, arrhythmia, thromboembolic events, and cyanosis.
CV pharmacology: action, side effects, interactions, preparation and administration (sedation, analgesia, vasoactive drugs, vasodilators, antihypertensives, diuretics, lipid-lowering agents, antiplatelet, antithrombotic, thrombolytic, antiarrhythmic agents, etc.), and the safe use of blood products. Computerised history monitoring.
Warning signs and/or symptoms in patients with congenital heart disease who require urgent evaluation, treatment, and communication with specialists in congenital heart disease.
Emerging pharmacology evidence and non-pharmacological management of CV-specific symptoms at the end of life.
Different diagnostic and therapeutic tests [electrocardiogram (ECG), transthoracic echocardiography (TTE) and transoesophageal echocardiography (TEE), cardiac magnetic resonance imaging (CMR), computed tomography (CT), nuclear imaging, cardiac catheterisation, PCI, percutaneous structural heart disease, electrophysiological study (EPS) and ablation] and provide the appropriate information to the patient.
Protocols established prior to the different diagnostic and/or therapeutic techniques and surgery (anticoagulation withdrawal, double antiplatelet therapy, DM, allergy contrast, kidney failure, etc.).
Surgical protocol in patients with an indication for CVS and/or CIED implantation.
Driveline care protocol in patients with durable ventricular assist devices (VADs).
CVRF and the clinical practice guidelines (CPG) of the ESC for prevention (HTN, smoking, dyslipidaemia, DM and metabolic syndrome, and lifestyle).
Factors that influence the coordination of care and the effective transition throughout the care process.
Strategies for self-care support, including telemedicine and remote monitoring of CIEDs.
The heart transplant process (HTx), knowledge of the signs of rejection and specific pharmacological treatment.
Skills to
Apply knowledge of anatomy, physiology, and pathophysiology in clinical practice and recognise the clinical manifestations of CVD.
Apply BLS and ALS techniques.
Identify normal heart rhythm and early detection and management of ischemic alterations, rhythm and cardiac conduction disorders (tachy/brady-arrhythmia, conduction defects).

Conduct ongoing training in CVD, its acute complications, cardiological signs and symptoms, CV pharmacology, cardiological emergencies, electrocardiography, and training for patient education and communication.
Identify, recognise, evaluate, and alleviate common symptoms of CV conditions using pharmacological and non-pharmacological interventions.
Perform the physical examination: heart rate (HR), rhythm and regularity, BP, cardiopulmonary auscultation, peripheral pulses, detection of oedema, musculoskeletal alterations, cognitive function, and examination of other organs.
Apply established protocols before the different diagnostic and/or therapeutic techniques and surgery (anticoagulation withdrawal, double antiplatelet therapy, DM, allergy contrast, kidney failure, etc.).
Apply the surgical protocol in patients with an indication for CVS and/or CEID implantation.
Apply the driveline care protocol in patients with VAD, detecting early any sign of infection that may compromise the effectiveness of the device and/or the patient's life (wound care, dressings, pharmacological treatment).
Recognise, measure, and document normal ranges of CVD-related physiological parameters and distinguish between normal, abnormal, and potentially lethal. Review the patient's medical history, including the indication for the test and/or surgery, current illness and medical treatment, personal and family medical history, review blood tests, review ECG, necessary complementary tests, informed consent, and other data of clinical interest.
Properly prepare the patient, environment, and equipment necessary for cardiology-related diagnostic and therapeutic invasive and non-invasive testing (TTE, TEE, CMR, coronary CT, nuclear imaging, cardiac catheterisation, angiography, coronary and structural PCI, EPS, ablation, and CV surgical procedures). Application of pre- and post-nursing care in each case.
Suitably prioritise and provide patients with priority care in each CV area of work, based on evidence, including strategies for improvement, recovery of health, and prevention of other diseases, injuries, or ailments.
Foresee CVD-related events and anticipate them.
Identify CVRFs (modifiable, non-modifiable, emerging, and new throughout life), perform CVR stratification, and provide comprehensive care that includes prevention, diagnosis, treatment, and establishes barriers to the prevention of adverse events that may affect patient health outcomes.
Identify patients at risk of developing CVD to avoid unnecessary hospitalisations and readmissions.
Recognise emotional and coping responses to a CVD diagnosis.
Identify, recognise, evaluate, and alleviate common symptoms of CV conditions (atherosclerotic, HF, cardiac rhythm and conduction, structural abnormalities, heart muscle disorders) by safely delivering pharmacological and non-pharmacological interventions.
Interpret and take action on simple diagnostic tests to include ECG, chest x-ray, echocardiography, vital signs, and HF biomarkers suggestive of the patient's compromised haemodynamic status.
Identify and assess complex physical, psychological, social, and environmental needs relevant to CVD conditions throughout the adult lifespan (from diagnosis to the end of life, including sex counselling).

Guide, advise, and inform the patient about the evolution of the CVD and the possibilities of adapting to their new health situation and on aspects related to health promotion, prevention, and treatment of chronic health conditions, promoting a culture of demedicalisation of health and self-care.
Professional behaviour
Attitude of learning and continuous improvement in the promotion of CV health and the prevention of CVD.
To promote effective communication between the members of the MDT, the CVD patient, and the family, in the pursuit of common goals, in an environment of mutual support.
Respect the personal, social, and cultural beliefs and values of the patient and their family/social environment.
Work with nursing autonomy, within a system of culture and safety, subject to audit and quality control.
Willingness to discuss CVD-related treatments and care plan changes with the PC physician and nurse responsible.
Procedures and Techniques
Place:
Non-invasive monitoring.
Non-invasive respiratory support systems.
Ambulatory BP Monitoring Holter.
Manage:
CVR detection, prediction, and stratification scales.
Telemetry and/or monitors.
Electrocardiograph.
Defibrillator.
CV fluids, blood products, and drugs.
Transcutaneous temporary pacemaker (PM).
Carry out:
ECG.
BLS and ALS manoeuvres.
Apply procedures and techniques of:
Electrical cardioversion (ECV) and defibrillation if appropriate.

Manual haemostasis and/or with mechanical devices.
Venous and/or arterial compression bandage.
Vacuum-Assisted Closure therapy.
BLS and ALS.
Driveline care.
Surgical wound healing in CVS.

Domain 2. Psychological
Knowledge of
Emotional impact of the disease and/or advanced CVD treatments on patients and families.
Skills to
Talk to the patient to understand their knowledge, needs, and expectations regarding CVRFs, CVD, and their progression.
Identify knowledge about CVS and agreements with the CV surgeon (surgical technique, type of prosthesis, etc.), verifying that it coincides with their information.
Clarify concepts or doubts about the surgical environment and CVS to reduce their anxiety.

Domain 3. Care for the Family and Caregivers
Knowledge of
Barriers and facilitators that exist in developing a collaborative partnership with patients and their families.
Skills to
Tend to the relationship with patients and their families, trying to satisfy their needs and expectations in CV health and avoiding making value judgments.
Inform, support, and advise the family and primary caregiver about the CVD process and offer them the necessary resources to enable them to perform the role of primary caregiver.
Promote the use of family assessment instruments that make it possible to identify the role that the family may be playing in the health-disease process, and involve family members in the CVD process.

Domain 4. Bioethics

Knowledge of

The patient, the CVD, and its course, have training in ethics and palliative care, have information from the parties involved and make use of CPGs.

The four principles of bioethics: autonomy, beneficence, non-maleficence, and justice.

Different advance directive documents, their verification in the event of a vital emergency, and the ethical, social, family, personal, and economic repercussions derived from not taking them into account.

Ethical and legal considerations of blood transfusion, as well as its specific aspects of refusal for cultural or religious reasons.

Skills to

Participate in the process of deliberation and decision-making at the end of the patient's life, providing clear and precise information to the family, making sure that they have understood what the adjustment of the therapeutic effort consists of.

Defend and not violate, in the critical CV patient, the four principles of bioethics: autonomy, beneficence, non-maleficence, and justice.

Apply holistic care, based on ethical and legal standards that support their actions and aimed at maintaining and restoring CV health, preventing the onset/progression of CVD, alleviating suffering, and contributing to the patient's CR.

Take into account all those involved in decision-making in the different situations related to life, quality of life, the damage that may be inflicted, the adjustment of the therapeutic effort, the withdrawal of life-sustaining therapies, and/or the application of different procedures or techniques, which generate conflicts related to the autonomy/beneficence binomial.

Identify patients who are likely to adapt to the therapeutic effort and know the degree of vulnerability of the family's emotional state for relevant decision-making, actively participating in the withdrawal of life-sustaining therapy.

Ensure an adequate information process to the family before obtaining consent by representation necessary for intensive care oriented to organ donation.

Collaborate in increasing the HTx options of patients on the waiting list, with the corresponding impact on health and contribution to the sustainability of the system.

Identify the ethical and legal implications of blood transfusion during clinical practice and handle situations of refusal for cultural or religious reasons, in accordance with national and local protocols and policies.

Domain 5. Teamwork and leadership

Knowledge of

Different levels of the health care system to meet the needs of the CVD patient.

Priorities and/or goals of the group to establish a route and protocol for the care of patients with CVD.

New technologies, procedures, and techniques that help to provide solutions to problems according to the needs and objectives of CVD.

Professionals involved in the management of patients with CVD: internists, PC doctors and nurses, rehabilitation doctors, physiotherapists, psychologists, etc.

Skills to

Promote the figure of the liaison nurse and lead prevention, promotion, and HED programmes, which promote self-care, pharmacological adherence, and healthy lifestyles as a driving force to improve CV health.

Recognise the roles of the other members of the CV MDT (such as the cardiologist, internist, psychologist, family physician, geriatrician, manager, etc.), and the impact of any changes on service provision.

Collect data for national and international CVD registries.

Programme a care plan (CVD prevention/detection) coordinated with the receiving teams and with PC (patient roadmap) and shared with the patient (individual action plan).

Perform CVR stratification and provide comprehensive care that includes prevention, diagnosis, treatment, and that establishes barriers for the prevention of adverse events and avoids the progression of CVD.

Encourage and assist patients with CVD in the creation of patient associations that support those affected and the healthy family members who live with them.

Domain 6. Organisation and Management

Specific Competencies

Principles of quality (indicators, standards, clinical documentation, accreditation, CPG of the ESC) in the management of CVD.

Resource management (Planning, programming of health care activity, efficiency indicators, expenditure control, etc.) in the CV field.

Facility care methodology (procedures, protocols, CPG, care maps, discharge and continuity of care planning, evaluation of specified outcome criteria) that ensures CV care management.

Coordination channels that ensure effective communication with PC, liaison, and/or case manager nurses for all patients with CVD.

Skills to

Conduct a structured and planned follow-up, by telephone and in consultation, based on CPGs that ensure an evidence-based intervention and CV self-care: maintenance (diet, exercise, drugs), monitoring (daily assessment to detect relapses), and self-management (adequate response to problems, such as warning signs, etc.), early addressing of barriers to compliance and self-care, and monitoring of adherence.

Domain 7. Teaching and Research

Specific Competencies

General research, good practices, legal aspects, and their application in CV, development of search protocols and information management, scientific writing, bibliographic search, publication regulations, data collection and analysis, and the dissemination and communication of results.

Standards of care from your own organisation and from current evidence on CVD.

Skills to

Research and measure the social determinants of health that impact CVD patient self-care to better address health disparities and inequality.

Plan and develop research projects in the field of CV, the search and management of information, data analysis, and the dissemination and communication of results.

Conduct research on new organisational models in the CV field, in which new roles, changes in competences, and MDTs are promoted.

Encourage the creation of multidisciplinary CV teams with experts in research, innovation, and health management, as well as patient associations, and disseminate the conclusions.

Participate, within the MDT, in the development of procedures, protocols, and CPGs that guarantee the safety of the patient and the professional in the CV field.

Domain 8. Sociocultural

Knowledge of

Tools to identify patients with CVD and/or family members in vulnerable situations and/or in the process of mourning.

Skills to

Address the social determinants of health and provide effective, efficient, equitable, and accessible care for all across the entire CV care continuum.

Assess complex physical, psychological, social, and environmental needs relevant to CVD conditions across the adult lifespan (from diagnosis to the end of life and including sex counselling).

Guide, advise, and inform the patient about the evolution of their CVD and the possibilities of adapting to their new health situation and on aspects related to health promotion, prevention, and treatment of chronic health conditions, promoting the culture of demedicalisation of health and self-care.

Domain 9. Spiritual

Skills to

Ensure timely referral of the CVD patient to a specialist, e.g., for psychological, social, and spiritual support.

Domain 10. Legal

Knowledge of

Judgments and the relevant local, national, and European Union legislation related to CV patient care and the provision of health services: informed consent, patient capacity and autonomy, confidentiality, data protection, documentation standards, and safe working environment.

Judgments and local, national, and European Union legislation relating to the prevention, communication, and monitoring of adverse events, such as medication errors, adverse incidents, or failures of CV MDTs.

Protocol and local and/or national guidelines for the transfer of urgent and non-urgent CV patients within and between hospitals.

Guide, advise, and inform the patient.

Skills to

Comply with local, national, and European Union judgments and legislation related to CV patient care and the provision of health care services: informed consent, patient capacity and autonomy, confidentiality, data protection, documentation standards, and a safe working environment.

Comply with local, national, and European Union rulings and legislation regarding the prevention, communication, and monitoring of adverse events, such as medication errors, adverse incidents, or failures of CV MDTs.

Apply the local and/or national protocol and guidelines for the transfer of the urgent and non-urgent CV patient within and between hospitals.

The following tables (7-15) detail the specific nursing competencies of the different areas of CV health. The therapeutic procedures linked to these areas of action are described in ANNEXE 3 of this document.

TABLE 7. SPECIFIC COMPETENCIES IN THE GENERAL HOSPITALISATION AREA [1,4,12,30,48,52–59]

Domain 1. Clinical Activity
Knowledge of
Protocol, complications, and treatment of acute coronary syndrome (ACS).
Aetiology, symptoms, and/or signs of valve dysfunction, alarm symptoms requiring urgent escalation, and complications of mechanical prostheses
Aetiology, symptoms and/or signs, complications, and management of endocarditis.
Aetiology, diagnosis, clinical characteristics, prognosis, and associated risks of bradycardia and tachyarrhythmias.
High-risk features on resting ECG in a patient with suspected arrhythmia and characteristics of different arrhythmias.
Clinical characteristics, diagnosis, and management of syncope.
Presentation, evaluation, management, and follow-up of common HF symptoms and causes that may exacerbate them.
Signs, symptoms, treatment, and management of pericardial disease.
Pericardiocentesis technique.
Management of complications related to HTN and hypertensive emergencies.
Epidemiology, aetiological and functional classification, diagnostic guidelines, and specific treatment of pulmonary hypertension.
Prevention and treatment of hypo- and hyperglycaemia in a CV patient with DM.
Safe handling and use of electromedical equipment: monitors, telemetry, defibrillator, VAD, PM, electrocardiograph, devices for non-invasive ventilation.
Indications, effective use, and improper operation of the temporary PM (electrical impulse, capture, and/or sensing output failures).
Complications in the CIED implant, both at the time of the procedure and in device follow-up.
Effective use and management of respiratory support, such as oxygen therapy and non-invasive ventilation devices, their side effects, and contraindications in cardiorespiratory complications.
Action, side effects, interactions, preparation, administration, and monitoring of specific CV pharmacology: levosimendan, milrinone, dobutamine, dopamine, sildenafil, amiodarone, adenosine, digoxin, isoproterenol, etc.

Protocols associated with the prevention of contrast-induced nephropathy.
Arterial introducer removal technique according to protocol, if applicable. Ensure compliance with patient immobilisation schedules.
Assessing and treating patient haemodynamic instability after percutaneous CV procedures.
Optimal targets for secondary prevention: BP, lipids, DM, physical activity, body weight, nutrition, etc.
Skills to
Identify common types of arrhythmias from the 12-lead ECG, including: AF, ventricular tachycardia, ventricular fibrillation, and atrioventricular heart blocks.
Analyse ECGs and monitoring devices to diagnose bradycardia and differentiate between different types of bradycardia.
Early identification of changes in cognitive and physical functioning indicative of electrolyte disturbances or dehydration.
Recognise the signs and symptoms of HF and acute HF decompensation.
Identify the signs and symptoms of pulmonary hypertension and its associated diseases.
Recognise signs and symptoms of impending cardiorespiratory arrest.
Recognise normal ranges of physiological parameters and distinguish between those that are normal, abnormal, and life-threatening, and manage alterations according to protocol.
Assess, diagnose, and address changing clinical situations (tamponade, arrhythmias, HF, bleeding, dyspnoea, etc.) following the protocols, procedures, and CPGs for patients with CVD to minimise and/or reduce CV and respiratory complications.
Shift checking of parameters, any programming changes that occur, and the patient's tolerance to them, verifying that there are no accidental modifications.
Monitor the condition of the power unit, its attachment, and the status of the internal battery of the PM.
Monitor the patient with continuous monitoring and early detection of electrocardiographic abnormalities and signs and/or symptoms of haemodynamic destabilisation.
Manage cardiothoracic drainage systems (permeability, amount of drainage, and drainage characteristics), according to protocol.
Correctly apply the technique of removal of the arterial introducer according to protocol.
Monitor haemostasis of the puncture site. Correct application of the manual compression technique, mechanical compression, compression by compression bandage, and skin care in CV interventions.
Manage and monitor the area of vascular access pre- and post-haemostasis in CV interventions. Check for complications, skin condition, and peripheral pulses.

