Implementing Reduced Fasting Preoperative Electronic Discharge Education in Elective Surgery

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Abstract

Problem & Purpose: Prolonged fasting prior to elective surgery correlates with poor patient outcomes. Enhanced Recovery After Surgery provides evidence-based instructions to reduce complications that adhere to the American Society of Anesthesiologist guidelines, including clear liquids and preoperative carbohydrate drink two hours preoperative for healthy adults. An outpatient preoperative optimization unit ordered nothing by mouth at midnight for all patients. Nurse Practitioners were limited in modifying instructions. A chart audit revealed that 94% of patients fasted greater than eight hours. The purpose of this quality improvement project was to embed Enhanced Recovery After Surgery preoperative interventions into the discharge education and to assess fasting times. **Methods:** A new electronic smartphrase, or pre-formatted instructions, was created for preoperative patient education. Training presentations and discussion sessions were held by project lead in week one to Nurse Practitioners. The smartphrase included reminders of exclusionary criteria and gave the staff two options for the patient; reduced or prolong fasting. The project was implemented over 15 weeks and involved ten Nurse Practitioners. Data was collected on patients given reduced fasting instructions, total patients per week, and average fasting times per week. This data was disseminated weekly to staff. **Results:** Eight out of ten Nurse Practitioners were available for education. This project impacted 528 patients. Utilization of reduced fasting instructions increased from 0% in week one to 60% in week fifteen. Fasting times decreased from 12.6 hours in week one and 8.7 hours by week fifteen. The shortest fasting time was 6.1 hours in week fourteen. **Conclusions:** The smartphrase led to more patients receiving reduced fasting instructions. Fasting times were decreased with integration of the smartphase into the workflow.

Keywords: Enhanced Recovery After Surgery, preoperative, fasting times, elective surgery, NPO

Implementing Reduced Fasting Preoperative Electronic Discharge Education in Elective Surgery

Fasting is vital prior to surgery to reduce gastric volume and acidity in the stomach. Fasting prevents vomiting during anesthesia that puts the patient at risk for aspiration pneumonia. However, fasting greater than eight hours can lead to dehydration and hypoglycemia (He et. al, 2022). On the contrary, reduced fasting (RF) is correlated with improved postoperative comfort, reduction in insulin resistance, and a lower stress response (Hapugoda et. al, 2022). The American Society of Anesthesia (ASA) guidelines recommend that healthy adults should be allowed to consume light meals eight hours and clear fluids up to two hours before elective surgery. It also recommends a carbohydrate drink 2 hours prior to surgery (American Society of Anesthesiologists, 2023). Enhanced Recovery After Surgery (ERAS) adheres to the ASA guidelines and provides evidence-based instructions for the operative continuum to prevent postoperative complications (American Association of Nurse Anesthesiology, 2023).

A Nurse Practitioner (NP) preoperative led facility at a large urban Mid-Atlantic hospital uses prolonged fasting (PF) orders, otherwise known as nothing by mouth (NPO) at midnight, prior to elective surgery. All patients seen at the site are over the age of 18 years. On the day of surgery, the patient was asked the last time they consume any food or drink, and this time was documented as ‘NPO time’ by the nurse.

The site lacked a workflow process to deliver RF instructions in their preoperative education. Previously, the NP regularly gave PF instructions in their discharge preoperative education. At the site, 94% of patients are fasting greater than eight hours and 6% are fasting less than four hours. Failure to shorten fasting times results in increased hunger and thirst, metabolic disturbances, long hospital stays, and increase hospital costs (Jang et. al, 2020).

There were several contributing factors to this problem, as seen as a fishbone diagram in Figure 1. The site attempted to implement a policy in 2020, but elective surgeries were cancelled due to the COVID-19 pandemic, and implementation failed. Also, the patient discharge education was automatically set to give PF instructions through pre-formatted instruction, also known as a smartphrase, in the electronic health record. If the NPs preferred RF instructions, they must manually input this information. After a thorough assessment, the root cause most responsible for long fasting times was the lack of an easy workflow process to give RF preoperative education to the patient. The purpose of this quality improvement project was to embed ERAS preoperative interventions into the discharge education and to assess fasting times.

Available Knowledge

The proposed evidence-based solution was to implement preoperative interventions based on the ERAS protocol for all patients examined at the site. These interventions included adherence to ASA guidelines including clear liquids and a carbohydrate drink up to two hours prior to surgery or fasting for eight hours from solids and liquids for high-risk patients (American Association of Nurse Anesthesiology, 2023). A review of the literature concluded that RF has demonstrated adequate gastric emptying to prevent aspiration without complications (He et. al, 2022).

A literature search was conducted to assess best practice and methods to reduce fasting times in elective surgery using the CINAHL database. The following key words were used to start the search: “preoperative”, “ elective surgery”, and “fasting”. This yielded 172 results. The timeframe was narrowed down to 2015-2022 which reduced it to 93 results. The search was further narrowed down by using filters for ‘peer-reviewed’ and ‘all adults’. This totaled 53 articles. Articles were excluded if they had no relevance to the topic including fasting blood sugars for diabetes diagnosis, dietary patterns for weight loss, or intermittent fasting. From the title review, ten articles were included as being most relevant. One article was eliminated due to a focused outcome measure of gastric ultrasonography. Nine articles were included in this evidence review and synthesis. See Table 1 for a full evidence review table and synthesis.

Three of the studies were randomized controlled trials, Torabikhah et al., Imbelloni et al., Jang et al. Pinto et al. (2015) was a systematic review of four randomized controlled trials. There were three cross-sectional studies, Trotta et al., Liang et al., and Sun et al. Finally, there was two retrospective analyses, Ruth et al. and Njoroge et al.

In Imbelloni et al. (2015) two fasting regimens were compared. This study showed no subjective reports of hunger or thirst resulting in increased patient satisfaction in the clear liquid group. The patients were given the carbohydrate drink by the hospital (Imbelloni et al., 2015). In another RCT, the carbohydrate drink supplied two hours and clear liquids before surgery was correlated with statistically significant total lower hospital costs, decreased length of stay, earlier initiation of soft diet, earlier first flatus, and lower c-reactive protein levels on day of surgery and postoperatively. The patients were given detailed information preoperatively (Jang et. al, 2020). Liang et al. (2021) found that there were no cases of aspiration in either group, but the shortened fasting group had reduced hospital stay durations and lower blood glucose levels. Episodes of post-operative nausea and vomiting and subjective reports of thirst or hunger were less in the shortened fasting group. Finally in this study, nurses taught each patient about fasting instructions and the significance (Liang et al., 2021). Njoroge et. al (2017) study of 65 elective surgical adult patients that fasted around 15 hours showed that 43% reported thirst, 37% reported hunger, and 29% reported anxiety. All instructions in this study were given by the clinical team verbally (Njoroge et. al, 2017). Pinto et. al (2017) systematic review of four randomized controlled trials found that PF resulted in longer hospital stays and worse clinical prognostic parameters including insulin resistance and cytokine production. The final randomized control trial reviewed found that giving the carbohydrate drink significantly reduced the fasting time and the use of analgesics post-operatively (Torabikhah et al., 2021). The ASA Practice Guidelines for Preoperative Fasting (2023) continues to support the interventions of clear liquids and a carbohydrate drink 2 hours prior to surgery for healthy adults.

Rationale

The quality improvement framework used to underpin the intervention was the Promoting Action on Research Implementation in Health Services (PARiHS) Framework. The essentials of this framework for successful implementation are evidence, context, and facilitation to influence change. Evidence included research, clinical experience, patient experience, and local information. The evidence for this project was assessed through an evidence review and interviews with experienced providers on the anesthesia team. The qualities of context included culture, leadership, and evaluation. The culture and leadership of the site was founded on evidence-based practice and the desire to deliver best practice for better outcomes for patients. Finally, facilitation included internal or external persons acting as facilitators during implementation. The facilitation was monitored by both the project leader (PL) and the clinical site representative (CSR). This framework determined specific enablers and barriers that may influence successful implementation and places them on a low to high continuum (Kitson et. al, 1998). Figure 2 depicts the PARiHs Framework model for this project. The ERAS preoperative interventions were anticipated to be successful as the PARiHS framework recognizes innovative evidence while accounting for culture and facilitators to influence successful implementation. There was strong leadership on this project team including Senior Nurse Manager as the CSR, a senior NP, and the Chief Medical Director of Anesthesia as team members.

Methods

Context

There were contextual factors to consider prior to implementation. The staff consisted of about ten NPs. The team for this project included the PL, the manager, a senior NP, and the chief medical director of anesthesia. The manager and the senior NP are the clinical site representatives (CSR). The chief medical director of anesthesia was the sponsor for this project. Anesthesiologists who worked in collaboration with the site expressed during an interview that throughout the operative continuum patients are at risk for metabolic disturbances from PF. Through interviews, the NPs reported a high level of dissatisfaction for not updating their practice to align with recent evidence.

RF education was not integrated into the electronic health record prior to this project. A smartphrase was used to populate discharge preoperative education for the patients. There was only one template for this education, and it did not include guidelines consistent with ERAS. The only option was to manually edit this education.

Intervention

The process prior to this project was the patient was seen by the NPs who performed a preoperative physical. At the end of this visit, the patient was either cleared for surgery or required further evaluation. If cleared for surgery, the patient was given nothing by mouth after midnight instructions in their preoperative discharge education. The appointment was complete after the discharge instructions are given. On the day of surgery, the fasting date and time were documented. The desired process featured a new smartphrase for NP use. The smartphrase included reminders of exclusionary criteria based on the ASA guidelines. The smartphrase gave the NP two options; “reduced fast” or “prolong fast”. The NP chose what the patient was eligible for based on their exam and clinical judgement. Education automatically populated based on this choice. The NP delivered this education verbally and in handout form. Current and desired process maps are displayed in Figure 3 and 4.

