Comparison of Traditional Cardiac Rehabilitation Programs With Intensive Cardiac Rehabilitation Programs on Health Outcomes in Cardiac Patients

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Comparison of Traditional Cardiac Rehabilitation Programs with Intensive Cardiac Rehabilitation Programs on Health Outcomes in Cardiac Patients: A Review

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HMSL 6840: Directed Readings

Dr. Todd Keylock

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Abstract

Introduction: Cardiovascular disease kills more than 850,000 people in the United States each year and includes numerous disorders such as myocardial infarction, stroke, and heart failure (American Heart Association, 2017; American Heart Association, 2020). Cardiac rehabilitation and secondary prevention programs are used to treat and prevent further instances of cardiovascular disease by implementing exercise, nutrition counseling, psychological and social support, and stress management. Purpose: Improvements in cardiovascular health are often seen after participating in cardiac rehabilitation, but the extent of these improvements may depend on the intensity of the program. This paper reviewed current literature and compared traditional cardiac rehabilitation to intensive cardiac rehabilitation in order to evaluate the improvement of cardiovascular disease risk factors such as systolic blood pressure, body mass index, and total cholesterol. Methods: Literature from the previous thirty years in the field of cardiac rehabilitation and secondary prevention programs was reviewed, and systolic blood pressure, body mass index, and total cholesterol were evaluated. Results: Multiple researchers have concluded that traditional cardiac rehabilitation/secondary prevention programs and intensive cardiac rehabilitation/secondary prevention programs may be used to reduce risk factors associated with cardiovascular disease; however, intensive programs tend to yield greater reductions in systolic blood pressure, body mass index, and total cholesterol than traditional programs. Conclusion: Based on the review of literature, both traditional and intensive cardiac rehabilitation and secondary prevention programs may be effective in reducing risk factors associated with cardiovascular disease; however, intensive programs yield greater reductions in certain cardiovascular disease risk factors. Further research is needed on the long-term impact of these programs.
According to the American Heart Association (2017), cardiovascular disease (CVD) includes many complications of the heart and blood vessels including myocardial infarction, stroke, heart failure, arrhythmias, and heart valve problems. CVD currently plagues more than 120 million Americans and claims more than 850,000 American lives per year (American Heart Association, 2020). Additionally, annual costs associated with CVD are upward of $350 billion (American Heart Association, 2020). Cardiac rehabilitation (CR) and secondary prevention programs (SPP) are multidimensional rehabilitation services with the crucial goal of decreasing instances of CVD morbidity and mortality (American Association of Cardiovascular and Pulmonary Rehabilitation [AACVPR], 2013). In conjunction with physicians, nurses, dieticians, psychologists, and exercise physiologists, central components of CR include medical examinations, exercise prescription, weight management, nutrition education, psychosocial intervention, and smoking cessation in an attempt to reduce risk factors associated with CVD (Fletcher et al., 2001). With devastatingly high numbers of CVD diagnoses each year, the need for effective CR is imperative. There are currently multiple methods of CR available for cardiac patients, two of which include traditional CR and intensive CR.

Traditional CR/SPP

Traditional CR programs offer a variety of services including exercise testing and rehabilitation, educational sessions, and CVD risk-factor evaluation; however, traditional CR programs tend to put an emphasis predominately on the exercise rehabilitation piece of the
program, as these sessions can either be exercise-based or education-based (Engebretson et al., 1999; Freeman et al., 2019). According to Mirman et al. (2020), due to time necessity, traditional programs dedicate the majority of the program to exercise. Aldana et al. (2003) reported that traditional CR consists of four phases ranging from phase I to phase IV, and patients typically participate in aerobic exercise in both clinical and community settings. While exercise is important, an educational component to CR is critical, as Kapko and Krzych (2017) determined that a strong knowledge of cardiovascular risk factors led to a more effective rehabilitation. Traditional CR programs are generally restricted by insurance to a maximum of 36 total sessions in phase II, and these services are typically offered three days per week for one-hour per day (Freeman et al., 2019).

