Diseases of the heart are a leading cause of death in many Western Countries. Approximately 1.5 million Americans suffer a myocardial infarction (MI) each year and 500,000 of these are fatal. Costs of the condition in terms of direct medical care services and indirect costs through loss of earnings and social security or insurance payments are considerable (Aden, Huang & Weaver, 1992; Picard et al., 199). Advances in medical technology and treatment for myocardial infarction mean that fewer patients die in the acute stage of the illness. However, these gains contrast with the small progress achieved in understanding and improving the rehabilitation phase following MI. The problems that MI patients face in changing their lifestyle, health care behaviour and returning to productive work can be more debilitating than the physical effects of the MI itself. Many patients, for instance, do not return to work following MI although they are physically capable of doing so. With greater numbers of patients surviving MI, understanding the processes that direct the recovery phase of the illness has gained in importance as an area for research.

MI brings with it a number of immediate psychological effects that have implications for longer term behaviour change. The initial period after the MI is typically marked by intense emotional and social disturbance for the patient and their immediate family. The MI patient can experience high levels of anxiety and depression during this period as they become aware of the full impact of the illness. This can produce psychological difficulties, intense fears about a further MI and for many patients, low expectations of regaining health and vigour.

Previous research has pointed to patients' beliefs and perceptions of their illness being critically important in the recovery phase of MI. Maeland and Havik (1987) found patients' in-hospital expectations of their future work capacity to be a strong predictor of eventual return to work. Byrne (1982) has also shown MI patients holding negative models of their illness to be less likely to return to work and to have lower levels of functioning regardless of the severity of their MI. Some have noted that MI patients often develop quite idiosyncratic ideas about their illness and recovery that are rarely disclosed or discussed in medical consultations. Logan (1986), in a study of patient drawings in cardiac patients, noted that some patients had clearly erroneous models of what damage had occurred to their heart following MI. In one example, he discusses a patient who believed that the large vessel supplying the blood to his heart had become almost completely blocked following his MI. A full explanation to counter this misconception resulted in an improvement in his angina symptoms and mood.

An extreme form of negative health perceptions is seen in "cardiac invalidism" (Riegel, 1993). Here patients adopt an extremely passive, dependant and helpless role in the belief that any form of overly vigorous activity will bring on another MI. A hypersensitivity to bodily symptoms means that normal sensations may be misconstrued to indicate over-exertion or an impending fatal MI. This pattern often results in the overuse of medical services mainly for reassurance about symptoms. Cardiac invalidism is often supported by the patient's spouse who becomes overprotective and may permanently take on many of the household tasks previously undertaken by the patient. This form of adaptation is difficult to change and can become a self-fulfilling negative spiral; deconditioning accompanies decreases in fitness with the result that any exertion is likely to be more acutely felt by the patient and interpreted as further confirmatory evidence for limiting activity.

Much of the available data in the MI area points to the fact that psychological variables assume primary importance over medical ones in influencing recovery following MI (e.g. Diederiks et al., 1991; Garrity, 1970 and that both patient's and spouse's perceptions about the illness are critical in rehabilitation and the return of social and occupational functioning (Garrity, 1975). However, to date, this work on psychological factors and
recovery from MI has not been based on any clear theoretical framework and has tended to focus predominately on psychopathology. Risk factors such as the Type-A behaviour pattern and hostility have received a great deal of attention (Case et al., 1985; Shekelle, Gale & Norusis, 1980 as has the role of depression (Frasure-Smith, Lesperance & Talajic, 1993; Levine et al., 1996) and social isolation (Appels, 1990) in research examining the influence of psychological factors on outcome from MI.

We believe the self-regulatory model of Leventhal and his colleagues (Leventhal, Meyer & Nerenz, 1980) has a useful application in understanding patients' behaviour following MI. This model provides a framework for understanding which illness perceptions may be important at various stages of the recovery process and may eventually offer a guide to the development of more effective interventions in the rehabilitation phase of the illness. Implicit in the illness perception approach is the view that the patient is an active participant in the treatment and recovery process. This approach fits with our own view of the MI patient. Rather than being a passive depository of information from medical and nursing staff, he/she is actively constructing a working model of how the MI came about, how long it will last and what consequences the illness will have for their lives in the future. Potential educational and rehabilitation programmes are evaluated by the patient from this standpoint and accepted or discarded depending on how they fit into the working cognitive model of their illness.

