

# ทำอย่างไรจะช่วยให้ผู้ป่วยโรคหลอดเลือดหัวใจ เผชิญกับภาวะเครียด ที่ได้รับจากการผ่าตัดทำทางเบี่ยงหลอดเลือด?

ดวงรัตน์ วัฒนกิจไกรเลิศ\*

**บทคัดย่อ:** โรคหลอดเลือดหัวใจเป็นปัญหาที่สำคัญของประเทศไทยและหลายๆ ประเทศทั่วโลก ผู้ป่วยจะต้องเผชิญกับปัญหาที่ก่อให้เกิดความเครียดมากมาย ทั้งอาการที่เกิดขึ้นโดยไม่คาดหมาย การตรวจวินิจฉัยและการรักษาที่ทำให้เกิดการบาดเจ็บต่อเนื่อง แม้ว่าการผ่าตัดทำทางเบี่ยงหลอดเลือดหัวใจจะถือเป็นมาตรฐานขั้นสูงในการรักษาผู้ป่วย แต่ก็เป็นการรักษาที่คุกคามต่อร่างกาย ส่งผลให้เกิดภาวะเครียดขึ้นกับผู้ป่วย ภาวะเครียดนี้มีผลทำลายระบบต่างๆ ของร่างกายทำให้เร่งกระบวนการเกิดการอุดตันของหลอดเลือดหัวใจ ขัดขวางกระบวนการหาย เพิ่มความตึงตัวของกล้ามเนื้อ และยังทำให้ผู้ป่วยมีความเสี่ยงต่อการติดเชื้อ พยาบาลสามารถที่จะช่วยให้ผู้ป่วยเผชิญกับภาวะเครียดได้ใน 2 ประการ ประการแรก คือการมุ่งแก้ปัญหา ซึ่งประกอบด้วยการประเมินปัญหา และช่วยผู้ป่วยในการแก้ปัญหา ปัญหาส่วนใหญ่ของผู้ป่วยแก้ไขได้เพียงให้ข้อมูลที่ตรงกับความต้องการของผู้ป่วย ประการที่สอง คือการมุ่งจัดการกับอารมณ์ เพื่อที่จะให้ผู้ป่วยมีอารมณ์ที่ดีขึ้น การสอนผู้ป่วยถึงวิธีการที่จะลดผลกระทบทางกายที่เกิดจากความเครียด โดยใช้วิธีการต่างๆ ได้แก่ การบริหารการหายใจ ไบโอฟีดแบค การผ่อนคลายแบบโพเกรสสิฟ และการจินตนาการ จะสามารถลดความเครียดได้

**คำสำคัญ :** โรคหลอดเลือดหัวใจ การผ่าตัดทำทางเบี่ยงหลอดเลือดหัวใจ ความเครียดและการเผชิญปัญหา

**Abstract:** Coronary heart disease (CHD) is a major health problem in Thailand and other countries worldwide. Patients with CHD are confronted with many stressful experiences including unexpected symptoms, invasive diagnostic procedures and treatments. In particular, coronary artery bypass graft (CABG) surgery, even though a gold standard of treatment, is a threatening experience with multiple stress provoking components which elicit a stress response in patients. The stress response exerts generalized wear and tear on many body systems which speed the process of atherosclerosis, decrease healing process, increase muscle tension, and makes a person more susceptible to infection. Nurses can help these patients cope with stress in two ways. The first is problem-focused, which involves assessing the specific problem and helping the patient to solve that problem. Often these problems can be ameliorated when the patient is given information relating to these problems. The other way is emotion - focused and is aimed at ameliorating the negative emotions associated with a specific problem. Teaching patients how to reduce the physical impact of stress on the body by methods such as deep breathing, biofeedback, progressive muscle relaxation (PMR) and guide imagery can be critical ways to reduce stress.

**Keywords:** Coronary heart disease (CHD), coronary artery bypass graft (CABG) surgery, stress and coping

\* ผู้ช่วยศาสตราจารย์ ระดับ 8 ภาควิชาการพยาบาล อายุรศาสตร์ คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล

### **How to help patients with coronary heart disease(CHD) cope with stress from heart surgery?**

Mr. J., a 55 years old, vice president of a big company, worked hard since he was young. He experienced chest pain three years ago while leading a meeting. A percutaneous transluminal cardiac angiography ( PTCA ) found 90% obstruction of the left coronary artery (LCA) and 50% obstruction of the right coronary artery (RCA) and both arteries were dilated by using a balloon. Two years later, he had chest pain again and the doctor planned to treat him with coronary artery bypass graft (CABG) surgery within three months of the examination. He did not want to wait, so he moved to another hospital in which he could have surgery within one month. While waiting for surgery, he had to use tranquilizers and had many questions about surgery such as " Is it safe?" "How can I deal with pain after surgery?" " How can I take care myself after discharge from the hospital?" " Can I work in the same position? ". Not only did Mr. J have questions like these but so do many patients in similar situations. What should nurses do to relieve this stress, help the patients through these troubling processes, and help assure that they have good quality of life.

