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Eliminating Routine Gastric Residual Volume Assessments in the Intensive Care Setting

John Marshall Smith
marshall.smith2@gcsu.edu

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Eliminating Routine Gastric Residual Volume Assessments in the Intensive Care Setting

Marshall Smith

Georgia College & State University

Sterling Roberts, DNP, RN, CHSE

Deborah MacMillan, PhD, RNC, CNM

Leslie Culpepper, MSN, CNS, CCRN

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Abstract

This evidence-based project sought to evaluate the practice change of routine GRV elimination within a 14 bed adult intensive care unit (ICU) at a large teaching hospital in the southeastern United States. For decades, the gold standard to determine tolerance to enteral nutrition (EN) has been routine GRV assessments via aspiration. However, recent studies have concluded the practice ineffective. Critical Care guidelines published in 2016 now recommend cessation of routine GRV assessments (Ozen, et. al, 2018). In-servicing, education, and implementation of a validated protocol from the University of Virginia Medical Center was used to enact the practice change. A 30-day pre-and post-implementation data collection design was conducted to determine effects on total volume of EN received as well as rate of adverse events. There was a significant difference in percentage of EN delivered between the routine group ($M = .60$, $SD = .17733$) and cessation group ($M = .81$, $SD = .12167$); $t(45) = -4.77$, $p = .00$, $CI = -0.305$ to -0.1238 , with no increase in adverse events (emesis, aspiration pneumonia). This data indicates that the elimination of routine GRV assessment is safe and results in improved nutrition provision. Additionally, it indicates use of a protocol for practice change as well as mandatory in-servicing can effectively change nursing practice. This is useful for implementing the practice change across various other units, patient populations, and facilities.

Keywords: critical care, enteral nutrition, gastric residual volume, intensive care, nasogastric tube, orogastric tube, percutaneous gastrostomy, tube feeding

Eliminating Routine Gastric Residual Volume Assessments in the Intensive Care Setting

Nutrition, the supply of nourishment to cells, is required for life-sustaining processes. Without proper nutrition homeostasis is not attainable, and a person's life is put in imminent danger. Proper nutrition involves the provision of appropriate amounts of vitamins, minerals, proteins, carbohydrates, fats and overall caloric intake in order to feed the daily demands and physiologic processes of a person's body. Nutrition is even more important when a person's body has been injured or put under large amounts of stress due to complications with their health (Ozen et al., 2018).

Patients requiring medical care, or, more specifically, intensive medical treatments within an intensive care unit (ICU) of a hospital, often require alternative forms of advanced medical therapy to support the healing process. One of these alternative treatment methods is that of nutrition administration when a person is unable to consume oral intake. The most common form of advanced nutritional therapy is that of enteral nutrition (EN). Instituted when a person is unable to consume nutrition orally, but still has a functional gastrointestinal (GI) tract, EN functions to meet basic nutrition needs but also serves to increase intestinal blood flow, maintain the GI mucosal barrier, and stimulate immune response (McClave et al., 2016).

Because many patients within ICU environments are unable to properly consume necessary nutrients orally due to severity of illness(es), requirement of mechanical ventilation, and/or overall debilitation, but maintain functioning GI tracts, EN is a common therapy. Common illnesses and therapies which may make a patient unable to consume oral intake include but are not limited to acute sepsis or septicemia, Acute Respiratory Distress Syndrome (ARDS), Myocardial Infarctions (MI), Cerebrovascular Accidents (CVA), extensive injuries

from trauma, mechanical ventilation (MV) and Continuous Renal Replacement Therapy (CRRT) (McClave et al., 2016).

A common challenge within the ICU setting is determining tolerance, and success, of provided therapies. Proving tolerance of EN has historically relied on subjective markers completed as routine tasks by nursing staff, specifically, the use of routine GRV assessments. However, this practice has come under recent scrutiny as it may negatively impact overall nutrition administration and may not be an accurate indicator of EN tolerance (Minju & Jiyeon, 2014).

Problem Statement

According to McClave et al. (2016), current data demonstrates that on average patients do not routinely receive total ordered volume of EN on a daily basis. This discrepancy is linked to several factors including: holding EN for routine nursing care (i.e. daily baths, repositioning, & medication administration), fasting for surgical procedures, ordered diagnostic exams, and suspected or confirmed EN intolerance (McClave et al., 2016). An internal survey conducted at southeastern hospital in 2016 also supported this research, concluding on average patients received only 55% of estimated necessary intake of EN while in ICU (Navicent Health, 2018). Inadequate nutrition and caloric intake can negatively impact several factors related a patient's overall outcome, as malnutrition increases the likelihood of several medical complications, including but not limited to increased length of hospital stay, electrolyte imbalances, impaired wound healing, and increased risk for mortality (Ozen et al., 2016).

