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Enhancing Discharge Process for Home IV Milrinone Patients With Advanced Heart Failure

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DNP PROJECT: ENHANCING DISCHARGE PROCESS FOR HOME IV MILRINONE PATIENTS WITH ADVANCED HEART FAILURE.

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Abstract

Purpose: Discharge processes for patients with heart failure on home intravenous inotrope support is fraught with barriers and complexities, and causes patients, caregivers, and bedside nurses' high levels of stress leading to potentially unsafe, complicated discharges. This project aimed to decrease discharge times and improve nurses' ability to safely and effectively discharge patients.

Background: The project was implemented in a 42-bed advanced heart failure IMU in the Texas Medical Center, where discharge times were longer than hospital standards at over 6 hours.

Methodology: Using elements of the Transition of Care Model, a discharge checklist was created to help staff prepare and organize discharge needs. Staff were educated on the use of the tool prior to implementation and cyclically during the project. Surveys were sent out to nursing staff before and after implementation to gauge staff opinion on discharge processes. Changes to the project were employed according to the Plan-Do-Study-Act quality improvement method.

Results: The checklist decreased discharge time by an average of one hour when comparing nine patients' pre-implementation to nine patient's post-implementation. Feedback from bedside staff found that the nurses felt the discharge checklist helped make the discharge process more organized, and patients were more prepared upon discharge.

Implications: A discharge checklist can improve discharge times and improve staff discharge capabilities and standardization for patients going home on IV milrinone. However, altering the standard workflow of a unit and brining on new initiatives leads to challenges in the sustainability of a discharge checklist.

Enhancing Discharge Process for Home IV Milrinone Patients with Advanced Heart Failure

As healthcare advances and more treatment options are utilized for complicated diseases such as advanced heart failure, the transition between the acute care hospital and life at home becomes increasingly complex to manage. Heart failure is when the heart is not strong enough to pump oxygen throughout the body and support the other organs in the body. According to the Centers for Disease Control and Prevention (CDC), 6.7 million adults older than 20 years of age have heart failure in the United States, with Texas one of the states with the highest incidence (Centers for Disease Control and Prevention, 2024). Milrinone is a type of phosphodiesterase inhibitor that can be given to patients in the advanced stages of heart failure (New York Heart Association class 4, with ejection fraction less than 25%) to help relieve symptoms by improving hemodynamic status (Zewail et al., 2003). In 2016, the 21st Century Cures Act was signed into law, this has led to increase in the coverage of home infusion therapy being covered by Medicare (U.S. Centers for Medicare & Medicaid, 2024). Now, more patients are using home intravenous infusions like milrinone and portable pump systems to manage their heart failure than ever before, and these treatments can provide improvements in hemodynamics, symptom relief, and a decrease in days hospitalized (Shringi et al., 2022).

Problem Description

Advanced heart failure patients can have long lengths of stay and complicated discharges. A poor transition of care also leads to higher costs for the patients and the hospital system due to prolonged lengths of stay and delayed discharges (Medicare.gov, 2023). Hospital expenses were projected to increase by $135 billion dollars in 2022 (American Hospital Association, 2022).

Transitioning from hospital to home can be confusing and difficult for providers, patients, and caregivers. For the patients being discharged on medications like home IV milrinone, the discharge process is even more long and complex than discharges of other patients. Discharging patients on home milrinone is typically a palliative measure, but many patients are also discharged on it while awaiting acceptance or clearance for surgery for either a left ventricular assist device (LVAD) or heart transplant (Eaton et al., 2022). Many of these patients have multiple tasks that must be completed before safely being discharged home. For instance, they will require a peripherally inserted central catheter (PICC) line or another central venous access; they must have an accepting pharmacy that will supply the medication, deliver it, and teach the patient how to use the home IV cassette or pump that the patient will use for medication delivery. Extensive interdisciplinary teamwork is involved, and all team members, including the patient, must be kept up to date and included in the care plan.

This heart failure intermediate medical unit (IMU) is a high acuity IMU located at a level one trauma center in the Texas Medical Center. The Texas Medical Center is the largest medical center in the nation. The heart failure IMU sees some of the sickest heart failure patients in the country. Many of these patients may have left ventricular assist devices (LVADs) or are waiting or have received heart transplantations. More frequently, some patients are also going home on continuous intravenous milrinone. There is currently no clear and streamlined process for frontline staff to ensure that the patients have all these discharge needs completed before the actual discharge. The lack of a good system for the transition of care can lead to poorer patient outcomes upon discharge, increases in readmissions, and decreases in patient and patient family members' understanding of their illness and care needs (Albert et al., 2015). The acute care unit in this project may see over twenty home IV milrinone infusion discharges a year. However, the

discharge process is fraught with complexities and barriers that can cause delays to discharge, stress amongst the hospital staff that is discharging the patient, and anxiety among patients and their caregivers. The transition of care for heart failure patient's dependent on IV inotropes, such as milrinone, at the Texas Medical Center, could be greatly improved to help patients better understand their needs inside and outside the hospital, take ownership of their disease, decrease the length of stay, and create safer more efficient discharges (Mallory et al., 2017).

Available Knowledge

Patient-centered transition-of-care checklists have facilitated the transition from the hospital to home (Albert et al., 2015). Many quality improvement projects have shown success in checklists and similar tools in improving not only discharge times, but also the overall discharge processes for a variety of patients.

