**HOSPITALIST IMPLEMENTATION IN ISMETT: SURGICAL COMANAGEMENT**

by

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Submitted to the Graduate Faculty of

Health Policy and Management

Graduate School of Public Health in partial fulfillment

of the requirements for the degree of

Master of Health Administration

University of Pittsburgh

2018

UNIVERSITY OF PITTSBURGH

GRADUATE SCHOOL OF PUBLIC HEALTH

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**ABSTRACT**

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**HOSPITALIST IMPLEMENTATION IN ISMETT: SURGICAL COMANAGEMENT**

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University of Pittsburgh, 2018

The hospitalist is a type of care model that redistributes human resources within health care organizations to provide more efficient and higher quality care, at the same time reducing unnecessary waste. It also alleviates the work load for particular health care professionals and therefore achieves a more balanced work flow. This essay is a retrospective study showing the implementation of the hospitalist model in a surgery unit and analyzing its outcome to demonstrate the performance of the model, ultimately showing positive results. The essay also includes an introduction of the hospitalist development in the United States and a literature review regarding the surgical co-management model.

In order to achieve a better quality of life, we must recognize the need of collaboration between public health agencies and hospital organizations. For example, a lower readmission rate not only reduces the cost for the health care organizations, but it also leads to better quality of care, which consequentially can prolong and improve the quality of life. The way health care organizations deliver care can affect the outcome of public health, as more and more hospitals are emphasizing patient-centered care. This also indicates that patients’ self-awareness is rising. In other words, if patients are more aware of their choice of care, health care professionals are more encouraged to provide relevant education to patients. As a result, the population at large will be more aware of their own health.

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# preface

I would like to thank my primary essay advisor, Professor Friede, for the earnest and kind instruction during the process; my second reader, Professor Zenati, who has been continuously teaching me how to do research and analyze the data with lots of patience and passion; my third reader, Mr. Ricci, who has provided me lots of support and discussion for this essay. I am very lucky to have them as my committee members. They make the process of writing this essay a very enjoyable and excellent learning opportunity.

Also, I would like to thank the transplant center, ISMETT, for providing these valuable data so that I have the opportunity to write this essay. Because of its project, I am able to learn more about the hospitalist model and how a hospital implemented the quality improvement project. Thanks also to Rachel Sterling from the Writing Center who has been working with me to review my essay.

# Introduction

The primary concern and goal for every healthcare system is to achieve the balance between cost, experience of care and population health, which is often known as the triple aim ("The IHI Triple Aim,"). In the field of transplant surgery, this principle seems even more critical due to its high-risk characteristic. Many studies have shown that the hospitalist system can benefit health care organizations by potentially decreasing length of stays, adverse outcomes, and reducing the cost (Marinella, 2002). In the hope of improving productivity, efficiency and quality, the University of Pittsburgh Medical Center International division (UPMC International) began a pilot project in their Italy transplant center, The Istituto Mediterraneo per i Trapianti e Terapie ad Alta Specializzazione (ISMETT), in 2016. The goal of the pilot project was to introduce hospitalists into one of its surgery units, and eventually establish a hospitalist system within the transplant center. The expected outcome of this project could benefit ISMETT by increasing patient and staff satisfaction, improving adherence with evidence-based clinical protocols and decreasing resource utilization. This essay aims to analyze the quantitative and qualitative outcomes from the pilot project and to demonstrate the effectiveness of this process improvement.

Hospitalist models have become more familiar in the United States (U.S.) health care system, and more studies have been done proving their positive outcomes such as shortened length of stay (Rifkin, Holmboe, Scherer, & Sierra, 2004), lower readmission rate (Roy, Heckman, & Roy, 2006), lower mortality rate and cost reduction. Although there are many research findings published showing the general improvement, few of them are related to surgery co-management and so far, up to our knowledge, no studies are related to transplant service. Consequently, this essay also discusses the hospitalist models in the U.S. and its application in the surgical setting.

