The Cardiac Society of Australia and New Zealand

Consensus Statement of Standards for Interventional Cardiovascular Nursing Practice

These standards were developed by Mr Kevin White, Ms Sandi Graham, Ms Kathryn Hines, Ms Bernadette Hoffmann, Ms Heather Macfarlane, Ms Helene Sirvas-Brown and Dr John Xavier Rolley on behalf of the CSANZ Interventional Nurses' Council Writing Committee.

These standards were reviewed and endorsed by the CSANZ Interventional Nurses' Council, Interventional Council, Heart Rhythm Council and Quality Standards Committee, and ratified by the CSANZ Board on Friday, 14th July 2017.

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ABBREVIATIONS

ACS	Acute Coronary Syndrome
ACLS	Advanced Cardiac Life Support
CCL	Cardiovascular Catheterisation Laboratory
CSANZ	Cardiac Society of Australia and New Zealand
EN	Enrolled Nurse
IAB	Intra-Aortic Balloon
IC	Interventional Cardiology
ICN	Interventional Cardiovascular Nurse
INC	Interventional Nurses' Council of the Cardiac Society of Australia and New Zealand
PPCI	Primary Percutaneous Coronary Intervention
RN	Registered Nurse
STEMI	ST-Elevation Myocardial Infarction

DOCUMENT HISTORY OF THE COMPETENCY STANDARDS FOR INTERVENTIONAL CARDIOVASCULAR NURSING PRACTICE

The recent acknowledgement of interventional cardiovascular nursing as a critical care nursing discipline and the lack of specific standards related to interventional cardiac nursing in Australia and New Zealand, led to the Interventional Nurses Council (INC) being inundated with requests for guidance, around the skills and knowledge interventional cardiac nurses needed to demonstrate to be competent practitioners, focused on maintaining patient safety for those individuals undergoing interventional cardiovascular procedures.

A previous working party and consensus conference was established to develop a definition and scope of practice for interventional cardiac nursing. From this consensus conference the need to establish competency standards and develop the minimum skills and knowledge required to maintain patient safety and optimise patient outcomes was identified. In 2013 on the completion of the definition and scope of practice for interventional cardiovascular nursing, the INC executive committee established a working party from the expert nurses who contributed to the development and refinement of the definition and scope of practice for interventional cardiovascular nurses. The working party were chosen by the INC executive committee based on their expertise in interventional cardiovascular nursing and also extensive experience in the provision of education and mentoring of interventional cardiovascular nurses in the clinical and postgraduate environment. The working party consisted of seven representatives from both Australia and New Zealand, and was charged with the development of the standards for practice, ensuring they were in line with the appropriate national nursing competencies, and quality and safety documents.

As the seven members of the group were spread across Australia and New Zealand. They began meeting in April 2013 via teleconference with two face to face meetings in Melbourne, Australia one in August 2013 and one in March 2014. Version 1 of the INC standards for interventional cardiovascular nursing practice (hereafter referred to as the Standards) were completed in March 2015 and endorsed by the Interventional Nurses Council at the AGM held at ANZET that year, in August 2015.

On the 1st June 2016 the Australian Nursing and Midwifery Council updated its competency standards for the registered nurse. The working party were asked to review and update the standards to reflect these changes and ensure the document continues to align with the competency standards for the registered nurse for both Australia and New Zealand. This review process was completed and the working party finalised the standards document on the 26th April 2017.

CHANGES TO THIS VERSION OF THE DOCUMENT

The following updates were made to version two of the Consensus Statement of Standards for Interventional Cardiovascular Nursing Practice:

- A background section was added to the document to better rationalise factors influencing the complexity of Interventional Cardiovascular Nursing in Australia and New Zealand.

- A section was added describing the role of the Interventional Cardiovascular Nurse in Australia and New Zealand, to better rationalise significance of Interventional Cardiovascular Nursing to contemporary cardiac care.

- The section of competency standards for Interventional Cardiovascular Nursing practice was amended to ensure it aligned with the 2016 Australian Nursing and Midwifery Council competency standards for the registered nurse and the New Zealand competency standards for the registered nurse

- A section was added demonstrating how the standards could be utilised by hospital managers, administrators, nurse unit managers and Interventional Cardiovascular Nursing educators to develop a professional development framework guiding interventional cardiovascular nurse training and education at a clinical level.

Given Interventional Cardiovascular nursing is a highly technological area and is rapidly evolving as a critical care nursing discipline. It is anticipated that this standards document will be reviewed in 5 years to ensure it remains applicable to contemporary Interventional Cardiovascular Nursing practice in Australia and New Zealand.

CONFLICTS OF INTEREST

No conflicts of interest were declared by any of the working party involved in the review and development of the standards. Industry support was received in the form of unrestricted education grants from:

- Abbott
- Medtronic
- Boston Scientific.

These grants were utilised to aid participants with travel for the face to face meetings and at no time did these companies seek to influence the working party or its outcomes in any way.

HOW TO USE THIS DOCUMENT

The document is intended to be used by government and hospital administrators, cardiac catheterisation laboratory managers, nurse managers and university and clinical educators. The document should be considered in setting policy, guidelines and procedures pertaining to the competence and education of Interventional Cardiovascular Nurses.

ACKNOWLEDGEMENTS

The standards and competencies outlined in this document have been the work of several individuals over several years. The committee would like to acknowledge the many efforts involved in developing the educational standards and competencies outlined in this document. These individuals include:

- Mr Kevin White
- Ms Bernadette Hoffmann
- Ms Heather Macfarlane
- Ms Helene Sirvas-Brown
- Ms Kathryn Hines
- Dr John Rolley

Furthermore, industry support has played a significant role in funding various meetings to assist the work of the committee through the provision of unrestricted education grants. The companies include:

- Abbott
- Medtronic, and
- Boston Scientific.

The committee would like to thank these companies for their very generous support.

BACKGROUND

Cardiac catheterisation laboratories have seen a significant increase in patient acuity and procedural complexity over the last 10 years in Australia and New Zealand. This increase in complexity is in line with the trends seen within the interventional cardiac community in Europe, United States and Asia. The significant increase in patient and procedural complexity in Australia and New Zealand, has occurred due to developments on three fronts. First the rise in an ageing patient population and subsequent rise in multiple co-morbidities such as type 2 diabetes and renal impairment (Lalor et al 2014, Lee-Koo et al 2014). Secondly the development and availability of technology and new percutaneous treatment options for previously inoperable coronary and structural heart disease, allowing treatment for patients considered too sick for conventional surgery (Feldman & Leon 2007). Thirdly contemporary management of patients experiencing ST segment elevation myocardial infarction (STEMI) has identified urgent percutaneous coronary intervention (PCI) as a key strategy in reducing mortality and morbidity (DeLuca et al 2004). Subsequently systems have been developed expediting those patients experiencing STEMI to be treated in the cardiovascular catheter laboratory (CCL) (Hutchison et al 2009), increasing the number of patients presenting to the cardiovascular catheterisation laboratory who are procedurally complex and at significant risk of clinical deterioration.