In this chapter we outline the application of the illness perception approach to MI recovery. Initially, we consider how an illness perception approach may provide a more in-depth understanding of the acute phase of MI, in particular how it relates to treatment delay. We then examine how the causal attributions that the patient and spouse make are related to subsequent positive changes in health habits and behaviour. The role of illness perceptions in predicting attendance at cardiac rehabilitation programmes and return to work is also discussed. In the latter part of the chapter we look at the relationship of illness perceptions to emotion and coping as part of the self-regulatory model. We complete this chapter with an attempt to pull these various parts together to form a model of how illness perceptions operate following a MI.

The data on which this chapter is based has been drawn from the Heart attack recovery project- a research project based in Auckland, New Zealand. The study followed 143 first time heart attack patients aged 65 years or under for 12 months following their admission to hospital. Subjects in the study completed assessments in hospital and at 3, 6 and 12 months after their admission. Spouses also completed questionnaires about their perceptions of their partner's illness. This study used a new instrument called the Illness Perception Questionnaire (IPQ) (Weinman et al., 1996) to measure the illness perception components of identity, time line, control/cure and consequences. This new measure provides an efficient way of comprehensively assessing the patient's perceptions of their illness, which was previously only possible through semi-structured interviews.

MAKING SENSE OF EARLY MI SYMPTOMS

The onset of a heart attack provides an excellent model of how patients make sense of symptoms and rapidly build implicit cognitive models about what may be causing their physical distress. Unlike many other serious illnesses, the onset of myocardial infarction is typically sudden. Individuals go from feeling well to feeling sick very rapidly. Often the illness is signalled by pain in the chest or left arm, as well as nausea and sweating. The recognition of these symptoms as a possible MI or serious illness often occurs only after the person has mentally discarded other potential causes for their symptoms; "This must be indigestion from tonight's meal - I will take some antacid tablet" or "Perhaps I strained my muscles while I was working today". By generating possible causes and starting the treatment appropriate to these lay models, the individual has commenced a psychological process to satisfactorily explain and manage their pain and symptoms. This process may conclude with the person seeking medical assistance for their symptoms, but in many cases of MI, death occurs prior to the individual seeking such help.

The cognitive process of excluding potential diagnoses is explained cogently by Leventhal's self-regulation model which highlights the critical role of appraisal in this process. In a manner very analogous to scientific inquiry, personal hypotheses about acute symptoms are adopted or discarded on the basis of how usefully they provide a coherent explanation and direct successful coping strategies. Successful strategies are, in patient terms, ones that provide relief from symptoms and pain as well as being consistent with the patient's model of the illness. In the case of MI, initial strategies to manage symptoms based on personal models of indigestion or muscle strain are typically unsuccessful at causing a reduction in pain and are usually soon discarded. Short-term strategies instituted by the patient seeking to understand and manage their early
symptoms may ultimately delay the seeking of medical care and worsen long-term prognosis. Most fatalities from MI occur within one hour of the onset of symptoms and more than 50% of patients in this category die without ever reaching hospital.

The recent advent of thrombolytic therapy for treating the acute stage of MI has focused more attention on understanding and reducing patient delay between the onset of symptoms and the initiation of treatment. Clinical trials have demonstrated that thrombolytic therapy has a far more beneficial effect the earlier it is instituted following the onset of symptoms. Early thrombolytic therapy can limit the amount of damage from the MI and alter the course of the illness (ISIS-2 Collaborative Group, 1988). A recent study showed a 45% mortality reduction in a group treated by thrombolytic within one hour of the onset of symptoms compared to a group not treated by thrombolytic (GSSI, 1986). The effectiveness of early thrombolytic treatment has encouraged more research into the factors influencing delay. Mass media campaigns have also been developed to provide information about early symptoms of myocardial infarction and to highlight the importance of quick action in response to chest pain. In the United States, the National Heart, Lung and Blood Institute recently developed a National Heart Attack Alert Program to increase community awareness of the symptoms of acute myocardial infarction as a means of reducing treatment delay for MI.