## Overview of Hospital Medicine

### The History of Hospitalists

The term hospitalist was introduced in 1996 when Dr. Robert Watcher and Dr. Lee Goldman first mentioned the term in the New England Journal of Medicine. During that time, managed care started to become a trend in health care (R.M. Wachter & Goldman, 1996). As more people enroll in managed care organizations, the less bargaining power hospitals have in negotiating reimbursement rates (DePuccio, 2014). Therefore, this new care model urged hospitals to find out an innovative solution to manage and improve care more efficiently. The hospitalist is one of the innovative models created in response to managed care. Over the past 20 years, this specialty has grown rapidly in the U.S. from hundreds to more than 50,000. Nowadays, about 75% of hospitals, including all highly ranked academic centers, have implemented hospital medicine in U.S. (Robert M. Wachter & Goldman, 2016).

### The Role of Hospitalists

The definition of hospitalist has been changed after many years. In the first article where Dr. Wachter defined this new term, he described hospitalists as “specialists in inpatient medicine — who will be responsible for managing the care of hospitalized patients in the same way that primary care physicians are responsible for managing the care of outpatients” (R.M. Wachter & Goldman, 1996). Three years later, he proposed a more detailed definition in another journal article, claiming that “A hospitalist is a physician who spends at least 25% of his or her professional time serving as the physician-of-record for inpatients, during which time he or she accepts “hand-offs” of hospitalized patients from primary care providers, returning the patients to their primary care providers at the time of hospital discharge” (R. M. Wachter, 1999). As one can tell, both definitions not only emphasize the inpatient care, but also connect hospitalists with primary care physicians. The reason for that is because at that time, under the pressures of managed care, the main expectation of hospitalists was to take care of the patients referred by the primary care physicians (PCPs) and to become the bridge of communication between PCPs and hospitals. Nowadays, the Society of Hospital Medicine (SHM) came out with their own official definition which describes hospitalists as “Physicians whose primary professional focus is the general medical care of hospitalized patients. Their activities include patient care, teaching, research, and leadership related to hospital medicine (Pantilat, 2006).” Over the years, hospitalists have gradually established their own role and expanded their duties in the healthcare system.

Although the hospitalist is considered a type of provider, there is no special training for this particular type of physician. The question, then, is who will be the best candidate for this position? A survey in 1999 indicated that among all the hospitalists, 89% of them were previously trained in internal medicine(Lindenauer, Pantilat, Katz, & Wachter, 1999). Ten years after that survey, the proportion yet remained the same. About 82% of hospitalists are internists, 15% are pediatricians and 3% are family medicine physicians (Soong, Christine, Eddy, Eric, & Robert, 2009). Compared to internists, hospitalists mostly take care of patients in the intensive care units or medical wards, not in the clinics or offices. In addition, hospitalists are more likely to be involved in the hospital-wide quality improvement efforts (Greenwood, 2017).

### Surgical co-management and Hospitalists

Most previous surgical co-management studies focused on discussing the effectiveness of orthopedic surgery (Whinney & Michota, 2008), yet no research was found related to organ transplant surgery. Back in 1994, a study from Minneapolis Veterans Affairs Medical Center had already showed the benefit by having an internist join their cardiothoracic surgery team. They found that by having the internist round with the surgical team daily, writing orders for those patients that had comorbidities and making recommendation for medications, length of stay actually shortened by six days and total laboratory utilization was reduced (Macpherson, Parenti, Nee, Petzel, & Ward, 1994). The University of California-San Francisco (UCSF) medical center introduced the surgical hospitalist model to their acute general surgical service in 2007. The goal of the innovation was to alleviate the burden for surgeons who must be on call for 24 hours as well as manage the daytime consultations and emergency surgical care in the emergency department (ED). Their team successfully restructured the surgical call system by staffing three full-time board-certified general surgeons who dedicated all their time to the ED and inpatient consults. The new model successfully improved the response time in the ED, timelines of care and the education of surgery house staff. Also, the satisfaction rate of providers in the emergency department had a positive improvement.