Assess the patient's oximetry, detect early symptoms of desaturation and/or pulmonary congestion, and optimise management of oxygen therapy administration techniques in the event of respiratory decompensation in patients with CVD.
Monitor clinical-haemodynamic status, fluid volume, laboratory data, medical treatment, and tolerance/adherence to pharmacological treatment.
Monitor, detect early, and act according to protocol in episodes of chest pain and/or dyspnoea, as well as possible signs/symptoms of hypoperfusion or HF.

Procedures and Techniques

Place:
Non-invasive monitoring.
High-flow non-invasive respiratory support systems or continuous positive airway pressure.

Manage:
Cardiothoracic drains.
Monitoring and/or telemetry systems.
Epicardial, endovascular, and transcutaneous temporal PM.

Carry out:
Coagulation control: activated clotting time.

Apply procedures and techniques of:
Removal of temporary PM electrodes, arterial introducer, and radial compression band.
Manual haemostasis and/or with mechanical devices.
Vacuum-Assisted Closure therapy.

TABLE 8. SPECIFIC COMPETENCIES IN FUNCTIONAL TESTS AND CARDIAC IMAGING[60-62]

Domain 1. Clinical Activity
Knowledge of
Specific CV pharmacology: action, side effects, interactions, preparation, and administration (inotropes, muscle relaxants, antiarrhythmics, echocardiographic contrasts, isotopes, hypotensives, etc.).
Safe handling and use of electromedical equipment: electrocardiograph, defibrillator, ergometry equipment, echocardiograph, etc.
Different diagnostic procedures (TEE, pharmacological echocardiography, echocardiography with contrast, ergometry, ergospirometry, nuclear medicine, etc.), indications, contraindications, and patient preparation.
Contraindications of the different CV procedures and the inherent complications, collaborating in the management of those that put the patient at risk.
Safety measures in radiological protection in cardiac imaging procedures.
Clinical manifestations of CVD (alterations in contractility and corresponding perfusion regions of the coronary arteries, cardiac rhythm and conduction), and early management of clinical deterioration and/or warning symptoms in stress echocardiography.
Foundations of cardiac pathophysiology, understanding the elementary bases of electrocardiography, and knowing and understanding how to interpret the main CV pathologies.
Equipment for digital storage, acquisition of digital images, storage of the most representative images, and execution and interpretation of the new applications of ultrasound equipment, in relation to the different CV image tests.
Bases of ultrasounds and echography, understanding the anatomical and functional assessment of the heart and the integration of the findings into comprehending the pathophysiology.
Skills to
Manage the requests and scheduling of the different studies.
Place the patient in the appropriate position, according to protocol, and monitor, assessing a reliable electrocardiographic signal.
Monitor pharmacological treatment and administer CV drugs following existing clinical guidelines and protocols for this purpose. Apply a protocol for receiving and monitoring the patient's condition before, during, and after the study.
Interpret data and adopt the safe practices necessary to minimise the risk of incidents and/or adverse events before, during, and after the study.
Echocardiography Nurse Technician

Knowledge of

Basic anatomical planes that define an echocardiographic study.

Intracardiac flows analysed with cardiac Doppler technique.

Pathophysiological changes that occur in the different cardiac pathologies.

Basic alternatives that should be analysed with Doppler echocardiography in each of the cardiac pathologies.

Skills to

Perform, under supervision, echocardiographic examinations that comply with current protocols and standards according to the CPGs and recommendations of recognised echocardiographic societies, such as *the European Association of Cardiovascular Imaging, the American Society of Echocardiography, the Inter-American Society of Cardiology*, among others, for subsequent analysis and interpretation by the echocardiographer cardiologist.

TEE

Skills to

Perform the basic preparation of the patient, apply anaesthesia to the oropharynx and sedation with drugs according to protocol.

Watch and monitor the patient, detect and treat possible complications, as well as plan care in the post-sedation recovery stage during TEE, according to protocol.

Collaborate with the echocardiographer cardiologist in obtaining images during TEE.

Contrast echocardiography

Knowledge of

Different types of contrast and activation.

Skills to

Administer the different contrast solutions (contrast echo, gadolinium, iodinated contrast, etc.) used in the different cardiac imaging tests. Know its indications, contraindications, and possible side effects.

Stress test

Knowledge of

Classification of the stress test, according to the ergometer, test objective (diagnostic, prognostic, assessment of functional capacity and/or therapeutic response), according to parameters studied and stress limits.

Stress test protocols and criteria for completing a stress test.
Use of isotopic drugs: safe handling of drugs and advice on precautions to patients and families.
Skills to
Operate the different types of ergometers (bicycle, treadmill) used in the service.
Provide the patient with information about the test to be performed and prior considerations: dietary restrictions, physical exercise schedules, and the suspension or not of the usual medication depending on the purpose of the test.
To assess the presence of factors favouring false positives or false negatives in diagnostic tests for IHD.
Stress Echo (Dobutamine)
Verify that all the material is prepared, such as an infusion pump, echocardiograph, complete emergency cart, oxygen sockets or tank, aspirator, and Baumanometer.
Monitor, assess, and detect early the appearance of CV signs and/or symptoms before the administration of the inotropic drug.
Procedures and Techniques
Place:
Specific monitoring of this area.
Manage:
Contrast solutions (contrast echo, gadolinium, iodinated contrast, etc.).
Carry out:
Ergometry.
Saline infusion test in addition to the TTE.
Probe flushing protocol for TEE with enzymatic solutions.
Apply:
CV drug administration protocols specific to this area.

TABLE 9. SPECIFIC COMPETENCIES IN HAEMODYNAMICS[63-69]

Interventional Room
Domain 1. Clinical Activity
Knowledge of
The most relevant CPGs and consensus documents of the ESC on the treatment of CVD.
Radiation protection (holding a title in radiation protection for professionals involved in interventional radiology procedures).
Material in the haemodynamics room, its location, and maintenance.
Devices for the treatment of aortic, tricuspid, pulmonary, and mitral structural pathology: valvuloplasty, percutaneous implants, and/or clip-on repairs.
Safe handling and use of specific material and equipment for diagnostic and interventional procedures and implantation of circulatory assist devices in haemodynamic, paediatric, and adult patient rooms.
Indications and contraindications of diagnostic and/or therapeutic catheterisation in paediatric and adult patients.
Calibration of pressure transducers in all devices that require it, according to regulations.
Techniques, their indications, associated complications, and nursing functions: PCI, PCI in bifurcation lesions, PCI in chronic total occlusions, PCI in left common trunk disease, PCI in saphenous, radial, and/or aorto-coronary mammary bypass, PCI in ACS, with and without ST-segment elevation, atherectomy techniques (rotational, orbital, and laser), thrombectomy with thrombus aspiration catheters, intracoronary pressure guidance and advanced studies in microcirculation, intracoronary ultrasound, intracardiac ultrasound, optical coherence tomography, intra-aortic balloon pump (IABP), short-term percutaneous ventricular assist device or VAD (IMPELLA®), extracorporeal membrane oxygenation (ECMO), temporary PM insertion, atrial septal defect closure, ventricular septal defect closure, closure of patent ductus arteriosus and patent foramen ovale, closure of the left atrial appendage, Transcatheter Aortic Valve implantation (TAVI), percutaneous mitral, tricuspid, and pulmonary valve implantation, mitral valvuloplasty, aortic valvuloplasty, treatment of mitral regurgitation, and tricuspid clip (with accreditation).
Protocols for the management and control of patients with percutaneous ventricular assistance (ECMO, IMPELLA®, IABP, etc.) and/or VAD and their specific care.
Complications of cardiac catheterisation, including general, cardiac, coronary, vascular, and arrhythmic complications. Know how to identify and act on complications related to PCI (diagnostic and/or therapeutic) and the nursing interventions required: coronary spasm, coronary dissection and acute occlusion, coronary perforation, slow flow or no-reflow, TIMI flow and pathological TIMI flow myocardial perfusion grading or myocardial blush grade, air embolisation, restenosis, thrombosis, peripheral vascular complications, arrhythmic complications, iatrogenic fracture of interventional material that requires rescue, etc.

Functions necessary for an emergency situation: cardiopulmonary resuscitation, IABP, ECV, defibrillation, airway management, temporary PM, pericardiocentesis, placement of short-term circulatory assist devices, and administration of emergency medication according to protocol.

Interpretation of invasive pressure waves, recognising morphologies according to the different heart chambers and acting on abnormalities.

Pharmacotherapy (indications, preparation, interactions, administration, adverse effects, antidotes) associated with PCI: administration of intracoronary drugs, Gp IIb/IIIa platelet receptor inhibitors, antiplatelet agents, anticoagulants, drugs necessary for pharmacological tests, drugs related to sedation and anaesthesia, and drugs used in emergency situations.

Protocols for preparation, intra- and post-procedure that can be applied to different patients according to their history or intervention to be performed (allergy to contrast, allergy to aspirin and/or associated antiplatelet agents, withdrawal of anticoagulation, diabetic patients or patients with kidney failure, among others).

Cannulation of vascular access (arterial and/or venous) to perform catheterisation, as a delegated activity. Ensure compliance with patient immobilisation schedules.

Percutaneous vascular closure devices, when delegated, as well as planning the necessary care in the surveillance of patients with CVD.

Start-up and handling of all the auxiliary equipment necessary during the technique: intracoronary and intracardiac ultrasounds, optical coherence tomography, coronary physiology, atherectomy device for the treatment of calcified plaque, lithoplasty devices, thrombectomy, IABP, temporary PM, oximetry, pressure transducers, automatic contrast injector, and other diagnostic and interventional devices.

Checklist prior to the diagnostic or interventional procedure to optimise patient safety.

Preparation and assembly of the sterile surgical field and handling of material and devices with sterile technique.

Skills to

Perform vascular echo-guided venipuncture for vascular access cannulation.

Identify and handle the introducers, guidewires, catheters, balloons, stents, and other devices used in the haemodynamics table, appropriate for different interventional techniques, and establish the complications associated with their use.

Offer adequate emotional support and provide information to the patient and family before, during, and after the PCI in haemodynamics.

Attend to the physical and personal aspects of the patient during the procedure, providing a safe and comfortable environment.

Programme the functions of the radiodiagnostic equipment according to the needs of the technique. (Magnification, fluoroscopy images per second and acquisition, scope quality, recorded fluoroscopy, multiple image overlapping techniques (StentBoost®, StentViz®, etc.), digital subtraction tools, rotational angiography, etc.).
Operate the intracoronary ultrasound and optical coherence tomography equipment and perform the necessary measurements of the arteries under study by means of quantitative coronary angiogram and/or left ventricular ejection fraction (LVEF).
Prepare the assembly, on the surgical table, of all the specific devices and materials used in diagnostic and therapeutic procedures.
Assemble devices for the treatment of aortic, tricuspid, pulmonary, and mitral structural pathology: valvuloplasty, percutaneous implants and/or clip-on repairs.
Apply the protocols for the preparation, intra and post-procedure, that can be applied to different patients according to their history or intervention to be performed (contrast allergy, aspirin allergy, withdrawal of anticoagulation, diabetic patients or patients with kidney failure, etc.).
Carry out the correct monitoring of the patient.
Perform haemodynamic control of the patient during PCI, recognising signs and symptoms of complications and acting early on them.
Identify important intraprocedural considerations for nursing staff, including: clinical status of the patient, correct use of the different equipment and devices, and complete recording of activity and technique in the database.
Store the catheterisation images on the medium that the centre has (central server, CD/DVD or any other local practice).
Carry out the control of material consumption, forecast of subsequent use by checking goods on deposit and completion of prosthesis cards.
Collaborate by helping the anaesthesiologist, in case of general anaesthesia or deep sedation, during the different haemodynamic interventions.
Prepare continuous positive airway pressure ventilatory support.
Perform different tests or laboratory examinations such as: Allen test, platelet function test, activated clotting time, and oximetry test during right catheterisation.
Apply, if necessary, the technique of removing the arterial and/or venous introducer according to protocol.
Perform haemostatic control of the venipuncture area and insertion of catheters/introducers in coronary intervention and haemostasis by manual or mechanical techniques or with haemostatic devices and/or vascular closures. Place compressive dressings according to protocol.
Assess the PCI venipuncture site (bleeding, bruising, pain, heat, etc.) and the affected limb, using pulses, colour, temperature, and capillary filling.
Provide the patient with information on rest/mobilisation guidelines, recommended water intake, and signs and/or symptoms (chills, cold affected limb, bleeding...) about which the nurse should be notified, to avoid complications in the puncture area of the coronary intervention.

Use the appropriate tools for correct documentation and register the PCI (techniques performed, medication used, complications presented, patient symptoms).
Outpatient area
Knowledge of
Basic assessment of the patient in the nursing consultation for patients undergoing coronary and/or structural PCI.
Skills to
Manage haemodynamics nursing consultations, both in the previous catheterisation visit and in the follow-up after coronary and structural PCI.
Lead the haemodynamic nursing consultation to reduce complications, improve care, and enhance patient satisfaction.
Procedures and techniques
Place:
Arterial and venous vascular access routes.
Mechanical and/or pneumatic compression devices according to protocol.
Manage:
Fluoroscopy equipment, intracoronary/intracardiac ultrasounds, optical coherence tomography, rotational atherectomy device, IABP, temporary PM, oximetry, pressure transducers, ultrasound equipment for cannulation of complex vascular accesses, automatic contrast injector, ECMO, IMPELLA®, etc.
Carry out:
Calibration of pressure transducers in all devices that require it.
Allen test: evaluation, choice, and positioning of the access site.
Platelet Function Test.
Coagulation control: activated clotting time.
Cannulation of the vascular access (arterial and/or venous) to perform catheterisation, as a delegated function.
Apply procedures and techniques:
Removal of the arterial introducer.
Haemostasis techniques through manual, mechanical, or haemostatic devices.

TABLE 10. SPECIFIC COMPETENCIES IN ELECTROPHYSIOLOGY AND CARDIAC PACING[7,70-78]

Interventional Room
Domain 1. Clinical Activity
Knowledge of
Functions necessary for an emergency situation: Cardiopulmonary resuscitation, IABP, ECV, defibrillation, airway management, invasive and non-invasive mechanical ventilation, temporary PM, pericardiocentesis, temporary circulatory assist devices, and administer emergency medication according to protocol.
Management of specific equipment: respirator, defibrillator, PM, ultrasound, electrocardiograph, polygraph, scope equipment, image intensifier, pressure monitor, digital image processor, radiofrequency source, cryoablation console, navigator, programmers, etc., in adult and/or paediatric patients.
Specific material for each interventional procedure: catheters, connectors, polygraph, radiofrequency source, cryoablation console, navigator, interrogator, etc.
Recording systems, mapping systems, or cardiac stimulators for ablation techniques and navigators and fundamentals of cardiac pacing.
Radiological protection subject (holding a title in radiological protection of professionals who carry out interventional radiology procedures) during interventional electrophysiology/electrical stimulation procedures.
Different techniques that are performed in the electrophysiology laboratory: EPS, ablation of arrhythmias by radiofrequency or cryoablation, CIED implant, Insertable Holter, ECV, tilts and pharmacological tests.
Complications typical of electrophysiology procedures: vascular complications, dissection, cardiac perforation, cardiac tamponade, ventricular arrhythmias, and those associated with sedation-analgesic drugs (hypoxia, apnoea, airway obstruction) and local anaesthetics.
Types of vascular accesses used in electrophysiology: arterial and venous femoral, brachial, jugular, subclavian, in adult and/or paediatric patients.
Handling of surgical instruments, clothing, and preparation of the surgical field in the electrophysiology room.
Indications and techniques for ECV.
Tilt-Test procedure in syncope of unknown aetiology.
Pharmacological tests in the diagnosis of cardiac arrhythmias.
Subcutaneous Holter insertion technique.
Protocols (preparation, intra-, and post-procedure) that can be applied to different patients according to their history or intervention to be performed (withdrawal of anticoagulation, antiplatelet therapy, contrast allergy, antibiotic allergy, etc.).

Pharmacotherapy (indications, preparation, interactions, administration, adverse effects, antidotes) associated with the different interventional procedures: anticoagulants, analgesics, local anaesthetics, hypnotic drugs, antiarrhythmics, flecainide, adenosine, isoprenaline, etc., and drugs in conscious sedation.
Skills to
Check the availability and correct functioning of emergency equipment: defibrillator, ultrasound machine, advanced cardiopulmonary resuscitation equipment, PM battery, emergency drugs, and pericardiocentesis equipment.
Identify and manage the introducers, guidewires, catheters, and other devices used in the different interventional procedures in electrophysiology, and detect/manage the complications associated with their use.
Identify and understand the electrophysiological procedure/device implant procedure for each type of patient.
Inform the patient about the electrophysiology/cardiac pacing procedure to be performed and resolve their doubts, creating a climate of trust at all times.
Perform ultrasound-guided venipuncture for vascular access cannulation in the arrhythmia unit.
Carry out the checklist (if provided by the centre) prior to the interventional procedure in the Arrhythmia Unit.
Apply protocols (withdrawal of anticoagulation, antiplatelet therapy, contrast allergy, antibiotic allergy, etc.).
Prepare the patient according to the electrophysiology to which they are subjected, and the surgery with the necessary material to perform it, together with the Auxiliary Nursing Care Technician.
Cannulate an arterial catheter if the procedure requires it. In case of cannulation, monitor and calibrate invasive BP.
Monitor the patient: 12-lead ECG via the polygraph, defibrillation electrodes, and haemodynamic control of the patient during the electrophysiology procedure, detecting early signs and/or warning symptoms.
Perform the activated clotting time for optimal coagulation control according to protocol.
Maintain records of each procedure of the arrhythmia unit: activity, material, and prosthesis (CIED).
Detect the complications of electrophysiology procedures: vascular complications, dissection, cardiac perforation, cardiac tamponade, ventricular arrhythmias and those associated with sedation-analgesic drugs (hypoxia, apnoea, airway obstruction) and local anaesthetics.
Correctly apply the arterial introducer removal technique according to protocol, if applicable.
Perform haemostatic control of the puncture area and insertion of catheters/introducers in the electrophysiology and haemostasis procedure through manual, mechanical, or haemostatic devices. Place compressive dressings according to protocol.