Criteria Considered for Review

For the literature search, studies like this quality improvement project on the heart failure unit were evaluated. Studies that supported the use and feasibility of implementing discharge and transition of care aids from hospital to home were key. The main databases used were Embase and Cinhal, and citations were organized using the Mendeley reference organizer.

Search Terms and Strategy

For the first search to find evidence, the terms "heart failure" AND "discharge" OR "transition of" were utilized. This produced some good literature, but meta-analyses and broad reviews of different studies and articles. Many of these studies were large randomized controlled trials or meta-analyses with high levels of evidence but less specific to transitions of care checklist implementation. For the second search, "discharge planning" AND "transition of care checklist" were used, resulting in a more concise outcome with studies using transition

checklists, albeit with lower levels of evidence. However, many of these were qualitative studies, making it challenging to find studies with substantial data. Studies from over ten years ago and seemingly relevant studies that didn't align with the topic—for instance, pharmacist-driven discharge tools were excluded from the review.

Synthesis of Evidence

Many studies have shown that patient discharge, especially for complex patients such as those in the heart failure populations, greatly benefit from extra help with the transition of care (Eiss et al., 2015). All the studies, whether large, higher-level evidence studies or smaller projects and lower-level evidence qualitative studies, support that discharge checklists and other aids to patient discharges provide various benefits (Hirschman et al., 2015). The large meta-analysis studies are a good gateway to finding smaller, more qualitative studies. They also offer a lot of background on the struggles with discharges and transitions of care, particularly for complex patients like those with heart failure. Interviews and surveys were the main methods used to collect data for the studies, but readmission rates and costs were also considered in many of the studies.

Studies such as Ahmad et al. (2016), Davison & Swanson (2020), and Eiss et al. (2015) found that families and caregivers were often overlooked and need as much support and involvement in the care plans as the patients and their providers (Ahmad et al., 2016). Many of the program interventions started to identify the role that supporters like caregivers and family members play. They have started to include them in the discharge process and take them into account when it comes to success after the hospital (Albert, N.M. et al., 2015). In the smaller cohort studies by Ahmad et al. (2016), Mallory et al. (2017), Wong et al. (2018), Eiss et al. (2015), and Alibeigi et al. (2015), there were commonalities in that they all implemented a

similar type of bundle for transitions and discharges and then measured the intervention using surveys and electronic health record audits. The literature also supported using a more "patient-centered" approach to the transition of care as it supported the understanding of diseases and the patients' ownership of those diseases (Alibeigi S. et al., 2015).

Levels of Evidence Studies provided a large range of sample sizes. While some sample sizes were rather large, most studies involved small cohorts from a single unit or hospital setting. All the studies, however, showed that some form of a discharge or a transition of care aide was beneficial in usually multiple ways. Many commonalities were found in their methods, often utilizing interviews or surveys to gather their data.

Strengths and Limitations The studies reviewed were presented in many different academic journals and utilized sound data and methods. All the studies used teams and patient-centered approaches for their implementations. All the implementations were also well thought out and supported by those involved. These studies served as an excellent foundation for a study on the transition of care in the heart failure unit with this patient population.

Most of the studies did suffer from some limitations. Time and sample sizes were two of the biggest limitations. Many studies were conducted in small cohorts with a lower level of evidence. Inconsistencies in methods and biases were identified in several studies, particularly those conducted by organizations attempting to demonstrate implementation relevance.

Rationale

By using process mapping as seen in Appendix A, the current practice and where change was needed could be evaluated. This process mapping shows where the current practice needs improvement (Agency for Healthcare Research and Quality, 2020). The plan-do-study-act (PDSA) approach was used to evaluate the intervention and make necessary adjustments to the

implementation. Having a transition-of-care checklist that the bedside nurse and patients can follow during their stay involves the patient more in the plan and what they might need or expect once they leave the hospital. The Transitional Care Model or "TCM" is an intervention that has been widely studied and used for the last twenty years to aid in the transition of care from hospital to home and is a nurse-led and team-based model of care (Hirschman et al., 2015). The TCM was developed as a nurse-led model for older adult patients who may experience deficits or barriers in completing daily activities and managing healthcare needs and needed an intervention to decrease their risks for poor outcomes as they move through our healthcare environment (Hirschman et al., 2015). There are nine core components of the TCM consisting of screening (identifying those who are high risk of poor outcomes), staffing (generally utilizes advanced practice registered nurses who are responsible for care management), maintaining relationships, engaging patients and caregivers, assessing/managing risks and symptoms, education/promoting self-management, collaborating, promoting continuity (Hirschman et al., 2015). This also reduces the time needed for education and information on the actual day of discharge. Studies have shown that tools like this can greatly improve the communication of everyone involved in a plan of care (Mallory et al., 2017). A discharge or transition of care checklist provides the bedside staff, with the responsibility of discharging a patient, a visual aid to follow along with the plan of care day by day and inquire with the rounding provider team about anything that may need to be done before the patient can be discharged. This is important as bedside nurses change every shift and important information may be lost shift to shift, impacting continuity of care. This also helps with educating the patient about what is needed for their care once they are home (Albert et al., 2015).

Specific Aim

The goal of the project was that three months after the implementation of the transition of care checklist, heart failure patients being discharged on home IV milrinone from the intermediate medical unit will have their discharge time (time from the time the discharge order is placed to the time the patient is taken out of the unit system) decrease by an average of one hour. There is also a secondary goal of improving frontline nursing staff self-reported proficiency and satisfaction with the discharge process for home IV milrinone patients.