**Intensive CR/SPP**

Intensive CR is a new method of services that increases frequency and intensity of the rehabilitation program for cardiac patients (AACVPR, 2013). When compared to traditional CR, intensive CR is more rigorous, offering up to six different sessions per day, and up to 72 total sessions (AACVPR, 2013). Often, these programs offer more time-intensive sessions lasting upward of 3-4 hours each (Freeman et al., 2019; Freitas et al., 2010). Additionally, intensive CR programs do not focus primarily on exercise training, but equally incorporate nutrition education, stress management, social support, and exercise training (Freeman et al., 2019). Furthermore, intensive CR programs are held to an exceptionally high standard. To prove efficacy, intensive CR programs are required by the Centers for Medicare and Medicaid Services to exhibit a significant decline in numerous health outcomes, including, but not limited to, low-density lipoprotein, triglycerides, body mass index (BMI), blood pressure, and medication use (as cited in AACVPR, 2013, p. 83-84).
The purpose of this paper is to review the current literature and examine the data collected by researchers on the impact of traditional vs. intensive cardiac CR on health outcomes in cardiac patients. Specifically, this paper will compare the efficacy of phase II traditional CR programs to intensive CR programs when assessing systolic blood pressure, BMI, and total cholesterol. It is hypothesized that when analyzing health outcomes following CR, intensive CR programs are more effective in lowering systolic blood pressure, BMI, and total cholesterol than traditional CR programs in the weeks, months, and years to follow.

**Systolic Blood Pressure**

Blood pressure is the amount of force being applied on the walls of arteries, and hypertension, or high blood pressure, is a prominent risk factor for developing cardiovascular disease (Centers for Disease Control and Prevention [CDC], n.d.). Healthy blood pressure is classified as a systolic reading of <120 mm Hg and a diastolic reading of <80 mm Hg (Whelton et al., 2018). While systolic blood pressure and diastolic blood pressure have both proven to be risk factors for cardiovascular disease, systolic BP has a stronger relationship with CVD than does diastolic BP (Haider et al., 2003). According to Whelton et al. (2018), hypertension harms numerous structures and functions of the heart, increasing the risk for atrial fibrillation and heart failure; however, physical fitness reduces the risk of increases in systolic blood pressure and inhibits the overall development of hypertension. With the implementation of CR, patients often see changes in systolic blood pressure throughout the duration of the program (Aldana et al., 2003).
Traditional CR/SPP

Beckie et al. (2013) evaluated 99 women in a traditional, 12-week, three days per week CR program in order to assess physiological improvements. Prior to the program, baseline measures were recorded for graded exercise tests and blood pressure (Beckie et al., 2013). At baseline, the mean systolic blood pressure reading was 124.3 mm Hg ± 17.6 mm Hg (Beckie et al., 2013). Using the results from the graded exercise tests, subjects then participated in aerobic exercise and resistance training at 60% to 80% of their maximal heart rate for a total of thirty-six sessions and were offered up to eight educational sessions throughout the program (Beckie et al., 2013). After the completion of the program, blood pressure was again measured, and the post-CR mean systolic blood pressure among participants was reported at 119.6 mm Hg ± 16 mm Hg (Beckie et al., 2013). Results from the study show that patients enrolled in this traditional CR program saw a 4.7 mm Hg drop in systolic blood pressure as a result of program participation (Beckie et al., 2013).

While Beckie et al. (2013) found a decrease in systolic blood pressure, not all studies report comparable findings. In a similar study conducted by Carlson et al. (2000), forty-two low-to-moderate-risk cardiac patients were enrolled in a traditional CR program that consisted of three sessions per week for a duration of six months. Each CR session included 30-40 minutes of aerobic exercise, and throughout the program, patients were provided education in the form of individual counseling, group classes, and video presentations; furthermore, patients were scheduled to participate in a three-session cardiovascular risk factor educational course (Carlson et al., 2000). At baseline, the patients enrolled in the program underwent exercise testing and had resting blood pressure measured (Carlson et al., 2000). Authors reported that prior to the interventions, the average BP reading was 137 mm Hg ± 17 mm Hg. After six months of CVD-
education and exercise at 60%-85% of aerobic capacity, subjects again had resting blood pressure measured, and researchers reported a slight increase of 0.3% in resting systolic BP.

