

# Staff nurses knowledge and skills regarding management of patients with Myocardial Infarction and Angina

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## ABSTRACT

Myocardial infarction is one of the most common coronary heart lesions referred to as an invisible epidemic in the 21<sup>st</sup> century. A nurse must have adequate knowledge regarding the underlying mechanisms, subtle and obvious signs and must also possess competency of the emergency management.

Similarly patients with stable angina can be managed with lifestyle changes, especially smoking cessation and regular exercise, along with taking antianginal drugs. Randomized controlled trials show that antianginal drugs are equally effective and none of them reduced mortality or the risk of MI.

In recent decades, the role of management of MI and Angina has been the focus of attention by the vast majority of professionals with nurse to be in the front line.

The main goal of management of MI and Angina is to prompt patients participate in their therapeutic treatment regimen to such an extent that they can achieve living almost a normal life. Management of MI and Angina programs comprising prescriptive exercise, health education, and counseling, yield compelling improvements in cardiac morbidity and mortality of participants. Furthermore, detection, diagnosis and monitoring of psychological distress should be part of treatment since after admission patients frequently experience clinically significant levels of anxiety or depression that may persist for long thus affecting the outcome of cardiac disease. Usually, health professionals fail to recognize psychological distress in patients with coronary artery disease because they perceive it as a normal reaction to the stressful event of acute myocardial infarction. As a result, symptoms are misdiagnosed as physical problems while the underlying cause remains.

Education provided by the nurses to the patient is associated with increased patient satisfaction, lower levels of anxiety and depression, high levels of compliance to treatment, as well as improved quality of life not only for the patients but for their supporting environment.

The aim of this review was to present the role of nursing education in cardiac management of MI and Angina patients.

**Keywords :** Myocardial Infarction, Initial Management, Knowledge, Nursing Staff, Antianginals, stable angina

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## I. INTRODUCTION

The heart is a four-chambered hollow muscular organ. The heart lies within the thorax between the lungs in the mediastinal space. The heart is composed of three layers:

- i. A thin inner lining, the endocardium
- ii. A layer of muscle, the myocardium
- iii. And a fibrous outer layer, the epicardium

The heart is divided vertically by the septum, and it creates right and left atrium and ventricle. The myocardium is composed of specialized cardiac muscle found only in the heart. It is not under voluntary control, but like skeletal muscle, cross stripes are seen on microscopic examination. The heart is supplied with arterial blood by the right and left coronary arteries which branch from the aorta. Coronary artery disease (CAD) is a type of blood vessel disorder that is included in the general category of atherosclerosis. Atherosclerosis is often referred to as "hardening of the arteries" which is an abnormal accumulation of lipid or fatty substances and fibrous tissue in the vessel wall. These deposits, called atheromas may rupture and forms the thrombus that obstruct blood flow, leading to sudden cardiac death or an acute myocardial infarction (MI) which is the death of heart tissues. As cardiovascular disease remain the most common cause of death in both developed and developing countries, all health professionals including nurses should know the risk factors, preventive measures and its management.

## II. Aim and Objective

Cardio Vascular disease is the common cause for death. The major form of cardio vascular disease is coronary artery disease, manifested as myocardial infarction, angina pectoris or sudden cardiac death.

Myocardial Infarction (M.I) is a life threatening condition characterized by the formation of localized necrotic areas within the myocardium. M.I. usually follows the sudden occlusion of a coronary artery and abrupt cessation of blood and oxygen flow of the heart muscle.

The common risk factors for M.I are smoking, high B.P, too much fat in diet, diabetes, male gender, age and hereditary. Evidence suggests that Reactive Oxygen species (ROS) may play important role in the pathogenesis of myocardial infarction. Myocardium Infarction continues to be significant problem in industrialized countries and is becoming an increasingly significant problem in developing countries. Acute myocardial infarction is one of the major causes of mortality and morbidity in the world. The most common cause of Acute Myocardial Infarction (AMI) is atherosclerotic coronary artery disease with erosion or rupture of a plaque causing transient, partial or complete arterial occlusion.