Methods

Context

Patients who are being discharged on home IV milrinone are very ill and in the final stages of advanced heart failure with very complex discharge needs. In the heart failure unit, the healthcare providers usually have a good care plan for the patient. However, patients often do not fully understand that plan and do not know what it entails once they leave the hospital. Additionally, the plan is discussed for days before discharge, but nothing is set into motion until the day before or day of discharge. Patients receive a high amount of information and education all at once. Patients discharged on a home IV infusion have additional tasks and things that need to be set up before going home to help them be successful, but also do not have the help of care coordinators as the LVAD and transplant patients that are discharged from the IMU have. Often, these discharge tasks and preparedness for home fall on the bedside nursing staff assigned that day. Issues with continuity of care and the rotation of providers and nurses can also cause some oversight in discharge preparation. Patient-centered transition-of-care checklists have been shown to help make this transition from hospital to home more successful (Albert et al., 2015).

Intervention

The nurses in the Heart Failure IMU used a transition of care checklist based on The Transitional Care Model (TCM). Meetings with case managers, bedside nursing staff, advanced practice and physician providers, and nursing administrators were had to help develop the checklist using elements based on the TCM and how best to implement the project on the unit. The case management team and providers were asked to give insight as to what should be included on the discharge checklist that was implemented. Once the checklist was created, meetings were held with the cardiovascular service line leaders and hospital head of education. They then provided feedback about how best to implement and what data would be most beneficial and easiest to track. The final checklist that was developed to be implemented can be found in Appendix B. The checklist consists of a space to indicate the anticipated date of discharge and 9 elements or tasks that need to be completed prior to the patient being discharged. Each element also includes a timeframe that it needs to be completed in and once complete has a space next to it where the nurse can sign the date and their initial to show it has been completed. IRB approval was obtained as noted in Appendix C. After IRB approval of the project, education on the discharge checklist was begun with members of the bedside staff. At first, the education was only done at unit practice council meetings. The project lead communicated with staff via staff GroupMe and email chains, and the project lead phone number was available to staff with questions regarding project. During the first few weeks of implementation, many nurses were still unsure when and how to use the checklist; a PDSA cycle was conducted, and education began at unit huddles before each shift for 3 weeks. After a second PDSA cycle, nurses were also asked to sign a sheet once they felt comfortable implementing the discharge checklist after they had been educated at the huddle.

Bedside nurses then used the checklist to help aide them in discharging the home milrinone patients. Once the decision was made with the patient and healthcare team that the patient would be going home on IV milrinone, the checklist was given to the nursing staff to attach to the unit Kardex that follows with the patient during handoff between nurses at shift change. As items on the checklist were completed the nurse for that day would sign their initials and the date of completion on the side. Every day during multi-disciplinary rounds the checklist could be reviewed with case managers and kept up to date. As discharge day gets closer, the checklist could be reviewed with providers to ensure that all orders and home care needs had been addressed. After the patient has been discharged, the nurses would give the completed checklist to the charge nurse. The charge nurses kept a folder with the completed checklists and are also in charge of recording when the patients are discharged, and what their delay to being discharged in under two hours was. If it was a home milrinone patient, this was indicated on the discharge log. At the end of the month, the service line supervisor takes the discharge log and records all the discharges and the times it took to discharge into an excel spreadsheet that could only be accessed on the locked administrative computers at the hospital. Charge nurses, the supervisors, and administrators are the only ones with access to the file.

Before the checklist was implemented, optional anonymous surveys via Survey Monkey were sent out the unit bedside nurses to gauge how they felt on the current discharge process pre-checklist implementation. Three months after the checklist was implemented the same survey was sent out to the nurses. There was also a space for comments on the post implementation survey to see if the nurses had any feedback on the intervention or any ideas they had for improvement to the project.

Study of the Intervention and Data Collection

Discharge time data (time taken from the time the discharge order is placed until the patient leaves the unit) will be assessed before and after the 3-month intervention to see if any improvement is noted. Data was collected by utilizing data that is standard to be collected on the unit. Every time a patient is discharged, the time that it takes a nurse to discharge the patient from the time the discharge order is place to the time the patient leaves the unit, is recorded. A reason why a patient may be discharged in more than the 2-hour goal is also recorded. The time and reason were noted by charge nurses and kept in a folder on the unit that the heart and vascular supervisor collects at the end of the month. This time is kept on an Excel spreadsheet in a private folder on hospital administrative computers that the charge nurses have access to. This data is collected, managed, and shared by the heart and vascular supervisor with the project leader. Project leader then calculated average times for discharges pre and post implementation.

A voluntary anonymous survey known as “Discharge Process” (Appendix D) via Survey Monkey was also sent to bedside nursing staff to see if they felt the intervention was successful. The nurses were surveyed on their feelings about the current discharge process before the intervention was implemented and then again 3 months after it was implemented. The survey consisted of 5 dichotomous, yes or no, questions about the discharge process.

Measures

The measures chosen are to impact the processes of clinical care and improve outcomes. This will also be a beneficial project for the hospital and patient as costs associated with delayed discharges will hopefully be reduced. We will be measuring the time it takes to discharge IV milrinone patients as well as receiving feedback from the bedside nursing staff who are discharging the patients. This data is collected by the unit and hospital service line.

Analysis

Both qualitative and quantitative data will be gathered and utilized in this project. Data from the last 6 months on current processes will be gathered first to analyze current practices, this included 9 discharges taking longer than 2 hours of patients going home on IV milrinone infusions. For the next couple of months, or until at least 9 patients can be analyzed, data will be collected during the intervention and stored on password-encrypted hospital computers. Mean data from the 6 months before the intervention will be compared with the mean data after. The averages for times pre- and post-implementation were recorded and analyzed via line graphs.

