DEPRESSION AND ANXIETY IN THE CARDIAC PATIENT: THE NEED FOR A COMPRHENSIVE CARDIAC PSYCHOLOGY APPROACH

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For Skyler, Alexa, Courtney & Evan

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& Question Everything

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Introduction

Since the 1960's when cardiac care and interventions were in their infancy, cardiac care itself has made rapid advancements within its biomedical realm. While heart pioneers such as Denton A. Cooley who started the Texas Heart Institute in 1962, and Michael E. Debakey were laying the foundation from which heart programs across the country would look to for the latest surgical techniques, medicine as a whole had surrounded itself with many bio-physiological accomplishments and was able to safely don the white coat of empiricism resetting their own standards as technology and health care grew and improved. While the numbers of people saved through modern cardiac care and interventions are impressive, heart disease is still the number one cause of mortality for both men and women. At the start of this decade, data showed that "Heart disease causes one in every three deaths in the United States annually and is responsible for 17 percent of yearly healthcare spending. When lost productivity is added in, the total comes to about $444 billion a year" and also that " it is still the number one cause of preventable death in America among both women and men, and among all races and ethnic groups",(Tomaselli GF, Harty M, Horton K, Schoeberl M. The AHA and the Million Hearts Initiative, 2011, p. 1795).

As good as modern cardiac care is, as with many aspects of modern medicine, there is always room to grow and make it better. Heart disease is a true mind/body dilemma and as of late more attention is being paid toward the effects of the mind when it comes to prevention, cause, and recovery. More and more research is yielding evidence of the presence and effect of psychological disturbances within heart disease; chief among these are depression and anxiety. The fact is the physiological substance and the psychological phenomena of heart disease should be natural allies. What is needed is an approach to cardiac care that comprehensively treats the

entire mind/body being, offers paths of prevention, provides meaningful support and strategies after a cardiac event or surgery, and provides doctors with psychological data that can reveal specific problems the patient might have during recovery so that they can be properly addressed thereby providing a better outcome. The space between the biomedical reality and the biopsychosocial nature of heart disease is the true mind/body landscape where psychological interventions can enable and enhance the biomedical properties of healing. This landscape is replete with substantive psychological phenomena that plays a key physiological role in the development, treatment, and healing of heart disease. But most important, this landscape is the space where our physical frailties can mingle with our metaphysical abilities. It is a very short walk from healing a patient by implanting a stent, to enhancing that healing by implanting an idea, a purpose, and a focus that will grant to the patient the full spectrum of care and a more complete intervention.

Hospitals around the country are beginning to incorporate integrative health programs that patients can seek out to help them address any mind/body issues that they may be having. In some aspects these programs are “lip service” to the “healing arts” and there is a great distance between what they can do compared to their biomedical big brother. A true integrative approach must be the willful conflation of the physical, along with the patient’s psychodynamics and awareness. Once that bridge has been built cardiac care will be able to reach new heights.

Cardiac Psychology

The first person to write a book that specifically dealt with some of the psychological dimensions surrounding the cardiac patient was Dr. Robert Allen, who in 1996 authored Heart and Mind: The Practice of Cardiac Psychology. His main focus was dealing with type A behaviors and the adverse effects that they were having on the heart. He is still practicing at the

Division of Cardiology at Weill Cornell Medical College in New York City. In a recent paper, he was recalling how in a 1959 study "2 cardiologists, Meyer Friedman and Ray Roseman, reported that subjects diagnosed type A had an increased risk of myocardial infarction (MI), compared with those assessed type B (largely an absence of type A behaviors). A 22 year follow up of this cohort, however, determined that subjects with type A actually survived their MI's "better" than those with type B"(Allen, 2014, p. 148). The reason for this is that type A people are more likely to experience angina pectoris (chest pain) alerting them to a possible cardiac problem, whereas their calmer type B counterparts are more prone to suffer sudden cardiac death (SCD). Type A people are still in great danger of cardiac problems despite these findings and they can certainly be seen as the genesis of cardiac psychology as pioneered by Dr. Allen.

The world of cardiology and the treatment of the cardiac patient has greatly changed in just the twenty years since Dr. Allen wrote Heart and Mind. Many others have expanded on his work. Also known as behavioral cardiology and psychocardiology, much interest and research has now been aimed at the complexities of dealing with the psychological side of heart disease and the cardiac patient. One such paper by Alan Rozanski M.D. has pointed out that "over the last decade, studies of psychosocial risk factors for CHD have increased exponentially. Accordingly, the present review explores new knowledge regarding behavioral and psychosocial risk factors, with particular emphasis on meta-analytic studies, which were nearly nonexistent before 2005", (Rozanski, 2014, p. 100). These studies, along with professionals like Dr. Allen who are actually practicing cardiac psychology in one form or another, are growing the field and have given birth to an array of different treatments and therapies as well as diagnostic tools specifically designed to address depression, anxiety, and psychosocial issues.

At present, cardiac psychology is pretty much whatever the practitioner wants it to be and whether they wish to keep it a psychological discipline or engage the medical community to broaden its scope of care. “Because behavioral cardiology covers such a wide range of disciplines, and also because medicine is becoming increasingly sub-specialized, no one person has the expertise to master the entire field of behavioral cardiology. It’s approach, therefore, differs from that of most other areas of medicine in that it is essentially interdisciplinary, and typically involves an active collaboration between physicians, psychologists, nurses, and dietitians, with the cardiologist as the gatekeeper.”, (Pickering, Clemow, Davidson, & Gerin, 2003, p. 101). The goal of every cardiac program should be to have as complete and diverse a staff as stated above. This type of collaboration would eventually lead to more advanced psychotherapeutic, pharmacotheraputic and enhanced interventions that will ultimately lead to better patient outcomes. In a hospital setting, the cardiac psychologist would be responsible for designing prevention programs for those patients at high risk of experiencing a cardiovascular problem. This would include helping patients after a cardiac event (post MI) as well as pre op and post op cardiac surgery (coronary artery bypass graft), and proper follow up aimed at reducing readmissions whereas so many of them stem from the psychological effects of the previous cardiac event.

“As continued emotional distress after cardiac events increases risk for morbidity and mortality, understanding the factors that contribute to or diminish risk for psychosocial impairment following a cardiac crisis is a critical endeavor”, (So & La Guardia, May 2011, p. 83).

Biopsychosocial Perspective

In the 1970’s, as medicine was deeply entrenched in the biomedical model, George L. Engel decided there was a need for a new model and introduced us to the biopsychosocial approach. It

never really got any traction, especially within the medical community, yet can be seen as more useful today, not as a specific approach, but rather as a guide to remind us that heart disease is comprised of all the three aspects it represents. The biopsychosocial model as it was designed failed for several reasons. One of them being that it was too reliant on psychology and another being that doctors could not implement it because it was too time consuming. Yet when dealing with depression and anxiety, poverty and social isolation, and the effects that they have on the biological processes and the diseases they contribute to, biopsychosocial considerations are inescapable.

Cardiovascular Risk Factors

According to the Center for Disease Control (CDC), the three main modifiable risk factors for heart disease are high blood pressure, high cholesterol, and smoking. These are followed by physical inactivity, overweight and obesity, and diabetes mellitus. Non-modifiable risk factors are those things we have no control over such as family history and age. The most prominent psychological risk factors are depression and anxiety followed by stress and hostility. When encountered in heart disease psychological risk factors become psychosocial risk factors as evidenced by their epidemiology. “Psychosocial factors that promote atherosclerosis and adverse cardiac events can be divided into two general categories: emotional factors and chronic stressors. Emotional factors include affective disorders such as major depression and anxiety disorders as well as hostility and anger. Chronic stressors include factors such as low social support, low socioeconomic status, work stress, and caregiver strain”, (Rozanski, Blumenthal, Davidson, Saab, & Kubzansky, 2005, p. 637).

There is a need for aggressive preventative programs where modifiable risk factors can be addressed thereby hopefully avoiding the advancement of heart disease or other illnesses. Any

one risk factor is bad enough, but the fact is that most people will have more than just one. For instance depression and anxiety are well known cohorts just like smoking and high blood pressure. These risk factors can sometimes be traced back to aspects of the person such as low motivation, low self-esteem, lack of relevance, or a personality compromised by a negative upbringing.

The Problem: Depression

Depression can be present in an individual before, during and after a cardiac event and is prevalent throughout the population. “By 2020 depression will be second only to CHD as the major cause of global disability adjusted life years lost”, (Page, 2010 p. 736). There have been numerous investigations and meta-analyses in recent years examining the effects that depression has on the cardiovascular system and the evidence keeps mounting. One paper noted that “The evidence falls into three categories. First, depression predicts the onset of and poor prognosis for heart disease (Sherwood et al, 2007; Van der Kooy et al., 2007).Second, the link between depression and CHD is due at least in part to the link between depression and cardiac risk factors and behaviors(Lichtmanet al., 2008; Ziegelstein, 2001) such as noncompliance with medication regiments, dropout from rehabilitation programs, social isolation, tobacco cessation, and poor adherence to secondary preventative treatment – including healthy diets, exercise, and stress reduction – as well as inadequately treated diabetes and hypertension (Carney, Freedland, Miller, & Jaffe).”, (Ai, Rollman, & Berger, 2010, p. 28).

Evidence has clearly shown how great a medical dilemma depression is in the cardiac patient. The first thing to be considered is that depression is severely under diagnosed in the cardiac setting where some estimates put it as high as affecting up to 65% of the patients, and even mild forms of depression can be attributed to a compromised recovery. “The development

of guidelines for family medicine practitioners in the detection and management of post-myocardial infarction (post-MI) depression lends further support to the importance of awareness of depression as a predictor of morbidity and mortality in patients with coronary heart disease" (Blumenfeld, Soujanen, & Weiss, 2012, p. 269).

While the correlation between depression and CAD has been well documented, there are differing views on the mechanism behind the effects it has on the patient. One interesting idea is called the platelet hypothesis. "The platelet hypothesis states that there are abnormalities in platelets in patients with depression. The serotonin metabolism is abnormal in depressed patients' brains as well as in their platelets. Those platelet abnormalities may predispose CAD patients with depression to have platelets more likely to degranulate to certain triggers, leading to thrombosis that can cause an acute MI or unstable angina. Platelets are a critical component of the pathophysiology of CAD, and thus, platelet abnormalities can exacerbate the development and progression of CAD", (Somberg & Arora, 2008, p. 76). While this hypothesis is yet to be proven, there is mounting evidence suggesting there are more than a few adverse reactions the body has to depression, and its influence on platelets. A study was performed as recently as 2014 by the Johns Hopkins Medical Institution in Baltimore. "Platelet reactivity is a key component of the pathophysiology of coronary atherosclerosis. Potent vasoconstrictors such as adenosine diphosphate 9ADP), epinephrine, and thromboxane have been well studied in patients with stable coronary artery disease (CAD). Mental stress has been shown to induce platelet activation in patients with CAD. Serotonin (5-HT) has recently gained increasing interest as greater evidence collects on depression as an independent risk factor for cardiovascular disease. 5-HT has been considered to be the link between the 2 diseases of CAD and depression. 5-HT has been shown

to also mediate an exaggerated platelet response in patients with acute coronary syndrome (ACS)", (Kim MD, McClure III, Neighoff, Vaidya, & Williams, 2014, p. 359).

The role that serotonin plays is well established as biological fact and now we are seeing evidence of serotonin's effect on platelets which further connects depression to heart disease. As early as 1991, the New England Journal of Medicine was reporting findings showing that serotonin could escape certain metabolic pathways and accumulate in platelets. Another concept to explain the association between depression and heart disease is the Macrophage Theory of Depression. Macrophages are white blood cells that basically eat up cellular debris such as microbes and cancer cells. It is as though infections, tissue damage, and antigens in food can create the excessive secretion of macrophage, monoclines, thereby causing depression. The macrophages are also an important part of recovering from cardiac events. "The requirements of monocytes and macrophages for cardiac healing in neonatal and adult hearts after myocardial injury has been demonstrated in a number of studies and depends on several different mechanisms, including removal of necrotic tissue and cellular debris, stimulation of angiogenesis, and promotion of scar formation", (Lorchner et al., 2015, p. 360).

The Immune-Cytokine Model of Depression, or Cytokine (ICMD) –Induced Depression, is unique in that it doesn't consider depression to be a disease but rather "a multifaceted sign of chronic immune system activation. During chronic immune system activation, greater than normal amounts of various cytokines are secreted. The cytokines produce the multifaceted signs and symptoms of depression. Cytokines are at the heart of the immunological basis of depression since they provoke a wide spectrum of neuropsychiatric symptoms when given to human volunteers", (Ronald Smith).

