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## Impact Of Care Coaching On Hospital Length Of Stay, Readmission Rates, Post-Discharge Phone Calls, and Patient Satisfaction Post-Bariatric Surgery

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### Abstract

**BACKGROUND**—Bariatric surgery is well established as an effective means of treating obesity; however 30-day readmission rates remain high. The Bariatric Care Coaching Program was developed in response to a perceived need for better communication with patients upon discharge

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### DISCLOSURES

The authors have no commercial associations that might be a conflict of interest in relation to this article.

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from hospital, and prior to being seen at their first post-op visit. The lack of communication was apparent from the number of patient phone calls to clinic and readmissions to hospital.

**OBJECTIVES**—The aim of this study was to evaluate the impact of the Care Coach Program on hospital length of stay (LOS), readmission rates, patient phone calls, and patient satisfaction.

**SETTING**—The study was conducted at The Ohio State University, Wexner Medical Center.

**METHODS**—A retrospective review was conducted on patients who had primary bariatric surgery from July 1, 2013 to June 30, 2015. The control group included patients who underwent surgery from July 1, 2013 – June 30, 2014, before development of the program, and the experimental group was comprised of patients who received care coaching from July 1, 2014 – June 30, 2015. Demographics, post-operative complications, LOS, clinic phone calls and hospital readmissions prior to the first post-operative visit were collected from medical records. Patient satisfaction scores were collected from the Hospital Consumer Assessment of Healthcare Providers and Systems Survey [HCAHPS]. Univariate, bivariate co-efficient analysis, and a conditional logistic regression model were performed utilizing SAS software.

**RESULTS**—There were 261 and 264 patients in the care-coach and control groups, respectively. The care-coached group had fewer patients with intractable nausea/vomiting (11.11%; [p=0.0164]), and more patients with a shorter LOS (2.3 + 1.1 days; [p=0.032]), related to laparoscopic sleeve gastrectomy (2 + 0.9 days vs. 2.3 + 0.8 days; [p=0.002]). There was no difference in readmission rates [p=0.841] or phone calls to clinic [p=0.407]. HCAHPS scores demonstrated an improvement in patients' perception of communication regarding medications (59th versus 27<sup>th</sup> percentile), discharge information (98th versus 93rd percentile), and likelihood of recommending the hospital (85th versus 74th percentile). **CONCLUSION:** The Bariatric Care Coach Program is an important new adjunct in the care of our bariatric inpatients. It has had the greatest impact on post-operative nausea/vomiting, LOS for sleeve gastrectomy, and patient satisfaction. Further studies are needed to evaluate how to use this program to reduce readmission rates and phone calls to clinic.

### Keywords

Care-coach; bariatric surgery; post-operative complications; hospital length of stay; hospital readmission; patient satisfaction; HCAHPS

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## INTRODUCTION

As the prevalence of obesity rises, so too does the demand for successful therapies. Over the last decade bariatric surgery has evolved into a safe approach to weight loss, making it the most effective therapeutic intervention for treating morbid obesity. The demand for, and success of bariatric surgery stems, in part, from the improved safety profile of surgical procedures which may, in part, be attributed to the accreditation process,<sup>(1-2)</sup> now conducted through the Metabolic and Bariatric Surgery Accreditation and Quality Improvement program (MBSAQIP).

Given that the mortality rate for bariatric surgery is now similar to that of a laparoscopic cholecystectomy,<sup>(3)</sup> focus is being turned to other aspects of patient care, most notably

hospital length of stay (LOS) and readmission rates. Specifically, while LOS varies depending on the type of procedure, median time for a laparoscopic gastric bypass is approximately 2 days, and longer stays have been correlated with age > 65 years, BMI > 50 kg/m<sup>2</sup>, diabetes, dyspnea on exertion, ASA class, and certain biochemical abnormalities.<sup>(4)</sup> Readmission rates for bariatric surgery average around 5%, but can range from 2% to 20%.<sup>(5-8)</sup> Risk factors for readmission include type of procedure, age, race, BMI, publically funded insurance, and longer LOS.<sup>(5-6, 9-11)</sup> Although most of these risk factors are fixed, there are common non-surgical reasons for readmission, including poor pain control, nausea and vomiting, dehydration and wound infections,<sup>(5-12)</sup> that may be modified which could affect both LOS and readmission rates. Specifically, control of pain and/or nausea/vomiting, preventing dehydration and educating patients on signs/symptoms related to wound infections are impacted by patients' variability in experience of pain and nausea, patients' understanding and expectation of their recovery in the perioperative period, and consistency in the provision and communication of care.

