What are the clinical and financial benefits of using same-day discharge with patients undergoing catheter ablation for atrial fibrillation? A retrospective study comparing same-day discharges versus observation/inpatient patients.

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Abstract

Atrial fibrillation is the most common dysrhythmia and has significantly impacted healthcare staff and systems. Catheter ablations remain the most effective tool in the treatment of atrial fibrillation, and yet these have often contributed to hospital admissions and costs. Same-day discharges are a safe and cost-saving method being used more in this patient population. This study was completed to evaluate and compare same-day discharge versus admission following catheter ablation.

In the study, there were 321 patients who underwent catheter ablation for atrial fibrillation over 12 months from July 2021 to July 2022. Of these 321 patients, there were 74 same-day discharges. 30-day readmission rates for both samples were similar, with 4 (4%) patients readmitted following same-day release and 3 (2%) patients readmitted following observation or inpatient admission. 90-day readmission rates for both samples were also similar at 2.7% for same-day discharges and 1.2% for observation/inpatient admissions. There was a cost savings of at least $37,000 using same-day discharge versus at least $123,000 in costs for admission for observation or inpatient. Based on this study, the use of same-day discharge in catheter ablation for atrial fibrillation is reaffirmed as safe and cost-effective and should be considered in routine practice.

Chapter 1: Introduction

Introduction

Health care is constantly changing, and the recent pandemic exposed many issues and accelerated some changes. Providers, nursing, and staff shortages have become more problematic in many healthcare systems. Healthcare costs are constantly being scrutinized so that they may be less burdensome for systems, insurance companies, and patients. One practical intervention implemented to reduce costs for many procedures and surgeries has been the increasing use of same-day discharges (Kowalski et al., 2020). Using same-day discharges with patients at low risk for readmission or post-procedure issues is a method to decrease hospital and patient costs and ease the burden on hospital staff. Depending on the procedure and location, costs have been documented and forecasted to save tens of thousands per facility annually. Cumulatively nationwide and internationally, same-day discharge can save millions of dollars for patients and healthcare systems (Reddy et al., 2020).

For this program evaluation, I have looked at some of the clinical and financial impacts of same-day discharges in patients undergoing atrial fibrillation ablations. This evaluation is of a program instituted at a 480-bed regional hospital in northwest Pennsylvania. In this hospital system, many circumstances can create challenges with patient safety. Like most systems, staffing and bed availability issues are at the forefront of challenges to care. An American Nursing Foundation (2022) survey of over 12,000 nurses found that more than half of them plan on leaving or are considering leaving their current positions within six months. Over 89% of the respondents in this survey reported staffing shortages at their institution. The lack of staff created delays or cancellations of elective procedures.

Background

Atrial fibrillation is the most common cardiac arrhythmia. An estimated 3-6 million people in the United States live with atrial fibrillation, which is expected to grow to over 12 million in less than ten years (Vaillancourt et al., 2022). Atrial fibrillation increases one's risk for stroke, which is related to 15-20% of thromboembolic strokes. The lifetime risk for developing atrial fibrillation after age 40 is nearly 25%. Patients with atrial fibrillation also have a higher risk for hospitalization, with 1 in 3 requiring hospitalizations within a year of diagnosis of atrial fibrillation (Vaillancourt et al., 2022).

Patients with atrial fibrillation have multiple options for treatment, including antiarrhythmic therapy, cardioversion, and catheter ablation. Catheter ablation has been shown to have a higher success rate in treating atrial fibrillation. Studies have shown a 64% reduction in atrial fibrillation-related hospitalizations after catheter ablation, a 52% reduction in cardioversions, and a 65% shortened length-of-stay (Vaillancourt et al., 2022). In addition to catheter ablation becoming the standard treatment for atrial fibrillation, it has decreased hospital and patient costs. With further use of catheter ablation as first-line therapy, same-day discharges with these patients are also becoming more standard.

Same-day discharges are not new but becoming more widespread after the COVID-19 pandemic forced significant changes to care. Same-day discharges are safe for many procedures that once led to more extended stays. They are a proven cost-saving practice for hospitals and outpatient surgeries. Studies continually show that there is significant cost reduction related to same-day discharges. The Centers for Medicare and Medicaid Services reported a reimbursement rate for electrophysiology studies and atrial fibrillation ablations of nearly $21,500 (Vaillancourt et al., 2022). At the facility of this study, it was reported by the Director of Finance that the

average cost saved by same-day discharge is about $500 per patient. Kowalski et al. (2020) reported that hospital savings ranged from $45,000 to $84,000 annually across U.S. hospitals with same-day discharge use following atrial fibrillation catheter ablation. Reddy et al. (2020) reported that hospital savings using same-day discharge totaled over $81,000 over 13 months at the Royal Papworth Hospital in the United Kingdom. This was attributed to 128 same-day discharges.

PICO question

What are the clinical and financial benefits of using same-day discharge with patients undergoing catheter ablation for atrial fibrillation? A retrospective study comparing same-day discharges versus observation/inpatient patients.