No matter the model or the physiological pathway, depression in the cardiac patient should be addressed and treated as aggressively as the cardiac problem itself. This doesn't necessarily mean that a pharmacological approach is the right option, whereas there is conflicting information on anti-depressants and cardiovascular disease (CVD). It is clear that more research is needed that should focus on the physiological mechanisms and the pharmacologic and psychotherapeutic effects within those mechanisms. A 2013 study states that "Use of anti-depressants and its association with CVD development has been investigated in several prior studies, and the results have been conflicting. Some have reported the antidepressants to increase the risk of CVD, even after adjusting for depression, and some have reported the antidepressants to be protective against CVD, while yet others have found no significant association, especially after adjusting for depression. Potential CVD related side effects of anti-depressants are cardio-toxic blocking of calcium-channels in myocytes, orthostatic hypotension and arrhythmia arising from tricyclic antidepressants (TCA's). In the case of selective serotonin reuptake inhibitors (SSRI's), they have been indicated to increase the risk of bleeding. A suggested mechanism for a cardio-protective effect of SSRI is reduced platelet activity", (Rahman et al., 2013, p. 590). It is important to note that if a person has depression that leads to a cardiac problem, the depression itself can change as it will probably find one or several cohorts such as anxiety either during the health crisis or across the life span if not addressed and treated. Depression might show similar symptoms as laid out by the diagnostic statistics manual (DSM), but in the cardiac patient the symptomology is more unique because of the surrounding health complications and agitated psychodynamics that are trying to process many emotions and feelings aroused by the event. This is why it is important that the patient be seen by a person who knows and understands the intricacies of not just depressive symptoms, but what they are like in a cardiac environment

where every psychological decision must be made taking into account the patient's medical condition. It is far more complex than a person who says "I'm not happy with my job, I'm depressed" or "I don't love my wife anymore, I'm depressed". These are situations best left to today's "counselors" who are great at holding hands. For the person in CCU who just suffered a cardiac event, and who is going to develop different and unique thoughts that will range from fear to confusion to regret, they are going to need the help of someone who possesses the right knowledge and understands all of the information and data from both the psychological as well as the physical side of the situation.

Timing of the onset of the depression is also a factor whereas when it comes to MI patients there is a two fold increase that they will experience a poor cardiac prognosis or suffer another cardiac event than non-depressed patients. An acute cardiac event can be the trigger for the onset of depression and usually yields a more compromised recovery than a patient who had depression before the acute event. Those with treatment resistant depression represent the toughest recoveries because of the persistent nature of the negative health aspect. For many patients who have lived with depression many years before they experience a cardiac event, it's not a question of if, it is just a question of when. Those who experience chronic depression (dysthymia) tend to experience health complications as they reach middle age. This is because depression wears down the body and its ability to self-heal and maintain a protracted period of homeostasis. Depressed people are very poor self healers because they usually worry about a health crisis more than they do thinking about how to get better. With the body in a constant state of arousal, there is a release of stressed-induced hormones such as cortisol and epinephrine that impede the healing process. The cardiac patient, especially those who suffer an MI, are in the greatest need to have their thoughts reorganized so that through guidance and treatment they can find a

positive framework from which they can help to build their own path toward healing, thereby making the healing process a more positive and rewarding experience.

Since it has been established that depression is a risk factor for coronary heart disease (CHD), the question now needs to be asked what effect does (CHD have on depression. “CHD is a potential risk factor for depression, as CHD is associated with increased prevalence of depression. An estimated 17% to 27% of CHD patients have major depressive disorder (MDD), compared with around 5% in the general population. In addition, CHD in older persons without depression at baseline was found to be associated with an increased risk of developing depressive symptoms two years later”, (Meijer, Zuidersma, & De Jong, 2013, p. 2).

The idea that a cardiac event can bring about depressive symptoms is consistent with the fact that just about every major health crisis and illness will no doubt leave a person with a certain amount of depression. One of the questions on the Hospital Anxiety and Depression Scale is if “worrying thoughts go through your mind”? It’s hard to imagine any ill person not being concerned and worried for their health. It’s normal. It’s the severity of the depression that is the indicator as to how much of a problem it might be in someone’s recovery. “Depression has been found to affect the prognosis of patients with CHD even though some of these patients may not always meet the DSM-IV criteria for major depression”, (Kiropoulos et al., 2012, p. 216).

If depression is not treated while the patient is in the hospital for a cardiac event, and they take it home with them, they are more prone to experience a readmission. As the aforementioned article states, “Longitudinal studies have found that individuals with CHD who are depressed are less likely to adhere to their treatment regime and lifestyle recommendations following a cardiac event and might be at higher risk of subsequent cardiac events. Comorbid depression and low

social support has also been found to seriously impact prognosis with a 3 to 5 fold increase risk of death found in those with CHD who had poor social support".

The negative effects of depression on the cardiac patient is broad and touches all types of cardiac issues. Take for example coronary artery bypass surgery (CABG). Depression can be found pre-operatively, post-operatively, as well as after discharge, and the complications that it produces have been well documented. "Our findings support a growing body of evidence that documents the high prevalence of depressive symptoms after CABG and links the symptoms to adverse outcomes after surgery. In particular, the high levels of depressive symptoms prevalent immediately after surgery, at the time of discharge from the hospital, and 6 weeks after discharge, support the findings of McCrone et al that depression is greater than population norms during the early post-operative period. Our finding that depressive symptoms were highest within 48 hours after extubation is consistent with this earlier report that dysphoria peaks during the second to third postoperative day. Factors related to the surgical experience, such as pain, sleep deprivation, isolation, and loss of control, may intensify feelings of depression in the first few days after CABG", (Doering, Moser, Lemankiewicz, Luper, & Kahn, 2005, p. 321). Of interest in the "factors related to the surgical experience" is the term "loss of control". This term is used by patients in all forms of cardiac events. The feeling that one has lost their own choice and destiny is a psychological shock that the patient struggles with. For the preoperative CABG patient, they are looking at weeks where the life they wanted to live will either be put on hold or changed indefinitely. Those who have a fierce sense of independence are most affected by this loss of control. It takes adaptive strategies to get them to see the one thing they must focus on, whatever control they have, is their recovery, because it is the road back to their total control.

Also of note from the article is the finding that “Patients responses to the stress of surgery is influenced by depression, which may enhance the production of pro inflammatory cytokines”, which reinforces the idea of cytokine-induced depression.

The effects that depression has on heart disease is far from being fully understood. Further investigation will no doubt yield a better understanding, and that understanding will yield better patient interventions. This will ultimately lead to better patient outcomes and decreased readmissions. As one study had found, “This research adds to previous studies by using an empirically supported model of depression and anxiety to interpret the association with CABG patient outcomes where an increased risk of readmission was associated with preoperative anxiety and post-operative depression.” Also “The six-month readmission rate in the present study was 32% and the most common causes were for infections, pleuritic chest pain, respiratory complications, arrhythmia and angina as is consistent with previous readmission studies”, (Tully, Baker, Turnbull, & Winefield, 2008, p. 287).Readmissions can occur for many reasons and many of those reasons can be traced back to complications rooted in a compromised recovery because the mind side of the problem was never properly addressed or treated. To do this there will have to be an inclusion of cardiac psychology with which a more thorough profile of the patient can be made so that all the issues can be seen and a more collaborative approach to healing can be fostered.

The Problem: Anxiety

There are many studies that have taken place to measure the prevalence of Anxiety in the United States. There’s a lot of number crunching and data to be digested, and the results are sometimes skewed because of issues pertaining to those diagnosed with an anxiety disorder who don’t get counted. While there are countless other people who can’t afford the proper healthcare

or those who self-medicate are disqualified. Perhaps a more practical way of getting a good idea of just how prevalent anxiety has become is to take into consideration some words from a 2010 Forbes magazine article titled America's Most Popular Mind Medicines that states "Doctors write nearly 50 million prescriptions for Xanax every year – that's more than one Xanax prescription every second". And that's just for Xanax. There are at least seven other anxiolytics in the benzodiazepine family alone. And the truth is that it is impossible to tell how many of those prescriptions are going toward real anxiety patients whereas 90% of those scripts are being written by general practitioners and internists, and not by psychiatrists.

Like depression, anxiety can lead to the cause of heart disease and cardiac events, exacerbate during the illness and complicate recovery, and eventually be the cause of readmission. There is an estimated 40 million people in the United States with some form of anxiety disorder. Of these, many have generalized anxiety disorder (GAD) which is not heart friendly. "The hallmark clinical feature of GAD is unequivocally excessive and uncontrollable worry (anxious apprehension). Worry might also emerge as important in CHD considering that interrelated cognitive processes (e.g. rumination, worry, and perseverative cognitions) are evident in GAD and depression", (Tully, Cosh, & Baune, 2013, p. 628). Because there is so much worry connected to the cardiac patient, it makes worry one of the top psychological issues that need to be addressed immediately.

In many ways anxiety is just as bad, if not worse than depression. Like depression, the afflicted spend a lot of time worrying about things that aren't worth worrying about or beyond their control. But where depression shuts you down, anxiety ramps you up. With depression, there can be suicidal ideation whereas a person with anxiety is generally afraid of death. And where in

depression everything seems hopeless, with anxiety there is constant worry that everything will become hopeless.

Anxiety in the cardiac patient is not studied as much as depression, but what evidence there is points towards the dangers it possesses. “Symptoms of anxiety are frequent among patients with coronary heart disease (CHD) and increased prevalence rates of up to 30% for any kind of anxiety disorder were found in groups of cardiologic patients. Elevated levels of anxiety are associated with higher levels of depression and an impaired health-related quality of life. Furthermore, anxiety seems to be of prognostic value for the development and the course of CHD. This was confirmed by two recent meta-analyses: anxiety emerged as an independent and significant risk factor for the development of CHD in healthy subjects as well as a risk factor for a worse prognosis and increased risk of mortality in patients with established CHD. The influence of anxiety as a risk factor has also been found to be independent of depression or other psychological factors”, (Merswolken, Siebenhuener, Orth-Gomer, Zimmerman-Viehoff, & Deter, 2011, p. 365).

One of the problems with anxiety occurs when a person goes through life absent of any anxiety symptoms and then has a cardiac event such as an MI and the onset of anxiety is sudden and forceful. This type of shock to the system does not go away on its own and can lead to periods of anticipatory anxiety, panic attacks, post traumatic stress disorder (PTSD), and substance abuse through self-medication. Anxiety can have far reaching effects that in several ways can become psycho-anatomical as the previous article pointed out. “Anxiety has been linked to coagulation and fibrinolysis, which is one of the pathophysiologic mechanisms potentially mediating this relationship”. It has also been found that, “In PTSD, biological factors such as lower cortisol levels, increased sympathetic activity and resting mean blood pressure

have been shown to be related to a hypercoagulable state, reflected by an increased amount of procoagulant molecules, providing a plausible biopsychological link to coronary artery disease", (Robicsek, Makhoul, Klien, Brenner, & Sarig, 2011, p. ?) High levels of anxiety are common in those with PTSD making it a valid link as a cause of hypercoagulation.

The relationship between anxiety and coronary artery disease has always been apparent from a psychological stand point, but now as the evidence keeps coming in via research and studies, it is now more apparent from a medical perspective whereas the data shows that "the pathophysiologic mechanisms that have been proposed as mediators for this relationship is the activation of coagulation and fibrinolysis. It has been shown that acute mental stress activates coagulation and fibrinolysis within a physiological range, and that chronic psychosocial stressors are related to a hypercoaguable state reflected by an increase in procoagulant proteins and by reduced fibrinolytic capacity". The article goes on to explain how anxiety in an effort to help the body, actually becomes an agent that does more harm than good. "There is also evidence for an activation of hemostasis through anxiety and to a lesser extent, through depression. Subclinical anxiety symptoms were linked to a higher level of fibrinogen, plaminogen-activator-inhibitor-1 (PAI-1) and D-dimer. Neuroendocrine and neural responses triggered by anxiety can be described as part of allostasis, i.e. the efforts of the body to maintain homeostasis and assure survival under stress. When these efforts are inefficiently repeated, the resulting wear and tear on the body is labeled the 'allostatic load', which can accelerate disease processes such as CAD. For CAD, hemostatic alterations promoting atherosclerosis and thrombosis are one possible component of allostatic load", (Geiser et al., 2008).