NURSING CARE IN THE CARDIOVASCULAR CATHETERISATION LABORATORY

Interventional Cardiovascular Nurses provide care for patients from elective admissions to critically ill patients requiring percutaneous treatment of cardiac diseases. These patients are cared for through the peri-procedural process of a wide range of complex interventions split into three broad categories of coronary artery disease, cardiac rhythm management and structural heart disease. Below is a comprehensive, but not exhaustive, list of these procedures currently performed in cardiac catheter laboratories (CCL) around Australia and New Zealand.

CORONARY ARTERY DISEASE:

- Angiography
- Percutaneous Coronary Intervention (PCI) including primary and rescue PCI
- Rotablation
- Advanced Coronary Imaging (Intravascular Ultrasound, Optical Coherence Tomography)
- Fractional Flow Reserve
- PCI of Chronic Total Occlusions
- Percutaneous Transluminal Septal Myocardial Ablation (PTSMA)
- Embolisation

CARDIAC RHYTHM MANAGEMENT:

- Loop recorders

- Direct Current Reversion (DCR)
- Pacemaker
- Implantable cardiac defibrillator (ICD)
- Biventricular defibrillator
- Electrophysiology studies and ablation for supraventricular and ventricular tachycardia's
- Electrophysiology mapping systems
- Pulmonary Vein Isolation
- AV node ablation

STRUCTURAL HEART DISEASE:

- Balloon Valvuloplasty – Aortic, Mitral and Pulmonary
- Transcatheter Aortic Valve Replacement (TAVR)
- Transcatheter Mitral Valve Replacement (TMVR)
- Mitral Clipping and Cinching
- Atrial and ventricular septal defect closure
- Closure of patent ductus arteriosis (PDA)
- Left atrial appendix occlusion

Patients presenting to the CCL are very prone to clinical deterioration as a consequence of the underlying pathophysiology of their illness and the risks associated with performing such technically complex procedures. Patients presenting to the CCL as critically ill are usually those experiencing progression of an acute coronary syndrome. This is most commonly seen in patients with an acute myocardial infarction (AMI) and typically follows the trajectory of Hollenberg's paradigm of cardiogenic shock (Hollenberg et al 1999). Cardiogenic shock remains the leading cause of death in patients presenting to hospital with an AMI, and carries a mortality rate of approximately 50% (Hochman et al 2006). Clinical complications during interventional cardiac procedures can also occur as a direct or indirect result of mechanical injury to heart structures or vascular structures, and carries a significant increase in mortality to patients. Clinical deterioration can also be associated with unwanted side effects of the drugs used during the procedure such as anaphylaxis or hypotension. A summary of peri-procedural complications by cause is shown in Table 1.

TABLE 1: POTENTIAL ADVERSE EVENTS CAUSING CLINICAL DETERIORATION IN INTERVENTIONAL CARDIAC PATIENTS

Adverse events associated with natural progression of unstable acute coronary syndromes and structural heart disease	**Adverse events directly associated with performance of interventional cardiac procedures**
Ventricular pump dysfunction and failure	Bleeding: access site / non-access site
Ventricular rupture	Coronary artery dissection
Papillary muscle rupture	Embolic stroke
Arrhythmia	Acute thrombosis / acute stent thrombosis
Myocarditis and Pericarditis	Distal embolisation of coronary thrombus
	Anaphylaxis
	Cardiac Tamponade
	Aortic dissection
	Aortic rupture
	Coronary artery rupture
	Access vessel dissection and/or rupture
	Lost or trapped equipment in the body

Interventional cardiac nurses are responsible for a range of highly complex clinical tasks in the CCL. Due to the potentially high mortality rate associated with complications and the critically ill nature of the patients presenting to the CCL, nurses must be trained to a very high standard both in the technical skill and dexterity of performing the procedures, but also in the critical thinking and hypothetico-deductive reasoning required to anticipate potential complications before they happen. They are required to provide interventions and correctly prepare equipment to support the treating medical team, thus improving patient safety. Interventional cardiac nurses fulfil a myriad of key roles in the provision of patient care and maintenance of patient safety:

PRE-PROCEDURAL:

- The pre-procedural assessment and preparation of patients for all lab procedures and the identification of factors that increase procedural patient risk.
- The collaborative management of identified patient risks to maintain patient safety and minimise the risk of adverse events and poor patient outcomes.

INTRA-PROCEDURAL

- Holds primary responsibility for monitoring patient vital signs and the recognition and response to any clinical deterioration occurring during the peri-procedural

period, as the treating cardiologist is focused on the technical execution of the procedure.

- The performance of the 2nd operator role alongside the interventional cardiologist assisting with the technical execution of all procedures.
- The preparation and operation of all equipment and consumables used for each procedure carried out in the CCL. This includes the setup, operation and interpretation of advanced imaging technologies such as; intravascular ultrasound (IVUS), intravascular optical coherence tomography (OCT) and the setup and operation of advanced devices for de-bulking calcium from coronary arteries i.e. rotablator. Interventional cardiovascular nurses are also responsible for the preparation of coronary stents / scaffolds, percutaneous valves and delivery systems prior to implantation along with many other devices currently utilised.
- The performance of the circulating nursing role including the medical management of the deteriorating patient. This includes the administration of vasoactive, inotropic and chronotropic medications and infusions, antiplatelet infusions and glycoprotein IIb/IIIa inhibitors.
- The administration of sedation to relieve patient discomfort and pain, and ongoing monitoring to ensure airway patency and maintenance of protective reflexes (Thomas et al 2015).
- Providing support to anaesthetists when both elective and emergency intubation are required in lieu of a specialist postgraduate trained perioperative nurse or anaesthetic nurse.

POST-PROCEDURAL

- The post-procedural management and recovery of cases performed in the cardiac catheter laboratory including:
    - Vascular Access site management both with vessel closure devices and access sheath removal
    - Management of recovery from intra-procedural sedation (Thomas et al 2015).
    - Cardiac and haemodynamic monitoring (invasive and non – invasive)
    - Post-procedural pain management
    - Management of potential post-procedural complications, most commonly:
        - access site bleeding
        - non-access site bleeding
        - vasovagal syncope,
        - arrhythmias
        - hypotension
        - hypertension

- Patient education on the following:
    - The action, dosage and potential side effects of their discharge medications

- Safety considerations related to access site punctures and procedural outcomes i.e. driving returning to work, steps to take if symptoms return etc.
- Cardiac risk factor management to optimise quality of life and minimise the progression of the disease processes

Note: This list is not exhaustive and is expected to change with the development of new technologies and new nursing roles as interventional cardiac nursing continues to develop and refine itself as a critical care discipline.

