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Outpatient Intravenous Antibiotics

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Outpatient Intravenous Antibiotics Benchmark Project

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To

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Acknowledgments

I would like to begin by thanking those who have supported me and given grace and patience along the way through this program. The first individual who has shown me the most grace and patience is my lovely husband who has given more of himself each semester to ensure myself and our son are well taken care of, that I have the time to complete course work, and has taken on more responsibility. The rest of my family and friends also deserve to be mentioned as they have stood beside me during this time when I have not had a lot of spare time to be as present. Finally, I would like to thank my professors who have guided me and mentored me to be the best student and provider I can be. First, I would like to mention Dr. Marzilli. Dr. Marzilli has been my professor for two classes and has shown an immense amount of support, guidance, and knowledge to assist with my understanding of course content. She has been such a light and has provided a positive environment with each course and I could not be more appreciative of that. The next professor I would like to mention is Dr. McInnis. I first met Dr. McInnis in my Diagnostics course and since that time, I have felt so supported and cared for as a student. She provided an open communication relationship with her students and goes out of her way to ensure we are understanding of content and skills as she truly wants us to be the best we can be. Professors that you genuinely have a connection with are very special and I will forever remember these professors for their positivity and mentorship through this program.

Executive Summary

There are many challenges within health care and when implementing a change within a health care system. The goal of the proposed project is to address some of the key challenges that face the health care system. The project aims to reduce hospital admissions, decrease length of stays, decrease cost for the hospital facility and the patient, and improve the emotional response to treatment by providing a more patient focused treatment plan. The goals of this project are to be addressed by initiating more outpatient intravenous antibiotics for patients that require intravenous antibiotics for an extended period of time. Many of the patients that are recipients of inpatient intravenous antibiotics are candidates to receive these treatments at an outpatient facility or in their personal homes.

The literature has shown that the patients who are administered intravenous antibiotics in an inpatient facility have comparable results to those that have intravenous antibiotics administered in an outpatient facility or at home. This finding shows us that these patients can have positive outcomes outside of the hospital system and open rooms for those that do not have the option to be provided treatment in an outpatient setting as well as decrease cost for both the patient and the facility. Outpatient antibiotics are already in use and being provided to patients, but the goal with this program is to use them more appropriately and more frequently to address the challenges that face our healthcare system. Ultimately, with this program, we see positive outcomes for both the healthcare facility and the patient which should be our number one priority with each choice we make as healthcare providers.

Rationale for Project

The reasoning behind a change is paramount to its success and approval from peers and those that will be involved in the program. One of the primary goals with medical care should be to provide a positive outcome for the patient affected. The proposed change project has the same goal in mind and aims to provide multiple positive outcomes including decreased admissions, decreased length of stay, decrease cost, and improve patient outcomes. Our local hospitals have seen such an increase in patients entering the emergency department that they have had to expand their main facility as well as add clinics and emergency departments to a multitude of cities. Based on the facts that the healthcare system is seeing an enormous uptick in patient visits per year, this calls for an intervention with how we categorize which patients are truly appropriate for admission and how we can care for them in an alternative way to open up beds for patients who require admission.

Literature Synthesis

When implementing change, there must be a purpose for the change and evidence that supports the change. For this project, our primary goals are to produce positive outcomes for patients, decrease hospital admissions, decrease length of stays, and decrease cost for both the healthcare facility and the patient. The literature suggests that with the implementation of outpatient intravenous antibiotics, these goals can be achieved. Outcomes or results of those who received outpatient intravenous antibiotics have shown to be comparable to those who received intravenous antibiotics inpatient (Gunderson, et., al, 2018). Another goal regards the decrease in hospital admission and decrease length of stay, which can be done using outpatient intravenous antibiotics. These patients are vetted in the emergency department to identify if they would be appropriate candidates for outpatient therapy and if so, the process of initiating that treatment

begins there decreasing their time spent in the hospital (Rentala, et., al, 2016). In addition to these goals, the topic of cost is always of priority for both the patient and the medical facility. The evidence shows that there is a decrease in total cost of care for both the patient and the healthcare entity (Ansari, 2013). When it comes to providing quality patient care, there should always be a goal to have the patient have a positive experience and feel involved in creating their treatment plan. Literature has provided proof that patients in fact feel more involved and are more pleased with their overall care when they are treated with outpatient intravenous antibiotics (Kumari, et., al, 2018).