Guidelines and recommendations for the provision and tolerance of nutrition have evolved significantly in recent years. This is especially true in the critical care population, where nutrition support in the form of enteral and parenteral nutrition is used to support patient care.

Critical care guidelines published in 2016 by the American Society of Parenteral and Enteral Nutrition (ASPEN) and The Society for Critical Care Medicine (SCCM) suggest that GRV not be used to assess tolerance in critical care patients receiving EN. Instead, it is suggested to monitor other markers of intolerance, including emesis and/or abdominal distention (McClave et al., 2016).

Despite these guidelines, adopting this practice change has been difficult. Reasons for this delay are often related to habits and/or work routines that are either slow to change and/or have not aggressively researched evidence-based practice findings related to this issue. Therefore, institutions have sought to adopt the elimination of GRV assessments through enactment of protocols and algorithms that are nursing driven. Developing, adopting, and sustaining these protocols is key to ensuring permanent practice change (Kueny et al., 2015).

Purpose of the Project

The purpose of this project is to determine the overall effectiveness of the institution of UVA Medical Center enteral feeding guidelines and algorithm on patient care outcomes. In order to address this specific issue more directly, pre- and post-implementation data collection will occur within an intensive care unit at a southeastern facility in an attempt to answer questions related to the care of patients receiving EN. Considering the limited amount of current research available and the need to assess the overall care of ICU patients in general when enacting a practice change, this quality improvement project seeks to determine the impact to patient care and condition with implementation of a new EN protocol which eliminates routine GRV assessments. This project aimed to address the following clinical questions:

Clinical Questions:

1. For patients receiving EN, does cessation of routine GRV assessments lead to increases in total received EN as compared to performing routine GRV assessments?
2. For ICU patients receiving EN, what effect does cessation of GRV assessments have on incidence of emesis as compared to performing routine GRV assessment?
3. For ICU patients receiving EN, what effect does cessation of GRV assessments have on incidence of aspiration pneumonia as compared to performing routine GRV assessment?
4. Among nursing staff providing EN, does participation in mandatory in-service training demonstrate compliance with cessation of GRV assessment guidelines after implementation in the pilot unit when no order is present?

Needs Assessment and Credibility

This quality improvement project was designed to determine the success of the implementation of a planned evidence-based practice change to eliminate the current nursing practice standard of routine GRV assessments every four hours in all patients receiving gastric EN. Malnutrition increases the likelihood of several medical complications, including but not limited to increased length of hospital stay, impaired wound healing and increased mortality rates (Tume et al., 2017). For several years one of the most common practices for monitoring EN tolerability has been that of GRV assessment. As stated by Ozen et al. (2018) the basis of GRV assessments involves monitoring EN tolerance through the periodic visualization of gastric content via feeding tube aspiration. In theory this gives the provider information on the patient's overall ability to tolerate EN. Though this has been a commonly accepted approach to EN tolerance, recent indicators suggest GRV assessments are no longer recommended as a primary way to assess overall EN tolerance in critical care environments (Ozen et al., 2018). Baseline

studies demonstrate clearly that the practice of routine GRV assessments leads to inadequate nutrition provision, thus increasing the likelihood of these complications. This, coupled with guidelines suggesting cessation of routine GRV assessments, highlights the need for a practice change within the organization.

As healthcare organizations seek to implement evidence-based guidelines, use of protocols have shown increased compliance (Parrish & McCray, 2019). Evidence quality is essential to development of guidelines which can be used in clinical practice (Bhaumik, 2017). Additionally, it is important to verify the applicability of guidelines to the selected patient population. Guidelines published by the UVA Medical Center have shown efficacy across a patient population similar in scope to those found at the southeastern hospital. Credibility of these UVA Medical Center guidelines and algorithm were determined through analysis of multiple factors, assuring elimination of bias as well as demonstrating quality of evidence through the selection process. Therefore, the goal of this project is to assess the successful implementation of the evidence-based UVA Medical Center guidelines and algorithm for cessation of GRV assessments.