Previous studies have supported the fact that delaying medical attention when suffering an M.I. may lead to complications such as cardiac dysrhythmia, CHF, pericarditis and rupture of heart structure. Delaying treatment times for clients suffering an acute M.I. potentially poses a disadvantage for receiving occlusion elimination therapies.

The nurses do not have adequate knowledge to interpret E.C.G. The electrodes placed on the patients by nurses were often not in the correct anatomic site which causes changes in the E.C.G. morphology and lead to misdiagnosis. The lead selected by many nurses to monitor patients is diagnostically inferior to other available leads and the lead placement is often inaccurate. E.C.G. monitoring practice of nurses caring for patients who have suffered from M.I. showed that lead selection was inappropriate. Only 43% of the surveyed correctly identified the classic ischemia, injury and infarction. The knowledge and skill of

E.C.G. monitoring among staff nurses" shows average knowledge (42.5%) and skill scores (29.18%). During the past decade there has been a widespread movement in the field of medicine, particularly on the part of nurses towards a more accurate and efficient treatment of acute myocardial infarction. Diagnosis, medication and treatment of M.I. errors results in thousand of adverse events and preventable reactions and deaths per year. Nurses along with other health care professionals should share the responsibility of determining how these errors occur and designing strategies on how to reduce them and in the process saving other people's lives. Knowledge of the E.C.G. patterns and its changes and interpretation can help a lot in effective nursing management of M.I. More number of M.I. occurs in the hospital, and it is likely that the nurse in the first responder to such an emergency. Therefore nurses need to possess adequate knowledge in assessment and emergency management, which is achieved and maintained almost entirely by proper training and retraining with scientific knowledge. Promoting health in a hospital setting in a realistic goal for acute care nurse. Nurse should be alert to life style induced diseases and risk factors that precede these diseases. Further, during clinical experience the investigator observed that patients with M.I. are develop complication and may occur death due to less alertness.

### Stable Angina

Angina pectoris was first defined by William Heberden in 1768. He described it as a smothering sensation or tightness across the front of the chest which may radiate to the left arm or to arms as well as the jaw or back. It is usually triggered by exercise or emotional stress and it may be aggravated by the ingestion of a heavy meal. The pain usually resolves by stopping exercise or with sublingual nitroglycerin. Angina is arbitrarily defined as stable when the angina episodes are stable over a period of 3–6 months. Atypical features, such as shortness of breath during exercise in the absence of pulmonary disease or extreme fatigue during exertion, have been considered as angina

equivalents. These atypical presentations in the absence of chest pain are often found in women, older people and people with diabetes.

### Causes of Stable Angina

The exact etiology of stable angina is not well defined; however, it is thought to be secondary to a mismatch between myocardial supply and demand. The majority of patients with angina have significant narrowing of one or more epicardial coronary arteries. It is also recognized that many patients with stable angina have non-obstructive or even normal coronary arteries.

### Guidelines for Stable Angina

There are published guidelines for the management of patients with stable ischemic heart disease and stable angina. The ESC and NICE guidelines (*Table 1*) provide recommendations divided into classes:

- Class I where the evidence and/or general agreement that a given treatment or procedure is beneficial, useful and effective.
- Class IIa where the weight of evidence or opinion is in favour of usefulness/efficacy.
- Class IIb where usefulness/efficacy is less well established by evidence or opinion.
- Class III where there is evidence or general agreement that the given treatment or procedure is not useful/effective and in some cases may be harmful.

In addition, for each class of recommendation, a level of evidence is included:

Level of evidence A denotes that data were derived from multiple randomized clinical trials or meta-analyses.

• Level of evidence B indicates that data were derived from a single randomized clinical trial or large non-randomized studies.

• Level of evidence C is where a consensus of opinion of the experts and/or small studies, retrospective studies or registries was available.

NICE guidelines (*Table 1*) are based on extensive reviews of published data and take into consideration cost-effectiveness and the adverse effects of medications. The terms first-line treatment and

second-line treatment are used and guidance is given on the most appropriate use of antianginal therapy, taking co-morbidities into consideration when selecting therapy.