The evidence supports this project and aims to provide an improvement in the overall care that is given to patients and increase each patient's satisfaction with their medical care. There are enough challenges and barriers within healthcare that must be managed and implementing this change project can alleviate some of the challenges.

Stakeholders

The stakeholders involved in this project are vital to its success. Each stakeholder plays a pivotal role in implementing this change project and ensuring that it upholds its purpose. Those involved in this project include the hospital facility, physicians, nurse directors, case managers, staff nurses, home health agencies, outpatient pharmacies, and the patients. The hospital facility will be affected based on admission and discharge rates and nurse directors will be responsible for overseeing the project within their departments. Physicians will provide the treatment plan and collaborate with the different departments and patients to select an agreed upon plan that will set the patient up for success. Case managers will be able to assist with identifying appropriate patients for the project and assisting them with the transition to outpatient care, staff nurses will be responsible for providing care and monitoring the patients on a routine basis, and the home

health agencies and pharmacies will be involved in providing outpatient care with nurse evaluation and medication management. The patients will also be stakeholders as they will be responsible for compliance, providing insight into their treatment progress, and will be the ones with the anticipated outcomes. Each stakeholder is responsible for a separate piece of the puzzle and plays an important role to the overall outcome of the project.

Implementation

The first step in implementing outpatient intravenous antibiotics involves identifying the patient population that is appropriate for this treatment. The ideal patient is someone who has a support system, access to healthcare or resources to supplement the cost of home health services as well as medications, and the ability to remain compliant with the education and treatment plan provided. Those involved in selecting the appropriate population include the physicians, case managers, and nurses. These stakeholders should be well educated on the project to understand which patients best fit the criteria, which will be discussed further. Once the patient population has been identified, the next step is to incorporate the personnel involved in assisting the patient with their treatment plan. The personnel for this goal would include a home health agency, nurse navigator or a case manager, nursing staff, managing physician, and a pharmacy able to provide the medications needed. When selecting personnel, forming a relationship with those involved prior to plan implementation can help create a more cohesive and collaborative unit to implement a project. By forming a relationship, the communication improves for all involved, standing protocols can be developed, a standard of care can be established, and a familiarity with the companies and staff can develop. Creating relationships should be made through meetings, referrals, organized staff events, and community events.

After selecting personnel involved in the treatment plan, it is time to identify each person's responsibility for the plan and set guidelines for their expected performance. The patient's support system is not one that can be tightly managed as it is outside the control of a facility, but education can be provided to their support system on encouraging the patient throughout the process, assisting with their care, and monitoring the patient for any needs and notifying the appropriate figure. The patient and their support system should have personal time spent with them that details how the treatment plan will go, what to expect, what to monitor for, how to perform any needed skills, and how to notify their provider if needed. The home health agency should be responsible for the initial education provided at home, provide their standard of care, identify risks in the patient's home environment that would complicate their treatment, provide education to the patient and support system on the treatment plan and how they can assist as applicable, organize a schedule of visits to the patient's home to complete their treatment plan, and ensure the patient is able to communicate to those involved in their care. The nurse navigator or case manager should establish a schedule of once a week, or more if needed, phone calls or FaceTime meetings with the patient to discuss their treatment progress and any concerns that may need to be addressed. The nurse navigator would then document the conversation and distribute the communication to the patient's managing physician and home health agency to ensure all parties are up to date on the patient's current state of health. The nursing staff from the home health agency would be responsible for making the scheduled visits to the patient's home to provide the care outlined by the managing physician. The nursing staff would take note of any complications or adjustments needed to the treatment plan and communicate that to the nurse navigator and managing physician. The physician is responsible for establishing the treatment plan with the patient. They help determine treatment protocols and

follow the patient throughout their care. The physician should see the patient in person whether that be at the patient's home or in their office for regular follow ups to ensure the patient is progressing as hoped. They will be responsible for reviewing documentation regarding the patient to ensure the treatment plan is staying on course and adjust as needed. The physician's documentation will be provided to the home health agency and the nurse navigator to maintain the continuity of care. The last personnel involved will be the pharmacy. Creating a strong relationship with a pharmacy that can routinely provide intravenous antibiotics will be an important piece of the plan. It can be difficult to find pharmacies that supply these types of medications and so having that relationship already established can decrease the stress and time spent organizing the medication arrangements. The pharmacy should be responsible for reviewing the plan of care and ensuring the patient's allergies, current medications, medical history, and labs do not interfere with the proposed treatment plan. They will also be responsible for producing the medications needed, supplies needed, ordering labs related to the medications being administered to ensure the patient stays within safe limits, and shipping all items to the patient's home on a schedule or ensuring someone can pick up the medication and secure it for the patient.