AUSTRALIA AND NEW ZEALAND HEALTHCARE QUALITY AND SAFETY DOCUMENTS INFORMING THE DEVELOPMENT OF THE STANDARDS

The standards are informed by the following key Australia and New Zealand healthcare quality and safety organisations/documents:

AUSTRALIA:

1. National Quality and Safety Healthcare Standards
2. ANMC Competency statements

NEW ZEALAND:

1. Aoteoroa/New Zealand Health Quality and Safety Commission
2. Nursing Council of New Zealand – Standards and guidelines for nurses
3. Te Tiriti / Treaty of Waitangi

Under the Health Practitioners Competence Assurance Act 2003, the Nursing Council of New Zealand ('the Council') governs the practice of nurses by setting and monitoring standards and competencies for registration, which ensures safe and competent care for the public of New Zealand.

Cultural safety, the Treaty of Waitangi and Maori health are aspects of nursing practice that are reflected in the Council's standards and competencies. Standards for the registration of nurses in all scopes of practice require the content of theory and practice related experience in nursing programmes to include cultural safety, the Treaty of Waitangi and Maori health. Competencies outlined in the scopes of practice for nurses require the nurse to practise nursing in a manner that the health consumer determines as being culturally safe, and to demonstrate ability to apply the principles of the Treaty of Waitangi/Te Tiriti O Waitangi to nursing practice. These standards and competencies describe the requirements for cultural competence set by the Council under section 118(i) of the Act. In addition to this, the Nursing Council's Code of Conduct for Nurses also requires nurses to practice in a culturally safe manner, and practise in compliance with the Treaty of Waitangi.

MINIMUM THEORETICAL KNOWLEDGE AND SKILL

PURPOSE, AIMS AND OBJECTIVES

PURPOSE

To improve patient outcomes through clear delineation of competency standards for Interventional Cardiovascular Nurses (ICNs) across Australia and New Zealand. The standards will assist with ensuring the safety and quality of care for patients undergoing interventional cardiovascular procedures for acute coronary syndromes.

AIMS

To support the professional development of Interventional Cardiovascular Nurses in Australia and New Zealand.

OBJECTIVES

The purpose of the standards is to:

- Support the provision of high quality and safe patient care through a structured framework, designed to achieve consistency in the professional development of interventional cardiac nurses, working within Australia and New Zealand.
- Outline the minimum levels of knowledge and skill required of interventional cardiac nurses in Australia and New Zealand, matched to a proposed taxonomy of service delivery in CCL's;
- Outline the minimum knowledge and skill levels of Registered Nurses (RNs) working within the CCL setting;
- Support CCL managers, hospital and government policy makers in developing policies and procedures that support the ongoing professional development of ICNs; and
- Support the development of educational opportunities for ICNs.

TAXONOMY OF SERVICE DELIVERY

A proposed Taxonomy of Service Delivery (Taxonomy) was developed to assist CCLs and CCL managers with identifying their service provision, for the following purposes:

- Aid managers in identifying the established skill set of interventional cardiovascular nurses for recruitment purposes;
- To outline the key areas for orientation of new or transferring staff to the CCL;
- Assist with mapping competencies;
- Provide a framework to identify CCL levels of service delivery
- To share ideas and collegial support

Taxonomy Level	Services Provided
Level One	• Diagnostic procedures • No on-call service • No Primary PCI services • Selective invasive radiology services • Basic Cardiac Rhythm Management • Access to Cardiac Nurse Educator
Level Two	• Diagnostic procedures • PCI procedures • After-hours service • Selective invasive radiology services • Cardiac Rhythm Management • Electrophysiology • Primary PCI within standard operational hours • Participation in research and clinical trials • Access to Interventional Cardiovascular or Cardiac Nurse Educator
Level Three	• Diagnostic procedures • PCI procedures • Primary & Rescue PCI procedures • After-hours on-call service • Cardiac Rhythm Management • Electrophysiology • Vascular/endovascular procedures • Renal denervation procedures • Structural heart procedures • Device/pharmaceutical clinical trials centre • Dedicated Interventional Cardiovascular Nurse Educator

PLEASE NOTE: THE TAXONOMY HAS NOT BEEN DEVELOPED FOR ACCREDITATION PURPOSES.

These are the minimum requirements that must be met at each level of service provision. Each level may use additional modules, from higher levels, to provide the Minimum Theoretical Knowledge and Skill required for the provision of services above the stated level:

- Level 1 provides the foundational knowledge and skills required for all practitioners. It is the minimum requirement for Novice Practitioners.
- Level 2 builds on the foundations of level one, providing additional modules for the delivery of more advanced services & allows the fluid transfer of knowledge.
- Level 3 builds upon both level 1 and 2 and represents the highest level of service delivery.

Theoretical knowledge and clinical skills are offered to provide the RN with knowledge to assess, plan, provide, manage, document and critically analyse the care of the patients and family within the CCL environment.

LEVEL 1
foundation knowledge
Cardiac anatomy & physiology
Acute Coronary Syndromes & atherogenisis
Arrhythmia interpretation
Haemodynamic monitoring
Vascular access & complications
Temporary trans-venous pacing
Intra-aortic Balloon Pump (IABP)
Medical emergencies in the CCL
Advanced Life Support (ALS) • ARC ALS 2 • NZ RC6
• Aseptic technique
Diagnostic Procedures • Left heart catheterisation • Right heart catheterisation • Procedural complications • Procedural techniques • Procedural roles & responsibility • Indications, contraindications, co-morbidities, high risk patients • Radiographic images
Cardiac Rhythm Management (CRM) • Conduction abnormalities • Device implant procedures • Procedural complications • Procedural roles & responsibilities • Surgical count procedure
Radiology procedures • Procedural complications • Procedural techniques & roles • Specialised equipment • Indications, contraindications, co-morbidities, high risk patients
Sedation • Medications • Monitoring • Airway management • Over-sedation intervention • Recovery
Care of the patient pre, peri & post procedure for <u>all</u> procedures performed
Medications & contrast media
OHSW & IM
Radiation safety

