Background Phase II Cardiac Rehabilitation has been shown to be effective at reducing hospital readmission and risk factors associated with cardiovascular disease, and improving functional capacity. Delaying Cardiac Rehabilitation has been associated with poorer outcomes, including lower functional capacity. The risk of cardiovascular disease doubles in the presence of Metabolic Syndrome, a population less likely to adhere to Cardiac Rehabilitation.

Significance
- Due to clustering of risk factors, patients with Metabolic Syndrome are at double the risk for future cardiac events.
- Cardiac Rehabilitation is a particularly effective strategy for reversing many of the risk factors associated with Metabolic Syndrome. Participation in exercise-based Cardiac Rehabilitation has demonstrated improvements in body mass, resting blood pressure, and functional capacity.
- A delay in Cardiac Rehabilitation uptake may be related to less favorable outcomes, including changes in functional capacity.
- There is a knowledge gap regarding the association between delayed Cardiac Rehabilitation uptake, and hospital readmission and functional capacity in this population.

Purpose
We sought to determine the relationship between the length of time to the start of Cardiac Rehabilitation and hospital readmission in patients with Metabolic Syndrome. Further, we aimed to determine if there was an association between demographic variables and functional capacity, and readmission in this patient population.

Methods
- This was a retrospective, medical records based study.
- We examined the records of a convenience sample of 353 Cardiac Rehabilitation patients with Metabolic Syndrome.
- Logistic regression was used to examine the relationship between time to Cardiac Rehabilitation uptake and readmission.
- Categorical factors were described using frequencies and percentages.
- Unordered categorical factors were compared between readmission groups using Pearson chi-square tests, while Wilcoxon rank sum tests were used for categorical factors.
- Multivariable logistic regression models were used to identify predictors of readmission at various time points.
- SAS software (Version 9.4; SAS Institute, Cary, NC) was used to perform the analysis.

Results
- Patients readmitted within 30 days of hospital discharge were more likely to be female (p=0.038), non-white (p=0.002) and have lower functional capacity (p<0.001).
- Patients readmitted within 90 days were more likely to be non-white (p=0.001), female (p=0.018), and have lower functional capacity (p<0.001).
- In multivariable analysis, while race (0.50 [0.25, 0.99]; p=0.045) and higher functional capacity (0.80 [0.66, 0.93]; p=0.005) were protective against hospital readmission within the first 90 days.
- Race, sex, and functional capacity remained significant predictors of readmission at 1 year, however in multivariable analysis, only race (OR=0.41 [0.22, 0.79]; p=0.007) and functional capacity (OR=0.83 [0.73, 0.95]; p=0.007) were significant.
- Early Cardiac Rehabilitation was not significantly associated with readmission at any time point (p=0.05).

Conclusion and Recommendations
Functional capacity was the most important predictor of readmission among patients with Metabolic Syndrome, even when intake to Cardiac Rehabilitation was delayed. These results raise questions about the unique traits of patients with Metabolic Syndrome who begin Cardiac Rehabilitation. Participation in Cardiac Rehabilitation is important for this population due to the potential to improve functional capacity, which may protect against readmission. Future research should examine novel approaches to improving Cardiac Rehabilitation uptake and adherence, and functional capacity among patients with Metabolic Syndrome, especially women and non-whites.