

Spring 5-6-2023


Center Based Cardiac Rehabilitation Outcomes Associated with COVID-19 Pandemic: A Retrospective Comparative Cohort Study

Haley Williams
University of Nebraska Medical Center

Kayla Woodworth
University of Nebraska Medical Center

Tell us how you used this information in this [short survey](#).

Follow this and additional works at: https://digitalcommons.unmc.edu/con_dnp

 Part of the [Cardiology Commons](#), [Infectious Disease Commons](#), [Nursing Commons](#), [Other Analytical, Diagnostic and Therapeutic Techniques and Equipment Commons](#), [Other Medical Sciences Commons](#), [Virus Diseases Commons](#), and the [Viruses Commons](#)

Recommended Citation

Williams, Haley and Woodworth, Kayla, "Center Based Cardiac Rehabilitation Outcomes Associated with COVID-19 Pandemic: A Retrospective Comparative Cohort Study" (2023). *Doctor of Nursing Practice Projects: College of Nursing*. 17.

https://digitalcommons.unmc.edu/con_dnp/17

This Final Project is brought to you for free and open access by the College of Nursing at DigitalCommons@UNMC. It has been accepted for inclusion in Doctor of Nursing Practice Projects: College of Nursing by an authorized administrator of DigitalCommons@UNMC. For more information, please contact digitalcommons@unmc.edu.

University of Nebraska Medical Center

College of Nursing

DOCTOR OF NURSING PRACTICE (DNP)

FINAL DNP PROJECT

CENTER BASED CARDIAC REHABILITATION OUTCOMES ASSOCIATED WITH COVID-19 PANDEMIC: A

RETROSPECTIVE COMPARATIVE COHORT STUDY

by

Haley Williams and Kayla Woodworth

The final DNP project presented to the

Faculty of the University of Nebraska Medical Center College of Nursing

In Partial Fulfillment of the Requirements for the Degree

DOCTOR OF NURSING PRACTICE

April 2023

Susan Barnason, PhD, RN, APRN-CNS, CEN, CCRN, FAEN, FAHA, FAAN

Sue Schuelke, PhD, RN-BC, CNE, CCRN-K

Abstract

Background: Traditional cardiac rehabilitation (CR) is a multidisciplinary, multifaceted program for cardiac patients. Throughout the Covid-19 pandemic, health care, including center-based CR (CBCR) programs, were closed to in-person sessions. Even with the return to CBCR participation, patient outcomes may have been affected by this disruption in care. The goal of this study was to determine if CR participation outcomes differed before and after CBCR program closure due to Covid-19.

Methods: A retrospective comparative cohort design was used to examine CR participant outcome data before and after the Covid-19 pandemic. Convenience sampling of CR participants at a large, urban midwestern community hospital was used. Comparison of CR patients who completed CBCR prior to restriction (within 60 days prior to Covid-19 closure) were compared to CR participants attending CBCR within the 60 days following CBCR restriction. Data was collected from CR participants' medical record and included: a) participant demographic and clinical characteristics, and b) CR outcomes: BMI, BP, MET's and diet modification.

Results: A total of 37 CR participants were included in this study; 12 participants in the pre-Covid group and 25 participants in the post-Covid group. The mean age of CR participants in both groups was 71 years (pre-Covid M=71.17, post-Covid M=71.32). The average number of CBCR classes attended by the pre-Covid group was M=23.36, compared to M=27.12 in the post-Covid group. Data analysis to compare differences between demographic, clinical and outcome variables in each group were analyzed using chi square and t-test statistical analysis. There were no statistically significant differences between the pre- or post-Covid groups. Baseline and discharge BMI for the pre-Covid group was M=31.36 and M=29.19 respectively; compared to the post-Covid group BMI M=29.66 at baseline and M=29.71 at discharge. Blood pressure (BP) was categorized as normal, Stage 1 hypertension, or Stage 2 hypertension. The majority of the pre-Covid group had participants in the normal BP category at CR baseline and discharge. The majority of the post-Covid group had participants in the elevated BP