Once the foundation of the plan has been established, it is time to propose the plan to the hospital or facility that will be discharging the patient and ensure they are accepting of the plan. The hospital or facility is a primary stakeholder and should be adequately educated on the project as they will be affected by cost and admission/discharge rates.

The next step in organizing this plan is to discuss the plan with all of those involved and gather their responses, preferences, areas they identify that need an adjustment, and see if there are any missing pieces that could better benefit outcomes and experiences. The patients should

be interviewed and have an opportunity to provide feedback. This should be done with the identified patient population and not as a general patient survey as the patients that have been included in the project's population have a better understanding of their current medical conditions, what will be required of them for their treatment plan, and they are more emotionally invested in this topic and can provide a more reliable and honest response to the projected plan. The physicians, pharmacies, home health agencies, case managers, and nurses should also be involved in the feedback portion of the plan to identify areas of improvement as they might have a history of experience with outpatient intravenous antibiotics and be able to provide scenarios of complications that took place that can be avoided.

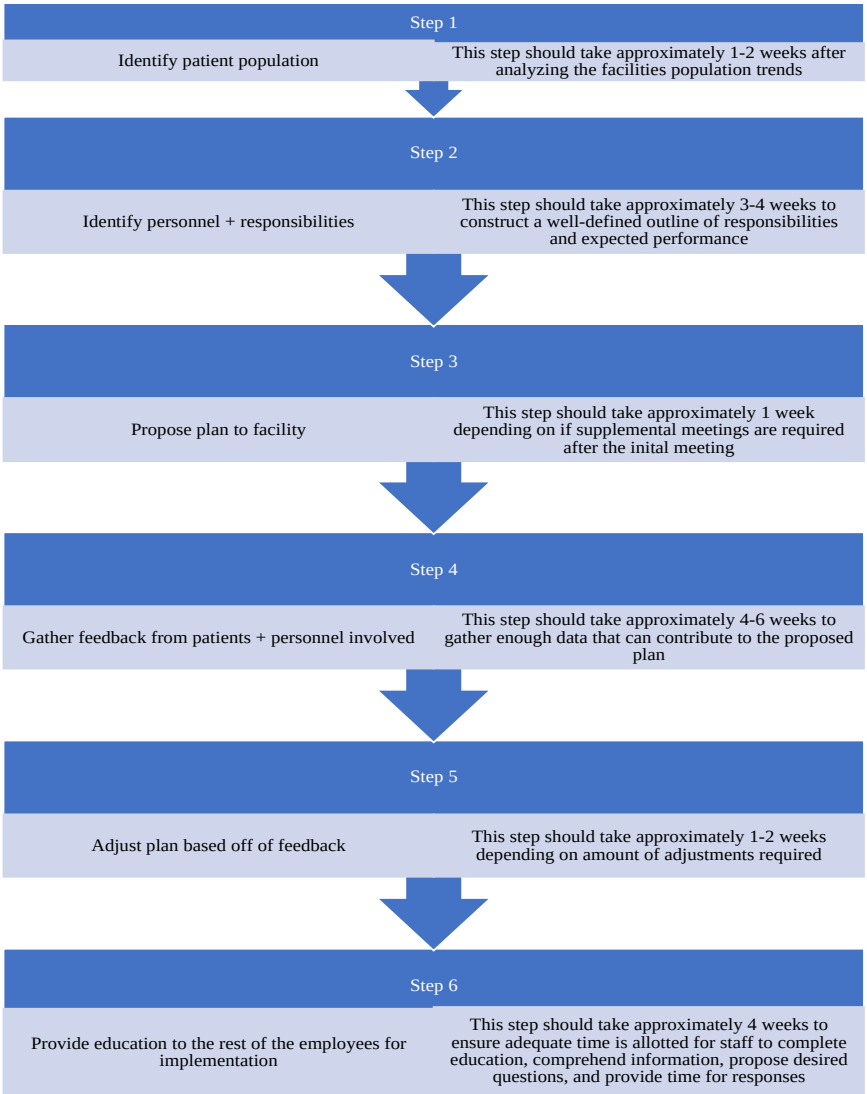
After gathering feedback, it is necessary to review the established plan and make changes where needed based on feedback. If any adjustments are made, it would be responsible to update the facility of changes. Once the plan has been finalized, it is essential that all employees at the different entities involved be educated on the finalized plan and be prepared to implement the new standards of care and protocols, be knowledgeable of the relationships with each other and expected outcomes for the patients. It is imperative that a strong communication loop is established between all personnel to ensure that patient care remains on a continuum which decreases the chance of errors and complications.