LEVEL 2
level 1 modules of theoretical knowledge & skill must be completed, plus the following modules related to service provision
Percutaneous Coronary Intervention • Atherogenisis & lesion assessment • Balloon angioplasty • Coronary stenting • Complex procedures – grafts, bifurcations, CTO, LM • Procedural techniques • Procedural complications • Procedural equipment • Procedural roles & responsibilities • Medications • Indications, contraindications, co-morbidities, high risk patients
STEMI • Primary PCI • Rescue/salvage PCI & thrombolysis • Out of Hospital Cardiac Arrest (OOHCA) • Management of the deteriorating patient & medical emergencies in CCL • Procedural complications • Procedural roles & responsibilities • Medications • On call team & 24hr service provision
Electrophysiology (EP) • Conduction abnormalities EP diagnostic: • Procedural requirements & techniques • Procedural complications • Specialised equipment • Procedural roles & responsibilities
EP Ablation: • Procedural requirements & techniques • Procedural complications • Specialised equipment • Procedural roles & responsibilities
EP Pulmonary Vein Isolation (PVI) • Procedural requirements & techniques • Procedural Complications • Specialised Equipment • Procedural Roles & responsibilities
Care of the patient pre, peri & post procedure for <u>all</u> procedures performed

LEVEL 3
level 1 & 2 modules of theoretical knowledge & skill* must be completed*, plus the following modules related to service provision
Advanced diagnostic procedures • Procedural requirements & techniques • Procedural complications • Specialised equipment • Procedural roles & responsibilities • Medications
Advanced revascularisation techniques • Procedural requirements & techniques • Procedural complications • Specialised equipment • Procedural roles & responsibilities
Structural heart procedures Structural heart anomalies • Procedural requirements & techniques • Procedural complications • Specialised equipment • Procedural roles & responsibilities
Renal denervation Renal anatomy & physiology SNS & PSNS Mechanisms of hypertension • Procedural requirements & techniques • Procedural complications • Specialised equipment • Procedural roles & responsibilities
Care of the patient pre, peri & post procedure for <u>all</u> procedures performed

INTERVENTIONAL NURSES COUNCIL COMPETENCY STANDARDS FOR INTERVENTIONAL CARDIOVASCULAR NURSING PRACTICE

The Interventional Nurses Council competency standards for interventional cardiovascular nursing practice are based on the Australian Nursing and Midwifery Council Registered Nurse Standards for Practice 2016 and the Nursing Council of New Zealand Competencies for Registered Nurses 2007. The Interventional Nurses Council competency standards give critical care clinical context to how both of these practice standards are implemented into interventional cardiovascular nursing practice to support the development of nursing staff with a high quality, holistic patient safety approach to critical care nursing.

DOMAIN 1: THINKS CRITICALLY AND ANALYSES INTERVENTIONAL CARDIOVASCULAR NURSING PRACTICE

- Accesses evidence-based resources, activities and expert advice to meet the health needs of those undergoing Interventional Cardiovascular therapies and procedures.
- Engages and contributes to the evidence-base of Interventional Cardiovascular Nursing. Supports and participates in research that promotes and enhances patient care.
- Identifies and appraises research evidence relevant to improving the health outcomes of those requiring Interventional Cardiovascular therapies and procedures.
- Integrates relevant research findings and other developments in decision-making about Interventional Cardiovascular Nursing.
- Participates in pre-briefing and debriefing processes to improve interventional cardiovascular nursing specific outcomes (e.g. Mortality and Morbidity meetings post MER etc.)

DOMAIN 2: ENGAGES IN THERAPEUTIC AND PROFESSIONAL RELATIONSHIPS TO ENHANCE THE DELIVERY AND EXPERIENCE OF INTERVENTIONAL CARDIOVASCULAR NURSING CARE.

- Actively contributes to the multidisciplinary approach to managing critically ill patients undergoing complex interventional cardiovascular procedures in the acute care setting.
- Practices acknowledging the impact of the interventional cardiology specialty on the culture, dignity, values, beliefs and rights of those requiring Interventional Cardiovascular therapies and procedures.
- Communicates effectively in the context of an individual's social and emotional responses to undergoing Interventional Cardiovascular therapies and procedures.
- Recognises that individuals experiencing cardiovascular disease and accessing interventional cardiac services are the experts in the experience of their life. Acknowledges the thoughts and views of the individual should be treated with the appropriate consideration and respect.
- Recognises the need to ensure patients have adequate knowledge of the potential benefits and adverse effects of Interventional Cardiovascular therapies and procedures, while respecting their beliefs and preferences.
- Provides patient education of therapies to treat cardiovascular, including lifestyle changes and recommendations, to facilitate positive health choices.
- Provides information that reflects knowledge of the pathophysiology and progression of cardiovascular disease, including the episodic and chronic nature of disease, and current evidence regarding treatment options.
- Contributes to initiatives relating to Interventional Cardiovascular consumer movement, the profession, multidisciplinary team and health care systems aimed at enhancing Interventional Cardiovascular care including participation in clinical trials.
- Advocates for the individual undergoing interventional cardiovascular therapies or procedures and their family in issues of patient safety and complex clinical care.
- Participates in Orientation, preceptorship programs and mentoring of colleagues, imparting knowledge of appropriate risk management strategies to minimise patient risk during interventional cardiology procedures.
- Demonstrates leadership that enables positive role modelling for interventional cardiovascular nurses and collegial professions.
- Provides feedback that acknowledges the performance of colleagues within the interventional cardiovascular team, while also encouraging staff development and fostering team cohesion.
- Recognises and values the contribution, opinion and ideas of each member of the interventional cardiovascular team.
- Recognises that trust, respect, inclusivity and team diversity are important factors in an effective, high functioning interventional cardiovascular team and work to ensure these values are upheld.

DOMAIN 3: MAINTAINS THE CAPABILITY FOR PRACTICE.

- Identifies and promotes opportunities for the professional development of individuals within the interventional cardiovascular team.
- Initiates debriefing as determined by critical events associated with interventional cardiovascular procedures or as requested by interventional cardiovascular team members.
- Promotes a positive culture among the interventional cardiovascular team, including supporting staff morale and building emotional intelligence to enhance team awareness.
- Recognises the importance of self-care and developing resilience to protect the physical, mental, social and emotional well-being of the interventional cardiovascular team.
- Recognises the challenges of communication amongst the interventional cardiovascular team in stressful or emergency situations. Identifies and implements strategies to facilitate effective interdisciplinary exchange of information within the team, while maintaining professionalism amongst team members at all times.
- Clarifies and interprets information gained from professional and public sources regarding cardiovascular disease management, Interventional Cardiovascular therapies and procedures.
- Acknowledges personal and team members' needs for professional development and support to meet the needs of those requiring Interventional Cardiovascular therapies and procedures.
- Demonstrates a commitment to maintaining competence through participation in professional development activities relevant to specialty.
- Recognises the ongoing changes in interventional cardiovascular technologies and development of treatment options, and maintains an active approach to continuing professional development
- Understands the impact that Interventional Cardiovascular treatments and procedures can have on all areas of health and wellbeing.
- Actively engages in the provision of technical and clinical support and direction to less skilled interventional cardiovascular team members.
- Identifies learning needs through critical reflection, performance review and assessment of emerging developments in the practice of Interventional Cardiovascular Nursing care.
- Participates actively in workplace, professional, consumer and other organisations to enhance Interventional Cardiovascular therapies and procedures.
- Maintains membership of professional organisations and industry groups relevant to the interventional cardiovascular nursing specialty.
- Advocates for and promotes the contribution of specialist Interventional Cardiovascular Nursing to positive outcomes for patients in the clinical and policy context.
- Participates in professional clinical supervision and peer review processes, monitoring personal and professional responses to situations arising within the delivery of interventional cardiovascular care

DOMAIN 4: COMPREHENSIVELY CONDUCTS ASSESSMENTS.

