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Improving Heart Failure Education Prior to Discharge: An Emmi Implementation Project

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Capstone Project Final Written Report

Improving Heart Failure Education Prior to Discharge: An Emmi Implementation Project

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Executive Summary

Background: Heart failure is one of the leading causes of hospitalizations and increased health care costs in the United States. Many patients are readmitted within 30 days of discharge, resulting in increased costs. **Purpose of Capstone Project:** The purpose of this capstone project was to improve heart failure education for patients admitted with heart failure to Mercy Medical Center by utilizing Emmi educational videos in order to decrease the risk of hospital readmissions, improve quality of life, and decrease costs. **Methods:** The project focused on educating nurses about the importance of utilizing the video. It was asked of the nurses that each patient admitted with a diagnosis of heart failure have the opportunity to watch the educational video prior to discharge. The number of patients with heart failure that were given the opportunity to watch the Emmi educational video was collected. The evaluation of this project was a comparison of the number of Emmi educational videos utilized before the implementation of the Capstone Project to the numbers of videos utilized after the implementation. **Results:** When comparing the ordering of the Emmi videos after implementation to before the implementation, there was a noticeable increase in Emmi usage. This included the ordering for all categories of the heart failure Emmi and the general heart failure Emmi. Unfortunately, ordering the Emmi did not mean that the video was utilized. **Recommendations:** It was recommend that the utilization of Emmi videos be continued. Nurses need continued encouragement to utilize the video and not just order it. It was also recommended that APRNs and PAs focus on ordering and implementing the Emmi videos. Lastly, making Emmi utilization a function of case managers, cardiac rehab nurses, and discharge nurses was recommended.

Introduction

Heart failure (HF) occurs when the heart muscle is weakened and cannot pump enough blood to meet the body's needs for blood and oxygen. Causes of HF include coronary artery disease, myocardial infarctions, hypertension, arrhythmias, damaged heart valves, and viral or bacterial cardiomyopathies. Treatment for HF is multi-factorial. If the cause is reversible, such as a damaged heart valve or multi-vessel disease, then heart surgery is warranted. Optimal medical therapy for HF includes beta-blockers, ace inhibitors, and diuretics. According to Bakal et al. (2014), "Each year in the United States, 5.1 million individuals with heart failure undergo approximately one million hospitalizations, 668,000 emergency department visits and 3 million physician outpatient visits resulting in an overall cost of approximately \$40 billion per year" (p. 1).

Background Information

According to Feltner et al. (2014), "Heart failure (HF) is a leading cause of hospitalization and health care costs in the United States. Up to 25% of patients hospitalized with HF are readmitted within 30 days" (P. 774). The need to decrease HF hospital readmission rates in the cardiology specialty was evident. In the United States, reducing readmission rates is an important focus of current health policy initiatives. Ranasinge et al. (2014) points out that one out of every five Medicare beneficiaries are readmitted within 30 days of hospital discharge. These high readmission rates create a very high cost to the health care system.

Problem Statement

Management of HF and prevention of hospital readmission in cardiac patients is a complicated process that requires a lot of maintenance and education on the parts of cardiac nurses and cardiac advanced practice nurses. Although there is a vast amount of information regarding the proper management of acute HF, many heart failure patients are readmitted within 30 days of discharge. The purpose of this Capstone Project was to implement a standardized heart failure education program for patients admitted with heart failure to Mercy Medical Center. Evidence supported that such an intervention would decrease the risk of hospital readmissions, improve quality of life, and decrease costs. Specifically, this intervention focused on educating patients about the pathophysiology of HF, correct use of medications, specific lifestyle changes, and parameters to monitor using an educational tool called Emmi.

Pate & Deoghare (2015) stated, "There have been considerable advances in the pharmacological management of HF over the past 20 years. Beta blockers, angiotensin converting enzyme (ACE) inhibitors, ARBs (angiotensin receptor blockers), and aldosterone antagonists improve survival in HF patients" (p. 101). The educational tool, Emmi, helped patients understand the importance of their HF medications, including how to properly take them and what to monitor.