The period of delay from the onset of symptoms to arrival at hospital varies widely between countries and between urban and rural areas. However, a consistent finding is that regardless of location, the patient's decision time is the main component of total treatment delay (Dracup et al., 1995). In our Auckland sample, the median period of delay was 2 hours 30 minutes. A large multi-site Italian study of 5,301 patients found a median time of 3 hours 50 minutes (GISSI, 1995), while a similar US study of 212,990 patients from 904 hospitals found an average delay of 2 hours. In this study, older patients, women and those who arrived at hospital during the daytime hours had significantly greater delay times (Maynard et al., 1995). Other research has found patients with a history of angina or heart failure to take longer to recognise the early symptoms of the MI as a serious health threat (Meischke, Eisenberg & Larsen, 1993; Schroeder, Lamb & Hu, 1978).

The adoption by patients of a more serious illness model “Maybe I am having a heart attack”, or even the contemplation of this as a possibility - “I should call a doctor about my symptoms”, is strongly influenced by a number of factors in MI patients. The strength of the pain experienced is influential in increasing motivation for a satisfactory explanation. Pain also acts as a strong cue to the person about the dangerous nature of the condition (GISSI, 1995). We have found previous personal experience with heart disease through a family history of the disease seems to facilitate the adoption of a more serious illness model and to reduce delay from the onset of symptoms to arrival at hospital (Petrie, Weinman & Sharpe, 1996). Interestingly, Cameron (1996) in this volume has also identified a family history of cancer as being associated with vulnerability beliefs and an increased availability of cancer illness representations. Previous studies with other illnesses have also found that personal experience with an illness leads to an overestimation of, its frequency (Jemmott, Ditto & Croyle, 1988). It seems likely that this process also influences the perception of the likelihood of MI and facilitates earlier treatment.

We also found the identity component of the patient's illness perception had an impact on treatment delay. Illness identity represents the symptoms that individuals perceive as being associated with their heart condition. These symptoms may in some cases differ from those seen as part of the condition from a strictly medical point of view. For example, about one third of MI patients in our sample identified dizziness and sore eyes as symptoms caused by their heart condition. We found while there was no difference between patients who delayed versus those that didn't on the number of physical symptoms they associated with their condition, those patients who reached hospital earlier were more likely to associate breathlessness as being part of their illness (Petrie, Weinman & Sharpe, 1990). Previous research has been largely unsuccessful in identifying differences in symptoms between patients who delay and those that reach care early. However, it may be that the critical factor in this relationship is not the symptoms per se, but the patient's cognitive model of what particular symptoms signal a myocardial infarction that is critical. One of the difficulties of encouraging early action in this area is that for some patients the symptom onset is slow rather than sudden and may subside and reoccur over time, thus adding difficulties in the interpretation of symptoms (Dracup et al., 1995).

Another important factor influencing the interpretation of early symptoms of a heart attack is the influence of significant others. This is particularly so in individuals whose normal coping style is to seek out others for advice and support. Others provide a way of checking out personal ideas about symptoms and are an important source for advice about appropriate action. We have found treatment delay in MI patients to be significantly shorter in those who coped with their MI by seeking out the advice of others about what to do.
While previous research has pointed out the fact that most patients do typically discuss their symptoms with those around them, it may be the speed with which this occurs that may be critical in the delay process.

The early identification of myocardial infarction symptoms represents a real life and death example of the Leventhal self-regulatory model in action. The cognitive processes involved in recognition of MI symptoms as representing a serious threat to health are influenced by previous knowledge about the symptoms of heart disease, either through a family history or personal experience. The early seeking out of advice and support from others seems to facilitate the identification of symptoms as potentially threatening and thus reduce treatment delay. Interventions designed to alter lay models about what symptoms indicate myocardial infarction are likely to have significant influence on delay times.

**CAUSAL ATTRIBUTIONS**

For most people, a heart attack is a very frightening experience. When individuals are confronted with an unexpected negative event such as a physical assault, accident, or serious illness, there is a powerful inclination to find a cause for the event (Bulman & Wortman, 1977). Knowing the cause of an illness or other traumatic incident helps make the experience less anxiety provoking and the future more predictable. Once a diagnosis of myocardial infarction has been made, most patients spontaneously develop ideas about the cause of their illness. The process of finding a cause or causes for the MI helps patients make sense of their illness experience and provides a framework to guide their future actions to cope with the disease.