Several strategies and interventions were employed to achieve the goals for this project. RF education was integrated into the electronic health record via a smartphrase at the beginning of Fall 2023. The smartphrase first displays exclusionary criteria in checkbox format to serve as a reminder of those who cannot get RF instructions. Below the checkboxes, there are instructions that if a checkbox is marked then the NP should choose PF instructions. Then, there was an option that prompts the NP to choose “reduced fast” or “prolong fast”. The options will automatically populate the chosen patient education in the preoperative discharge education. The NP was unable to give preoperative discharge education without using these smartphrase options. The NP verbally gives the discharge education and the patient was sent home with a packet with the instructions. See Appendix A for PF instructions. See Appendix B for RF instructions. See Appendix C for exclusionary criteria checklist.

The PL trained the NPs in a staff meeting through presentation and discussion on the new ERAS workflow process on week one. Attendance was collected by the manager without identifiers. Successful tactics included partnership and communication. All staff had adequate time to ask questions during training sessions. Open communication was used to facilitate discussion and answer questions. Staff was given a hard copy of the presentation to reference. The PL was present at the site weekly for questions, discussion, and troubleshooting which was beneficial for adherence. Results were displayed on a weekly basis in the NP office on a bulletin board. This incentivized staff to adhere to the workflow process and monitor for goal attainment. Staff was also provided encouragement to use the appropriate instructions. The smartphrase was launched in Fall 2023 and project implementation was for 15 weeks. There was one week of staff training and 14 weeks of data collection.

Measures

The primary outcome measure was average fasting time per week. Fasting times is defined as the amount of time, documented in hours and minutes, the patient has not had food or drink (American Society of Anesthesiologist, 2023). On the day of surgery, a preoperative checklist was filled out for every surgical patient requiring information on NPO date/time. These metrics are valid and reliable to measure the effectiveness of implementation of ERAS preoperative interventions. See Appendix D for preoperative checklist.

Utilization of RF instructions was a process measure that was monitored throughout. The number of patients given RF instructions compared to the number of patients examined weekly was collected from the electronic health record. The measurement plan for structure goals included creation of a smartphrase in the electronic health record and creation of preoperative fasting education based on both ERAS and ASA guidelines which was completed prior to implementation. Protocol compliance was supervised weekly by ongoing clinical supervision by both the CSR and PL. The CSR acted as the daily champion and the PL supervised weekly. This project did not require any additional financial or budget concerns. During monthly meetings, questions and feedback on implementation was encouraged and acted upon. Data sharing and benchmarking was available weekly for data to be disseminated to staff in real time.

Data was collected weekly during site visits. The PL compared the weekly census to the number of patients receiving RF instructions. The data was entered electronically through a Research Electronic Data Capture (REDCap) audit tool. See Appendix E for the Adherence Audit. On the day of surgery, NPO date/time was documented in a preoperative checklist.

Weekly chart audits done by the PL on average fasting time in hours was performed and entered electronically into an audit tool in REDCap. See Appendix F for the Preop Checklist audit.

Staff was trained how to use the smartphrase for every patient seen at the site to receive preoperative fasting instructions. This measure ensured completeness of all data to be collected. Also, ambulatory surgical nurses were made aware of the project to ensure accuracy of the NPO date and time for data collection. There were no conflicts of interest so the data should be presumed accurate.

The quantitative data was analyzed using descriptive statistics. The data collected weekly was transferred into two run charts. The first run chart included the percent of patients who received RF instructions over fifteen weeks. The second run chart included the mean fasting time over fifteen weeks. Interpretations were analyzed based on both pre-implementation and post-implementation data. Conclusions were drawn regarding intervention effectiveness and improvement over fifteen weeks of implementation.

Ethical Considerations

The ERAS workflow process interventions did not pose a threat of harm to any patient. The intervention benefitted patients by delivering best practice of ERAS interventions to improve postoperative outcomes to elective surgical patients. Privacy protections included a private room for patient encounters for the exam and all discharge education was discussed behind a closed door. Educational discharge instructions were printed in the office printer that only the staff has access to. Confidentiality data measures included chart audits occurring on a site-owned password protected computer and no identifiers were necessary for data collection. Data risks were mitigated by entering all data electronically into REDCap, a HIPAA compliant, password protected server, accessible only to the PL and project faculty. Data was coded through

REDCap. The project was devised to address a specific clinical practice problem at the site involving workflow processes specific to the site, therefore, non-generalizable outside of this site. Project data was provided for evaluation and presented externally with permission from the site. The Human Research Protections Office of the Organization's Institutional Review Board gave Non-Human Subjects Research determination. The hospital institution requires submission of a DNP project approval form to the Director of Nursing Research to ensure all elements of the Institutional Review Board are met.

Results

Quantitative data was collected weekly to determine utilization of the smartphrase and fasting times. Run charts were employed for analysis of this data. Time was the first variable on the run charts. The second variables, on two separate run charts, were mean number of patients that received RF instructions and mean fasting times. The goal of the project was to discover a causal relationship between the smartphrase and the staff utilization and fasting times.

Eight out of ten NPs were educated on the new workflow process. The project impacted 528 patients. Out of these patients, 335 were given RF instructions which was 63% of the patients seen over fifteen weeks. Refer to Figure 5 for the run chart displaying a weekly breakdown. During week nine, clarifications on eligibility of RF instructions based on ASA guidelines were given to the NPs. After this clarification, there were three weeks that more than 70% of patients were given RF instructions. Week thirteen showed the highest percent of patients receiving RF instructions at 77.7%. There were only three patients that did not receive any instructions. One patient refused to receive discharge preoperative education leaving the visit early and two others did not receive printed education due to a technical error of the smartphrase on the first day of implementation. Appropriate technological adjustments were made on the first day for all providers to have access to the smartphrase.

The run chart demonstrates two runs. There was a run of two from week four to five and a run of three from week twelve to fourteen. There were no trends or shifts. There were two astronomical points. The first was during week one which was the education week and the NPs did not have access yet to the smartphrase. The second astronomical point was week six. The variation of data arises from multiple contextual factors at the site. The contextual factors include the patient population and acuity, the number of patients evaluated, and staff time constraints. During implementation, two NPs were not available to return to work which increased the patient load for other providers. Week six was especially challenging with illness and personal obligations affecting staff which resulted the NPs defaulting back to PF instructions for their patients while under the stress of higher patient volumes. Finally, further defining the exclusionary criteria was barrier that was overcome during implementation but did impact the data. More patients were eligible based on the clarification of "significant gastroesophageal reflux disease" in the ASA guidelines, however, all patients on glucagon-like-peptide 1 agonists (GLP-1) medications were excluded based on ongoing research about the side effects of these medications affecting gastric emptying. There are numerous patients with diabetes and obesity who take GLP-1 medications and led to variations in the data.

The primary outcome goal was to decrease average fasting time to less than four hours. Fasting times decreased from 12.6 hours in week one to 8.7 hours in week fifteen. The shortest fasting time was 6.1 hours on week fourteen. Refer to Figure 6 for a weekly breakdown. This data reveals that the integration of the new workflow process decreased fasting times over the fifteen weeks. The run chart for this data showed two runs. There was a run of three from week four to eight and a run of five from week nine to fourteen. There are no trends or shifts. There is one astronomical shift on the first week when implementation had just started. Again, there were many contextual factors affecting the variations in this run chart. During week two, the carbohydrate drink was added to the supply par without budget contributions. This allowed for providers to deliver the carbohydrate drink directly to the patient instead of recommending the patient purchase a sports drink at home. The most significant factor was the differences in documentation of NPO time/date in the preoperative checklist. Some documentation included solid NPO time, liquid NPO time, or “yes/no” use of carbohydrate drink while other documentation only included total NPO time. Ambulatory Surgical Care nurses are the individuals documenting this data. The manager of this unit was made aware of the project prior to implementation and designated nurses were educated on the process. It proved to be essential that all the nurses should have been included in this project and trained on the new workflow process to ensure accurate documentation.

The PL addressed issues in real-time through strategies including weekly meetings with the NPs to provide re-education and clarifications by site experts. The PL also sent out a reminder of the project’s purpose to the manager of the Ambulatory Surgical Care nurses on week eight which could have influenced the reduction of fasting times.

Discussion

The integration of ERAS preoperative interventions into the workflow at the site was well utilized by the NPs. The project successfully increased the number of patients who received RF instructions through integrating the instructions into the EHR. Having the education automatically populate led to more RF instructions being given. Although most of the evidence used verbal education only, allowing for both verbal and written instructions was beneficial for patient compliance. The project data supports having a workflow that allows NP to easily give instructions for either RF or PF. Without the integration of a new workflow process to provide easy access to RF instructions, it is unlikely that there would be an increase of utilization of RF instructions or a decrease in overall fasting times. The structure and process changes made to the site helped raise awareness of best practice included in ERAS guidelines and allowed the NPs to have access to providing their patients with RF or PF instructions without a massive time constraint of manually inputting patient-specific instructions.

The intervention also led to a reduction in fasting times. However, it was noted during this project that there are multiple factors that affect fasting times. These factors include patient compliance, opposing instructions being given by other specialties, and variation in documentation. Fasting time documentation also varied between all nurses. Standardizing this documentation would be helpful for the future. Comparable with the evidence, there were no reports of aspiration or bad outcomes correlated with RF instructions given.