Survey responses of bedside staff were also compared from before the intervention to responses 3 months after intervention implementation using descriptive statistics and qualitative analysis. Bar graphs were then used to view the answer data from the surveys

Ethical Considerations

As always in nursing, patient's rights, health, and safety are paramount. Only numerical time data on discharges was collected, and no patient-identifying information will be used. Similarly, nurse-focused surveys will be anonymous, and nurses will only respond if they wish to. IRB approval was obtained from University of Texas Health Science Center as noted in Appendix C.

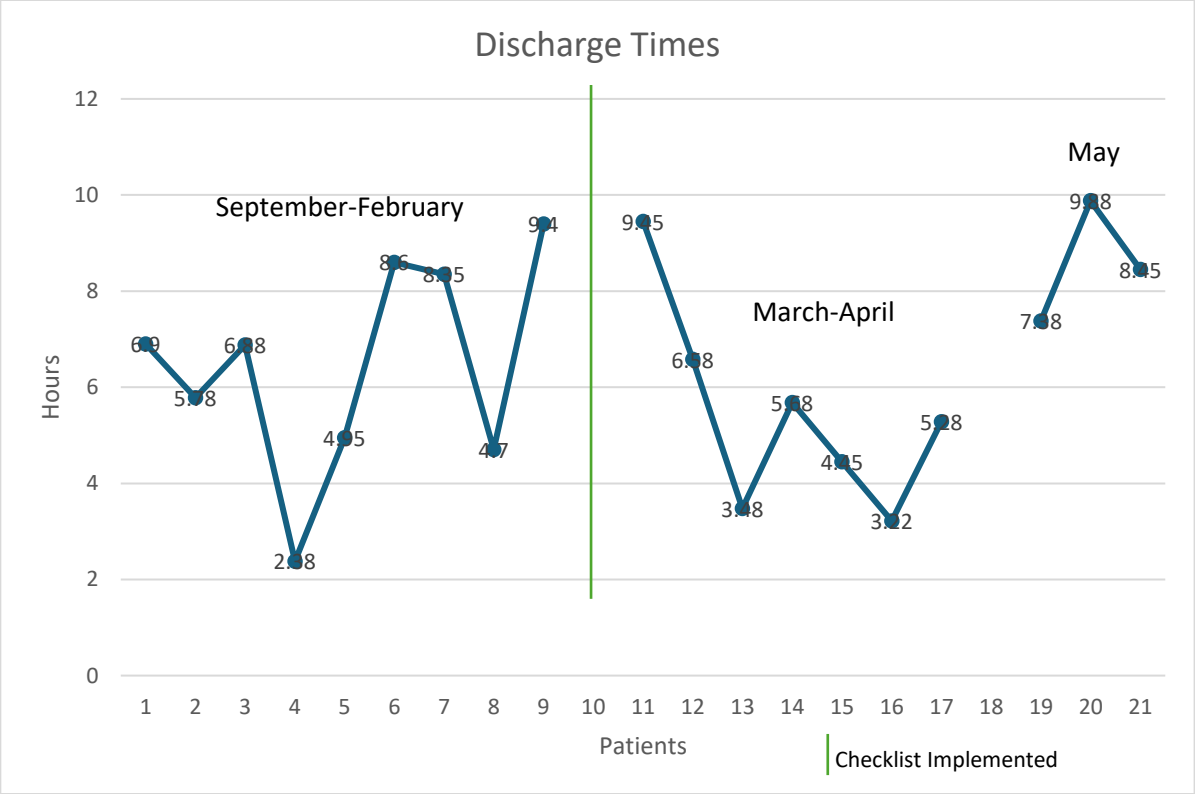
Results

Pre-implementation data was collected from September 2023 through February 2024. During this time 9 patients were discharged from the heart failure IMU on IV milrinone. The quickest discharge time was 2 hours and 38 minutes and the longest was 9 hours and 40 minutes. The average time it took to discharge a patient during this time was 6 hours and 44 minutes pre-implementation. For the seven patients discharged post-implementation the average was 5 hours and 45 minutes. In February education on the discharge checklist was conducted and

implementation began March 1st, 2024. At the beginning of the month a PDSA cycle was needed to re-educate and further educate staff about proper use of the discharge checklist, and this was done at huddles. The first discharge after implementation was 9 hour and 45 minutes. However, after re-education the discharge times saw improvement and the average discharge time for 7 patients discharged after implementation was 5 hours and 45 minutes, including the discharge that took over 9 hours. The next three discharges in May saw an uptick in discharge times averaging 8 hour and 57 minutes. However, out of these discharges the two longest were the same patient who had been readmitted and discharged twice in that month and had known social barriers that prevented a timely discharge. Nurses also began to not utilize the checklist as much as they had at the beginning for a variety of reasons including excitement of the new checklist wearing off, new nurses had just gotten off orientation and needed more education on the checklist, and new initiatives or other projects taking precedence over the milrinone checklist. Figure 1 shows the pre-implementation and post-implementation discharge time data during the project.

Figure 1.

Discharge Times Graph.