Assess the puncture area for insertion of catheters/introducers in the electrophysiology procedure (bleeding, haematoma, pain, heat, etc.) and the affected limb by pulses, colour, temperature, and capillary filling.
Provide the patient with information on rest/mobilisation guidelines, recommended water intake, and signs and/or symptoms (chills, cold affected limb, bleeding...) about which the nurse should be notified, to avoid complications in the puncture area of the electrophysiology procedure.
Prepare the nursing discharge report of the patient undergoing EPS.
CIED Consultation
Knowledge of
Operation and handling of the different specific electrophysiology equipment (CIED programmers, electrocardiograph device, crash cart, defibrillator, sphygmomanometer, etc.).
Interrogation of the different CIEDs: assess the programmed parameters (pacing mode, HR limits, amplitude and duration of the electrical impulse, detection, polarity of the stimulation and sensing, atrioventricular intervals, refractory periods, frequency sensor, algorithms to reduce ventricular pacing, etc.), monitoring of arrhythmias and/or automatic and patient-activated events and programming of the CIED according to the needs of each patient.
Available CIED monitoring platforms.
Signs of complications in the area of CIED insertion and measures required in each of them (haematoma, seroma, dehiscence, extrusion, risk of decubitus, displacements, etc.)
Management of the parameters of the CIED.
Skills to
Manage the different work agendas, reviews, and appointments for complementary tests, according to the CIED implemented.
Explain, inform, and educate the patient about the objective of CIED implantation, its operation, precautions, and recommendations.
Perform a comprehensive assessment of the patient: clinical stability, anamnesis and physical examination (surgical wound/generator pocket/implant area), and assess symptoms suggestive of a CIED malfunction/complications.
Perform a generalised and focused assessment in search of data that informs us about the condition of the patient with cardiac resynchronisation therapy (CRT) and signs of decompensation.
Assess, with the chest X-ray, the correct position of the implanted CIED electrodes.
Review and monitor the surgical wound and/or CIED implant area, ruling out local complications.
Assess the condition of the cables (pacing and sensing thresholds and impedances) and the status of the CIED battery.

Identify the possible malfunction of the CIED (capture failures, sensing, inadequate therapies, noise, etc.).
To review and analyse the different diagnostic tools (frequency histograms, incidence of arrhythmias, pacing percentages) in patients with CIED.
Programme the different parameters of the CIED in a personalised manner and according to the needs of each patient.
Prepare a nursing report with the findings and interventions implemented after the detection of significant events in the review of the CIED.
Insertable Holter
Skills to
Identify the events caused by undersensing and oversensing of the Holter and try to program the device to minimise them.
Identify the different bradyarrhythmias and tachyarrhythmias.
Interrogate the Holter and analyse automatic and patient-triggered events.
Pacemaker
Knowledge of
ECG technique in patients with cardiac pacing in the conduction system for correct programming.
Skills to
Assess the existence of diaphragmatic or pectoral contractions that could be caused by extracardiac (phrenic or diaphragmatic) pacing of the PM.
Perform an ECG on patients with cardiac pacing in the conduction system for correct programming.
Cardiac resynchronisation therapy
Skills to
Perform an ECG as a fundamental parameter to program CRT.
Review the percentage of biventricular cardiac pacing and the incidence of atrial and ventricular arrhythmias.
Control episodes of increased intrathoracic impedance, caused by CRT that indicates an accumulation of fluids in the thoracic cavity due to a decompensation of the HF.
Assess HR variability: Index of Standard deviation of the NN interval (SDNNI). Assess the programmed parameters (mode, frequencies, outputs, sensitivities, polarity, atrioventricular intervals, refractory periods, sensor, automatic sensitivity, and pacing control algorithms, etc.).
Implantable cardioverter defibrillator
Skills to
Assess the status of the CRT electrodes (pacing thresholds and impedances, and defibrillation impedance).

Assess the battery status and charging time of the CRT capacitors.
Review the monitored and treated arrhythmias and check whether or not they are being treated correctly.
Remote Monitoring
Knowledge of
Management and operation of the different remote monitoring systems used in your centre.
Activate home monitoring on the device and activate alerts according to the protocol established in the service.
The most frequent electrical values used in the evaluation of the functioning of cardiac pacing systems.
Systematic review of data and referral criteria to other professionals.
Protocols for action in the event of different clinical events and/or device failures.
Skills to
Advise the patient and family about the functioning of the implanted CIED (transmitters, event marker, etc.) to ensure the successful sending of data from their home.
Establish periodic communication with the patient carrying a CIED to evaluate the correct functioning of the device.
Prepare a schedule of transmissions for the patient in those CIEDs and platforms that require it.
Review and analyse data, transmission, and diagnosis of faults or errors in the device that must be communicated to the physician.
Perform triage and analyse CIED transmissions based on the findings. Discuss with the referring physician those transmissions that present significant events according to the protocol established in each centre (AF episodes in non-anticoagulated patients, ventricular arrhythmias, asystole, etc.).
Record the findings from the CIED transmission and data of interest for the review of future transmissions.
Carry out telephone and/or telematic follow-up in all patients with remote CIED.
Procedures and Techniques
Place:
Arterial catheter if required by the procedure.
Radio frequency patch and reference patches in the case of navigator use.
Electrosurgical grounding pad.
Holter Monitor, Holter vest
Manage:
Arrhythmia polygraph and stimulator.

Radioscopy equipment: selection of the appropriate programme according to procedure.
Programmer: performing threshold, impedance, and programming tests of the device during implantation.
Carry out:
Insertable Holter implant.
ECV during the EPS procedure under medical indication.
Venography, if medically indicated.
Coagulation control: activated clotting time.
Evaluation of the implant area to rule out early complications such as haematoma and/or infection.
Telemonitoring in the field of Electrophysiology.
Apply procedures and techniques of:
Removal of arterial introducer.
Manual and mechanical haemostasis techniques and percutaneous vascular closure devices when this function is delegated.

TABLE 11. SPECIFIC COMPETENCIES IN CRITICAL CARE[53,79–85]

Domain 1. Clinical activity
Knowledge of
Management of critical patient care: IHD, HF, cardiogenic shock, multi-organ dysfunction, postoperative CVS, post-structural PCI, post-cardiopulmonary resuscitation care, cardiac tamponade, abnormal metabolic states, identification and treatment of arrhythmias, ALS, implantation and management of temporary PM, invasive haemodynamic monitoring, airway management, invasive and non-invasive mechanical ventilation, management of mechanical cardiocirculatory support and continuous renal replacement techniques.
Protocols for the management and control of patients with ECMO, IMPELLA®, IABP, ... and/or VAD and their specific care.
HTx process: prevent infection, promote self-care, integrate the patient into the environment and their family, detect and prevent complications, as well as reduce and clarify negative experiences.
Specific drugs (inotropes, vasopressors, vasodilators, diuretics, antiarrhythmics, sedatives, analgesics, etc.) specific to the critically ill CV patient according to guidelines/prescription from the medical team.
Safe handling and use of electromedical equipment in the Intensive Care Unit-Acute Cardiological Care Unit: ventilator, haemodialysis machine, defibrillator, circulatory support devices, monitors, PM, electrocardiograph, devices for non-invasive ventilation, infusion pumps, and temperature control device.

Specific nursing care for invasive cardiological techniques in critical CV patients.
Correct preparation of the patient, the environment, and the necessary equipment in specific techniques: endotracheal intubation, emergency resternotomy, invasive and non-invasive haemodynamic monitoring (central venous pressure line, arterial catheter), pericardiocentesis, catheter care, access to lines and placement of urgent mechanical circulatory support devices.
Advanced practices in critical CV patients: feeding (enteral or parenteral nutrition), catheter care, dialysis, intravascular temperature control, haemodynamic monitoring, ventilation, weaning off the ventilator, and prevention of complications.
Cardiothoracic drainage equipment, in critical CV patients, and monitoring of the amount and type of drainage and early identification of potential complications.
Nutritional scales (NUTRIC Score) in critically ill CV patients and in the use of equipment to maintain adequate nutritional support (enteral or parenteral), in the monitoring of nutritional evolution and in the prevention and identification of complications.
Rehabilitation process of the critical CV patient, from the moment they are admitted to the Intensive Care Unit-Acute Cardiological Care Unit until their discharge.
Organ donation process: application of care to maintain the safety and viability of the organs to be transplanted and to establish the link between the MDT, patient, and family, providing emotional support.
Skills to
Perform a comprehensive and systematic assessment of the critical CV patient's situation: Respiratory status, CV status, neurological status, kidney function, temperature control, acid-base balance, skin integrity, wound care needs, and comfort and dignity.
Effective use of the temporary PM and the shift check of the parameters and programming changes that occur, and of the patient's tolerance to them, checking that there are no accidental modifications.
Monitor the condition of the power unit, its attachment, and the status of the internal battery of the temporary PM.
Assess, diagnose, and address changing clinical situations, and speed in decision-making following protocols, procedures, and CPGs for CV patients, to minimise and/or reduce CV, neurological, and respiratory complications.
Manage the airway of the critical CV patient in an emergency situation or in processes in which sedation is necessary, following the recommendations of the CPGs.
Administer specific drugs (inotropes, vasopressors, vasodilators, diuretics, antiarrhythmics, sedatives, analgesics, etc.) specific to the critically ill CV patient according to guidelines/prescription from the medical team.
Perform advanced practices in critical CV patients: feeding (enteral or parenteral nutrition), catheter care, dialysis, intravascular temperature control, haemodynamic monitoring, ventilation, weaning off the ventilator, and prevention of complications.

Manage cardiothoracic drainage equipment in critical CV patients, and monitor the amount and type of drainage and early identification of potential complications.
Apply nutritional scales (NUTRIC Score) in critical CV patients and in the management of equipment to maintain adequate nutritional support (enteral or parenteral), in the monitoring of nutritional evolution and the prevention and identification of complications.
Maintain a collaborative attitude in the rehabilitation process of the critical CV patient, from the moment they are admitted to the Intensive Care Unit-Acute Cardiological Care Unit until their discharge.
Control the aspects necessary to maintain or withdraw a treatment for the critical CV patient, once agreed with the MDT.
Make decisions in the critical CV patient in the face of complex and rapidly changing circumstances: emergencies, patient deterioration, altered consciousness, sepsis, multisystem failure, withdrawal of active treatment, adaptation of therapeutic effort, end-of-life care, withdrawal of life-sustaining therapy, organ donation, and rehabilitation.
Apply recent scientific evidence, in critical CV patients, to inform decision-making on ventilation, weaning, dialysis, sedation practice, management of delirium/agitation, pain management, nutrition rehabilitation, invasive monitoring, and titration of inotropes and catecholamines.
Address the situation of the final days, in the critical CV patient, establish the level of complexity and apply palliative care.
Assess the needs of the critically ill patient and their family and prevent and/or treat complications or worsening of the disease.
Procedures and Techniques
Place:
Central venous access lines by peripheral and/or central arterial puncture and Swan-Ganz catheters.
Invasive monitoring.
Manage:
Fluids, blood products, and vasoactive drugs.
Cardiac pacing with temporary epicardial, endovascular, and transcutaneous PM.
Percutaneous circulatory support (IABP, percutaneous axial pump).
Mechanical ventilation equipment.
Cardiothoracic drainage equipment.
Renal support therapy equipment.
Hypothermia maintenance devices.
Echography for ultrasound-guided venipuncture of complex vascular accesses.
Carry out:

Cardiac pacing with temporary epicardial, endovascular, and transcutaneous PM.
Apply procedures and techniques of:
Measurement of cardiac output and derived haemodynamic variables.
Invasive and non-invasive mechanical ventilatory support.

TABLE 12. SPECIFIC COMPETENCIES IN PREVENTION AND CARDIAC REHABILITATION[12,33,72,86–89]

Domain 1. Clinical Activity
Knowledge of
CV training equipment (cycle ergometers, treadmill, arm ergometers, depending on the type of patients).
Exercise physiology and haemodynamic responses to aerobic or strength/endurance exercise.
Muscle training material required in patients with CVD: weights, dumbbells, bands and/or strength training machines.
Indication of CIEDs and their programming. Verify that a previous verification has been carried out before the start of the CR program to allow vital signs and symptoms in response to exercise and alterations in heart rhythm to be monitored with certainty.
Recommendations on exercise and its types, and the prescription of the appropriate exercise load for patients with CVD, both in daily living and sports activities. Include exercises that promote self-care.
Calculation of the training HR and monitoring of reaching the training HR in all phases of the CR program.
Ankle-brachial index determination procedure with arterial Doppler.
Assessment test appropriate to a CR program and to the different CV pathologies (psychological and quality of life assessments), interpretation of these and the ability to plan interventions, according to results.
Interventions in behaviour and lifestyle modification techniques in CV patients (Prochaska and DiClemente model, Bandura model, etc.) and strategies for lifestyle change and adherence to pharmacological treatment: professional advice, motivational interviewing, nursing history, etc.
Skills to
Assess the clinical situation of the patient with CVD on a daily basis, and ensure coordination and continuity of care within the CR program.
Evaluate the status of the surgical wound (thoracotomy and saphenectomy) in coronary post-grafts and puncture area revisions (femoral or radial) in post-PCI patients.

Correctly perform the ankle-brachial index technique and recognise normal and altered levels in patients with PAD.
Assess the type of exercise program (thus estimate the level of supervision and monitoring), according to the stratification of the CVR.
Monitor specific nursing care in prevention and CR programs, ECG monitoring, BP measurement, continuous evaluation of the patient during exercise sessions, and surveillance and execution of corrective and/or preventive actions and the early detection of problems (cardiorespiratory arrest, arrhythmias, AMI, etc.).
Identify signs of exercise intolerance and acute and chronic adaptations to exercise in patients with CVD.
Decide to suspend exercise in patients with CVD in the presence of potential events.
Schedule follow-up based on the patient's age, diagnosis, and comorbidities, time with respect to the CV event, and the evolution of the patient during the rehabilitation treatment sessions.
Train the patient in self-assessment: presence of CVD-related symptoms, perception of exertion during exercise, well-being, CVR limits, and immediate actions to be taken (inform the CR group or immediate discontinuation of exercise).
Collaborate in the development of educational programs for patients with CVD, in collaboration with the rest of the members of the MDT.
Provide oral and written information on CVD and CVRF control strategies, lifestyle modification: diet and eating habits, withdrawal from toxic habits, CVRF self-management, recommendations on physical activity, stress management, action in the case of symptoms (angina, HF weight gain, etc.), knowledge of their drugs, knowledge of basic cardiopulmonary resuscitation for patients and their families.
Monitor compliance with secondary prevention measures with respect to BP, lipids, tobacco, DM, obesity, regular physical exercise, etc., directly related to the risk of CVD or its progression.
Provide assessment in counselling and therapeutic management on possible sexual dysfunction after a CV event (lack of confidence in sexual activity, decreased libido, erectile dysfunction, and/or ejaculation disorders).
Utilise didactic material and resources to modify CVRF and change the lifestyle of patients with CVD, and be available to work in a group with the CR MDT. Possess good personal and health habits, and an enthusiastic and professional attitude.
Coordinate and lead the various activities of the prevention and CR programme: educational, information, training, etc.
Procedures and Techniques
Place:
Holter Monitor
Manage:

Scales for the detection, prediction, and stratification of CVR in the field of CR.
Training equipment: stationary bike, cycle ergometer, or treadmill.
Carry out:
Co-oximetry.
Ankle-brachial index measurement.
Borg test.
Oxygen Consumption Equivalent (MET) evaluation.
Apply procedures and techniques of:
Telemonitoring and teleintervention techniques in the field of CR.
Relaxation techniques/Stress management.
Behaviour and lifestyle modification techniques: Prochaska and DiClemente Model, Bandura Model, etc.

TABLE 13. SPECIFIC COMPETENCIES IN HEART FAILURE UNITS[90-116]

Domain 1. Clinical Activity
Knowledge of
Pathophysiology, epidemiology, aetiology, diagnosis, classification, prevention, prognosis, and the health and social impact of HF.
HF with "reduced, intermediate, or preserved" LVEF according to CPGs. HF classification according to *the New York Heart Association* (NYHA) and the AHA/*American College of Cardiology* (ACC) stages.
HF-related drugs, their indications, contraindications, action, and possible side effects of oral medical treatment: angiotensin-converting enzyme inhibitors, angiotensin 2 receptor antagonists, beta-blockers, aldosterone receptor antagonists, neprilysin and angiotensin receptor inhibitors, SGLT2i, diuretics (flexible regimen), and interactions, preparation, and administration of intravenous drugs (antihypertensives, diuretics, lipid-lowering agents, antiplatelet agents, antithrombotic, antiplatelet agents, thrombotic, antiarrhythmics, inotropes, etc.).
Drug titration in patients with HF: clinical patient management, laboratory tests, adverse events, surveillance of parameters and interactions with other drugs and factors influencing individual susceptibility to side effects.
Diagnosis, clinical management, and specific self-care for HF patients.
NECPAL criteria for establishing severity/progression/advanced disease in HF.
Nursing care oriented and adapted to patients with HF and their families in a situation of advanced illness and/or end of life, which contributes to improving their comfort.
Education integrated to the needs of the HF patient.