Timetable & Flowchart

A structured plan has been created with details indicating the estimated length of time to complete each step. Step one involves identifying the appropriate patient population and would take an estimated 1-2 weeks after gathering the facilities population trends. Step two involves selecting the personnel and identifying each of their responsibilities in detail which would take approximately 3-4 weeks. Step three focuses on proposing the plan to the facility which can take

about one week depending on meeting frequency. Step four is when all the data would be collected and this includes feedback from the stakeholders with the goal of using that data to adjust the plan as needed, which should take around 4-6 weeks. Step five is when the feedback adjustments would be made and reflected upon which is estimated to take 1-2 weeks. Step six is the final step and includes educating the stakeholders and patients on the plan to ensure their understanding which can take about four weeks.

A flowchart has been included to show the steps and their estimated timeframe.



Data Collection Methods & Planned Evaluation

A success for this program will be if the evaluation plan shows a higher percentage of patients had an improved experience from outpatient antibiotics, decrease in hospital readmission rates from complications, decrease in length of stay percentages, decrease in intravenous antibiotic complications, and decrease in cost for the patient and facility.

Obtaining qualitative data will be conducted through questionaries that will be provided to the participating patients as well as the stakeholders. The questionaries given to the patients will provide information regarding their personal experience. The questionnaires given to the stakeholders will be to obtain data that provides insight into the strengths and weaknesses of the program. On the questionnaires, there will also be a section for an open response that participants can place information that may not have been addressed by the pre-selected questions on the questionnaire.

To obtain quantitative data, a statistical analysis framework will be utilized for data collection and interpretation. This data will provide information on hospital admissions related to treatment complications, change in treatment and the reasoning, length of stay from the patient's initial hospital admission, and total cost of care for the patient and hospital facility. Data should be collected weekly as each patient will be completing their treatment on different timeframes and staying up to date on changes to each patients plan, or completion of their plan, is necessary for accurate data management.

Patients that remained in the hospital during their intravenous antibiotic course had an increased chance of acute renal failure by 27.1%, nosocomial infection by 10.4%, and a higher 28-day hospital readmission rate by 10.4% (Ong, et., al, 2019). One study found that 97% of participating patients would prefer to be treated at home (Minton, et., al, 2017).

As discussed, a successful evaluation plan would be to have results comparable to those of the provided evidence that supports the initiative for the program. Through data collection, a continuous evaluation of this project can be seen, and the strengths and weaknesses can be recorded. Having the ability to trend the data and identify areas of needed change are imperative to a successful project and positive outcomes for the patients involved.

When evaluating the proposed plan, the data collection is an invaluable resource to show if the project is having a positive outcome as anticipated. The stakeholders should review the data on a regular basis, bi-weekly if possible, and use that information to make changes as needed to stay up to date on the current evidence and trends. Questionnaires should be sent out to patient's multiple times throughout their treatment plan so we can catch any areas of concern promptly. Throughout the treatment plan, each patient's progress, admissions, length of stay, cost of hospitalization for the patient and the facility, and patient's emotional response should be evaluated to determine the programs current success rate.