Theoretical Framework

In this project, Lewin's Change Theory is the fundamental framework. In summary, the Change Theory has three stages and involves the process of unfreezing, changing, and refreezing. Unfreezing involves establishing a new method or practice by letting go of an old one. The second stage, changing, involves the adaptation of a new practice that is more productive and useful. The third stage is refreezing, establishing the new practice as the standard operating procedure or the new norm.

Specific to this project, the old practice that is to be let go is the observation and hospitalization of every patient after a procedure which in this case is an atrial fibrillation catheter ablation. This is the unfreezing stage. The changing stage is enacting and promoting same-day discharge for these ablation patients. Finally, the refreezing stage involves the acceptance of same-day discharge for atrial fibrillation ablation patients as standard and becomes the expectation for these patients regularly.

Problem Statement

Healthcare costs are consistently higher than desired for patients and healthcare systems. Costs and ways to decrease them are always a national and local focus. The COVID-19 pandemic created strain and opportunity for patients and healthcare systems. The ongoing strain on staff and patients has caused elevated risks and healthcare delays in many areas. Patients needing elective treatment are often deferred due to patients of higher acuity and need. With that said, same-day discharging is a way to allow appropriate care for those in urgent need but not delay care for other patients. Implementation and detailed evaluation of this process are necessary to promote long-term use.

Purpose

This project aimed to look at the safety and cost-effectiveness of same-day discharge of patients following catheter ablation for atrial fibrillation at a western Pennsylvania hospital that is amongst the busiest in this area in their health care system. As discussed above, there has been ample research on the use and safety of same-day discharges for patients undergoing various procedures. The use of same-day discharges has been studied for over ten years worldwide. With the impact of the COVID-19 pandemic and prior understanding of same-day discharge safety, there was an opportunity for more widespread use. After elective procedures were resumed, the hospital implemented its same-day discharge policy in 2020. With continued use, there may be a significant financial impact in the form of cost reduction. It is also expected that adverse patient outcomes will be similar or improved with same-day discharge. Ultimately, same-day discharge should be the expectation for first-case catheter ablation.

Research Question

In this quantitative research, using same-day discharge with atrial fibrillation ablation patients is being studied in several aspects. The research looks at patient clinical outcomes and financial impact. The following research question has guided this study.

RQ_1: What are the clinical and financial benefits of using same-day discharge with patients undergoing catheter ablation for atrial fibrillation?

Hypothesis

Based on the existing literature and the process involved in this project, it was hypothesized that same-day discharges are both safe and cost-saving for patients undergoing atrial fibrillation catheter ablation. It is believed that complication and readmission rates for these patients will be nearly the same or better than those who stay overnight for observation. There will likely be a significantly positive financial impact with these same-day discharges.

$H1_0$: There will be no difference in clinical outcomes or financial impact between patients discharged on the same day and those admitted for observation or as inpatients.

$H1_a$: There will be a significant or statistical difference in clinical outcomes when comparing patients discharged the same day versus those admitted for observation or as inpatients.

$H1_b$: There will be a significant or statistical difference related to cost when comparing patients discharged the same day versus those admitted for observation or as inpatients.

$H1_c$: There will be a significant or statistical difference in clinical outcomes and cost when comparing patients discharged on the same day versus those admitted for observation or as inpatients.

Rationale and Specific Aims

Prior research regarding same-day discharge use in health has primarily been done retrospectively. They are done as observational cohort studies looking at historical patient data. The advantages of retrospective cohort studies include the ability to study multiple outcomes associated with a single exposure, the ability to choose a subject-specific exposure, and the ability to obtain a larger sample with broader inclusion criteria and fewer exclusion criteria. Research obtained using cohort studies can be more generalizable in clinical practice (Wang & Kattan, 2020).

The use of cohort study in this research allows the population of atrial fibrillation patients to be evaluated regarding more than one factor. This quantitative study was performed with this in mind. The evaluation looked at the impact of same-day discharge on atrial fibrillation ablation patients and various factors affiliated with them.

Significance

The significance of this study is related to the impact on both local and worldwide practice. Prior research has repeatedly determined that using same-day discharges in catheter ablation patients is safe and cost-effective. The significance of this particular study is in two parts. It further reinforces the consistency of prior research findings worldwide in other systems. It also determines the practicality of the same-day discharge process in a local health system and project. This research can change historical processes that may be unnecessary in current and future patient care. It may result in financial benefits and savings for patients and healthcare systems.

Nature of the Study

As mentioned, this research study was completed as a retrospective cohort study. This type of design is best when evaluating the process of same-day discharge because multiple

outcomes can be evaluated from a specific population. Bias is limited as the sample population is already determined. No significant patient input should impact this study's quality and specific measures.

Definition of Terms

Numerous definitions should be discussed as part of this project. Atrial fibrillation, catheter ablation, cryoablation, radiofrequency ablation, anticoagulation, major complications, minor complications, and same-day discharge are terms to be understood.