Theoretical Model

Because this DNP Capstone Project was quality improvement focused, the Plan-Do-Study-Act cycle was chosen for the theoretical model. Cahill (2014) explained that with the Plan-Do-Study-Act (PDSA) cycle, a person could make

changes on a small scale by planning a change, implementing the change, studying the results of the implementation of the change, and applying what is learned. The PDSA cycle was then conducted multiple times with small improvements made with each cycle.

For the purpose of this Capstone Project, the initial Plan phase was completed in the project design section. Subsequent planning phases were dependent on future cycles. The Do phase was the implementation phase of the project during which the changes proposed during the planning phase were put into practice. During the Study phase, outcomes were evaluated and results were observed. The Act phase consisted of going through the cycle multiple times in order to make the necessary improvements that were indicated in the Study phase. The PDSA cycle model was effective for the Capstone Project because it allowed for continual evaluation of what was and was not working and provided a guide for planning changes to improve the outcomes.

Project Description

Literature Review

Twenty research articles were selected to support the relevance of improving education in patients with heart HF in order to improve outcomes. Dadosky et al. (2016) conducted a study to evaluate whether a nurse-led educational intervention for patients admitted with HF would decrease the 30-day readmission rates. The educational intervention included one-on-one educational sessions, screening for financial barriers to treatment, and referrals to other disciplines such as social work or dieticians. The readmission rates of the

interventional group were compared to the control group. The control group received standard HF discharge instructions and follow up. There were seventy-five patients in the interventional group and 228 in the control group. They found that the educational intervention was effective in reducing the 30-day readmission rates. The 30-day readmission rate for the control group was 18% and the 30-day readmission rate for the intervention group was 12%. This was a quasi-experimental study with an evidence level of three. The strengths of this study were its simple implementation process and definitive conclusions. The weaknesses of this study were the small sample size, it was not randomized, and there was no statistical analysis. Also, the patients included in the interventional group were considered higher risk than the ones included in the control group, so there was not equality between the two groups.

Gerdes & Lorenz (2013) performed a retrospective chart review at a Veteran's Affairs (VA) medical center comparing hospital readmissions for patients with HF receiving bedside education and those patients attending an additional HF education class. They compared the number of hospital readmissions at 30, 60, and 180 days of the patients who received the additional education class to those who just received the usual education. They found a statistically significant reduction in readmissions at 30 days for the patients who had the education class. They performed T-tests that revealed that the 30 day readmission rate for the intervention group was 20% compared to 27% for the control group ($p=0.021$). The number of readmissions for the intervention group was lower than the control group, but the analysis did not show statistical significance. This study had an

evidence level of 4. Its limitations were that some of the patients had more than one structural classification included. Retrospective studies rely on chart information only. The strength of this study was that it was statistically significant.

Warden et al. (2014) conducted a quasi-experimental study to determine the impact of a pharmacist-managed program for education of HF patients at discharge. The study included 35 patients that were compared to a control group of 115 patients. The frequency of discharge counseling rose significantly ($p = 0.007$). Both 30-day all-cause and HF-related readmissions were decreased when compared with the control group ($p = 0.02$ and $p = 0.11$). They found that the involvement of a pharmacist in medication reconciliation and discharge education for HF patients resulted in an increase in adherence with core measure, reduction in readmission rates, and increased quality of care. This study had a before-and-after quasi-experimental study design with an evidence level of three. Its weakness was that there was no randomization. Its strength was that the statistical analysis was clear.

Bertuzzi et al. (2012) performed a before and after experimental study to assess the knowledge of HF in patients with heart failure before and after monitoring nursing care at home. They found that there was a significant improvement in the knowledge of HF in patients after the homecare interventions. The percent of knowledge before intervention was $64 \pm 18.2\%$ and the percent of knowledge after the intervention was $70.8 \pm 16.9\%$. This was a statistically significant improvement in learning ($p=0.020$). This study had an evidence level of three. The weakness of this study was that it did not address its limitations. The

strengths of this study were that it had a good abstract, the results were consistent and there were definitive conclusions.

Arthur et al. (2015) conducted a quality improvement study to assess the effects of improving 60 minutes of HF education on HF readmission rates. They used a bundle of strategies, including 1-hour inpatient education class, a revised patient education booklet, and implemented a bedside education flow sheet. They found that there was significant improvement in the 30-day readmission rates associated with the implementation of the quality improvement measures. Two years after the project started, 81.4% of patients were receiving the education program and the 30-day readmission rate dropped to 19% from 29%. This study had an evidence level of five. Its weakness was that the results found were correlative data and not causative data. Its strengths were that the results were consistent and the strategies were well defined.