Furthermore, in a study conducted by Aldana et al. (2003), researchers reported similar results. At baseline, Aldana et al. (2003) reported those enrolled in traditional CR had a mean systolic blood pressure reading of 128.1 mm Hg ± 16.8 mm Hg, and six months after the baseline measurements, outcome measures for systolic BP were reported to have increased 1.10mm Hg.

While Beckie et al. (2013) reported a decrease in systolic BP after participating in traditional CR, further studies reported a post-intervention increase in systolic BP (Aldana et al., 2003; Carlson et al., 2000). Additional research is needed in order to determine the efficacy of traditional CR on systolic BP. In addition to traditional CR programs, intensive CR programs also yield change in systolic blood pressure in cardiac patients.

**Intensive CR/SPP**

Cardiac patients that participate in intensive CR programs may experience greater reductions in systolic blood pressure over time. In a study conducted by Freitas et al. (2011), 101 cardiac patients participated in an intensive, four-week rehabilitation program while researchers evaluated multiple physical parameters, including a preliminary stress test using an ergocycle to determine heart rate reserve. Additionally, the researchers measured resting blood pressure in all subjects. The intensive cardiac rehabilitation program focused on improving medical care, monitoring risk factors associated with CVD, exercise training, nutrition modifications, social and psychological support, and educational courses on relaxation (Freitas et al., 2011).

According to Freitas et al. (2011), the daily exercise portion of the program lasted three hours per day, five and a half days per week and consisted of a 45-minute training session on an ergocycle or a treadmill and a one-hour walk outside at 60% to 80% of the heart rate reserve. Furthermore,
Comparing traditional cardiac rehabilitation programs with intensive cardiac rehabilitation programs, participants partook in 45 minutes of fitness, gymnastics, aquatic training, or martial arts in addition to therapy, and educational workshops were provided for three to four hours per week (Freitas et al., 2011). Prior to participating in intensive CR, the mean resting systolic blood pressure for study participants was 127 mm Hg ± 16 mm Hg, but by engaging in intensive CR, there was a 10% decrease in the group mean, and post measures were recorded at 115 mm Hg ± 17 mm Hg (Freitas et al., 2011). Additional studies show long-term results of intensive CR.

Bjarnason-Wehrens et al. (2007) studied the long-term efficacy of a three-week intensive CR program with an initial study group of 327 patients. Each patient enrolled in the program participated in educational, somatic, psychological, and social programs for five to seven hours each weekday, as well as joined four to five therapy sessions per day (Bjarnason-Wehrens et al., 2007). Additionally, patients underwent a baseline physical assessment on a cycle ergometer and throughout the study, approximately 60% of the participants self-reported exercise for the duration of the study (Bjarnason-Wehrens et al., 2007). Resting blood pressure was assessed at baseline, immediately following CR, 6-months after CR, 12-months after CR, and 24-months after CR (Bjarnason-Wehrens et al., 2007). At baseline, authors reported the mean systolic blood pressure reading was 126.8 mm Hg ± 17.3 mm Hg, and when measured immediately following the program, the mean blood pressure decreased to 124.5 mm Hg ± 17.3 mm Hg; however, at 6-months, 12-months, and 24-months post-program, systolic readings steadily rose to 132.9 mm Hg ± 18.5 mm Hg, 132.6 mm Hg ± 17.9 mm Hg, and 133.2 mm Hg ± 19.7 mm Hg, respectively. 24-months after the completion of CR, 61.2% of patients reported regular physical activity, but while systolic blood pressure lowered immediately following the completion of the program, study results indicate that results may not be sustainable in the long-term (Bjarnason-Wehrens et al., 2007). Furthermore, Silberman et al. (2010) reviewed 24 intensive CR sites to evaluate the
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Effectiveness of the intensive CR program in improving multiple health outcomes for cardiac patients at one year.