To address modifiable factors related to both hospital LOS and readmission rates, the Bariatric Care Coach Program was developed at our institution, and implemented on July 1, 2014. It was created in response to a perceived need for better and more consistent communication with patients from the time of their initial hospital stay and discharge, through to their first post-operative visit. The need for improvement in this area was apparent based on readmission rates and the number of patient phone calls received prior to the first post-operative visit. Therefore, the aim of this study was to evaluate the impact of the Care Coach Program, one year after its implementation, on hospital length of stay, readmission rates and overall patient satisfaction. Secondary aims included evaluation of care coaching on common, non-surgical, post-operative complications that have been shown to effect LOS and readmission rates.

## METHODS

### Data Collection

After receiving Institutional Review Board Approval, a retrospective review was performed on all patients who underwent primary laparoscopic Roux-en-Y gastric bypass [LRYGB] or laparoscopic gastric sleeve [LSG] from July 1, 2013 to June 30, 2015. All surgeries were performed by one of three surgeons using the same surgical approach. Additionally standardized post-operative order-sets for pain and nausea control, DVT prophylaxis, Foley catheter management and diet were used for all patients. Exclusion criteria included patients who underwent laparoscopic gastric banding, patients' whose pre-operative comorbidities required a planned ICU stay and patients with immediate post-operative complications directly related to surgery, and beyond the control of the care coaches, necessitating prolonged hospital stay (i.e. staple line leak). The control group included patients who underwent surgery from July 1, 2013 to June 30, 2014, before implementation of the Care Coach Program. The experimental group was comprised of patients who received care coaching from July 1, 2014 to June 30, 2015. Using the electronic medical record (EMR), baseline demographic information, immediate post-operative complications impacted by care coaching (i.e. pain, nausea/vomiting, dehydration, oxygen requirements), hospital

length of stay and readmissions rates prior to the first post-operative clinic visit were collected. Additionally, the number of, and reasons for, phone calls to the clinic after discharge, but prior to the first post-op visit, were collected as a surrogate for patients' understanding of their discharge instructions.

Patient satisfaction scores were calculated from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey, developed by the Agency for Healthcare Research and Quality, mailed to patients 2 weeks after discharge.

### The Care Coach Program

The Bariatric Care Coach Program was developed and implemented on July 1, 2014. The care coaches are comprised of 4 nurses identified as having an interest in bariatric patients, who received their bariatric nurse certification and who are experienced charge nurses. Their participation in this program is voluntary and on the day of their assignment as charge nurse, they also assume the role of care coach with specific responsibilities, detailed below, for all the bariatric patients admitted on the service. Therefore each patient has their own floor nurse as well as a care coach during their hospital stay. The responsibility of the care coach is to educate the patient and family on the daily plan of care, from the time a patient arrives from the post-anesthetic care unit (PACU) to the time they are discharged from hospital. Additionally, the care coaches participate in daily rounds with the surgical team and follow-up with patients, once they are discharged, via phone calls.

In order to achieve these goals, each post-operative day has a plan of care tailored to the specific needs of patients' during their hospital stay (Table 1). The plan of care represents the framework of how care should be delivered. Additionally, a detailed record of patient progress is maintained by the care coach in a *Patient Flowsheet*, which resembles a checklist of items (Table 2). The flowsheet was developed specifically for the program by the care coaches. It is a "smart phrase" that was created to be easily incorporated into the EMR, facilitating documentation for all bariatric patients' plan of care. The flowsheet enables communication amongst care coaches and with patients, and identifies any obstacles the patient may need to overcome to ensure a smooth recovery after surgery.

Therefore, once the patient arrives on the floor from the PACU the care coach meets with the patient and family to discuss the day's goals which include, (a) discussing the plan for intravenous pain and nausea control, including doses and timing of medications, (b) explaining the importance of weaning off oxygen and how to use the incentive spirometer (IS), and (c) encouraging light activity (i.e. up out of bed to a chair). Additionally, a "Bariatric Package" is given to the patient/family which contains (a) written material explaining the care the patient will receive throughout the hospital stay titled "Bariatric Surgery: Your Care in the Hospital", (b) a protein shaker and (c) a pill crusher. The written material, a hardcopy of what the care coaches discuss every day, outlines in detail what the patient should expect during their stay from the time they leave the OR to the time they are discharged. It addresses pain and nausea control with both intravenous and oral medications, IS use, details of the hospital diet with a menu, a hospital activity record to document IS use, pain, nausea and activity in hospital, and what is required when preparing to leave the hospital. The goals for subsequent days in hospital are addressed similarly, as outlined in

Table 1–2. Prior to patients being discharged, the care coach prints off the discharge instructions and reviews, with both the patient and their family, the details of how and when to take medications, diet, including details of fluid and protein intake, activity, bathing, wound care, and what to do in care of an emergency. Additionally, the patients are provided a list of websites that outline bariatric menus, nutritional supplements and products, web resources for support, and a home record to monitor protein and fluid intake, IS use, and ambulation after leaving the hospital. Finally a business card with the name of all the coaches and a direct phone number is provided to the patient to easily call with any questions or concerns.