Many patients have clearly developed ideas about the cause of heart attacks based on first-hand knowledge of people they have known who have had myocardial infarctions or from information taken from the mass media. The popular media image of a heart attack victim is a harried male executive who has brought the illness on through constant overwork and relentless job stress. Usually the victim is seen as not having enough time off for relaxation and their health may be already compromised by smoking, being overweight and paying scant regard to a healthy lifestyle or diet. In fact, people’s ideas about why someone is susceptible to a heart attack is much more clearly defined in our culture than for other common illnesses such as diabetes, arthritis, or cancer. The availability of these causal models makes the MI patient’s attributional search considerably easier than for other illnesses.

Our sample of MI patients were asked to rate a list of 24 possible causes of their illness based on a five-point scale for how likely each one was to have caused their illness. This list was generated from recent studies of attributions following MI (Affleck et al., 1987; De Valle & Norman, 1992). Figure 1 shows the 12 most common attributions for patients in our study. Stress was the cause most patients identify as the reason for their MI. Further stress items such as “the type of work I do” and “overwork” also appear in the top 12 rated causes.

Other common causal attributions relate to an unhealthy lifestyle; “eating fatty foods”, “lack of exercise”, “smoking”, “being overweight” and “a poor diet”. Stress has been found to be the most common perceived cause of heart attacks in a number of studies in both the United States (Affleck et al., 1987; Rudy, 1980) and the United Kingdom (De Valle & Norman, 1992).

The search for causes of illness is not limited to patients, but is also common in others close.
to the patient (Taylor, Lichtman & Wood, 1984). Causal attributions can also provide the spouse with a greater sense of control in a situation which many find very stressful. Studies have found a large percentage of spouses to show increased rates of psychological distress and symptoms of anxiety during the time their partner is in hospital (Bedsworth & Molen, 1982) and up to one year after their partner's MI (Mayou, Foster & Williamson, 1978; Skelton & Dominian, 1973).

In our study we also had spouses rate the cause of their partner's heart attack on the same scale. The spouses' ratings are also presented in Figure 1 and show a high degree of concordance with patients about the relative importance of various causes. However, some differences did exist between patients and spouses; patients rated smoking and a poor diet as significantly more important than spouses, while spouses rated overwork on the part of their partner higher than patients. These differences may represent a self protective bias on the part of the spouse, many of whom may also smoke and presumably eat a similar diet.

One important aspect of causal attributions is the ways in which they can influence perceived control and involvement in future behaviour. Thus we were interested in seeing whether patients' and spouses' attributions predict later changes in health behaviour after the patient leaves hospital. Previous research has produced inconsistent findings on the relationship between causal attributions and health behaviour change, with some studies finding an association (Bar-On, 1987; Ire Vane & Norman, 1992) and others finding no relationship (Croog & Richards, 1977; Rudy, 1980). A possible explanation for this inconsistency is that previous work on attributions and illness have largely categorised causal attributions under four headings; self, others, chance, or the environment (Turnquist, Harvey R Andersen, 1988). These categories, however, may be more reflective of the attributions and research concerns of psychologists rather than those of patients. For a more extensive discussion of this and related issues, see the chapter by Marteau in Section 2 of this hook.

Most patients make considerable changes in their diet and exercise patterns in the six months following their MI. Relevant data from our MI sample are shown in Figure 2. We found that patients make significant changes in their diet following their MI by eating less red meat, fried food and food high in salt or sugar. Patients also increased their consumption of bran or high fibre food, fruit, and ate breakfast more often. The frequency with which patients engaged in strenuous exercise also increased and smoking rates dropped markedly.

Factor analysis of patients' most common causal attributions resulted in three interpretable attributional factors for MI patients. The first factor, labelled lifestyle, had high loadings on "eating fatty foods", "lack of exercise", "being over-weight", "high levels of cholesterol" and "smoking". The second factor we labelled stress, loaded highly on "overwork", "stress" and "my type of work". The third factor, called heredity; loaded high on "heredity" and "high blood pressure". A further factor analysis of the spouses' causal attributions also resulted in three similar factors. Two factors, lifestyle and stress, were closely related to the patient factors and were significantly correlated. The third spouse factor was labelled family distress and loaded highly on "depression", "arguing with people", as well as "family problems and worries".