Silberman et al. (2010) studied 2,974 participants, taking baseline resting blood pressure measures prior to program participation, and the mean value was reported as 132.7 mm Hg ±17.4 mm Hg. Cardiac patients then followed a multi-disciplinary program that included social support sessions, cooking lessons, exercise programs, and stress management courses, and patients were asked to continue following this protocol for 1-year, at minimum (Silberman et al., 2010). The authors collected further measures at 12-weeks and 1-year following the intensive CR program, and from baseline to 12-weeks, the mean systolic BP reading decreased by 8.7%; from baseline to 1-year the mean systolic BP reading decreased 4.7%; however, from 12-weeks to 1-year, the mean systolic BP reading increased by 4.4%. Results from the present literature indicate that intensive CR is more effective than traditional CR in lowering systolic BP in the short-term; however, there is limited data on the long-term impact of traditional CR in relation to systolic BP. Cardiac rehabilitation also impacts body mass index, an additional positive risk factor for developing CVD.

**Body Mass Index**

According to Fock and Khoo (2013), body mass index (BMI) is a risk factor for developing CVD and is a way to classify overweight and obese individuals; furthermore, overweight can be defined as a BMI of 24 kg/m² -29.9 kg/m² and a BMI of 30 kg/m² or greater is considered obese. Additionally, the authors report that cardiovascular diseases such as hypertension, stroke, and coronary artery disease are all attributable to obesity; however, exercise can be used as a tool to lower body weight and BMI, in turn, reducing the risk of CVD.
COMPARISON OF TRADITIONAL CARDIAC REHABILITATION PROGRAMS WITH INTENSIVE CARDIAC REHABILITATION PROGRAMS

While physical activity is one tool to reduce weight and BMI, exercise should be paired with a caloric deficit in order to obtain significant weight loss; therefore, dietary education about how to do this safely and effectively should be provided (Fock & Khoo, 2013). The implementation of CR has shown to decrease BMI in cardiac patients (Lavie et al., 1993; Aldana et al., 2003).

**Traditional CR/SPP**

In a study conducted by Lavie et al. (1993), 274 patients who had undergone a major cardiac event were referred to a traditional phase II CR program. At baseline, all patients had BMI measured, and a mean score of $27.8 \text{ kg/m}^2 \pm 4.2 \text{ kg/m}^2$ was recorded (Lavie et al, 1993). After baseline measures were recorded, patients underwent a 12-week, 36-session program that consisted of 10 minutes of warm up, 30-40 minutes of continuous exercises including walking, cycling, and jogging, and 10 minutes of a cool-down period. After the completion of the program, participants showed a mean decrease of 1.5% in BMI. In a later study using the same traditional CR protocols, Lavie and Milani (1996) observed 314 individuals. Of those total participants, 116 patients were classified as obese and 198 patients did not classify as obese. At baseline, BMI was measured in all participants, and in the obese participants, the average BMI was $31.2 \text{ kg/m}^2 \pm 3.2 \text{ kg/m}^2$, while in the non-obese participants, the average BMI was reported as $24.6 \text{ kg/m}^2 \pm 2.1 \text{ kg/m}^2$ (Lavie & Milani, 1996). After the completion of the traditional CR program, post-intervention measurements were taken and BMI had deceased an average of 1.5% in the total study population; however, BMI showed a significant decrease (3%) in the obese participants, and no decrease in the non-obese participants. Similarly, Carlson et al. (2000) found that after implementing six months of traditional CR, the group mean for BMI decreased 1.8%. Multiple researchers have shown that traditional CR may yield a decrease in BMI, but as the intensity of the programs shifts, additional shifts in BMI may result (Mirman et al., 2020).
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Intensive CR/SPP

