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# Perioperative Beta Blocker Utilization and Associated Cardiovascular Outcomes in the Hospital Setting

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## INTRODUCTION

It is oftentimes noted that patients' home medications are not faithfully reviewed and or implemented for various reasons, including a presenting illness, challenges with medical literacy, and due to health professional's mishap. Thus, it appears that some home medications, including beta blockers, did not get restarted during the course of their hospitalization. Beta Blockers are a commonly utilized medication class within the hospital setting. They are guideline directed therapy for congestive heart failure, stable chronic angina, arrhythmias, acute coronary syndromes as well as hypertension. One critical area of importance is the surgical patient who is admitted while on chronic outpatient beta blocker therapy. The importance of continuing this therapy is seen in both cardiac and non-cardiac surgical patients (3). A previous Cochrane Review**(1)** based on 88 randomized controlled trials showed the significance of perioperative beta blockers on the reduction in post-operative rhythm disturbances in patients undergoing cardiac surgery. Perioperative beta blocker therapy continues to be forefront of discussions regarding care for the perioperative patient.

## AIM STATEMENT

The purpose of this project is to note the administration practices of beta blockers at OSU Medical Center and to improve perioperative beta blocker utilization by at least 25%. We aim to do this through reminders or prompts in the EMR in addition to hospital wide education to improve the appropriate usage of the medication.

## METHODS

The patients assessed were those admitted inpatient for specifically for surgical intervention or required surgical intervention during their hospital course. This study was approved by the OSU Medical Center Pharmacology Institutional Board. The electronic medical record was utilized to identify patients who underwent surgery and were on chronic beta blocker therapy. Additionally the following data was also reviewed: risk of surgery, urgency of surgery, indications for beta blockers, type of beta blocker utilized, as well as the length of time the patient has been on beta blocker. The data assessed was for patients over the period of approximately 6 months.

## RESULTS

| Inclusion Criteria |
|---|
| Age over 18 |
| Utilization of beta blockers during the hospitalization |
| Beta blocker use at home, as recorded per home medications list |
| Patient required surgical intervention during the hospitalization |
| **Exclusion criteria:** |
| No beta blocker administration during hospitalization |
| Non cardiovascular utilization of Beta blockers (eg. varices, migraines, anxiety and essential tremors) |

Figure 1: Medication Administration vs Post Operative Cardiovascular Event

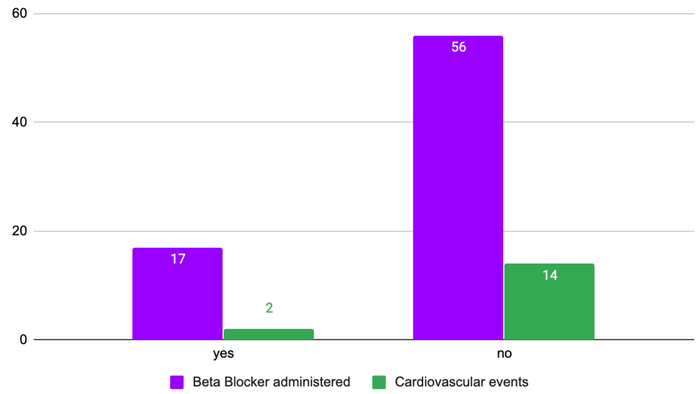



Figure 2: Adverse Cardiac Events

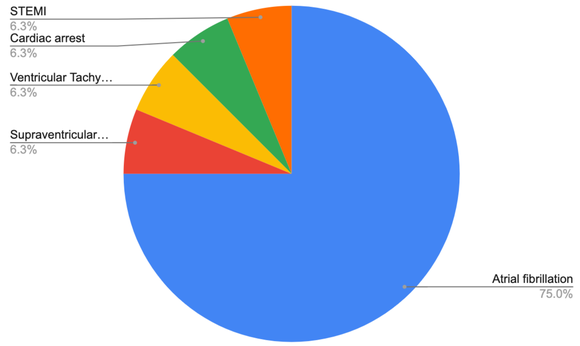



Figure 3: ASA Classifications for Surgical Interventions Performed

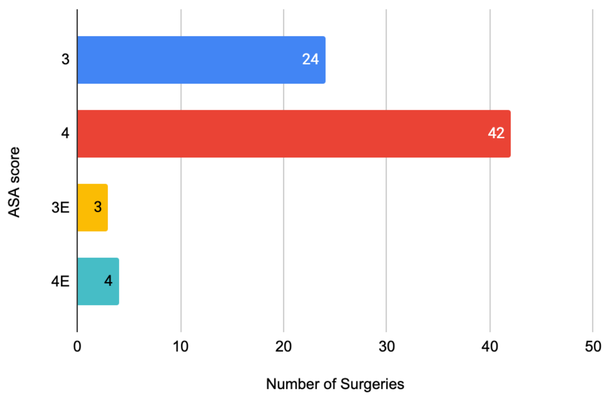
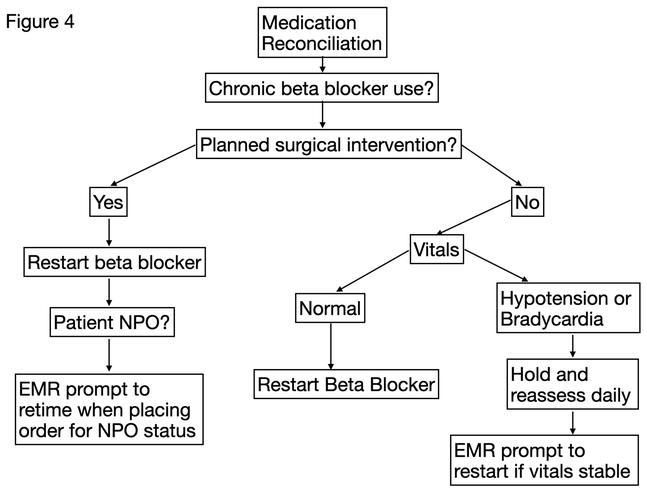



Figure 4




## RESULTS

This study was a retrospective analysis of 73 patients who were administered beta blockers in the perioperative period. The data accounted for the type of beta blocker, indication for the medication , if appropriate dosing was achieved, type of surgery and whether the patient received the morning dose of the beta blocker. Over 70% of patients did not receive beta blocker prior to surgery (Figure 1). Twelve developed atrial fibrillation, 1 had a cardiac arrest, 1 STEMI, 1 SVT and 1 was noted to have 33 beats of ventricular tachycardia (Figure 2). Also reviewed was the patient's ASA classification (Figure 3). With the information gleaned from the retrospective analysis, a proposed algorithm for improvement in the proper utilization of the medication was also created (Figure 4).

## CONCLUSIONS

A critical area of importance in the care of the surgical patient is continued use of chronic outpatient beta blocker therapy in both cardiac and non-cardiac surgery. This analysis showed most patients did not receive beta blockade prior to their surgical intervention. Among the adverse cardiac events that occurred in the postoperative period, atrial fibrillation post cardiac surgery was the most common. This is the most common arrhythmia after cardiac surgery, occurring in up to 30-40% of patients. Through our analysis 75% of people who experienced adverse cardiac events were noted to have postoperative atrial fibrillation. We cannot specifically state that the cause of the arrhythmias was directly related, but the event rate may have been reduced with proper administration. Administering medication as indicated may have decreased postoperative complications, decreased hospital length of stay and subsequently lower hospital costs. Furthering this study would represent a vital step in improving patients' morbidity and mortality within this facility by introducing new guidelines, via flowsheets or built -in process within the EMR for improvement in beta blocker utilization.

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## ACKNOWLEDGEMENTS