Besides the positive clinical outcome exhibited, some studies also presented positive feedback from both the physicians and nurses. Rochester Methodist Hospital conducted a randomized controlled trial on patients who received hip and knee arthroplasty (Huddleston et al., 2004). They established a Hospitalist-Orthopedic Team and had three internal medicine hospitalists involved. Under the new model, the three hospitalists were responsible for providing all indicated postoperative medical care after the surgical team completed initial postoperative orders. The outcome not only showed reduced minor operative complication rates, it also presented a stronger satisfaction rate by nurses and surgeons.

## Background and Significance

### UPMC International and ISMETT

The University of Pittsburgh Medical Center (UPMC) is a nationally and internationally recognized healthcare organization, known for transforming medicine with innovative solutions that improve patients’ lives. The vision of its international division is to leverage their expertise and resources to help other healthcare systems around the world. They believe the best health care should be accessible near patients’ homes, rather than seeking it outside. UPMC has partnered with more than 13 countries and 25 health care organizations, and this number is still increasing.

ISMETT is a well-known leading transplant center located in Palermo, Sicily, Italy. It was created through an international partnership between UPMC and the Region of Sicily in 1997. For more than two decades, ISMETT has brought excellent transplant services to areas in the Mediterranean ("The Istituto Mediterraneo per i Trapianti e Terapie ad Alta Specializzazione (ISMETT).", 2016). Through collaboration with UPMC, ISMETT is also able to share the expertise and professionalism of UPMC’s worldwide renowned hospitals and research centers.

### Project Overview

At a transplant center, surgeons often perform operations and see inpatients in the same day. However, this work process not only limits the volume of surgeries a surgeon can take on, but also decreases the time that a surgeon can spend with the postoperative patients. A study has shown that the time physicians spend with patients can affect components of the care, such as the clinical outcome, patient satisfaction, and physician fulfilment (Dugdale, Epstein, & Pantilat, 1999). Therefore, the balance between the surgical productivity and the quality of inpatient care is a critical issue. The goal of the pilot project is to improve the process of care delivery by introducing hospitalists for patient medical management.

During the pilot project, four physicians were trained as hospitalists in the abdominal surgery unit (ASU). Three physicians originally worked as hepatologists at ISMETT, and a new physician was recruited externally to the ASU. The pilot project just completed its first phase at the abdominal surgery unit. If the outcome reveals a positive influence, it will be expanded to the cardiothoracic unit (CTU) (Figure 1).



Figure . The flow and measurement of the hospitalist pilot project at ISMETT

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**Figure 2. The previous process flow in the abdominal surgery unit**



**Figure 3. The process map in the abdominal surgery unit with hospitalists involved**

In order to demonstrate the work flow of the unit, the author developed two process maps (Figure 2 and 3) with the potential issues that might arise at each stage. Figure 2 shows the previous process flow before hospitalists were involved. In this process, repetitive tasks and poor communication are some of the problems that impede the efficiency of care. During the day, the surgery team usually does rounds at 5-6 am in the early morning before they enter the operating room. Due to the limited time surgeons have, they usually do a quick check that focuses on patients’ surgical site condition, mobility and function. Because it is very early and surgeons are usually in a hurry, Patient Care Coordinators (PCC) and bedside nurses are often not involved in the rounds. Besides the surgery team, medical teams (such as hepatologists or nephrologists) also do the rounds during the day. In general, they spend more time than surgeons on evaluating patients’ medical conditions. During this time, bedside nurses are more likely to be involved with the rounds; however, when two or more teams come to the unit at the same time, the nurses often miss some discussion. In the evening, around 5pm, when surgeons finish all the operations for the day, they will do their second rounds. From the first rounds to the second rounds, there is often a 12-hour-long period in which surgeons are not accessible to these postoperative patients.