Examining the relationship between attributions and changes in health behaviour six months following MI, we found the belief by patients that the MI was caused by a fatty lifestyle was significantly related to overall improvements in diet and to an increase in the frequency of strenuous exercise (Petrie et al., 1996). Attributions related to stress or to heredity were unrelated to later changes in health behaviour. We found a similar pattern in the data for spouses. In spouses the attribution of

![FIGURE 2 Changes in health habits following myocardial infarction](image-url)
the MI to lifestyle was also significantly correlated with an increase in their partner’s frequency of strenuous exercise and to positive dietary changes.

These data suggest that causal attributions are very common following MI and show a high degree of agreement between patient and spouse. There appears to be widespread cultural belief that stress is the major cause of heart attacks and this causal attribution would seem important to modify if changes are required in dietary and health behaviour. Patient beliefs about heart attacks seem to group into three main causes; stress, lifestyle and heredity factors which are different from the way causal attributions have been previously grouped and analysed by researchers. It seems from our data that causal attributions are important determinants of later changes in health behaviour. They provide important guideposts for patients and their spouses by directing coping towards controlling a future myocardial infarction. Patient and spousal beliefs that the MI was caused by a faulty lifestyle were precursors to making changes in the types of foods eaten at home and participation in regular exercise. However, the belief that the MI was caused by stress, which is the most common attribution made by patients, had no relationship with later lifestyle changes.

CARDIAC REHABILITATION PROGRAMME ATTENDANCE AND RETURN TO WORK

After the acute phase of myocardial infarction, patients are typically directed into a cardiac rehabilitation programme. Rehabilitation programmes are aimed at helping the patient adjust to their illness, modifying the risk factors for a future MI, limiting or reversing the extent of cardiac disease, as well as improving return to social and occupational functioning. Most rehabilitation programmes include graduated exercise training, education about cardiac disease and guidelines for lifestyle change. Cardiac rehabilitation programmes are now also widely used with patients who have undergone coronary artery bypass surgery, coronary angioplasty and also for patients with stable angina pectoris.

The effectiveness of cardiac rehabilitation programmes has been reviewed recently. This analysis showed benefits for patients in terms of exercise tolerance, a reduction in smoking, improvement in psychological well-being, a reduction in the cardiovascular symptoms of angina and heart failure and a reduction in mortality (Wenger et al., 1996). The extent of benefit in terms of reduced mortality from cardiac rehabilitation programmes is, however, difficult to quantify when put in the context of recent improvements in cardiac medication such as ACE inhibitor therapy and the fact that randomized controlled studies have often used highly selected samples.

Despite the likely benefits of cardiac rehabilitation for MI patients, a significant proportion of patients fail to intend any rehabilitation sessions or drop out prematurely (Gable et al., 1991). In our study of first time MI patients we found 31/0 of patients failed to turn up to cardiac rehabilitation (Petrie et al., 1996). Previous research is suggestive of the fact that patients choosing not to attend rehabilitation may have different views of their illness than patients who do attend. A recent study found that patients who were judged by staff to view their illness less seriously were less likely to attend cardiac rehabilitation (Aden et al., 1997), and others have argued that a rehabilitation programme cannot be successfully started with myocardial infarction patients unless they have developed compatible personal models of their illness (Amity, 1975).

We tested this by examining differences in illness perceptions between MI patients who attended rehabilitation and those who did not. We found illness perceptions measured by the IPQ shortly after admission to hospital were associated with later rehabilitation attendance. Although patients who attended rehabilitation programmes did not differ in terms of the medical seriousness of their MI or their age, they did have a significantly stronger belief that their illness could be controlled or cured (Petrie et al., 1990). This suggests that the decision to participate in rehabilitation is strongly influenced by the patient's beliefs about their illness and, in particular, the perceived efficacy of rehabilitation in changing the course of their heart condition.