Kommuri et al. (2012) performed a randomized control trial in order to evaluate the changes in performance on assessments of HF knowledge before and after a one-on-one teaching session with a nurse educator. The number of patients randomized to the education intervention group was 113, and they demonstrated statistically significantly higher scores compared to the control group of 114 patients ($p=0.007$). They concluded that education on HF prior to hospital discharge resulted in improving patients' knowledge and therefore reducing the risk of readmission. The RCT had an evidence level of two. A weakness of the study was that the questionnaire used had not been previously used or studied. The strengths

of the RCT were that the results were statistically significant, the study was clearly delineated, and it included statistical analysis.

Adib-Hajbaghery et al. (2013) conducted a systematic review of clinical trials done to determine the effectiveness of continuous education through post-discharge follow up on HF readmission rates. After a review of twenty-one studies, they concluded that patient education and follow up done by nurses could decrease the HF readmission rates. This article had an evidence level of one. The weakness of this review was that it covered a multitude of interventions for HF outcomes. The strengths of this review were that the methods were well defined and the results were consistent.

Schell (2014) conducted a literature review of seventeen articles in order to evaluate the benefit of a discharge navigator, patient education and discharge planning on reducing readmission rates of patients with HF. The literature review included randomized control trials, literature reviews, systemic reviews, a prospective longitudinal study, a case study and a pilot program. The literature review revealed that a nurse-led discharge navigation that includes one-to-one and group education, accurate medication reconciliation and follow-up appointments was beneficial in reducing HF readmission rates. This literature review had a level of evidence of two. Its weaknesses were that there was no experimental study done. Its strength was that the search strategies were well defined and reproducible.

White & Hill (2014) performed a quality improvement study in order to improve multidisciplinary organization of patient care and education and improve self-behaviors. They also aimed to decrease the HF readmission rates and the

hospital length of stays. They found that the length of stay decreased from 6.05% to 4.42% and that the readmission rates decreased from 23.1% to 12.9%. They concluded that improving multidisciplinary organization of patient care, education and self-behaviors overall improved HF outcomes. This study had a level of evidence of five. Its weaknesses were variances in the day of hospital stay that patients were diagnosed with HF. Its strengths were strong statistical analysis, well-defined methods, and consistent results.

Kinugasa et al. (2014) evaluated a program focused on inpatient HF education to determine improvement of outcomes in a Japanese rural setting. The study was retrospective and compared patients subjected to the inpatient education program to patients who were treated with usual care. They divided patients into three groups: patients who received no education, patients who received 1-2 types of education, and patients who received 3 types of education. The statistical analysis revealed that patients who had 3 types of education had the best outcomes. They concluded that multidisciplinary intensive education was key to improving outcomes. The strengths of the study were strong statistical analysis with consistent recommendations. The weakness was that HF readmission rates were not addressed.

Stut et al. (2014) conducted a multicenter observational trial with randomized components study to develop and test an online educational program to improve self-care in patients with HF. The educational program was called "HeartCycle." The authors found that the programs helped most non-adherent patients with HF to improve their self-care behaviors. There were 123 patients

enrolled, and 80% of them achieved their personal goals after starting the educational program. The patients who utilized the program achieved their goals. The weaknesses of this article were that it did not address HF readmission rates. The results were also largely centered on patient reporting. The strengths were well-defined methods and definitive conclusions.

Juillière et al. (2013) aimed to evaluate the relationship between therapeutic patient education (TPE) in clinical practice and mortality in patients with HF. There were 3,237 patients that participated in the study, 2,347 were educated and 890 were not educated. The mortality rate in the educated group was 17.4% compared to the mortality rate of 31% in the non-educated group ($P < .001$). They concluded that TPE was associated in lower all-cause mortality. The strength of this study was consistent results with statistical analysis. The weakness was the lack of randomization.

Zhu et al. (2013) performed a systematic review and meta-analysis of 28 studies to examine the effectiveness of health education programs on exercise habits in patients with HF. They found that education programs had positive effects on motivating patients with HF to exercise, exercise adherence, exercise duration, and exercise level. This meta-analysis had a level of evidence of one. Its strengths were that the strategies are well defined with consistent results. Its weakness was a possible language bias.