### Guidelines for Antianginal Therapy

A previously published article compared the American and Canadian guidelines. This article compares the recommendations for antianginal therapy in ESC and NICE guidelines (*Table 1*). Both sets of guidelines agree that optimal medical therapy includes antianginal therapy and medications to prevent MI and stroke, including aspirin and statins. They both favour the use of sublingual short-acting nitrates for the relief of an established attack of angina or for prophylaxis. Both guidelines recommend the use of BB or CCB as first-line therapy with the notion that non-DHP CCB should not be combined with ivabradine or BB. NICE guidelines recommend a trial of a maximally tolerated dose of either a BB or a CCB as initial therapy.

### Guidelines to Reduce MI and Sudden Cardiac Death

Lifestyle Changes Smoking cessation or abstinence reduces the risk of CAD mortality by 50% in 1 year and after 5–15 years the coronary mortality risk reaches that of non-smokers. In addition to decreasing cardiovascular mortality and morbidity, stopping smoking in patients with angina also increases exercise performance.<sup>64</sup> Although based on small observational studies, exercise training was shown to have favorable outcomes in patients with stable angina. Both guidelines emphasize the importance of smoking cessation and regular exercise. NICE guidelines do not specify any special diets, while ESC guidelines recommend a Mediterranean diet. Management of MI and Anginas recommended in ESC guidelines, but not in NICE guidelines.

### Ant platelet Therapy

Both guidelines recommend daily use of low-dose aspirin because it has been shown to reduce the incidence of acute MI and sudden death in patients

with known CAD. This has only been shown to be effective for patients with stable angina in a small study. The use of aspirin in patients with stable angina in the absence of CAD is uncertain.

### Treatment of Dyslipidaemia

There are no specific trials of statins in patients with stable angina, however this class of drugs reduce all-cause mortality, acute coronary events, and the need for revascularization in patients with CAD and in those at high risk of CAD. ESC guidelines recommend the use of statins to achieve the ideal low-density lipoprotein goal (<1.8 mmol/l), while NICE guidelines

**Table 1: Chronic Stable Angina Pharmacotherapy: Comparison of Guideline Recommendations**

Antianginal Drug	European Society of Cardiology	National Institute for Health and Care Excellence
<b>First-line therapy</b>		
Sublingual nitroglycerin	IB	
Short-acting nitrates	IB	First-line treatment
Long-acting nitrates	IIaB	Second-line treatment
Beta-blockers	Uncomplicated patient: IA Previous MI: IB Reduced LVEF (<40%): IB	First-line treatment*
Calcium channel blockers:	Non-dihydropyridines: IA Dihydropyridines: IA	First-line treatment* Avoid non-dihydropyridines with BB or ivabradine
<b>Second- and third-line therapy</b>		
Ranolazine	IIaB	Second-line treatment <sup>c,d</sup>
Ivabradine	IIaB Use when beta-blockers are contraindicated	Second-line treatment <sup>c,d</sup>
Nicorandil	IIaB Preferred to nitrates	Second-line treatment <sup>c,d</sup>
Trimetazidine	IIbB	NA
Allopurinol	Second- or third-line agent for symptom control	NA
<b>Interventions for secondary prevention of cardiovascular disease</b>		
Abstain from smoking	I	Assess the need for lifestyle advice, including smoking cessation
Aspirin	I 75–150 mg daily (consider clopidogrel if aspirin intolerance)	75 mg. Take into account the risk of bleeding
Statin	I Target dose to achieve LDL level <1.8 mmol/l or >50% reduction	Offer statin in line with lipid modification guidelines (atorvastatin 80 mg to achieve non-HDL cholesterol reduction >40%)
ACE inhibitor or ARB	II: normal LVEF I: with hypertension and/or diabetes	Consider ACE inhibitor for patients with diabetes

recommend the use of high-dose statins, such as 80 mg atorvastatin (*Table 1*).

### **Control of Hypertension**

There are no specific trials of antihypertensive medications in patients with stable angina who also have hypertension. But given the documented beneficial effects of controlling blood pressure on hard outcomes, especially stroke and heart failure, both guidelines recommend optimal control of blood pressure in patients with stable angina to reduce the incidence of stroke and MI. The blood pressure goal is <140 mmHg for systolic, however recent data suggest that lowering systolic blood pressure to 120 mmHg may be a desirable option if tolerated by the patient.