category at CR baseline and normal at CR discharge. Dietary modification was measured by Rate Your Plate (RYP). The pre-Covid group had a RYP score of M=65.78, with decrease to M=61.66 at CR discharge; compared to the post-Covid RYP score of M=61.00 at baseline and increase to M=67.25 at discharge. A six-minute walk test completed at CR admission and discharge demonstrated both groups increased distance walked. The pre-Covid group baseline was M=1211.36 ft. and increased to M=1800.00 ft at discharge; compared to post-Covid group with CR baseline M=1085 ft and increased to M=1533 ft at discharge.

Conclusions: During the pre-post Covid phases of the pandemic, CR participant outcomes were comparable. During the pandemic, CR participants were able to demonstrate progress in cardiovascular health and improvements in secondary cardiovascular risk reduction. Furthermore, the evaluation of CR participant outcomes provides a basis for providers to coach and support CR participants' secondary CV risk reduction after completion of the CBCR program. Limitations to the study includes the number of available patients observed through chart review.

Introduction

Individuals with cardiovascular diseases or those who have undergone cardiovascular procedures or surgeries are often referred to cardiac rehabilitation (CR) to help improve outcomes and reduce risk of secondary cardiac events. Traditional center-based cardiac rehab (CBCR) provides individuals with a wide variety of education and training for both physical and psychosocial aspects to help improve cardiac function and patient outcomes. Core components that the American Heart Association (AHA), The American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR), and the Agency for Health Care and Policy Research, have agreed should be included as part of CR include, assessment and nutritional counseling, weight management, blood pressure, lipid, and diabetes management, tobacco cessation, psychosocial management, exercise training and counseling (Tessler & Borodin, 2022). Participation in CR can help reduce progression of cardiac diseases and improve quality of life.

With the onset of Covid in spring of 2020, hospital systems were forced to close programs, including CBCR, to help prevent the spread of the virus. The disruption of care between the time of closure and reopening of CR may have negatively affected patient outcomes. This study was proposed to help assess if there were differences in patient outcomes between CBCR before and after program closure. These outcomes can then be assessed and evaluated by outpatient providers in order to help improve and reduce the risk of secondary cardiac events.

Methods

Study Design

A retrospective comparative cohort study was conducted at Nebraska Methodist Health (NMH) system in Omaha, Nebraska, with approval from the Institutional Review Board. Convenience sampling was used for patient data collection. Patients were not directly affected by this study, nor was personal

information including patient names or medical record numbers used, so patient consent was not necessary.

Data Collection

Data was collected via convenience sampling from two pools of patients, (1) data from patients who completed CR 60 days prior to closure and (2) data from patients who completed CR 60 days following closure. Data was collected between July 2022 and November 2022. Nebraska Methodist CR used paper medical records, therefore data was documented on a data collection tool worksheet and transferred to an electronic database for analysis. See Appendix A for the Data Collection Tool. Data collection consisted of (1) participant demographics and clinical characteristics and (2) CR outcomes. Participant demographics included age, gender, race, marital status, employment, highest level of education, and insurance coverage. Clinical characteristics included weight, height, blood pressure (BP), body mass index (BMI), waist circumference, cholesterol, triglycerides, high-density lipoproteins (HDL), and low-density lipoproteins (LDL) lab levels, patient-health questionnaire-9 (PHQ-9) scores, 6-minute walk results, and Rate Your Plate scores. Cardiovascular Risk Factors, including hypertension, sleep apnea, hyperlipidemia, tobacco use, diabetes mellitus, and sedentary lifestyle were also documented. CR outcomes comparing both groups were obtained for BMI, BP, metabolic equivalent (MET), and diet modification using a tool called Rate Your Plate. The number of classes offered through NMH CR totaled eight. These classes included Orientation to CR, CR Equipment Orientation, Dietician Consultation, Fats and Oils, Intro to Healthy Heart, How to Read Nutrition Labels, and Eating Out. These classes were offered to both CR delivery groups. Other data collected included target CR participant goals, which were the same among all participants, did not have a significant factor in data analysis.