Meng et al. (2016) conducted a randomized control trial to compare a patient-centered self-management educational group program for patients with HF to the usual inpatient HF education. They found a small significant effect of the

educational program on self-monitoring and insight ($p < 0.05$). They also found that significant effects on symptom monitoring after six months ($p < 0.05$). This randomized control trial had an evidence level of two. Its strengths were the statistical analysis and sample size.

Lowery et al. (2012) performed a prospective quasi-experimental study comparing patient outcomes of a nurse practitioner led disease management model to outcomes under usual care. There were 969 veterans in the study, 458 in the intervention group and 511 in the control group. They found that patients in the nurse practitioner led disease management program had significantly fewer HF admissions at one year ($p < 0.05$). They also found that the patients with the intervention had lower mortality at both one and two years. This prospective quasi-experimental study had a level of evidence of three. Its weakness was the lack of randomization of patients. Its strength was the excellent statistical analysis.

Zarea et al. (2015) conducted a systematic review and meta-analysis in order to evaluate the impact of written education versus oral education for patients with HF on hospital readmission rates and associated costs. They focused on estimating the mean saving cost of patient readmission. They found that the cost saved in the intervention group (written education) versus the control group (oral education) was \$2,751. They also found the mean of total cost saved in the intervention group versus the control group was \$2,047. This study had an evidence level of 1. It had an excellent statistical analysis with delineated outcomes.

Lakdizaji et al. (2013) performed a randomized control trial in order to examine the impact of an educational training program on the quality of life of

patients diagnosed with HF. There were 44 patients in the program. Twenty-two were in the intervention group and received one-on-one teaching sessions, counseling sessions, and phone calls over three months. There were 22 in the control group that received routine care. They concluded that educational training programs can be effective in improving the quality of life of patients diagnosed with HF and suggested that providing educational programs for patients with HF to help improve their quality of life. This randomized control trial had a level of evidence of two. Its weakness was its small sample size of 22. Its strength was that the study was randomized.

Rodríguez-Gázquez et al. (2012) conducted a randomized controlled trial to evaluate the effectiveness of a nursing educational program that includes educational meetings, home visits, printed material and telenursing on the improvement of self-care behaviors in patients diagnosed with HF. There were 33 people in the intervention group and 30 in the control group. Each group received an assessment tool before and after the education intervention. Sixty-six percent of the intervention group improved by at least 20% where as only 26.6% of the control group improved by at least 20 percent. They found that the educational program was beneficial on improving the self-care behaviors in patients diagnosed with HF. The strength of this study was that it was randomized and had strong statistical analyses. The weakness was that sample size of 63 was small.

Chang et al. (2016) performed a randomized control trial to evaluate the effects of an educational program on sleep disturbance and psychological distress in patients diagnosed with HF. There were 84 participants, 43 were randomly

assigned to the intervention group and 41 were randomly assigned to the control group. Anxiety and depression levels were significantly higher in the control group ($p < 0.001$). They found that educational programs had a positive effect on the quality of sleep and psychological distress in patients diagnosed with HF. This randomized control trial has a level of evidence of two. The weakness of the study was the small sample size. The strength was the randomization of the study.

Kollia et al. (2016) conducted a systematic review of 22 studies in order to reinforce the importance of nursing education to improve the outcomes of patients diagnosed with HF, specifically self-care behavior, quality of life, mortality, and readmission rates. They found that nursing education was beneficial on improving self-care behaviors in patients with HF. This systematic review had a level of evidence of one. Its weakness was that it did not find evidence that the education program improved quality of life, but it did find evidence that educational programs improved self-care behavior.

Lambrinou et al. (2012) provided a meta-analysis of 19 randomized control trials to evaluate the effect of HF management programs (HF-MP) with nurse-driven discharge planning on the outcomes for patients diagnosed with HF and readmission rates. The relative risk of HF readmissions of the intervention group compared to the control group was 0.68, 95% confidence interval ($p < 0.05$). Their findings suggested the growing need to include nurse-led discharge planning in HF management. This meta-analysis had a level of evidence of one. The weakness of this study was that it excluded studies using advanced technology and studies not done in English. Its strength was its statistical analysis.

