What is Myocardial Infarction?

Myocardial Infarction (MI), also known as a 'Heart Attack', can be defined as either the injury or death of the muscular tissue of the heart. Myocardial infarction occurs when blood flow decreases or stops to part of the heart, causing damage to the heart muscle. Like any other muscle in the body, the heart also needs its own constant supply of oxygen and nutrients.

The heart has four main arteries. Two of them large, with branching arteries that deliver oxygenated blood to the heart muscle. If one of these arteries or branches becomes blocked, a portion of the heart is starved of oxygen, a condition known as "cardiac ischemia." If a cardiac ischemic attack lasts for an extended period, the starved heart tissue begins to die. This is known as a heart attack, otherwise known as myocardial infarction – literally, "death of heart muscle."

Symptoms of Myocardial Infarction

The most common symptom associated with a MI is chest pain or discomfort in the chest which may refer into the shoulder, arm, back, neck or jaw. Often it occurs in the centre or left side of the chest and can last for more than a few minutes. This discomfort may initially be mistaken for heartburn. Other symptoms may also occur such as shortness of breath, nausea, feeling faint, a cold sweat or tiredness and fatigue.

Myocardial Infarction Risk Factors

Common risk factors associated with Myocardial Infarction include:

- High blood pressure
- Smoking
- Diabetes
- Lack of exercise
- Obesity
- High blood cholesterol
- Poor diet
- Excessive alcohol consumption

Prevention of Myocardial Infarction

It has been scientifically proven that physical activity reduces the risk of cardiovascular disease. Those at risk of developing cardiovascular diseases should aim to participate in 150 minutes of moderate or 75 minutes of vigorous-intensity aerobic exercise a week.

Other lifestyle changes that can help prevent Myocardial Infarction also include:

- Stop smoking
- Choose good nutrition
- Manage blood cholesterol
- Lower high blood pressure
- Be physically active every day
- Aim for a healthy weight
- Manage diabetes
- Reduce stress
- Limit alcohol intake

Myocardial Infarction rehabilitation guidelines

It is important that the Cardiac Rehabilitation Programme is created and overseen by a multidisciplinary team. The cardiac rehabilitation team should provide information, education and advice to both the patient and their families throughout the process. Rehabilitation post myocardial infarction is divided into four phases:

- First Phase: Hospital Care and early rehabilitation post myocardial infarction
- Second Phase: Immediate Post Discharge
- Third Phase: Intermediate Outpatients
- Fourth Phase: Long-term Maintenance

In this article we are going to look at phases three to four.

Before starting the Cardiac Rehabilitation Program (Phase 3), the patient should be cleared by their Cardiac rehabilitation Team and overseeing doctor.

Phase 3: Intermediate Outpatients

Phase 3 should start between 4-8 weeks after hospital discharge and can be anywhere between 6-12 weeks in length, based on the patient's progress.

Structured exercise sessions that meet the needs of the individual patient will be the focus during this phase, thus the training program will be individualised. These sessions will accompany the patient's continued efforts at home to increase daily physical activity levels.

The patient can expect safe and effective progression. The progression will first be increasing the frequency and duration of selected activities and then the intensity.

According to John Hopkins exercise physiologist Kerry J. Stewart, "Aerobic exercise and resistance training are the most important for heart health." Flexibility is also important, although it does not contribute directly to heart health, it provides a good foundation for performing aerobic and strength exercises more effectively.

Aerobic Exercise for Phase 3 Rehabilitation

Resistance Training for Phase 3 Rehabilitation

- **Resistance Training** (Strength Work), has a more specific effect on body composition. For people who are carrying a lot of body fat (including a big belly, which is a risk factor for heart disease), strength training can result in helping reduce body fat and create leaner muscle mass. According to the American College of Sports Medicine, at least two non-consecutive days per week of resistance training is beneficial.

Examples: Training with free weights (such as hand weights, dumbbells or barbells), on weight machines, with resistance bands or through body-resistance exercises, such as push-ups, squats and chin-ups.

Research shows that a combination of aerobic exercise and resistance work may help raise HDL (good) cholesterol and lower LDL (bad) cholesterol.

Flexibility and Balance for Phase 3 Rehabilitation

- Flexibility workouts, such as stretching, do not directly contribute to heart health. However, stretching benefits musculoskeletal health, which enables you to stay flexible and free from joint pain, cramping and other muscular issues. Flexibility is crucial to enhancing aerobic exercise and resistance training. Balance exercises help maintain stability and prevent falls, which can cause injuries. Practicing your balance helps to re-establish neuromuscular control, which is the awareness of the position of a joint in space – mechanoreceptors found in both muscles and joints send this information to your brain.

Flexibility and balance exercises are recommended each day post exercise.

Examples: For Flexibility, static stretches are beneficial, holding the stretch for 20-30sec. For Balance, single leg stance for 30 seconds – first on a stable surface, and then an unstable one.

Aqua Therapy for Phase 3 Rehabilitation

Aqua therapy is a great low impact exercise environment for stable Myocardial Infarction patients to improve or maintain cardiovascular functional capacity. It is also beneficial in maintaining and improving strength of major muscles groups. The greatest benefits of exercising in an aquatic environment is the reduction of weight bearing on joints and increased blood flow from the hydrostatic pressure created by the water.

Strength training in water is beneficial as individuals work against the resistance of the water increasing their strength while reducing joint pressure, increasing blood flow, and increasing range of motion. This is highly effective for any patient with low levels of fitness, elderly populations, orthopaedic injuries, disabled, neurological, recovering post-surgery or individuals who are overweight and struggle to exercise on land.

Phase 4: Long-term Maintenance

Phase 4 involves the long-term maintenance of physical activity and lifestyle change. The patient is advised to make exercise a lifestyle and daily habit. In phase 4 the conditioning programme initiated in Phase 3 will be progressed or maintained. We as Biokineticists can help create specific training programs, monitoring the patients progress and advancing their exercises safely and clinically. Trained in first aid, our pool is a safe environment to confidently exercise under the guidance of an experienced professional. This is necessary and very important if patients are to gain long-term benefit. Evidence suggests that both physical activity and lifestyle changes must be maintained and sustained for cardiac benefits to continue.

Should you be in recovery post myocardial infarction and planning for your journey of rehabilitation, we can assist with developing a personalised Cardiac Rehabilitation Program. And, as always, remember that prevention is better than the cure. If you are aware of family history or underlying health problems that could make you vulnerable to a Myocardial Infarction, take action today.

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