Feasibility and Background

The location of this project is a 14-bed adult ICU within an acute-care hospital in the southeastern United States. Current practice within the southeastern acute-care hospital requires GRV to be monitored every four hours in patients receiving EN, with EN to be held for a previously determined period of time if GRV exceed 400 milliliters. This is a nursing task and is completed by the nurse assigned to provide care each shift (Navicent Health, 2018).

Approval for this quality improvement project was obtained from the Institutional Review Boards (IRB) at both Navicent Health and Georgia College & State University (GCSU).

As stated previously, this project design is based upon the concepts from the UVA Medical Center's *Clinical Decision Tool for Transitioning Away From GRV Checks*. Though there are many concepts listed within this tool regarding EN delivery and monitoring, the foundation revolves around the elimination of routine GRV assessments within nursing units (Parrish & McCray, 2019).

Permission was received from the UVA Medical Center for implementation of the published Gastric Residual Algorithm. The nurse education intervention portion of the project occurred through in-servicing within the unit. In-services occurred over multiple varied days and times. Additional printed education material was posted within the unit for nursing staff reference. Data collection was completed by the primary investigator (PI) via the facilities' electronic medical record (EMR) in the form of chart reviews conducted utilizing Cerner® PowerChart™. There were no financial expenditures associated with the design and implementation of this practice change.

Review of Literature

Many of the reviewed findings examine the practice of GRV checks, nurses' attitudes, and beliefs surrounding the practice, and the evidence supporting elimination of the practice. Two databases were utilized in order to search for applicable research and reviews: PubMed and Cumulative Index of Nursing and Allied Health Literature (CINAHL®) Complete. These databases were also combined with searches within the online journals: Nutrition in Clinical Practice (NCP) and the Journal of Parenteral and Enteral Nutrition (JPEN), both publications of the American Society of Parenteral and Enteral Nutrition (ASPEN). Initial search parameters limited results to the past five years; however, review of results identified limited evidence-based studies demonstrating safety with elimination of routine GRV assessments. A review of Critical

Care Guidelines in Nutrition Support, published by McClave et al. (2016), led to identification of additional sources dated 2010-2013. Therefore, in an effort to include literature that is both current and applicable, search parameters were expanded slightly to include study date ranges 2010-2019, with the majority of studies chosen occurring between 2013 and 2019.

The following key phrases were utilized to search both databases and the online journals: *critical care, enteral nutrition, gastric residual volume, intensive care, nasogastric tube, orogastric tube, percutaneous gastrostomy, and tube feeding*. The initial search of *gastric residual volume* yielded a total of 1,084 articles from combined sources. After the addition of another keyword, *enteral*, search results were filtered to 152 articles or summaries. Review of these results and elimination of duplicates yielded a total of 47 records for screening.

Selection

Of the 47 records screened for inclusion in the literature review, exclusion criteria employed eliminated nineteen, resulting in a total of 28 full-text articles reviewed for eligibility. The primary form of exclusion was in determining study completion versus opinion-based article or commentary. Of the 28 remaining, additional exclusion criteria primarily focused on the target population, with an additional 11 studies eliminated due to applicability specifically to the neonatal population only.

Of the 17 articles included in the review 13 were of quantitative analysis, three were qualitative, and one was both quantitative and qualitative. Two major themes emerged: the current practice of nursing staffs and nursing perspectives of GRV assessment and in comparison, multiple bedside trials determining value, or lack thereof, or direct GRV measurements to determine tolerance of EN. Surveys completed by Ozen et al. (2018), Ahmed et al. (2012) and Metheny et al. (2012) performed assessments centered around bedside nurses'

perspectives and current practices regarding the topic. A study by Ozen et al. (2018) found that it was more common for nurses with five or more years of experience to monitor GRV than those with less experience ($p = 0.004$). Similarly, Ahmed, Le, Kaitha, Morton & Ali (2012), surveyed 582 bedside ICU nurses and found that aspiration risks and potential intolerance were the most common concerns and reasons for withholding EN; however, there was no consensus established among nurses regarding when to withhold EN based on these factors.

Lastly, a national survey conducted by Metheny et al. in 2012 also found inconsistencies nursing perspectives of EN tolerance. Of 2,298 nurses surveyed, multiple discrepancies were found regarding when EN was withheld based on GRV assessments. Results showed that most nurses withheld EN when gastric residuals reached between 200-250 milliliters (ml), while only 12.6% stated they began withholding once GRV reached 500 ml (Methany, Mills & Stewart, 2012).