In a study conducted by Mirman et al. (2020), researchers compared the efficacy of traditional CR to intensive CR when examining body mass in patients with coronary artery disease. The traditional group followed a 24-36-session rehab program that included 1-hour sessions of aerobic training, strength training, and balance exercises over a period of 8-12 weeks, where participants exercised at 70-85% of their maximal heart rate (Mirman et al., 2020). Additionally, those in the traditional rehab group met with a nutritionist and a psychologist one time, as needed, and were offered optional education classes before or after their program, covering topics such as nutrition and diabetes management (Mirman et al., 2020). The intensive group followed a 9-week program that included two weekly sessions, with each session lasting four hours (Mirman et al., 2020). During the program, the intensive group participated in exercise training at 70-85% of their maximal heart rate, followed a low-fat diet, engaged in stress management programs, and attended group support sessions led by mental health professionals (Mirman et al., 2020). Study participants were placed in either the traditional group or the intensive group based on patient preference, physician recommendation, and insurance benefits. Prior to rehab participation, the traditional group had a mean BMI of 27.3 kg/m² ± 6.1 kg/m², while the intensive group had a mean BMI of 27.8 kg/m² ± 5.6 kg/m² (Mirman et al., 2020). After participating in the CR programs, the traditional group ended with a mean BMI of 27.3 kg/m² ± 6.0 kg/m², while the intensive group ended with a mean BMI of 26.6 kg/m² ± 5.2 kg/m² (Mirman et al., 2020). Results indicate that participation in the intensive CR program led to statistically significant losses in BMI, while participation in the traditional program did not lead to a reduction of BMI (Mirman et al., 2020). Intensive rehabilitation programs may have a
greater impact on BMI than traditional rehabilitation programs; furthermore, CR influences lipid profiles as well.

**Total Cholesterol**

According to Mamrack (2015), hyperlipidemia, a risk factor for the development of cardiovascular disease, is defined as elevated levels of lipids in the blood; furthermore, high levels of lipids in the blood lead to a build-up of plaque in the arteries, resulting in the decreased ability to pump blood to the heart, often times resulting in myocardial infarction and other cardiovascular diseases. According to AACVPR (2013), lipid levels, or cholesterol levels, are determined by multiple factors including genetics, environment, and lifestyle habits such as diet and exercise. High-density lipoprotein (HDL), low-density lipoprotein (LDL), and very low-density lipoprotein (VLDL) are the three main classes of cholesterol found in the blood, and total cholesterol (TC) is calculated by summing these three classes of lipids (AACVPR, 2013). A TC score greater than 200 mg/dL is a positive risk factor for developing cardiovascular disease (American College of Sports Medicine [ACSM], 2014).

**Traditional CR/SPP**

Participation in CR has shown to lower TC, in turn, decreasing the likelihood of developing further cardiac problems (Beckie et al., 2013). Beckie et al. (2013), measured lipid profiles in 99 women prior to the completion of a 12-week traditional CR program. Patients were instructed to complete a 12-hour fast, and then researchers measured lipid profiles using a Cholestech LDX System, and they found that the mean value for TC prior to the program was 167 mg/dL ± 36 mg/dL. After baseline measures were taken, participants completed 12-weeks of traditional CR, including physical exercise at 60% to 80% of their maximal heart rate and
supplemental educational sessions. Upon the completion of the program, the authors measured mean TC to be 158 mg/dL ± 36 mg/dL, indicating that there was a mean decrease in TC of 9 mg/dL. Although certain studies have shown a decrease in TC during traditional CR, other studies have shown this decrease may only apply to certain populations.

In a comparison of health outcomes in elderly cardiac patients (mean age 70.1 years) to younger cardiac patients (mean age 53.9 years), Lavie et al. (1993) measured baseline fasting lipid levels prior to participation in a traditional CR program. The elderly group was comprised of 92 patients, and at baseline, mean TC was reported at 204 mg/dL ± 44 mg/dL, and the young group was comprised of 182 patients, and at baseline, mean TC was reported at 209 mg/dL ± 38 mg/dL (Lavie et al., 1993). Patients then underwent 12-weeks of a prescribed exercise program at 70% to 85% of their maximal heart rates and were encouraged to adhere to dietary protocols to improve health outcomes. However, upon the completion of the program, only the young group saw improvements in TC values, with a 2% decline. Intensive CR appears to have a more profound effect on lipid levels than traditional CR programs.