There are numerous actions in place to sustain this project at the site. The site has agreed to continue using the smartphrase with the exclusionary checkboxes and options. Moving forward, an on-site ERAS team will collect data with an Information Technology specialist with the goal of collecting more data including preoperative blood glucose, length of stays, and patient satisfaction. The ERAS team is also working on a hospital-wide initiative to standardize preoperative instructions given to patients across multiple specialties. This team received the advice to include surgical services and ASCU nurses in this initiative. Finally, to further sustain this project and align with the evidence, it would be beneficial for the site to create an order set of NPO status that all specialties could view. The evidence from other publications promoted verbal and written instructions, but the evidence also did promote EHR order sets as well.

Conclusion

Reducing fasting times prior to elective surgery is associated with better post-surgical outcomes with less metabolic disturbances and increased patient satisfaction. There was provider dissatisfaction with not using best practice supported by both ERAS and the ASA. The pre-formatted instructions were successfully integrated into the NPs workflow and led to an increase in RF instructions being given. The instructions did not disturb workflow. Clarifications from site experts were required to appropriate include and exclude patients from RF. The growing evidence GLP-1 affecting gastric emptying had a huge impact on this project and requires more evidence to determine if RF instructions are safe in this population. Using both verbal and written instructions led to a reduction in fasting times. Fasting times were still considerably higher than the anticipated goal of less than four hours. Further actions to decrease fasting times include standardizing documentation of fasting times, creation of an order set, and inclusion of surgical services and ASCU nurse in the initiative.

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Table 1

Evidence Review and Evidence Synthesis Table

Citation #1 Imbelloni, L., Pombo, I., & Filho, G. (2015). Reduced fasting time improved comfort and satisfaction of the elderly patients undergoing anesthesia for hip fractures. *Official Publication of the Brazilian Society of Anesthesiology, 65(2),* 117-123. http://dx.doi.org/10.1016/j.bjane.2013.10.019 Level: I/A

Purpose or Hypothesis	**Type of Evidence and Research Design**	**Sample (population, size, setting)**	**Intervention Procedures**	**Primary Outcome/Measures**	**Results Conclusions**
The aim of this study is to investigate protocol implementation of the ingestion of a carbohydrate rich drink before surgery and postoperative comfort and satisfaction with anesthesia in elderly patients with hip fractures.	Prospective, Randomized Controlled Trial Single center study	**Sampling Technique:** Convenience **Eligible Participants:** Patients with hip fractures receiving spinal anesthesia **Setting:** Brazilian Public Hospital **Inclusion:** ASA physical status I-III, over the age of 60 years, normal blood volume without pre-existing neurologic disease, coagulation abnormalities, infection at the lumbar puncture site, agitation/delirium, with HgB levels >10% and not admitted to the ICU **Accepted:** 100 patients **Control:** 50 patients **Intervention:** 50 patients **Power analysis:** Significance level of 5% to 80% was used. Sample size calculation indicated 47 patients in each group. **Group Homogeneity:** No significant differences between	**Control Protocol:** NPO after 9 pm the night before surgery **Intervention Protocol:** drank 200mL carbohydrate rich drink 2-4 hours prior to surgery **Treatment Fidelity:** Not discussed.	**Primary outcome** fasting times in hours Secondary outcomes included well being and satisfaction Well being was recorded after anesthesia visit, before surgery, before discharge from PACU, and on the morning of the first postoperative day in the hospital. Patients were asked to evaluate hunger, thirst, agitation, postoperative nausea and vomiting, and satisfaction- with Yes/No.	**Statistical Analysis:** Mann-whitney U and Fisher's tests were used for statistical analyses, P value was <0.05 to be significant. Mean fasting time was 13.5 hours in the control group and 3 hours in the experimental group. In the control group, 70% of the patients were hungry and 90% were thirsty on arrival to the OR. No patients complained of hunger and only 10% complained of thirst in the experimental group. There was no difference between thirst/hunger in patients in the PACU. **Conclusion:** The satisfaction questionnaire for surgical patients could become a useful tool in assessing quality of care. Carbohydrate drink significantly reduced preoperative discomfort and increases satisfaction with anesthesia care.

		groups regarding age, weight, height, gender, and physical status.			

Citation #2 Jang, S., Kang, A., Ahn, H., Hwang, S., & Lee, S. (2020). Reduced fasting time in patient who underwent totally laparoscopic distal gastrectomy. *Annals of Surgical Treatment and Research.* https://doi.org/10.4174/astr.2020.99.4.205

Level: I/A

Purpose or Hypothesis	**Type of Evidence and Research Design**	**Sample (population, size, setting)**	**Intervention Procedures**	**Primary Outcome/Measures**	**Results Conclusions**
The focus was on investigating the effects of reducing preoperative fasting time and early oral feeding on the postoperative recovery after total laparoscopic distal gastrectomy.	Research, Non-blinded randomized controlled trial	**Sampling Technique:** Convenience **Eligible Participants:** patients with gastric cancer undergoing a total laparoscopic distal gastrectomy **Setting:** January 2016 and December 2018 at Pusan National University Hospital in Korea **Excluded:** Combined resection of spleen, liver or colon, severe adhesions due to previous abdominal surgery, or open gastrectomy patients **Accepted:** 347 patients **Control:** 208 patients	**Intervention Protocol:** Carbohydrate-rich clear fluids were supplied until 2 hours prior **Control Protocol:** required to fast at least 8 hours prior to general anesthesia **Treatment Fidelity:** Not discussed	**Primary Outcomes** Hospital length of stay measured in days Total hospital costs Day of first flatus Initiation of soft diet measured in days CRP levels Postoperative readmission and complications	**Statistical analysis:** The chi-square test was used to compare differences in quantitative data. Student t-test was used to compared differences in measured data. Total hospital cost was lower in the treatment group (11,228,547 ± 1,947,877 Korean Won vs. 12,509,839 ± 4,390,575 reduced fasting time group and 13.9% (29/208) in the Korean Won, $P < 0.001$). Length of stay, day of first flatus and initiation of soft diet were all shorter in the reduced fasting group ($P < 0.001$, $P < 0.002$, and $P < 0.001$, respectively). CRP levels on the day of surgery were significantly lower in the reduced fasting group ($P < 0.007$). Postoperative complications and readmission rates were similar between the two groups ($P > 0.05$). The complications postoperatively were 8% in the reduced fasting group and 14% in the control group. Abdominal fluid collection was the most common complication. The reduced

		Intervention: 139 **Power analysis:** Not discussed **Group Homogeneity:** There was no significant differences between groups regarding age, sex, DMI, ASA status, presence of comorbidities, operative time, blood loss, and pathological state. (All P> 0.05)			fasting time group had shorter duration of hospital stay, an earlier flatus, and lower level of serum CRP concentrations on day of surgery, day 2, 5, and 7. **Conclusion:** Reduced fasting time can enhance postoperative recovery in patients who undergo TLDG and may reduce medical costs.

Citation #3 Liang, Y., Yan, X., & Liao, Y. (2021). The effect of shortening the preoperative fasting period on patient comfort and gastrointestinal function after elective laparoscopic surgery. *American Journal of Translational Research, 13*(11), 13067-13075.

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Level/Quality: II/B

Purpose or Hypothesis	**Type of Evidence and Research Design**	**Sample (population, size, setting)**	**Intervention Procedures**	**Primary Outcome/Measures**	**Results Conclusions**
The purpose of the study was to shorten fasting times and water deprivation times for patients undergoing elective laparoscopic surgery to explore the shorter times influence on patient comfort and postoperative gastrointestinal function.	Research; Cohort study	**Sampling Technique:** Recruitment **Eligible Participants:** Patients undergoing elective laparoscopic cholecystectomies, ASA class I-II. **Setting:** People's Hospital of Changsou District from March 2019 to August 2020 **Excluded:** Those with contraindications to surgical anesthesia, those allergic to the drugs used in the	**Intervention Protocol:** Patients were subjected to 6 hours fasting and 2 hours water deprivation. **Control Protocol:** the patients were subjected to 12 hours fasting and 6 hour water deprivation before surgery **Treatment Fidelity:** Patients were all operated on and cared for	**Outcome Measures:** Postoperative hospital stay durations measured in days. Intraoperative aspiration and postoperative nausea/vomiting-objective. Preoperative hunger measured by mild, moderate, severe,, or unbearable. Classification of thirst measured by mild, slight thirst, moderate, significant, severe. Preoperative comfort levels measured by numeric scale of 0 to	**Statistical Results:** Between group comparisons were performed using independent sample t tests with a statistical significance set at P<0.05. The research group had shorter hospital stays and lower blood glucose levels compared to the control group (P<0.001). No intraoperative reflux or aspiration occurred in either group. Postoperative nausea/vomiting in the research group was 5.15% and was 21.95% in control group (P< 0.05). Patients in the research group were less hungry and thirsty than the patients in the control group preoperatively (P<0.05). Patients preoperative comfort scores in the research group were remarkable lower than the control group.

		study, paitents with comorbid cardiovascular diseases, respiratory disease, liver and kidney insufficiencies, or other severe primary organ diseases, patients with a history of abdominal surgery, patients with coagulation dysfunction or immune system diseases, patients with family history of mental illness **Accepted:** 179 patients underwent elective laparoscopic cholecystectomies **Control:** 82 patients, 48 males and 34 females, 32-68 years old **Intervention:** 97 patients, 50 males and 47 females, 34-70 years old **Power Analysis:** Not discussed. **Group Homogeneity:** No significant differences in baseline data of sex, age, BMI, disease type, marital status, residence, nationality, educational background, history of smoking or alcohol drinking, or history of hypertension between the two groups. P>0.05, Demonstrated in Table 1.	by the same team. Regular training of medical staff was conducted and compliance was assessed. Significance of fasting was explained to all.	10, 1-3 indicating mild, 4-7 moderate, and 8-10 severe.	**Conclusions:** Shortening preoperative fasting improves comfort levels of patients undergoing elective laparoscopic cholecystectomies. Shorter fasting times alleviates thirst and hunger, promotes recovery of GI function, and relieves preoperative anxiety, postoperative pain, and adverse reactions.