Statistical Analysis

SPSS Statistics was used for all statistical analysis. The mean (M) was used to express continuous variables, such as age and number of classes attended. Categorical variables or differences between

demographic, clinical, and outcome variables in each group were analyzed using chi-square test and t-test statistical analysis. A P-value was used to analyze differences between groups. P-values less than or equal to 0.05 were considered statistically significant.

Results

Data was collected on 75 CR participants. Of these patients, 38 participants were excluded from the study due to insufficient data, death, or dropping out of CR early. The pre-Covid group consisted of 12 participants and the post-Covid group consisted of 24 participants. The study included 36 total participants in statistical analysis. Table 1 and Table 2 shows participant demographics and clinical characteristics of both pre-Covid and post-Covid groups, respectively.

The mean age of CR participants among both groups was 71 years (pre-Covid M=71.17, post-Covid M=71.32). The average number of CBCR classes attended increased in the post-Covid group (pre-Covid M=23.36, post-Covid M=27.12). Baseline and discharge BMI for the pre-Covid group was M=31.36 and M=29.19 respectively; compared to the post-Covid group BMI M=29.66 and M=29.71, which actually saw a slight increase from starting BMI. Blood pressure (BP) was categorized into four categories (1) normal, (2) Elevated, (3) Stage 1 hypertension, and (4) Stage 2 hypertension. The majority of the pre-Covid group had participants in the normal BP category at CR baseline (n=6) and discharge (n=7). The majority of the post-Covid group had participants in the elevated BP category at CR baseline (n=8) and normal at CR discharge (n=13). Surprisingly, there were no participants in the pre-Covid admit and discharge category with Stage 1 or Stage 2 hypertension. See Table 3 for categorization of BP. Dietary modification was measured by Rate Your Plate (RYP), a dietary assessment tool used to identify areas of strength and weaknesses in one's own dietary choices (Gans et al, 2000). Patients answer multiple questions that measure nutritional knowledge and daily habits and are given a score based on their answers. The higher the score, which ranges between 27-81, the more knowledge and habits the individual possesses to make healthy dietary choices. The pre-Covid group had a RYP score of M=65.78,

with decrease to M=61.66 at CR discharge; compared to the post-Covid RYP score of M=61.00 at baseline and increase to M=67.25 at discharge. A six-minute walk test (6MWT) is used to assess cardiopulmonary function and can help identify impairment to provide modification in therapy if needed (Mayos Casanova & Anjum, 2022). A six-minute walk test was completed at CR admission and discharge. It demonstrated both groups increased distance walked from admission to completion of CR. The pre-Covid group baseline was M=1211.36 ft. and increased to M=1800.00 ft at discharge; compared to post-Covid group with CR baseline M=1085 ft and increased to M=1533 ft at discharge. Despite these differences among mean, there were no statistically significant differences between the pre- or post-Covid groups in any categories.

Discussion

Data collected from the pre- and post-Covid groups was comparable; in other words, the closure of CBCR during the Covid-19 pandemic did not play a part in the outcomes of patients. Participants in both groups were able to demonstrate progress in cardiovascular health and improvements in secondary cardiovascular risk reduction. Learning and implementing cardiac risk reduction behaviors is paramount for the long-term health of patients with cardiac disease. Modest weight loss, or at least 5% of total body weight lost, plays a significant role in improving cardiovascular health and reducing cardiac mortality (Wing et al., 2013).