Perhaps even more important than nursing perspective regarding GRV practices, this review also sought to determine the current evidence for routine use of GRV. Regarding the multiple quantitative articles resulting in recommendations and conclusions based on patient outcomes, statistical data suggests there is little to no correlation in frequent direct GRV aspirational assessments and reduction of unwarranted outcomes such as increased aspiration risk, increased MV support and/or duration, increased ICU length-of-stay, or mortality. One prospective randomized controlled trial compared tolerance and outcomes in patients receiving EN both with and without GRV assessments. Findings of this study resulted in an increased volume of EN received and no association between GRV measures and adverse events, outcomes, or complications (Reignier et al., 2013).

Synthesis of Evidence

GRV assessments provide a direct visual analysis of the amount of EN content within the stomach, but much speculation persists as to the accuracy of this visual analysis and whether frequent monitoring of GRV actually promotes quality outcomes. Additionally, there is no evidence-based marker which proves tolerance or intolerance of EN based on frequent direct aspirational assessment. This large variation in objective criteria has led opinions to vary greatly on what defines an elevated GRV and how to respond to elevated GRV. Multiple qualitative and quantitative studies have demonstrated the inaccuracies of GRV assessments as well as no documented improvements in patient outcomes associated with routine GRV aspirational assessments. This research, coupled with current ICU guidelines recommending cessation of GRV assessments, demonstrates adequate evidence to consider practice change within the ICU for elimination of frequent GRV assessments (McClave et al., 2016).

Limitations of Evidence

Limitations of this review revolved around limited availability of research completed within the past five years. This required expanding search criteria to include the last eight years as opposed to a more optimal time frame of a five-year period. An additional limitation was one of the available articles was limited to abstract review versus full text, which limited available useful data. Despite evidence-based guidelines that suggest elimination of routine GRV assessments to be a positive step forward regarding enteral nutrition management, there is a lack of clear research studies that demonstrate the overall safety and efficacy.

Strengths of Evidence

Although still a relatively new practice, literature supports the practice change of no longer using aspiration of GRV as a focus for advanced nutritional tolerance. Considering the

risk factors associated this practice, many publications no longer support the use of GRV assessment as recommendations for current practice. Considering current research and the proposed study location, substantial improvements of patient outcomes in such a large healthcare facility should be considered.

Stakeholder and Organizational Sources

The southeastern hospital is an educational facility with a culture known for acceptance of change based on evidence-based practice. The southeastern hospital provides numerous medical services which are vital to the overall health and wellbeing of the surrounding public, and it prides itself in promoting direct patient care initiatives. As stated on their website, their core values include Integrity, Respect, Ownership and Caring as the foundation to their organizational excellence. At the forefront of these values is that of bedside patient interaction and care (Navicent Health, 2018). Interviews with critical care intensivists, ICU clinical nurse specialists, bedside clinical nursing staff, and nursing administration reveal the institution's commitment to evidence-based care, improving patient outcomes, and a desire to streamline nursing workloads for the foreseeable future. Of those interviewed, no objections were made regarding the institution of the UVA Medical Center guideline and algorithm nor the foundation of this project.

Conceptual Theories

The framework associated with this project encompasses concepts from both Lewin's Theory of Planned Change and Melnyk's Seven Steps of Evidenced-Based Practice (EBP). Because the UVA Medical Center algorithm is a change in nursing practice that has been a part of critical care culture for decades, it will require an approach that is measured and complete. Changes in practice require careful planning and combined efforts in order to achieve sustained

transformation and ensure patient safety. Therefore, it is important to utilize a change theory which can provide the structure for change implementation.

Lewin's Theory of Planned Change

The Lewin Theory of Planned Change (LTPC) is a process encompassing three steps that need to occur before an organization or group accepts a change of practice or mindset:

Unfreezing, Moving and Refreezing. The first step is referred to as *Unfreezing*, which involves a detailed assessment to determine what practice is currently being used, what data or preferences determine why this practice is used, and why a change in strategic plan is necessary for future implementation. This step is generally viewed as the most challenging part of the LTPC, especially when referring to a larger organization or corporation, because it typically involves universal acceptance that a current practice is limited and/or obsolete (Mitchell, 2013). Although this step might not require a complete overhaul of a particular nursing practice from a foundational level, it can certainly lead to significant complications such as resistance or stress within an organization even when modifications are perceived to be minor (Shirey, 2013).