Citation #4 Njoroge, G., Kivuti-Bitok, L., & Kimani, S. (2017). Preoperative fasting among adult patients for elective surgery in kenyan referral hospital. *International Scholarly Research Notices.* https://doi.org/10.1155/2017/2159606 Level/Quality: III/B

Purpose or Hypothesis	**Type of Evidence and Research Design**	**Sample (population, size, setting)**	**Intervention Procedures**	**Primary Outcome/Measures**	**Results Conclusions**
The study assessed preoperative fasting among adult patients scheduled for elective surgery at Kenyan Referral Hospital	Descriptive cross-sectional study	**Sampling Technique:** Purposefully selected **Eligible Participants:** Patients undergoing surgery from April to July 2015 **Setting:** Surgical patients at Kenyan Referral Hospital from April and July 2015 **Excluded:** Pediatric, obstetric, and patients who could not consent. Surgeries that only took place between 8-5pm and weekends. **Accepted:** There were 79 patients and only 65 total patients completed **Control:** No control **Intervention:** 79 patients with 65 completion, 82% response rate **Power analysis:** sample Size calculation was based on a formula- no other information given **Group Homogeneity:** No Control group.	**Intervention Protocol:** Data collected from patients using close-ended questions for quantitative evaluation and open-ended questions for qualitative evaluation Components of questionnaire include: demographics, reasons for preoperative fasting, complaints about NPO guidelines, source of preoperative fasting instructions, opinion on preoperative fasting instructions, and fasting time.	**Primary Outcomes:** Demographic characteristics associated with complaints about NPO orders Knowledge of preoperative fasting Source of preoperative fasting instructions Duration of fasting Outcomes of surgery defined by hunger, thirst and anxiety on a score of none, mild, moderate and severe	**Statistical analysis:** Descriptive and inferential statistics were generated. Mean, median and mode with standard deviation. Also, chi-square. Those with educational levels reported more complaints about NPO orders based on analyses with chi-square showed significance ($\chi2$ = 8.473, df = 3, and p = 0.037). Knowledge deficit regarding reasons for preoperative fasting. Only 6.2% of patients gave correct reason for preoperative fasting. Half respondents were unsure. While others gave irrelevant answers including preventing bleeding. Instructions of preoperative fasting varied between the nurse (80%), anesthetist (15%) and the surgeon (5%) "3). Of the ones (7.7%) who

					consumed clear fluids, 3.1% fasted for less than 15 hours, while 3.1% starved for 15 to 18 hours and 1.5% fasted between 19 to 22 hours. Among the respondents (15.4%) who consumed light meal, 12.3% fasted for 15 hours or less, while 3.1% starved for 15 to 18 hours.” Outcomes of surgery defined by hunger, thirst and anxiety on a score of none, mild, moderate and severe- Hunger 37% Thirst 43.1% Anxiety 29.2% **Conclusion:** Nurses are critical in providing preop fasting instructions.

Citation #5 Pinto, A., Grigoletti, S., & Marcadenti, A. (2015). Fasting abbreviation among patients submitted to oncologic surgery: a systematic review. *Arc Bras Circ Dig, 28(1)*,70-73. DOI:http://dx.doi.org/10.1590/S0102-67202015000100018

Level/Quality: I/B

Purpose or Hypothesis	**Type of Evidence and Research Design**	**Sample (population, size, setting)**	**Intervention Procedures**	**Primary Outcome/Measures**	**Results Conclusions**

"The purpose of this review was to evaluate the effect of fasting abbreviation among patients submitted to oncologic surgeries compared to the traditional fasting protocols"	Research, Systematic Review from RCTs	**Sampling Technique:** Selected and evaluated by two independent researchers **Eligible Participants:** RCTs among individuals with malignant neoplasms **Setting:** N/A- the articles were from Brazil, USA, Croatia, and China **Excluded:** Other languages besides English, Portuguese and Spanish. Exclusion for use of parenteral nutrition and duplicate publications. **Accepted** Four articles including 150 patients 128 patients had colorectal cancer 22 patients had gastric cancer **Control:** Most articles control was traditional NPO at midnight. **Intervention:** Similar fasting abbreviations **Power analysis:** Not discussed **Group Homogeneity:** Not Discussed	**Intervention Protocol:** Similar interventions among fasting abbreviation including 400mL to 800 mL carbohydrate drink 2-3 hours prior to anesthesia. Some studies required bowel prep. **Control Protocol:** Most were NPO at midnight **Treatment Fidelity:** Four studies with varied fasting abbreviation protocols.	**Primary Outcomes:** Main outcomes varied among the studies. Ranging from hand grip strength, hospital stay length (days), serum glucose, insulin resistance evaluated by the HOMA index and ISI, interleukin 6, interleukin 10, and CRP/albumin ratios. "Impossible to evaluate the results through meta-analysis" Secondary outcomes were heterogenous; GI function based on bowel movements, thirst, hunger, anxiety, nausea, and weakness which were subjective.	**Statistical Analysis:** **Study 1:** reduction in hospital stay among those with fasting abbreviation ($p = 0.02$). Improved functional capacity measured by hand grip strength in the fasting abbreviated group ($p < 0.05$). **Study 2:** plasma glucose was significantly lower in the group that received liquids followed by carbohydrates in the end of the surgical procedure, compared to the control group ($p=0.001$) and to the placebo group ($p= 0.002$); although the HOMA index has significantly increased in the end of the surgery in the three groups, it increased more subtly in the group with fasting abbreviation ($p< 0.001$), as well as the ISI increased in the same period ($p<0.001$). **Study 3:** Il-6 levels were higher among individuals in traditional fasting protocol ($p<0.05$). Patients receiving fasting abbreviation

					protocol showed higher IL-10 levels (p<0.05). **Study 4:** Significantly less hospital stay in treatment group (p=0.04). CRP/albumin ration was significantly higher in the control group. Secondary outcomes were heterogenous. **Conclusions:** The fasting abbreviation protocols in patients with neoplasm appear to be beneficial.

Citation #6 Ruth, M., Josephine, M. & Williams, A. (2018). A preoperative fasting in the day care patient population at a tertiary care, teaching institute: a prospective, cross-sectional study. *Journal of Health and Research, 5*, 105-109. DOI: 10.4103/cjhr.cjhr_118_17 Level/Quality: III/B

Purpose or Hypothesis	Type of Evidence and Research Design	Sample (population, size, setting)	Intervention Procedures	Primary Outcome/Measures	Results Conclusions
The aim of this study was to evaluate the preoperative fasting times for solids and clear fluids and to assess hunger and thirst levels in adults undergoing elective day care surgery at a tertiary care, teaching institute.	Prospective, cross-sectional observational study	**Sampling Technique:** Convenience **Eligible Participants:** patients posted for elective surgical procedures in the day care operation rooms, ASA class 1 or 2 adult patients **Setting:** Day care surgery center at a tertiary care, teaching institute **Exclusion:** Patients	**Intervention Protocol:** All patients were given fasting instructions by the nursing staff on their preoperative visit a day before the surgical procedure. Patients were given a questionnaire to indicate the time of last ingestion of solids and clear fluids when admitted to facility	**Primary outcome** Duration of preoperative fasting for clears and solids in terms of hours **Secondary-** Degree of thirst and hunger based on a numeric rating scale 0 to 10.	**Statistical Analysis:** T-test was used for analysis of continuous data with normal distribution and Mann-Whitney U test for data with nonnormal distribution. Chi-square test was performed for categorical variables and the outcome variable. Mean duration of fasting for solids ranged from 6

		> aged 70 and < 18 years. ASA status 3 and higher, those undergoing emergency surgery, on enteral nutrition, or who were receiving IV fluids preoperatively. Patients undergoing gynecological and GI or obstetric surgery were excluded. **Accepted:** 330 patients, split into AM slot of 226 and PM slot of 104 **Power analysis:** The required sample size was 276 patients. **Group Homogeneity:** Not discussed	and 30 minutes before induction of anesthesia. They were also asked to indicate preoperative anxiety on a numeric scale 0-9. **Control Protocol:** None. **Treatment Fidelity:** All patients received similar treatment but AM and PM slots.		hours to 19 hours. The mean duration of clear fluid fasting was 2 hours to 18 hours. The patients on the morning schedule had significantly shortened duration of fasting for solids as compared to those on the afternoon schedule ($P < 0.0001$, 95% CI: −3.53 to −2.44). The fasting times for clear fluids for the patients on the morning schedule were statistically comparable to that of the patients posted for the afternoon schedule ($P = 0.0742$; 95% CI: −0.07–1.65). The point prevalence of clinically significant hunger and thirst was 7.88 and 8.18, respectively, on March 31, 2017. No thirst and clinically relevant thirst scores (4 or more) were reported by 188 (56.9%) and 27 (8.2%) patients, respectively. **Conclusion:** Patients are following inappropriately prolonged fasting routines, and there is a need to enforce liberal preoperative fasting guidelines to improve care.