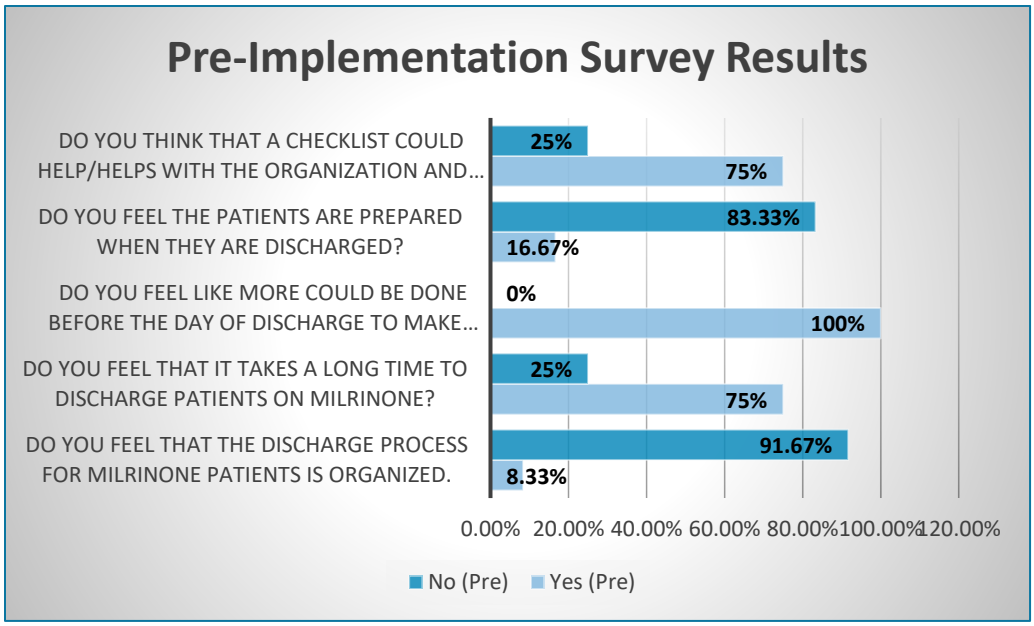


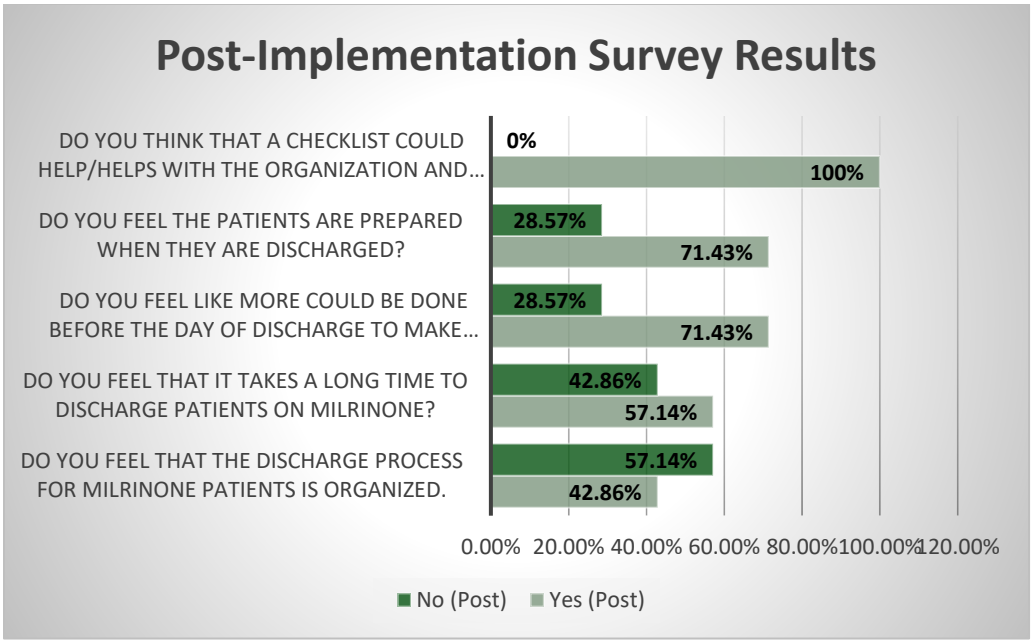
Frontline nursing staff were also given surveys via Survey Monkey to complete to give feedback on the discharge process both before the implementation of a discharge checklist and 3 months after the implementation. There were 5 questions, all yes or no, and nurses were able to answer anonymously and by choice. Survey is found in Appendix D. For the pre-implementation survey, 12 nurses answered the survey and responses were that only 8.33% of nurses felt the discharge process was organized, 75% felt that it took a long time to discharge milrinone patients, 100% thought that more could be done the day before discharge, 16.67% felt patients were prepared upon discharge, and 75% though that a discharge checklist could help with the process. 3 months post implementation the same survey was sent out and 15 nurses answered this time. Post-implementation 42.86% of nurses though the discharge process was organized, 57.14% thought that it takes a long time to discharge milrinone patients, 71.43% felt that more could be done before discharge, 71.43% thought that the patients were prepared upon discharge,

and 100% thought that a checklist helped with the discharge process. On the post-implementation survey a comment box was also included for nurses to provide additional feedback about the project. Some of the responses included that home health orders were an issue and timely delivery of the medication was something that also needed to be improved. Nurses also reported that the checklist helped them discharge other patients on the unit as it provided a clear list of discharge needs that they could follow easily and keep up with case managers and provides during multidisciplinary rounds. Survey results can be found under Figure 2.

Figure 2.

Nurse Survey Results.