Research on CR patient outcomes show that patients who participated in CR continue to incorporate lifestyle modifications and medication adherence at one-year post-CR, providing further confirmation of the benefit of learning these behaviors while in the program (Griffo et al., 2013). The evaluation of CR participant outcomes provides a basis for providers to coach and support CR participants in secondary CV risk reduction after completion of the CBCR program. This is an important factor, considering some individuals do not continue outpatient CR programs after they are discharged from CBCR. Through medications management and education, as well as encouragement to continue

balanced diets and increased activity, all of which is taught in CR, providers can continue to build upon the knowledge CR participants learn through the program to improve patient outcomes and quality of life.

Conclusion

This study investigated the impact of CR patient outcomes before and after the Covid-19 pandemic. Data was obtained and analyzed from CR patients in pre-Covid and post-Covid cohorts. CR participant data was comparable between the pre-Covid and the post-Covid groups. Despite differences in mean between both groups, there were minimal differences in outcomes between these two phases of the pandemic. Considering that CBCR was unavailable during the height of the pandemic, the comparison of these two groups was useful in identifying the minimal effect that the pandemic had on CR. Both groups were able to demonstrate progress in their cardiovascular health and improve secondary cardiovascular risk factors. This information can be useful as a starting point for outpatient providers to care and treat these individuals after completion of CBCR programs. A limitation of this study was the sample size used in statistical analysis. The sample size was small and further studies with larger sample sizes should be explored.

References

- Gans, K.M., Hixson, M.L., Eaton, C.B. and Lasater, T.M. (2000), Rate Your Plate: A Dietary Assessment and Educational Tool for Blood Cholesterol Control. *Nutrition in Clinical Care*, 3: 163-169. <https://doi.org/10.1046/j.1523-5408.2000.00045.x>
- Griffo R., Ambrosetti M., Tramarin R., Fattirolli F., Temporelli PL., Vestri AR., De Feo S., Tavazzi L. (2013). Effective secondary prevention through cardiac rehabilitation after coronary revascularization and predictors of poor adherence to lifestyle modification and medication. Results of the ICAROS Survey. *International Journal of Cardiology*, 167(4), 1390-1395. doi: 10.1016/j.ijcard.2012.04.069.
- Matos Casano, HA., & Anjum, F. (2022). Six Minute Walk Test. In *StatPearls*. StatPearls Publishing.
- Tessler J, & Bordoni, B. (2022). Cardiac Rehabilitation. In *StatPearls*. StatPearls Publishing.
- Wing, R. R., Lang, W., Wadden, T. A., Safford, M., Knowler, W. C., Bertoni, A. G., Hill, J. O., Brancati, F. L., Peters, A., Wagenknecht, L., & Look AHEAD Research Group (2011). Benefits of modest weight loss in improving cardiovascular risk factors in overweight and obese individuals with type 2 diabetes. *Diabetes care*, 34(7), 1481–1486. <https://doi.org/10.2337/dc10-2415>