Coronary heart disease (CHD) is expected to become one of the major health problems in Thailand. In the year 2000, the estimated prevalence rate of heart disease in Thailand was 5 millions per 64 millions population<sup>1</sup> and the Department of epidemiology, Ministry of Public Health, Thailand, reported that deaths from CHD

increased from 3.51/100,000 population in 1996, 5.35/100,000 in 2000 to 19.3/100,000 in 2003.<sup>2</sup> For comparison, it is estimated for the year 2003 that 13,200,000 Americas will be diagnosed with CHD, which is 37.3 percent of all deaths or 1 of every 2.7 deaths.<sup>3</sup> Stress is the major cause of heart attack, higher than smoking, high blood pressure, or high cholesterol.<sup>4</sup> Heart attack, treatment, and self care are also a major cause of stress.

### **How do symptoms, Invasive diagnosis and surgery cause stress?**

Patients with CHD are confronted with many stressful experiences in life including unexpected symptoms, invasive diagnosis, and treatment. Chest pain is a frightening symptom. Fear of dying, anxiety, depression, and anger are common stress reactions in patients and families. After experience chest pain research by Whitehead et al <sup>5</sup> predicts that the patients who fears death will also experience depression and anxiety. Mended Heart Organization<sup>6</sup> surveyed 518 adults who experienced chest pain, and found that CHD symptoms led to stress along with depression and hopelessness. Eighty percent of patients fear another attack more than they fear of death and 40 percent of them are not doing all they can do to avoid another attack. One in six patients suffer from clinical depression and the continued presence of depression after recovery increases the risk of death to 17 percent within six months after heart attack. Patients without depression have a lower mortality rate.<sup>7</sup> Patients who continue to

demonstrate stress as a result of a heart attack show substantially higher rates for a second heart attack and death than those who are able to put these feelings behind them.<sup>4</sup>

Invasive diagnosis, which is sometimes used to dilate the coronary vessel (such as cardiac catheterization) may make the patient particularly vulnerable to stress. Cardiac catheterization can lead to severe complications such as penetrating the vessels, or trauma to the heart muscle and bleeding after the procedure which is the leading cause of death. This procedure can take as long as 3 to 5 hours and is often performed under conscious sedation because anesthesia may alter the cardiovascular hemodynamics. Pain and anxiety may not only confound clinical data (blood pressure, cardiac rhythm) but also may be manifested as distress, fear of death, or lack of cooperation.<sup>5</sup>

Many therapies including CABG surgery, the gold standard of treatment, have been shown to be beneficial in reducing the incidence of cardiovascular events. However, surgery causes pain, discomfort, may cause complications during or after the procedure, and may require complicated self care. Complications of coronary interventional procedures, which may be life threatening, sometimes occur unpredictably. Approximately 13,360 CABG surgeries performed in Pennsylvania hospitals in 2004, had a hospital mortality rate of 1.98%, a 30-day mortality rate of 2.31%, a 7-day readmissions rate of 5.21% and a 30-day readmissions rate of 13.20%.<sup>9</sup>

Heart surgery is a threatening experience, with multiple stressful components - concern about admission to a hospital, separation from family, ambiguity in the operating room, worries about general anesthesia and recovery, one's physical condition, anticipation of painful procedures, and fear of dying. Accordingly, it is not surprising that even operations that physicians consider "minor" can provoke strong emotional reactions in patients. If these psychological response are sufficiently intense, they can have important consequences. The weight of the evidence suggests that greater distress or stress prior to surgery is associated with a slower and more complicated postoperative recovery.<sup>10</sup> High preoperative fear or stress is predictive of a variety of poorer outcomes, including requiring more anesthesia, greater pain, more postoperative complications, poorer treatment compliance and longer hospital stays.<sup>10</sup>

However, demand for CABG surgery has outstripped capacity, and long queues for the procedure are now common in many countries. Patients often wait one month or more for surgery to be scheduled and performed. Waiting for bypass surgery in particular, is associated with significant psychological problems. A postal survey<sup>11</sup> of 72 patients awaiting bypass in Iceland found that fatigue, shortness of breath, chest pain, stress, and depression were the most prominent symptoms. In addition, the uncertainty that may accompany long queues for surgery has been noted to cause considerable stress for patients. A Canadian study<sup>12</sup> examined the needs of 147 patients awaiting cardiac

surgery as well as 125 family members. The study found that the second major concerns of the sample was their ability to cope with the waiting period. The first concern was their worries about the success of the operation itself.