- Utilizes evidence-based principles in the assessment and management of common diseases and treatment of related symptoms, experienced by those undergoing Interventional Cardiovascular therapies and procedures.
- Conducts assessments of the interventional cardiovascular patient, using an evidence based approach to patient assessment that enables consistent prioritisation and collection of all physiological cues relevant to clinical deterioration
- Actively encourages and contributes to a team approach to determining the interventional cardiovascular service needs of the population to enhance community health and social wellbeing
- Actively encourages and contributes to a team approach to determining priorities for interventional cardiovascular service provision and cost efficient allocation of services to maximise health and social benefits to the community population.
- Actively explores all available resources to enhance care planning and care provision for community population's requiring care of cardiac disease.
- Ensures appropriate and cost efficient use of resources when planning cardiac care provision for community populations.

DOMAIN 5: DEVELOPS A PLAN FOR NURSING PRACTICE.

- Communicates and networks with multidisciplinary specialist teams when planning, delivering and evaluating care to those undergoing Interventional Cardiovascular therapies and procedures.
- Integrates collected assessment data with knowledge of evidence based practice when planning individualised interventional cardiovascular patient care, to ensure patient safety is maintained and the highest possible standard of care achieved.
- Participates effectively in interventional cardiovascular teams to plan and implement strategies to meet the needs of those requiring Interventional Cardiovascular therapies and or procedures.
- Plans and delivers holistic nursing care for those undergoing Interventional Cardiovascular therapies and procedures.
- Promotes efficient exchange of information between care providers and health care settings regarding the clinical, practical and support needs, preferences and care plans for those requiring interventional cardiovascular therapies and or procedures.
- Maintains high quality and comprehensive documentation for the care of all patients undergoing interventional cardiovascular therapy planned care, assessed outcomes and modifications to care.
- Participates effectively in teams to plan and implement strategies to meet the needs of those requiring interventional cardiovascular therapies and or procedures.
- Understands the impact of health systems and organisational policies on the delivery of interventional cardiovascular therapies and procedures.
- Identifies and understands the range of support services available to those requiring interventional cardiovascular therapies and procedures.
- Manages space within the interventional cardiovascular lab to promote efficient delivery of interventional cardiovascular therapies and procedures, while also optimising patient and staff space particularly during complex and emergency procedures
- Proactively manages patient flow to maximise patient access to interventional cardiovascular service provision and minimises the impact of service block to optimise patient safety.
- Considers the cost effective use of equipment and consumables when planning interventional cardiovascular care for individuals, and utilises strategies that incorporate a risk verses cost benefit analysis, to ensure both positive patient outcomes and long term sustainability.

DOMAIN 6 PROVIDES SAFE, APPROPRIATE AND RESPONSIVE QUALITY NURSING PRACTICE.

- Maintains and utilises knowledge of the evidence base appropriate to interventional cardiac nursing to inform decision making, ensuring the provision of high quality care.
- Maintains a high level of knowledge of the pathophysiology and progression of cardiovascular disease, including the episodic and chronic nature of disease, and current evidence regarding treatment options.
- Always ensures all aspects of their interventional cardiac nursing practice remains compliant with the employer's policies, guidelines and standards.
- Always ensures all aspects of their interventional cardiac nursing practice remains compliant with the appropriate national regulations and appropriate legislation governing clinical practice.
- Reports potential and actual issues of risk, when system issues or inappropriate clinical care means interventional cardiovascular practice falls below the expected standards.
- Provides advice and professional support to colleagues about clinical management and professional issues in Interventional Cardiovascular Nursing.

DOMAIN 7: EVALUATES OUTCOMES TO INFORM NURSING PRACTICE.

- Monitors and evaluates team and nursing based outcomes with the individual and their family, to ensure the best possible outcomes for individuals at every stage of their interventional cardiac procedure.
- Assesses the impact of Interventional Cardiovascular therapies on individuals and considers clinical circumstances, treatment and care plan, and the individual's preference for information.
- Evaluates and monitors the progress of the individual undergoing interventional cardiovascular therapies facilitating progression towards the expected goals and outcomes
- Appropriately revises the interventional cardiovascular care plan based on the evaluation process against the expected goals and outcomes
- Determines, documents and communicates the revised plan of care, including further priorities, goals and new outcomes with the interventional cardiovascular team, the individual and their family

UTILISING THE STANDARDS TO DEVELOP A PROFESSIONAL DEVELOPMENT FRAMEWORK GUIDING INTERVENTIONAL CARDIAC NURSE TRAINING AND EDUCATION (SUGGESTED EXAMPLE)

The taxonomy of service delivery is used to define and identify the educational requirements of the interventional cardiac nurse based on the services provided. A level 3 service has been used to develop this example:

Taxonomy Level	Services Provided
Level One	• Diagnostic procedures • No on-call service • No Primary PCI services • Selective invasive radiology services • Basic Cardiac Rhythm Management • Access to Cardiac Nurse Educator
Level Two	• Diagnostic procedures • PCI procedures • After-hours service • Selective invasive radiology services • Cardiac Rhythm Management • Electrophysiology • Primary PCI within standard operational hours • Participation in research and clinical trials • Access to Interventional Cardiovascular or Cardiac Nurse Educator
Level Three	• Diagnostic procedures • PCI procedures • Primary & Rescue PCI procedures • After-hours on-call service • Cardiac Rhythm Management • Electrophysiology • Vascular/endovascular procedures • Renal denervation procedures • Structural heart procedures • Device/pharmaceutical clinical trials centre • Dedicated Interventional Cardiovascular Nurse Educator

With level 3 service provision, interventional cardiac nurses would require development of a comprehensive training program covering all aspects of all three levels of over their training period.

Matching to the educational taxonomy, the focus of their immediate training and education requirements would be to attain proficiency of level one knowledge and skills so they could be a functioning member of the team. It is anticipated this should take approximately 3 months.