The second attribute to the LTPC model is *Moving*, or the implementation of the new plan or strategy within the chosen setting. This part of the LTPC is widely considered to be the most time consuming, as adopting new a new practice change usually requires sufficient time to fully take effect. Patience is vital regarding this attribute, as generally not everyone will accept the change in practice immediately (Mitchell, 2013). Even if current research dictates the need for a change in practice this does not mean that all of those involved will be accepting or remember the strategy change initially. Open communication is also very important regarding moving, as using respectful reminders of the practice change will many times be necessary (Shirey, 2013).

Specifically, this step involved the implementation of a new EN protocol for the ICU and education regarding this practice change. As stated previously, in-service training sessions were held for the nursing staff before implementation of the new protocol. The nursing staff was also provided with supplemental education material for review, as well as a copy of the UVA GRV algorithm (see appendices).

The final part of the LTPC is *Refreezing*. Refreezing is established when data and organizational compliance is ready to officially make the new strategic plan of action part of its new practice guidelines. Though this will take some time to establish regarding this specific plan of action, it is nonetheless necessary to perform the aforementioned steps of unfreezing and moving in order for refreezing to take effect (Mitchell, 2013). The goal of this project is to have sufficient amount of data to support the elimination of routine GRV assessments and to have this practice change fully implemented for all future patients throughout the southeastern hospital facility.

Melnik's Seven Steps of Evidenced-Based Practice

In order to further evaluate the effectiveness of this evidenced-based project, Melnyk's seven step approach to implementation of Evidenced-Based Practice (EBP) guidelines was also utilized. This approach to EBP guideline implementation consists of seven steps intended to apply the most therapeutic practice methods to current practice which have been deemed effective through clinical trial designs and results (Melnik, Gallagher-Ford, Fineout-Overholt, 2016). Using this practice was beneficial in establishing the outline of the project.

The first of the seven steps, Step Zero, is to *cultivate a spirit of inquiry*. This step is the foundation of a project, as it intends to explain why a particular option is important and worth examining at a more detailed level (Melnik et al., 2016). Nutrition is a vital primary piece to the

life of a human being. This is especially true of a patient requiring intensive care treatment modalities, as the metabolic demands of these patients is typically higher than those who are considered to be healthy. Though somewhat limited in quantity, current research shows support for the elimination/reduction of routine GRV assessments (McClave, et al., 2016). Considering the support garnered from previous studies, further examination could also support this practice change on a broader spectrum across the healthcare landscape.

The next step, Step One, is to address the inquiry in PICOT format: *Patient/Problem, Intervention, Comparison, Observation & Time* (Melnyk, Gallagher-Ford, Fineout-Overholt, 2016). This format aided greatly in the overall development of the project and recording of the data, as it helped to ask questions of the overall analysis. Addressing the problem specifically, assigning the population to be assessed, establishing the specific intervention to be initiated by the researcher, determining a comparison group to review differences and similarities, and focusing on a time period for analysis were all equally important steps to implement for analysis.

Step Two of the EBP process revolves around finding the best available evidence addressing the topic that has already been recorded ((Melnyk et al., 2016). Although the topic of eliminating routine GRV assessments has only been addressed aggressively in recent years, initial research displays promise and actually supports this practice change; however, the topic is still relatively new and will require more established data in order to be considered standard at a broader level.

Step Three of the EBP process is the analysis of the current evidence available. Finding statistics that addresses the topic is one thing, but determining their overall relevancy and reliability is more important. Analyzing the data thoroughly will also generally narrow the spectrum of the supporting evidence. It is important to obtain as much evidence as possible

when attempting to implement a practice change, however it is more important that data collected is from reputable sources and is a minimal risk for being subject to bias (Melnyk et al., 2016).

Step Four of the EBP process is stated as follows: *integrate the evidence with clinical expertise and patient preferences and values*. This step attempts to answer the question of why a particular study and/or intervention is being established. Although current data and research into a topic might warrant further exploration or forms of physical intervention(s), this does not mean that the research or intervention(s) should be implemented. As in the case of routine GRV assessment elimination, it is vital to understand the overall complexities of the assessment process (Melnyk et al., 2016). Current research supports this practice change within the general field of nursing, but how does it affect patients within an intensive care environment? In order to properly assess this concept, the implementation of this study will be specifically located to an intensive care environment with nurses who are trained to assess and intervene in a wide range of critical care modalities, including advanced EN tube placements and maintenance.