**Intensive CR/SPP**

In a study conducted by Ornish et al. (1998), 48 patients with cardiovascular disease were randomly assigned to either Ornish’s intensive secondary prevention program or to a control group. In the intensive SPP, the experimental group followed a strict, very low-fat dietary plan, physical activity, stress management, smoking cessation, and group support, while the control group followed the advice of their physicians about changes in lifestyle habits, and both groups were followed for five years. Prior to program participation, all patients had baseline lipid levels measured, and the TC levels for the experimental group were 225.1 mg/dL ± 11.9 mg/dL, while the TC levels for the control group were 247.9 mg/dL ± 9.4 mg/dL. After 1-year of following the
intensive protocol, Ornish et al., (1998) took additional measures on TC, and the experimental group decreased by 6.62 mg/dL, while the control group decreased by 3.6 mg/dL. While 5-year follow-up lipid levels were not reported, Ornish et al., (1998) reported that in the experimental group, there were significantly fewer instances of cardiac events when compared to the control group at five years, indicating greater efficacy of intensive programs. Further studies have demonstrated how increasing the intensity of a SPP can increase health-related quality of life.

In a comparison study of two intensive SPPs, the Ornish program and the Benson-Henry Mind/Body Medical Institute (MBMI), Razavi et al. (2014) noted meaningful changes in lipid levels in cardiac patients 65 years of age and older, with measurements taken at 3-months, 12-months, and 24-months. Both SPP programs incorporated exercise, dietary counseling, stress management, and psychosocial support; however, the Ornish program was more intense overall. The Ornish program included an initial 12-week intense phase, where patients participated in three 4-hour sessions during week 1, they participated in two 4-hour sessions in weeks 2-11, and they participated in three 4-hour sessions in week 12 (Razavi et al., 2014). Additionally, patients received nutrition counseling that directed them to eat a low-fat, vegetarian diet. After the initial 12-weeks, during the remainder of year one, intervention was based on medical risks, with patients receiving either two-hour weekly sessions for 12 or 24 weeks or four-hour weekly sessions for 40 weeks.

The MBMI program included an initial 13-week phase with one 3-hour session per week where patients were encouraged to eat low-fat diets, participate in group support sessions, and attend health assessment sessions (Razavi et al., 2014). For the remainder of the first year, patients participated in a 3-hour session two times each month. In both intensive SPPs, patients were monitored and reevaluated during a second year. At baseline, The Ornish group had a mean
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TC level of 163.7 mg/dL ± 47.5 mg/dL, while the MBMI group had a mean TC level of 160.3 mg/dL ±3.2 mg/dL. After three months of the Ornish program, mean TC levels dropped 23.8 mg/dL from baseline, after 12-months, mean TC levels were 9.4 mm/dL lower than baseline, and after 24-months in the Ornish program, mean TC levels were 12.6 mm/dL lower than baseline. After three months of the MBMI program, mean TC levels dropped 6.9 mm/dL from baseline, after 12-months, mean TC levels were 9.1 mm/dL lower than baseline, and after 24-months in the MBMI program, mean TC levels were 8.2 mm/dL lower than baseline measures. These results indicate that more intense programs may yield more drastic changes in TC levels in cardiac patients.

Practical Implications

Current literature in the field of CR and SPP suggests that traditional and intensive programs may positively impact CVD risk factors such as systolic blood pressure, BMI, and TC; however, research indicates that intensive programs have a more profound, longer-lasting effect than traditional programs. While there is limited data on the long-term impact of traditional CR for risk factors associated with cardiovascular disease, Thomas et al. (2019) found that after participating in traditional CR, all-cause hospital readmissions were similar compared to those who did not participate in any form of CR. By implementing CR/SPP with more intense regimes, adults impacted by cardiovascular disease may experience greater reductions in CVD risk factors, in turn, reducing morbidity and mortality following a cardiac event. Fitness and health professionals can apply these intensive regimes to current protocols to increase health among cardiovascular patients. Reducing cardiovascular-related morbidity and mortality will drastically
reduce annual medical costs nationwide, as well as increase overall health-related quality of life for millions of Americans.

**Directions for Future Research**

The worldwide prevalence of CVD has led scientists and health professionals to consider comprehensive treatment programs in order to combat cardiac morbidity and mortality; however, the long-term impact of CR and SPP is not well-reported. While researchers often report changes in CVD risk factors throughout the duration of the program, the lack of follow-up, specifically in traditional CR/SPP, is an area in which more data should be presented. There is a shortage of literature addressing how participation in traditional and intensive cardiac programs may continue to positively impact cardiovascular risk factors in a one-year, two-year, or five-year follow-up. This information is critical in that it will provide healthcare professionals data to continue to adapt secondary prevention programs for optimal health in cardiac patients.