Another Canadian study<sup>13</sup> of 21 patients and their spouses who had been waiting an average of 2.4 months for surgery found that uncertainty was inversely related to quality of life and hope for both patients and their spouses. There was also evidence that patients awaiting treatment for coronary artery disease were anxious and depressed and that such problems were related to the severity of chest pain and breathlessness. Fitzsimons, et al.<sup>14</sup> interviewed 70 patients who were waiting for surgery. The participants in this study cited 5 main sources of stress: chest pain, uncertainty, fear of the operation, physical incapacity, and dissatisfaction with the care offered to them. The State Trait Anxiety Inventory scores for this sample were high during all the waiting period and there was a statistically significant relationship between increasing angina and state trait anxiety.

When the time for surgery arrives the patients still have high levels of stress. Preoperative anxiety is common. The amount of reported anxiety depends on gender, age, and the motive for surgery. Extensive surgery or surgery with an uncertain outcome also produces more anxiety than surgery with relative little ambiguity about the course of events. CABG surgery is an extensive operation with a relative uncertain outcome. Many presurgical patients also experience depressive symptoms that have been

reported to increase after the operation. Vingerhoets<sup>15</sup> studied 80 patients on the day before, seven days after, and six months after open-heart surgery. He found that preoperative emotional arousal significantly predicted the level of emotional distress after surgery and higher levels of preoperative state anxiety were associated with poorer outcome.

Barbarash, et al.<sup>16</sup> assessed preoperative heart surgery stress in 79 patients and its influence on the course of early intraoperative period. They found that 24 hours before operation the patients became anxious, demonstrated coronary insufficiency, and aggravated arrhythmia as shown by Holter EKG monitoring. Bergmann, et al.<sup>17</sup> in a study of 30 patients found that during the transport to the operating room, the level of salivary cortisol, which is related to stress were approximately three times higher during the transport than immediately after admission to the hospital. After induction of anesthesia, cortisol levels decreased considerably. However postoperatively, salivary and plasma cortisol went up again, then returned to high-normal values until the sixth postoperative day. The presence of stress may complicate the induction of anesthesia and alter the pharmacokinetics of the agents used by inducing catecholamines release. Highly stressed patients require more anesthesia than those who are in less distress. This could presumably increase the severity of symptoms such as vomiting, nausea, headache, and pain at the incisional site. A study<sup>18</sup> found that greater self-reported anxiety and stress are typically related to more severe postoperative

pain which may also affect recovery activities, such as breathing exercise and early ambulation. Stress is also one of the causes of arrhythmia, a frightening occurrence during surgery.

During recovery from cardiac surgery, depression can intensify pain, worsen fatigue and sluggishness, or cause a person to withdraw into social isolation. Of the patients who were depressed before surgery, 53% were depressed at one month and 47% at one year, whereas of those who were not depressed before surgery, only 13% were depressed at one month and only 9% were depressed one year post-CABG surgery.<sup>19</sup> Patients who had CABG surgery and untreated depression after surgery also had increased morbidity and mortality rate.<sup>7</sup>

Because of advances in surgical and medical technologies, CABG surgery patients can now be safely discharged as early as 4 days after surgery. Most health care professionals believe that patients recover better at home, in their own environment. However, Leske and Pelczynski<sup>20</sup> found that with early discharge, patients and family members are faced with increased challenges in the self regulating aspect of post operative care. Care givers identified the early days after discharge as the most difficult and frightening period of adjustment and they found only one of five caregivers reported feeling prepared for patient discharge.

To be a patient with CHD all the experiences of illness including having symptoms, the investigation, waiting for surgery, pre and post operative issues, and discharge from hospital are full of stress. Even when the treatment is

successful and the patients are discharged from the hospital, the stress from illness is not totally eliminated. Patients still have to follow a regimen and many of them have cardiac symptoms and return to the cycle of stress again and again. Stress not only affects mental health but also affects other aspects of health.

### **How stress affects health?**

The stress response exerts generalized wear and tear on the body, when body parts and systems are forced to work overtime for long periods without rest and rejuvenation. They begin to malfunction and eventually break down. The relationship between stress and health can be seen as follows:

#### **Stress and the Endocrine System**

The stress response is intimately linked to endocrine system functioning. Chronic hormonal imbalance is related to a host of illnesses, ranging from sexual dysfunction to lowered immune system functioning. Stress diminishes sexual desire and response among men. The hypothalamus triggers a decrease in the secretion of the pituitary hormones, follicle stimulating hormone (FSH), and luteinizing hormone (LH). These hormones are responsible for stimulating the testes to produce testosterone. This decreased level of FSH and LH results in decreased level of testosterone, which affects the sex centers in the brain. Another endocrine disorder affected by stress is premenstrual syndrome (PMS) which appears 2-6 days before the onset of menstruation. Psychosocial symptoms include negative emotion such as

anxiety, irritability, depression, anger, insomnia, confusion, and social withdrawal. Physical symptoms include fluid retention, breast tenderness, weight gain, headaches, dizziness, nausea, increase appetite, and a craving for sweets.<sup>21</sup>