1. Atrial Fibrillation (AF)-A type of arrhythmia that occurs when the heart beats irregularly and often too fast. It is a common type of arrhythmia that affects millions of people worldwide.
2. Arrhythmia- An irregular heartbeat that can occur when the electrical signals that control the heartbeat are disrupted
3. Catheter Ablation- A medical procedure used to treat certain arrhythmias, including atrial fibrillation. It involves the insertion of a catheter into a blood vessel and using it to destroy a small area of the heart tissues causing arrhythmia.
4. Radiofrequency Ablation- A type of catheter ablation that uses high-frequency radio waves to destroy heart tissue causing arrhythmias.
5. Cryoablation- A type of catheter ablation that uses extreme cold to destroy heart tissue causing an arrhythmia.
6. Same-Day Discharge- A procedure in which patients who undergo catheter ablation for atrial fibrillation can go home the same day as the procedure.
7. Anticoagulation Medication – Drugs used to treat blood clots and stroke in patients with atrial fibrillation

8. Major Complications- serious and potentially life-threatening side effects can occur after a medical procedure, such as catheter ablation.
9. Minor complications- Less serious side effects that can occur after a medical procedure, such as catheter ablation, but typically do not pose a threat to the person's health or life.

In this project, major complications are defined as adverse outcomes that result in permanent damage or even death. Major complications affiliated with atrial fibrillation ablations include in-hospital death, stroke, access site complication requiring intervention, cardiac tamponade requiring drainage, phrenic nerve injury, cardiac arrest, advanced heart block, and atrio-esophageal fistula. Minor complications affiliated with atrial fibrillation ablations include pericarditis or groin access site hematoma (Steinbeck et al., 2018).

Assumptions, Limitations, Delimitations

As this study was a retrospective cohort study, there were no significant assumptions based on the specificity of the procedure and the outcomes being evaluated. A limitation of this study is that there needed to be funding for this research. The lack of funding may impact motivation, time, and investigator participation in research. Delimitations of this study include location and data timeframe. This study was performed at one specific healthcare center in northwest Pennsylvania. This facility is one of many in the entire system. Another delimitation is the data timeframe. The process being studied was evaluated over 12 months. Ongoing research can include data from the inception of the process and data from dates past the chosen timeframe.

Chapter 2: Literature Review

Same-day discharge after the completion of catheter ablation for arrhythmia is a recent development in treating heart rhythm disorders. This approach can allow patients to return home the same day as their procedure rather than requiring them to stay overnight in the hospital. Some students have evaluated the safety and effectiveness of same-day discharge after catheter ablation. The students generally found that same-day discharge is appropriate and safe for selected patients and can result in improved patient satisfaction and decreased healthcare costs.

However, it is essential to note that same-day discharge may only be prudent for some patients. Careful selection of patients and close monitoring of their recovery is essential to ensure the best possible outcomes. Additionally, further research is needed to understand the long-term effects of same-day discharge and to determine the best methods for achieving it. Studies looking at both cost savings of same-day discharge and the safety of same-day discharges have been completed. Chu et al. (2021) performed a retrospective review of possible same-day discharge patients who underwent catheter ablation in 2019. In their study, there were 157 eligible patients for same-day discharge, 63% of first-case ablations. The estimated financial impact of a population of this size was between $1.11 and $1.48 million dollars (Chu et al., 2021).

Amin et al. (2018) pointed out in a study involving percutaneous coronary intervention (PCI) that there are potential cost savings of at least $5000 per case using same-day discharge. In this study, over 600,000 PCI patients were evaluated from January 2006 to December 2015. It was found that few of these patients were discharged the same day as an intervention, but many could have been candidates for it. The estimated total savings for hospitals with same-day discharges for PCI was nearly $577 million (Amin et al., 2018). Creta et al. (2020) studied same-day discharges in patients undergoing atrial fibrillation ablations. Their study took place in London, UK, and identified 727 subjects who met the criteria for same-day discharge. Their

study conducted in 2017 found that same-day discharges are safe and effective, citing that there was only a 3.7% complication or 30-day readmission rate (Creta et al., 2020).

He et al. (2021) performed a multicenter cohort study of the safety and cost-effectiveness of same-day day discharge for left atrial ablation. In their study, 967 patients from January 2011 to December 2020 underwent left atrial ablation. Of these patients, 414 were deemed candidates to be discharged the same day. Five of these patients had significant complications, and 30 had minor complications; therefore, there were 379 same-day discharges. It was determined that these same-day discharges in this study saved $163,500. It was estimated that if their same-day discharge policy were applied to their patients during this study, the costs saved would have exceeded $443,000 (He et al., 2021).

Deyell et al. (2020) conducted a study from 2010 to 2014 evaluating same-day discharges versus overnight observation atrial fibrillation ablation patients. Their study of 3,054 patients had a readmission/complication rate of 7.7% in the same-day discharges (2,418 patients) versus 10.2% in overnight observation patients (636 patients). Field et al. (2021) performed an actual work cohort study evaluating outcomes with catheter ablation patients. Their study included 1,610 same-day discharges and 4,637 overnight stay patients. They found no significant difference in post-procedure complications, 2.7% versus 2.8%. Interestingly, they found no significant difference in atrial fibrillation recurrence between the two groups, 10.2% versus 8.8% (Field et al., 2021). Rajendra, Hunter, Morales, and Osorio (2020) looked at the implementation of same-day discharges following catheter ablation for atrial fibrillation. In their study, several factors played into candidacy for same-day discharge. Bleeding risk, medical history (congestive heart failure, respiratory disease, planned future procedures, BMI), and home location all determined candidacy/risk for their patients. Based on their criteria for low risk, there were 44

patients planned for same-day discharge from April 2017-June to 2018. Of these patients, 41 were discharged the same day as planned. Two patients were monitored overnight for observation, and one stayed by personal choice. The same-day discharge patients were contacted the following day by a nurse, and no patients discharged the same day had readmission within 30 or 60 days (Rajendra et al., 2020).