A significant number of MI patients fail to return to work even although they are medically capable of doing so. Past research has identified that cardiac rehabilitation seems to have a minimal impact on the patient’s decision to return to work (Wenger et al., 1990). Patients with a poorer education, a more unstable job history, higher levels of psychological distress and greater levels of family instability have been noted as being at risk for not returning to work after MI (Oldridge, 1991). Previous research however, has not systematically examined how patients’ beliefs about their illness relate to the speed with which they return to work. We looked at this aspect in the Heart attack recovery project. The median time in our study for patients previously in full time employment to return to work was six weeks. We found that rehabilitation attendance was unrelated to the speed of return to work. However, those MI patients who returned to work within six weeks were characterised by a perception that their illness held less serious consequences and would last a
shorter time. The patient's belief about the future consequences of their illness also predicted disability outside work. We found the perception that the illness held grave consequences also predicted future disability in the patient's social interaction, work around the home and recreation (Petrie et al., 1996). These results suggest that more importance should be taken of patients' illness beliefs when planning rehabilitation and other interventions designed to improve function and return to work after MI. Patients may benefit from assessment of their personal ideas about their heart attack and perhaps an intervention designed to alter misconceptions and overly negative or catastrophic views of their illness and recovery. Previous work suggests that catastrophic thinking may be associated with greater levels of dysfunction in chronic illness (Petrie, Moss-Morris & Weinman, 1995) A difficulty in identifying patients' beliefs about their illness is that these are rarely volunteered by patients in medical consultations for the fear of being thought as stupid or misinformed by the doctor. The patient may also be reluctant to express ideas that put them in conflict with the doctor on whom the patient is reliant on for ongoing care. Moreover, patients are rarely asked for their ideas or views about their illness in medical consultation. The outcome of this process is that patients' illness beliefs remain essentially private.

THE DEVELOPMENT AND STABILITY OF ILLNESS PERCEPTIONS

With any chronic health problem, patients' representations of their illness may develop over a period of time, particularly if their problem is one that does not readily fit with an existing personal model. Leventhal, Nerenz and Steele (1984) found that many of their patients initially conceptualise their illness in acute terms, on the basis of their perceptions of its identity and time-line. Thus, the initial expectation with most conditions is that the illness will go away either because that is its natural time-course, or because treatment will be effective. The early symptoms of MI may well activate acute non-cardiac representations and this may be one reason for the delays in seeking help which we have discussed earlier in the chapter. However, it is important to note that cardiac representations can also be generated in response to the non-cardiac symptoms associated with general or abdominal pains. This reflects the strength of heart disease prototypes in which Leventhal et al. (1984) call "the generalised pool of illness information current in the culture", as well as the potential salience of heart disease to the individual (e.g. one's father or brother had a heart attack).

Once any disease has been diagnosed or confirmed, then this information will generally have a direct influence on the patient's representation, but there are often considerable discrepancies between doctors' and patients' perceptions (e.g., Lacroix, 1991). The onset of MI is sudden and means that it is possible to examine and compare patients' representations from the onset of the illness. We have found in our data that within a few days of experiencing their first MI, patients report clear beliefs about the identity, cause, cure/control, consequences and time line of their illness. While many of these beliefs are shared across the sample (e.g., the pattern of causal attributions - as discussed earlier), there is considerable variation in the extent to which patients assess the severity of their heart attack or see it as amenable to cure or control. Thus, at the onset of a MI, patients do seem to have ready access to prototypic or shared representations with some common ideas about causal factors but with large individual variation in other illness perceptions, which are instrumental in influencing subsequent behaviour and adaptation.

Previous work on illness perceptions in other illness groups has not used prospective studies or repeated designs and there is very little information available about the way illness perceptions change over time. Self-regulatory process changes will occur in response to new symptoms and information, or as the result of negative coping, appraisals. In contrast, other approaches to the study of illness, such as attribution theory, indicate that causal attributions can remain quite stable and influential over long time periods (Turnquist, Harvey & Andersen, 1988). MI offers an excellent opportunity to examine this issue since it is possible to track illness perceptions from the time of onset of illness. In our study we have assessed patients' perceptions of their MI on four occasions, shortly after the onset, then at 3, 6 and 12 months afterwards.