Factors that affect the lack of adherence to the therapeutic regimen in patients with HF (the health system, disease status, complexity of treatment, socioeconomic factors, etc.).
Skills to
Facilitate learning, management, and coping with the disease (self-care) for patients and families: knowledge of the disease, diet, exercise, pharmacological treatment, and self-management (flexible diuretic regimen), monitoring of BP, HR, diuresis, weight, dyspnoea, orthopnoea, fever, etc., and appropriate use of health resources (HF consultation, day hospital, and primary and specialised emergency services).
Identify barriers to self-care using validated tools and early addressing of difficulties.
Evaluate the effectiveness of self-care.
Perform physical examination in patients with HF (auscultation, presence of oedema, dyspnoea, orthopnoea, etc.), take vital signs (BP, HR, oxygen saturation, weight, abdominal circumference), perform blood tests, ECGs, and evaluate/apply measures according to the centre's protocol.
Identify the predisposing causes (risk factors), determinants, and precipitants of HF, typical signs and/or symptoms, and clinical profile of patients with acute HF according to the presence/absence of congestion or hypoperfusion.
Monitor the clinical-haemodynamic status (compensated or decompensated), NYHA functional class, fluid volume, laboratory data, medical treatment, and tolerance/adherence to pharmacological treatment of the patient with HF.
Apply titration protocols for specific drugs for patients with HF in coordination with the cardiologist and other specialists, taking into account the patient's clinical status and possible adverse events.
Apply referral protocols for HF patients to prevention and CR programs and occupational therapy.
Establish a channel of communication and access to the nurse in the presence of symptoms and/or warning signs, decompensations, side effects or problems with pharmacological treatment.
Prescribe medical devices necessary for self-care in patients with HF according to current nursing prescription guidelines and established protocols.
Tricameral ICD consultation
Knowledge of
Surgical protocol in patients with an indication for implantation of a tricameral implantable cardioverter defibrillator (ICD).
Effective use of ICD and CRT: objective, indication, contraindication, and potential complications: wound dehiscence, pocket infection, cable and/or wall breakage.
Skills to
Monitor the effectiveness and side effects/adverse events related to ICD function in the immediate and long-term phases.

Follow-up of HF patients included in telemedicine programmes: HeartLogyc, Cardiomet, Optivol, etc.
Heart Transplant Consultation
Knowledge of
HTx process: indications/contraindications/complications, diagnostic tests, and inclusion of the patient on the waiting list.
Donation process: how the organ is obtained, necessary tests and analyses of the donor, criteria for choosing the recipient on the waiting list, coordination of the day of the HTx.
Surgical protocol in patients with an indication for HTx.
Specific pharmacology in HTx: action, side effects, interactions, preparation, and administration (immunosuppression, inotropes, chronotropes, vasopressors and stress hormones, bacterial prophylaxis, antifungal, antituberculosis, anti-toxoplasma, anti-cytomegalovirus and *staphylococcus*).
Signs and symptoms of acute graft rejection, in the immediate and long-term postoperative period.
Hygienic-dietary measures of strict compliance in the HTx to avoid or reduce the incidence of rejection and/or infection.
Skills to
Apply the surgical protocol in patients with an HTx indication.
Assess, identify, and monitor the signs and symptoms of graft rejection in the immediate and long-term postoperative period.
Develop an individualised educational plan for the patient and caregiver: hygienic-dietary habits, pharmacological treatment, signs and/or symptoms of infection and/or rejection.
Ventricular Assist Consultation
Knowledge of
Surgical protocol in patients with an indication for mechanical circulatory support systems.
Protocols on the specific care of the different mechanical ventricular assist devices.
Evidence-based intervention protocols and guidelines to decrease the incidence rate of infections and complications arising from cardiovascular surgery.
Management of anticoagulant and antiplatelet therapy in patients with VAD and their potential complications.
Technique for measuring mean BP using Doppler.
Skills to
Correctly perform the technique of measuring mean BP using Doppler and interpret results.
Educate in the use of the device according to hospital protocol.
Recognise the signs of infection and its management (wound care, dressings, pharmacological treatment, follow-up, etc.).

Perform structured follow-up of the patient with a VAD, evaluate and record coagulation parameters and potential alterations, acting according to the centre's protocol.
Cardio-Oncology Consultation
Knowledge of
Oncological care process and potential CV complications associated with antitumor treatment.
Cardiotoxicity risk stratification and comprehensive care that includes prevention, diagnosis, treatment, and establishes barriers for the prevention of adverse events and avoids interruption of antitumor treatment.
Basic CV monitoring protocols in patients with antitumor treatment and high risk of developing cardiotoxicity.
Cardiological adverse effects of radiotherapy, its mechanism of action, and the radiobiological bases involved.
Different cancer therapies. Know the oncohaematological treatments that can aggravate or induce hypercoagulability, hypertension, diabetes, or dyslipidaemia.
Basic protocols for monitoring antitumor treatment.
Knowledge of care coordination and effective transition throughout the cancer process.
Skills to
Carry out risk stratification and provide comprehensive care that includes prevention, diagnosis, treatment, and establishes barriers for the prevention of adverse events and avoids interruption of antitumor treatment.
Recognise the clinical manifestations of CVD before and during the initiation of antitumor treatment.
Interpret and take measures, according to protocol, in diagnostic tests of the patient undergoing antitumor treatment: ECG, chest x-ray, vital signs, and HF biomarkers suggestive of compromise of the patient's haemodynamic status.
Assess complex physical, psychological, social, and environmental needs relevant to CVD conditions throughout the oncological process.
Familial heart disease
Knowledge of
Definition and classification of familial heart disease.
Types of familial heart disease (hereditary or genetic): genetic cardiomyopathies and channelopathies (hypertrophic, dilated, arrhythmogenic, spongiform, idiopathic restrictive cardiomyopathy, etc.), Brugada syndrome, long or short QT syndrome, and catecholaminergic ventricular tachycardia.
Clinical presentation and management of the most common familial heart diseases in childhood.

Symptoms, signs, complications, treatments (ICD, PM, HTx/kidney transplant, etc.) that may be related to the familial heart disease under study.
Tools for constructing the family tree, stratification of the risk of sudden death, and to begin the clinical study of the relatives of patients with familial heart disease.
Terms implicit in the performance and interpretation of the family tree (proband, consultant, phenotype, affected, carrier).
The technique of drawing a family's medical history and kinship in a family tree or pedigree.
Different genetic studies (genetics laboratory or outsourcing to specific centres) in patients and/or relatives with familial heart disease.
Specific treatment of familial heart disease: medical, pharmacological, invasive, or surgical.
Pharmacological treatment with prostaglandins in paediatric patients with congenital heart disease.
Operation and organisational chart of the Family Heart Disease Unit.
Therapies and drugs involved in familial heart disease: ICD, implantable Holter, ablation/septal ablation, myectomy.
Implications of familial heart disease in pregnancy and physical exercise.
Skills to
Generate a reliable, complete, summarised and updated family tree.
Ability to recognise hereditary patterns and identify at-risk family members.
Identify a fast, effective, direct contact and organise families.
Correct handling, labelling, shipping, and conservation of samples.
Schedule follow-up of family members at risk of presenting the disease, according to the disease and the severity of the phenotype.
Coordinate appointments/tests to minimise the impact on patients and families.
Procedures and Techniques
Place:
Elastomeric infusor.
Manage:
VAD.
Respiratory support devices (oxygen therapy and continuous positive airway pressure).
HF detection, prediction, and stratification scales.
Carry out:
Six-minute Walk test.
Borg test.
Lung ultrasound.

BP measurement by Doppler.
Apply procedures and techniques of:
Genetic studies.

TABLE 14. SPECIFIC COMPETENCIES IN CARDIOVASCULAR SURGERY[1,10,53,115,117–127]

Domain 1. Clinical Activity
Knowledge of
Anatomy, physiology, and pathophysiology in clinical practice and recognise the clinical manifestations of CVD.
Comorbidities: COPD, obstructive sleep apnoea syndrome, renal and hepatic dysfunction, anaemia/iron deficiency, DM, musculoskeletal disorders, depression, and cognitive impairment.
Safely handle electromedical equipment: monitors, telemetry, defibrillator, VAD, temporary PM and/or CIED, electrocardiograph, non-invasive ventilation devices, etc.
Effective use of the temporary PM and checking of the parameters and programming changes that occur, and the patient's tolerance to them, ensuring that there are no accidental modifications. Monitor the condition of the power unit, its attachment, and the status of the internal battery of the PM.
Effective use of respiratory support in patients with CVS, including oxygen therapy and continuous positive airway pressure, along with their contraindications and side effects.
Pathophysiology of congenital diseases in childhood and postoperative management in each specific situation (Tetralogy of Fallot, single ventricle, transposition of great vessels, etc.) to control risks and minimise postoperative complications.
Aspects involved in connecting the patient to extracorporeal life support therapies: extracorporeal circulation, ECMO, IABP, IMPELLA® and medium- and long-term ventricular assist devices.
Technique for measuring mean BP using Doppler.
Technique for measuring the ankle-brachial index and recognising normal and altered levels in patients with PAD.
Surgical protocol for patients with an indication for CVS, vascular, and/or ICD implantation, and make the necessary records prior to surgery.
Protocols and CPGs to reduce the incidence rate of infections and complications derived from CVS.
Indications/contraindications of vacuum-assisted therapy in patients undergoing CVS surgery, and the ability to install, handle, and maintain it.
Basic principles of asepsis, antisepsis, sterility, and contamination in medical-surgical practice and the main pathogenic microorganisms related to infections.

Skills to
Take a history and review the medical history of the patient with an indication for CVS: indication for the test and/or surgery, current illness and medical treatment, personal and family medical history, blood tests, ECG, necessary complementary tests, informed consent, and other data of clinical interest.
Record effectiveness and side effects/adverse events related to temporary PM and/or ICD function.
Monitor the CVS-operated patient with continuous monitoring and early detection of electrocardiographic abnormalities and signs and/or symptoms of haemodynamic destabilisation.
Assess, diagnose, and address changing clinical situations in the postoperative period of CVS (tamponade, arrhythmias, HF, bleeding, dyspnoea, etc.) following the protocols, procedures, and CPGs of coronary patients to minimise and/or reduce CV and respiratory complications.
Perform respiratory monitoring in the postoperative period of CVS. Monitor HR, rhythm, depth and effort of the breaths. Watch for diaphragmatic muscle fatigue (paradoxical movement). Control the amount and type of expectoration.
Assess the oximetry of the CVS-operated patient, detect early symptoms of desaturation and/or pulmonary congestion, and optimise management of oxygen therapy administration techniques.
Correctly perform the technique for measuring mean BP using Doppler and interpret results.
Correctly perform the ankle-brachial index technique and recognise normal and altered levels in patients with PAD.
Collaborate with the physiotherapist in the respiratory physiotherapy techniques to be performed post-CVS, to avoid respiratory complications.
Apply the surgical protocol in patients with an indication for CVS, vascular, and/or ICD implantation and make the necessary records prior to surgery.
In CVS patients, handle drainage equipment and monitor the amount and type of drainage, and early identification of potential complications.
Apply protocols to reduce the incidence rate of infections and complications derived from CVS.
Follow the CPG recommendations for the prevention of surgical wound infection in CVS.
Evaluate the overall state of the sternal wound and/or saphenectomy: borders, epithelialisation, exudate, maceration and/or signs of systemic infection (fever and leukocyte increase) or local infection (erythema/heat/oedema/exudate/induration/tenderness or pain).
Operating Room Area
Knowledge of
Programming of CV care and surgical activity, efficiency indicators, cost control...

Safe operation and handling of electromedical equipment in CVS surgery: scope equipment, ventilator, circulatory support devices, ultrasound, electrocardiograph, defibrillator, monitors, temporary and/or definitive PM, and infusion pumps. Know how to detect and act immediately in the event of mechanical failures (machine failures, electrical failures, oxygenator failures, circuit failures).
Different pathologies of the CV system (valvular, coronary, myocardial, and aortic pathology) and the different surgeries, indications, and specific techniques for each one.
CV and extracorporeal circulation-specific pharmacology, cardioplegic solutions, anaesthetic drugs, hypnotics, vasopressors, narcotics, heparin, protamine, used in the CVS operating room and the safe use of blood products. Computerised medical record monitoring.
Methodology of extracorporeal circulation and the development of new technologies.
Metabolic, cellular, and tissue functioning and the behaviour of body fluids, whether in liquid or gaseous states, values of the blood count, ionogram, and blood gases, which influence the haemodynamic status of the CVS-operated patient.
Skills to
Coordinate the surgical process and strictly follow the protocols, circuits, and established clinical routes, both in the preparation of the operating room and the preparation and management of the patient in each CV surgical process.
Correct preparation of the CV operating room: function and location of the surgical table and lights, oxygenation/artificial ventilation equipment, aspiration system, infusion and fluid regulation equipment (perfusion pumps, temperature regulation equipment...), electrosurgical/laser systems according to the type of surgery.
Identify the patient, consult the CVS surgical schedule, and operating room assignment (Surgical Checklist).
CVS circulating /scrub nurses
Skills to
Coordinate and/or collaborate in the transfer of the patient to the operating table and verify the patient's safety in the event of intraoperative changes of position in CVS.
Monitor vital signs: HR, BP, oxygen saturation, body temperature, respiratory status, and other parameters according to protocol in all CVS interventions.
Maintain optimal oxygenation and perfusion, using oxygen therapy, mechanical ventilation, blood products (after confirmation of identity/compatibility) and/or pharmacological measures of CV support, if necessary, in patients undergoing CVS.
Monitor the evolution of the CV surgical act, by controlling bleeding and response to medication and/or therapeutic techniques.
Perform nursing therapeutic procedures during CVS, as prescribed by the doctor or according to protocol: insertion of venous and/or central accesses, placement of catheters, preparation and collaboration in the insertion of drains, tamponade, immobilisation, etc.
Detect and act early in the event of embolisms or thrombi, during CVS.

Collect and identify blood and/or biological samples during the CV surgical process, which must be processed or analysed and manage their submission for intraoperative or deferred analysis (pathological anatomy, bacteriology, etc.).
Record the data in the electronic information systems: type of CV intervention, assessment/ preparation, CV surgical roadmap, surgical activity, devices/monitoring used, fluid balance, both electrolytes and blood products, perioperative incidents, and patient care plan.
CVS anaesthesia Nurse
Skills to
Perform/record a checklist prior to anaesthetic induction and CVS: fasting, allergies, risk-based operative tests (ECG, complete blood tests, chest X-rays, etc.), anaesthetic informed consent, etc.
Prepare and review intubation material and devices to secure the airway (tubes, guidewires, sears, Guedel, face masks, probes, laryngoscope, fiberscope, aspirator, difficult airway cart, etc.), during CVS.
Prepare/administer, according to protocol, the drugs necessary for induction, anaesthetic maintenance (etomidate, propofol, sevoflurane/isoflurane, cisatracurium/rocuronium, remifentanil, etc.), support drugs, and multimodal pain control, depending on the type of CVS. Monitor the patient's response during drug administration.
Control/verify the positioning of probes, arterial/venous catheters, epicardial electrodes, drips, cardiothoracic drains, etc., once the patient has been transferred to their bed.
Procedures and Techniques
Place:
Hospitalisation and/or operating room
Thoracic/pericardial/pleural drainage systems.
Vacuum-Assisted Closure therapy.
Venous compression bandages.
Manage:
Hospitalisation:
Temporal epicardial, endovascular, and transcutaneous PM, CIEDs, VADs.
Respiratory support systems.
Operating room:
Specific monitors for the field of CVS, ultrasound, and respirator.
IABP.
Normothermia module.
Temporal epicardial, endovascular and transcutaneous PM, CIEDs, and VADs.
Scope equipment.
Carry out:

Hospitalisation:
Measurement of mean BP by Doppler.
Ankle-brachial index measurement.
Coagulation control: activated clotting time
Provocation techniques [Plantar ischemia (Samuels test) and capillary-venous filling].
Operating theatre:
ECV and defibrillation techniques in the field of CVS.
Myocardial protection techniques and normothermia in cardiac surgery.
Bone marrow protection/drainage techniques in abdominal aorta surgery.
Monitoring of neuromuscular blockade.
Bispectral index monitoring and suppression rate monitoring.
Thermodilution or transpulmonary lithium-dilution monitoring.
Provocation techniques [Plantar ischemia (Samuels test) and capillary-venous filling].
Instrumentation of the different procedures in CVS.
Apply procedures and techniques of:
Haemostasis techniques through manual and/or mechanical techniques.
Core temperature measurement techniques.

TABLE 15. SPECIFIC COMPETENCIES OF THE CARDIOVASCULAR HEALTH CARE NURSE AS A CASE MANAGER[64,67,75,102,115,128–132]

Knowledge of
Criteria, care circuits, and referral protocols for patients with decompensated HF.
Criteria and referral routes for follow-up of chronic and stable patients, according to the HF patient profile, in the different care services (PC, general cardiology, internal medicine, geriatrics).
Integrated care process and technological tools for clinical support in AF.
Telecardiology tools (home visits/structured calls/video calls, etc.) and telecare (app/online portal, HFmatters.org platform) that facilitate self-care, self-management, and therapeutic adherence.
Planning the discharge of patients diagnosed with HF during their hospitalisation through face-to-face contacts with the HF MDT (including PC), coordinating discharge with the PC team, carrying out (or promoting) an early home visit after discharge during the first 48 hours, and supporting the PC team in follow-up during the first three months after discharge, according to the established clinical route.