Once patients are discharged, the care coach calls them on days 1, 3, and 7 post-discharge. These conversations determine whether pain and nausea are adequately controlled, and if the amount of water and protein intake is adequate. Additionally, the coach reviews the individual *Patient Flowsheet* to identify areas within which the patient struggled while hospitalized, in order to personalize their advice, thereby facilitating recovery. Finally, the phone calls allow patients to voice any concerns they have about their recovery, which can be immediately addressed by either the care coach or physician. The conversations are documented on a spreadsheet stored on an internal shared drive that is accessible to all coaches. The spreadsheet lists all patients, MRN numbers, dates of surgery, surgeon, surgery, telephone numbers, and dates patients are to be called. The content of each phone call is documented such that any questions or concerns the patient may have is addressed at the time of the initial conversation and revisited at subsequent conversations. If a patient cannot be reached, a message is left identifying the caller, reason for the call, and a number that directly connects the patient with the care coach. If a care coach is in charge over the weekend, phone calls are still conducted for patients discharged on the weekend. If there is no coach working on a weekend day or holiday, the surgeon provides detailed discharge instructions, and patients are informed that they will receive a phone call by a care coach on the next workday.

### Statistical Analysis

Patient demographics and clinical characteristics were summarized by study group (care coached vs. control) and reported as means (standard deviations) for continuous variables and percentage (frequency) for categorical variables. Chi-squared or Fisher's exact tests were used to test differences in categorical variables between study groups where relevant. Continuous variables were compared between study groups using Student's t-tests or Wilcoxon rank sum tests where relevant. We further compared LOS, time to readmission, and time to first communication across study groups for each of the LRYGB, LSG, and LAGB subgroups respectively using Fisher's exact tests. All hypothesis testing was conducted using a two sided alpha of 0.05. SAS 9.3 (SAS Institute, Cary, NC) was used for all statistical analyses.

Patient satisfaction scores were calculated from the HCAHPS survey using only responses from patients included in this study. The raw data, provided by Press Ganey Associates, Inc. our third party survey vendor, was grouped into care-coach and control group. Top-Box scores, defined as a score of 9 to 10 (range of 1–10) for questions that asked for a numerical

value, or a score of “always” for those questions that used descriptors (i.e. never, sometimes, usually, always), were compared using Chi-squared and Fisher’s Exact test where appropriate. National percentiles were calculated by Press Ganey using Oracle SQL Developer (Oracle Corporation, Redwood City, California).

## RESULTS

### Patient Characteristics

Five-hundred and forty-seven patients had a primary bariatric surgical procedure at our institution from July 1, 2013 to June 30, 2015. Of these, 19 were excluded because they underwent a laparoscopic adjustable band placement, 1 was excluded because their pre-operative comorbidities required a planned ICU stay, and 2 developed leaks at the gastrojejunostomy in the immediate post-op period. Therefore a total of 525 patients were included in the study, of which 261 received care coaching (experimental) and 264 made up the control group. Two-hundred and fourteen patients had LRYGB (40.8%) and 311 underwent LSG (59.2%).

Comparisons between the care coached and control groups demonstrated no differences in gender distribution (female: 78.2% and 79.9%; [p=0.6196]), race (Caucasian: 83.1% and 89.8%; African American: 15.3% and 8.7%; Other: 1.5%; [p=0.57]) or pre-operative BMI (49.3+14.3 kg/m<sup>2</sup> and 47.9+8.10 kg/m<sup>2</sup> [p=0.5461]) (Table 3). However age differed between the groups with a slightly higher mean age in the control group (46.29 + 10.66 years versus 44.46 + 10.21 years [p=0.0453]). Analysis of obesity-related comorbidities demonstrated a significantly higher proportion of patients with medically managed hypertension in the control group (18.2% and 8.8%; [p=0.0017]), but there was no difference in the prevalence of type 2 diabetes, hyperlipidemia or obstructive sleep apnea (26.4% and 27.8% [p=0.734]; 34.9% and 34.5% [p=0.924]; 47.9% and 43.6% [p=0.3191]) for care coached and control groups, respectively (Table 3).

### Surgery, Hospital Length of Stay, Readmissions, and Post-Discharge Phone Calls

The type of surgery performed did not differ between the care coached and control groups (LRYGB: 40.2% and 41.3% and LSG: 59.8% and 58.7%; [p=0.8052]).