#### Stress and the Cardiovascular System.

The "fight-or-flight" response occurs automatically in stress situations. The sympathetic nervous system "turns on" and the pituitary gland releases certain hormones which result in the pouring out of epinephrine, norepinephrine and cortisol. In response to these hormones, many changes occur throughout the body. The heart beat quickens, the blood pressure rises and fat mobilizes from tissue. The increased turbulence and the circulating stress hormones may damage the lining of arteries. When such damage occurs, platelets in the blood adhere to the injured walls in an attempt to promote a healing process which results in a thickening of the arterial wall. The thickened wall attracts other substances in the blood such as low density cholesterol (LDL) which may also result in a speeding the process of atherosclerosis in the coronary arteries.<sup>4,22</sup> Psychological stress has been shown to induce an increase in platelet count and activity leading to induced transient endothelial dysfunction and causes vasoconstriction at sites with atherosclerotic plaques.<sup>23,24</sup> This, in combination with the increased levels of von Willebrand factor, coagulation factors VII and VIII, and plasma fibrinogen, may have an additive effect in promoting occlusive thrombus formation.<sup>19</sup> Mental stress also induces wall motion abnormality and

is found to be associate with mortality.<sup>25,26</sup> Cortisol also inhibits the breakdown of epinephrine and norepinephrine and increases blood cholesterol and fat levels.<sup>21</sup>

#### Stress and the Immune System

Chronic stress tends to dampen the immune system, making it more susceptible to colds and other infections. Typically, the immune system responds to infection by releasing several substances that cause inflammation.<sup>27</sup> A July 2004 meta-analysis<sup>28</sup> of 93 studies conducted over the past 30 years found stress does indeed affect the immune system in powerful ways. Natural immunity produces quick-acting, all-purpose cells that can attack many pathogens, but they bring fever and inflammation. The body takes a few days to mount a more specific attack on particular invaders with specific immunity. This response includes lymphocytes (T-cells and B-cells). Specific immunity has both cellular responses, which fight pathogens that get inside cells (such as viruses), and humoral responses, which fight pathogens that stay outside cells, such as bacteria and parasites. Different types of immune response are correlated with different types of stress. Chronic long-term stress suppresses the immune system. The longer the stress, the more the immune system shifted from "fight or flight" response to more negative changes, first at the cellular level and later in broader immune function.

#### Stress and Wound Healing

Stress appears to reduce the activity of compounds important to healing process.

Greater fear or distress before surgical procedures is associated with poorer post surgical results. Kiecolt-Glaser, et al.<sup>29</sup> reported that a study of family members who provided care for a relative with Alzheimer's disease are typically more distressed than well matched controls. The study showed that caregivers took an average of 9 days or 24% longer than controls to completely heal a small, standardized wound. Moreover, Glaser, Kiecolt-Glaser, et al.<sup>30</sup> studied 36 women who received wounds, a series of small blisters on the forearm. They found that the fluid levels of two key healing compounds (interleukin-1 and interleukin-8) were significantly lower in samples gathered from women with the highest levels of stress versus women with lower levels of stress.

#### Stress and Muscle Tension

Stress is the event that leads to muscle tension, tightened fists and clenched jaws.<sup>4</sup> Stress also causes muscle tension. Headache associated with chronic muscle tension is caused by involuntary contractions of the muscles of the eyes, forehead, neck, and jaw, which are usually unnoticeable. Chronic tension in this region results in tension headache. Backache, especially in the lower back region, is often the result of chronic muscle tension. As with tension headaches, backaches are the result of chronic, involuntary contractions of skeletal muscles.<sup>21</sup>

#### Stress and the Digestive System

Stress hormones slow the release of stomach acid and the emptying of the stomach and also stimulate the colon, which speeds the passage of its contents leading to stomachache

or diarrhea. Chronic stress can also lead to continuously high level of cortisol which can increase appetite and cause weight gain.<sup>27,31</sup>

#### Stress and the Nervous System

If the fight-or-flight response never shuts off, stress hormones produce persistent feelings of anxiety, helplessness and impending doom. Oversensitivity to stress has been linked with severe depression, possibly because depressed people have a harder time adapting to the negative effects of cortisol. The byproducts of cortisol act as sedatives, which contribute to the overall feeling of depression. Excessive amounts of cortisol can cause sleep disturbances, loss of sex drive and loss of appetite.<sup>27</sup>

#### Stress and Other Systems

Stress worsens many skin conditions such as psoriasis, eczema, hives and acne and can be a trigger for asthma attacks.<sup>27</sup>

Stress affects many systems of the body. Helping the patients cope with stress is an essential role of the nurse.