Citation #7 Sun, Z., Sun, X., Huo, Y., I, Mi, M., Peng, G., Zhang, C., Jiang, Y., Zhou, Y., Zhao, X., Li, T., Wu, X. (2022). Abbreviated perioperative fasting management for elective fresh fracture surgery: guidelines adherence analysis. *BMC Musculoskeletal Disorders*, *23*, 2-6.

https://doi.org/10.1186/s12891-022-05574-5 Level/Quality: II/A

Purpose or Hypothesis	Type of Evidence and Research Design	Sample (population, size, setting)	Intervention Procedures	Primary Outcome/Measures	Results Conclusions
The purpose of this study is to analyze the compliance with abbreviated fasting and the effects in patients undergoing surgical repair of elective fresh fractures.	Research; retrospective analysis	**Sampling Technique:** Voluntary participation **Eligible Participants:** Elective fresh fracture (< 3 weeks) surgical patients older than 14 years of age. **Setting:** Trauma Center at Beijing Jishuitan Hospital, China **Excluded:** Multitrauma patients, open fractures, mental disorders, alcohol dependence, history of drug abuse, pregnant or lactating patients. **Accepted** 306 patients enrolled **Control:** No Control group **Intervention:** All 306 patients **Power analysis:** Not discussed **Group Homogeneity:** No control group for comparison.	**Intervention Protocol:** Intervention based on Enhanced Recovery After Surgery guidelines. Clear liquids were recommended up to 2 hours before surgery for all surgical patients. Those with delayed gastric emptying related to upper GI cancer, pregnancy, morbid obesity, GERD, diabetes and inability to engage in oral feedings were excluded. A carbohydrate rich drink was high recommended the night before surgery. Postoperatively, patients were allowed liquids and solids within 2 hours after surgery. **Control Protocol:** No control protocol. **Treatment Fidelity:** Intervention group received same protocol.	**Outcome Measures:** Compliance Fasting times in hours Dependent Variable: Subjective Comfort Analysis of thirst and hunger	**Statistical Analysis:** Quantitative data are presented as mean and standard deviation or as a percentage. Group comparisons of quantitative data used student's t test and the Mann-Whitney U test. Chi-square test was used for group comparison of categorical data. P Value of <0.05 was considered statistically significant. 71.6% compliance rate for preoperative carbohydrate loading and 93.5% compliance with postoperative resuming 2 hr after surgery 25.2% non-compliance with preoperative abbreviated fasting The median preoperative fasting time for liquids was 2 hours and solids

					was 19 hours. 70.3% reported no thirst and 74.2% reported no hunger. **Conclusion:** “Among 306 patients with fresh fractures, a 71.6% compliance rate for preoperative carbohydrate loading was achieved. The postoperative fasting time was shortened to 1 h for liquids and 2.8 h for solids. More than 70% of patients had no thirst or hunger perioperatively under the current protocol. However, the preoperative fasting time was still relatively long, and further abbreviating the preoperative fasting time would probably further improve patients’ subjective comfort according to our logistic regression analysis.”

Citation #8 Torabikhah, M., Yousefi, H., Ansari, A., & Musarezaie, A. (2021). The effect of reducing the fasting time on postoperative pain in orthopedic patients: a randomized controlled trial. *Iranian Journal of Nursing and Midwifery Research.* DOI: 10.4103/ijnmr.IJNMR_291_19

Level/Quality: I/A

Purpose or Hypothesis	**Type of Evidence and Research Design**	**Sample (population, size, setting)**	**Intervention Procedures**	**Primary Outcome/Measures**	**Results Conclusions**

The purpose of the study was analyze the effect of fasting time reduction by using carbohydrate solution on postoperative pain and analgesic consumption in those undergoing orthopedic surgery The study also analyzed effect of preoperative fasting time reduction on the use of postoperative analgesia.	Research; One-Step Randomized Controlled Trial	**Sampling Technique:** Recruitment; simple sampling method **Eligible Participants:** Willing participants over the age of 18 with ASA status I or II undergoing orthopedic surgery **Setting:** Isfahan, Iran Hospital (no other information given on type of hospital) **Excluded:** Those with multiple traumas, no diabetic mellitus patients, those that are not candidates for spinal anesthesia, **Accepted:** 64 patients **Control:** 32 patients, all included in follow up and analysis **Intervention:** 32 patients, all included in follow up and analysis **Power Analysis:** Sample size was determined by statistical experts and similar studies. The confidence coefficient, test power, and standard error were 95%, 80%, and 0.70 standard deviation, respectively. The number of samples was determined to be 64. **Group Homogeneity:** Both groups were	**Intervention Protocol:** 200 mL of 12.5% carbohydrate solution given 2 hours prior to surgery **Control Protocol:** Fasting after midnight **Treatment Fidelity:** All patients received IV fluids intraoperatively with 1000cc of dextrose 33.3%, NS 0.3%, and 4mL/kg of LR. The same anesthesia technique was used for all patients. Blinding was not possible, but healthcare team did not know grouping.	**Outcome Measures:** Patient's subjective pain measured six times after the surgery (immediately afte consciousness, 2,4,5,12,24 hours later)- Measured by Visual Analog Scale Fasting times in minutes.	**Statistical Results:** Chi-square and t-tests were employed for the analysis of the demographic and surgical characteristics. Independent t-test was used for fasting times of the group, analysis of pain intensity, the surgical specifications and the dose of the used medicines. Mean age was 36.44. In both groups, the samples were 62.5% male. Mean BMI of control group was 26.29 and of the intervention group was 25.06. Mean fasting time of intervention group was 130.31 minutes and mean fasting for the control group was 641.25 minutes. The mean duration of surgery was 123.12 minutes for the intervention group and 123.59 of the control group. This was not statistically significant (t=-0.04, p=0.968). The pain scores were highest immediately after surgery and lowest 24 h after surgery in both groups. The greatest

		homogenous in terms of demographic characteristics, surgical specifications, and the medicines (p<0.05).			difference in pain intensity between both groups was at 12 hours. The mean pain intensity of the intervention group was lower than the control group with 5.88 of the intervention group and 6.30 of the control group, but this was not statistically significant (t=1.07, p=0.278). The amount of morphine administered was significantly less in the intervention group. **Conclusions:** The pain intensity in the patients with shortened fasting time was lower, but not statistically significant. Reducing fasting time by using carbohydrate significantly reduced the use of analgesics in the postoperative period.

Citation #9 Trotta, M., Ferrari, C., Alessandro, G., Sarra, G., Piscitelli, G., & Marinari, G. (2019). Enhanced recovery after bariatric surgery (ERABS) in a high-volume bariatric center. *Surgery for Obesity and Related Disease (15),* 1785-1792. https://doi.org/10.1016/j.soard.2019.06.038Level/Quality: II/A

Purpose or Hypothesis	**Type of Evidence and Research Design**	**Sample (population, size, setting)**	**Intervention Procedures**	**Primary Outcome/Measures**	**Results Conclusions**
The purpose of this study is to compare the conventional method to the fast-	Research; Retrospective Study	**Sampling Technique:** Convenience, 18 month comparison	**Intervention Protocol:** ERAS Protocol Preoperative,	**Outcome Measures:** Length of Hospital Stay Morbidity rate	**Statistical Results:** Univariate analysis was

track pathway and to analyze the results of enhanced recovery after bariatric surgery.		**Eligible Participants:** All patients undergoing a primary or revisional bariatric surgery (2122 sleeve gastrectomies and 278 Roux-en-Y gastric bypass) **Setting:** Single, High-volume bariatric center, Humantis Research Hospital Rozzano MI, Italy **Excluded:** Those with multiple traumas, no diabetic mellitus patients, those that are not candidates for spinal anesthesia, **Accepted:** 2400 patients **Control:** 345 patients **Intervention:** 1019 patients **Power Analysis:** Not discussed **Group Homogeneity:** Baseline characteristics did not differ between study groups.	Intraoperative and Postoperative Focusing on Preoperative- Optimized with comorbidities including CPAP for 1 month with OSA patients. Weight loss and smoking cessation only requested when applicable. Patients were allowed to eat a light snack up to 4 hours before surgery and to drink water up to 2 hours before. **Control Protocol:** Conventional Care of use of NG tubes & abdominal drainage) ***Focus on preoperative care **Treatment Fidelity:** All patients were counseled in a group setting with surgeon, anesthesiologist, nurse and nutritionist. Oral and written instructions given. Given appropriate dietary advice. After, all underwent preoperative testing including blood tests, EKG, upper GI studies or endoscopies, and etCO2 measurements with capnography).	Complication rate Pain Post-Op nausea vomiting Readmission/Reoperation	performed with Mann-Whitney U test for continuous data and Pearson's x2 test for categorical data. A 2 tailed value of P <0.05 was considered statistically significant. 82% of patients had good pain control (numeric rating scale < 3) and were free of post op nausea/vomiting during their hospital stay. Mean length of stay was 2.1 days. No perioperative mortality. There were 21 readmissions and 19 patients required reoperation within 30 days of discharge. **Conclusions:** ERAS protocol is safe, feasible and efficient. Immediate postoperative consequences were decreased. There was significant reduction of length of stay after intervention.