Generally speaking, surgeons and internists collaborate via consultation. Whenever surgeons need assistance with a patient’s internal medicine issues, for example, blood pressure or chronic diseases, they will call internists for recommendations. This works for both ways. When internists have questions about patient’s surgical issues, they also consult with surgeons. Although this seemed to be an efficient structure, a study indicated that seamless communication about the consultations and executions often do not exist (Whinney & Michota, 2008). Lack of communication between the two specialties often leads to inefficient delivery of care. Less comprehensive rounds often lead not only to the delay of diagnosis but also to preventable complications (Pucher, Aggarwal, & Darzi, 2014). Moreover, the PCCs and nurses, who are the ones that understand patients the most are often not involved in the rounds. As a result, whenever PCCs or bedside nurses see the orders afterward, they will need to call physicians for clarification again.

The new process (Figure 3) introduced hospitalists into the unit. Hospitalists are experienced internists who take care of patients in the unit and continuously evaluate their medical condition. They work closely with the nursing staff and surgeons and this improves communication and efficiency. Orders no longer need to wait until surgeons are available to come see the patients. Hospitalists monitor patients continuously, and once a consensus between surgeons and hospitalists is reached, they can process the discharge with the PCCs, which streamlines and accelerates the process. Patients who are supposed to be discharged that day are expected to leave earlier. In general, a good discharge plan can not only decrease the length of stay but can also reduce the admission bottlenecks (Haraden & Resar, 2004).

So far, the co-management model has been performed for 16 months and it has been showing positive feedback from the clinical staff. In this essay, the hypothesis is that the hospitalist co-management model would improve the quality and efficiency of care in the ASU. Specific outcomes and analysis will be discussed and this essay will provide a recommendation for the next step.

## author’s role

The author participated in meetings and discussions during the summer residency at UPMC International and performed data analysis for the first parts of the questionnaires. After the residency, the author decided to collect and expand the analysis with input of more clinical data and conducted literature review to provide UPMC International with a comprehensive report and reference for the future implementation. The pilot project and research provided the author an opportunity to enhance her research, process improvement and statistical analysis skills.

# methodology

## Study setting

From October 2015 to October 2016, abdominal surgery patients were admitted to the ASU under the original model of care, where the surgery team manages the postoperative patients with the support of other internal medical teams. After October 2016, the hospitalist co-management model was adopted in this unit. Hospitalists, with the assistance of PCCs, replaced the previous support from other medical teams and managed these postoperative patients from the moment the patients arrived in the ASU until discharge.

## Data collection

This essay was approved by the Quality Improvement Review Committee at UPMC. Data were obtained through a retrospective review of administrative data from the quality department at ISMETT.

### Data introduction

The analysis includes two parts: the monthly measurement of core clinical indicators in the ASU from October 2015 until September 2017, including one year before the implementation and one year after; the other measurement is the self-reported online questionnaire for nurses working in the ASU.

An online voluntary questionnaire (Figure 4) for nurses who had working with hospitalists in the past year was given to the ASU staff. The goal of the survey was to understand the general perception of nurses regarding their cooperation with physicians. The survey was sent out three times in different periods. The first one was sent out in November 2016, which was prior to the pilot program, and the other two were sent out six months and twelve months after the implementation. Nurses were surveyed using a five-point Likert scale (0 = Never to 4 = Always). The summary of questions is listed below.

|  |
| --- |
| **Questionnaire:**   1. Nurses receive necessary information at the appropriate times when communicating patients’ conditions to physicians 2. Physicians ask nurses to enter verbal orders for them 3. Physicians are present when nurses need them 4. Physicians involve nurses in the patient rounding 5. Physicians are available to provide education for topics that nurses don’t fully understand 6. Physicians are interested in quality results and actively involved in the quality improvement projects |

**Figure 4. The online nursing staff questionnaire**

Besides the questionnaires, the following monthly clinical indicators were chosen from the International Quality Patient Care Committee (IQPCC), which has a list of metrics UPMC International utilizes to evaluate quality performance:

• Patient length of stay

• Patient satisfaction scores

• Abdominal surgery operating room volume

• Catheter-associated Urinary Tract Infections (CAUTIs)

• Central line-associated bloodstream infections (CLABs)

• Falls for ASU service patients

• ICU readmissions

• Needle stick injuries for staff

• Conditions calls

### Statistical Analysis

Clinical indicator analysis was performed using SPSS Statistical Software version 25. A Mann-Whitney U test (Wilcoxon Rank Sum Test) was run to determine differences in these indicators before and after the implementation. Variables that have similar distribution between pre- and post-implementation are compared using medians, others are compared using mean ranks. All tests that used in the analysis were of 2-tailed nature. P value less than 0.05 were considered statistically significant. The online self-reported questionnaire was analyzed and demonstrated as a histogram using Microsoft EXCEL version 2017.