**Conclusions**

Cardiac rehabilitation and secondary prevention programs incorporate exercise, nutrition counseling, stress management, and psychosocial support in an attempt to improve health-related quality of life and reduce risk factors associated with CVD. While both traditional and intensive programs can reduce risk factors of CVD, research indicates that the increase in rigor of the intensive programs yield greater reductions in systolic blood pressure, BMI, and TC in cardiac patients. Reducing systolic blood pressure, body mass index, and total cholesterol levels in cardiac patients will increase health-related quality of life and decrease cardiovascular-related deaths nationwide.
References


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COMPARISON OF TRADITIONAL CARDIAC REHABILITATION PROGRAMS WITH INTENSIVE CARDIAC REHABILITATION PROGRAMS


Intensive Cardiac Rehabilitation: A New Program to Boost Heart Health

Julia Thatcher: M.Ed. Candidate, Kinesiology
Goals and Objectives

• **Goals and Objectives**
  • What exactly is intensive cardiac rehabilitation (ICR)?

  • What are the CMS approved ICR Programs, what do these programs include, and how can they be implemented?

  • What impact does ICR have on the physical health and overall satisfaction of patients? And what is the long-term impact of an ICR program?

  • What does ICR look like in a local setting?

  • Can I answer any additional questions?

What is Intensive Cardiac Rehabilitation (ICR)?
What is Intensive Cardiac Rehabilitation (ICR)?

• **ICR** aims to equally incorporate nutrition education, stress management, social support, and exercise training
  • Nutrition Education
  • Stress Management
  • Social Support
  • Exercise Training
  • Risk Factor Modification

• **ICR** is a method of services that increases the frequency and intensity of rehabilitation for cardiac patients
  • **Frequency**: Up to 18 weeks, 72 total sessions
  • **Intensity**: 2-6 sessions per day, up to 3-4 hours per day
CMS Required Components of ICR

CMS 5 Required Components of ICR:
1. Physician prescribed exercise
2. Cardiac risk factor modification
3. Psychosocial assessment
4. Outcomes assessment
5. Individualized treatment plan
According to the Centers for Medicare and Medicaid Services: ICR programs must accomplish one or more of the following outcomes:

1. Demonstrate a positive progression of coronary heart disease
2. Decrease the need for coronary bypass surgery
3. Decrease the need for percutaneous coronary interventions
According to the Centers for Medicare and Medicaid Services: ICR programs must demonstrate a significant reduction from baseline to post-rehab in five or more of the following measures:

1. **Low density lipoprotein**
2. **Triglycerides**
3. **Body mass index**
4. **Systolic blood pressure**
5. Diastolic blood pressure, and
6. The need for cholesterol, diabetes, or blood pressure medication
1. **Dr. Ornish’s Program for Reversing Heart Disease**
   1. Exercise
   2. Low-fat diet
   3. Smoking cessation
   4. Stress Management
   5. Group support sessions

2. **Pritikin Program**
   1. 75% - 80% of diet consisting of complex carbohydrates
   2. Exercise
   3. Counseling

3. **Benson-Henry Institute Cardiac Wellness Program**
   1. Exercise
   2. Behavioral Interventions
   3. Counseling

# CMS Approved ICR Programs

<table>
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<tr>
<th>Program</th>
<th>Diet</th>
<th>Exercise</th>
<th>Lifestyle Modifications</th>
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| [Omish Lifestyle Medicine](https://www.omish.com) | - Fruits/Vegetables
- Whole grains
- Legumes
- Soy products
- Nonfat dairy
- Egg Whites
- **Increase real food**
- **Limit processed food** | - 30 minutes per day
- 3-5 hours of aerobic exercise per week
- Strength training 2-3 times per week | - Stretching
- Meditation
- Deep Breathing
- Progressive relaxation |
| [Pritikin](https://pritikinfoods.com/program/)       |                                           | **Regular, moderate exercise**                | **Finding inner peace**                      |
| [Benson-Henry Institute](https://bensonhenryinstitute.org) | - Fruits/Vegetables
- Whole grains
- Fish
- Lean sources of protein
- Avoid saturated fat, processed meats, and cholesterol rich foods
- **Whole, unprocessed foods** | - 30-90 minutes of cardiovascular conditioning
- 6 days per week
- Strength training 2-3 times per week for 20 minutes
- Stretch 10 minutes per day | - Stress management
- Mood management
- Group Support
- **Creating a healthy mind/body connection** |
|                                               | - Dietary counseling
- **Disease prevention though mind body care** | - Tai Chi
- Yoga
- Jogging | - Stress Management                          |
Health Outcomes of ICR: Total Cholesterol