Process Measures & Outcome Measures

Some process measures included having nurses sign and date on the discharge checklist once things were completed on it. Once the patient was discharged, nurses turned in the completed checklist and it was then stored in a folder with the charge nurses. The charge nurses also keep a binder with a record of patients discharged, how long it took them to be discharged, who the bedside nurse was that discharged them, and the reasons that their discharge may have been delayed more than the set goal of two hours. This data is kept in a binder that the service line supervisor then takes and enters data into an excel sheet to track discharge times. This excel sheet is only edited by him and only accessed by those with administrative access. At the end of the month, the project lead accesses the excel sheet and records the times for the patients who had a reason of home milrinone as their discharge delay. The numerical times and number of patients were the only things recorded by the project lead. Patient data including names of patients and any other patient identifying data was left off. The times were then averaged and recorded into graphs to measure pre and post implementation times.

Contextual Elements

The inpatient acute care environment can be a challenging one to implement a quality improvement project in. There are many elements that can impact the success of a project for better or for worse. Chaotic conditions in the hospital that often see busy shifts fraught with overworked, burnt-out healthcare workers is one of the biggest challenges facing our hospital healthcare today. Staffing challenges amongst bedside nursing staff, and providers and case managers who may see more thirty or more acutely ill patients in the hospital a day while also attending to clinic visits and procedures are just some of the elements that are frequently seen in the inpatient setting. In this setting some context to note is that many bedside nurses that are implementing the checklist are new nurses who are just learning and may feel overwhelmed by the prospect of a new project. The nurses may face a challenging patient load with patients who have very complex care needs and many barriers to safe, efficient, and successful discharges home. However, support from mangers, charge nurses, and senior nurses is readily available. The support and push for quality improvement projects on the unit is high. This is a magnet hospital with large shared professional governance programs and educators with experience and availability to assist with high quality evidence-based quality improvement.

Observed Associations

Doing a quality improvement project at a large, magnet, teaching hospital can be a great background for success, but also it can have its challenges as well. There is much bureaucracy and many other projects simultaneously going on at once. This can stretch your resources thin and make it more challenging. Also, this being a large level one teaching facility means that the acute care units is busy with some of the most complex patients you will see in a healthcare

system. The basis and support are there in these large hospital systems, but the actual execution of a project can be faced with barriers and get lost in a large system.

Unintended Consequences

One thing to note that was an unexpected result of the discharge checklist for home IV milrinone patients, was that it also seemed to help nurses with their discharging of other types of patients on the unit as well. Nurses felt more confident overall in their discharging. However, even though the nurses reported that they liked the checklist and that it was helpful, getting every nurse every shift to utilize the checklist was a consistent challenge. Sustainability and education of nurses was an issue that ended up being one of the largest challenges faced. Frequent re-education was done at huddles, multidisciplinary rounds, and staff meetings, but often responsibility fell on charge nurses to ensure that nurses caring for milrinone patients had the checklist and were using it correctly. This added extra tasks onto the charge nurses, and some were more consistent than others with ensuring bedside staff had a checklist.

Missing Data

If a home milrinone patient was discharged in less than two hours, the reason for their discharge would not have been recorded so these discharge times were not included in the average. However, no patients being discharged on home IV milrinone were noted to be discharged in under two hours during the quality improvement implementation.

Discussion

Summary

A discharge or transition of care checklist can be a great tool when it comes to discharging patients who have many barriers or complex home care needs. The discharge checklist did originally help with the discharge times and over the first two months after

implementation helped to decrease the discharge time by an average of an hour. However, the time increased again in the third month mostly due to unintended barriers of one patient with frequent readmissions and then unforeseen barriers to being discharged. Although the discharge checklist helped slightly with the discharge times, one of the biggest improvements that should be noted was the bedside nursing staff's feelings about the discharge process for home IV milrinone patients. The surveys sent to staff showed that the bedside nurses felt much better about the discharge process and found the use of a checklist helpful in organizing their discharge tasks and processes for these complex patients. This helped organize care and helped nurses feel better and more capable when it came to discharging their patients. The nurses also noted that they felt the patients were more prepared upon discharge as well.

Interpretation

Similar quality improvement projects have shown comparable results. A project done by Yvonne Swain, at the University of San Francisco, also showed slight improvements in discharge times, but more benefit in the actual discharge process itself, with similar barriers in how the change in workflow is accepted on the unit (Swain, 2018). Another quality improvement project by Becky Le at San Jose State University echoed the results from this project as well with an improvement of an hour to the discharge time and benefits that were limited by staff issues including buy-in, burn out, staffing shortages, and a short time frame for the study (Le, 2023). These kinds of checklists and tools are shown to improve the quality of our healthcare system, but our healthcare system and the way that in hospital processes are conducted remain the largest barrier to projects creating lasting and substantial improvements. If successful they have the potential to save healthcare systems money, improve care of patients and their caregivers upon

return home, and while at home, and improve long term workflow and conditions for frontline healthcare staff.

Limitations

This project is limited by a short time frame and compliance of all staff. Bias may exist due to only some staff participating in the feedback received. This staff also tends to be the staff most interested and most likely to be compliant in engaging with the quality improvement project.