Structural pathology, TAVI, and other treatment options and their complications.
Different mechanical circulatory support systems, such as destination therapy or bridge to HTx: indications, objectives, and potential complications derived from surgery or the device itself (haemorrhage, thromboembolism, pump thrombosis, infection, right ventricular failure, and device failure).
Use and maintenance of the VAD and accessories (power supplies, response controller, batteries, charger, parameter monitoring), parameters and limits of the alarms established in each patient, cleaning, and immobilisation of the lead cable and protocols on specific care of the different VADs.
Skills to
Participate in MDT meetings (including PC) for patient review and discussion of complex patients.
Follow the criteria, care circuits, and referral protocols for patients with decompensated HF.
Follow the criteria and referral routes for the follow-up of chronic and stable patients, according to the profile of the HF patient, in the different care services (PC, general cardiology, internal medicine, geriatrics).
Plan and coordinate end-of-life care in collaboration with the PC HF reference teams of the HF program and end-of-life care units.
Coordinate the VAD MDT (nurses, CV surgeons, cardiologists, haematologists, anaesthesiologists, etc.) according to the protocol established for this type of patient, to avoid complications and, if they appear, to detect and solve them early.
Conduct the organisation, control, and implementation of the intraoperative record and the relevant documentation, and set up the device, with the help of the operating theatre staff.
Coordinate in-hospital care, assistance in the operating room, education and training of staff and, especially, the patient/caregiver on VAD management to provide them with the maximum possible autonomy.
Document and file, during the peri- and intra-hospital period, the parameters for VAD control, as well as the necessary complementary tests (echocardiography, blood tests, chest X-rays, etc.), and communicate any possible modifications to be made to the doctors responsible for the patient in the different services.
Optimise pump flow and monitor recovery of the patient's kidney, liver, and respiratory functions.
Coordinate the outpatient follow-up of the patient, the management of the VAD nursing consultation, the different medical appointments and complementary tests, and provide care.
Establish communication and coordination between the CVD patient and the VAD team throughout the patient's life.
Participate in the clinical triage of the patient who is a candidate for TAVI, in the management of the waiting list, and in the scheduling and coordination of follow-up.
Coordinate the patient-family Heart Team throughout the process.

Conduct a global assessment of the patient who is a candidate for TAVI, analysing them at a clinical, physical, psychological, and psychosocial level.
Assess different geriatric syndromes, self-care, frailty, and quality of life, using validated scales, which may be key in the acceptance or rejection of a TAVI implant, as well as predictors of complications or late hospital discharges.
Educate/advise the patient and family about the TAVI implantation surgical process.
Coordinate the performance of pre-procedure diagnostic tests and throughout the TAVI process, managing interconsultations (geriatrics, physiotherapy, social worker).
Ensure the correct optimisation of treatment, dietary measures, and regular physical exercise programs, as well as the identification and control of CVRF, in patients undergoing TAVI.
Carry out follow-up of symptoms and complications (arrhythmias, stroke or transient ischemic attacks, major and minor vascular complications, acute renal failure, prosthetic dysfunction, and/or paravalvular regurgitation, etc.), according to the established protocols and previously designed clinical trajectories.
Coordinate the implantation of definitive PM after the TAVI procedure, if necessary.
Plan, upon hospital discharge, complementary tests and medical appointments, according to the TAVI protocol.
Refer to the CR program, according to the centre's protocol, to improve functional capacity, quality of life, and control CVRFs associated with the TAVI patient.
Collaborate in the development of standardised protocols.
Participate in the evaluation of the TAVI program by supporting the implementation of improvements.
Know the transition to palliative care when performing a TAVI.
Coordinate the outpatient follow-up of the patient, manage the AF nursing consultation, the various medical appointments and complementary tests, and provide care.

The CPGs recommend estimating the overall CVR to classify people into the different risk groups and to be able to prioritise and adapt preventive and/or therapeutic interventions to the estimated absolute vascular risk. In the CV field, there are scores or scales that facilitate risk stratification, both in primary and secondary prevention, and many specific to a type of event, which allow us to know the patient's prognosis and/or survival and help to make the relevant therapeutic decisions. The following table (Table 16) refers to the main scales applicable to people with CVD and/or at risk of acquiring it.

TABLE 16. APPLICATION SCALES IN PATIENTS WITH CVD [12,116,133–153]

Cardiovascular risk (CVR)	
*SCORE	*Consult here*
*SCORE2 (40-69 years)	*Consult here*
*SCORE2-OP (> 70 years)	*Consult here*
HeartScore	*Consult here*
Smart risk score	10-year risk of recurrent vascular events in patients with overt CVD *Consult here*
LIFE-CVD	Lifetime Risk Score *Consult here*
MACE and 2MACE Scores	CV event predictors. *Consult here*
EPICARDIAN	CVR in the Spanish elderly population. *Consult here*
IBERLIFERISK	Lifetime CVR from age 18 to 75. *Consult here*
Fuster—BEWAT Score	Risk for subclinical atherosclerosis. (5 Health indicators: BP, physical activity, BMI, fruit and vegetable intake, and tobacco use). *Consult here*
Ideal CV Health (CVH) Index	Same as the Fuster-BEWAT Score (+ cholesterol and glucose). Needs blood tests. *Consult here*
Framingham Scale	CVR. *Consult here*
Mortality risk	
GRACE	Mortality within the first six months after discharge. *Consult here*
PROFUND Index	Risk of death and functional impairment in patients with multiple pathologies. *Consult here*
LEE Index	To assess mortality at four years in adults over 60 years of age. *Consult here*

*INDIANA Project Score	Risk of death from CVD. *Consult here*
Coronary Artery Disease	
*TIMI	Risk of mortality in ST-elevation ACS. *Consult here*
*CADILLAC	Risk of mortality in patients undergoing primary PCI. *Consult here*
**Hill-Bone Compliance Scale*	Analyses the barriers to adherence and behaviour of patients with HTN. *Consult here*
Valvular Disease	
**Toronto Aortic Stenosis Quality of Life Questionnaire (TASQ)*	Quality of life in patients with Aortic Stenosis. *Consult here*
**Essential Frailty Toolset (EFT)*	Frailty in patients with aortic stenosis. *Consult here*
**TAVI Patient Journey*	Patient satisfaction and experience during the TAVI procedure *Consult here*
Cardiac surgery	
*EuroSCORE and EuroSCORE II	Preoperative risk in CVS. *Consult here*
*STS score	*Consult here*
**Transfusion Risk Understanding Scoring Tool* (TRUST)	Risk of transfusion in patients undergoing CVS. *Consult here*
**Transfusion Risk and Clinical Knowledge* (TRACK)	Predicts the possibility of having a blood transfusion in a CVS. *Consult here*
*ACTA-PORT Score in older cardiac surgery patients at risk of frailty	Predictor of red blood cell transfusion risk in older patients undergoing CVS at risk of frailty. *Consult here*
Thrombosis/bleeding	
*CHA2DS2-VASc	Risk of stroke at 12 months. *Consult here*

*Bleeding Research Academic Consortium´s Scale (BARC)	Classification of haemorrhage. *Consult here*
*CRUSADE Bleeding Score	Risk of bleeding in patients with ACS. Consult *Consult here*
*PRECISE-DAPT	Risk of bleeding during prolonged treatment with dual antiplatelet therapy. *Consult here*
*PARIS (Patterns of Non-Adherence to Anti-Platelet Regimen in Stented Patients)	Predicts the risk of out-of-hospital bleeding after PCI. *Consult here*
*Atria Score	Risk of bleeding in patients with anticoagulation in non-valvular AF. *Consult here*
*HAEMORR$_2$HAGES Score	Risk of bleeding on anticoagulation for chronic AF of non-rheumatic origin *Consult here*
*HAS-BLED	Risk of bleeding in one year in patients with AF. *Consult here*
*Wells scale	Pulmonary thromboembolism. *Consult here*
*Geneva Score	Pretest probability of pulmonary thromboembolism. *Consult here*
*PESI (Pulmonary Embolism Severity Index)	Pulmonary Thromboembolism Severity Index. *Consult here*
*Padua Scale	Risk of a venous thromboembolic event. *Consult here*
	Peripheral artery disease
*Fontaine	Claudication. Stages of progressive arterial insufficiency. *Consult here*
*WIfI Classification	Wounds, ischemia, and foot infection. *Consult here*
*Edinburgh Claudication Questionnaire	Peripheral arterial claudication, assesses pain in the lower extremity. *Consult here*

Heart failure	
Functional capacity in IHD	
*NYHA New York Heart Association	Functional classification of HF. *Consult here*
*DASI Duke Activity Score Index	*Consult here*
Quality of life in IHD	
*KCCQ (Kansas City Cardiomyopathy Questionnaire)	Quality of life in patients with HF. *Consult here*
*MLHFQ (Minnesota Living with Heart Failure Questionnaire).	*Consult here*
*CHFQ (Chronic Heart Failure Questionnaire).	*Consult here*
*EHFMG	HF mortality in the Emergency Department. *Consult here*
*EVEREST	Signs and symptoms of congestion. *Consult here*
Disease Awareness/Self-Care	
*EHFS-CBS (European Heart Failure Self-Care and Behaviour Scale).	Self-care capacity and knowledge of HF *Consult here*
Prognostic Assessment in HF Patients	
*MEESSI	Risk of patients with acute HF in emergency departments. *Consult here*
ELAN-HF	*Consult here*
*Seattle Heart Failure Score	Mortality at 1, 2, and 5 years. *Consult here*
*EFFECT	Mortality at 30 days and 1 year. *Consult here*
*ADHERE	Mortality from three basic clinical parameters. *Consult here*
*Heart Failure Risk Calculator	Mortality at 1 and 3 years. *Consult here*
INTERMACS (Interagency Registry for Mechanically Assisted Circulatory Support)	Advanced HF stratification *Consult here*
Cardio-oncology	

HFA-ICOS	Risk of CV toxicity in cancer patients. *Consult here*
Heart Transplant	
*HFSS (Heart Failure Survival Score)	Predictive model of survival at one year. *Consult here*
Arrhythmias	
*Romhilt-Estes	ECG criteria for left ventricular hypertrophy. *Consult here*
*Qtc	ECG measurements to identify long or short QT. *Consult here*
*Syncope Risk Score	Evaluation of syncope 30 days after urgent/emergency care. *Consult here*
HARMS2_AF	Prediction of new-onset AF. *Consult here*

Definition of the minimum contents in the training of nurses in cardiovascular health care

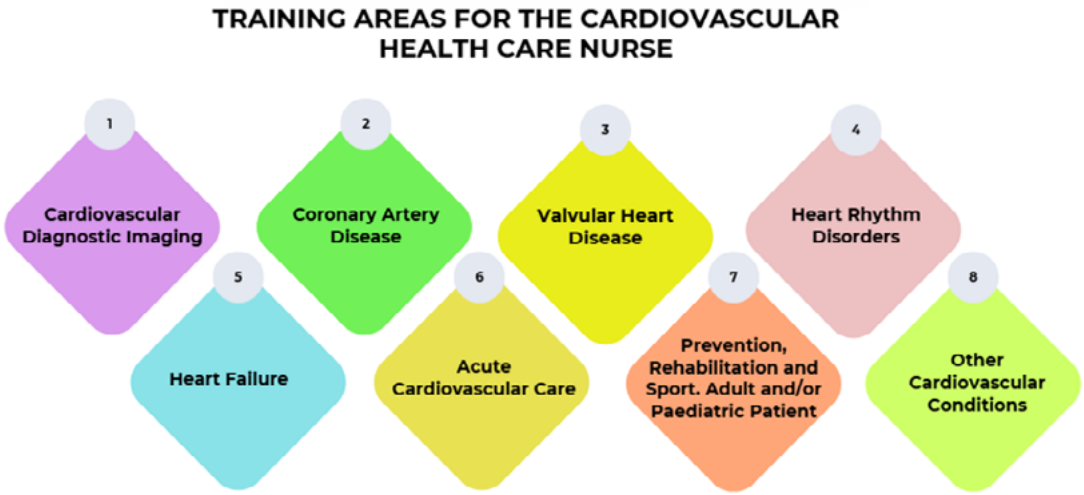
10. DEFINITION OF THE MINIMUM CONTENTS IN THE TRAINING OF NURSES IN CARDIOVASCULAR HEALTH CARE

Despite the heterogeneity of curricular development, there is a certain unanimity that the training of Nurses in Cardiovascular Care should go beyond the Bachelor's Degree in Nursing. When defining the minimum educational contents that train nurses in the field of Cardiovascular Health Care, it is difficult to agree on the necessary qualifications linked to advanced practice roles, as there is no specific regulation by law.[20,154]

The minimum necessary time of professional experience in clinical practice focused on specific advanced management resources, to ensure the training of nurses in this area, would be two years.

Taking as a reference the experience of other countries, organisations, and programs of Cardiovascular Health Care Nurses,[20,154] it is necessary to identify the knowledge, skills, and attitudes that describe the capacities that should be included in postgraduate training programs, for which the following areas should be taken into consideration (Fig. 6):

Figure 6. Training Areas for the Cardiovascular Health Care Nurse. Own elaboration.



There is a broad consensus that the Cardiovascular Health Care Nurse must complete their postgraduate university training to acquire specific competencies.[155,156]

Competency-based training is a teaching and learning process aimed at helping people acquire/integrate skills, knowledge, and attitudes in clinical practice. The educational and training requirements for Cardiovascular Health Care Nurses follow the criteria of the

ACNAP Core Curriculum,[1] published in 2023, which outlines the clinical competencies needed to practice as a CV nurse and is designed to align with the ESC core curriculum in cardiology.

The curriculum is based on:

- Patient-centred care: to avoid fragmentation, with a care model that respects the patient's experience, values, needs, and preferences in the planning, coordination, and provision of care.
- Psychosocial health: Identify patients for whom additional psychological/psychiatric information may be beneficial and make the appropriate referrals.
- Patient-reported outcome measures (PROMs) and patient-reported experience measures (PREMs): to assess quality of life, mental health, specific symptom burden, before and after treatments from their own perspective, and identify areas for improvement and perform analyses and comparative assessments.

The adaptation of the Core Curriculum made by the SANC National Scientific Society can be consulted at this link:

Definition of the minimum contents in the training of nurses in cardiovascular health care

11

11. CONTRIBUTION OF THE CARDIOVASCULAR HEALTH CARE NURSE TO THE HEALTH SYSTEM

The figure of the Cardiovascular Health Care Nurse adds great value to the effectiveness and efficiency of the health system, as there is evidence that they improve the self-management of angina pectoris (90% vs 80%), there is a reduction in hospital readmissions (8% vs 16%) and admissions and/or medical visits (29% vs 42%), and an increase in healthy physical activities (53% vs 41%), associated with motivational telephone follow-up, after the PCI performed by these nurses.[157]

The role of these nurses in relation to the planning of discharge in patients undergoing coronary artery bypass surgery is associated with a decrease in readmission rates (14.4% vs 6.8%) and hospital stay (6 days vs 5%), as well as a higher rate of home discharge (82.7% vs 73.9%).[158]

HF patient care programs, where cardiovascular health nurses play an important role, have been able to reduce relative mortality (12%), all-cause hospital admissions (8%), and HF-specific admissions (20%).[159]

Pharmacological titration by the nurse specialising in HF has achieved a significant increase in drugs with prognostic value and a lower number of hospitalisations due to HF (0.69 vs 9), through a greater number of outpatient consultations (6.41 vs 2.81).[160]

Nurse-led transitional care for patients with HF, according to scientific evidence, reduces all-cause readmissions by 9% and between 25-29% for HF, as well as a decrease in hospital stay by 13-14%.[112,161]

Interdisciplinary secondary CV prevention programs with the participation of these nurses have achieved an increase in adherence to European recommendations regarding the consumption of fruit and vegetables (98% vs 53%), consumption of oily fish (42% vs 19.5%), physical activity (31% vs 12.4%) and a reduction in BP (69% vs 47.1%), as well as LDL concentrations (86.1% vs 67.6%).[162]

Nurse-coordinated CR programs in patients undergoing CVS have shown an improvement in functional capacity (75%) and a decrease in mortality (50%). Furthermore, these programs in patients after PCI have achieved an increase in pharmacological adherence (16.1%), diet (61.3%), and physical activity (90.3%).[88,163]

A decrease in all-cause mortality (2.8% to 1.6%) has been observed in relation to discharge planning by the nurse.[164]

Regarding the home follow-up by the CV nurse, some data indicate a 3.9% reduction in readmissions at 30 days in patients undergoing valve surgery.[163]

A lower incidence of adverse events related to the role played by these nurses (8.93 % vs 56.6 %) was also observed using checklists in patients undergoing chronic coronary total occlusion interventions.[165]

Another relevant aspect is the association between nurse-coordinated care in secondary prevention and the reduction of systolic BP by 2.96 mmHg, LDL cholesterol by 0.23 mmol/L, and a 25% improvement in smoking cessation rates[166]. Additionally, there is a decrease in the annual rate of minor ischemic stroke in the nurse-led AF clinic (0.47%/year vs 3.88%),[167] fewer complications (2 vs 6), and a 57.3% reduction in costs of implantable loop recorder implantation led by suitably trained nurses.[168]

Finally, the telemonitoring carried out by these CIED nurses reduces the time to diagnosis (2 months), the response time in patients with ICD and CRT (22-36 days), decreases the number of hospital follow-up visits (55%), and hospital stays (50%). As a financial result, it reduces the cost per patient by 41%.[169]

Challenges of the cardiovascular health care nurse

12. Challenges of the cardiovascular health care nurse

The increasing prevalence of CVD and the increase in the survival rate have generated a greater demand for health care in this area and significantly increased health expenditure. This leads to a new model of CV health care and a change in the orientation of nursing practice, whose purpose is to respond to the needs of a society that will increasingly require a higher level of care.[19,170,171]

For all these reasons, the challenges faced by the Cardiovascular Health Care nurse are, among others:

- **Professional recognition**: Although it may seem obvious, we pose this as a first challenge, since the profile of the Cardiovascular Health Care Nurse must be recognised and regulated at the national level and implemented in all autonomous communities, to guarantee equity in the provision of quality care for the cardiovascular health of the population and so that these nurses can exercise the competencies described.
- **Continuing training**: The incessant progress in diagnostic and/or therapeutic technologies and innovative therapies in CVD requires training that is constantly updated, adapted to needs and care profiles to improve results in each of the areas of CV care.
- **Material resources**: The effort involved in the correct implementation of new technologies and diagnostic tools for these professionals is a challenge in itself, as it requires specific attention and resources that respond to the needs of a changing environment.
- **Individualised Education**: The Cardiovascular Health Care nurse faces the challenge of adapting health education to patients of all ages, adjusting the content according to the generational and cultural characteristics of each group, taking into account social determinants, including the most vulnerable groups.
- **Time and commitment to research**: The need to research and generate nursing evidence requires time and funding to advance in CV health care.
- **Staffing**: The appropriate ratio of nurses would guarantee lower rates of adverse events and better CV health outcomes.
- **Work-life balance**: Work-life balance, in a demanding work environment such as CV health care, would favour safe, quality care.