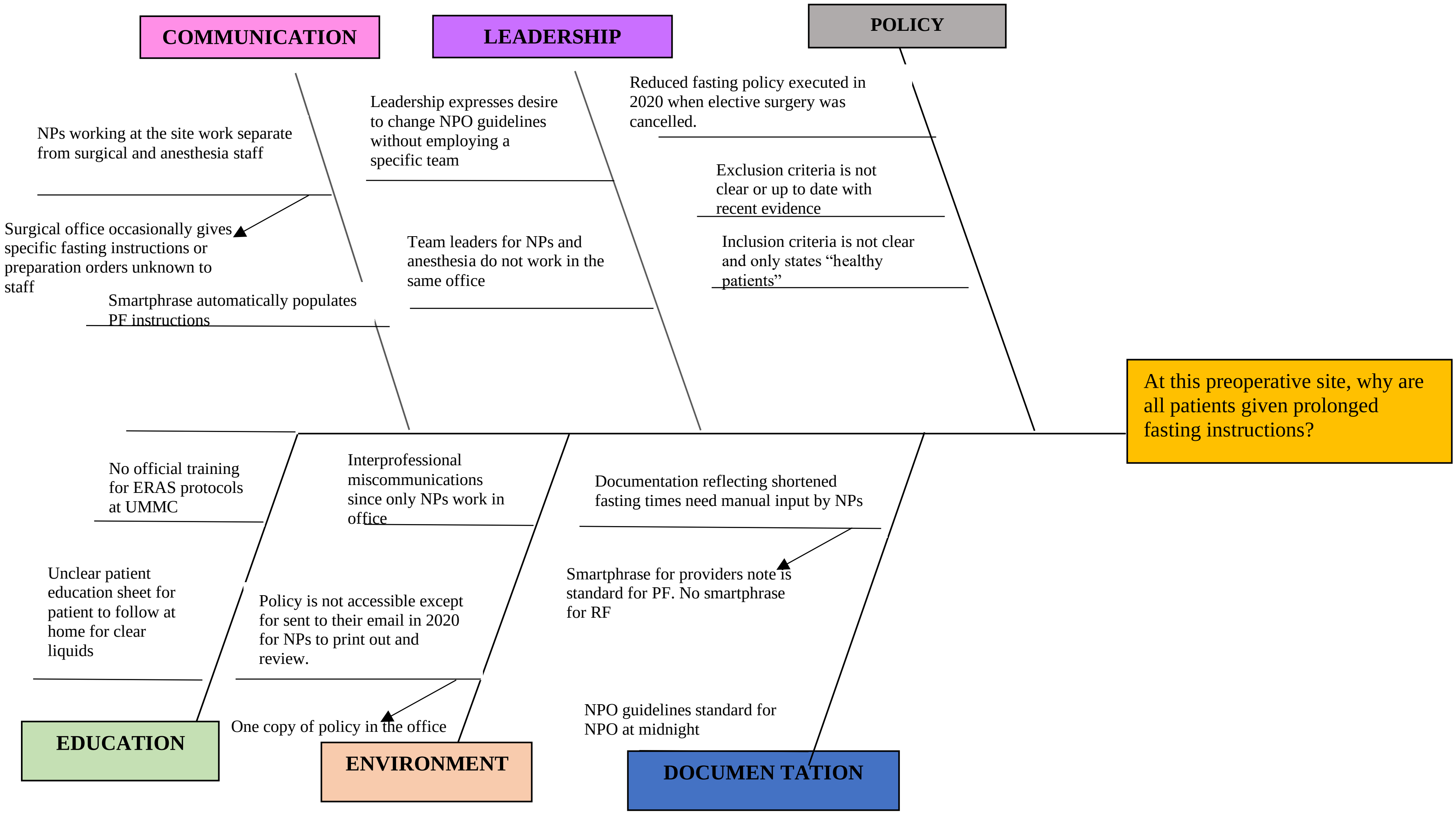
Project Title: **Enhanced Recovery After Surgery in Adult Elective Surgery: Preoperative Interventions**

JHNEBP Model Level	Total Number of Sources	Author and Quality Rating of each study	Synthesis of Findings

Level 1 Experimental study · Randomized Controlled Trial (RCT) · Systematic review of RCTs with or without meta-analysis	4	Torabikhah, M. et al (A) Imbelloni et al (A) Jang et al (A) Pinto et al (B)	All of the studies measured varied protocols of shortened fasting times and carbohydrate drink prior to surgery. Although all the studies measured different outcomes, all studies concluded that fasting abbreviation and reduced fasting was beneficial for preoperative comfort. Torabikhah et. al (2021) concluded that carbohydrate drink 2 hours prior significantly decreased the use of analgesia in the PACU. Imbelloni et. al (2015) concluded the same, but measured reduced pain preoperatively. Jang et. al (2020) measured hospital costs and there was a significant reduction in hospital costs in the fasting abbreviation group.
Level II Quasi-experimental studies · Systematic review of a combination of RCTs and quasi-experimental studies, or quasi-experimental studies only, with or without meta-analysis	3	Trotta et. al (A) Liang et. al (B) Sun et al (A)	These studies all had similar interventions of reduced fasting following Enhanced Recovery after Surgery. Sun et. al and Liang et. al both showed reduction of hunger and thirst. Sun et. al showed that patients still were fasting longer than guidelines recommended. Liang et. al also studied GI function whereas no other study measured this. Trotta et. al confirmed the safety of ERAS protocol and also measured length of stay which was reduced.
Level III Non-experimental study · Systematic review of a combination of RCTs, quasi-experimental, and non-experimental studies, or non-experimental studies only, with or without meta-analysis · Qualitative study or systematic review of qualitative studies with or without meta-synthesis	2	Ruth et al (B) Njoroge et al (B)	Although the two studies implemented similar interventions, they measured different outcomes. Ruth et. all measured fasting times were prolonged that that liberal fasting should be enforced. Njorge et. al measured that thirst, anxiety and hunger were all present with long fasting times.
Level IV Opinion of respected authorities and/or reports of nationally recognized expert committees/consensus panels based on scientific evidence			
Level V Evidence obtained from literature reviews, quality improvement, program evaluation, financial evaluation, or case reports · Opinion of nationally recognized expert(s) based on experiential evidence			
Overall Quality Rating w/rational and Recommendation: A, Strong, Consistent evidence across multiple studies.			
(Johns Hopkins Hospital, n.d.)			

Figure 1

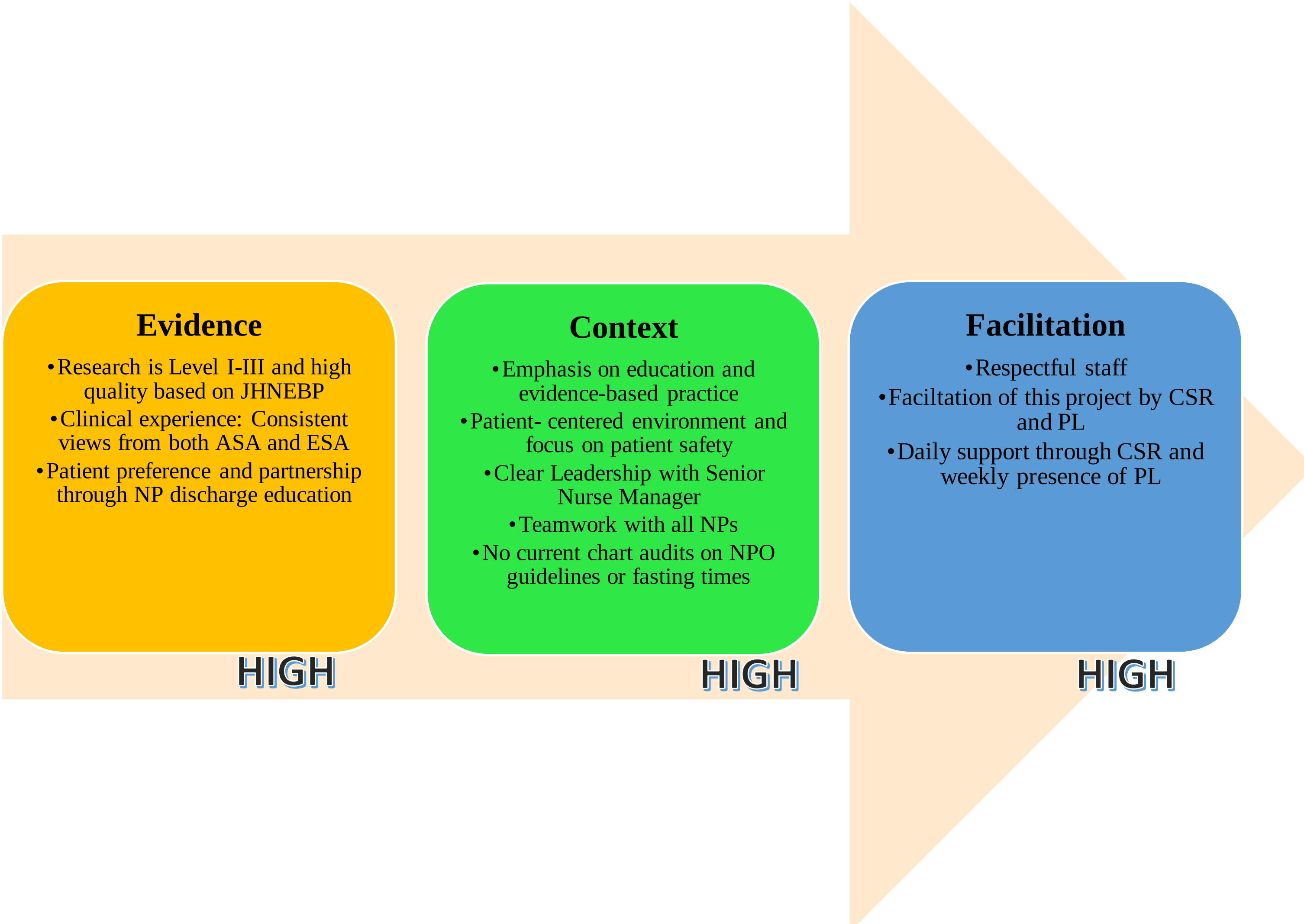
Fishbone Diagram of Root Causes



Note. Fishbone assessment of root causes contributing to the problem through clinical share days and provider interviews