Comparison of immediate post-operative complications demonstrated a statistically significant difference in the number of patients with intractable nausea/vomiting, necessitating additional anti-emetic medications outside our standard protocol, in the control group (18.6% versus 11.1%; [p=0.0164]). However, there was no difference in the proportion of patients with pain requiring medication in addition to our standard protocol (13.8% versus 17.1%; [p=0.3023]), additional intravenous hydration (22.6% versus 14.4%; [p=0,054]), prolonged oxygen requirement in the form of nasal prongs (6.5% versus 10.6%; [p=0.094]), urinary tract infections (0.8% versus 1.1%; [p>0.999]) or incision site infections (0% versus 0.4%; [p>0.999]) between the care-coached and control groups (Table 3).

Hospital length of stay (LOS) was statistically different between the care coached and control groups (2.3 + 1.1 days versus 2.5 + 0.8 days; [p=0.032]). When LOS was analyzed for each procedure, there was a significant difference in LOS for LSG (2 + 0.9 days versus

2.3 + 0.8 days; [p=0.002]) but not RYGB (2.7 + 1.2 days versus 2.7+ 0.8 days; [p=0.999]) for care coached and control groups, respectively (Table 4). Examination of number of days demonstrated that a greater proportion of patients in the care-coached group had a LOS between 0–1 days (16.9% versus 3%) and more patients in the control group were discharged 2–3 days after surgery (87.5% versus 74.3%; [p<0.0001]). Analysis of LOS by type of surgery demonstrated that the difference between the groups was related to patients who underwent LSG. Specifically, a greater proportion of patients who underwent LSGs in the care-coached group stayed 0–1 days (27.6% versus 5.2%), and more patients in the control group stayed 2–3 days after surgery (89.7% versus 68.6%; [p<0.001]). There was no significant difference in LOS for patients who underwent a LRYGB between the care-coached and control groups (Table 4).

Readmission rates (8.1% versus 7.6%; [p=0.841]) and the proportion of patients who called the clinic (36.8% versus 36.4%; [p=0.921]), before their first post-operative visit, did not differ between the care-coached and control groups. Additionally, there was no significant difference in readmission rates or the rate of phone calls to the clinic by type of surgery (Table 5–6). Finally, analysis of the reasons for readmission or calls to the clinic did not demonstrate a difference between the two groups (Table 4–5).

### Patient Satisfaction

HCAHPS scores from July 1, 2013 to June 30, 2014 (control group), and July 1, 2014 to June 30, 2015 (care coached group) were collected and included only responses from patient in this study. The response rates were 28.7% (n/N = 75/261) and 29.5% (n/N = 78/264) for the care coached and control groups, respectively. Analysis of our internal raw scores did not demonstrate a significant difference in Top-Box scores for any category between the care coached and control group (Table 7). National percentile ranks, based on comparisons between institutions nationally, did not demonstrate a difference with respect to patients' perception of physician communication (97<sup>th</sup> versus 98<sup>th</sup> percentile) or overall hospital rating (69<sup>th</sup> versus 68<sup>th</sup> percentile). However there appeared to be improvement in patient satisfaction regarding communication about medications (59<sup>th</sup> versus 27<sup>th</sup> percentile), and understanding of discharge information (98<sup>th</sup> versus 93<sup>rd</sup> percentile) in the care coached versus control groups. Additionally, patients in the care-coached group were more likely to recommend the hospital (85<sup>th</sup> versus 74<sup>th</sup> percentile).

## DISCUSSION

Lengths of stay and readmission rates are measurable and actionable outcomes that serve as proxies for surgical complications, coordination of care and patient satisfaction. These metrics are important, as quality of care is increasingly becoming tied to hospital and surgeon reimbursement. Root cause analyses performed at our bariatric quality meetings determined that we had room for improvement in reducing lengths of stay, readmissions, and post-operative phone calls. Evaluation of our inpatient practices found variability in specific bariatric-related knowledge and experience among the nursing and house-staff that had the potential to affect these patient outcomes. Therefore the Care Coach Program was developed to improve patient experience through consistent care and communication by a specialized

nursing team to mitigate preventable causes of early post-operative readmissions, phone calls and prolonged LOS. While the program is considered a success by those involved, this study aimed to objectively evaluate quality outcomes that were considered potentially preventable by improved inpatient education and counseling.

Our analysis demonstrated that patients who received care coaching had reduced rates of intractable nausea and vomiting. Although a causal relationship cannot be drawn between our program and decreased post-operative nausea/vomiting, the result speaks to the role of care coaches in providing consistent information to patients about controlling their symptoms through timely use of anti-emetic medication and measured oral intake.