A large prospective study by Nordin et al. (2021) looked at post-procedure complications following catheter ablation of atrial fibrillation. Their study evaluated 5,414 patients from 2001 to 2020. Results of their study revealed that there was a total of 108 (2.0%) patients who had significant complications following their ablation before discharge. These complications included congestive heart failure, pericardial effusion, significant heart block, or transient ischemic events. The study also found that 61 (1.1%) patients had minor complications, defined as transient phenic nerve injury and groin site issues, including hematoma, pseudoaneurysm, and bleeding. Patient factors associated with more complications included cardiomyopathy history, significant valvular disease history, higher BMI, longer procedure duration, transient ischemic attack/cerebral vascular accident history, and female gender. The researchers noted that most complications occurred during the procedure or within six hours of the procedure being completed. Based on the results, it was deemed safe to discharge most patients the same day if patients had no complications within six hours post-procedure (Nordin et al., 2021).

Bartoletti et al. (2019) performed a study that looked at same-day discharge patients following catheter ablation. Their study looked at patients from 2014-2017, and in that study, 169 patients were discharged on the same day. Their study identified 811 patients who were morning cases for catheter ablation. In conclusion, they felt same-day discharge was safe and

feasible in select patients and could have been utilized more in their population (Bartoletti et al., 2019).

A study completed by Akula et al. (2020) evaluated the implementation of same-day discharge for catheter atrial fibrillation ablation patients. Their study found 426 patients after a same-day discharge policy implementation. Of these 426, 374 (88%) were discharged the same day as the ablation. The 51 patients were not discharged and stayed for observation for various reasons—only 17 of the 51 stated for ablation-related issues. There were 15 who stayed for non-ablation-related medical care, 14 who stayed due to their preference, and five who stayed for late-in-day procedure completion. (Akula et al., 2020).

Steinberg et al. (2022) published a Journal of Cardiovascular Electrophysiology student on "Patient-reported outcomes and costs associated with vascular closure and same-day discharge following atrial fibrillation ablation." The study aimed to evaluate patient-reported outcomes and costs associated with the vascular closure devices used and the same-day discharge following the ablation. The authors used a retrospective chart review to collect data on patient demographics, procedural characteristics, and patient-reported outcomes, including pain, swelling, discomfort at the puncture site, and the length of hospital stay. The study results showed that using vascular closure devices was associated with improved patient-reported outcomes, including reduced pain, swelling, and discomfort at the puncture site. Additionally, patients who underwent same-day discharge and significantly shorter hospital costs.

The authors concluded that using vascular closure devices and same-day discharge following atrial fibrillation ablation is associated with improved patient-reported outcomes and decreased healthcare costs. They noted that these findings have important implications for patient care and suggest that further research is needed to understand these approaches' benefits

and limitations better and determine the best methods for optimizing patient outcomes and reducing healthcare costs.

The overall safety, cost-effectiveness, patient acceptance, and feasibility of same-day discharge following atrial fibrillation catheter ablation are consistent throughout the previously discussed studies.

Chapter 3: Methodology

This research aimed to determine how same-day discharges impact the safety or clinical outcomes and costs of patients undergoing these ablations.

The focus of this research study was atrial fibrillation catheter, ablation patients. Patients who underwent catheter ablation for atrial fibrillation were evaluated and compared in this program evaluation. The variable evaluated was same-day discharge versus observation/inpatient status. The outcomes evaluated based on the phenomena included clinical outcomes and complications, readmission at 30 days, and cost-benefit.

Research Methodology

The methodology determined for this research was quantitative.

Research Design

The method for this project involves a retrospective cohort analysis. Same-day discharge was brought up as a potential process as the COVID-19 pandemic persisted. The facility studied is a 480-bed hospital and tertiary-care medical facility in Erie, Pennsylvania. Four electrophysiologist cardiologists are employed at the facility and involved in the research. The population involved in this project were patients undergoing catheter ablation for atrial fibrillation. Historically at this facility, patients undergoing catheter ablation for atrial fibrillation would stay overnight for observation. The following morning, patients were discharged home if

there were no overnight events or potential complications. Same-day discharge was proposed as bed availability, and staffing issues made consistency difficult. The electrophysiology department determined a process for same-day discharges like prior processes in other healthcare systems.

In same-day discharge policies, numerous criteria must be met to be considered. Prior research has used factors such as time or order of procedure, patient residence distance, procedural complications, recovery condition, and physical assessment near discharge. Generally, patients were the first or morning cases to be eligible for same-day discharge. Any periprocedural complication or issue excludes patients from same-day discharge. Patients with any issues post-procedure were usually not eligible for same-day discharge. These issues can include symptoms, groin site complications, or patient preference.