#### How to help the patients cope with stress?

Coping refers to the set of cognitive, emotional, and behavioral responses used to manage a stressful situation.<sup>32</sup> Coping styles are seen in an individual's consistent use of particular strategies for managing stressors across contexts. An individual's coping style is dependent on a number of interacting factors, including problem-solving skills, social skill, social support, health and energy, beliefs, material resources, temperament, and familial coping patterns. Successful coping is not

indicated by the absence of distress but rather by how the event is managed.<sup>8,32</sup>

The coping effect is accomplished in two major functions: problem-focused, which involves addressing the problem causing distress; and emotion-focused: which is aimed at ameliorating the negative emotions associated with the problem.<sup>21,33</sup> A meta-analysis<sup>34</sup> of psychoeducational programs composed of health education (problem-focused) and stress management (emotion-focused) for CHD in a cardiac event such as myocardial infarction (MI), CABG surgery, PTCA or combination found that psychoeducation programmes yielded a 34% reduction in cardiac mortality and a 29% reduction in the recurrence of MI. Problem-focused coping strategies attempt to change the troubled person or the environment by acting on the environment or the person. The efforts are often directed at defining the problem, generating alternative solutions, weighting the alternatives in terms of their costs and benefits, choosing among them, and acting. Coping failure may be due to an uncomplicated lack of knowledge, skill, or experience.<sup>32</sup>

Assessing the problem is essential for the nurse to help the patients and caregivers solve the problem. Many studies have shown that patients with CHD need information about their disease, investigative and treatment procedures (both pre and post procedure) and how to take care themselves when they stay at home.<sup>35</sup> The goal of giving information is to promote a sense of mastery by enabling the patients or caregivers to anticipate events, to facilitate understanding

of the meaning/purpose of these events, to correct misappraisals and to avoid ambiguity, confusion, and fear of the unknown. Information giving is congruent with information seeking as a dominant coping strategy and is enhanced by the provision of sensory descriptions. It is important to remember that some patients cope by avoidance and may experience increased stress when health information is provided. Although certain information may be deemed necessary, refocusing may be the most effective intervention for these individuals. Family members should be included in this process whenever possible.<sup>8</sup>

Information can be provided by a variety of methods, including (1) verbal discussions with the physician, nurse, and other health care team members in group, one on one discussion, or both; (2) videotapes of a disease, hospitalization, procedure, or discharge video which summarizes the self care activities; (3) written information or picture books; (4) preoperative classes; (5) hospital tours; (6) via computer/internet. It is important to remember that information processing is affected by multiple factors, including stress and cognitive level. Stress affects learning and retention of information.<sup>36</sup> Thus, ongoing assessment of stress and validation of the patients' understanding are needed.<sup>8</sup>

Verbal information should be simple, realistic, and nurses should avoid words that can be threatening or misinterpreted. Written materials are generally enhanced by visual images or diagrams. Presently, vast amounts of health related websites are available on the internet and are rapidly becoming the most



frequently accessed on-line resources. However the quality has been found to be questionable. It is essential for nurses and health care personnel to collect or develop health education programs in the hospital homepage or a specific homepage which includes the content of disease, treatment procedures and self care which are general or specific to that hospital. To strengthen adherence to recommended recovery management strategies, patients may need reinforcement of recovery information and they should be given opportunities to ask questions regarding health concerns as they arise.<sup>37</sup>

Because of advances in surgical and medical technologies, CABG patients can now be safely discharged as early as four days after surgery. With early discharge, patients are faced with increased challenges in the self regulating aspect of post operative care. Patient's instruction have to begin at admission and nurses should encourage family members to participate in the discharge planning program with various education tools.<sup>8.37</sup> Problem-focused and emotion-focused coping can both facilitate and impede each other in the coping process<sup>32</sup> because stress affects learning and retention of information.<sup>36</sup>

#### **Emotion-focused**

Emotion-focused events consist of cognitive processes directed at lessening emotional distress and includes strategies such as avoidance, minimization, distancing, selective attention, positive comparisons, and wresting positive value from negative events.<sup>32</sup> Many studies reported lessening emotional distress improved prognosis in coronary heart disease.<sup>38</sup>

Although many stressful aspects of illness or hospitalization can be reduced or eliminated by correcting faulty appraisals and providing positive reinforcement of correct appraisals, there are still many other aspects with which patients either cannot or will not cope. Some stressors can not be eliminated or avoided. Teaching the patients how to reduce the physical impact of stress on the body such as deep breathing, biofeedback, progressive muscle relaxation (PMR), meditation and guide imagery is essential in holistic care.