As mentioned earlier, when the body is threatened by illness, anxiety sets in. When the body is in a prolonged state of arousal, there is a psychological negative effect. This is what the

allostatic load is and it is fueled by anxiety and flawed psychological processes. Because anxiety rarely stays in a mild or manageable state for too long a period of time, especially during a health crisis like a cardiac event, the allostatic load is prone to increase until one of two things happens, the first being the formation of a disease or health problem, or the anxiety gets cut off so as to reduce the allostatic load and a path toward homeostasis can be reconfigured. Anxieties biological effects on the cardiac patient must be fully understood and addressed if there is going to be a full recovery.

Another article addresses the aforementioned plasminogen-activator-inhibitor-1 (PAI-1) and D-dimer. “The role of D-dimer in atherosclerosis but also of other hemostasis molecules like fibrinogen and the antifibrinolytic serine protease type 1 plasminogen activator inhibitor (PAI-1) is further underscored by numerous prospectively designed studies showing a positive association between these measures and increased coronary risk”, (Von Kanel, Kudielka, Schulze, Gander, & Fischer, 2004, p. 354). Hypercoagulability is directly linked to high levels of anxiety and forms a peripheral problem for the cardiac patient and those trying to treat them. The anxiety forms a barrier for the proper implementation of interventions and their healing results as it continues to be an instigator of future clotting and complications as stated by Von Kanel et al, “Given the emerging evidence for a link between anxiety and cardiovascular disease, including acute coronary events, there is a surprising dearth of studies on hemostatic function in subjects with both anxiety symptoms and anxiety disorders. If anxiety was associated with accelerated clotting, this might help explain the increased incidence of arterial thrombotic events in individuals who feel anxious”.

Anxiousness can be very high for the cardiac preoperative patient. While great effort has gone into easing a patient’s fears and anxieties by a caring and attentive staff, they usually lack

the knowledge and expertise of a cardiac psychologist. Yet through studies, a better understanding of the problem is coming into focus. “Stress and anxiety were present in cardiac patients in the preoperative period. The results of this study allowed us to showcase not only the intrapersonal factors (pain, illness, and suffering) but also the extra personal ones (anesthesia, surgery, and complications after surgery) which are the causes of anxiety before surgery. The high intensity of stress and anxiety level in the preoperative period of cardiac patients depend on the gender of the patient. Women are more often afraid of cardiac surgery than men. The study showed that the greater the patients anxiety resulting from his state of health, the greater the intensity of stress in the preoperative period”, (Rosiek, Kornatowski, Rosiek-Kryszewska, Leksowski, & Leksowski, 2016, p. 7). The suggestion that women are more afraid than men must be an observational one because even with using tests or scales, anxiety levels are difficult to measure and a person who appears to be less anxious could actually be experiencing high levels of worry and anxiety. It is possible for one patient to experience weeks of high levels of anxiety leading up to surgery, and then it is possible for someone to keep it in check, only to have it erupt the day of the surgery. And this type of anxiety is almost always completely internalized unlike day to day anxiety which usually manifests itself in physical ways such as rashes, chest pain, dizziness, loss of appetite and nervousness. It can be said that preoperative anxiety is a more “well thought out anxiety” based on medical information, severity of illness, type of surgery, and survival rates. Gender plays a neutral part when these factors are considered. Also, patients have a way of shaping their anxiety through comparisons such as observing how well other people have managed through a similar surgery. If someone they know had bypass surgery that didn’t go well, it is likely to raise the level of anxiety in them. One of the curious aspects of anxiety is that it is something that we make ourselves. It is a psychological product of

our world, how we see ourselves in our world, and how we perceive the threats from our world. When a patient is facing bypass surgery, there are many immediate threats to their world, and while these threats can't be eliminated, they can be illuminated, and be presented to the patient as less of a threat and more of a help.

Anxiety is also a clever illness and should never be underestimated. Given the right conditions, anxiety can mutate much in the same way a virus can, and will become adaptable to the hosts psychodynamic weaknesses until the anxiety becomes entrenched in the persons daily functioning. Once this happens, behaviors will become modified due to the negative reinforcement emanating from the anxiety. Doubts and fears will become psychological check points for most activities as the person's world slowly closes in on them, one anxious day after another. These are the things people who live with anxiety have said about their condition. Luckily they are also the ones who didn't want to stay like that and sought help so they could regain their normal life back. It is so unfair to help someone through a cardiac crisis with the best doctors and latest techniques to provide them with a cure, only to let them go home where without proper follow up, some of them will be psychologically cannibalized by anxiety and depression.

Depression and Anxiety as Cohorts

It is obvious how debilitating and how complicating depression or anxiety can be. Each one is its own formidable problem. But together they are entirely something else. Comorbidity between anxiety and depression is very strong as is its effects on cardiovascular disease. And the fact is that wherever you find one of them, the other is likely to also be present. Once they are together they begin to undermine a person's health. "It is believed that behavioral mechanisms and pathophysiological mechanisms underlie the relationship between stressors, such as

depression and anxiety, and heart disease. Poor psychosocial conditions can contribute to adverse health behaviors, such as smoking and alcohol consumption. Direct pathophysiological mechanisms include affective disorders activating the hypothalamic-pituitary- adrenal (HPA) axis and the sympathetic nervous system (SNS), which in turn affects neuroendocrine, sympathetic, and behavioral activation. Since anxiety and depression are stressors that are likely to be related to these mechanisms, it is imperative to consider both when assessing for heart disease", (Berecki-Gisolf, McKenzie, Dobson, McFarlane, & McLaughlin, 2013, p. 592).

The effects of anxiety and depression must be considered with specific patient populations whereas its effects will be as different as each disease. Take heart failure (HF) patients for example. It is understandable that this class of patients would struggle with high levels of depression and anxiety. "In addition to the severe physical impairments, many HF patients also face harsh emotional challenges, particularly depression and anxiety. Research has indicated that at least one in five HF patients present clinically significant depressive symptoms, and the prevalence of anxiety has been reported in the range of 18% to 63%." The subsequent study revealed just how bad depression and anxiety can affect HF patients. "This study showed that both depression and anxiety were common emotional difficulties experienced by HF patients. Approximately half or more of the participants exhibited moderate to severe symptoms of depression or anxiety. This result is particularly alarming considering the measures used in this study were devoid of somatic symptoms and could not falsely inflate the severity of these emotional disturbances. In addition to the observation that emotional stress was common in HF patients, this study also demonstrated depression and anxiety at baseline independently predicted not only the concurrent physical health functioning but also its decline over a 6-month period while controlling for demographic and medical covariates. Furthermore, the increase in

depression or anxiety symptoms over 6 months further predicted the deterioration in patients' physical functioning which could not be explained by the baseline levels of depression and anxiety, as well as other covariates", (Shen et al., 2011, p. 379). It is easy to see the debilitating effects the depression and anxiety as cohorts can have on, in this particular case, patients with HD.

They stated the prevalence of anxiety was 18% to 63%. The real number is probably on the high side, somewhere around 50% with very few patients being able to say that they truly don't feel depression and anxiety at all. And while it is hard to miss the symptoms of depression and anxiety at these levels, it is not hard to misdiagnose it because there can be a grey area where the depression and anxiety overlap making it difficult to gauge which one is having an effect on a particular behavior or emotion. Because so many studies have looked at either depression on its own or anxiety on its own, the subtleties of them as cohorts is going to need a lot more investigating.

Another patient population that is dramatically affected by the combination of depression and anxiety is those who have had to experience a myocardial infarction (MI). Depression and anxiety generally tend to co-occur in patients after an MI. The onset of negative emotions can start as soon as the patient is stable and has time to digest what has happened and the immediate effects it is going to have on their life. "Negative emotions, such as depression and anxiety, have been related to coronary artery disease (CAD) and a poor prognosis after myocardial infarction. Possible mechanisms linking negative emotions to the post-MI period include increased vulnerability to arrhythmias as a result of increased sympathetic tone and increased platelet aggregation", (Strik, Denollet, Lousberg, & Honig, 2003, p. 350). In the post MI patient it is the effects of the anxiety that will outweigh the effects of the depression, especially in the hospital

setting. For those with pre-existing anxiety the hope is that the anxiety can be stabilized pharmacologically if that is how they are managing it. For those who didn't have pre-existing anxiety the effects of the event can produce a sensory and emotional overload. Those without pre-existing anxiety are also more prone to have put off seeking help once they had the symptoms of a heart attack. Many people go into "cardiac denial" and try to dismiss the symptoms as something else. They engage in avoidant behavior because the prospects of experiencing something as life changing as a heart attack is too overwhelming. Some who are in generally good physical health such as people who eat right, exercise, and watch their weight, will sometimes have the longest pre-hospital delays as the struggle with the acceptance that such a thing could happen to "them". Reducing pre-hospital delay is widely recognized as a crucial step in reducing mortality from ACS. Studies investigating pre-hospital delay (delay from the onset of symptoms to hospital admission) have shown that the largest proportion of this time interval (60-80%) consists of the time taken by patients to evaluate their symptoms and reach a decision to seek medical help (decision delay). Only 25% of patients experiencing acute cardiac symptoms call for medical help within one hour of symptom onset, and 40% wait more than 4 h before seeking help. Previous studies have reported average delays between 2 and 4 h exposing patients to a high risk of fatal cardiac arrhythmias and increasing their risk of extensive myocardial damage", (Perkins-Porras, Whitehead, Strike, & Steptoe, 2008, p. 503).

Cardiac denial can continue even after hospitalization and the patient is stable. There can be an attitude of non-acceptance and the patient will reconfigure the event into something more agreeable with their ego. Some people try to find their comfort zone when it comes to rationalizing adverse life events and something as abrupt as a cardiac event is something that will have to set in slowly for some patients. Cardiac denial can also lead to noncompliance of

recommended changes once they get home. A person can find themselves falling back into an unhealthy diet because they think “that wasn’t really a heart attack. I can eat what I want”. The Cardiac Denial of Impact Scale can help with assessing the patients’ level of denial while they are in the hospital which could help with designing an approach to get them to move toward acceptance of the situation.

With all the different ways depression and anxiety affect an MI patient, it becomes clear that there is a need to have it addressed by someone who specializes in it. “The high levels of symptoms of distress observed in this and other studies argue strongly for routine psychological screening of all MI patients in hospital. Those identified as suffering from depression and/or anxiety should be considered for psychological or pharmacological treatment, if there are no cardiac contra-indications. In addition the persistence of symptoms of depression and anxiety following discharge from hospital, as well as the appearance of depression and anxiety in patients who were not previously distressed, suggests the need for regularly reviewing patients’ psychological status, and intervening when necessary”, (Lane, Carroll, Ring, Beevers, & Lip, 2002, p. 19).

Of great importance is to get the anxiety under control because it can create so many setbacks for the patient even after they leave the hospital. More so than depression, anxiety could ultimately lead to another cardiac event and readmission as the anxiety interferes with the proper healing process and turns the mind into the body’s enemy. “Anxiety results from perceptions of threat and inability to control upcoming situations. The anxious apprehension and arousal results in physiological changes that may affect the cardiovascular system, such as enhanced activation of the hypothalamic-pituitary-adrenal axis, increased fibrin turnover and reduced heart rate variability. Cardiovascular disease is more prevalent in anxious individuals and anxiety was

found to be predictive of recurrent cardiac events in post-MI patients, over and above the effect of depression", (Denollet, Strik, Lousberg, & Honig, 2006, p. 351).

A good assessment tool to use that reveals the depression and anxiety in the patient is the Symptom of Anxiety-Depression index which is brief and easy to use. It focuses on the anxiety through tension and recklessness, and on the depression through feeling blue and hopelessness. It has been proven to be a reliable tool and is a good place to start to identify the anxiety and depression. As the patient stabilizes, a deeper look at the symptoms can be made using other tests and scales.

Preoperative & Postoperative Anxiety & Depression

High levels of anxiety can have a negative influence on physiological aspects and cause postoperative complications which could turn into a longer hospital stay. Just about everything about preoperative cardiac surgery can create anxiety from the tests to the anesthesia. It is crucial that the patients' anxiety be in a manageable state so as to ensure success after the surgery. There are many talented nurses who go the extra mile to ease the patients' worries and fears but the process of relieving the anxiety has to start a long time before the patient gets to the operating room. It has to start the day they are admitted to the hospital so that it can become a daily positive aspect of their journey that is aimed at returning them to good health. The talents of the nurses and doctors must be matched by someone who is specifically trained to deal with preoperative anxiety. "Numerous studies have underlined the importance of preoperative depression and anxiety for mortality after cardiac surgery. Although anxiety and depression are highly co-morbid and tend to share risk factors, anxiety is a discrete emotional experience. Anxiety has been characterized as a future-oriented, negative affective state with a component of fear, resulting from the perception of threat and the individual's perceived inability to predict,

control, or obtain the desired results in upcoming situations. Symptoms of anxiety may be adversely associated with a high risk of ischemic heart disease, and anxiety has been associated with an increased risk of myocardial infarction and fatal ischemic heart disease after CABG. In a parallel analysis of preoperative anxiety and depression, only anxiety was significantly associated with increased mortality after adjusting for known mortality risk factors", (Cserep et al., 2012, p. 5).