Conclusions

This quality improvement project showed that discharge checklists can be helpful tools when it comes to patients with complex care needs and improving the processes for their transition from hospital to home. They are also beneficial to nursing workflow and improving knowledge and organizational gaps for frontline or bedside nursing staff who are tasked with preparing patients for discharge home or to other facilities. Although this project was focused on home IV milrinone patients, other patients with equally or even less complex care needs could benefit from similar tools as well. An unexpected benefit was that the discharge tool helped nurses organize discharge processes and helped to educate nurses about discharge needs for other types of patients as well. This leads to the need and want by stakeholders to create tools for every patient on the acute care unit that will be discharged. However, sustainability remains a challenge in busy acute care settings as any interruption to workflow and buy in from staff used to standard processes can be a difficult hurdle. Standardizing these types of tools and making them a normal part of the everyday workflow would likely show the biggest benefit to the sustainability of these types of tools. Educating and involving the frontline staff during orientation to the unit would improve sustainability and the actual utilization of the checklists long term.

Other Considerations

Lessons Learned

Education on the quality improvement project and what it entails should start very early on. A longer time frame for the project would also have been beneficial to get the best quality data. Pre-implementation data collection starting sooner and looking back further and then conducting a longer implementation stage and post-implementation data could provide a better understanding of improvements made or not made.

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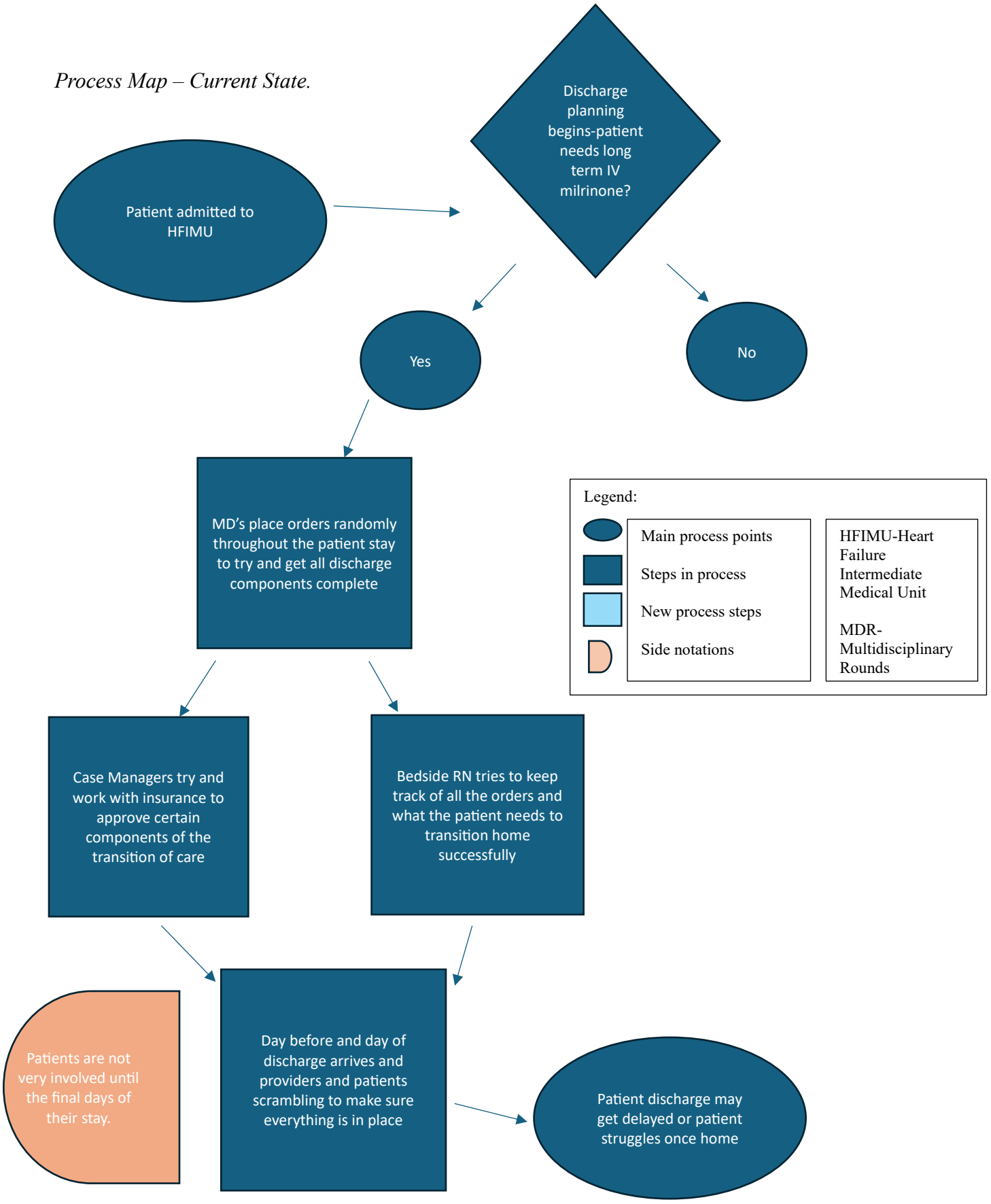
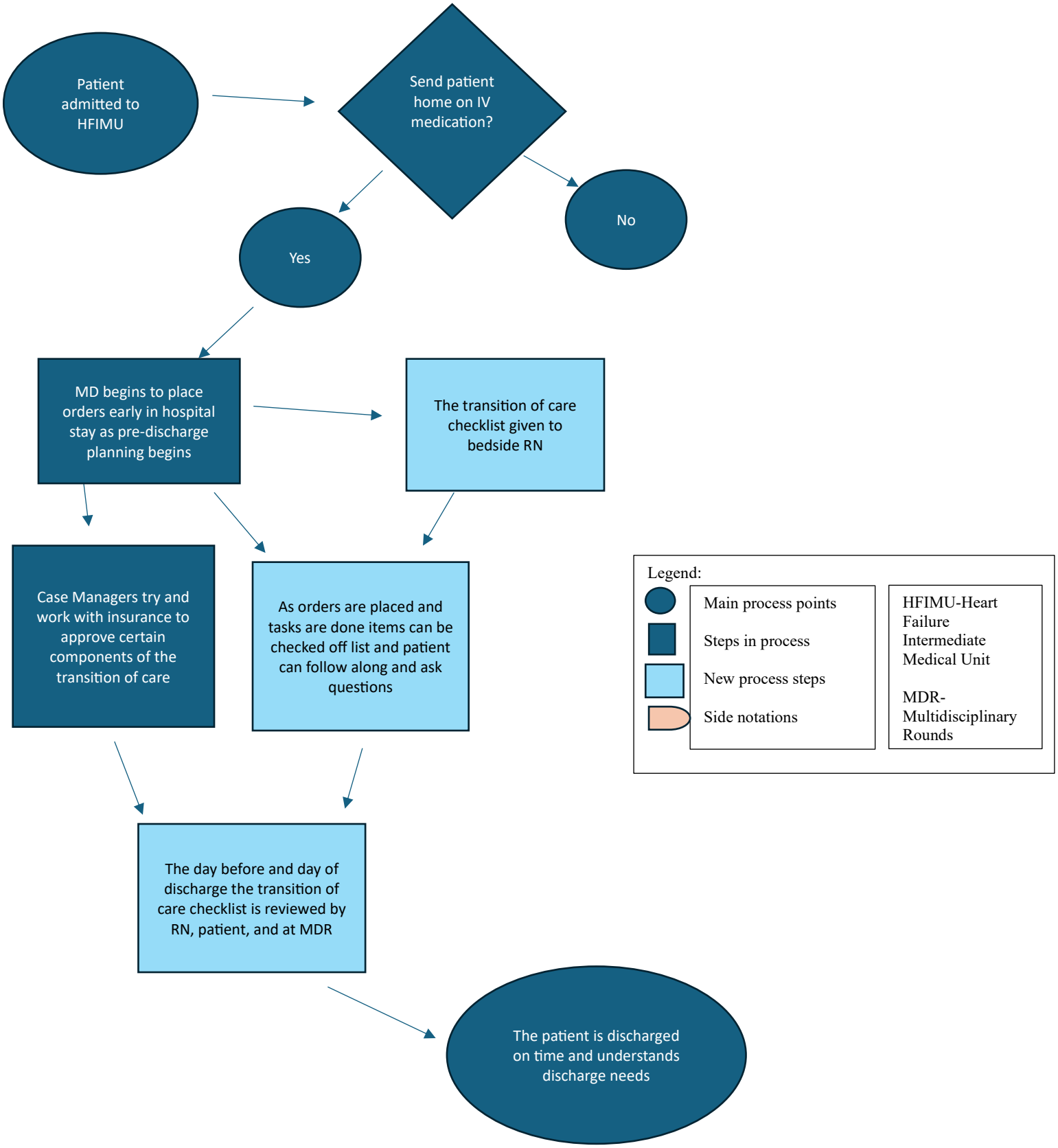
Appendix A