Acronyms and abbreviations

13

13. ACRONYMS AND ABBREVIATIONS

ACC: American College of Cardiology

ACNAP: Association of Cardiovascular Nursing & Allied Professions

ACS: Acute coronary syndrome

AF: Atrial Fibrillation

AHA: American Heart Association

ALS: Advanced Life Support

AMI: Acute myocardial infarction

BLS: Basic Life Support

BP: Blood Pressure

CGE: General Nursing Council

CHS: Cardiovascular Health Strategy

CIED: Cardiac Implantable Electronic Device

CMR: Cardiac Magnetic Resonance Imaging

COPD: Chronic Obstructive Pulmonary Disease

CPG: Clinical Practice Guidelines

CR: Cardiac Rehabilitation

CRT: Cardiac Resynchronisation Therapy

CT: Computed tomography

CV: Cardiovascular

CVD: Cardiovascular disease

CVR: Cardiovascular risk

CVRF: Cardiovascular Risk Factors

CVS: Cardiovascular Surgery

DM: Diabetes mellitus

ECG: Electrocardiogram

ECMO: Extracorporeal membrane oxygenation

ECV: Electrical Cardioversion

EPS: Electrophysiological study

ESC: European Society of Cardiology

FEC: Spanish Heart Foundation

GDP: Gross domestic product

HED: Health Education

HF: Heart failure

HR: Heart rate

HRQoL: Health-Related Quality of Life

HTN: High blood pressure

HTx: Heart transplant

IABP: Intra-aortic balloon pump

ICD: Implantable cardioverter defibrillator

IHD: Ischemic heart disease

INE: National Institute of Statistics

LVEF: Left ventricular ejection fraction

MDT: Multidisciplinary team

NHS: National Health System

NYHA: New York Heart Association

PAD: Peripheral Artery Disease

PC: Primary Care

PCI: Percutaneous Coronary Intervention

PM: Pacemaker

PREMs: Patient-Reported Experience Measures

PROMs: Patient-Reported Outcome Measures

SANC: Spanish Association of Nursing in Cardiology.

SEC: Spanish Society of Cardiology

TAVI: Transcatheter aortic valve implantation

TEE: Transoesophageal echocardiography

TTE: Transthoracic Echocardiography

VAD: Ventricular assist device

WHO: World Health Organization

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Annexes

16

16. ANNEXES

ANNEXE 1. CONTRIBUTIONS OF THE SANC TO THE DEVELOPMENT OF COMPETENCIES OF THE CV NURSE AND COLLABORATIONS WITH OTHER SCIENTIFIC SOCIETIES.

Training	
Accreditations	*Haemodynamics and Interventional Cardiology* *Heart failure* Electrophysiology/Cardiac Stimulation
CAMPUS AEEC	A wide range of courses that add value to nurses in all areas of cardiology through knowledge applicable to their daily practice
Annual Meetings	*https://www.reunionicsec.com/ INSUFICIENCIACARDIACA2024* *https://www.sogacar.com/reunion-anual-de-la-sociedad-gallega-de-cardiologia-santiago-de-compostela-31-mayo-y-1-de-junio-de-2024/* *https://www.reunionritmo.com/RITMO24* *https://secardiologia.es/agenda/2601-reunion-anual-asociacion-riesgo-vascular-y-rehabilitacion-cardiaca-2*
Congresses	*National Congress of Nursing in Cardiology* 1978-2018, and jointly with the Spanish Society of Cardiology (SEC), since 2019 *Congress of the Catalan Society of Cardiology* *Congress of the Association of Interventional Cardiology ACI-SEC* *Congress of Cardiovascular Diseases of the Andalusian Society of Cardiology* *Congress of the Castilian-Leonese Society of Cardiology (SOCALEC)* *Astur Galaico Congress of Cardiology*
MASTERS	*Four Editions of the Master's Degree in Nursing in Haemodynamics and Interventional Cardiology (MEHCI).* *Master in IHD*
WEBINAR	Since 2022, every month, on the most relevant topics in the clinical practice of cardiovascular nurses.
Website, since December 1999	*Training Resources for Nurses* *Cardiovascular Health Tab*

Research	
Journal "Nursing in Cardiology" (ISSN 1575-4146) was founded in 1994.	
CUIDEN citation ranking 2021	Rank 45 Quartile according to dispersion: q4 Ordinal quartile: Q4 CUIDEN Immediate impact RIC: 0.273 Immediacy index 0.045 Adjusted Value Impact Factor 0.231
H-index (scientific nursing journals according to Google Scholar Metrics [2014-2018])	Rank: 16 H Index: 4 Median H: 5
Dialnet Journal Index 2022 - Nursing (DJI)	C4 quartile 22nd Percentile Rank 28 Five-year impact 0.03
Scholarships	
1 grant to an annual research project, through the SEC 5 AEEC-Congress scholarships 6 Annual Congress communications awards 2 awards for magazine articles 2 grants for training activities for SNAC work groups and subsidiaries	

Publications	
MAREC Studio	Identifies nursing ratios by provinces and autonomous communities (ACs), evaluates the care provided to the population, and the level of autonomy of nurses in the most specific areas of cardiology.
Manuals	*Cardiovascular*, *CVR Prevention*, *CV Critical Care*, *HF Procedures*, *Prevention and CR*, *Nursing Procedures in Haemodynamics and Interventional Cardiology*, *Arrhythmias and Electrophysiology* and *Cardiac Pacing and Implantable Devices*.
Consensus documents	*Consensus document on the figure of the TAVI Nurse in the Haemodynamics Working Group of the Spanish Association of Nursing in Cardiology* *Stratification, monitoring, and control of CVR in cancer patients.* *SEC, FEC, SEOM, SEOR, SEHH, SEMG, AEEMT, AEEC, and AECC consensus document* Consensus Document on Peripheral Artery Disease

Collaboration	Ministry of Health, Consumer Affairs and Social Welfare: *CHS*. *Article "The nursing perspective of cardiology in health care in the 21st century" and development of the "CORE CURRICULUM" IN CARDIOLOGY NURSING* Health Technology Assessment Report: EFFECTIVENESS, SAFETY, AND COST-EFFECTIVENESS OF OUT-OF-HOSPITAL CARDIAC REHABILITATION IN ISCHEMIC HEART DISEASE OR HEART FAILURE (Ministry of Health, Evaluation Service of the Canary Islands Health Service; 2023). PENDING FINAL REPORT.

Institution	Activities
SEC	*Co-organisation of the annual congress of Cardiovascular Health* *Clinical Guidelines Working Group (ESC Guideline Commentaries)* *Master of Nursing in Haemodynamics and Interventional Cardiology* Spanish Journal of Cardiology REC: Interventional Cardiology REC: Cardioclinics SEC EXCELLENT
FEC	*Heart foundation 151 digital journal (fundaciondelcorazon.com)* Participation in National Congresses of the Spanish Heart Foundation Patient Platform. *FEC-422 program II patient congress (fundaciondelcorazon.com)* Participation in International Congresses *https://programadetodocorazon.plus/* CV Health Promotion Campaigns
Cardioalianza	Participation in National Congresses *IX Congress of patients with cardiovascular diseases - Cardio Alianza* *X Congress of patients with cardiovascular diseases Cardio Alianza* Preparation of consensus documents *cardioalianza-informe-andalucia.pdf* CV Health Promotion Campaigns
Other entities: patient associations, national and European coalitions for the development of CV health and prevention strategies	Adherence to the CNPT's MADRID 2023 DECLARATION Webinars and training activities with other patient associations at the local level Faro Project. Secondary prevention in atherosclerotic vascular disease (AVD) in Andalusia: Interdisciplinary position paper. faro.pdf (*sacardiologia.com*)

ACNAP	ACNAP *Congress* *Core curriculum for continuing education of nurses and allied professionals in a cardiovascular setting.* *Webinars, online courses* *Mentoring Program*: Facilitates the development of cardiovascular nurses and allied health care professionals who are involved in research and/or clinical practice. Publications: *European Journal of Cardiovascular Nursing* *Consensus and position papers* *Clinical Practice Guidelines*
ESC	Congresses: ESC Congress, ESC Acute Cardiovascular Care, EHRA, ESC Preventive Cardiology, Heart Failure, Euro-Echo Imaging, ICNC-CT, EuroPCR Course, PCR London Valves, etc. Professional development: certification exams, training scholarships, and scholarships. Interactive online and/or face-to-face educational programs Clinical Guidelines: Most up-to-date versions of Clinical Practice Guidelines and Documents Publications: European Heart Journal and 16 other publications covering cardiovascular medicine and research.
AHA American Heart Association American Stroke Association CPR & ECC Professional Heart Daily	Programmes targeting women and children, improving hospital care and bystander CPR, with many members, in many countries, to address the problem of noncommunicable diseases and help save more lives. AHA/ASA medical guidelines and scientific statements on various topics of CVD and cerebrovascular accident (CVA). 14 scientific journals published by the American Heart Association and the American Stroke Association
Maintenance of Certification	
Seminars, webinars, podcasts, etc.	

ANNEXE 2. NANDA-I DIAGNOSES WITH THEIR DEFINITION AND RELATED FACTORS

Development of NANDA-I diagnoses, definition, risk factors, objectives, and interventions in all labels that are considered primary in the work of the Cardiovascular Health Care Nurse.

In the diagnostic labels related to CVD with cross-sectional relation to other clinical processes, the definition, risk factors, and associated problems are developed, if relevant.

Domain 1. Health promotion: Awareness of the well-being or normality of the functions and strategies used to maintain control, promote well-being and normal functioning.

Class 1. Health awareness: Recognition of well-being and normal functioning.

Code	Diagnosis	Definition
00355	Excessive sedentary behaviours	Unsatisfactory activity pattern during waking hours that has low energy expenditure.
Related factors:		
Difficulty adapting areas for physical activity. Impaired physical mobility.		
Defining characteristics:		
The average daily physical activity is lower than recommended according to sex and age. Prolonged inactivity.		

Class 2. Health Management: Identification, control, implementation and integration of activities to maintain health and well-being.

Code	Diagnosis	Definition
00262	Readiness for enhanced health literacy	Pattern of obtaining, assessing, and applying basic health information and services necessary to make health decisions, which can be reinforced.
Defining characteristics:		
Willingness to improve the ability to read, write, speak, and interpret values related to daily health needs. Willingness to improve the surveillance of civil and/or governmental processes that impact public health. Willingness to improve health communication with health personnel. Willingness to improve knowledge of the usual health determinants that impact the social and physical environment. Willingness to improve personal health care decision-making. Willingness to improve social support. Willingness to improve understanding of health information in making health care choices. Willingness to obtain sufficient information to orient oneself in the health system.		
NOC:		
1603. Health-seeking behaviour		
1602. Health-promoting behaviour		
1703. Health beliefs: perceived resources		

NIC:

5510. Health education

5515. Health literacy enhancement

7400. Health system guidance

Code	Diagnosis	Definition
00353	Elder frailty syndrome	Dynamic state of unstable equilibrium includes the deterioration of functions and reserves in all physiological systems.

Related factors:

Anxiety. Confusion. Decreased energy. Muscle weakness. Exhaustion. Fear of falls. Impaired postural balance. Insufficient knowledge of modifiable factors. Inadequate social support. Malnutrition. Sedentary behaviours.

Defining characteristics:

Decreased activity tolerance (00298). Excessive fatigue burden (00477). Decreased feeding abilities (00328). Inadequate nutritional intake (00343). Impaired physical mobility (00085).

NOC:

3100. Self-management: acute illness

3102. Self-management: chronic disease

1847. Knowledge: chronic disease management

2006. Personal health status

0300. Self-care: activities of daily living (ADL)

1912. Falls

2801. Community risk control: chronic disease

0222. Gait

1006. Weight: body mass

1308. Adaptation to physical disability

0200. Ambulation

0400. Cardiac pump effectiveness

0401. Circulation status

1004. Nutritional status

0208. Mobility

0007. Fatigue level

0113. Physical aging

0202. Balance

1305. Psychosocial adjustment: life change

1633. Exercise participation

0005. Activity tolerance

NIC:

5230. Coping enhancement

5440. Support system enhancement

5330. Mood management

4040. Cardiac care

4044. Cardiac care: acute

4046. Cardiac care: rehabilitation

6486. Environmental management: safety

0180. Energy management

4254. Shock management: cardiac

4130. Fluid monitoring

1160. Nutritional monitoring

1800. Self-care assistance

5510. Health education

5602. Teaching: disease process

7320. Case management

6610. Risk identification

1100. Nutrition management

6490. Fall prevention

0200. Exercise promotion

Code	Diagnosis	Definition
00276	Ineffective health self-management	Unsatisfactory management of symptoms, treatment regimen, and lifestyle changes associated with living with a chronic illness.

Related factors:

Contradictory lifestyle preferences. Difficulty managing a complex therapeutic regimen. Difficulty making decisions. Inadequate knowledge about the treatment regimen. Lack of knowledge of the seriousness of the problem. Lack of knowledge of susceptibility to sequelae. Unrealistic expectation of treatment benefits.

Defining characteristics:

Exacerbation of signs of the condition. Exacerbation of symptoms of the condition. Dissatisfaction with the quality of life. Failure to include the therapeutic regimen in daily life. Failure to take action to reduce risk factors. Ineffective decisions in daily life to achieve health goals.

NOC:

1803. Knowledge: disease process

1813. Knowledge: treatment regime

1704. Health beliefs: perceived threat
1702. Health beliefs: perceived control
1606. Participation in health care decisions
NIC:
5510. Health education
5614. Teaching: prescribed Diet
5612. Teaching: prescribed exercise
5616. Teaching: prescribed medication
5520. Facilitating learning
7400. Health system guidance
5540. Enhancing learning readiness

Code	Diagnosis	Definition
00293	Readiness for enhanced health self-management	Pattern of satisfactory symptom management, treatment regimen, consequences, and lifestyle changes associated with living with a chronic disease, which can be reinforced
Defining characteristics:		
Willingness to improve daily life choices to achieve health goals. Willingness to improve decision-making. Willingness to improve the inclusion of the treatment regimen in daily life. Willingness to improve the management of risk factors. Willingness to improve the recognition of signs of disease. Willingness to improve the recognition of disease symptoms.		

Domain 2. Activities of ingesting, assimilating, and using nutrients in order to maintain and repair tissues and produce energy.

Class 5. Hydration: Uptake and absorption of fluids and electrolytes.

Code	Diagnosis	Definition
00492	Risk for imbalanced fluid volume	Susceptible to rapid shifts between intracellular and/or extracellular fluids, excluding blood.
Risk factors:		
Inadequate fluid intake. Excessive sodium intake. Inadequate knowledge about fluid needs. Ineffective medication management.		
Associated problems:		
Active fluid loss. Deviations that affect the absorption of liquids. Deviations that affect the elimination of liquids. Deviations that affect fluid intake. Deviations that affect vascular permeability. Pharmacological preparations.		
NOC:		
0603. Severe fluid overload		

1835. Knowledge: heart failure management

1902. Risk control

0400. Cardiac pump effectiveness

1008. Nutritional status: food and fluid intake

0504. Renal function

2303. Post-procedure recovery

2305. Surgical recovery: immediate postoperative

0601. Water balance

NIC:

6650. Surveillance

6610. Risk identification

2080. Fluid/electrolyte management

4054. Central venous access device management

4250. Shock management

2020. Electrolyte monitoring

4260. Shock prevention

4090. Arrhythmia management

2380. Medication management

4120. Fluid management

6680. Vital signs monitoring

Code	Diagnosis	Definition
00026	Excessive fluid volume	Excessive fluid retention.

Related factors:

Excessive fluid intake. Excessive sodium intake. Ineffective medication management. Deviations that affect the elimination of fluids. Pharmacological preparations.

Defining characteristics:

Altered blood pressure. Alteration of pulmonary arterial pressure. Alteration of the respiratory pattern. Oedema. Increased central venous pressure. Contributions greater than losses. Jugular engorgement. Oliguria. Pleural effusion. Positive hepatojugular reflex. Presence of heart sound S3. Pulmonary congestion. Weight gain in a short period of time.

NOC:

0503. Urinary elimination

0606. Electrolyte balance

0414. Cardiopulmonary status

0415. Respiratory status

1214. Agitation level

1211. Anxiety level

1006. Weight: body mass

2112. Hypertension severity

0802. Vital signs

3107. Self-management: hypertension

3106. Self-management: heart failure

1622. Compliance behaviour: prescribed diet

1837. Knowledge: hypertension management

1835. Knowledge: heart failure management

0400. Cardiac pump effectiveness

1008. Nutritional status: food and fluid intake

1009. Nutritional status: nutrient intake

0603. Severe fluid overload

NIC:

4170. Hypervolemia management

2020. Electrolyte monitoring

2080. Fluid/electrolyte management

6680. Vital signs monitoring

4090. Arrhythmia management

2380. Medication management

1100. Nutrition management

1260. Weight management

4120. Fluid management

4130. Fluid monitoring

Code	Diagnosis	Definition
00421	Inadequate fluid volume	Decreased intracellular and/or extracellular fluid, not including blood.