In terms of LOS, this study demonstrated that patients in the care coach group had a shorter post-operative stay compared to the control group, due to those patients who underwent LSG. Interestingly there was no effect of care coaching on LOS for patients who underwent LRYGB. On average, more patients with LSG stayed 0–1 days in the care-coached group compared to 2–3 days in the control group. This was unexpected given relatively short LOS for this group, regardless of care coaching, but suggests that consistent communication with patients may translate into significant gains in terms of patient readiness for discharge. Care coaching did not impact the LOS in the LRYGB group, the majority of whom stayed 2–3 days. Carter et al.<sup>(4)</sup> performed a retrospective analysis of 9,593 LRYGB procedures using the ACS-NSQIP database and multivariate analysis demonstrated severity of medical comorbidities and length of procedure independently predicted longer lengths of stay. Therefore the lack of effect of our program suggests that we need to analyze this cohort in more detail to determine what, beyond communication, affects recovery. Finally it must be noted that, given average LOS for these procedures ranged from 1 – 4 days, and LOS was measured by subtracting the day of surgery from the day of discharge, without specifically recording the time of day that patients were transferred to the hospital floor or discharged from hospital, our observed differences, or lack thereof, may be altered with more detailed analysis.

In analyzing readmission rates, we grouped readmissions into 0–2, 3–7, 8–14 and >14 days after discharge to determine whether there was any effect of calling patients after discharge on days 1, 3, and 7. Results demonstrated no difference between the two groups, and no difference by type of surgery. Additionally, no difference in the reasons for readmission was observed. The overall average readmission rate in our study was 7.8%, which is in line with larger published studies.<sup>(5, 7)</sup> Additionally, the most common complications that predicted readmission were similar to that observed in other studies<sup>(7, 10)</sup> and included pain, nausea/vomiting, dehydration and superficial wound infections.

Assessment of patient satisfaction scores demonstrated no significant difference in any category between the care coached and control groups. Of note, only the “Top-Box” raw data scores were analyzed because those are the scores used by the Centers for Medicare and Medicaid (CMS) to determine reimbursement. Our national percentile ranking appeared either unchanged or improved in certain categories. Specifically, our program appeared to have had a positive effect on patients’ perception of care, especially since physician rating remained relatively unchanged during the study period. The HCAHPS scores also



demonstrated improved perception of communication regarding medications, improved patients' understanding of discharge information, and increased likelihood of recommending the hospital. It was not possible to determine significance of these changes because these rankings are based on a comparison with other institutions for which the raw data was not accessible. However, we still felt it important to report these percentile rankings because CMS-driven hospital reimbursement is becoming increasingly linked to satisfaction scores and, while no causal relationship can be drawn between improvement in these scores and the initiation of our care coach program, implementation of this program was the only change made to our program over the study period, and therefore an association may be implied.

Our study has several limitations. First, the retrospective design makes it impossible to establish causality between the implementation of our program and the observed outcomes. Additionally, being retrospective, the information collected relied on the accuracy of what was recorded in the EMR. Further, although this study analyzed 525 patients, this is still a small sample size, and therefore observed outcomes may not hold true for larger cohorts of patients. Concerning readmissions to our facility or other hospitals, the process for collecting this data entailed reviewing all patient encounters documented in our institution's EMR, including telephone calls, and emergency department visits, from the time the patient was discharged to the time they were seen at their first clinic visit. Additionally, the initial post-op visit, attended by 100% of patients, was reviewed to determine whether there was any information regarding re-admission to other facilities outside our own. Given that we did not have access EMRs outside our own institution, our readmission data could only be collected from our institution's EMR. Kellogg et al. demonstrated that 58% of readmissions were to primary institutions, and 42% occurred at local/regional hospitals.<sup>(5)</sup> Therefore our observed readmission rates, based on documentation in our institution's EMR, may underestimate the actual rates. Additionally, although there was relative homogeneity between the care coach and control groups, we did not evaluate the effect of the severity of pre-operative comorbidities, operative time and surgeon experience on LOS and readmission rates which may have contributed to the outcomes of our study.

## CONCLUSION

The introduction of the Patient Protection and Affordable Care Act has mandated a change in the way we deliver healthcare. It represents a paradigm shift from a volume-based to a value-based health care delivery model wherein improving the patient experience of care, one of three key features, is linked to reimbursement. Through ongoing quality review of our MBSAQIP data we identified LOS and readmission rates as areas that needed improvement. Through root cause analysis we determined that clearer and more consistent communication was required and therefore the Bariatric Care Coach Program, developed through buy in and coordinated effort between the floor nursing staff, surgery team, and outpatient clinicians, was developed and implemented. In analyzing our outcomes one year after its implementation, we believe that our program has been an important component of our quality improvement initiative despite the similarities in overall outcomes. From these results, future considerations will include optimizing discharge materials and counseling, targeting those patients at risk for readmission, and focusing on ways to remedy reasons for

readmission/calls to clinic by more detailed pre-operative counseling in order to improve patients' understanding and expectation of their recovery in the perioperative period.