Figure 2

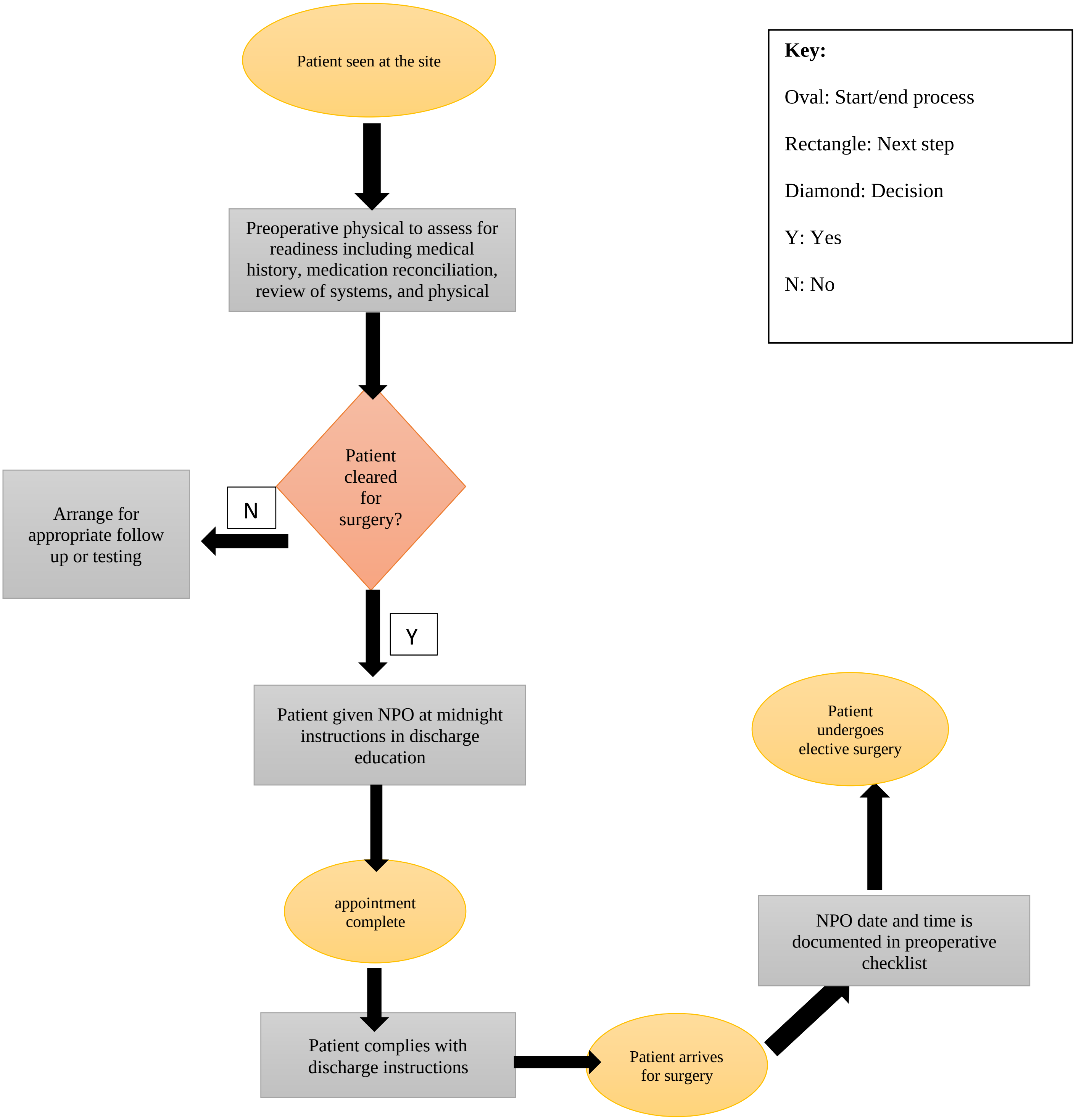
PARiHS Framework Model for ERAS Preoperative Interventions



Note. Evidence, context and facilitation factors were assessed at the site and rated high that will lead to successful implementation.

Figure 3

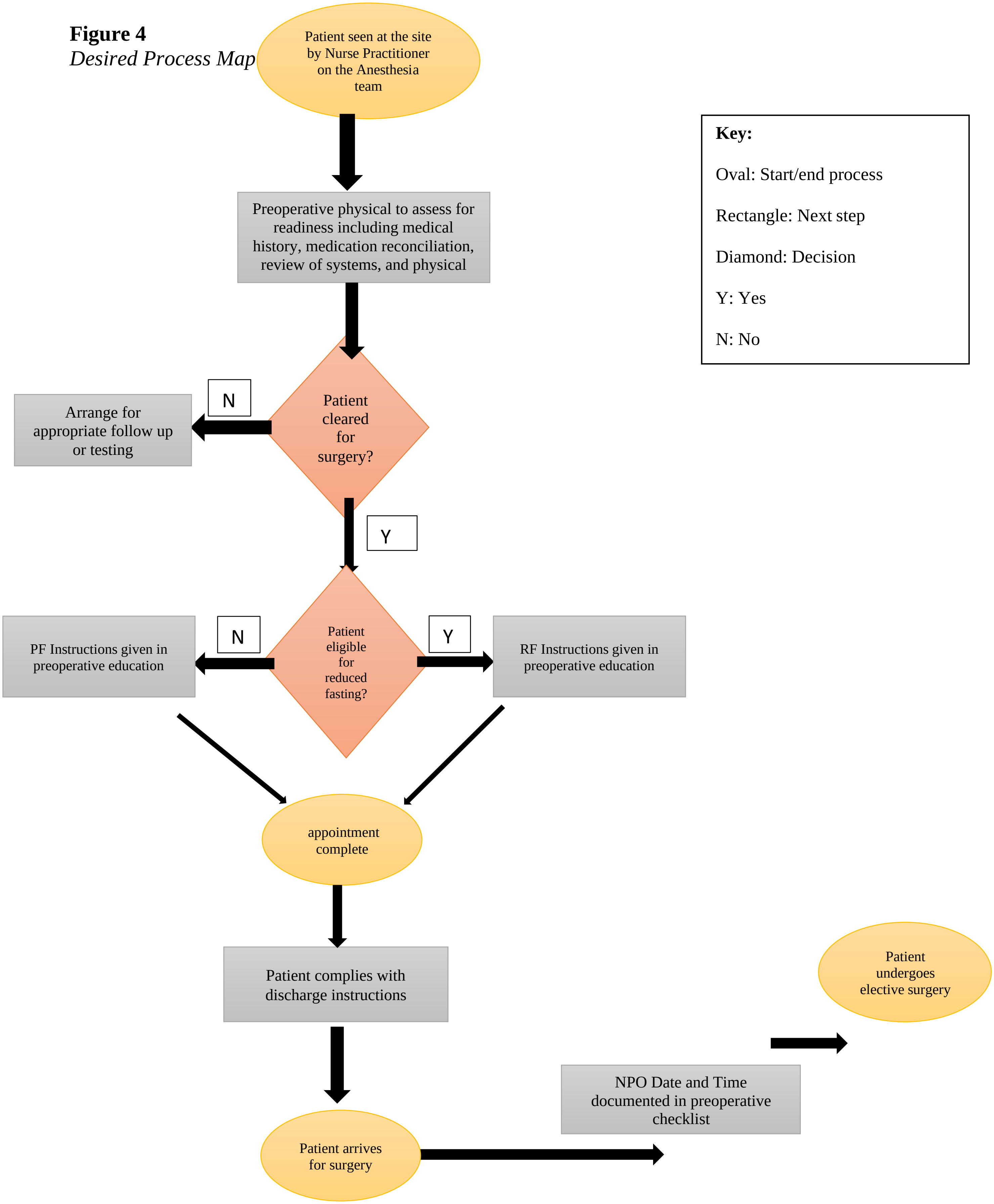
Current Process Map



Note. The figure portrays the current process, prior to implementation, at the site. The process starts at the site visit and ends on the day of surgery.