# results

## Online Nursing Staff Questionnaire

The pre-implementation online survey (Figure 5) was posted in November of 2016. 27 nurses responded to the survey. 52% were from the ASU and 12% from the Pediatric ASU (with additional responses from CTU 36%). According to the results of the survey, more than 50% of nurses said physicians often were not present in the unit when nurses needed them. Neither did the physicians provide further information, nor involve nurses in patient rounds. Moreover, 26% of nurses said physicians always or often required them to enter verbal orders because physicians were not in the unit or in a place that had access to Sunrise, the electronic medical record system in ISMETT.

After six months of implementation, the first post-survey was posted online in June of 2017, and nurses were encouraged to complete the survey within a reasonable timeline. 26 nurses answered the survey - 58% from ASU and 38% from PASU (with additional responses from CTU - 4%). Improvements were found in all seven questions. The frequency of nurses receiving necessary information and prompt assistance from hospitalists increased an average of 40%; the percentage of hospitalists that actively participated in patients’ discharge/transfer plans increased 47%. Also, the times that physicians asked nurses to enter their verba l orders decreased from 26% to 0%. Overall, nurses were more satisfied with the presence of hospitalist coworkers.

**Figure 5. Pre- and post-survey outcomes; accumulated percentage of categories “always” and “often” from nurses in three units**

## Clinical outcome analysis

The pre-implementation data includes 12 responses from October 2015 through September 2016; the post-implementation data covers 12 responses from October 2016 to September 2017. Efficiency and clinical outcomes are shown in Table 2. Overall, the length of stay (U=82.5, p=0.551) is similar between pre- and post-implementation groups. However, looking at the trend in Figure 4, the line has less variation after the implementation and eventually plateaus and becomes stable. Patient satisfaction score (U=53, p=0.96) (Figure 7), which was calculated as a percentage of number of patients who scored the highest, 9 or 10 over all the respondents. The score slightly increased and has less variation in the post-implementation period. However, there is no statistical significance between two periods. On the other hand, number of condition calls (U=38.5, p=0.05) (Figure 12) increased significantly. The mean rank rose from 9.71 to 15.29. Condition call is a method of communication between clinical staff to react to the most urgent situations. Whenever bedside nurses or other clinical staff found patients in an emergent condition, they push the call buttons next to the beds, which will transfer the message into a broadcast system. Depending on the unit and condition, the information will be broadcasted into specific areas, and the responding medical teams will show up in a short time. Oftentimes, there are different types of condition calls regarding patient’s severity, which will activate a corresponding plan. For example, in ISMETT, Condition A means the patient doesn’t have a pulse at that moment, and Condition C means the patient’s condition seems deteriorating.

The number of falls per patient days (U=65.6, P=0.71) did not show any obvious differences. The trend (Figure 9) also retains the same pattern with both groups’ medians equaling 0. The two common infection rates within the hospital, CLABs (U=72, p=1) and CAUTIs (U=54, p= 0.284), also did not show significant difference for pre- and post-implementation groups. There were at least eight months in the pre-implementation group when no infections were identified; however, the slightly increased numbers in the post-implementation group are not significant enough to justify the difference (Figure 10 and 11). Needle stick injuries (U=72, P=1) were not significantly different between pre- and post-implementation groups (Figure14).

In terms of efficiency, surgical volume has increased significantly in the post-implementation group (U=34, p=0.03). Moreover, the trend (Figure 8) has eventually achieved stability and plateaued. The rate of readmission to the ICU within 48 hours (U=47.5, p=0.08) has increased slightly after implementation (Figure 13); however, there is no significant difference between two groups.