Congruence of Organization's Strategic Plan to Project

It is a strategic plan of Mercy Health Systems to reduce the 30-day hospital readmission rates of HF patients and to improve the education of HF patients. This was congruent with the capstone project. The Capstone Project aimed to have each HF patient watch the Heart Failure Emmi, which improved the education of the patients and theoretically reduced readmission rates.

Project Objectives

This DNP Capstone Project centered on the idea of improving the outcomes related to HF in adults. Specifically, improving the education of these patients. The readmission rates were significantly high, leading to decreased reimbursement by Medicare. There were several outcomes that could be improved in HF patients that would lead to the ultimate improved outcome of decreasing readmission rates. These included weight monitoring, medication compliance, blood pressure improvement, decreased sedentary lifestyles, improved diet adherence and improved compliance with appointments. This project aimed at improving the education of patients with HF in order to improve the previously mentioned outcomes. The first objective for this capstone project was to improve the understanding of nurses regarding the use of Emmi educational video. The second objective was to improve the number of heart failure patients who watched the video. The goal of the capstone project was to have every patient with a diagnosis of HF watch an Emmi educational video on HF.

Project Design

Intervention Plan

This quality improvement project used the following procedures for a project design. It focused on educating nurses about the use of the HF educational video and how to implement the video. It was asked of the nursing staff that each patient admitted to Mercy Medical Center Northwest Arkansas with a diagnosis of HF in their care have the opportunity to watch the educational video prior to discharge. There were six types of HF educational videos: general HF, HF and smoking/alcohol, HF and water pills/fluids, HF and sodium, HF and daily weight, and HF – What it is. Data was collected on the general HF video and all categories of HF videos. Further information on the Emmi educational videos can be found in Appendix D.

The number of orders for the Emmi HF educational video was collected weekly, as well as the number of patients that watched the HF Emmi educational video. The study site was the Telemetry unit of Mercy Hospital Northwest Arkansas. The sample included all patients on the telemetry unit who had a diagnosis of HF between December 5, 2016 and February 28, 2017. There were no exclusion criteria. Prior to implementation of the project, an informational meeting regarding the need for administration of the Emmi educational video for HF patients was held with the nurses of the telemetry unit. There were reminders for the nurses in the form of emails.

Timeline of Project Phases

This Capstone Project required Institutional Review Board (IRB) approval from the University of Arkansas and Mercy Health Systems. The implementation process began after approval was gained from the IRB of Mercy Health Systems and the University of Arkansas.

- Submission of IRB approval to Mercy IRB board: October 3, 2016
- Submission of proposal to Capstone committee: October 12, 2016
- Presentation of proposal to Capstone Committee: October 19, 2016
- Presentation of information to nurses: October 20-November 30, 2016
- Data Collection Period: December 5, 2016 – February 28, 2017
- Data Analysis: March 13, 2017
- Capstone Defense: April 3, 2017

Resources

The resources utilized for this project included the capstone chair, capstone committee member, a cardiac nurse practitioner, the manager of the telemetry unit, and nursing staff. No funds were needed for this project.

Market Analysis

As mentioned above, Bakal et al. (2014) stated that the treatment for HF results in an overall cost of approximately forty billion dollars yearly. A large proportion of the costs spent on HF treatment would be reduced by better control of readmission rates. Feltner et al. (2014) discussed how HF is a leading cause for hospitalization and that as much as 25% of heart failure patients discharged are readmitted within thirty days. This created motivation to reduce readmission rates in order to cut back on costs. Using the Emmi educational tool was a low cost

measure to improve the understanding of HF and ultimately reduce readmission rates. If the tool helped to reduce readmission rates, then the costs savings would be impressive.

Perceived Barriers

There were a few anticipated barriers to the Capstone Project. First, the definition and diagnosis of cardiomyopathy or heart failure was sometimes misplaced on a patient. There were specific criteria to diagnosing a patient with heart failure. Some patients were diagnosed with heart failure, but it was an incorrect diagnosis because the patient did not meet the requirements for the heart failure diagnosis. Another barrier would be the workload of a telemetry floor nurse. Nurses are very busy and sometimes overworked, and there would be some who would ignore this request and see it as yet another task.