Cardiac surgery patients who were taught a simple deep breathing relaxation technique preoperatively to use postoperatively had a significantly decreased blood pressure, heart rate, respiratory rate and pain than control group.<sup>39</sup>

Biofeedback facilitates conscious relaxation and control of physiological processes through feedback most often provided by physiological monitoring equipment. The patient is taught a method of relaxation and then provided data regarding pertinent parameters, such as heart rate, muscle tension, and skin temperature that indicate sympathetic stimulation. Relaxation augmented by heart rate biofeedback has been used successfully in a comprehensive stress-management program in the patient with CHD.<sup>40</sup>

Progressive muscle relaxation (PMR) is one method used to reduce muscular tension. Stress commonly causes muscle tension. Control of muscle tension appear to help reduce the physical effects as well. PMR involves the tensing and then the relaxing of all the major muscle groups, usually in sequential steps from

feet, thighs, buttocks, stomach, chest, hands, forearms, shoulders, neck, and head or from head to feet. The nurse guides the patient through the process or uses a tape recorder. PMR is useful in nursing practice because it is easy to teach and can be used for a wide spectrum of patients. The efficiency of this technique is equal to electromyography (EMG) biofeedback<sup>41</sup> but it much cheaper. For patients with heart disease, especially a few day after MI or surgery, passive PMR is probably more appropriate than active PMR because the patient only relaxes the muscle.<sup>42</sup>

Guided imagery therapy is a cognitive-behavioral technique in which a patient is guided in imagining a relaxing scene or series of experiences.<sup>43</sup> Over 200 research studies in the past 30 years have explored the role of mind-body techniques in helping prepare people for surgical and medical procedures and helping them recover more rapidly. These studies have shown that guided imagery may significantly reduce stress and anxiety before and after surgical and medical procedures. In addition, guided imagery has proven to help people dramatically decrease pain and the need for pain medication, decrease side effects and complications of medical procedures, reduce recovery time and shorten hospital stays, enhance sleep, strengthen the immune system and enhance the ability to heal, and increase self-confidence and self control.<sup>44,45</sup>

Meditation is a learned process through which a person attempts to quiet the mind. The methods used to quiet the mind involve

consciously removing disturbing thoughts or filling the mind with only one thought, such as a mantra or prayer. By removing other thoughts, it is believed that stress can be reduced. Meditation is probably best learned through a mentor, although books and other audiovisual aids are available.<sup>42</sup> One study<sup>46</sup> found that people who had normal to high blood pressure and practiced meditation were 23% less likely to die than people who did not and had a 30% decrease in the rate of deaths due to heart disease.

Massage is a scientific method of manipulating the soft tissues of the body to have specific effects. Its objective is release of tension. Although few studies have examined the effectiveness of massage therapy for heart disease, massage has a relaxing effect and reduces stress-related hormone levels. Lowering stress hormone levels can lower cholesterol and blood pressure and may, therefore, prove to be beneficial for reducing the risk of heart disease.<sup>47</sup>

Prayer is an activity related to religion. It has many forms and expressions, and can be generally defined as "a representation of one's longing for communication or the communication with God or the Absolute".<sup>42</sup> Faith and prayer has been shown to positively affect healing. Koenig, et al.<sup>48</sup> found that individuals who attend religious services at least once a week and prayed at least once a day or studied the Bible frequently were 40% less likely to have high blood pressure than those who did so infrequently. Another study<sup>49</sup> found that people who pray have lower depression and suicide rates. A qualitative study<sup>42</sup> of adults undergoing CABG found that spiritual-

religious issues become very important when a person is faced with a crisis or potentially life-threatening event.

Social support in addition to the many interventions mentioned above is efficient in decreasing stress. There is evidence that social support, whether provided by a successful patient, partner or other, may serve to buffer the impact of psychological stress, ameliorating distress and enhancing physical recovery.<sup>19</sup>

**Conclusions**

CHD is a non communicable disease that cannot be cured. The patients are not only confronted with many stresses in their life but are also confronted with many stresses from their symptoms, treatment and self care. Stress affects many systems of the body such as the cardiovascular system, and the immune system. Studies have indicated that patients need information about their disease, investigative and treatment procedures, and self care. Nurses can help patients cope with stress in two ways by using problem-focused which involves addressing the problem causing distress and emotion-focused which is aimed to improve the negative emotions associated with the problem. Nurses play an important role in enhancing a holistic and psychosocial approach to assist patients achieve better health outcomes.

**Acknowledges**

The author thanks Prof. Dr. Jillian Innouye and Assit. Prof. Dr. John Casken, School of Nursing and Dental Hygeine, University of

Hawaii, USA for taking the time to edit both the content and language of this article.