### **Management of Diabetes**

Diabetes is commonly found in patients with stable angina. Control of diabetes reduces micro- as well as macro vascular complications. Based on the Action to Control Cardiovascular Risk in Type 2 Diabetes (ACCORD) trial, an HbA1C level <7% is desirable. Both guidelines recommend routine use of Angiotensin-converting enzyme inhibitors or angiotensin receptor blockers (ARB) for patients with stable angina who have diabetes.

### **Arteries or Micro vascular Angina**

NICE does not make any specific pharmacotherapy recommendations for patients with stable angina and normal coronary arteries or micro vascular angina, while ESC guidelines recommend a trial of antianginal drugs. There are no efficacy trials regarding hard outcomes in patients with stable angina who have normal coronary arteries. Current evidence does not support the routine use of aspirin or statins in patients with micro vascular angina who have normal coronary arteries.

### **Identification of High-Risk Patients with Left main or Severe Triple Vessel Coronary Artery Disease**

Updated NICE guidelines recommend use of coronary CT angiography for an initial investigation for all patients with typical and atypical angina to define coronary anatomy non-invasively, even if the patients are adequately treated with pharmacotherapy. This is based on available data showing that coronary artery bypass surgery is superior to medical treatment in this group of patients. ESC guidelines, on the other hand, use non-invasive stress testing to define a high-risk group.

### **The role of nursing education**

Studies have revealed the value of nursing practice in secondary prevention and disease management. Cardiac rehabilitation programs including nursing education exert a beneficial effect on patients' quality of life, exercise capacity, lipid profile, body mass index, and body weight, blood pressure, resting heart rate, survival rate, and mortality rate and decreased myocardial infarction risk factors.

Given the fact that the role of nurses in providing education is multidimensional Riccio et al., demonstrated that this role may be categorized in three different levels:

- a) Technical level needed to carry out diagnostic tests and based on cooperation with cardiologists
- b) A second level at which nurses provide information to patients and in-hospital counseling so as to help them combat the disease and be actively involved in the medical treatment, and
- c) Providing psychological support both to the patient and the family during acute illnesses about the treatment.

It is widely accepted that the period during hospitalization is considered the most appropriate for starting rehabilitation and identify those patients who are in need of intense and elaborate treatment.

Accordingly, follow-up programs conducted by well trained in cardiology prevention and cardiovascular professional nurses are of vital importance.

#### The Nurse's Role

Nurses promote cardiovascular health through health-promotion and disease prevention activities. In both primary and secondary prevention of cardiovascular disease, nurses are actively involved in all phases of care, including detection, evaluation, diagnosis, initial therapy, and long-term maintenance. They are involved across all settings, from the community to the coronary care unit. Nurses perform multiple roles, including case finding, referral, follow-up and tracking, patient education, coordination of care, monitoring response to care, and creative interventions.

Nurses with advanced preparation as nurse practitioners diagnose risk factors and disease, select and prescribe treatment, and manage diagnosed conditions. Nurses with doctoral preparation design and conduct research studies. In both of these roles, the nurse may function independently or as part of a multidisciplinary team. Nurses with exceptional expertise develop community programs and participate in government and organizational groups, setting policy and developing consensus guidelines for practice.

### III. CONCLUSION

Nurses represent a large proportion of health care community. They play a vital role in treatment as they are close to the patients and their families during all the process of disease. It is a matter of great importance for nurses to meet the rehabilitative care needs of patients through education, support, supervision and reinforcement. Nursing education in management of MI and Angina can improve health outcomes and reduce the risk of a new cardiac event. A health educational programme organized by nurses for patients after a cardiac event or surgery improves

patients' knowledge of their illness and awareness of behavioral changes to prevent a new event or readmission to hospital.

Nursing health worker teams, collaborating with physicians, pharmacists, nutritionists, and other professionals in a variety of community settings, can provide efficient and cost-effective health promotion for both primary and secondary prevention of cardiovascular disease.

Lessons from the past suggest that community-based nurses and neighborhood or community health workers, linking with community institutions such as the health department, schools, churches, and community centers, can effectively help meet the challenges in promoting cardiovascular health. The roles of the nurse and the neighborhood health worker are collaborative and synergistic.

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