Table 1*Demographic and Clinical Data for Pre-Covid Participants*

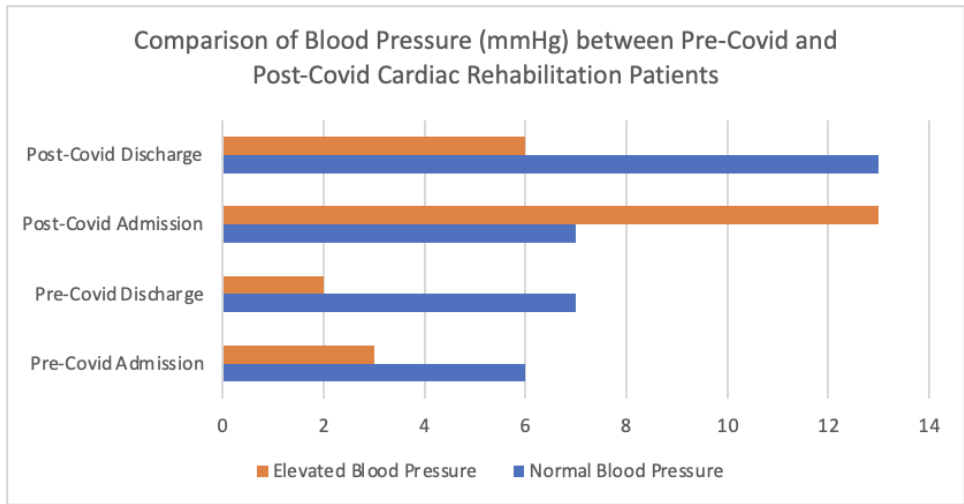
CR Pre=1 Post COVID=2		N	Minimum	Maximum	Mean	Std. Deviation
Pre-Covid	Age	12	41	91	71.17	14.899
	Weight (lbs)	12	124	266	190.92	42.532
	Dischg Weight (lbs)	11	173	240	191.95	20.797
	Admit BMI	12	19.5	42.4	31.367	6.5583
	Dischg BMI	11	19	39	29.19	5.653
	Admit Waist Circumference (in)	12	29	44	39.21	3.714
	Dischg Waist Circumference	8	29	41	37.88	3.730
	Number of CR Sessions Attended	11	15	36	23.36	9.298
	Admit Glucose	1	102	102	102.00	.
	Dischg Glucose	0				
	Admit HgA1c	6	5.40	7.20	6.1000	.66933
	Dischg HgA1c	4	5	6	5.65	.208
	Admit Cholesterol	11	88	260	158.27	51.426
	Dischg Cholesterol	2	106	169	137.50	44.548
	Admit Triglycerides	10	38	336	158.70	80.264
	Dischg Triglycerides	2	86	131	108.50	31.820
	Admit HDL	10	29	70	43.90	13.568
	Dischg HDL	2	31	47	39.00	11.314
	Admit LDL	10	19	164	89.20	46.773
	Dischg LDL	2	75	105	90.00	21.213
	Days from hospital Discharge to CR	12	3	64	23.67	19.237
	Admit PHQ-9 Score	11	0	17	2.91	5.009
	Dischg PHQ-9 Score	11	0	15	4.00	4.359
	Admit MET	12	2	24	6.37	8.252
	Dischg MET	4	4	32	10.80	14.134
	Admit 6-min walk	11	550	1675	1211.36	395.184
	Dischg 6-min walk (ft)	1	1800	1800	1800.00	.
	Admit RYP	11	53	70	61.55	5.373
	Dischg Rate Your Plate-RYP	9	60	71	65.78	4.466
	Valid N (listwise)	0				

Table 2*Demographic and Clinical Data in Post-Covid Participants*

CR Pre=1 Post COVID=2		N	Minimum	Maximum	Mean	Std. Deviation
Post-Covid	Age	25	50	87	71.32	9.953
	Weight (lbs)	18	126	335	188.16	44.745
	Dischg Weight (lbs)	24	121	331	190.89	51.426
	Admit BMI	18	21.0	46.8	29.667	6.2537
	Dischg BMI	22	18	46	29.71	6.576
	Admit Waist Circumference (in)	23	0	56	38.58	10.595
	Dischg Waist Circumference	13	28	56	39.87	7.230
	Number of CR Sessions Attended	25	11	54	27.12	10.329
	Admit Glucose	6	84	128	112.33	18.041
	Dischg Glucose	6	79	149	107.50	26.883
	Admit HgA1c	9	5.40	7.20	6.0556	.54798
	Dischg HgA1c	6	6	8	6.15	.922
	Admit Cholesterol	24	66	286	169.12	51.821
	Dischg Cholesterol	7	100	255	144.00	51.300
	Admit Triglycerides	24	37	569	150.75	126.428
	Dischg Triglycerides	7	60	371	121.57	111.333
	Admit HDL	24	17	94	47.13	18.480
	Dischg HDL	7	38	59	48.71	7.718
	Admit LDL	24	22	196	100.00	38.898
	Dischg LDL	7	40	134	74.57	30.243
	Days from hospital Discharge to CR	24	2	90	26.17	24.016
	Admit PHQ-9 Score	21	0	21	4.86	4.693
	Dischg PHQ-9 Score	16	0	17	3.25	4.465
	Admit MET	23	1	24	3.55	4.492
	Dischg MET	5	3	22	8.54	7.976
	Admit 6-min walk	20	250	1600	1085.00	291.141
	Dischg 6-min walk (ft)	3	1400	1800	1533.33	230.940
	Admit RYP	20	39	75	61.00	9.409
	Dischg Rate Your Plate-RYP	16	45	95	67.25	11.705
	Valid N (listwise)	0				