Step Five, or evaluating of results, is a required piece of any research project, as supportive and observable data are cornerstones to any EBP research. Without measurable objectives and organized data collections systems, results could be seen as incomplete or invalid. Negative, positive, and inconclusive data should be measured and recorded properly in order to ensure the integrity and authenticity of a project (Melnyk et al., 2016). For this project it is important to document thoroughly the method of data collection, as most data will come from secondary sources. Although this data will be highly useful in determining best practice for patients requiring EN support, secondary data collection also presents the risk of inconsistencies (Reigner, et al., 2013).

Data will be collected via a researcher-developed survey instrument specifically designed for evaluation of this planned practice change. Implementation of the evidence-based guideline will occur after pilot testing the survey tool via a sample population prior to the practice change. This will not only verify the data collection instrument but also validate collection methods.

Lastly, Step Six of the EBP guidelines is an often-overlooked part of the process but is nonetheless a very important aspect of any EBP intervention. This step refers to sharing of information and/or findings. Regardless of whether a project invokes a desired or predictable outcome, its results can generally be seen as a positive influence on clinical practice. Information should be gathered so that it can be shared with those who can apply it properly (Melnyk et al., 2016). For this project, information and results will be shared with intensive care staff and the healthcare organization. This data will be shared in hopes of implementing the practice change house-wide, based on evidence-based guidelines as well as success found at the facility level.

Changes or updates to current nursing practices are largely welcomed within advanced clinical settings, especially when sufficient amounts of research and data support modifications in practice; however, change in practice does not always happen instantly. Mild or moderate resistance to change is often present, especially when it comes to clinical nursing practice within larger healthcare organizations (Shirey, 2013). Patience and repetition are often needed in order for acceptance of the need to modify to take full effect.

Methodology and Design

This project utilized a pre-post chart review design over a 60-day period within the adult ICU at southeastern hospital facility and analyzed multiple critically-ill patients impacted by numerous disease processes. The direct requirement for inclusion was limited to patients who

received enteral nutrition support for at least 24 hours within the ICU during the pre-selected 60-day period of time. In order to limit inconsistencies of data interpretation and to evenly evaluate the data between the routine and cessation groups, the study was split into two consecutive 30-day periods of time. The routine group was evaluated within the first 30 day period and the cessation group was evaluated within the second 30-day period. Patients within the routine group continued to receive routine GRV assessments via direct aspiration by the nursing staff, whereas the cessation group would follow the UVA Medical Center guidelines and algorithm. Data collection focused on tolerance of EN support, total milliliters of EN delivered, and recordings of incidence(s) of aspiration pneumonia and occurrence(s) of emesis. Other pertinent demographic data related to the care of these patients (i.e. diagnosis, use of intravenous vasopressors and/or intravenous narcotic drips) were also collected and recorded for informational purposes, though they were not specific to the four previously mentioned primary questions of the project.

The PI-developed educational materials for the ICU staff were provided. Each ICU staff member was educated about the practice change by the PI via mandatory in-service training within the designated work room of the ICU. All in-service training sessions followed the southeastern hospitals' educational standards. Content for these in-services included a handout of the UVA Medical Center guidelines and algorithm (see Appendix A) detailing evidence supporting this practice change, a copy of a *STOP Sign* (see Appendix B) that would be placed above the bed of every patient's room, and an educational flyer for each clinical staff member explaining the change in practice. Each educational session lasted roughly five to ten minutes. ICU staff were then given the opportunity to ask any questions or address any concerns related to this practice change both during the in-service as well as at any point during

the project. All nursing staff employed in the ICU (n=54) received this training. The PI's contact information including name, phone number and email address was also posted within the unit for the clinical staff. A *STOP Sign* was posted outside of every patient room, as well as above every patient bed in order to aid with compliance and remembrance of the new protocol by the ICU clinical staff.

A roster containing the names and signatures of clinical staff for the ICU (including any temporary contract clinical staff members) was collected by the PI (See Appendix C). For staff not currently assigned to this specific ICU roster and those unable to attend previously scheduled in-service training sessions, the UVA Guidelines and Algorithm was made available and posted within the ICU nurses' station and in the staff break area. This information contained the reasons for this practice change via the *Educational Handout* (see Appendix D) and *STOP Sign*. Outside clinical staff members working in the ICU were also required to review this material and sign the above-mentioned roster sheet in order to verify acknowledgement of the material and of this practice change.