- **Total Cholesterol**
  - Elevated lipids in the blood increase a person’s risk for developing cardiovascular disease and myocardial infarction

Ornish et al. (1998):
- Group 1: Ornish ICR
- Group 2: Control

**1-Year Results**
- Group 1: -6.62 mg/dL
- Group 2: -3.6 mg/dL

**5-Year Results**
- Fewer cardiac events in Ornish group

Image: https://www.cdc.gov/cholesterol/index.htm
Health Outcomes of ICR: Body Mass Index

- **Body Mass Index (BMI)**
  - Obesity (BMI of 30 kg/m² or greater) is a risk factor for CVD, and is connected to hypertension, stroke, and coronary artery disease

  **Mirman et al. (2020):**
  - Group 1: Traditional
  - Group 2: Intensive

  **Results**
  - Group 1: No change in BMI
  - Group 2: Significant loss in BMI
  - 27.8 kg/m² > 26.6 kg/m²
Health Outcomes of ICR: Systolic Blood Pressure

- **Systolic Blood Pressure**
  - Hypertension can harm numerous structures and functions of the heart and is a prominent risk factor for CVD

Freitas et al. (2011):
- After a 4-week ICR program, patients saw a mean decrease in SBP of 10%

Silberman et al. (2010):
- After 12-weeks of ICR, patients saw a mean decrease in SBP of 8.7%

Image: https://www.healthline.com/health/high-blood-pressure-hypertension#overview
Long-Term Efficacy of ICR: Exercise Habits and Health Outcomes

Exercise Habits (Bjarnson-Wehrens et al, 2007)
• 24 - months after participating in a 3-week ICR program:
  • 61.2% of patients reported regular physical activity
  • 11.3% of patients reported no physical activity

Health Outcomes (Silberman et al, 2010)
• Baseline to 1-year in ICR:
  • TC: 6.2% decline
  • BMI: 7.8% decline
  • SBP: 4.7% decline

Patient Satisfaction and Attendance

• “Patient satisfaction went through the roof! Our patients get to participate in hands on learning and have increased interactions with staff”

• Patient Engagement Increased: ICR patients attend on average 48 – 52 sessions, while traditional patients attend an average of 21 – 22 sessions

How satisfied were you with today's visit?

Image: https://www.quicktapsurvey.com/feedback/templates/patient-satisfaction
Local ICR Example Program

Offerings:

➢ 4 dietary workshops
➢ 4 exercise physiology workshops
➢ Cooking classes 1/week
➢ Risk factor education 1/week
➢ 6-8 patients/class

Staffing:

➢ 1:4 staff to patient ratio
➢ Clinical Exercise Physiologists
➢ Registered Nurses
➢ Dietician
➢ Addictive Services Employee

Image: https://www.jimcolemanstore.com/cpweek/cp-week-cardiac-staff-id-holder.html
Local ICR Programs

1. Lima, OH
2. St. Mary’s, OH
3. Springfield, OH
4. Ottowa, OH
5. Ypsilanti, MI
6. Chelsea, MI
7. Urbana, OH (coming soon)
In Conclusion...

- ICR programs must align with Benson-Henry, Pritikin, or Ornish
- Institutions are reimbursed for education sessions
- Local ICR’s have shown an increase in patient satisfaction and attendance
- Peer-reviewed literature shows statistically significant improvements in health outcomes
Questions?

For additional follow up questions and to submit your evaluation form, please email me directly at jthatch@bgsu.edu

Thank you
References


References


References


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References


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