Table . Efficiency and Clinical Outcome Data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcome Variables | Pre-implementation(N=12) | Full implementation(N=12) | U | *p\** |
| Length of stay | 8.4 (11.63) | 8.5 (13.38) | 61.5 | 0.56 |
| Patient satisfaction score\*\* | 0.843 (11.11) | 0.849 (10.92) | 53 | 0.96 |
| Operation cases | 41 (9.33) | 45.5 (15.67) | 34 | 0.03 |
| Fall rate | 0 (13.04) | 0 (11.96) | 65.5 | 0.71 |
| Needle stick injuries | 0 (12.5) | 0 (12.5) | 72 | 1.00 |
| Number of condition call | 1.2 (9.71) | 2.2 (15.29) | 38.5 | 0.05 |
| Readmission to ICU\*\*\* | 0 (10.46) | 0 (14.54) | 47.5 | 0.08 |
| CLABs rate | 0 (12.5) | 0 (12.5) | 72 | 1 |
| CAUTIs rate | 0 (131) | 0 (169) | 53 | 0.284 |
| Data are presented as median (mean rank) | |  |  |  |
| \*Exact Sig. (2-tailed) |  |  |  |  |
| \*\* Total responses with highest rating (9 and 10)/Total number of responses | | |  |  |
| \*\*\* Readmission within 48 hours from last discharge/ICU admission | | | | |

****

**Figure 6. The average length of stay in the ASU (patient days)**



**Figure 7. Patient Satisfaction Score; responses that score 9 and 10 over total responses**



**Figure 8. The abdominal surgery volume per month in the unit**



**Figure 9. Number of falls per patient days in the unit**



**Figure 10. Central line-associated bloodstream infections (CLABs) rate in the unit**



**Figure 11. Catheter-associated Urinary Tract Infections (CAUTIs) rate in the unit**

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**Figure 12. Number of condition calls in ASU per patient days**

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**Figure 13. Patients readmissions to ICU within 48 hours**

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**Figure 14. Number of needle stick injuries in clinical staff**

# Discussion

## CLINICAL OUTCOME

Most previous studies have analyzed the effectiveness of the hospitalist system in a general setting; few of them are related to surgery co-management. This essay is novel in examining the hospitalist system in a transplant specialty and investigating clinical staff’s experiences with the new model. Although few studies have measured the volume of surgery cases as an indicator for the hospitalist outcome, the author thinks it will be a helpful indicator in examining surgery and care efficiency. This essay showed that the presence of hospitalists significantly increased the volume of surgical cases. Oftentimes, patients’ scheduled surgeries are delayed because there is no bed available to take care of postoperative patients. Hospitalists can continuously take care of these patients’ medical issues and efficiently complete the discharge orders while surgeons are focusing on the operations. Although there is no significant decrease in the length of stay between pre- and post-periods in this essay, few variances were found in the post-implementation period. When the new program is implemented into an organization or unit, it usually takes time for staff to adapt to the changes and gradually improve processes. Therefore, a long learning curve could be the reason clinical staff in the unit may be adapting the new work flow.

Although many studies have proven that the hospitalist program can reduce the length of stay, this essay didn’t observe any significant difference. However, a study didn’t find any significant difference in length of stay until the second year (Auerbach et al., 2002). This is possibly because of the multiple factors such as the program’s learning process and more complex complications. Moreover, it is difficult to observe the improvement in the length of stay when patients are discharged only few hours earlier. However, we still consider this as an important criterion when thinking about patient-centered care. More observation and access to medical records could help examine this indicator more thoroughly.