Cost & Benefits

When reviewing a change program, there is great interest in understanding the benefit and the cost behind such a change. The *Journal of General Internal Medicine* performed a study which provided evidence showing patients who received intravenous antibiotics in an inpatient facility versus those who received them in an outpatient facility had comparable mortality rates, but the overall cost savings was greater in an outpatient setting (Gunderson, et., al, 2018). From this study, we can deduct that patients' outcomes do not worsen based on their chosen treatment environment, but the overall cost savings and patient experience is improved. Both patient experience and cost savings are heavy determining factors when it comes to selecting a treatment plan. One study performed on home intravenous therapy found that out of their selected patient

population, 97% of their patients were able to avoid hospital admission which opens hospital beds and decreases costs (Rentala, et., al, 2016). This study has huge implications for this project as it demonstrates that there is evidenced potential to increase available hospital beds, decrease admission rates, and decrease cost for both patient and facility. The cost for both the patient and health care facility are always of high concern and evidence has shown that home intravenous therapy lead to significant societal and third-party payer perspective (Minton, et., al, 2017). A more descriptive breakdown of cost savings was discussed in an article produced by the *British Medical Journal* and describes the most frequently used outpatient antimicrobial treatment methods (outpatient facility, home health, self-care) and discovered the five year estimated savings to the UK NHS was found to be in the range of 60-77 million euros (Dimitrova, et., al, 2021).

A more precise study was conducted with more literal numerical figures and based their data off the most common outpatient treatment methods including home health, outpatient facilities, and self-administration. This study found that a six-week inpatient, dual therapy, broad-spectrum intravenous antibiotic course costs about $50,980, an extended care facility costs $31.072, and home health costs $12,307 (Odom, et., al, 2016). With the presented literature, it is evident that using outpatient intravenous antibiotics, many positive outcomes can be a result.

Results

The goals of this proposed change project hope to decrease admission rates, decrease length of stays, decrease cost, improve patient experiences, and improve patient outcomes. The presented evidence has shown that these goals can be achieved using outpatient intravenous antibiotics. The results from the research show that a treatment already available for use, can be implemented to its full capacity and used more appropriately with a targeted patient population

and have impactful results that accomplish the proposed goals. Overall, this project has shown great success can be implemented in most health care facilities. There is not a limitation to the project's location or frequency of use which allows this project to remain versatile and adaptable.

Recommendations

For this proposed change, although a benchmark project, a recommendation would be to fully utilize the identified evidence. Hopefully using this evidence, it leads to the use of other treatments or patient care protocols that are already available but can be used in new ways to allow for a more diverse and cost-effective treatment plan for patients.

After implementing this project into a hospital facility and allowing enough time to collect adequate amounts of data, the next step would be to implement it in another facility with different patient populations to see how it can be utilized. Implementation of this project in different areas allows stakeholders to identify more strengths and weaknesses so this project can continue to be adjusted as needed and improved so that it provides consistent positive outcomes.

Personally, I think this project would be beneficial to most if not all hospital facilities as we have seen that our nation's population continues to grow older, and more individuals are being affected by medical conditions. The patients that are most affected by their conditions are those that end up being hospitalized and we have seen that there is a shortage of hospital beds available to the public. By implementing this project, hospital bed shortage can be relieved. I have these same recommendations for my own facility as I have seen first-hand how they have been affected by many factors that this proposed change could improve.

Many recommendations can be made from the literature and from that, I recommend the leadership at my facility to absorb all the information possible, implement the proposed change,

focus on continuing to improve the project, and aim for new goals with new projects to improve patient care.

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Appendix

Patient Experience Questionnaire

1. Did you discuss your treatment plan with your provider prior to beginning?	Yes
	No. Please explain why:
2. Did you feel involved in creating your treatment plan?	Yes
	No. Please explain why:
3. On a scale from 0-5, 0 being not at all and 5 being very satisfied, how do you rate your level of involvement in your treatment plan?	0 1 2 3 4 5
4. Do you feel like your providers were well educated on your treatment plan?	Yes
	No. Please explain why:
5. Were all of your questions or concerns addressed in a timely manner?	Yes
	No. Please explain why:
6. On a scale from 0-5, 0 being not at all and 5 being very satisfied, please rate how satisfied you were with your treatment plan.	0 1 2 3 4 5
7. On a scale from 0-5, 0 being not at all and 5 being very satisfied, please rate how satisfied you were with the care you received from your providers.	0 1 2 3 4 5
8. Please include any information that was not addressed on the questionnaire.	
9. Would you like someone to contact you regarding your survey results to discuss further?	Yes
	No

Stakeholder Open-Ended Questionnaire

1. What strengths have you identified in this project?	
2. What weaknesses have you identified in this project?	
3. What complications have you seen from this project?	
4. What complaints have you received regarding this project (patient and/or staff)?	
5. What adjustments do you feel need to be made and how do you propose those adjustments be implemented?	
6. Please include any information that was not addressed in the questionnaire.	