Once again control becomes a big issue. Loss of control is always in the forefront of the cardiac patients mind no matter how much they wrestle with trying to come to terms with it. Cardiac surgery is very problematic for those who have control issues where they can be expected to experience very high levels of anxiety and depression. The more the loss of control, the higher the level of anxiety, and the sense of loss of control is not an easily modifiable behavior because it is so ingrained in the persons mind and daily living.

Another group that is affected by preoperative anxiety is the elderly who may have some control issues already due to compromised mobility and other physical ailments. "Significant levels of patient-reported preoperative anxiety independently predicted a greater risk of in-hospital mortality or major morbidity in elderly patients undergoing cardiac surgery. This increased hazard persisted even after adjustment for surgical risk (STS risk score) related to traditional risk factors and depressive symptoms. The majority of patients with high levels of anxiety were unlikely to have a clinical diagnosis of general anxiety disorder. Importantly, because high levels of anxiety are potentially modifiable, identifying these patients could provide an opportunity to increase psychological comfort and improve the clinical outcomes in this high-risk group", (Williams et al., 2008, p. 139).

One of the most frequently performed cardiac operations is Coronary Artery Bypass Graft (CABG) with “approximately 519,000 procedures performed each year. CABG accounts for more healthcare resources than any other single procedure and for more than $10 billion in healthcare costs annually.” (Doering, Moser, Lemankiewicz, Luper, & Kahn, 2005, p. 316). Anxiety can be persistent throughout the surgical process and into recovery. Those who had high levels of anxiety in the preoperative phase might experience an increase due to even further decreased mobility and control. Issues with pain commonly will also increase anger on top of the anxiety if not properly attended to. There is also the chance of the patient experiencing post pump psychosis, or “pump head”. This is thought to be caused by micro air emboli leftover in the brain after surgery. It is not directly associated with anxiety but is a form of delirium which in its more difficult cases calls for sedation or antipsychotic medication. It can surface in a mild form that resembles dementia with a loss of memory and confusion.

The patients’ perception of cardiac surgery is the basis for the fears and worries associated with it. Studies have been done examining how the patient views their upcoming surgery. In one such study patients’ who were discussing their preoperative anxiety made comments such as “Will I even make to the surgery?’, “What’s going to happen to me on the table?”, and “I feel like I’m on death row”. Thoughts like these are counterproductive and the patient needn’t get in the habit of catastrophizing the situation because it is only going to make the anxiety worse and lead to physical reactions such as compromising the immune response and create an imbalance in the electrolytes. And high level of preoperative anxiety will lead to postoperative problems. The preoperative anxiety must be identified and treated to avoid future complications such as wounds that heal slower and a higher chance of infections.

A problem that patients' might face after surgery is the possible occurrence of experiencing atrial fibrillation (AF). The reasons why this happens and what causes it are not really understood, but the answer in its simplest form would be that the heart just doesn't like being disturbed and as a result of this interference with its rhythm can occur. "Atrial fibrillation (AF) is the most common rhythm disturbance following coronary artery bypass surgery (CABG). With continuous electrocardiographic monitoring, reported postoperative AF incidences range from 25% to 40% post-CABG and up to 62% after a combined CABG and valve procedure. The occurrences of postoperative AF has been associated with prolonged length of stay (LOS), intensive care unit readmission, a greater need for reintubation, persistent congestive heart failure (CHF), stroke, and increased overall costs", (Villareal et al., 2004, p. 742).

Anxiety, more so than depression, can be an antagonist of AF, points at a correlation between AF and anxiety and depression. The anxiety can influence the severity of the fibrillations as the experience of the AF itself can cause more anxiety leaving the patient in a state of worry and concern. While AF and anxiety attacks do share the commonality of both creating episodes of irregular heart rhythms, AF is essentially an electrical problem with the heart and the anxiety is a problem of the mind, once again proving that cardiac issues are a true mind/body problem. Treating the anxiety won't make the AF go away but it might help diminish its effects, and cessation of the AF will definitely diminish that aspect of the patients' anxiety. Since there is no way of determining which patients' will experience AF and which ones won't, a common sense approach needs to be taken in the prevention of AF starting with the fact that those who can be identified with increased levels of anxiety during the preoperative phase will certainly have a greater risk of encountering AF compared to those with less anxiety or have had

their anxiety treated. Preoperative anxiety must be contained and decreased and maintained through the postoperative setting to help avoid the incidence of AF from occurring.

The anxiety and depression both before and after surgery have been shown to cause many problems which could ultimately lead to Postoperative Cognitive Dysfunction (POCD) which has been defined as a state of cerebral cognitive alterations following surgery and anesthesia that is characterized by impairment of attention, concentration, and memory that may have long term implications. Like so many other problems associated with anxiety and depression the trigger could be a stress response that leads to an increase in cortisol. It affects around 10% of all elderly patients but can occur in any age group. Its onset usually happens in the days and weeks after surgery but is believed to happen after six months due to depression and the fact that depression can be prominent in the cardiac patient for that many months. “Research indicated that patients with preoperative moderate cognitive-affective depression could be at risk for sustained feelings of depression even up to 5 years after surgery. Elevated emotional arousal (in about 10% of the patients in this study) was also found to be an independent risk factor for increased mortality and morbidity in the cardiovascular system”, (Stroobant & Vingerhoets, 2008, p. 330).

Solutions: Assessing the Problems

The more information about the patient, and the quicker a cardiac psychologist (CP) can learn it, the more capable he/she will be of commencing with a targeted approach to help the patient. Through the application of tests, scales, and questionnaires, along with consultations and observations, The CP will be able to create a “Cardiac Psychological Profile”. This profile will help the CP single out the most important concerns of the patient that will need to be addressed. The application of therapeutic approaches that will follow will be designed and shaped by this information and insight. Cardiologists, as well as nurses and other staff, will also find the profile

very useful whereas it can inform them of the most potential psychological obstacles that the patient might display that could interfere with the recovery process. Some of the tests and scales that will be used include:

Hospital Anxiety & Depression Scale A & D (HADS)

Cardiac Depression Inventory (CDI)

Quality of Life Scale (QOLS)

Becks Depression Inventory II (BDI II)

Becks Anxiety Inventory (BAI)

Herridge Cardiopulmonary Questionnaire (HCQ)

Becks Cognitive Insights Scale (BCIS)

Assessment of Depression Inventory (ADI)

Adult Manifest Anxiety Scale (AMAS)

Responses to Stress Questionnaire (RSQ)

Heart Patients Psychological Questionnaire (HPPQ)

Impact of Event Scale (IES-R)

The CP can determine which tests and scales will be most applicable and helpful for the patient based on each patients' specific needs. The more thorough the understanding of the patients complete mind/body condition and needs, the more prepared the CP will be to offer meaningful therapies and solutions. No two patients are alike and each one will display differing degrees of being forthcoming with information, the willingness to be helped, cooperation with doctors and hospital staff, and ability to go about making changes in their life.

Some of the tests and scales are ideal for fast preliminary information about the patient as is the case with the Patient Health Questionnaire and the Hospital Anxiety and Depression Scale.

Both are easy for the patient to understand, can be completed in minutes, and are easy to score and interpret. This first glimpse of the patients' mental state can be important predictors of difficulties that lie ahead as well as serving as behavior markers with which future changes and observations of behaviors can be compared with thus creating a more concise profile whereas the cardiac patient's moods and behaviors can be erratic.

One of the more useful assessment tools is the Herridge Cardiopulmonary Questionnaire (HCQ) which along with depression and anxiety looks at the levels of stress, social support, hostility, self-efficacy and motivation for a more complete picture. It then establishes a Global HCQ Score which reveals how problematic the patient and their recovery might be. It is one of the better assessment tools available and is very useful for post MI and post CABG patients.

Proper assessment will also require biomedical information. As it has been pointed out, a patients' psychodynamics don't merely have a nonchalant relationship with its physical counterpart. There are proven physiological actions that take place because of the influence on one another. This is why the CP must have some knowledge of the medical aspects for two reasons. The first being is that he/she must be able to communicate with doctors and staff. The CP will have to be able to understand the medical foundations of the patient they are treating. And the second being without knowledge of the biomedical aspects the psychological assessments and approaches would be incomplete. You can't treat just the depression in a cardiac patient, you must treat the depression of a cardiac patient. This means that there will be cardiac ramifications tied to the depression and a knowledge of the cardiac realm will be needed.

Long term assessment can be achieved as the patient recovers and prepares to go home. Follow up with the patients is very important because many of them who are exposed to daily psychosocial risk factors will be tempted to engage in the unhealthy behaviors that created their

cardiac problem in the first place. For some, the anxiety and depression that they struggled with in the hospital will be tested by psychosocial stressors when they get home, the distinction between the two of them has been clarified. “The relation between depression and anxiety and coronary heart disease differs from those of other psycho-social factors for several reasons. Firstly, unlike other psychosocial factors, depression and anxiety represent well defined psychiatric disorders, with standardized instruments for measurement. Secondly, depression and anxiety are commonly the consequence of coronary heart disease, and the extent to which they are also the cause poses important methodological issues. Thirdly, the ability to diagnose and treat such disorders makes them attractive points for intervention. Finally, depression and coronary heart disease could share common antecedents—for example, environmental stressors and social supports.” (Hemingway & Mermot, 1999, p. 1462).

Social support has been viewed as one of the more important interventions for the cardiac patient. Those with little or no social support do not fare well during the recovery process compared to those who have a more robust social support. Cardiac patients that live alone have been known to relapse within six months.

Solutions: Treatments

Once a patient is declared stable by the cardiologist or attending physician following a cardiac event or surgery, they should have their first meeting with a CP. Dr. Robert Allen thought it best that the meeting take place as early as possible. One of the benefits of this is that the patient shouldn’t be alone to ruminate about what they have been through. For instance, following an MI, a patients thoughts while alone are almost certainly thoughts that are replete with worry, anxiety, apprehension and many of unanswered questions. The CP can help the patient construct a positive mental framework from which they can proceed. Most cardiac

patients express concern over their lack of control over the situation. After some initial assessments, modified therapeutic techniques can be used to dissipate the felling of losing control. Minor tasks can be given to the patient that will bolster their sense of accomplishments and make them feel like they are in the driver's seat of their recovery. It is important that from the outset, the idea of survival and recovery be instilled in the patient.

Treatments can come in any form or combination of therapies. In the beginning, Solution Focused and Brief Therapy techniques can be utilized. These are well suited for the early stages of recovery whereas they are not concerned with the past and how the patient got here, but more about getting them to move forward. It is important to keep moving the patient away from the event because revisiting it only takes the patient back to the fears around it. With a solution focused approach it is helpful to keep reminding the patient that they are safe and as they recover, for many, they can be better than before.

When the techniques are designed specifically to fit each patient's needs, they can help them develop a working vision of their future beyond their immediate problems. The patients' thoughts will lead them to use words such as "can't", "won't", and "I doubt it". These must be dispelled and replaced with "recovery talk" where the focus is on abilities of healing. Cardiac patients have usually followed a path to their problem, whether it be the path of heredity or psychosocial issues. A cardiac psychologist can put them on a new path, where of their own volition, they can commence with building a new path away from compromised health.

Solution Focused Brief Therapy

Solution focused brief therapy (SFBT) works well with the cardiac patient because it offers immediate feedback that allows the patient to make choices about their life thus returning to them a sense of control. It is pointless to ask them about their childhood or engage in a drawn out

version of psychotherapy that is looking for the problem to solve. The problem is an MI or CABG, enough said. Instead of wasting time trying to psychologically reduce the event itself, let's put it in its proper place and move on to something more meaningful. There is no longer a psychological intervention that can prevent what has already happened, but there is plenty that can be done in the here and now, moving forward, and always keeping things positive. "Positive psychology emphasizes the clients' strengths and the supposition that happiness is not the result of having the right genes or mere chance, but is to be found through identifying and using the strong points that the client already possesses such as friendliness, originality, humor, optimism and generosity. Clients become increasingly emancipated. The therapist adopts an enabling role, leading the client in exploring his own way of solving the problems experienced, thereby using his own competencies to the greatest extent possible. Solution Focused Brief Therapy (SFBT) supports this evolution and abandons the "medical model", in which the therapists role can be likened to that of the aforementioned restaurant manager", (Bannink, 2007, p. 89).