**Reference**

1. Prevalence rate of heart disease [Online]. 2003 [cited 2003]; Available from: URL:<http://www.wrongdiagnosis.com>
2. Department of morphology. [Online]. 2005 [cited 2005]; Available from: URL: <http://epid.moph.go.th>
3. Cardiovascular disease statistics. [Online]. 2005 [cited 2005]; Available from: URL:<http://www.americanheart.org>
4. Burg MM. Stress, behavior, and heart disease. Connecticut: Yale University, School of Medicine; 2002.
5. Whitehead DL, Strike P, Perkins–Porras L, Steptoe A. Frequency of distress and fear of dying during acute coronary syndromes and consequences for adaptation. *Am J Cardiol* 2005 Dec 1;96(11):1512–1516.
6. Mended Heart Organization. Heart attack survivors often fear a second attack more than death [Online]. 2006 [cited 2006 ]; Available from: URL:<http://www.seniorjournal.com>
7. Pozuelo L. Depression and heart disease. Heart & Vascular institute, The Cleveland Clinic [Online]. 2004 [cited 2004 May]; Available from: URL:<http://www.clevelandclinic.org>
8. LeRoy S, Elixson EM, O’Brien P, Tong E, Turpin S, Uzark K. Recommendations for preparing children and adolescents for invasive cardiac procedures. *Circulation* 2003;108:2550–2584.
9. Pennsylvania’s guide to coronary artery bypass graft surgery 2004 [Online]. 2006 [cited 2006 Feb]; Available from: URL:<http://www.phc4.org>
10. Klecoft–Glaser JK, Page GG, Marucha PT, MacCallum RC, Glaser R. Psychological influences on surgical recovery: Perspectives

- from psychoneuroimmunology. *American Psychologist* 1998 November;53(11):1209-1218.
11. Jondsottir H, Baldursdottir L. The experience of people awaiting coronary artery bypass graft surgery: The Icelandic experience. *J Adv Nurs* 1996;27:68-74.
  12. Lindsay P, Sherrard H, Bickerton L. Educational and support needs of patients and their families awaiting cardiac surgery. *Heart Lung* 1997;26:458-465.
  13. Staples P, Jeffrey J. Quality of life, hope, and uncertainty of cardiac patients and their spouses before coronary artery bypass graft surgery. *Can J Cardiovasc Nurs* 1997;8:7-16.
  14. Fitzsimons D, Parahoo K, Richardson, SG, Stringer M. Patient anxiety while on a waiting list for coronary artery bypass graft surgery: A qualitative and quantitative analysis. *Heart Lung* 2003 Jan/Feb;32(1):23-31.
  15. Vingerhoets G. Perioperative anxiety and depression in open-heart surgery. *Psychosomatics* 1998;39:30-37.
  16. Barbarash OL, Shabalina LV, Bergen EI, Guliaeva EN, Barbarash NA. Phenomenon of preoperative stress in patients with ischemic heart disease. Assessment of its clinical and prognostic significance. *Ter Arkh* 1998; 70(12):31-35.
  17. Bergmann P, Huber S, Michler H, Liebl E, Hinghofer H, Rehak P, et al. Perioperative course of stress in patients confronting cardiac surgery. *The Internet Journal of Thoracic and Cardiovascular Surgery* 2000;3(2):1-12.
  18. Deva C, Bansal S, Gombar S. Ventricular tachycardia encountered in the preinduction period in an anxious patient. *Anaesthesia* [Online]. 2000 Feb 2 [cited 2000 Feb 14]; Available from: URL:<http://www.priority.com/anaes/tachy.htm>.
  19. Lane D, Carroll D, Lip GYH. Psychology in coronary care. *Q J Med* 1999;92:425-431.
  20. Leske JS, Pelczynski SA. Caregiver satisfaction with preparation for discharge in a decreased-length-of-stay cardiac surgery program. *J Cardiovasc Nurs* 1999 Oct;14(1):35-43.
  21. Blonna R. Coping with stress in a changing world. St. Louis: Mosby; 1999.
  22. Ghiadoni L, Donald AE, Cropley M, Mullen M, Oakley G, Taylor M, et al. Mental stress induces transient endothelial dysfunction in humans. *Circulation* 2000 November 14;102(20):2473-2478.
  23. Strodl E, Kenardy J, Aroney C. Perceived stress as a predictor of the self-reported new diagnosis of symptomatic CHD in older women. *International Journal of Biobehavioral Medicine* 2003;10(3):205-220.
  24. Strike PC, Magid K, Brydon L, Edwards S, McEwan E, Steptoe A. Exaggerated platelet and hemodynamic reactivity to mental stress in men with coronary artery disease. *Psychosom Med* 2004 July 1;66(4):492-500.
  25. Schellenbaum GD, Rea TD, Smith NL. Mental stress-induced ischemia and all cause mortality in patients with coronary artery disease. *Circulation* 2002 Nov 26;106:e183.
  26. Everson-Rose SA, Lewis TT. Psychosocial factors and cardiovascular diseases. *Annual Review of Public Health* 2005 April;26:469-500.
  27. Stress: Why you have it and how it hurts your health. *Health/Library* [Online]. 2005 [cited 2005 Dec 22]; Available from [www.cnn.com/HEALTH/library/SR/00001/html](http://www.cnn.com/HEALTH/library/SR/00001/html).
  28. Segerstrom S, Miller G. Psychological stress and the human immune system: A meta-analytic study of 30 years of inquiry. *Psychological Bulletin* 2004;130(4): 601-630.