Related factors:

Difficulty obtaining fluids. Inadequate knowledge about fluid needs. Ineffective management of one's own medication. Inadequate fluid intake. Inadequate muscle mass. Malnutrition.

Defining characteristics:

Alteration of skin turgor. Decreased blood pressure. Decreased pulse pressure. Decreased pulse volume. Decreased urine output. Decreased venous filling. Dryness of mucous membranes. Skin dryness. Increased body temperature. Increased heart rate. Increased urine concentration. Thirst. Weakness.

NOC:

0503. Urinary elimination

1101. Tissue integrity: skin and mucous membranes

0407. Tissue perfusion: peripheral

1006. Weight: body mass

2112. Hypertension severity

0802. Vital signs

0601. Water balance

1008. Nutritional status: food and fluid intake

0602. Hydration

NIC:

4044. Cardiac care: acute

2020. Electrolyte monitoring

2080. Fluid/electrolyte management

6680. Vital signs monitoring

4090. Arrhythmia management

2380. Medication management

1100. Nutrition management

1260. Weight management

4120. Fluid management

4130. Fluid monitoring

Code	Diagnosis	Definition
00028	Risk for deficient fluid volume	Susceptible to experiencing a decrease in intracellular and/or extracellular fluid, not including blood.

Risk factors:

Difficulty obtaining fluids. Inadequate knowledge about fluid needs. Ineffective management of one's own medication. Inadequate fluid intake. Malnutrition.

Associated problems:

Active fluid loss. Deviations that affect the absorption of liquids. Deviations that affect fluid intake. Deviations that affect the elimination of liquids. Pharmacological preparations. Therapeutic regimen.

Code	Diagnosis	Definition
00491	Risk for impaired hydro-electrolyte balance	Susceptible to changes in serum electrolyte levels.

Risk factors:

Excessive fluid intake. Insufficient knowledge of modifiable factors. Inadequate fluid intake.

Associated problems:

Compromised regulatory mechanisms. Dysfunction of endocrine regulation. Renal dysfunction. Therapeutic regimen.

Domain 3. Elimination and exchange: Secretion and excretion of the body's waste products.

Domain 4. Activity/rest. Production, conservation, expenditure, or balancing of energy sources

Class 2. Activity/exercise: Movement of parts of the body (mobility), performing a task, or carrying out actions frequently (but not always) with resistance.

Code	Diagnosis	Definition
00298	Decreased activity tolerance	Insufficient stamina to complete required or desired activities of daily living.
Related factors:		
Muscle weakness. Fear of pain. Imbalance between oxygen supply and demand. Impaired physical mobility. Inadequate muscle mass. Malnutrition. Pain. Impaired physical mobility. Sedentary behaviours.		
Defining characteristics:		
Abnormal blood pressure in response to activity. Abnormal heart rate in response to activity. Anxiety when activity is required. Electrocardiographic alterations. Chest discomfort from exertion. Exertion dyspnoea. Fatigue. Weakness.		
NOC:		
1639. Self-direction of instrumental activities of daily living (IADL)		
0002. Energy conservation		
0001. Resistance		
0005. Activity tolerance		
NIC:		
0180. Energy management		
4310. Activity therapy		
0221. Exercise therapy - ambulation		

Code	Diagnosis	Definition
00299	Risk for decreased activity tolerance	Susceptible to experiencing insufficient endurance to complete the required activities of daily living.
Risk factors:		
Muscle weakness. Depressive symptoms. Imbalance between oxygen supply and demand. Impaired physical mobility. Inadequate muscle mass. Malnutrition. Pain. Sedentary behaviours		

Associated problems:
Neoplasms. Neurodegenerative diseases. Respiratory disorders. Traumatic brain injuries.
NOC:
0306. Self-care: instrumental activities of daily living (IADL)
0002. Energy conservation
0001. Resistance
0005. Activity tolerance
NIC:
0180. Energy management
4310. Activity therapy
0221.Exercise therapy: ambulation

Class 3. Energy balance: A state of dynamic harmony between the contribution and expenditure of resources.

Code	Diagnosis	Definition
00477	Excessive fatigue burden	Exaggerated and sustained feeling of exhaustion and decreased capacity for usual physical and mental work.
Related factors:		
Excessive anxiety. Increased physical exercise. Malnutrition. Pain. Loss of physical condition.		
Defining characteristics:		
Decreased aerobic capacity. Decreased walking speed. Difficulty maintaining regular physical activity. Difficulty maintaining usual routines. Inadequate physical endurance. Not feeling relief through the usual energy recovery strategies. Weariness. Increased physical symptoms. Increased rest requirements.		
NOC:		
0008. Fatigue: disruptive effects		
0007. Fatigue level		
0300. Self-care: activities of daily living (ADL)		
0306. Self-care: instrumental activities of daily living (IADL)		
1204. Mood equilibrium		
0313. Self-care status		
1633. Exercise participation		
0005. Activity tolerance		
3102. Self-management: chronic disease		
2013. Lifestyle balance		
1009. Nutritional status: nutrient intake		

2004. Physical fitness
0208. Mobility
2102. Pain level
NIC:
0200. Exercise promotion
1100. Nutrition management
5250. Decision-making support
5820. Anxiety reduction
2380. Medication management
4310. Activity therapy
6040. Relaxation therapy
5330. Mood management
0180. Energy management

Code	Diagnosis	Definition
00465	Impaired surgical recovery	Perioperative physiological or psychological alterations that prolong the recovery period to achieve and/or improve the preoperative functional health status.
Related factors:		
Impaired physical mobility. Increased blood glucose level. Malnutrition. Negative emotional response to the surgical outcome. Ineffective self-management of overweight. Persistent pain. Tobacco use.		
Defining characteristics:		
Improper appetite. Difficulty of movement. Excessive healing time. Physical discomfort. Fatigue. Interruption of the healing of the surgical area. Requires help with self-care.		
Associated problems:		
Inadequate functional capacity. Pharmacological preparations. Significant comorbidity.		

Class 4. Cardiovascular/pulmonary responses: Cardiovascular mechanisms that support activity/rest.

Code	Diagnosis	Definition
00032	Decreased breathing abilities	Difficulty maintaining adequate ventilation during inspiration and/or expiration.
Related factors:		
Anxiety. A body position that inhibits lung expansion. Excessive fatigue burden. Increased physical exercise. Ineffective self-management of overweight. Pain.		
Defining characteristics:		

Paradoxical abdominal breathing pattern. Alteration of chest movements. Alteration of tidal volume. Bradypnea. Cyanosis. Decreased expiratory pressure. Decreased inspiratory pressure. Decreased ventilation per minute. Decreased vital capacity. Hypercapnia. Hyperventilation. Hypoventilation. Hypoxemia. Hypoxia. Increased anteroposterior diameter of the chest. Nasal flaring. Orthopnoea. Pursed-lip breathing. Tachypnoea. Overuse of accessory respiratory muscles. Adopting the tripod posture.

Code	Diagnosis	Definition
00201	Risk for ineffective cerebral tissue perfusion	Susceptible to decreased blood circulation in the brain.

Risk factors:

Inadequate measures to address modifiable factors. Inadequate blood pressure management. Inadequate knowledge of the disease process. Tobacco use. Improper use of substances.

Associated problems:

Blood clotting disorders. Brain injuries. Cardiovascular diseases. Hypercholesterolemia. Intracranial aneurysm. Mechanical valve prosthesis. Pharmacological preparations. Sleep apnoea. Treatment regimen.

NOC:

3105. Self-management: dysrhythmia

3104. Self-management: coronary artery disease

3111. Self-management: peripheral arterial disease

3107. Self-management: hypertension

3106. Self-management: heart failure

3109. Self-management: lipid disorder

0409. Blood coagulation

1830. Knowledge: cardiac disease management

1837. Knowledge: hypertension management

1852. Knowledge: arrhythmia management

1849. Knowledge: coronary artery disease management

1860. Knowledge: peripheral artery disease management

1835. Knowledge: heart failure management

1858. Knowledge: lipid disorder management

1845. Knowledge: anticoagulant therapy management

1865. Knowledge: thrombus threat reduction

1902. Risk control

1931. Risk control: stroke

1932. Risk control: thrombus

1908. Risk detection

0400. Cardiac pump effectiveness

0401. Circulation status
2301. Medication response
2112. Hypertension severity
NIC:
4040. Cardiac care
4044. Cardiac care: acute
4104. Embolus care: peripheral
4106. Embolus care: pulmonary
5614. Teaching: prescribed diet
5616. Teaching: prescribed medication
5618. Teaching: procedure/treatment
5602. Teaching: disease process
6610. Risk identification
4270. Thrombolytic therapy management
4050. Cardiac risk management
4110. Embolus precautions
4150. Haemodynamic regulation
6650. Surveillance
4062. Circulatory care: arterial insufficiency
4066. Circulatory care: venous insufficiency
4095. Defibrillator management: external
4096. Defibrillator management: internal
4091. Pacemaker management: permanent
4092. Pacemaker management: temporary
6680. Vital signs monitoring
6490. Fall prevention

Code	**Diagnosis**	**Definition**
00204	Ineffective peripheral tissue perfusion	Decreased peripheral blood circulation in the extremities
Related factors:		
Excessive sodium intake. Inadequate knowledge of the disease process. Insufficient knowledge of modifiable factors. Sedentary behaviours. Tobacco use.		
Defining characteristics:		

Absence of peripheral pulses. Ankle–brachial index < 0.90. Capillary filling time > 3 seconds. Decreased blood pressure in the extremities. Reduction of the distances achieved without pain in the six-minute walk test. Decreased peripheral pulses. Delayed healing of peripheral wounds. Oedema. Pain in the extremities. Femoral murmur. Intermittent claudication.

NOC:

0200. Ambulation

1101. Tissue integrity: skin and mucous membranes

2102. Pain level

0422. Tissue perfusion

0416. Tissue perfusion: cellular

2115. Peripheral artery disease severity

0603. Severe fluid overload

0802. Vital signs

1619. Self-management: diabetes

3111. Self-management: peripheral arterial disease

3107. Self-management: hypertension

3109. Self-management: lipid disorder

0409. Blood coagulation

1625. Smoking cessation behaviour

1820. Knowledge: diabetes management

1837. Knowledge: hypertension management

1854. Knowledge: healthy diet

1860. Knowledge: peripheral artery disease management

1847. Knowledge: chronic disease management

1858. Knowledge: lipid disorder management

1803. Knowledge: disease process

0400. Cardiac pump effectiveness

0208. Mobility

1633. Exercise participation

2112. Hypertension severity

0401. Circulation status

0602. Hydration

0407. Tissue perfusion: peripheral

NIC:

2660. Management of impaired peripheral sensitivity

3590. Skin surveillance

4490. Smoking cessation assistance

4064. Circulatory care: mechanical assist device

4066. Circulatory care: venous insufficiency

6200. Emergency care

5602. Teaching: disease process

4170. Hypervolemia management

4180. Hypovolemia management

1100. Nutrition management

2080. Fluid/electrolyte management

4250. Shock management

4254. Shock management: cardiac

4256. Shock management: vasogenic

3480. Lower extremity monitoring

4130. Fluid monitoring

6680. Vital signs monitoring

1920. Acid-base monitoring

4210. Invasive haemodynamic monitoring

3320. Oxygen therapy

4070. Circulatory precautions

3540. Pressure ulcer prevention

6320. Resuscitation

4150. Haemodynamic regulation

2300. Medication administration

0200. Exercise promotion

2380. Medication management

4110. Embolus precautions

5510. Health education

4062. Circulatory care: arterial insufficiency

Code	Diagnosis	Definition
00228	Risk for ineffective peripheral tissue perfusion	Susceptible to decreased blood circulation in the extremities.
Risk factors:		
Excessive sodium intake. Inadequate knowledge of the disease process. Insufficient knowledge of modifiable factors. Sedentary behaviours. Tobacco use.		

Associated problems:

Cardiovascular diseases. Diabetes mellitus. Intravascular procedures. Therapeutic regimen.

Code	Diagnosis	Definition
00240	Risk for decreased cardiac output	Susceptible to experiencing insufficient blood volume, pumped by the heart, to meet metabolic demands in people with cardiovascular and/or pulmonary conditions and trauma.

Risk factors:

Inadequate management of arrhythmia treatment. Inadequate blood pressure management. Insufficient knowledge of modifiable factors. Inadequate management of one's own medication.

Associated problems:

Cardiovascular diseases. Cardiovascular surgery. General anaesthesia. Hypoxia. Increased metabolic rate. Oxygen therapy. Hydroelectrolyte imbalance.

NOC:

0005. Activity tolerance

3105. Self-management: dysrhythmia

3104. Self-management: coronary artery disease

3106. Self-management: heart failure

1849. Knowledge: coronary artery disease management

1835. Knowledge: heart failure management

0414. Cardiopulmonary status

0910. Neurological status: autonomic

0603. Severe fluid overload

0400. Cardiac pump effectiveness

0401. Circulation status

0404. Tissue perfusion: abdominal organs

0407. Tissue perfusion: peripheral

0802. Vital signs

NIC:

4050. Cardiac risk management

4090. Arrhythmia management

4170. Hypervolemia management

4180. Hypovolemia management

4120. Fluid management

4260. Shock prevention

4150. Haemodynamic regulation

4040. Cardiac care

4044. Cardiac care: acute

Code	Diagnosis	Definition
00362	Risk for imbalanced blood pressure	Susceptible to recurrent elevation or decrease of the force exerted by blood flow on the arterial wall, above or below the desired individual levels.

Risk factors:

Inadequate fluid volume. Inadequate treatment follow-up. Inadequate knowledge of risk factors. Inadequate self-management of orthostatism. Improper use of substances. Tobacco use.

Associated problems:

Cardiovascular diseases. Diabetes mellitus. Dyslipidaemias. Metabolic syndrome. Pharmacological preparations. Hydroelectrolyte imbalance.

NOC:

3105. Self-management: dysrhythmia

0202. Balance

0401. Circulation status

0008. Fatigue: disruptive effects

0007. Fatigue level

0405. Tissue perfusion: cardiac

0416. Tissue perfusion: cellular

0802. Vital signs

NIC:

4040. Cardiac care

4090. Arrhythmia management

4162. Hypertension management

4175. Hypotension management

4050. Cardiac risk management

6680. Vital signs monitoring

Code	Diagnosis	Definition
00291	Risk for thrombosis	Susceptible to obstruction of a blood vessel by a blood clot that can break off and lodge in another vessel.

Risk factors:

Atherogenic diet. Inadequate fluid volume. Excessive stress. Impaired physical mobility. Insufficient knowledge of modifiable factors. Ineffective management of prevention measures. Ineffective medication management. Ineffective self-management of overweight. Sedentary behaviours. Tobacco use.

Associated problems:

Cardiovascular diseases. Haematological diseases. Serious condition. Metabolic diseases. Surgical procedures.

NOC:

1865. Knowledge: thrombus threat reduction

1932. Risk control: thrombus

0602. Hydration

0407. Tissue perfusion: peripheral

0408. Tissue perfusion: pulmonary

NIC:

4104. Embolus care: peripheral

4106. Embolus care: pulmonary

3480. Lower extremity monitoring

4110. Embolus precautions

Code	Diagnosis	Definition
00311	Risk for Impaired Cardiovascular Function	Susceptible to changes in the normal process of substance transport, body homeostasis, elimination of tissue metabolic waste, and organ function.

Risk factors:

The average daily physical activity is lower than recommended according to sex and age. Excessive fat accumulation for age and sex. Excessive alcohol consumption. Excessive stress. Inadequate eating habits. Insufficient knowledge of modifiable factors. Ineffective blood glucose management. Inadequate blood pressure management. Ineffective lipid balance management. Tobacco use. Improper use of substances.

Associated problems:

Depressive disorder. Diabetes mellitus. Dyslipidaemias. Hypertension. Insulin resistance. Pharmacological preparations.

NOC:

1627. Weight loss behaviour

1811. Knowledge: prescribed activity

1837. Knowledge: hypertension management

1802. Knowledge: prescribed diet

1841. Knowledge: weight management

1858. Knowledge: lipid disorder management

1865. Knowledge: thrombus threat reduction

1937. Risk control: dehydration

1928. Risk control: hypertension

1941. Risk control: obesity
1929. Risk control: lipid disorder
1932. Risk control: thrombus
0400. Cardiac pump effectiveness
0401. Circulation status
1009. Nutritional status: nutrient intake
0804. Metabolic function
2300. Blood glucose level
1633. Exercise participation
0405. Tissue perfusion: cardiac
0416. Tissue perfusion: cellular
0404. Tissue perfusion: abdominal organs
0407. Tissue perfusion: peripheral
0408. Tissue perfusion: pulmonary
2112. Hypertension severity
0802. Vital signs
NOC:
6520. Health screening
5246. Nutritional counselling
4040. Cardiac care
4044. Cardiac care: acute
4104. Embolus care: peripheral
4106. Embolus care: pulmonary
5602. Teaching: disease process
0200. Exercise promotion
4090. Arrhythmia management
2120. Hyperglycaemia management
2125. Hyperlipidaemia management
4050. Cardiac risk management
4254. Shock management: cardiac
3480. Lower extremity monitoring
6680. Vital signs monitoring
4110. Embolus precautions

Class 5. Self-care: Ability to carry out activities to take care of one's own body and bodily functions.