The frequency of condition call hasn’t been used for previous studies. In this essay, the number of condition calls were significantly increased after the implementation. The author’s belief is that the involvement of hospitalists may empower nurses to make more condition calls than before. The logic behind this is, in the past, it was relatively difficult to reach out to surgeons during the day, and oftentimes, nurses tended to not utilize this function, even when they were not sure about the patient’s situation. With support of the hospitalists, nurses receive more sufficient bedside education regarding patients’ condition, and it is much easier for them to find a hospitalist than a surgeon to solve problems. Under this assumption, nurses might have more confidence making condition calls whenever they see any potential problems with patients. However, it will be more helpful if further studies can observe what type of condition call is increasing and what type is not. Presumably, we hope to see the Condition C increased and Condition A decreased, because this means that nurses are more comfortable to make the decision and their awareness is actually rising.

The patient’s readmission rate to ICU within 48 hours, patients’ fall rates, and other clinical outcomes did not have significant differences between the two periods. The small sample size with only limited responses might be the reason for this result. It is also highly possible that ISMETT is already maintaining a good standard of care, and therefore, it is hard to see a dramatic improvement from the previous stage.

## ONLINE NURSING STAFF QUESTIONNAIRE

The Online Nursing Staff Questionnaire is another approach that was rarely seen in the previous studies. The value of this questionnaire is to understand nursing staff’s perception regarding the collaboration with hospitalists. According to the questionnaire outcome, nurses overall reported strong satisfaction with the new model. In the past, an average of less than 50% of nurses were comfortable to say they received adequate information from the physicians, and they were often not involved in the rounds. 20% of nurses also reported entering verbal orders for physicians, which is not considered proper practice, because it causes patient safety issues such as miscommunication. The U.S. federal law actually requires that verbal orders should only be used for emergency situations and should not be used frequently ("Code of Federal Regulations 482.21(c)(2)(i),"). Fortunately, this essay found that after the hospitalist model was introduced, no nurses were asked to enter verbal orders for physicians. Due to the structure of the pilot project, these surveys only included the nurses’ perspective. The author suggests that the in the next phase, surgeons could also be included in the questionnaires to gain a further understanding of the collaboration.

## Limitations

This is a retrospective study analyzing previous data available in the ASU in ISMETT. As a result, the data structure is limited by the way it was collected. This essay did not adjust for patients’ gender, age, complications or any previous health conditions. Also, it was not able to adjust the outcome based on different types of abdominal surgeries. The author suggests that in future implementation, patients’ characteristics and factors such as common surgery site infections and complications should be considered when evaluating the outcome of the projects. Moreover, cost and resource utilization could also be a very helpful indicator to examine the project’s efficiency. Many previous studies have shown that the hospitalist model can reduce costs (Marinella, 2002).

Also, this essay only analyzed the 48-hour readmission rate from ICU, there was no data available to examine the particular 30-day readmission rate, which is a critical quality measure used in all the acute care hospitals in the U.S. It will be helpful to see the 30-day readmission rate and the time of patients’ discharge. The author suggests that standardized indicators and a user-friendly portal could be established.

# cONclusion

The findings from this essay suggests that the one-year hospitalist pilot project implemented in the ASU at ISMETT improved satisfaction among the nursing staff. The volume of surgery cases and the number of condition calls also increased significantly, which is evidence of more efficient care. Although there are several clinical outcomes that do not show significant changes, the author believes more observations and longer implementation time in the future can potentially address this issue.

This is the outcome of the first phase of hospitalist pilot project. ISMETT will expand the model to the cardiothoracic unit this year. The author hopes the findings in this essay can benefit the second phase implementation and provide more insights into the co-management model.

# bibliography

Auerbach, A. D., Wachter, R. M., Katz, P., Showstack, J., Baron, R. B., & Goldman, L. (2002). Implementation of a voluntary hospitalist service at a community teaching hospital: Improved clinical efficiency and patient outcomes. *Annals of Internal Medicine, 137*(11), 859-865. doi:10.7326/0003-4819-137-11-200212030-00006

Code of Federal Regulations 482.21(c)(2)(i).