Statement of Mutual Agreement with the Agency

The Statement of Mutual Agreement with the Agency can be found in Appendix B.

Evaluation Plan

Methods of Evaluation

The evaluation plan focused on evaluating the process of implementing the project. Objective one was evaluated by measuring the number of patients with HF that had an order placed for the Emmi educational video. Objective two was evaluated by measuring the number of patients that completed the Emmi educational video. Specifically, tables and graphs were constructed to demonstrate the difference between the number of Emmis utilized (ordered, started and

completed) before and after the project implementation. The number of videos ordered and watched was further delineated by the category of HF video.

Evidence Based Measures applied

The evaluation of the project was one of the implementation processes. The evaluation plan included graphs and tables for a quality improvement model. The graphs and tables displayed the effects of the Capstone Project on Emmi use over a period of time.

Measures/Instruments used for each objective

The variables for the Capstone Project included the number of Emmis ordered before and after the intervention and the number of patients who watched the Emmi before and after the intervention. Instruments used included the computers and tablets to view the Emmi educational video.

Results

The baseline data for the project was as follows: In 2014, there was one general heart failure Emmi ordered, one started, and one completed. In 2015, there were eleven heart failure programs ordered, zero started and zero completed. Two of these were the general heart failure video. In 2016, there were two general heart failure programs ordered, one started and one completed.

After the intervention, twenty-two heart failure programs (all categories) were ordered, seven were actually started, and four were completed. Thirteen of these programs were the general heart failure program; six of which were started and four were completed.

Graphs and tables of the results can be seen in Appendix C.

Discussion

When comparing the ordering of the General Heart Failure Emmi video after implementation to before the implementation, there is a noticeable increase in the number of Emmi general HF videos ordered. Only 2 were ordered in 2016 prior to the intervention compared to 13 ordered after the intervention. Based on these results, objective 1 (improving the understanding of nurses regarding the use of the Emmi educational video as measured by the number of Emmi videos ordered) was met. However, comparing the usage of all categories of HF Emmi did not reveal improvement. There were 26 HF Emmis (all categories) ordered in 2016 prior to the intervention, but there were only 22 ordered post intervention. Based on these measures, objective 1 was not met.

Unfortunately, ordering the Emmi did not mean that the video was utilized. Twenty-two Emmi HF (all category) videos were ordered post intervention, but only 32% of these were started and only 18% were completed. This is compared to the 2016 pre-intervention data, which show that 26 were ordered and 10 were completed. Based on this data, objective 2 (increase the numbers of heart failure patients who watched Emmi educational video) was not met since the number of videos completed post intervention were less than the number prior to the intervention. When evaluating the number of general HF videos watched, there was an improvement from the 2016 pre-intervention data to the post-intervention data. In 2016, prior to the intervention, only one general HF video was watched. In comparison, there were 4 general HF videos watched post intervention. Based on this data, objective 2 was met.

There were several limitations noted for this Capstone Project. The obvious limitation was the issue of bedside nurses being too busy. Many nurses viewed the utilization of the HF education video as extra work. This barrier was further added to by the decreased availability of a working tablet or computer to utilize the Emmi videos. Another barrier noted was that there was very poor attendance of nursing staff at the staff meetings. Also, many nurses admitted to not reading the emails. Lastly, ordering the Emmi video did not mean that it was utilized. Many nurses ordered the video but did not set the patient up to watch it.

Recommendations

Recommendations include the continuation of the utilization of Emmi, as it was a very valuable educational tool. There was a strong need for the encouragement of nurses to utilize the video and not just order it. With the purpose to further encourage nurses to implement the video, staff meeting attendance needs to be enforced. In order to improve nursing utilization of the Emmi video, it is recommended that the reasons for it not being enforced be investigated. If a person is able to find out why the nurses don't utilize the video, then they can make recommendations for improvement. The consideration of utilizing Nurse Practitioners and Physician's Assistants to order and implement the Emmi videos is also a recommendation. Education of patients is a very important role for Nurse Practitioners, and the use of the Emmi video would provide support to this role. The Emmi educational video can also be used as an outpatient at home or during office follow up visits. Lastly, the consideration of making Emmi utilization a function of

case managers, cardiac rehabilitation nurses and discharge nurses is also a recommendation.

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