29. Kiecolt-Glaser JK, Marucha PT, Malarkey WB, Mercado AM, Glaser R. Slowing of wound healing by psychological stress. *The Lancet* 1995 November 4;346:1194-1196.
30. Glaser R, Kiecolt-Glaser JK, Marucha PT, MacCallum RC, Laskowski BF, Malarkey WB. Stress slows wound-healing process. *Archives of General Psychiatry* 1999;56:450-456.
31. Monnikes H, Tebbe JJ, Hildebrandt M, Arck P, Osmanoglou E, Rose M, et al. Role of stress in functional gastrointestinal disorder: Evidence for stress-induced alterations in gastrointestinal motility and sensitivity. *Digestive Disease* 2001;19(3):201-211.
32. Lazarus RS, Folkman S. *Stress, appraise, and coping*. New York: Springer Publishing; 1984.
33. Folkman S, Moskowitz JT. Coping: Pitfalls and promise. *Annu. Rev Psychol* 2004; 55:745-774.
34. Dusseldorp E, Van ET, Maes S, Meulman J, Krasij V. A meta-analysis of psychoeducational programs for coronary heart disease patients [Online]. 1999 [cited 2005 Dec 22]; Available from: URL:<http://agatha.york.ac.uk/online/dare/20003-8313.htm>
35. Scott JT, Thompson DR. Assessing the information needs of post myocardial infarction patients: a systemic review. *Patient education and counseling* 2003 June;50(2):167-177.
36. Cupples S. Effects of timing and reinforcement of preoperative education on knowledge and recovery of patients having coronary artery bypass graft surgery. *Heart and Lung* 1991;20(6):654-660.
37. Brennan PF, Moore SM, Bjornsdottir G, Jone J, Visovsky C, Rogers M. HeartCare: an internet-based information and support system for patient home recovery after coronary artery bypass graft (CABG) surgery. *Journal of Advanced Nursing* 2001 Sep; 35(5):699-708.
38. Johan D, Dirk B. Reducing emotional distress improves prognosis in coronary heart disease: 9-year mortality in a clinical trial of rehabilitation. *Circulation* 2001 October 23;104(17):2018-2023.
39. Miller KM, Perry PA. Relaxation technique and post operative pain in patients undergoing cardiac surgery. *Heart Lung* 1990; 19(2):136-146.
40. Nolan RP, Kamath MV, Floras JS, Stanley DJ, Pang C, Picton P, et al. Heart rate variability biofeedback as a behavioral neurocardiac intervention to enhance vagal heart rate control. *Am Heart J* 2005 June;149:1137.e1-1137.e7.
41. Ost L, Breitholtz E. Applied relaxation vs. cognitive therapy in the treatment of generalized anxiety disorder. *Behavior Research and Therapy* 2000; 38:777-790.
42. Ignatavicius DD, Workman ML, Mishler MA. *Medical-surgical nursing across the health care continuum*. 3<sup>rd</sup> ed. Philadelphia: W.B.Saunders; 1999.
43. Hamilton A. Guide imagery therapy. *Encyclopedia of mental disorders* [Online]. 2005 [cited 2006 Jan 31]; Available from: URL:<http://www.minddisorders.com>
44. Tusek D, Cwynar R, Cosgrove DM. Effect of guide imagery on length of stay, pain and anxiety and two days shorter hospital stay. *J Cardiovasc Manag* 1999;10(2):22-28.
45. Guided imagery: It's use in heart surgery and other procedure [Online]. 2005 Sep [cited 2005]; Available from: URL:<http://www.clevelandclinic.org>
46. Nazario B. Meditation may cut heart disease death. *The American Journal of Cardiology* 2005 May 2;95:1060-1064.
47. Hart JA, Lee L, Lippin RA. Myocardial infarction. [Online]. 2004 [cited 2004 April]; Available from: URL:<http://www.allina.com>

48. Koenig HG, George LK, Hays JC, Larson DB, Cohen HJ, Blazer DG. The relationship between religious activities and blood pressure in older adults. In *J Psychiatry Med.* 1998;28: 189-213.
49. Bramm AW, Beekman AT, Deeg DJ, Smit JH, van Tilburg W. Religiosity as a protective or prognostic factor of depression in later life: results from a community survey in the Netherlands. *Acta Psychiatr Scand* 1997;96:199-205.