Process Map – Current State.



Process Map – Future State.



Appendix B

Milrinone Discharge Checklist.

Transitioning From Hospital to Home on IV Milrinone

Anticipated Date of discharge:

_____

TO Do before discharge:

	Date Completed and RN Initials
☐ PT/OT Assessments completed (before home health orders)	
☐ Central/PICC Line Placed (at least 24 hours before dc)	
☐ Home Health Order Placed/Hospice Initiated (48-72 hours before at least)	
☐ Insurance Approval (at least 24 hours before dc)	
☐ Medication Delivered to Bedside (by morning of dc)	
☐ Supplies Delivered to Bedside (by morning of dc)	
☐ Education and Training Completed with Patient and at least 1 caregiver (at least 24 hours before dc)	
☐ Transportation home arranged (by morning of dc)	
☐ Home health care has hooked up patient to home set up (within 2 hours after dc order)	

Appendix C

IRB Approval Letter

Dear Kaitlyn Bauer,

Thank you for registering "*Enhancing Discharge Process for Home IV Milrinone Patients with Advanced Heart Failure*. " with the UTHealth Houston Quality Improvement Registry.

This submission does not meet the regulatory definition of human subjects research; therefore it does not need to be submitted to the UTHealth Houston Committee for the Protection of Human Subjects for review.

This assessment only applies to entities under the UTHealth Houston IRB's purview; it does not apply to non-UTHealth Houston sites that may be involved in this project. Additional review and approval may be required by those entities.

As a reminder, QI findings may be published, but may not be reported or represented as research.

Good luck with your project!

To access QI Project No. 2023-2324, use this link: https://redcap.uth.tmc.edu/surveys/?s=o3QDvNV3fLL5PKvg&var=qdohy67fg

Appendix D

Discharge Process Survey

Discharge Process

Question Title

1. Do you feel that the discharge process for milrinone patients is organized?

Yes
No

Question Title

2. Do you feel that it takes a long time to discharge patients on milrinone?

Yes
No

Question Title

3. Do you feel like more could be done before the day of discharge to make the discharge process easier?

Yes
No

Question Title

4. Do you feel the patients are prepared when they are discharged?

Yes
No

Question Title

5. Do you think that a checklist could help/helps with the organization and streamlining of the discharge for patients on IV milrinone?

Yes
No

Done