The idea that traditional forms of psychotherapy can be used on cardiac patients is Neanderthal in its concept and irresponsible in its application. Modern psychotherapy, just like everything else in this world, has gotten quicker, more streamlined, results oriented, more aggressive, and better than it was before. What your family was like growing up, how popular you were in school, and how long you breast fed, can all be left to the "hand holders" of the psychological community including many coaches and counselors who do nothing more than become a highly paid best friend that you can open up to. The kind of therapeutic techniques needed for the cardiac patient has surpassed any of the old school approaches whereas cardiac psychology is more malleable and not fixed to any rigid psychological definitions. Its fluidity allows it to change with the patients changes and draws on whatever disciplines it needs to yield

results. By not meeting the problem head on, your average counselor or social worker is only facilitating a relationship between two people with the cardiac problem at the center of the relationship. For some, that is all well and good as the client gains a certain level of comfort and the counselor gains validation through the process. But the truth is cardiac events are traumatic violations of a persons' physical health and well-being and needs to be addressed with a psychological force equal or stronger to that of the physical violation. And that force should include aggressive assessments and uncompromising solutions that treat the problem rather than talk about it.

With SFBT, the genesis for the solutions to the problem already lie within the patient, and because it is more interested in health achievements rather than health failures, patients find it easier to engage. "Participants described their experience of SFBT as different from previous experiences of psychological therapy, as the psychologist was interested in finding out about the participants' wider goals in life, not limited to those within therapy. Asking questions about what participants wanted to achieve in life instead of solely focusing on their difficulties helped them to feel hopeful for the future and encouraged them to think about what was important to them. As a result, therapy was described by a number of participants to be the start of their journey back to where they wanted to be in life", (Carra, Smith, & Simm, 2014, p. 388).

As SFBT improves the patient's mood and self-confidence, the memory of the event becomes minimized as the patient becomes more focused on getting back to where they were. In many cases some of the patients were living a compromised life leading up to their cardiac event due to low energy and possible chest pain resulting from blocked arteries. Once the physical problem is fixed, these people stand the chance that will be even better than before, a point that must be well impressed on them whereas it is a great aspect of motivation.

When combining quick diagnostic and assessment tools with SFBT, the CP is maximizing the chance that the patient will react in a timely manner and immediately experience positive results from which rebuilding of the psyche can begin.

Positive Psychology

Not a day goes by that one person says to another “stay positive” or “think positive”. Positive thinking is beneficial, especially when compared to negative thinking. This can be seen in the nocebo effect where a person becomes ill simply because they truly believe that they are going to become ill. In the last decade the psychological community has made strides in honing the positive aspects of the mind into therapies that have yielded some remarkable results. One part or another of positive psychology can be found in sports psychology, executive training, coaching, and the treatment of depression. For the cardiac patient, it can become a lifeline with which they can pull themselves out of their health crisis. “Behavioral medicine investigators have had a longstanding interest in how health might be influenced by positive dimensions of experience (e. g., social integration, self efficacy, perceived control). More recently, constructs derived from or elaborated by positive psychology (e. g., positive affect, subjective well-being, benefit finding, forgiveness) have commanded growing attention in health research”, (Miller, Sherman, & Christensen, 2010, p. 1 ann. behav. med. (2010) 39:1–3).

For the cardiac patient, the basics of positive psychology can serve to decrease depressive symptoms and increase happiness. This is important because the sooner the depression and anxiety can be decreased, the easier it will be for the patient to take part in further interventions and their path toward healing. Positive psychology interventions can also help to form a barrier between the patient and the stress and anxiety that takes place during recovery whereas it can be

used as a tool to project the idea that the patient is capable of overcoming the present adversity that they are facing and regaining control of the situation.

While positive interventions will be used in the here and now, their true nature is to have a lifelong effect on the patient as they will learn coping skills on their own through the experience of being ill and then being a part of their own healing process. The idea of self-healing is one that must be instilled in the patient. The way to do it is through positive psychological techniques that seeks to show them that despite their physical problem there are still good things in them and things in their life that are right, and that being and doing your best is the same in sickness as it is in good health. Either way, you are making positive achievements that are adding to your recovery.

Positive psychology is a good adjunct with other techniques because it can act as the spark to get the wheels rolling. For instance, positive psychology and SFBT make a great therapeutic team because they complement each other so well with the SFBT looking for solutions and the positive psychology guiding it and moving it forward. As stated before, SFBT is not concerned with the negative event that got the patient where they are, so it is with positive psychology that is only concerned with the happiness and optimal experience of the patient. These techniques work well in the hospital setting because it enables the patient to build on the therapeutic experience in their own time and also leaves them with time for other important interventions like social support or a peer support group.

Positive psychology can also help with emotion regulation as it tries to keep the patient on one purposeful path of recovery. Emotions and frame of mind are of course important parts of the recovery process. Through emotions the CP can access tools that the patient has that could be put to good use thus they are called positive emotions. According to the Broaden and Build

Theory of Positive Emotions, “positive emotions further elicit thought action repertoires that are broad, flexible, and receptive to new thoughts and actions, whereas negative emotions elicit thought-action repertoires that are limited, rigid, and less receptive. The broadening aspect of this theory posits that, after a person experiences a positive feeling, he or she is more open and more receptive”, (Kim & Franklin, 2015, p. 30). The broadening aspect is consistent with what has been observed of patients during the recovery process, and that is that little achievements lead to bigger achievements. Once a patient gets the ball rolling it’s hard to stop them. There are of course periods of setbacks for some, but this is why it is important to introduce them to all the coping tools possible so that setbacks will be seen as a temporary obstacle and not a game changer.

Research is currently being done by psychophysiologists to try and better understand how positive emotions work. In the broaden and build theory, there are clearly manifestations that begin with a conscious choice of one behavior and a conscious rejection of another. With the cardiac patient, that choice is made easier by the fact that no one chooses to get sicker, the only logical choice is to get better. So it is through positive psychology and the regulation of positive emotions that the patient begins to heal.

Motivation

In counseling motivation plays a large role in whether or not the client wants to engage in therapy and devote their energy to changing behaviors. This isn’t so much the problem with cardiac patients where most of them are quite eager to find ways to get better, get out of the hospital, and return to their regular life. Motivational dynamics are what pushes the patient forward. Such is the case as seen in one of the six theories of motivation known as the Drive Theory of Motivation which holds a strong biological and psychological component, for instance

if you are hungry, you will eat. Thus hunger is the motivational force. For the cardiac patient the motivating force above all others is wellness. If asked of a cardiac patient “What do you want to do”? The obvious answer is “get better”. That need to get better is relevant to Self Determination Theory (SDT) in which a person’s intrinsic needs are addressed. “SDT is an approach to human motivation and personality that uses traditional empirical methods while employing an organismic metatheory that highlights the importance of humans' evolved inner resources for personality development and behavioral self-regulation (Ryan, Kuhl, & Deci, 1997). Thus, its arena is the investigation of people's inherent growth tendencies and innate psychological needs that are the basis for their self-motivation and personality integration, as well as for the conditions that foster those positive processes”, (Ryan & Deci, 2000, p. 68). In SDT motivation can be seen as the psychological dynamo that keeps things moving ahead. It is a sort of self-coercion that we do to ourselves in order to get what we want. Needs must be met and we have to develop a way to meet those needs. Attainment of better health is both a physical and psychological need, a need of the mind and body, and there is also an intrinsic need to exist in a state of homeostasis. Cardiac patients’ that are ill due to psychosocial problems need to see that the cause of their problem is external and that the solution is internal and that they needn’t view recovery as work, but rather as a way of gaining a greater insight into themselves because there is so much there to be found. “Motivation concerns energy, direction, persistence and equifinality--all aspects of activation and intention. Motivation has been a central and perennial issue in the field of psychology, for it is at the core of biological, cognitive, and social regulation. Perhaps more important, in the real world, motivation is highly valued because of its consequences: Motivation produces”, (Ryan & Deci, 2000, p. 68). It is important that the CP understand how to elicit and direct the patients motivations. Without guidance a patients’

motivations might be there, but not know what to do with them. It is one thing to be motivated to get well, but it is another thing to be motivated and know how to get well.

The premise of SDT is that there are three things that a person needs to feel in order to achieve psychodynamic growth. 1) Competence – A person has to have a working knowledge and the ability to be proficient in a variety of skills. 2) Connection – It is important to feel like you are a part of other people's lives. 3) Autonomous – The need to be in control of yourself and your destiny. If these three dimensions can be shaped during recovery, the result will be a more complete individual.

Another important component that should be considered is relevance. What makes an individual relevant to themselves and those around them? It is not enough to be connected to one's self or those around you, there has to be a relevance to that connectedness, a meaning to why it exists. If a cardiac patient sees little relevance to their life, there will be little motivation for them to engage in steps to continue that life. This can be seen with poor social support and the poor outcomes that people who are alone experience. Since their disease is most likely rooted in non- optimal human functioning, it is also likely that they are experiencing non-optimal psychological functioning that could include faulty processes and poor motivation. Motivation can be seen in people as either passive or active. Passive motivation gets you to work, sits you behind your desk, gets you home and sitting in front of the TV. Active motivation challenges one's self to move beyond their current mental and physical boundaries. This intrinsic motivation is much better than motivation that occurs in exchange for rewards because intrinsic motivation is self rewarding and self-fulfilling. While external rewards can be satisfying they can also serve to undermine the true nature of motivation and lead back to poor functioning. Helping the cardiac patient get connected to their intrinsic motivation must be done through positive

reinforcement and gradually so as not to overwhelm the patient with too many tasks, and expectations should never be made of the patient, whatever they can't do today they'll be able to do tomorrow. Naturally some will take longer to grasp the recovery process than others and worse yet there are a few who won't grasp it at all.

The "Cardiac Cripple"

For some cardiac patients' they will settle into a life of self perceived caution, sometimes even after they have demonstrated recovery skills, and begin to live a life where everything revolves around not wanting to stress their heart in any way because they have convinced themselves that it will bring about another cardiac event. These people are known as cardiac cripples. While they do the right things such as avoiding fats, cholesterol, and oils, they do the wrong things like not exercising, worrying too much, and waiting for something bad to happen. They are not "treatment resistant" to the previous mentioned forms of therapy but rather they are resistant to treatment because they refuse to deviate from their self-imposed exile within themselves.

Cardiac Cripple is not a disease nor is it classified in the DSM-V (Diagnostic Statistics Manual –V) as a real disorder. It is somewhat similar to hypochondriasis which is described as, "A.preoccupation with fears of having, or the idea that one has, a serious disease based on the person's misinterpretation of bodily symptoms. B. The preoccupation persists despite appropriate medical evaluation and reassurance", (DSM-IV-TR). The distinction is that a hypochondriac "thinks" that something is wrong with them, whereas the cardiac cripple is "waiting" for something to be wrong with them. This again feeds into the nocebo effect where they will eventually get sick again whereas we have seen what the effects of worry and anxiety have on the cardiovascular system.

Cardiac cripples are evidence of the psychological effects that a cardiac event can have on an individual. Their self perceptions, diet, activities, and sense of wellbeing suddenly do a 180 and are abandoned for a more rigid and confined existence. It is a very unique patient population that is rarely studied and lacks research from both the medical and the psychological community. It is a stubborn condition that might best be understood as told through the eyes of a doctor who is explaining the cardiac cripple state and what happened to one of his patients. “He is only 45 but he suffered a heart attack sometime last year. He didn’t smoke or drink. He was totally without any risk factors but he still had a heart attack. An angiogram revealed a single vessel disease which was promptly stented without complications. So, in all sense of the word, he is well. In fact, he did not have any more chest pains since then. But he was so traumatized by the whole thing that he could not return to what he used to do anymore. He is now anxious all the time, wondering when he will have another attack, wondering if his stented vessel will block up again, he doesn’t exercise anymore fearing that it might aggravate his heart, he has zero sex life now, he doesn’t work, he eats only healthy food, and he doesn’t do anything except sit at home and breathe!” The doctor concluded “We doctors have failed to address the psychological impact of a cardiac event on a patient. We just assume that once the blocked is reopened or stented, all is well. We fail to see that some patients become psychological cripples”. (Jimbo, 2006).