Table 3

Admission and Discharge Blood Pressure Categories



Appendix

Data Collection Form Page 1

Data Collection Form

Date of Collection: Click or tap to enter a date.

Patient Name: Patient Name Study Site:
 CHI: Prior During After

Address: Address NMH: Prior During After

Phone Number: Phone #

<u>Age:</u> Age	<u>Gender:</u> <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other: Type if Other	<u>Race:</u> <input type="checkbox"/> Caucasian <input type="checkbox"/> Black <input type="checkbox"/> Hispanic <input type="checkbox"/> Asian <input type="checkbox"/> Native American <input type="checkbox"/> Other: Type if Other	<u>Marital Status:</u> <input type="checkbox"/> Married <input type="checkbox"/> Single <input type="checkbox"/> Divorced <input type="checkbox"/> Widowed <input type="checkbox"/> Separated
--------------------	---	--	--

<u>Height:</u> Height	<u>Weight:</u> Weight		
-----------------------	-----------------------	--	--

<u>Employment:</u> <input type="checkbox"/> Employed Full Time <input type="checkbox"/> Employed Part Time <input type="checkbox"/> Unemployed <input type="checkbox"/> Disability <input type="checkbox"/> Retired <input type="checkbox"/> Volunteer <input type="checkbox"/> Homemaker <input type="checkbox"/> Other: Indicate here.	<u>Highest Level of Education:</u> <input type="checkbox"/> Some high school <input type="checkbox"/> High school graduate <input type="checkbox"/> Some college <input type="checkbox"/> Associate degree <input type="checkbox"/> Bachelor's degree <input type="checkbox"/> Master's degree <input type="checkbox"/> Doctorate degree	<u>Healthcare:</u> <input type="checkbox"/> Insurance <input type="checkbox"/> Self-pay <input type="checkbox"/> Medicare <input type="checkbox"/> Medicaid <input type="checkbox"/> VA <input type="checkbox"/> Other Indicate here.	<u>Reason for CR Referral:</u> Enter reason for CR referral.
--	---	---	---

Date of first CR attendance: Click or tap to enter a date.	<u>CR Delivery Group:</u> <input type="checkbox"/> Prior to CBCR Restriction <input type="checkbox"/> Remote <input type="checkbox"/> After CBCR Restriction
Date of last CR attendance: Click or tap to enter a date.	
Number of classes attended: Enter # of classes attended.	
Number of classes available: Enter # of classes available	Date of hospital discharge: Click or tap to enter a date.
Primary event/reason for CR referral: Enter event/reason for CR referral.	Date of 1st CR visit: Click or tap to enter a date.
Days from hospital discharge of cardiac rehab: Enter # of days from hospital discharge of cardiac rehab	Any rehospitalizations during CR? <input type="checkbox"/> Yes <input type="checkbox"/> No
Delayed due to COVID? <input type="checkbox"/> Yes <input type="checkbox"/> No	Any ED visits during CR? <input type="checkbox"/> Yes <input type="checkbox"/> No