Several factors were identified as inclusion criteria for eligibility for same-day discharges at the facility studied. First, the patient was to be the first ablation case of the day. Generally, there are multiple procedures performed by each physician daily. For patients to be considered for same-day discharge, they had to be the first procedure of the day and in the morning. Second, the patients had to be local to the area. The facility where data was collected is considered a regional or rural facility. Many patients come from regional areas, often with distances as far as 150 miles. With the implementation of same-day discharge for electrophysiology procedures, the distance limit was 30 miles from the facility to the patient's residence. Patients who would otherwise be eligible for same-day discharge outside of distance were offered hotel stays outside the facility. This allowed patients to leave if stable but be close if needed for return due to issues.

Each patient was monitored in the Post-Anesthesia Recovery Unit before returning to the short-stay unit. Patients were monitored for 4-6 hours of bed rest. After 3-4 hours of bedrest,

groin site suturing was removed, and bedrest continued for 1-2 hours. Following completion of bedrest, patients were to ambulate halls with the reassessment of their groin site and assessed for any symptom development. Post-procedure electrocardiogram was performed on all patients. If patients had symptoms, limited echocardiography was considered or completed if indicated. With no issues observed or voiced, patients were discharged home or to the hotel with family or caregivers. Patient information was entered in a UPMC confidential log through Microsoft Teams. This log was viewable by nurses in the office for reassessment post-discharge. Patients were contacted by telephone by triage nursing staff or electrophysiology providers (physicians or advanced practice providers) the following morning for reassessment, and documentation of this call was completed in the electronic medical record.

The team members involved in the process include physicians, advanced practice providers, electrophysiology lab registered nurses, recovery nurses, short-stay nurses, and outpatient triage nurses.

As mentioned previously, this project was a cohort study to analyze the implementation of a same-day discharge process. The expectation with this project was that same-day discharges of catheter ablation patients would be a safe process to implement permanently. If patients met specific criteria and were discharged, adverse outcomes were expected to be similar or less than catheter ablation patients admitted for observation overnight in the hospital.

This study collected and analyzed data from July 2021 to July 2022. We collected data on all atrial fibrillation catheter ablation patients for this project. This approach allowed for extensive comparison amongst all patients of this population, regardless of the length of stay. Having all the patient information with population allowed for comparison amongst same-day discharge patients and comparison of same-day discharges versus overnight observation.

Population and Sample Selection

This program evaluation occurred at a 480-bed hospital in northwest Pennsylvania in Erie, Pennsylvania. The hospital is a tertiary care facility that is a level II trauma center. For this evaluation, the general population was patients undergoing catheter ablation for atrial fibrillation. The target populations included these patients who were discharged the same day as the catheter ablation compared to the patients who were observed overnight or admitted as inpatients. These patients had no specific geographic information that included or excluded them from the study.

The sample size for this project included 321 patients over 12 months, from July 2021 to July 2022. This sample size is comparable based on prior studies that involved research on same-day discharges at single centers. In Chu et al. (2021) there was a sample size of 249 patients. Bartoletti et al. (2019) had a sample size of 1,599 patients. This sample size was over three years, from 2014-2017. Reddy et al. (2020) had a sample size of 448 patients over 13 months from March 2017 to April 2018. Vaillancourt et al (2022) had a sample size of 727 patients. This sample was collected from January 2019 to the end of December 2020. Deyell et al. (2020) studied same-day discharge at two major tertiary centers in Canada from 2010 to 2014. Their study reported that the average amount of atrial fibrillation catheter ablations performed at the included facilities was around 300. This is consistent with the volume of catheter ablations performed annually in this study's facility.

Instrumentation

This study is a retrospective cohort study. Data were gathered through chart reviews using diagnosis and procedure codes. UPMC Clinical Analytics was the program used to collect and extract the data. Quality management at the facility created a SQL query within Xper IM, a clinical data monitoring and information management program.

Validity

There is validity to this evaluation given that the research topic variables were measured and assessed as initially aimed. This project analyzed readmission rates, complications, and costs in patients undergoing atrial fibrillation catheter ablations. The study accurately measures the variables involved based on the results reported and collected. There is external validity given that the results reported in this study appear consistent with other similarly designed studies. There is internal validity as several team members were involved in the study design and data collection similarly.

Reliability

The programs used in this study are available for widespread use. Microsoft Excel is a part of most computing systems and is often used to analyze data collected. Xper IM is a program used throughout hospital systems in cardiac procedure suites.

Data Collection and Management

Patient case data is entered and stored automatically in Xper, an information entry and management program used in many cardiology procedure suites. The quality manager used this program to extract patient data in the study. He created a SQL (Structured Query Language) in the electrophysiology case reporting program using the term “afib ablation.” These cases' account numbers were then used to extract visit information, including admission and discharge dates. The data was then transferred to a Microsoft Excel spreadsheet for further organization.