In the patient’s quest to live longer and prevent another cardiac event, it is easy to see the deleterious effects that his behavior will eventually have on his health. The main and most dangerous aggravator of this condition is obviously the excessive worry and anxiety along with the physical inactivity which are two prime risk factors for heart disease. And despite pointing out to the patient that they are engaging in a pattern of behavior that created the problem in the first place, they remain unmoved and unconvinced as they languish in the first stage

(precontemplation) of the Transtheoretical Model of Behavior Change which means that they have no intention of changing their present behavior in the foreseeable future.

Treatment for the cardiac cripple varies whereas they are mostly afraid to do anything, so a good starting point would be to dispel the fear. This might be done through a modified form of Rational Emotive Behavioral Therapy (REBT) in which irrational thoughts are revealed and disputed. The goal would be to get the patient to see that their irrational thinking is creating the fear that is stopping them from taking actions that would make them healthy. The problem with REBT is that the patient will have to show some sense of being a willing participant, but if properly designed and structured to reach the patient on their own level it could get things started.

Once the patient gets to the stage where they are willing to take the next step in their recovery it would be best to take things real slow. In these early stages the patient will be afraid of "over doing" just about anything that they are asked to do creating the risk that they will become afraid and retreat back to their non-active state. Very brief treatments of Exposure Therapy might be the best thing at this point. Becoming a little bit more physically active than they presently are is a good start. Brief walks, a short bike ride, or a few minutes of abbreviated calisthenics to slowly introduce the patient to exercise could help. Once it appears that the patient is comfortable with this level of exercise it can be slowly increased.

A helpful aid during this stage might be a Smart Heart device that allows you to take your own EKG with your smart phone. Being able to show the patient that there is nothing wrong with them during exercise goes a long way to alleviating and fears and anxiety that they may have about their physical activity. The same can be said for use of it while they are at home and they think they feel a chest pain. The device is easy to use and they can even send the EKG to their

cardiologist or doctor. In a comprehensive cardiac program that would include the implementation of the benefits of a cardiac psychologist, one of the benefits of utilizing the Smart Heart device is that instead of worry about their health, they can do a wireless 12 lead EKG that, if all is well, will put them at ease. It would also prevent some of them from going to the emergency room and could also cut down on unneeded doctors' visits. It is clearly a useful device during the recovery and rehabilitation process.

The cardiac cripple is another example of why there is a need for cardiac psychology. It is a waste to have talented doctors using their skills and medical technology to save a patient only to have them sit around and wait to die. It is more likely that they will experience another cardiac event that would completely psychologically traumatize them. But with the right treatment, that could all be avoided and they can be shown that their life is worth living.

Psychopharmacology

The treatment of anxiety and depression in the cardiac patient may need to include drugs such as anti-depressant and anxiolytics. An understanding of the drugs, how they work, dosing ranges, and possible side effects is needed. Psychopharmacology must be one of the tools that the cardiac psychologist can be able to rely on. Being that a CP can't write prescriptions the aspects of the discipline that is needed to be of use extends from the medical to the practical, with an emphasis on keeping in mind that it is a cardiac patient that is the subject and not a normal counseling patient.

Anxiety can have different etiologies and can appear to stem from biomedical abnormalities or something more psychogenic. If a patient is already on anti-anxiety medication before their cardiac problem, this will be recognized by the physicians and included in the patients' notes. It is a clear indication that there is already an anxiety problem with the patient that the CP will have

to address. For the ones that are not currently on anti-anxiety medication, and develop enough anxiety due to an acute psychological stressor (the cardiac event) that warrants the use of an anxiolytic, the CP must take this into account as treatment progresses.

One of the problems with giving anxiolytics to cardiac patients is that therapeutic dosing should last from 4 – 6 weeks. Doctors are prone to give the patient Xanax or Ativan, both of which are addictive and troublesome to stop using them as the patient has to be gradually weaned off them. So the problem is that you have a patient that is now being put through the stress of trying to stop using an anti-anxiety drug. A better management tool in this situation could be BuSpar (buspirone) because it is not as addictive and presents less problems when the patient decides to come off of it. BuSpar can be used for the short term relief of anxiety but has also been used up to year with no complications. This is good because of the varying levels of anxiety that can occur in so many different patients. If a patient's anxiety level has decreased at the 8 week period they may choose to stop using the drug, however, another patient might have significant anxiety at the 16 week period and need to keep using it. It adds a flexible dimension to its use in treating anxiety.

Selective Serotonin Reuptake Inhibitors (SSRI's) have been very successful in treating depression in cardiac patients whereas it is believed that they could have a "cardioprotective" effect on the heart. This happens for a few reasons with the best one being that SSRI's act as an inhibitor to serotonin –mediated platelet aggregation which we have seen leads to atherosclerosis. Dosing may need to be increased in patients with existing depression due to the psychological effects of the cardiac event. Because it could take several weeks for SSRI's to take effect, this could be problematic for the patient for whom depression is new as a result of the

cardiac event. Special attention needs to be given to try to manage the depression with other therapies until the medication can take effect.

The Cardiac Outpatient - PTSD

Once the patient is discharged from the hospital they will hopefully be able to resume their lives. For many though there will be obstacles that will need to be overcome. Many will have to conquer risk factors like smoking and over eating. Some as a result of their cardiac event may have lost full functioning power in their heart which will make them a step slower than before. And some will have to struggle with depressive symptoms that could cause a readmission.

More attention as of late is paying paid to the development of Post Traumatic Stress Disorder (PTSD) as a result of their cardiac event. Many heart attacks are sudden and the experience is certainly frightening enough to leave an impression in one's mind. It is easy to understand the negative psychological effect that this could have on a person. "There is growing evidence for the development of symptoms of posttraumatic stress disorder (PTSD) as a consequence of acute cardiac events in patients with coronary heart disease (CHD) (Gander & von Kanel, 2006; Spindler & Pedersen, 2005). PTSD classically occurs following traumatic experiences involving external stressors, but recently, attention has been drawn to the impact of stressful medical events on posttraumatic symptoms (Tedstone & Tarrier, 2003). ", (Wikman et al., 2012, p. 421). There are three different categories for the symptoms of PTSD. First, there are what's known as the "intrusive" symptoms which include remembering the event accompanied by nightmares and flashbacks. Secondly there is "avoidance" which is a way of trying to put psychological distance between the person and the event. And third is "physiological hyper-arousal manifested in irritability and sleep difficulties. There is some evidence that points toward the fact that the severity of the event can mimic the severity of the PTSD symptoms.

The cardiac event certainly meets the criteria in the DSM-IV which states "(1) the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others. And (2) the person's response involved intense fear, helplessness, or horror.", (DSM IV, p. 218-219). And it is quite certain that PTSD symptoms in the post-cardiac event patient is greatly underdiagnosed simply because they don't get to see a person qualified in testing for it and making such a judgment. A comprehensive psychocardiac assessment would certainly identify the symptoms and advise a treatment for it. And even though PTSD symptoms could take a while to develop, the thorough psychological care the patient would receive after a cardiac event could possibly stop it from happening.

Much like anxiety and depression, PTSD presents similar problems following a cardiac event. "Posttraumatic stress is associated with a number of adverse consequences following ACS. For example, PTSD is associated with non-adherence to cardiac medications in MI patients, which in turn is related to poor medical outcome (Shemesh et al., 2001). A study by Shemesh et al. (2004) found that PTSD was associated with almost a threefold increased risk of readmission for MI.", (Wikman et al., 2012, p. 241). It is thought that one of the reasons PTSD victims don't properly adhere to their medication recommendations is that the medicine itself serves as a traumatic reminder of their illness, much in the way some people have a panic attack simply by walking into a doctor's office if something bad happened there when they were younger. For the cardiac patient who struggles with PTSD and does not properly take their medication, many will be readmitted for complications arising from the effects of the improper adherence to their recommended medications. In a previous study, it was revealed that one of the medications patients were not taking was Captopril which is an ACE (angiotensin converting

enzyme) that treats hypertension and improves survival after an MI. If they cease to take this medication, their blood pressure will increase putting them in danger of another cardiac event.

For at least 15 years, there has been knowledge of a connection between PTSD occurring in the cardiac patient in both the short and long term following cardiac events. As an earlier study found, “patients who maintained high scores of intrusion and avoidance behavior concerning the cardiac arrest experience over a long time period apparently failed to integrate the memory of the event into their preexisting schemata and suffered from a serious affective dysregulation and a pronounced impairment in quality of life. Patients with PTSD symptoms exhibited significantly higher degrees of depression and anxiety and a diminished capacity to resist emotional burden”, (Ladwig et al., 1999, p. 917). Failure to integrate traumatic events and thoughts into one’s schemata has long been a mechanism of coping when an aspect of reality is so unpleasant and horrifying that the rest of the psyche relegates it to be a psychological outcast, and its thoughts and memories remain active and manifest themselves in anxiety, nightmares, and other negative experiences. It is especially difficult for those who although have no demonstrative risk factors, but still suffer an MI. The shock to their whole physical and psychological system is indeed traumatic. There is a sense of betrayal that can’t be fully defined as the victim struggles with something that wasn’t supposed to happen to them in the first place. And all the family support and proper cardiac rehabilitation regiment won’t be able to dispel that betrayal. And so the mind keeps revisiting the event because it is unresolved and some sort of resolution is sought. And of course every time the event is revisited, so too is the trauma, and thus the negative psychological effects. It is not just the visual aspects of the event that have a lasting impression, but also the feeling of the event that reverberates in the conscious and creating a negative emotional impact on the victim as the previous study pointed out that “This study provides the first empirical

evidence that the application of the posttraumatic stress disorder paradigm in the long-term evaluation of cardiac arrest survivors significantly contributes to defining a patient population at high risk for serious emotional injury", (Ladwig et al., 1999, p. 917).

Another patient population that is showing signs of complications from PTSD within the first year of discharge are those who had significant cardiac surgery. These patients might have troublesome emotions as soon as they are admitted. As has already been established there will be elevated levels of anxiety for some as they struggle with the apprehension and the disappointment of their current situation.

"The prevalence of PTSD in cardiac surgery ranges from 5% to 14.7% based on different database" (Porhomayon, Kolesnikov, & Nader, 2014, p. 79). The percentages may not seem high, but when you consider the hundreds of thousands of cardiac surgeries that are performed each year, illustrates there are a lot of cardiac patients at risk and subjected to the symptoms of PTSD. Add this to the amount of misdiagnosed cardiac patients with anxiety and depression that could possibly have PTSD and the number becomes even greater. And while it is all well and good that because of new technologies and treatments there are more survivors of cardiac events, it also means that there are more people suffering with psychological side effects like PTSD.

As more evidence builds up outlining the fact that cardiac patients are prone to develop PTSD within the first year following a cardiac event or surgery, focus must be turned to how to treat it. On its surface cardiac related PTSD doesn't seem to be much different than the PTSD derived from other traumatic experiences, yet only through research will we be able to understand the full dimension of the problem at hand.

There can be different approaches as how to treat the PTSD. The conventional approach is to use cognitive behavioral therapy (CBT) and try to help the patient change the way they perceive

the event, but given the severity of the events sometimes, as well as the power of the intrusive thoughts, it is doubtful that a psychological intervention alone is going to yield lasting benefits. The addition of pharmacotherapy would deliver better results. “On balance, the SSRI’s should be regarded as the first-line pharmacotherapy for PTSD: although the addition of other medications may be required to address specific aspects of the symptom spectrum, on the basis of current evidence, treatment with an SSRI would be regarded as the most appropriate choice in many cases”, (Alderman, McCarthy, & Marwood, 2009, p. 79). In the case of a cardiac patient with PTSD, SSRI’s do seem like the right treatment tool whereas depression is also common in the cardiac patient making the drug an ideal fit. SSRI”s are also safe with most heart medications because of its serotonergic effects.

Cardiac patients with PTSD will require several health specialists for the proper treatment plan including a cardiologist, psychiatrist, cardiac psychologist, and a counselor. It is not enough to write a prescription and see how it works. There are many people including those outside the cardiac patient population who continually take some form of drug to treat a psychological symptom, but never treat the problem. Part of this is because people have time to take a pill, but they don’t have time get better. Also, there is no real stigmatization connected with taking anxiolytics or anti-depressants. The TV commercials that sell the products make everything seem safe and normal, not to mention drive countless people to their doctors to ask for certain drugs. Yet the fact is that pharmacotherapy in some cases will need to be an integral part of the cardiac patients recovery plan.