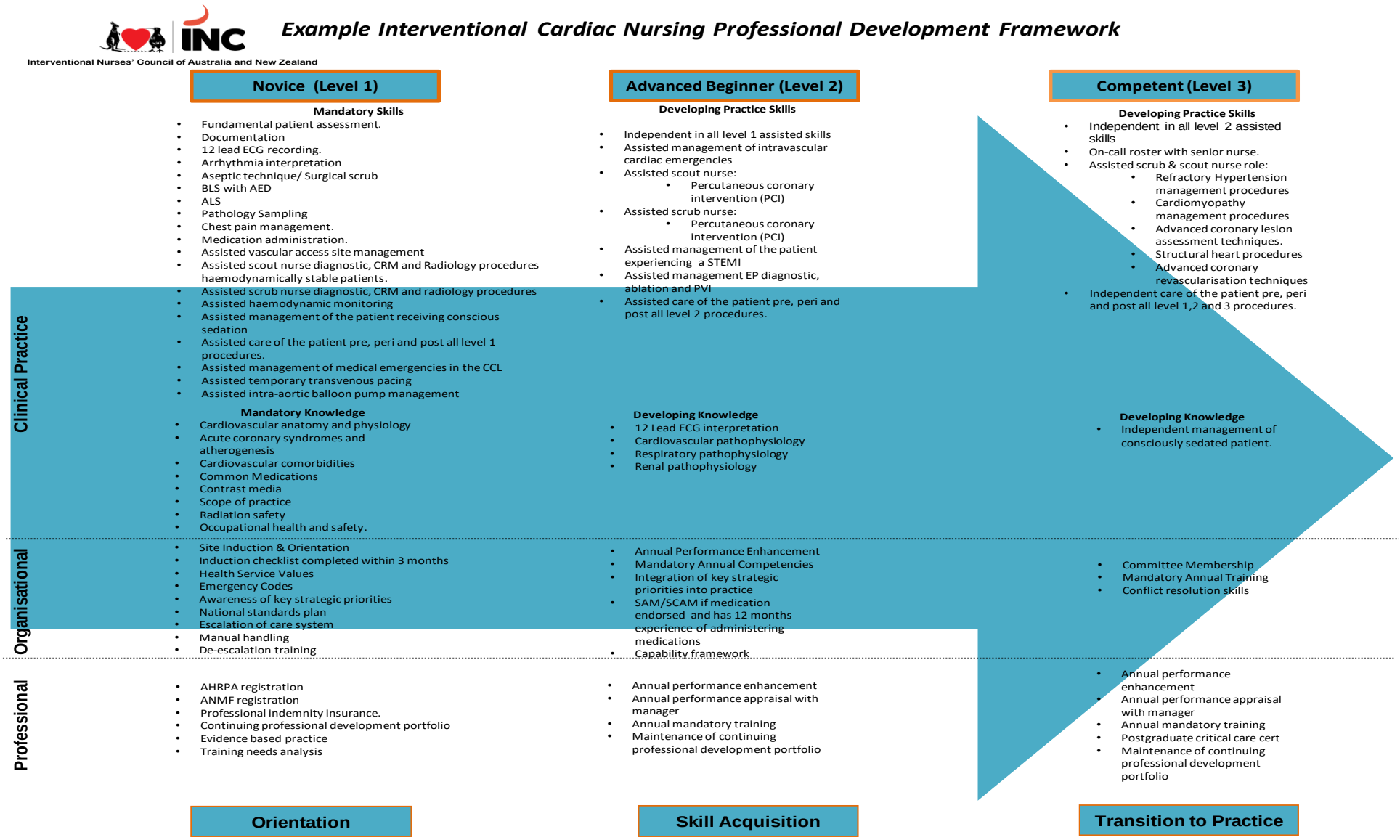
LEVEL 1
foundation knowledge and skills
Cardiac anatomy & physiology
Acute Coronary Syndromes & atherogenisis
Arrhythmia interpretation
Haemodynamic monitoring
Vascular access & complications
Temporary trans-venous pacing
Intra-aortic Balloon Pump (IABP)
Medical emergencies in the CCL
Advanced Life Support (ALS) • ARC ALS 2 • NZ RC6
• Aseptic technique
Diagnostic Procedures • Left heart catheterisation • Right heart catheterisation • Procedural complications • Procedural techniques • Procedural roles & responsibility • Indications, contraindications, co-morbidities, high risk patients • Radiographic images
Cardiac Rhythm Management (CRM) • Conduction abnormalities • Device implant procedures • Procedural complications • Procedural roles & responsibilities • Surgical count procedure
Radiology procedures • Procedural complications • Procedural techniques & roles • Specialised equipment • Indications, contraindications, co-morbidities, high risk patients
Sedation • Medications • Monitoring • Airway management • Over-sedation intervention • Recovery
Care of the patient pre, peri & post procedure for all procedures performed
Medications & contrast media
OHSW & IM
Radiation safety

Once the nurse is able to demonstrate the ability to perform all Level 1 clinical skills with minimum risk to patient safety. They would then commence building on their developing knowledge and skills by progression to the level 2 knowledge and skills while functioning independently within the team. It is anticipated this would take 3-6 months.

LEVEL 2
level 1 modules of theoretical knowledge & skill must be completed, plus the following modules related to service provision
Percutaneous Coronary Intervention • Atherogenisis & lesion assessment • Balloon angioplasty • Coronary stenting • Complex procedures – grafts, bifurcations, CTO, LM • Procedural techniques • Procedural complications • Procedural equipment • Procedural roles & responsibilities • Medications • Indications, contraindications, co-morbidities, high risk patients
STEMI • Primary PCI • Rescue/salvage PCI & thrombolysis • Out of Hospital Cardiac Arrest (OOHCA) • Management of the deteriorating patient & medical emergencies in CCL • Procedural complications • Procedural roles & responsibilities • Medications • On call team & 24hr service provision
EP diagnostic: • Procedural requirements & techniques • Procedural complications • Specialised equipment • Procedural roles & responsibilities
EP Ablation: • Procedural requirements & techniques • Procedural complications • Specialised equipment • Procedural roles & responsibilities
EP Pulmonary Vein Isolation (PVI) • Procedural requirements & techniques • Procedural Complications • Specialised Equipment • Procedural Roles & responsibilities
Care of the patient pre, peri & post procedure for <u>all</u> procedures performed

Once the nurse is able to demonstrate the ability to perform all Level 2 clinical skills with minimum risk to patient safety, level 2 knowledge and skills would be built upon by beginning development of the knowledge and skills demonstrated in level 3 while functioning independently within the team. It is anticipated this would take 6-12 months.