Data Analysis Procedures

Using the collected data from Xper IM, which was organized in Microsoft Excel, information was compared based on multiple characteristics. The pertinent data for comparison in the total data included length of stay, age, gender, and complication.

Ethical Considerations

In this study, there are minimal ethical concerns. The areas that need to be considered in any research are safety, anonymity, confidentiality, and conflict of interest. As a retrospective study, there are no risks to the patient from a safety perspective as the care and outcomes have already occurred. As part of the informed consent process with the procedures, risks regarding catheter ablation were discussed in detail with each patient. Each patient consented to treatment with catheter ablation. This study did not impact the procedure or after that in any way. As part of the informed consent process, patients consent to their procedure information to be used for scientific and educational purposes. This allows for the information to be used in evaluations such as this.

In this study, the data was collected initially using diagnosis and procedural codes. No names or other identifiers were used; therefore, anonymity was maintained throughout the study. Confidentiality was also maintained throughout the study. Data abstraction and analysis were done and held on a company-protected device with protective firewalls. In addition, permission was obtained through UPMC for this study. See Appendices.

Information and data obtained through this study are maintained in a Microsoft Excel worksheet. The information obtained is part of the patient's records and is kept indefinitely. Company firewalls protect the information. Related to this project, the information will be kept for the duration of the study’s completion.

Limitations and Delimitations

Related to the evaluation methodology, there are several limitations in this study. One limitation of this study is the timeframe. The same-day discharge process was initiated before July 2021 and has continued since July 2022, so the timeframe could be more expansive.

Another limitation is the procedure type. Same-day discharge is used in many types of procedures in electrophysiology and other specialties. Another limitation is the length of follow-up. This study determined readmission rates at 30 days and 90 days. One could evaluate beyond 90 days in other research.