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**Table 1**

Daily plan of care

<b>Daily Plan of Care</b>	
<b>POD 0</b>	<ul style="list-style-type: none"> <li>• Care coach meets patient and discusses plan for pain and nausea control (IV and po options)</li> <li>• Encourage light activity</li> <li>• Explain how to use the incentive spirometer and encourage use</li> <li>• Provide a <i>Daily Activity Log</i>"</li> </ul>
<b>POD 1</b>	<ul style="list-style-type: none"> <li>• Repeat all POD 0 education</li> <li>• Outline goals for activity and demonstrate activity</li> <li>• Explain diet options</li> <li>• Transition to oral analgesics and anti-emetics</li> <li>• Wean off oxygen</li> <li>• Collaborate with physician to ensure consistency in communication with the patient</li> </ul>
<b>POD 2</b>	<ul style="list-style-type: none"> <li>• Reinforce education regarding diet and activity</li> <li>• Review activity log and offer support</li> <li>• Discuss patients' plan for diet and hydration once discharged</li> <li>• Emphasize the importance of hydration once discharged</li> <li>• Discuss home medications</li> <li>• Discuss signs and symptoms that warrant a call to the physician</li> <li>• Collaborate with physician to ensure consistency in communication with the patient</li> </ul>
<b>POD &gt; 3</b>	<ul style="list-style-type: none"> <li>• Reinforce education regarding diet and activity</li> <li>• Collaborate with physician to ensure consistency in communication with the patient</li> </ul>

POD = post-operative day; IV = intravenous; po = per os

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**Table 2**

Daily Patient Flowsheet

	<b>POD #0</b>	<b>POD #1</b>	<b>POD &gt; 2</b>
<b>Pain Control</b>	<input type="checkbox"/> IV Pain Medication	<input type="checkbox"/> IV Pain Medication <input type="checkbox"/> Oral Pain Medication	<input type="checkbox"/> Oral Pain Medication
<b>IS/Oxygen</b>	<input type="checkbox"/> Instruction on IS <input type="checkbox"/> CPAP	<input type="checkbox"/> On Oxygen <input type="checkbox"/> IS	<input type="checkbox"/> Off Oxygen <input type="checkbox"/> IS
<b>SCD</b>	<input type="checkbox"/> In Use	<input type="checkbox"/> In Use	<input type="checkbox"/> In Use
<b>Diet</b>	<input type="checkbox"/> Ice Chips	<input type="checkbox"/> GB/Sleeve Diet	<input type="checkbox"/> Tolerating Diet
<b>Nausea</b>	<input type="checkbox"/> Zofran and/or Phenergan	<input type="checkbox"/> Zofran and/or Phenergan	<input type="checkbox"/> Zofran and/or Phenergan
<b>Activity</b>	<input type="checkbox"/> Out Of Bed	<input type="checkbox"/> Walk	<input type="checkbox"/> Walk
<b>Goals For Today</b>	<input type="checkbox"/> Pain Control	<input type="checkbox"/> D/C Foley <input type="checkbox"/> Diet/Hydration	<input type="checkbox"/> Diet/Hydration <input type="checkbox"/> Walk/Chair <input type="checkbox"/> PO Pain and Nausea Medications
<b>Expectations for Tomorrow</b>	<input type="checkbox"/> Ambulation <input type="checkbox"/> Diet	<input type="checkbox"/> Hydration <input type="checkbox"/> Discharge Planning <input type="checkbox"/> My Chart Explanation	<input type="checkbox"/> Tolerating Diet <input type="checkbox"/> Hydration <input type="checkbox"/> My Chart Explanation
<b>Barriers To Success</b>	<input type="checkbox"/> Finances <input type="checkbox"/> Motivation <input type="checkbox"/> Compliance <input type="checkbox"/> Family Support	<input type="checkbox"/> Finances <input type="checkbox"/> Motivation <input type="checkbox"/> Compliance <input type="checkbox"/> Family Support	<input type="checkbox"/> Finances <input type="checkbox"/> Motivation <input type="checkbox"/> Compliance <input type="checkbox"/> Family Support

POD = post-operative day; IV = intravenous; IS = incentive spirometry; SCD = sequential compression device; GB/Sleeve = gastric bypass/sleeve; PO = per os