DePuccio, M. J. (2014). Managed Care and Organizational Influences on Hospitalist Program Adoption. *Hospital Topics, 92*(4), 105-111. doi:10.1080/00185868.2014.968495

Dugdale, D. C., Epstein, R., & Pantilat, S. Z. (1999). Time and the Patient–Physician Relationship. *Journal of General Internal Medicine, 14*(Suppl 1), S34-S40. doi:10.1046/j.1525-1497.1999.00263.x

Greenwood, B. (2017). WHAT IS THE DIFFERENCE BETWEEN A HOSPITALIST VS. AN INTERNIST? Retrieved from <https://careertrend.com/difference-between-hospitalist-vs-internist-11913.html>

Haraden, C., & Resar, R. (2004). Patient Flow in Hospitals: Understanding and Controlling It Better. *Frontiers of Health Services Management, 20*(4), 3-15.

Huddleston, J. M., Long, K. H., Naessens, J. M., Vanness, D., Larson, D., Trousdale, R., . . . Investigators, T. H.-O. T. T. (2004). Medical and Surgical Comanagement after Elective Hip and Knee Arthroplasty: A Randomized, Controlled Trial. *Annals of Internal Medicine, 141(1)*, 28-38.

The IHI Triple Aim. Retrieved from <http://www.ihi.org/Engage/Initiatives/TripleAim/Pages/default.aspx>

The Istituto Mediterraneo per i Trapianti e Terapie ad Alta Specializzazione (ISMETT). (2016). Retrieved from <https://www.ismett.edu/en/ismett-2/>

Lindenauer, P. K., Pantilat, S. Z., Katz, P. P., & Wachter, R. M. (1999). Hospitalists and the practice of inpatient medicine: Results of a survey of the national association of inpatient physicians. *Annals of Internal Medicine, 130*(4\_Part\_2), 343-349. doi:10.7326/0003-4819-130-4-199902161-00003

Macpherson, D. S., Parenti, C., Nee, J., Petzel, R. A., & Ward, H. (1994). An internist joins the surgery service. *Journal of General Internal Medicine, 9*(8), 440-444. doi:10.1007/bf02599059

Marinella, M. A. (2002). Hospitalists—Where They Came from, Who They Are, and What They Do. *Hospital Physician, 38(5)*, 32-36.

Pantilat, S. (2006). What Is a Hospitalist? *The Hospitalist*.

Pucher, P. H., Aggarwal, R., & Darzi, A. (2014). Surgical Ward Round Quality and Impact on Variable Patient Outcomes. *Annals of Surgery, 259(2)*, p 222–226. doi:10.1097/SLA.0000000000000376

Rifkin, W. D., Holmboe, E., Scherer, H., & Sierra, H. (2004). Comparison of Hospitalists and Nonhospitalists in Inpatient Length of Stay Adjusting for Patient and Physician Characteristics. *Journal of General Internal Medicine, 19*(11), 1127-1132. doi:10.1111/j.1525-1497.2004.1930415.x

Roy, A., Heckman, M. G., & Roy, V. (2006). Associations Between the Hospitalist Model of Care and Quality-of-Care-Related Outcomes in Patients Undergoing Hip Fracture Surgery. *Mayo Clinic Proceedings, 81*(1), 28-31. doi:<https://doi.org/10.4065/81.1.28>

Soong, C., Christine, S., Eddy, F., Eric, E. H., & Robert, J. M. (2009). Characteristics of Hospitalists and Hospitalist Programs in the United States and Canada. *Journal of clinical outcomes management, 16*(2), 69.

Wachter, R. M. (1999). AN introduction to the hospitalist model. *Annals of Internal Medicine, 130*(4\_Part\_2), 338-342. doi:10.7326/0003-4819-130-4-199902161-00002

Wachter, R. M., & Goldman, L. (1996). The emerging role of "hospitalists" in the american health care system. *The New England Journal of Medicine, 335(7)*, 514-517.

Wachter, R. M., & Goldman, L. (2016). Zero to 50,000 — The 20th Anniversary of the Hospitalist. *New England Journal of Medicine, 375*(11), 1009-1011. doi:10.1056/NEJMp1607958

Whinney, C., & Michota, F. (2008). Surgical comanagement: A natural evolution of hospitalist practice. *Journal of Hospital Medicine, 3*(5), 394-397. doi:10.1002/jhm.359