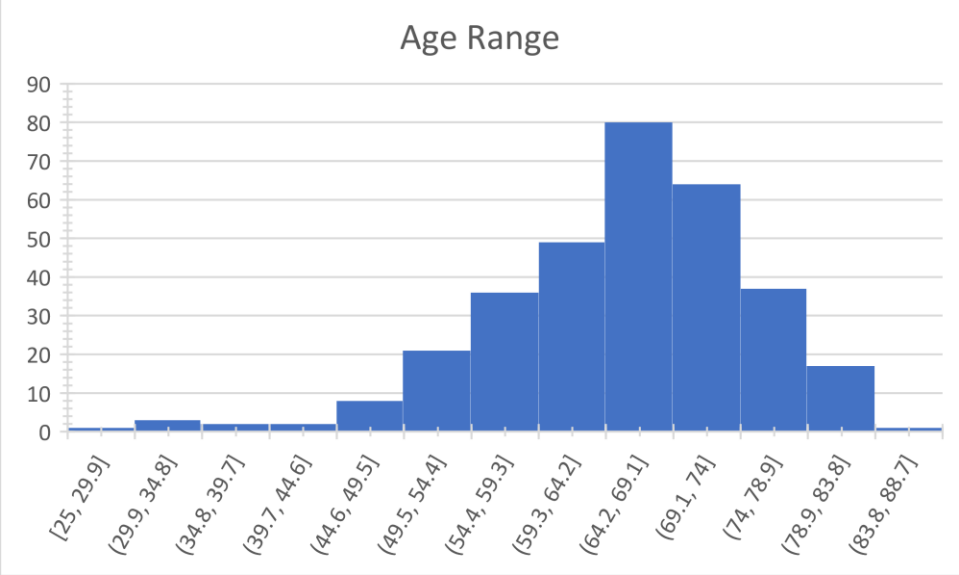
Summary

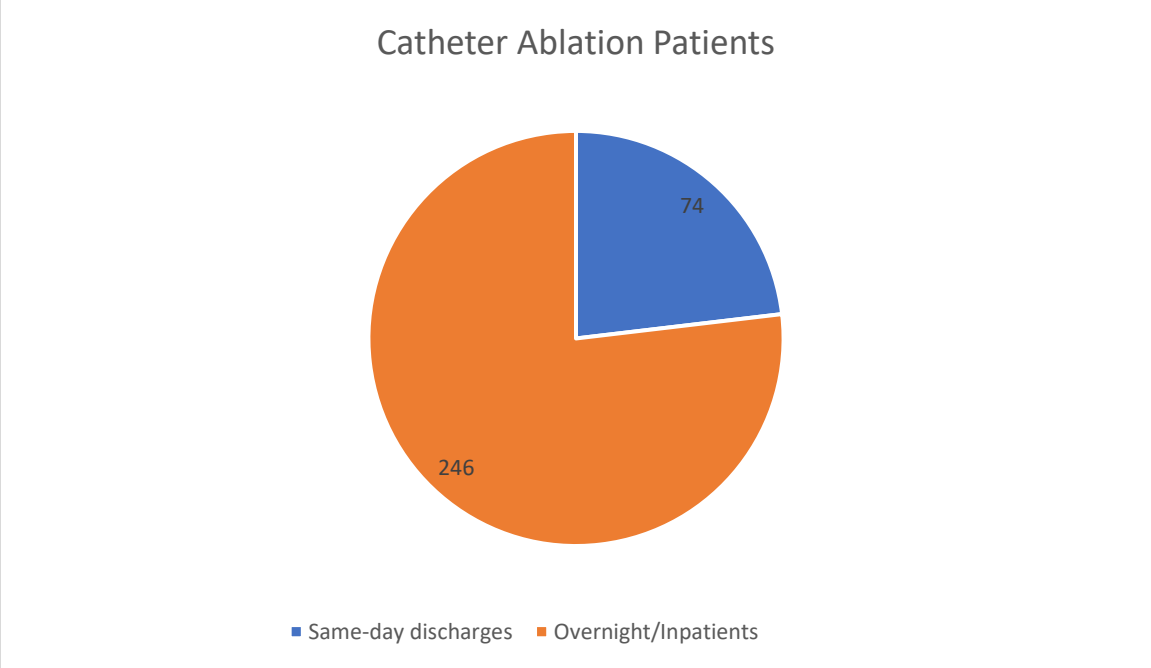
Chapter 4: Data Analysis and Results

This project aimed to evaluate using the same-day discharge process with patients undergoing catheter ablation. The PICO question was, "What are the clinical and financial benefits of same-day discharge in catheter ablation electrophysiology patients?" This retrospective program evaluation compared same-day discharge patients versus observation or inpatient patients over 12 months from July 2021 to July 2022.

In the process of a same-day discharge, eligible candidates were atrial fibrillation catheter and ablation patients. These patients were the first scheduled procedure of the day. They were monitored over 4-6 hours post-procedure. Finally, they had to have no complications peri-procedurally and post-procedurally to be discharged home the same day. These patients were then discharged home and contacted the following morning for reassessment. Patient information was given to providers' teams for contact the following day, and these patients were entered into a Microsoft Teams data group. In data collection, the Xper IM was used to populate all patients who underwent atrial fibrillation catheter ablations in the 12-month period. This data was then organized through Microsoft Excel worksheets which were then used to analyze the data. In this project, it was hypothesized that the same-day discharge with catheter ablation patients would be cost-effective and have similar outcomes related to readmission and complication rates as patients admitted as an inpatient or observation status.

Over the studied timeframe between July 2021 to July 2022, 321 atrial fibrillation catheter ablations were performed. Demographically, the patient's age ranged from 25 years of age to 84 years of age. The median age of the total population was 67 years old. There were 216 total male patients and 105 total female patients.





The total of same-day discharges was 74 patients. This was 23% of the total atrial fibrillation catheter ablation population over the studied timeframe. The median age of same-day

discharges was 66 years old. The oldest patient discharged the same day was 78 years old. The youngest patient discharged the same day was 31 years old. There were 55 male patients discharged the same day. There were 19 female patients discharged the same day. Of the same-day discharges, no complications were reported through follow-up calls the next day. Of those 74 patients, three were readmitted within 30 days of their procedure. 30-day readmission rate based on this timeframe was calculated to be 4%. One of those patients was admitted for acute congestive heart failure. Another patient was admitted with recurrent symptomatic atrial fibrillation resulting in inpatient admission. The third patient was readmitted for pericarditis. The patient readmitted for recurrent symptomatic atrial fibrillation was again readmitted within 90 days of the procedure due to acute congestive heart failure. One other patient was readmitted as an inpatient within 90 days of the procedure for symptomatic atrial fibrillation. The 90-day readmission rate for these same-day discharges was calculated to be 2.7%.

A total of 246 patients were admitted for observation or as inpatients following their catheter ablation for atrial fibrillation. Out of these 246 patients, there four patients were readmitted within 30 days of the procedure. Three of the patients were readmitted for acute congestive heart failure. One patient was readmitted within 30 days due to recurrent symptomatic atrial fibrillation. The 30-day readmission rate for observation/inpatient patients was calculated to be 1.6%. Out of the 246 patients, there three patients were readmitted within 90 days of the procedure. One patient was readmitted for noncardiac reasons that were unrelated to the procedure. Another patient was readmitted due to symptoms of chest pain related to recurrent atrial fibrillation. The third 90-day readmission was hospitalized due to sinus node dysfunction and underwent a dual-chamber pacemaker implant. The 90-day readmission rate for these patients was calculated to be 1.2%.

There was one patient out of the 321 procedures that died the same day as the procedure. The patient underwent catheter ablation without documented periprocedural abnormalities or complications. The patient went to the recovery unit. Several hours after the procedure, the patient lost consciousness in the setting of ventricular fibrillation. Ultimately, the patient died following multiple attempts of resuscitation.

Based on the reported cost savings with each same-day discharge, there was an estimated cost savings of $37,000 with 74 catheter ablation patients. Costs were more than that with patients admitted as inpatients. Based on this information, there was an estimated $123,000 additional cost related to overnight observations.