Code	Diagnosis	Definition
00442	Readiness for enhanced self-care abilities	A pattern of independent performance of activities of daily living, which can be reinforced.
Defining characteristics:		
Willingness to improve competence in the bathroom. Willingness to improve competence in dressing. Willingness to improve food competence. Willingness to improve grooming skills. Willingness to improve toilet proficiency.		
NOC:		
3105. Self-management: dysrhythmia		
1619. Self-management: diabetes		
3104. Self-management: coronary artery disease		
3111. Self-management: peripheral arterial disease		
1617. Self-management: heart disease		
3108. Self-management: kidney disease		
3107. Self-management: hypertension		
3106. Self-management: heart failure		
3109. Self-management: lipid disorder		
3101. Self-management: anticoagulant therapy		
0300. Self-care: activities of daily living (ADL)		
0306. Self-care: instrumental activities of daily living (IADL)		
1613. Self-direction of care		
1614. Personal autonomy		
2002. Personal well-being		
1632. Compliance behaviour: prescribed activity		
1622. Compliance behaviour: prescribed diet		
1623. Compliance behaviour: prescribed medication		
1602. Health-promoting conduct		
1634. Personal health screening behaviour		
1900. Immunisation behaviour		
1914. Risk control: cardiovascular disease		
1928. Risk control: hypertension		
1929. Risk control: lipid disorder		
1932. Risk control: thrombus		
1606. Participation in health care decisions		

1600. Adherence behaviour
1603. Health-seeking behaviour
0313. Self-care status
NIC:
1805. Self-Care assistance: Instrumental Activities of Daily Living
5395. Self-Efficacy Enhancement
4470. Self-modification assistance
5330. Mood management
5606. Teaching: individual
5616. Teaching: prescribed medication
4480. Self-responsibility facilitation
0200. Exercise promotion
5520. Facilitating learning
0180. Energy management

Domain 5. Perception/cognition: A system for processing human information, including attention, orientation, sensation, perception, cognition, and communication

Class 4. Cognition: Use of memory, learning, thinking, problem solving, abstraction, judgment, introspection, intellectual ability, calculation, and language.

Code	Diagnosis	Definition
00184	Readiness for enhanced decision-making	A pattern of choices that impacts goals related to health, well-being, and quality of life, which can be reinforced.
Defining characteristics:		
Willingness to improve the congruence of the decision with the objective. Willingness to improve the risk-benefit analysis of decisions. Willingness to improve understanding of options. Willingness to improve the use of reliable evidence for decision-making.		
NOC:		
1308. Adaptation to physical disability		
1215. Self-awareness		
1600. Adherence behaviour		
1621. Adherence behaviour: healthy diet		
1603. Health-seeking behaviour		
1601. Compliance behaviour		
1632. Compliance behaviour: prescribed activity		

1622. Compliance behaviour: prescribed diet

1623. Compliance behaviour: prescribed medication

1908. Risk detection

2013. Lifestyle balance

1209. Motivation

1614. Personal autonomy

1606. Participation in health care decisions

0906. Decision making

NIC:

5395. Self-efficacy enhancement

5240. Counselling

4470. Self-modification assistance

4480. Self-responsibility facilitation

5230. Coping enhancement

5270. Emotional support

5510. Health education

5520. Facilitating learning

5250. Decision-making support

Code	Diagnosis	Definition
00435	Inadequate health literacy	Insufficient acquisition, processing, comprehension, and/or recall of information related to a specific topic that affects one's own well-being.

Related factors:

Anxiety. Difficulty managing complex health systems. Depressive symptoms. Inadequate involvement in learning. Inadequate information. Inadequate participation in care planning. Inadequate trust in the health care professional. Insufficient personal effectiveness. Disinformation.

Defining characteristics:

Inadequate adherence to instructions. Inadequate test performance. Incorrect statements about a topic. Inappropriate use of knowledge in daily decisions to achieve healthy behaviour.

NOC:

1804. Knowledge: energy conservation

1820. Knowledge: diabetes management

1830. Knowledge: cardiac disease management

1837. Knowledge: hypertension management

1802. Knowledge: prescribed diet

1855. Knowledge: healthy lifestyle

1815. Knowledge: sexual functioning

1852. Knowledge: arrhythmia management

1836. Knowledge: depression management

1849. Knowledge: coronary artery disease management

1860. Knowledge: peripheral artery disease management

1863. Knowledge: stroke management

1847. Knowledge: chronic disease management

1857. Knowledge: kidney disease management

1835. Knowledge: heart failure management

1843. Knowledge: pain management

1862. Knowledge: stress management

1841. Knowledge: weight management

1858. Knowledge: lipid disorder management

1845. Knowledge: anticoagulant therapy management

1828. Knowledge: fall prevention

1864. Knowledge: stroke threat reduction

1865. Knowledge: thrombus threat reduction

1621. Adherence behaviour: healthy diet

1603. Health-seeking behaviour

1601. Compliance behaviour

1632. Compliance behaviour: prescribed activity

1622. Compliance behaviour: prescribed diet

1623. Compliance behaviour: prescribed medication

1814. Knowledge: treatment procedure

1803. Knowledge: disease process

NIC:

5614. Teaching: prescribed diet

5612. Teaching: prescribed exercise

5616. Teaching: prescribed medication

5610. Education: preoperative

5618. Teaching: procedure/treatment

5624. Education: sexuality

6520. Health screening

5250. Decision-making support

5240. Counselling

5246. Nutritional counselling

4066. Circulatory care: venous insufficiency

7310. Admission care

5820. Anxiety reduction

5510. Health education

5604. Teaching: group

6610. Risk identification

0180. Energy management

4170. Hypervolemia management

1100. Nutrition management

1260. Weight management

4050. Cardiac risk management

4360. Behaviour modification

7400. Health system guidance

7370. Discharge planning

5540. Enhancing learning readiness

6490. Fall prevention

4500. Substance use prevention

5606. Teaching: individual

5602. Teaching: disease process

5520. Facilitating learning

Code	Diagnosis	Definition
00499	Readiness for enhanced health literacy	Pattern of acquisition, processing, comprehension, and recall of information related to a specific topic that affects one's own well-being, which can be reinforced.

Defining characteristics:

Willingness to improve precise instruction follow-up. Willingness to improve accurate statements on a topic. Willingness to improve appropriate behaviour. Willingness to improve learning.

NOC:

1865. Knowledge: thrombus threat reduction

1932. Risk control: thrombus

0602. Hydration

0407. Tissue perfusion: peripheral

0408. Tissue perfusion: pulmonary

NIC:

4104. Embolus care: peripheral

4106. Embolus care: pulmonary

3480. Lower extremity monitoring

4110. Embolus precautions

Domain 6. Self-Perception: Self-Concept

Domain 7. Role/Relationships: Negative and positive connections and associations between individuals or groups of people and the means by which such connections are demonstrated.

Domain 8. Sexuality: Sexual identity, sexual function, and reproduction.

Class 2. Sexual function: The ability or ability to engage in sexual activities.

Code	Diagnosis	Definition
00386	Impaired sexual function	Difficulty moving through the stages of the sexual response cycle, which is perceived as unsatisfactory
Related factors:		
Misinformation about sexual function. Inadequate knowledge about sexual function. Perception of vulnerability.		
Defining characteristics:		
Alteration in sexual arousal when desired. Alteration of sexual behaviours. Decreased libido. Perception of sexual limitation. Negative emotional reaction to sexual difficulties.		

Domain 9. Coping/Stress Tolerance: Coping with events/processes.

Class 2. Coping responses: Processes for managing environmental stress.

Code	Diagnosis	Definition
00405	Maladaptive coping	Counterproductive cognitive and/or behavioural efforts to handle a stressful or unpleasant situation.
Related factors:		
High degree of threat. Deterioration of resilience. Imprecision in the assessment of the threat. Inadequate confidence in one's ability to deal with the situation. Inadequate preparation for stressors. Feeling of inadequate control. Inadequate social support. Inappropriate use of emotion-focused strategies.		

Defining characteristics:

Cognitive Behavioural: Anxiety. Avoidance behaviours. Decreased social interaction. Frustration. Risk behaviour. Improper use of substances. Intake below needs.

Consequences: Alteration of affective responses. Difficulty meeting basic needs. Fatigue. Frequent illnesses. Inadequate problem solving.

Domain 10. Life principles: Principles that underlie the reactions, thoughts, and behaviours about acts, customs, or institutions contemplated as true or possessing an intrinsic value.

Domain 11. Safety/protection. Absence of danger, physical injury, or immune system disorder, avoidance of loss, and preservation of protection and safety.

Class 1. Infection: Host responses to infection by pathogenic germs.

Code	Diagnosis	Definition
00004	Risk for infection	Susceptible to invasion and multiplication of pathogenic organisms.

Risk factors:

Difficulty managing invasive devices in the long term. Difficulty managing wound care. Deterioration of skin integrity. Inadequate knowledge to avoid exposure to pathogens. Inadequate vaccination. Malnutrition. Ineffective self-management of overweight. Tobacco use. Retention of body fluids.

Associated problems:

Anaemia. Chronic disease. Immunosuppression. Invasive procedures. Suppression of the inflammatory response.

NOC:

0703. Severity of infection

3102. Self-management: chronic disease

1625. Smoking cessation behaviour

1900. Immunisation behaviour

1844. Knowledge: acute illness management

1847. Knowledge: chronic disease management

0204. Immobility consequences: physiological

1102. Wound healing: primary intention

1103. Wound healing: secondary intention

1004. Nutritional status

0410. Respiratory status: airway patency

1101. Tissue integrity: skin and mucous membranes

2304. Surgical recovery: convalescence

2305. Surgical recovery: immediate postoperative
2301. Medication response
1913. Physical injury severity
1924. Risk control: infectious process
0702. Immune status
NIC:
6545. Infection control: intraoperative
3660. Wound care
3662. Wound care: closed drainage
3440. Incision site care
2380. Medication management
1100. Nutrition management
3540. Pressure ulcer prevention
6650. Surveillance
4490. Smoking cessation assistance
1874. Tube care: gastrointestinal
1872. Tube care: chest
5602. Teaching: disease process
0200. Exercise promotion
2080. Fluid/electrolyte management
6680. Vital signs monitoring
6540. Infection control
6530. Immunisation/vaccination management
6550. Infection protection

Class 2. Physical Injury: Bodily injury or harm

Code	Diagnosis	Definition
00425	Risk for impaired peripheral neurovascular function	Susceptible to disruption in the circulation, sensation, and mobility of a limb.
Risk factors:		
Insufficient knowledge of modifiable factors. Lack of attention to peripheral neurovascular symptoms. Inadequate and prolonged position of the limbs. Prolonged pressure on peripheral blood vessels. Prolonged pressure on peripheral nerves.		
Associated problems:		
Immobilisation. Mechanical compression. Vascular obstruction		

NOC:

0917. Neurological status: peripheral

0409. Blood coagulation

0204. Immobility consequences: physiological

1902. Risk control

0416. Tissue perfusion: cellular

2304. Surgical recovery: convalescence

1913. Physical injury severity

0401. Circulation status

0407. Tissue perfusion: peripheral

NIC:

0840. Positioning

4062. Circulatory care: arterial insufficiency

4066. Circulatory care: venous insufficiency

4104. Embolus care: peripheral

6610. Risk identification

3480. Lower extremity monitoring

4070. Circulatory precautions

4110. Embolus precautions

6650. Surveillance

4040. Cardiac care

5612. Teaching: prescribed exercise

4120. Fluid management

6680. Vital signs monitoring

4010. Bleeding precautions

Code	Diagnosis	Definition
00205	Risk for shock	Susceptible to a problem that manifests itself by the lack of perfusion or oxygenation of the vital organs.

Risk factors:

Excessive bleeding. Factors identified using a standardised and validated rating scale. Hyperthermia. Hypothermia. Hypoxaemia. Hypoxia. Inadequate knowledge of modifiable factors. Ineffective management of one's own medication. Inadequate fluid volume. Non-haemorrhagic fluid loss. Unstable blood pressure.

Associated problems:

Artificial respiration. Diabetes mellitus. Embolism. Heart disease. Infections. Medical devices. Surgical procedures.

NOC:

0418. Shock severity: cardiogenic

0419. Shock severity: hypovolemic

0421. Shock severity: septic

1902. Risk control

1924. Risk control: infectious process

0401. Circulation status

2305. Surgical recovery: immediate postoperative

2114. Hypotension severity

0413. Blood loss severity

0802. Vital signs

0400. Cardiac pump effectiveness

0601. Water balance

0416. Tissue perfusion: cellular

0703. Infection severity

NIC:

4180. Hypovolemia management

4130. Fluid monitoring

4010. Bleeding precautions

4140. Fluid replacement

6650. Surveillance

4062. Circulatory care: arterial insufficiency

4066. Circulatory care: venous insufficiency

4106. Embolus care: pulmonary

4054. Central venous access device management

3350. Respiratory monitoring

6540. Infection control

4040. Cardiac care

5602. Teaching: disease process

6610. Risk identification

2380. Medication management

4120. Fluid management

6680. Vital signs monitoring

3320. Oxygen therapy

4260. Shock prevention

Code	Diagnosis	Definition
00374	Risk for excessive bleeding	Susceptible to significant blood loss

Risk factors:

Inadequate adherence to anti-haemorrhagic precautions. Inadequate knowledge of bleeding management strategies. Ineffective management of one's own medication.

Associated problems:

Aneurysm. Disseminated intravascular coagulation. Essential coagulopathy. Pharmacological preparations.

NOC:

3101. Self-management: anticoagulant therapy

1623. Compliance behaviour: prescribed medication

1845. Knowledge: anticoagulant therapy management

1808. Knowledge: medication

1828. Knowledge: fall prevention

1813. Knowledge: treatment regime

1908. Risk detection

2304. Surgical recovery: convalescence

2305. Surgical recovery: immediate postoperative

2301. Medication response

0409. Blood coagulation

0401. Circulation status

0413. Blood loss severity

0802. Vital signs

NIC:

4028. Bleeding reduction: wound

5618. Teaching: procedure/treatment

2380. Medication management

4270. Thrombolytic therapy management

3440. Incision site care

4054. Central venous access device management

6680. Vital signs monitoring

2620. Neurological monitoring

3320. Oxygen therapy

4010. Bleeding precautions

4260. Shock prevention

6650. Surveillance

ANNEXE 3. TYPES OF THERAPY WITH THE INTERVENTION OF THE CARDIOVASCULAR NURSE.

Coronary heart disease	Percutaneous endovascular procedures: primary, salvage, and elective PCI. Pulmonary intervention for endovascular thrombectomy. Implantation of percutaneous acute ventricular assist devices (IMPELLA®, ECMO, IABP) and VADs. Coronary revascularisation surgery (conventional, minimally invasive, robotic, hybrid, etc.), with and without extracorporeal circulation.
Valvular disease	Percutaneous endovascular procedures: TAVI, percutaneous mitral, tricuspid, and pulmonary valve implantation, vena cava valve implants for advanced tricuspid regurgitation, percutaneous mitral/tricuspid clip-on repair, aortic and mitral valvuloplasty. Surgery: valve repair or replacement.
Heart failure	Implantation of devices: PM, ICD, CRT, baroreceptor activation therapy devices (Barostim), and cardiac contractility modulation. Implantation devices in the coronary sinus. Surgery: short-term ventricular assists, VADs and/or HTx.
Congenital and non-valvular pathology	Percutaneous endovascular procedures/surgery: Atrial septal defect, ventricular septal defect, atrial appendage closure, coarctation of the aorta and/or ductus arteriosus.
Familial heart disease	Percutaneous endovascular procedures/surgery: Left sympathectomy, arrhythmia ablation, septal myectomy, alcohol septal ablation, PM implantation, CRT, VAD, and HTx.
Arrhythmias	Cardiopulmonary resuscitation, ECV and defibrillation, EPS, ablation (radiofrequency/cryoballoon), PM/ICD/CRT, and insertable Holter.
Aorta pathology	Thoracic and abdominal aortic endovascular intervention. Surgery of the aorta (aortic arch, aortic root, etc.). Surgical and/or endovascular treatment of aneurysm and aortic dissection.
PAD	Infrarenal revascularisation surgery [conventional (femoropopliteal bypass), hybrid, endarterectomy, endovascular interventionism (single/drug-coated balloon angioplasty, metal/drug-eluting stent, and atherectomy)]. Aortoiliac bypass surgery (aortofemoral, aortoiliac, iliofemoral).

ANNEXE 4. OTHER NATIONAL AND INTERNATIONAL CHALLENGES FOR THE CARDIOVASCULAR HEALTH CARE NURSE.

Other national and international challenges for the Cardiovascular Health Care Nurse	
National Dimension	
"GOAL 2025: HEART FAILURE. URGENT NEEDS AND GUARANTEES IN THE FACE OF A HEALTH PROBLEM OF THE FIRST ORDER IN SPAIN".	Available *here*
NHS Cardiovascular Health Strategy (ESCAV), with the aim of improving the level of cardiovascular health of the Spanish population.	Available *here*
Cardiogenic Shock Code 2023. Expert document for a multidisciplinary organisation that allows quality care.[172]	Available *here*
Code Infarction Networks for the Care of ST-Elevation Acute Myocardial Infarction (STEMI).[173]	Available *here*
SEA 2022 Standards for Global Cardiovascular Risk Control	Available *here*
Cardiovascular Disease Acceleration Plan (CARDIOALIANZA)	Available *here*
The National CPR Plan (NCPRP), an initiative of the Spanish Society of Intensive and Critical Medicine and Coronary Units (SEMICYUC) for the implementation and dissemination of knowledge, techniques, and teaching methods of the different Life Support techniques.[174]	Available *here*
International dimension	
Global Strategy on Diet, Physical Activity, and Health (2004)	Available *here*
Plan to accelerate support to Member States in the implementation of recommendations for the prevention and management of obesity throughout life.	Available *here*