Life After a Cardiac Event: Support Groups

There is much that needs to be considered and addressed during the recovery of a cardiac event or surgery from medical complication to psychological complications to everything in

between. The ultimate goal is to get the patient back to a place in their life where the event is more a memory as they move forward. However, the truth is that for some their life has changed and there is no returning to things the way they were and continued support may be needed.

Many cardiac patients find support groups to be helpful. A good one would be moderated by a professional who has some expertise in the area but as patients start telling their stories and getting feedback there is a sense of communal healing. What's very helpful is when you have a person who had an event a year ago explaining what he went through to someone who experienced an event just a month ago. The exchange of information usually results in the newer patient gaining insight and adaptive strategies from the older patient. For best results the group should have no more than ten members and should last no more than two hours. The moderator will be able to steer the group toward topics that need to be addressed and can reinforce the positive things that some of the members might say to each other. At the beginning of the session everyone can "check in" with their latest thoughts. A good way to do this is to employ useful tactics like "hi and low" in which each person will state the highest and the lowest moment from their past week. It is common for their cardiac issues to be a part of it such as someone saying that their cholesterol went up, and someone else saying they walked one mile without any chest pain. The lows are comforted and supported and the highs give the others goals to attain. It fosters an environment where everyone is a helper and a part of something that works. "Participation in peer support groups provides opportunities for social support that is perceived as beneficial and that helps participants cope with their situation (Stewart et al., 2001; Subramaniam et al., 1999; Hildingh et al., 1995). "(Hildingh & Fridlund, 2003, p. 126).

Support groups are the single easiest and most accessible way for cardiac patients to feel better about themselves. Some patients have come to the first group a bit hesitant, but after

engaging with some of the members an effortless fit takes place. There are those for whom a group approach may not be the right fit. There are those who are uncomfortable in a group surrounding and don't like having to talk in front of people. Others get a sense of comfort by seeking out individual therapy with a professional counselor. And yet others still just aren't ready to share their story in public. Many patients retreat inside themselves and are embarrassed about their event and hospitalization. Still, the best place to find multifaceted support is in a group setting. Consider what can be gained in a group versus what can be gained by visiting a counselor. First of all, what are the counselor's qualifications? Many of them will say that they are experienced in behavioral cardiology or psychocardiology. But what does this mean? What is their experience? Did they gain knowledge by actually working in a cardiac unit for any length of time, or is it academic experience that they have? Granted there are some great ones out there such as Dr. Robert Allen, but there are also counselors who hang up a diploma and read books when they're not seeing a client. To be able to truly counsel cardiac patients much of your knowledge is going to have to come from working in a cardiac care setting. You can read about it in a book, but you can experience it by being there. That is how you gain knowledge in the field. By observing the doctors and nurses and the environment where it is all taking place, a person learns about what they see by being attentive and asking questions. And when there is a support group sharing their experience, they are in many ways doing the same thing because they have all been there, they have all observed their own struggles as well as others, and some have taken what they learned there and are now using that knowledge to help others.

Life After a Cardiac Event: Cardiac Rehabilitation

Some of the patients will enter into a Cardiac Rehabilitation and Secondary Prevention Program (CR/SP) as developed by the American Association of Cardiovascular and Pulmonary

Rehabilitation. These programs are carefully designed with the input of physicians and fitness specialists in order to deliver a safe and effective way to rehabilitate after a cardiac event. However, “In spite of the knowledge that patients referred to CR/SP are more likely to receive guideline-based care, to improve all lifestyle habits, and to report improved quality of life and physical and psychological function, referral to CR/SP occurs in less than 30% of eligible patients”, (, 2013, p. 1). This is one of the reasons that there are readmissions, quality rehabilitation that is proven to work and only a small minority of patients take advantage of it. Some of these patients may be cardiac cripples or don’t have proper access and transportation, but the number is far too large considering the benefits that await those who attend. One study looked at expanded cardiac rehabilitation and found that “The number of cardiovascular events were reduced in the expanded rehabilitation group compared with the standard cardiac rehabilitation. This was mainly because of a reduction of myocardial infarctions in the expanded group. Days at hospital for cardiovascular reasons were significantly reduced in patients who received expanded cardiac rehabilitation”, (Pluss et al., 2009, p. 79). It would appear that CR is not just a good thing for the cardiac patient, but that more of it is a better thing. And still its benefits are not taken advantage of by so many who could use its help. As irresponsible as this may sound, it is actually consistent with what is happening with many ill people everywhere. There are people who are not taking their medication properly, not exercising like their doctor told them to, people with hereditary heart disease eating lots of fried foods, people with lung cancer who are still smoking, and people worrying to much and not getting enough sleep. Yes there are those who do what the doctor tells them to do and go on to live a healthy life. But it is inevitable that people will get sick, they won’t like being sick, and they will do things that will keep them sick. There’s a reason why we spend so much on healthcare and biomedical research

and pharmaceutical studies, and it's not the diseases. It's the people who insist on putting their bodies in a vulnerable state for attracting the diseases. It is human nature that we have illness, but it shouldn't be human nature to make our bodies prone to it.

Life After a Cardiac Event: Complications, Anxiety, Depression

There are many complications that await the cardiac patient as they recover during the first year. As previously stated there recurrent levels of depression and anxiety that could actually be PTSD and require treatment. The problems presented by depression and anxiety are far reaching and can influence a variety of physical events that will require several doctors' visits or readmission. Such is the case with some survivors of acute myocardial infarction (AMI). "A significant proportion of patients experience health status declines in independence or physical function 1 year after AMI. Although there is some degree of overlap, these health outcomes appear to be distinct: occurring in isolation as well as together and influenced by different predictors" (Dodson et al., 2012, p. 795). In many of these cases of declining physical function within the first year of recovery, anxiety and depression will be found to be strong contributors to the problem. When these cohorts go untreated as outpatients they will inevitably create problems for the patient with not just their health, but with those things that good health is needed for such as work. If the person can't go to work because of their health the result is more stress and anxiety. As functioning decreases depression will ultimately set in until their condition deteriorates to the point of a medical emergency. It is hoped that somewhere during this time the patient is getting medical attention to help make matters better before they get worse. But a lot of times the person is so unhappy about their original hospital stay that they will not let on about developing symptoms in order to avoid having to go back to the doctor or hospital.

One study that was investigating persistent anxiety and recurrent events within the first year of recovery came up with findings of several important points. “First, they reiterate that anxiety symptomatology is under recognized and undertreated, and examination of effects of treatment on secondary prevention must be pursued. Second, they suggest that cardiac patients with comorbid anxiety do present with typical syptomatology, but may additionally present with more diffuse symptomatology. Third, over and above the effects of depressive symptonatology (among other confounding variables), nonphobic anxiety appears to have a negative effect on self-reported outcome following an ICE”, (Grace, Abbey, Irvine, Shnek, & Stewart, 2004, p. 351).

One of the effects of persistent anxiety is that it sometimes leads to chest pain which in turn fuels the anxiety until medical attention is sought. This chest pain will often end up in a trip to the emergency room where it will have to be diagnosed. Because the patient has had a previous cardiac event or surgery they will be treated different than someone presenting with atypical chest pain where MI has been ruled out. Many times the pain is found to be musculoskeletal or a digestive problem which is a relief to the patient, yet the effects of the anxiety have left their mark. Part of the problem is that people are not properly educated on what types of chest pain are cardiac related and which ones aren’t. As time goes by and people deal with their anxiety and they have multiple experiences of chest pain, they begin to sort it out and realize that every chest pain isn’t cardiac related. The avoidance of chest pain is a hallmark of the cardiac cripple who after one episode of atypical chest pain puts a stop to all exertion and anything else that in their opinion will cause chest pain which they perceive as leading to another cardiac event.

Within the first year of recovery some patients will be readmitted due to complications from anxiety, depression, stress, and PTSD. If a cardiac psychology program was properly

implemented many of those readmissions would not be needed because there would have been aggressive psychological follow up with the patients and preventative measures would have been taken at the first sign of a problem. The ultimate goal is to not wait for symptoms of illness to arise, but to keep assessing for symptoms of psychological distress that lead to an illness or an acute myocardial infarction (AMI). “The considerable burden that unplanned readmissions after AMI places on the healthcare system could be decreased if we could identify patients at high risk of readmission and institute, or intensify, measures to prevent a further coronary event”, ((Rana et al., 2014, p. 380). Because a CP would have a cardiac psychological profile to follow and augment as time goes by, preventions could be set up with the patient in hopes that the readmission would no longer be necessary. The more complications, the more readmissions. The more follow up care, the less readmissions. When the cost of a readmission in which there is various testing is compared to the cost of having a productive cardiac psychology team involved in the patient care, it becomes apparent that the burden that readmissions put on the healthcare system could be decreased by having a more concise follow up with recovering cardiac patients.

The mind/body nature of cardio vascular disease (CVD) must be treated as such and recognize the positive role that CP would play in reducing readmissions. “A considerable amount of scientific evidence demonstrates that emotions, personality traits and stress have an impact on CVD. Not only do psychological aspects constitute well-documented risk factors in the primary and secondary prevention of cardiovascular events, but intense emotions can trigger acute coronary syndromes” (Proietti et al., 2011, p. 432). For the recovering cardiac patient, a lot of their emotions are dependent on their levels of depression and anxiety. Emotional wellbeing is established by decreasing the levels of depression and anxiety while increasing psychosocial stability. For the patient to reach proper functioning there has to be a balance of keeping track of

the medical side of their life, while also expanding their social parameters with family, friends, fellow employees etc.

For the patient, the recovery process takes patience and adaptation skills. CVD doesn't happen overnight and so the cure doesn't happen that fast either. But given the right tools, information, and care, the cure will happen. "Recovery continues for months after CA. Despite recovery, depressive symptoms are common even 1 year after CA. Future clinical trials should include a combination of measures, perhaps including refined measures of depression and cognitive impairment, to yield a complete representation of recovery after CA", (Raina, Rittenberger, Holm, & Callaway, 2015, p. 7).

Conclusion

The need for the practice of cardiac psychology is apparent and supported by a plethora of research proving the connection between depression, anxiety, and cardiovascular disease. In a day and age where hospitals seek out the best talent and most up to date technologies and treatment, CP would be a logical addition both for its dimensions of healing as well as its usefulness in decreasing readmissions among the cardiac patient population. The psychological underpinnings of heart disease needs to be addressed with the same vigor as its physiology using all of the parameters of medical and psychological knowledge. A greater understanding of the problem has already begun, but it needs to be further developed.

Cardiologists and their staff don't have the time or the expertise to deal with the psychological nuances that each patient may possess, nor are they expected to. And such is the case with the integrated health spectrum. They also lack the proper qualifications and insight to deal with the psychological complexities of cardiac patients. But in a collaborative effort, the

most comprehensive and meaningful recovery can be made available to enhance recovery and reduce readmissions.

In the future, the education needed to accrue the specific knowledge utilized by cardiac psychology should come from a truly dedicated health psychology program that focuses on a dualist biomedical/psychosocial approach. It is a worthy endeavor that could reshape the humanities approach to health and healing.

Appendix A – Hospital Anxiety & Depression Scale (HADS

Hospital Anxiety and Depression Scale (HADS)

Tick the box beside the reply that is closest to how you have been feeling in the past week.
Don't take too long over you replies: your immediate is best.