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**Table 3**

Patient demographics, surgical procedures, post-op complications

	Care Coached Group	Control Group	p-value
<b>Total (n)</b>	49.7% (261)	50.3% (264)	
<b>Mean Age in years (SD)</b>	44.5 (10.21)	46.3 (10.66)	0.0453*
<b>Female (n)</b>	78.2% (204)	79.9 (211%)	0.6196
<b>Caucasian (n)</b>	83.1% (217)	89.8% (237)	0.057
<b>African American (n)</b>	15.3% (40)	8.7% (23)	
<b>Other (n)</b>	1.5% (4)	1.5% (4)	
<b>Mean Pre-Op Weight in kg (SD)</b>	136.6 (27.77)	136.4 (27.39)	0.9192
<b>Mean Pre-Op BMI in kg/m<sup>2</sup> (SD)</b>	49.3 (14.32)	47.9 (8.10)	0.5461
<b>Type 2 Diabetes (n)</b>	26.4% (69)	27.8% (73)	0.734
<b>Hyperlipidemia(n)</b>	34.9% (91)	34.5% (91)	0.924
<b>Hypertension (n)</b>	8.8% (23)	18.2% (48)	0.0017*
<b>OSA (n)</b>	47.9% (125)	43.6% (115)	0.3191
<b>LRYGB (n)</b>	40.2% (105)	41.3% (109)	0.8052
<b>LSG (n)</b>	59.8% (156)	58.7% (155)	
<b>Post-Op Complications</b>			
Pain (n)	13.8% (36)	17.1% (45)	0.3023
Nausea/Vomiting (n)	11.1% (29)	18.6% (49)	0.0164*
Poor U/O requiring IV bolus	22.6% (59)	14.4% (38)	0.054
Prolonged O <sub>2</sub> Requirements (n)	6.5% (17)	10.6% (28)	0.0940
Urinary Tract Infection (n)	0.8% (2)	1.1% (3)	>0.999
Incision Site Infection (n)	0.0% (0)	0.4% (1)	>0.999

Values are expressed as percentages unless otherwise indicated.

\* indicates statistical significance

OSA = obstructive sleep apnea; EWL = excess weight loss; TBWL = total body weight loss; LRYGB = laparoscopic Roux-en-Y gastric bypass; LSG = laparoscopic sleeve gastrectomy; U/O = urine output

**Table 4**

Length of Hospital Stay

	Care Coached Group			Control Group			p-value
	0 – 1 Days	2 – 3 Days	> 4 Days	0 – 1 Days	2 – 3 Days	> 4 Days	
<b>Total</b> Mean (SD) (days)	2.3 (1.1)			2.5 (0.8)			0.032 *
<b>LRYGB</b> Mean (SD) (days)	2.7 (1.2)			2.7 (0.8)			0.999
<b>LSG</b> Mean (SD) (days)	2.0 (0.9)			2.3 (0.8)			0.002 *
<b>0 – 1 Days (n)</b>	16.9% (44)			3.0% (8)			<0.0001 *
<b>2 – 3 Days (n)</b>	74.3% (194)			87.5% (231)			
<b>&gt; 4 Days (n)</b>	8.8% (23)			9.5% (25)			
<b>By Surgery</b>	<b>0 – 1 Days</b>	<b>2 – 3 Days</b>	<b>&gt; 4 Days</b>	<b>0 – 1 Days</b>	<b>2 – 3 Days</b>	<b>&gt; 4 Days</b>	
LRYGB (n)	1.0% (1)	82.9% (87)	16.2% (17)	0.00% (0)	84.4% (92)	15.6% (17)	0.8523
LSG (n)	27.6% (43)	68.6% (107)	3.9% (6)	5.2% (8)	89.7% (139)	5.2% (8)	<0.001 *

Values are expressed as percentages unless otherwise indicated.

\* indicates statistical significance

Total = all patients included in the study; LRYGB = laparoscopic Roux-en-Y gastric bypass; LSG = laparoscopic sleeve gastrectomy.

**Table 5**

Readmission to Hospital Before 1<sup>st</sup> Post-op Visit.

	Care Coached Group				Control Group				p-value
<b>Total (n)</b>	8.1% (21)				7.6% (20)				0.841
<b>Days after Discharge</b>									
0 – 2	1.9% (5)				1.1% (3)				
3 – 7	3.8% (10)				3.8% (10)				0.840
8 – 14	1.9% (5)				2.7% (7)				
> 14	0.4% (1)				0.00% (0)				
<b>By Surgery</b>	<b>0 – 2 Days</b>	<b>3 – 7 Days</b>	<b>8 – 14 Days</b>	<b>&gt; 14 Days</b>	<b>0 – 2 Days</b>	<b>3 – 7 Days</b>	<b>8 – 14 Days</b>	<b>&gt; 14 Days</b>	
LRYGB (n)	1.9% (2)	4.7% (5)	1.9% (2)	0.0% (0)	1.8% (2)	5.5% (6)	1.8% (2)	0.0% (0)	>0.999
LSG (n)	1.9% (3)	3.2% (5)	1.9% (3)	0.6% (1)	0.7% (1)	2.6% (4)	3.2% (5)	0.0% (0)	0.762
<b>Reasons</b>									
Pain	2.3% (6)				1.1% (3)				0.337
Nausea/Vomiting	1.5% (4)				1.1% (3)				0.723
Dehydration	1.5% (4)				0.4% (1)				0.214
Wound Infection	0.4% (1)				2.3% (6)				0.123

Values are expressed as percentages unless otherwise indicated.