The different dimensions of illness perceptions were compared over the four time periods, using a repeated measures one-way ANOVA. The results show that, although there is considerable variance in illness perceptions at each point in time, two dimensions show evidence of stability and two show a significant change over time. Patients' perceived control or amenability to cure of their MI showed a significant decrease over the 12 months from onset and their perceptions of time-line showed a highly significant increase over the same time period. Although perceived consequences of MI showed a small but consistent decline, this was not significant and the identity scores showed an initial reduction, but returned to baseline levels at 12 months.
The apparent stability of the identity and consequences dimensions may reflect the fact that, for many patients, there are relatively few further symptoms and that prototypic perceptions of heart disease are readily available. Prohaska et al. (1985) and Bishop (1987) have demonstrated that lay beliefs of heart disease are well defined and hence these are not only readily accessed shortly after MI onset but remain largely unchanged during the following year. The increasing time-line perceptions may reflect what Leventhal et al. (1984) describe as the change from an acute to a more chronic view of the disease over time and a similar pattern of cognitive change may be reflected in the reducing beliefs in the possibility of cure and control.

It is possible that part of this apparent consistency in patients' representations of their MI may reflect the methodology we have used. By asking patients to complete the same questionnaire at regular intervals may induce a need to be consistent and hence this may mask real variation. Systematic studies of the way in which questionnaire information is processed and the demand characteristics which are involved also show that respondents may actively strive to produce consistent responses (see Sheeran & Orbell, 1996).

Clearly, it will be necessary to establish the extent to which the relative stability of certain illness representations following MI are a function of the assessment procedure. If, as we suggest, there are good reasons for stability in these patients, then the implications of this are important for patient rehabilitation and recovery. It indicates the need to identify patient cognitions at an early stage in order to identify barriers to rehabilitation and recovery.

**ILLNESS PERCEPTIONS AND RECOVERY**

In this chapter we have aimed to demonstrate how the illness perception approach may be applied to develop a clearer understanding of the patient's experience following myocardial infarction. Examining the way individuals conceptualise their symptoms and illness, from the development of initial symptoms through to the rehabilitation phase, offers a new way of understanding the impact of a heart attack and many of the problematic behaviours that may accompany the condition. Delays in seeking treatment for cardiac symptoms can have a major influence on the outcome of the disease. While previous research has focused in an atheoretical way on the demographic and clinical factors associated with delay, illness perceptions offer the opportunity to understanding treatment delay as a dynamic process. Moreover, intervention programmes aimed at reducing delay should have measurable effects on the availability of a myocardial infarction representation.

Throughout the course of their illness we see the individual as an active participant who is always seeking a rapprochement between their illness model and their everyday experience. What is perhaps remarkable with MI is the speed with which clear cognitive models of illness are developed and how some change over time as the individual is confronted with the reality of the condition. In our study, the data indicate that on the whole, initial optimism about the time course and control or curability of the disease changed towards a more chronic illness model. However, there was considerable variation within the group and against this general shift there were some individuals whose ideas changed in the opposing direction. The relationship of changes in illness perceptions to overall emotional adjustment is an area that is in need of further investigation.

Patients' beliefs about whether their heart attack was caused by stress, genetic factors, or poor health habits act as a clear starting point for individuals when deciding to make changes in their personal health behaviours. For many, a heart attack is seen as a clear warning of the consequences of smoking, a poor diet and a sedentary lifestyle. However, many other patients do not make these associations and may see personal stress or family problems as the main reason for their illness. From this standpoint, changes to health behaviours make little sense. This process does not exclusively belong to the patient. Beliefs about the cause of the illness in the patient's family can, as we have seen, also influence these lifestyle changes. Spouses and family members can be effective agents for change in this area by offering prompts, encouragements and positive reinforcements for new behaviour.

Cardiac rehabilitation programmes have been shown to make a positive impact on many patients following MI. However, a considerable number of patients either do not attend or drop out from courses prematurely. We have found that the patient's view of their illness is an important factor in both rehabilitation attendance and in how quickly patients return to work following their MI. Our results suggest that highly negative or catastrophic thinking about illness is an important area for future intervention programmes. If such thinking can be identified early in the recovery process and interventions developed to foster realistic models and expectations, then improvements in the rates of functioning can be anticipated. These findings might also partially explain recent relating post-MI depression to clinical outcome (e.g., Lesperance, Frasure-Smith &
Talajic, 1966), since similar negative cognitive distortions may be associated with depression and these can serve to interfere with rehabilitation and recovery. An important challenge for the future is to develop techniques that access private views of illness in situations where patients may feel reluctant to discuss these freely. Another is to develop effective interventions for changing individuals' catastrophic and negative cognitions about their illness. Progress in these areas is likely to improve the adjustment and recovery of function in patients following myocardial infarction.

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