Figure 4

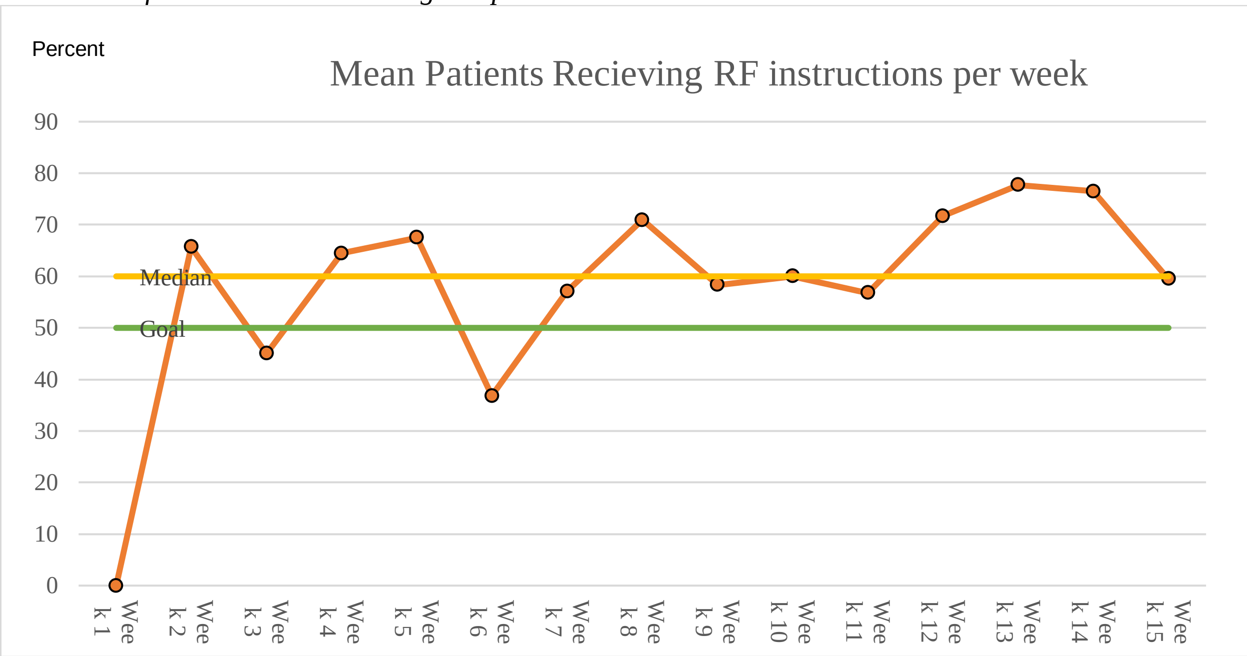
Desired Process Map



Note. The process map portrays the ideal desired process after implementation.

Figure 5

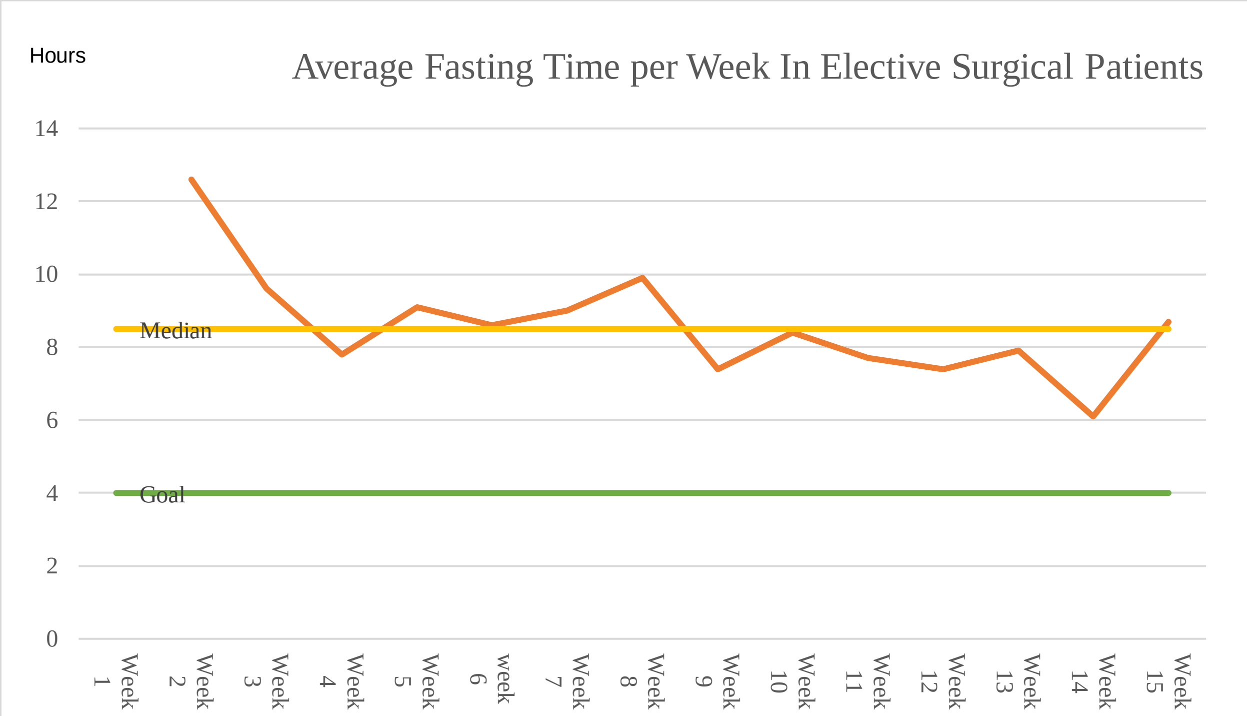
Run Chart of mean RF instructions given per week



Note. The mean number of patients receiving RF instructions over fifteen weeks.

Figure 6

Run Chart of Average Fasting times per week



Note.The average fasting times over fifteen weeks. The shortest was week 15 at 6.1 hours.

Appendix A

Prolonged Fasting Instructions

ADULT PROLONGED FASTING INSTRUCTIONS FOR ELECTIVE SURGERY

PLEASE READ BEFORE THE DAY OF PROCEDURE

Patients are normally told to arrive 2 hours prior to their surgery start time to the ASCU. You will be called the day before your surgery with this time.

Solids and Liquids

Stop 8 hours prior to surgery

All solid food, all liquids, all candy, and mints.

Certain procedures may require special preoperative fasting instructions. If you received special instructions from your surgeon or physician performing the surgery, please follow those carefully! Please contact your surgeon's office if you have specific questions on their instructions.

Arrival Time	Stop eating and Drinking
6 a.m.	Midnight
8 a.m.	2 a.m.
10 a.m.	4 a.m.
12 p.m.	6 a.m.
2 p.m.	8 a.m.
4 p.m.	10 a.m.

Note. Created by project lead based on the evidence from ERAS and ASA and adapted from the site's policy.

Appendix B

Reduced Fasting Instructions

ADULT REDUCED FASTING INSTRUCTIONS

FOR ELECTIVE SURGERY

PLEASE READ BEFORE THE DAY OF PROCEDURE

Patients are normally told to arrive 2 hours prior to their surgery start time to the ASCU. You will be called the day before your surgery with this time.

Clear Liquids

Up until 2 hours prior to arrival

You are encouraged to drink clear liquids before surgery. Staying hydrated is good for you!
Examples of clear liquids: Water, Apple Juice (no pulp), Gatorade, black coffee, broth, jello, or tea.
On the way to the hospital, drink the Ensure Pre-Surgery drink.
(OR Sports Drinks (12oz) such as Gatorade/Powerade-avoid red, purple, orange and pink)
NO MILK, CREAM, HONEY, AND ALCOHOL

Solids and Non-Clear Liquids

Stop 8 hours prior to surgery

All solid food, all liquids you are unable to see through, all candy, and mints.

See chart below for directions on when to stop solids and fluids based on your arrival time.

Certain procedures may require special preoperative fasting instructions. If you received special instructions from your surgeon or physician performing the surgery, please follow those carefully! Please contact your surgeon's office if you have specific questions on their instructions.

Arrival Time	Stop Solid Foods	Drink Clear Fluids Until
6 a.m.	Midnight	4 a.m.
8 a.m.	2 a.m.	6 a.m.
10 a.m.	4 a.m.	8 a.m.
12 p.m.	6 a.m.	10 a.m.
2 p.m.	8a.m.	12 p.m.
4 p.m.	10 a.m.	2 p.m.

Note. Created by project lead based on the evidence from ERAS and ASA and adapted from the site's policy.

Appendix C

Exclusionary Criteria Checkboxes

- ☐ Gastroparesis (symptomatic or diagnosed)
- ☐ Prior gastric surgery (bypass, banding, sleeve, etc).
- ☐ Esophageal disorders (hiatal hernia, significant GERD)
- ☐ GI obstruction
- ☐ Pregnancy
- ☐ GLP-1 medications (Ozempic, Trulicity, Victoza)

These conditions can increase the likelihood of regurgitation and pulmonary aspiration. If one of the above boxes have been checked, please select Prolonged Fasting or modify these guidelines based upon clinical judgment.

Note. Created by project lead based on the evidence from ERAS and ASA and adapted with help from site experts.

Appendix D

Preoperative Checklist

PRE-OP CHECKLIST (most recent)

Pre-op Checklist - 04/10/18
Patient Verification
Sending unit phone #
Sending unit
Sending RN/Clinician
Patient ID Verified
ID Band On
Allergies Reviewed?
T&S complete and Blood band correct, current and in place
Voided (or Catheterized)
OSA Assessment Complete
Who is the patient contact and where are they waiting?
Patient contact phone/pager number
Procedure Verification
Procedure Verified?
Site Confirmed?
Site Marked?
Laterality Confirmed
Chart Verification
NPO Date
NPO Time
CHG Bath
1 Day Before Surgery
Day of Surgery

Note. An example of the preoperative checklist used by nurses to document fasting times.

Appendix E
REDCap Adherence Audit

Adherence Audit

1) Week

◯ 1
◯ 2
◯ 3
◯ 4
◯ 5
◯ 6
◯ 7
◯ 8
◯ 9
◯ 10
◯ 11
◯ 12
◯ 13
◯ 14
◯ 15
◯ 16

2) Number of patients given reduced fasting instructions

____

3) Total number of patients seen

____

Note. REDCap-generated project audit tool for data collection on number of patients given RF instructions and the weekly census.

Appendix F

Preop Checklist Audit

Week	◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7 ◯ 8 ◯ 9 ◯ 10 ◯ 11 ◯ 12 ◯ 13 ◯ 14 ◯ 15 ◯ 16
average length of fasting time (in hours)	__________

Note. REDCap-generated project audit tool for data collection on average fasting time per week.