(\*) indicates statistical significance

LRYGB = laparoscopic Roux-en-Y gastric bypass; LSG = laparoscopic sleeve gastrectomy; LAGB = laparoscopic adjustable gastric band.

**Table 6**

Calls to Clinic Before 1<sup>st</sup> Post-Operative Visit

	Care Coached Group				Control Group				p-value
	0 – 2 Days	3 – 7 Days	8 – 14 Days	14 Days	0 – 2 Days	3 – 7 Days	8 – 14 Days	14 Days	
<b>Total (n)</b>	36.4% (95)				33% (87) 264				0.407
<b>Days after Discharge</b>									
0 – 2	10% (26)				8.3% (22)				0.664
3 – 7	18% (47)				18.2% (48)				
8 – 14	6.9% (18)				6.2% (16)				
14	1.5% (4)				0.4% (1)				
<b>By Surgery</b>	0 – 2 Days	3 – 7 Days	8 – 14 Days	14 Days	0 – 2 Days	3 – 7 Days	8 – 14 Days	14 Days	
LRYGB (n)	7.6% (8)	18.1% (19)	12.4% (13)	1.0% (1)	6.4% (7)	24.8% (27)	5.5% (6)	0.9% (1)	0.355
LSG (n)	11.5% (18)	18% (28)	3.2% (5)	1.9% (3)	9.7% (15)	13.6% (21)	5.8% (9)	0.7% (1)	0.479
<b>Reasons</b>									
Medication	12.3% (32)				12.1% (32)				0.961
Diet/Activity	4.2% (11)				2.7% (7)				0.325
Pain	5.0% (13)				7.0% (19)				0.289
N/V/D	5.4% (14)				2.7% (7)				0.113
Incision Site	5.8% (15)				4.6% (12)				0.533
Dysphagia/Reflux	1.9% (5)				3.4% (9)				0.288
Toileting	3.8% (10)				6.1% (16)				0.239

Values are expressed as percentages unless otherwise indicated.

(\*) indicates statistical significance

LRYGB = laparoscopic Roux-en-Y gastric bypass; LSG = laparoscopic sleeve gastrectomy; N/V/D = nausea, vomiting, dehydration



**Table 7**

## HCAHPS Scores

Category/Questions	Care Coached Group % (n)	Control Group % (n)	p-value
<b>HCAHPS Overall Rating</b>			
• How would you rate this hospital?	73.3% (55)	73.1% (57)	.9714
• <i>National Percentile Rank</i>	<i>69<sup>th</sup></i>	<i>68<sup>th</sup></i>	<i>n/a</i>
<b>HCAHPS Doctor Communication</b>			
• Treated with courtesy and respect?	94.7% (71)	93.6% (73)	.7772
• Listened carefully to you?	89.3% (67)	89.6% (69)	.9556
• Explained things in a way you could understand?	81.1% (60)	84.6% (66)	.5630
• <i>National Percentile Rank</i>	<i>97<sup>th</sup></i>	<i>98<sup>th</sup></i>	<i>n/a</i>
<b>HCAHPS Comm re: Medication</b>			
• Staff describe medicine side effect?	50% (30)	40.9% (27)	.3059
• Staff tell you what new medicine was for?	77.1% (47)	78.8% (52)	.8133
<i>National Percentile Rank</i>	<i>59<sup>th</sup></i>	<i>27<sup>th</sup></i>	<i>n/a</i>
<b>HCAHPS Comm re: Discharge</b>			
• Receive information about symptoms or problems to look out for?	96% (71)	94.7 % (72)	1.000
• Staff talk about help available when you left?	88% (66)	85.5 % (65)	.6539
<i>National Percentile Rank</i>	<i>98<sup>th</sup></i>	<i>93<sup>rd</sup></i>	<i>n/a</i>
• <b>HCAHPS Recommend</b>			
• Would you recommend this hospital?	80% (60)	76.9% (60)	.6437
• <i>National Percentile Rank</i>	<i>85<sup>th</sup></i>	<i>74<sup>th</sup></i>	<i>n/a</i>

Values are expressed as percentages unless otherwise indicated. The values in parentheses represent the number of respondents that provided a "Top Box" score; defined as a score of 9 to 10 (range of 1–10) for questions that asked for a numerical value, or a score of "always" for those questions that used descriptors (i.e. never, sometimes, usually, always).