Chapter 5:

Discussion

Summary

As previous studies have shown, using same-day discharge in atrial fibrillation catheter ablation procedures is safe, reliable, and cost-effective for appropriate patients. Studies are

continuing to be done regarding the safety and cost-effectiveness of same-day discharges for many procedures, and most of them, have thus far shown that the process consistently is safe and effective and yields similar results as traditional observations. This specific study looked at catheter ablation patients at a northwest Pennsylvania hospital over 12 months to further review this process. It was a retrospective study comparing same-day discharge patients to catheter ablation patients admitted for observation or as inpatients. The PICO question for this study was, "What are the clinical and financial benefits of using same-day discharge with patients undergoing catheter ablation for atrial fibrillation?

Over 12 months, from July 2021 to July 2022, there were 321 catheter ablations for atrial fibrillation. Of the 321 ablations, there were 74 same-day discharges and 246 patients admitted for observation or as inpatients. One patient died the same day as their procedure.

Interpretation

A review and analysis of the data demonstrated that the 30-day readmission rate for these patients was 2% for observation patients and 4% for same-day discharges. The 90-day readmission rate was 1.2% for observation/inpatient patients and 2.7% for same-day discharged patients. Outside of the patient who died, there were no major complications noted. No procedural complications were documented. Readmitted patients had a recurrence of symptomatic atrial fibrillation, acute congestive heart failure, and pericarditis. One patient developed sinus node dysfunction resulting in a dual chamber pacemaker implant. With same-day discharge, the hospital had an estimated cost-saving of $37,000. This was based on an estimated $500 per 12-hour cost for the hospital admission.

The cost for these admissions would result in a higher value than $123,000. In comparison, there was at least an estimated $123,000 in extra costs related to patients staying

overnight for observation. This estimated cost does not include additional nights and additional testing.

Based on the data in the study, it was accepted that there is no significant difference between same-day discharges and admitted patients related to clinical outcomes. There was less than a 2% difference in both comparisons. Related to the financial impact, there is a significant difference between same-day discharge and admitted patients for observation or inpatient.

These results reinforce the safety and cost-effectiveness of same-day discharge with patients undergoing catheter ablation. It is consistent with prior studies showing similar results where same-day discharges save tens of thousands of dollars and have similar clinical outcomes or readmission rates.

Limitations

Strengths of this research include sample size as it is similar sampling to comparable studies. Also, the results are similar to comparable studies and reinforce the results and conclusions. Weaknesses to this study and limitations could be related to timeframe and onset. The onset of the same-day discharge process was initiated prior to July 2021. The timeframe can raise concerns for bias as the study was performed after the onset of the same-day discharge process. Therefore, further study could be done to strengthen the research by further evaluating from the onset of the process to present practice.

Conclusions

This research study can be replicated and has been similarly performed elsewhere. Ongoing research in this study would continue to reduce the risk of research imprecision, bias, or confounding. Ongoing and future will take place involving catheter ablations and discharge

process. Further research can continue to cement same-day discharge as a safe, reliable, and cost-saving process in healthcare. Future research can and should involve other electrophysiology procedures and noncardiac procedures done with historical observation overnight. With costs continuing to rise in healthcare, the use of same-day discharging following procedures is one way of reducing costs and easing some burden on healthcare systems and workers.

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Appendix A

Project Sponsor,

The Quality Improvement Review Committee is pleased to inform you that your QI project has been approved.

We have also notified your local quality department of this approval and encourage you to share updates on the project's progress.

Please note that results of QI projects must be reviewed by local quality directors and approved by the Chief Quality Officer prior to dissemination (via presentation or publication) outside of UPMC. UPMC has adopted the Standards for Quality Improvement Reporting Excellence guidelines, SQUIRE 2.0 as the suggested reporting format.

For multicentermulticenter projects, the QRC **approval** refers only to that **part of the project being performed at UPMC facilities** and the sponsors are responsible for obtaining approval from other non UPMC facilities participating in the project.

We suggest that you share your findings on this project with the QRC. When your project is complete, please navigate to the Quality Improvement Project Portal via MyApps or UPMC

Network and go to “My Projects.” Select the project and go to the “Project Summary” tab, add the findings in the “Project Results” field, and click “Submit Project Results to QRC.”

Projects reviewed and approved by the UPMC Quality Improvement Review Committee do not meet the federal definition of research according to 45 CFR 46.102(l) and do not require additional IRB oversight.

Project Submission Details:

Project ID: 4065

Project Title: What are the financial and clinical benefits of same-day procedural discharges in electrophysiology patients? A retrospective study evaluating same-day discharges versus traditional observation overnight patients.

Project Sponsor:

Matthew Hodas ** CRNP, Senior ** RHS00-UPMC Hamot HeartVascular

Project Co-Sponsor(s):

Deborah Pora ** Clinical Project Director, CVT ** HAMOT-Admin Cardio Pulmonary

Madhurmeet Singh ** Physician ** RHS00-UPMC Hamot HeartVascular

Jay Williams ** Quality Manager ** HAMOT-Admin Cardio Pulmonary

Submitted By:

Matthew Hodas ** CRNP, Senior ** RHS00-UPMC Hamot HeartVascular

Additional Information from the QRC: This is an excellent project - I am excited to see your results!

To view the full project, log in to the Quality Improvement Project Portal via MyApps or UPMC Network, click on "My Projects," and select project.

Thank you for submitting your project for our review

Eric J. Dueweke, MD, MBA, FACC

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