LEVEL 3
level 1 & 2 modules of theoretical knowledge & skill* must be completed*, plus the following modules related to service provision
Advanced diagnostic procedures • Procedural requirements & techniques • Procedural complications • Specialised equipment • Procedural roles & responsibilities • Medications
Advanced revascularisation techniques • Procedural requirements & techniques • Procedural complications • Specialised equipment • Procedural roles & responsibilities
Structural heart procedures Structural heart anomalies • Procedural requirements & techniques • Procedural complications • Specialised equipment • Procedural roles & responsibilities
Renal denervation Renal anatomy & physiology SNS & PSNS Mechanisms of hypertension • Procedural requirements & techniques • Procedural complications • Specialised equipment • Procedural roles & responsibilities
Care of the patient pre, peri & post procedure for <u>all</u> procedures performed



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STATEMENT OF CRITICAL PRACTICE STANDARDS FOR REGISTERED NURSES PARTICIPATING IN THE PROVISION OF CARE FOR THOSE REQUIRING URGENT AND OR EMERGENCY INTERVENTIONAL CARDIOVASCULAR PROCEDURES AND/OR THERAPIES OUTSIDE THE STANDARD OPERATING HOURS

BACKGROUND

The critically ill nature of the ST-elevation myocardial infarction (STEMI) patient and the complexity of managing patients undergoing Primary Percutaneous Coronary Intervention (PPCI) and other Interventional Cardiology (IC) emergency procedures that occur out of hours, requires further specialist training and experience to accommodate all potential critical care responses that may transpire in the Cardiovascular Catheterisation Laboratory (CCL).

Patients presenting to the CCL experiencing a STEMI can be defined as critically ill due to the physiological instability associated with the disease process. If left untreated, this commences a trajectory towards permanent disablement or death that can cause a cascade effect that may culminate in cardiac arrest as the end point of multi-organ failure (1-8). Treatment of STEMI with PPCI in a CCL has overwhelmingly been proven as the gold standard in reperfusion therapy to treat this disease process and this is reflected in the current worldwide best practice guidelines (9-12). This is a time critical procedure with a direct association between each 30-minute delay to reperfusion and an increase in patient mortality and morbidity at one year (9).

It is these factors that led to the establishment of the 'On-Call' Team which could provide an immediate response for urgent and emergency care for cases outside the standard operating hours; primarily a PPCI service for STEMI patients.

PURPOSE OF THIS STATEMENT

This statement aims to provide direction for managers of interventional cardiovascular services for the delivery of safe and quality patient care outside the standard operating hours and establishing an 'On-Call' team for urgent and emergency cases.

The statement provides:

- The recommended nursing constituency of the an 'On-Call' team; and
- A statement pertaining to the minimum standards of proficiency required of Interventional Cardiovascular Nurses (ICNs) rostered onto an on-call team.
- The expectation of an immediate nursing response once the 'On Call' Team is activated /called.

ENROLLED NURSES ON THE 'ON-CALL' TEAM

While the practice of deploying Enrolled Nurses (ENs) in the Cardiac Catheterisation Laboratory is varied and controversial, it is the position of the INC that the nature of the 'On-Call' team is such, that it is inappropriate for ENs to be included in its composition. The need for advanced resuscitation and pharmacological knowledge and skills, including ACLS and the use of emergency drugs, underpins this statement. The role of

the EN, as currently defined by the respective legislation, requires the practice of the EN to be supervised by an RN. The autonomous nature of the key roles of scrub and scout, while working within a team, require the them to identify, critically evaluate and initiate interventions under the direction of the operator, for example Interventional Cardiologist, rather than another nurse.

ROLE OF THE REGISTERED NURSE AS PART OF THE 'ON-CALL' TEAM

It is recommended that the CCL out of hour's 'On-Call' team, consists of the following nursing members:

- An Interventional Cardiovascular Nurse to fulfil the role of scrub nurse
- A second Interventional Cardiovascular Nurse to fulfil the role of circulating/scout nurse
- A third Interventional Cardiovascular Nurse or other appropriately trained professional i.e. Cardiac Technologist, Scientific Officer to be dedicated to the haemodynamic monitoring of the patient to aid in the recognition of clinical deterioration and documentation of vital signs.

Regardless of profession, each role requires an individual to be dedicated specifically to that purpose during the procedure. The use of one person fulfilling multiple roles at the same time should be actively discouraged due to the critical and unstable nature of the patient population. It is also recommended that all nursing members of the team have the ability and specialist training to be able to interchange roles if necessary to assist with combating fatigue and ensuring the provision of care in extenuating circumstances.

It is also recommended that the full 'On-Call' team be present ***prior*** to the commencement of the procedure to ensure a safe and high quality patient outcome.

Appropriate clinical competence should be evident with all nursing members of the CCL 'On-Call' team through extensive experience and specific training to cover all aspects of care of the critical interventional cardiology patient.

MINIMUM PRACTICE STANDARDS PRIOR TO BEING ROSTERED 'ON-CALL'

In keeping with the Interventional Nurses' Council Scope of Practice for Registered Nurses, it is recommended that RNs rostered onto 'On-Call' and after-hours services have specialist training and a period of supernumerary clinical support that will be directly related to the previous experience of the Registered Nurse as both an ICN and/or critical care nurse in an appropriate specialty, for example Coronary Care or Intensive Care.

It is highly recommended that every ICN have achieved at a minimum, annual proficiency in the following key areas be achieved and maintained:

- Advanced life support (ALS) certificate and accreditation
- IV Cannulation
- Emergency set up and use of PPCI equipment
- Primary assistance to the Interventional Cardiologist to perform:
    - Intra-Aortic Balloon (IAB) Catheter insertion and
    - IAB Pump application
    - Pericardiocentesis
    - Thrombectomy device
    - Temporary Pacing wire insertion and application
    - Application of covered stents and coils

    - Fractional Flow Reserve application
    - Any relevant new and emerging procedures pertinent to the CCL

In addition, RNs should demonstrate their level of clinical competence through extensive experience of providing high quality care for patients related to, but not limited to, the following key areas:

- Patient assessment and prioritisation of care;
- Preparation and maintenance of the sterile field;
- Familiarity with the CCL circulating environment and the ability to source equipment in a timely manner;
- Assisting the Interventional Cardiologist as second operator as applicable;
- Preparation of all equipment used during the PPCI and Interventional Cardiology (IC) emergency procedures including haemodynamic (blood pressure) support devices and bail out equipment;
- Advanced haemodynamic monitoring of the critically ill patient during the PPCI and IC procedure;
- Administration and monitoring of the effects of sedation and analgesia in the absence of an anaesthesiologist (Thomas et al 2015);
- Neurological assessment of cerebral oxygenation and perfusion;
- Knowledge of respiratory anatomy and physiology including:
    - SaO2/SpO2/Capnography;
    - Assessment of respiratory effort and efficacy of breathing;
    - Ability to provide airway support and oxygenation;
    - Ability to assist with emergency intubation;
- Pharmacological management of critical haemodynamic instability including the provision of inotropic support;
- 12 lead ECG and rhythm strip acquisition and interpretation;
- Knowledge of cardiac anatomy and physiology including the following:
    - Cardiac conduction system;
    - Location of the coronary arteries and the structures and areas of myocardium they supply;
    - Structure, function and location of the atrioventricular and semilunar valves;
    - Cardiac cycle and normal left sided and right sided heart pressures;
    - Pathophysiology of the cardiac and coronary artery disease processes;
- Knowledge of cardiovascular pathophysiology related to the critically ill patient;
- Recognition and response to peri-procedural complications that can occur during IC procedures and the critically ill patient; primarily associated with clinical deterioration:
    - Ventricular pump dysfunction and failure;
    - Ventricular rupture;
    - Papillary muscle rupture;
    - Arrhythmia;
    - Coronary artery dissection;
    - Access site and non-access site bleeding;
    - Acute thrombosis;
    - Anaphylaxis;
- Pharmacology of anticoagulants including loading doses, duration of onset, method of administration and reversal agents;
- Preparation of patient for inter-department/inter-hospital transfer;
- Preparation of patient for emergency cardiac surgery in a timely manner;

- Ability to collect and integrate data from multiple sources;
- Ability communicate to other team members and support services in an concise and accurate manner;
- Ability to think critically and solve problems as they arise, independently and as part of the 'On-Call' team;
- Appropriate recognition of requirement for activation of external clinical assistance and Code Blue team.

STATEMENT ON THE PROVISION OF EDUCATION FOR SPECIALIST INTERVENTIONAL CARDIOVASCULAR NURSES, INVOLVED IN THE CARE OF CRITICALLY ILL PATIENTS UNDERGOING INTERVENTIONAL CARDIOVASCULAR PROCEDURES

The Interventional Nurses Council of Australia and New Zealand considers one of the key roles of the Interventional cardiovascular nurse, is the provision of high quality, safe clinical care to critically ill patients undergoing interventional cardiovascular procedures. Preparation of specialist critical care nurses through high quality critical care nursing education, has been a key factor in developing the critical thinking and clinical decision making skills, linked with high quality care and therefore positive nursing outcomes for patients and their families (Bellomo, Stow & Heart 2007, Pelletier, Donoghue & Duffield 2003, Lyneham, Parkinson & Denholm 2008, Cotterill-Walker 2012). Other nursing disciplines caring for critically ill patients have long recognised the value of the provision of high quality nursing education in the preparation of specialist critical care nurses, most prominently intensive care nursing (Australian College of Critical Care Nurses Ltd 1999 and 2002) and emergency nursing (CENA National Professional Standards Committee 2008).

The Interventional Nurses Council of Australia and New Zealand recognises interventional cardiovascular nursing to be a critical care nursing discipline. This position statement outlines recommendations from the Interventional Nurses Council for the provision of education to equip interventional cardiovascular nurses, with the skills and knowledge to provide high quality, safe patient care to optimise positive nursing outcomes for patients and their families. Evidence based recommendations have be used in this position statement where available. As the development of an evidence base for interventional cardiovascular nursing is still in its infancy, where current research is not available to inform the recommendations, they are based on the opinion of expert interventional cardiovascular nurses. These expert interventional cardiovascular nurses all have extensive experience of current interventional cardiovascular nursing practice, along with experience educating and mentoring interventional cardiovascular nurses to develop the skills and knowledge required for clinical practice.

1. The education and training of specialist interventional cardiovascular nurses involved in the provision of care for critically ill patients undergoing interventional cardiovascular procedures, should be provided by a dedicated interventional cardiovascular nurse educator.

2. Interventional cardiovascular nurses caring for critically ill patients function at a specialist level and their educational preparation should be provided at a postgraduate level by a higher education institution.

3. The interventional nurses council endorses the recommendations of the Australian College of Critical Care Nurses 1999 Position Statement on Postgraduate Critical Care Nursing Education and the 2005 Declaration of Madrid on the preparation of critical care nurses.

4. Postgraduate courses preparing interventional cardiovascular nurses for the care of critically ill patients undergoing interventional cardiovascular procedures, should provide current evidence based knowledge and research, in combination with experience in clinical practice. Interventional cardiovascular nurses must be supported in clinical practice by specialist interventional cardiovascular nurse educators or interventional cardiovascular nurse preceptors, and assessed as displaying clinical competence on completion of their education. This focus on translation of evidence based knowledge and research into clinical practice will ensure the development of a flexible workforce able to provide effective, high quality, safe patient care within the cardiac catheterisation laboratory.

5. Postgraduate courses for interventional cardiovascular nurses must also include content facilitating the development of skills, preparing interventional cardiovascular nurses to contribute to the professional development of the discipline, service provision and expanding the evidence base in interventional cardiovascular nurse focused clinical outcomes. These skills should include, but not be limited to:

    a. Clinical research
    b. Change management
    c. Clinical auditing
    d. Leadership
    e. Reflective practice

6. Interventional cardiovascular nurse clinicians and both clinical and higher education providers must develop consensus on the outcomes of courses to prepare interventional cardiovascular nurses for the care of critically ill patients. Developing consensus in outcomes, will assist with ensuring consistency in clinical practice throughout Australasia ensuring high quality, safe patient care, regardless of where it is delivered.

7. Specialist interventional cardiovascular nurse educators and interventional cardiovascular nurse preceptors, should be given adequate time and resources to provide education, training, clinical supervision and clinical assessment. It is a recommendation of the Interventional Nurses Council that specialist interventional cardiovascular nurse educators and interventional cardiovascular nurse preceptors are supernumerary in the cardiac catheterisation laboratory numbers and not allocated a patient care load, while performing the roles of clinical supervisor or clinical assessor.

8. Government health departments and public and private health care providers must develop strategies to attract nurses to undertake specialist postgraduate interventional cardiovascular nurse education and training. Strategies must include the following:

    a. Future workforce planning including, role definition, professional development structure, advanced scope of practice and career incentives.
    b. Financial incentives to reduce the burden of undertaking specialist nurse training and reward the development of the high level skills required for specialist nursing practice.
    c. Flexible access to training to maintain work-life balance and prevent development of fatigue and stress related issues
    d. Flexible mode of delivery to provide access to education and training regardless of geographical location.

    These strategies will encourage growth in the workforce, given the importance of interventional cardiovascular care in the future of cardiac care service provision for Australasia.

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