<u>Classes at NMH:</u>	<u>Counseling/Class Sessions:</u>
Fats and Oils <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Cooking Classes Total Number of Attended: Enter # / Enter %
Intro to Healthy Heart <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Exercise Classes Total Number of Attended: Enter # / Enter %
Diet <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Weight Management Classes Total Number of Attended: Enter # / Enter %
How to Read Nutrition Label <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Tobacco Cessation Total Number of Attended: Enter # / Enter %
Eating Out <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Diabetes Management Total Number of Attended: Enter # / Enter %
Other: Enter other classes at NMH.	<input type="checkbox"/> Orientation to CR/Including Infection Prevention Total Number of Attended: Enter # / Enter %
	<input type="checkbox"/> Psychosocial Counseling Total Number of Attended: Enter # / Enter %
	<input type="checkbox"/> Stress Management Total Number of Attended: Enter # / Enter %

Orientation to CR/Including infection Prevention:
 Yes No

Appendix

Data Collection Form Page 2

CR Equipment Orientation Yes No
 Pritikin Program: Yes No
 Dietician Consultation: Yes No

Clinical Data

Medications at start of CR: Medications at start of CR

Medications at CR completion: Medications at CR completion.

	<u>Pre CR at Entry</u>	<u>CR completion</u>
BP	BP at Pre CR	BP at Completion
BMI	BMI at Pre CR	BMI at Completion
Weight	Weight at Pre CR	Weight at Completion
Waist Circumference	Waist at Pre CR	Waist at Completion
Cholesterol	Cholesterol at Pre CR	Cholesterol at Completion
Triglycerides	Triglycerides at Pre CR	Triglycerides at Completion
HDL	HDL at Pre CR	HDL at Completion
LDL	LDL at Pre CR	LDL at Completion
Glucose	Glucose at Pre CR	Glucose at Completion
Hg A1C	Hg A1C at Pre CR	Hg A1C at Completion
Clinical Outcome Data	Clinical Outcome Data Pre CR	Clin Outcome Data at CR complet
PHQ-9 Score	PHQ-9 Score Pre CR	PHQ-9 at CR Completion
MET	MET at Pre CR	MET at CR Completion
6 min walk	6 min walk Pre CR.	6 min walk at CR completion
Rate your plate	Rate your plate at Pre CR	Rate plate at CR complet

Cardiovascular Risk Factors

- | | | |
|---------------------------------------|--|--|
| <input type="checkbox"/> Hypertension | <input type="checkbox"/> Hyperlipidemia | <input type="checkbox"/> Diabetes Mellitus |
| <input type="checkbox"/> Sleep Apnea | <input type="checkbox"/> Tobacco Use
(pack years: Enter #) | <input type="checkbox"/> Sedentary lifestyle |

Charlson Comorbidity Index (CCI) Total # : Total

Comorbidity:

- | | | |
|---|---|--|
| <input type="checkbox"/> Acute MI = 1 | <input type="checkbox"/> CHF = 1 | <input type="checkbox"/> CVA = 1 |
| <input type="checkbox"/> Connective Tissue Disorder = 1 | <input type="checkbox"/> Peptic Ulcer Disease | <input type="checkbox"/> Liver Disease = 1 |
| <input type="checkbox"/> Diabetes = 1 | <input type="checkbox"/> Dementia | <input type="checkbox"/> Paraplegia = 2 |
| <input type="checkbox"/> Renal Disease = 2 | <input type="checkbox"/> Cancer = 2 | <input type="checkbox"/> Diabetes w/End Organ Damage = 2 |
| <input type="checkbox"/> COPD = 1 | <input type="checkbox"/> Severe Liver Disease = 3 | <input type="checkbox"/> Metastatic = 6 |
| <input type="checkbox"/> HIV = 6 | | |

Age: _____ (# years old)

Appendix
Data Collection Form Page 3

50 – 59 = 1 60 – 69 = 2 70-79 = 3 80=89 = 4 90-99 = 5

Target CR Participant Goals:

Pre CR

Enter Pre CR Goals.

CR Completion

Enter CR Completion Goals.

Number of dietician sessions attended: Enter # of dietician sessions attended.

Target Goals

Enter target goals.