D	A		D	A	
		I feel tense or 'wound up':			**I feel as if I am slowed down:**
	3	Most of the time	3		Nearly all the time
	2	A lot of the time	2		Very often
	1	From time to time, occasionally	1		Sometimes
	0	Not at all	0		Not at all
		I still enjoy the things I used to enjoy:			**I get a sort of frightened feeling like 'butterflies' in the stomach:**
0		Definitely as much		0	Not at all
1		Not quite so much		1	Occasionally
2		Only a little		2	Quite Often
3		Hardly at all		3	Very Often
		I get a sort of frightened feeling as if something awful is about to happen:			**I have lost interest in my appearance:**
	3	Very definitely and quite badly	3		Definitely
	2	Yes, but not too badly	2		I don't take as much care as I should
	1	A little, but it doesn't worry me	1		I may not take quite as much care
	0	Not at all	0		I take just as much care as ever
		I can laugh and see the funny side of things:			**I feel restless as I have to be on the move:**
0		As much as I always could		3	Very much indeed
1		Not quite so much now		2	Quite a lot
2		Definitely not so much now		1	Not very much
3		Not at all		0	Not at all
		Worrying thoughts go through my mind:			**I look forward with enjoyment to things:**
	3	A great deal of the time	0		As much as I ever did
	2	A lot of the time	1		Rather less than I used to
	1	From time to time, but not too often	2		Definitely less than I used to
	0	Only occasionally	3		Hardly at all
		I feel cheerful:			**I get sudden feelings of panic:**
3		Not at all		3	Very often indeed
2		Not often		2	Quite often
1		Sometimes		1	Not very often
0		Most of the time		0	Not at all
		I can sit at ease and feel relaxed:			**I can enjoy a good book or radio or TV program:**
	0	Definitely	0		Often
	1	Usually	1		Sometimes
	2	Not Often	2		Not often
	3	Not at all	3		Very seldom

Please check you have answered all the questions

Scoring:
Total score: Depression (D) _____ Anxiety (A) _____
0-7 = Normal
8-10 = Borderline abnormal (borderline case)
11-21 = Abnormal (case)

Appendix B – Self-evaluation Questionnaire (STAI)

SELF-EVALUATION QUESTIONNAIRE STAI Form Y-1

Please provide the following information:

Name_____ Date_____ S_____

Age_____ Gender (*Circle*) **M** F T_____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

 STAIP-AD Test Form Y

Appendix C – Holmes-Rahe Life Stress Inventory

The Holmes-Rahe Life Stress Inventory

The Social Readjustment Rating Scale

INSTRUCTIONS: Mark down the point value of each of these life events that has happened to you during the previous year. Total these associated points.

Life Event	Mean Value
1. Death of spouse	100
2. Divorce	73
3. Marital Separation from mate	65
4. Detention in jail or other institution	63
5. Death of a close family member	63
6. Major personal injury or illness	53
7. Marriage	50
8. Being fired at work	47
9. Marital reconciliation with mate	45
10. Retirement from work	45
11. Major change in the health or behavior of a family member	44
12. Pregnancy	40
13. Sexual Difficulties	39
14. Gaining a new family member (i.e., birth, adoption, older adult moving in, etc)	39
15. Major business readjustment	39
16. Major change in financial state (i.e., a lot worse or better off than usual)	38
17. Death of a close friend	37
18. Changing to a different line of work	36
19. Major change in the number of arguments w/spouse (i.e., either a lot more or a lot less than usual regarding child rearing, personal habits, etc.)	35
20. Taking on a mortgage (for home, business, etc..)	31
21. Foreclosure on a mortgage or loan	30
22. Major change in responsibilities at work (i.e. promotion, demotion, etc.)	29
23. Son or daughter leaving home (marriage, attending college, joined mil.)	29
24. In-law troubles	29
25. Outstanding personal achievement	28
26. Spouse beginning or ceasing work outside the home	26
27. Beginning or ceasing formal schooling	26
28. Major change in living condition (new home, remodeling, deterioration of neighborhood or home etc.)	25
29. Revision of personal habits (dress manners, associations, quitting smoking)	24
30. Troubles with the boss	23
31. Major changes in working hours or conditions	20
32. Changes in residence	20
33. Changing to a new school	20
34. Major change in usual type and/or amount of recreation	19
35. Major change in church activity (i.e., a lot more or less than usual)	19
36. Major change in social activities (clubs, movies,visiting, etc.)	18
37. Taking on a loan (car, tv,freezer,etc)	17
38. Major change in sleeping habits (a lot more or a lot less than usual)	16
39. Major change in number of family get-togethers ("")	15
40. Major change in eating habits (a lot more or less food intake, or very different meal hours or surroundings)	15
41. Vacation	13
42. Major holidays	12
43. Minor violations of the law (traffic tickets, jaywalking, disturbing the peace, etc)	11

Now, add up all the points you have to find your score.

150pts or less means a relatively low amount of life change and a low susceptibility to stress-induced health breakdown.

150 to 300 pts implies about a 50% chance of a major health breakdown in the next 2 years.

300pts or more raises the odds to about 80%, according to the Holmes-Rahe statistical prediction model.

Appendix D – Medical Outcomes Study (MOS)

Medical Outcomes Study Questionnaire Short Form 36 Health Survey

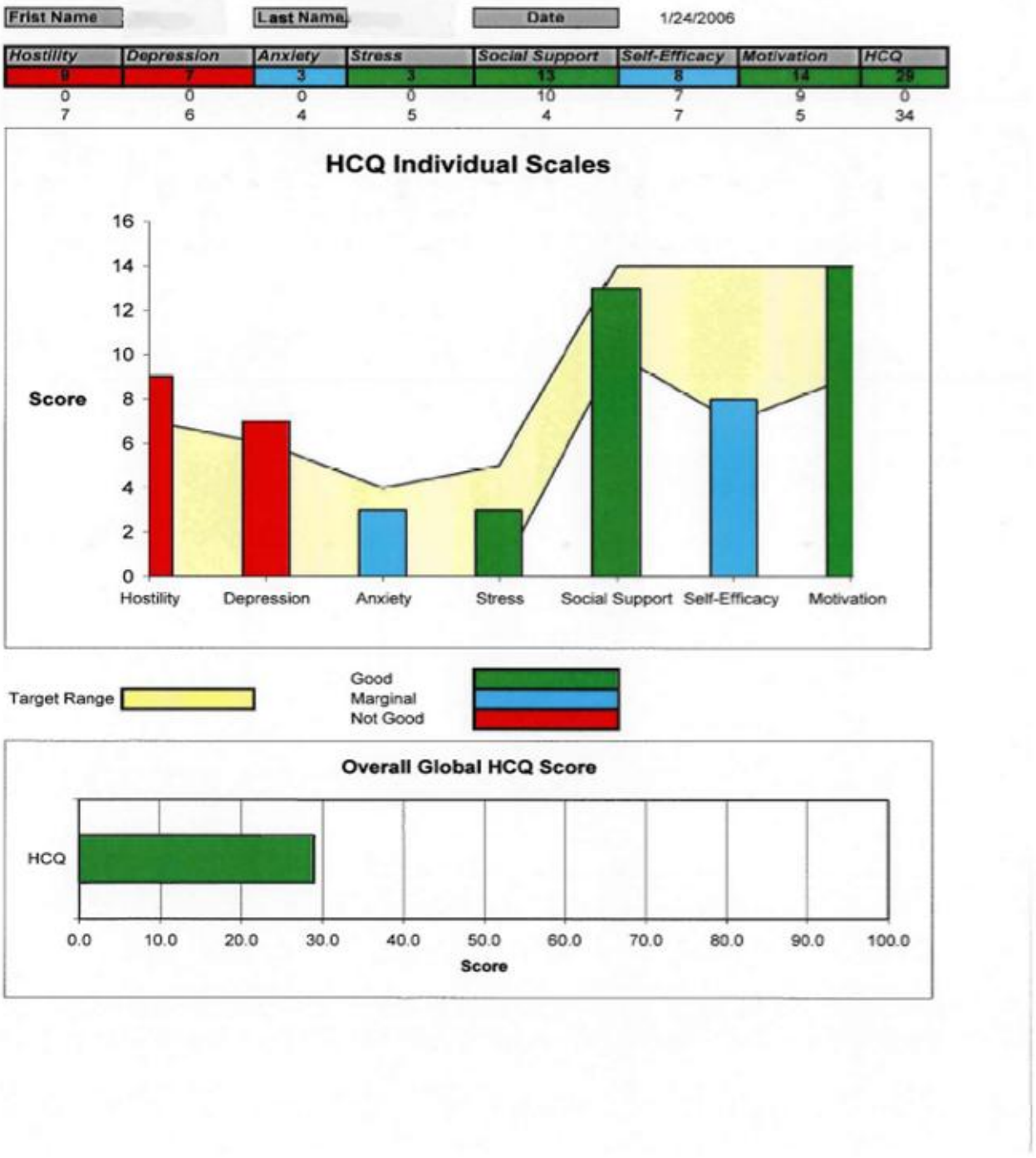
This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. Thank you for completing this survey! For each of the following questions, please circle the number that best describes your answer.

1. In general, would you say your health is:	
Excellent	1
Very good	2
Good	3
Fair	4
Poor	5
2. Compared to one year ago,	
Much better now than one year ago	1
Somewhat better now than one year ago	2
About the same	3
Somewhat worse now than one year ago	4
Much worse now than one year ago	5

3. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?
(Circle One Number on Each Line)

	Yes, Limited a Lot (1)	**Yes, Limited a Little (2)**	**No, Not limited at All (3)**
a. **Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports	1	2	3
b. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	1	2	3
c. Lifting or carrying groceries	1	2	3
d. Climbing **several** flights of stairs	1	2	3
e. Climbing **one** flight of stairs	1	2	3
f. Bending, kneeling, or stooping	1	2	3

Appendix E – Herridge Cardiopulmonary Questionnaire (HCQ)



Appendix F – CED-D

Center for Epidemiologic Studies Depression Scale (CES-D)

Date: _____

Below is a list of some of the ways you may have felt or behaved. Please indicate how often you've felt this way during the **past week**. Respond to all items.

Place a check mark (✓) in the appropriate column. During the past week...	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	All of the time (5-7 days)
1. I was bothered by things that usually don't bother me.				
2. I did not feel like eating; my appetite was poor.				
3. I felt that I could not shake off the blues even with help from my family.				
4. I felt that I was just as good as other people.				
5. I had trouble keeping my mind on what I was doing.				
6. I felt depressed.				
7. I felt that everything I did was an effort.				
8. I felt hopeful about the future.				
9. I thought my life had been a failure.				
10. I felt fearful.				
11. My sleep was restless.				
12. I was happy.				
13. I talked less than usual.				
14. I felt lonely.				
15. People were unfriendly.				
16. I enjoyed life.				
17. I had crying spells.				
18. I felt sad.				
19. I felt that people disliked me.				
20. I could not "get going."				

Source: Radloff, L.S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*: 385-401.

Appendix G – CES-D Scoring

Scoring for Center for Epidemiologic Studies Depression Scale (CES-D)

Directions: Do not score if missing more than 4 responses. 1) For each item, look up your response and corresponding score (0-3). 2) Fill in the score for each item under the last column labeled "Score." 3) Calculate your Total Score by adding up all 20 scores.

During the past week...	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	All of the time (5-7 days)	Score
1. I was bothered by things that usually don't bother me.	0	1	2	3	
2. I did not feel like eating; my appetite was poor.	0	1	2	3	
3. I felt that I could not shake off the blues even with help from my family.	0	1	2	3	
4. I felt that I was just as good as other people.	3	2	1	0	
5. I had trouble keeping my mind on what I was doing.	0	1	2	3	
6. I felt depressed.	0	1	2	3	
7. I felt that everything I did was an effort.	0	1	2	3	
8. I felt hopeful about the future.	3	2	1	0	
9. I thought my life had been a failure.	0	1	2	3	
10. I felt fearful.	0	1	2	3	
11. My sleep was restless.	0	1	2	3	
12. I was happy.	3	2	1	0	
13. I talked less than usual.	0	1	2	3	
14. I felt lonely.	0	1	2	3	
15. People were unfriendly.	0	1	2	3	
16. I enjoyed life.	3	2	1	0	
17. I had crying spells.	0	1	2	3	
18. I felt sad.	0	1	2	3	
19. I felt that people disliked me.	0	1	2	3	
20. I could not "get going."	0	1	2	3	
				Total Score:	

Scoring Results: Total Score of 16 or higher is considered depressed.
If your score indicates depression, see a health care/mental health professional for further evaluation and treatment. Bring these test results to your appointment.

Appendix H – Client Assessment Form

Client Assessment

Date_____ FullName_____

Address _____

Age_____ Gender_____ Marital Status_____ Occupation_____

Cardiac Risk Profile

Family History	Hypertension	Anxiety
Smoking	Diabetes	Anger
Alcohol/Drug Use	Inactivity	Stress
Overweight	Excessive Worry	Depression

Psychosocial Profile

Employment Status_____

Marital Status Y / N Resides With_____Where_____

Socio-Economic Tier 1 2 3 4 5

Overall Self Esteem 1 2 3 4 5

Initial Consultation

Observations _____

_____

_____

_____

_____

Patient Complaints/Issues_____

_____

_____

_____

Discussion/Interventions_____

_____

_____

Recommended Tests & Scales

Type	Outcome

Assessment

Overall assessment rating of possible recovery complications:

1	2	3	4	5	6	7	8	9	10
Low				Moderate					High

Results & Recomendations_____

_____

_____

_____

_____

_____

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