To address each clinical question, secondary data was obtained via retrospective chart review within Cerner® PowerChart™ with the study completed via 30-day pre and post intervention design. The routine portion of the study was completed via retrospective chart review of all patients admitted to the Medical ICU over a 30-day period who received EN for greater than 24 hours. Charts were reviewed to determine the following: patient age, patient admitting diagnosis, total volume of EN received daily compared to provider ordered volume, type of EN access, number of occurrences of GRV assessments, number of emesis occurrences while receiving EN, incidence(s) of aspiration pneumonia, intravenous narcotic(s) administration, and intravenous vasopressor(s) administration. The cessation portion of the

study was also completed via retrospective chart review for a total of 30 days post-implementation using the same PI-developed data collection tool.

After data collection, all information was coded and entered into SPSS® Version 25 for analysis of descriptive frequencies. Volume of EN received as compared to ordered was calculated by mean percentage and standard deviation. Patient age, number of emesis occurrences, and incidence(s) of aspiration pneumonia was also recorded. Additionally, the number of GRV assessments completed as compared to ordered was analyzed via SPSS®.

Chapter IV

The results of this study will be discussed in this chapter. Reported findings include patient demographics, relationships between routine GRV assessments and total volume of EN received and defining incidence of complications frequently associated with EN and GRV assessments. Pre-and post-implementation chart reviews were used to determine the effects of implementation of the GRV algorithm designed to eliminate the use of routine GRV assessments.

Sample Description

At conclusion of the study, a total of 47 participants were identified and used in data collection via retrospective chart review. SPSS® Version 25.0, was used for data and exploratory analysis. Of the 47 patient records reviewed, 24 (51%) were male and 23 (49%) were female. The average patient age for the routine group was 58.28 years (SD = 14.94), while the average age for the cessation group was 65.27 years (SD = 19.034). The total range of ages for both groups was 21 to 90 years of age.

The largest percentage of patients were admitted with a diagnosis of respiratory origin (43%). Other admitting diagnoses were sepsis (23%), renal (21%), cardiac (11%), and other

(2%). Multiple comorbidities were also listed for a large percentage of the patients, however only the primary admission diagnosis was recorded.

Enteral nutrition delivery routes consisted of Nasogastric (NG), Orogastric (OG), Percutaneous Endoscopic Gastrostomy (PEG), and Jejunostomy (JJ). Percentages for use of EN delivery route for the duration of the project are as followed: NG (15%), OG (55%), and PEG (30%). OG tubes were most commonly used within the ICU, as a large percentage of patients analyzed were orally intubated and receiving mechanical ventilation (MV) for respiratory support. It is medically contraindicated at the southeastern hospital for patients with JJ tubes to have residuals levels assessed via aspiration, therefore data regarding these patients was not included in this project.

It has been well documented that patients requiring intravenous vasopressors or intravenous narcotics are at a higher risk of decreased gastric motility and GI digestive complications. This is especially true for patients requiring these therapies simultaneously. Such complications include but are not limited to bowel impaction, delayed gastric emptying, gastritis, emesis, aspiration, other digestive complications, or any combination of the aforementioned (Aderinto-Adike & Quigley, 2014). Therefore, data regarding the usage of vasopressor and narcotic intravenous drips was also collected.

A total of 25 patients within this study required the use of intravenous vasopressor support at some point during his/her admission to the ICU. The number of patients within the ICU requiring at least one intravenous vasopressor in the routine group was 10 (40%), whereas the number of patients in the cessation group requiring at least one vasopressor was 15 (60%). The total number of patients requiring intravenous narcotic drips was very similar, totaling to 24

patients. Nine patients (37.5%) in the routine group received intravenous narcotics, whereas 15 patients (62.5%) were recipients during the cessation group time period.

Table 1

Sample Characteristics

<u>Characteristic</u>	<u>n (total)</u>	<u>Pre</u>	<u>Post</u>
Gender			
Male	24	14	10
Female	23	11	12
Admitting Diagnosis			
Respiratory	20	9	11
Sepsis	11	5	6
Renal	10	7	3
Cardiac	5	3	2
Other	1	1	0
EN Delivery Route			
NG	7	6	1
OG	26	12	14
PEG	14	7	7
Use of Narcotic Drip(s)			
No	24	9	15

Yes	23	16	7
Use of Vasopressor(s)			
No	22	15	7
Yes	25	10	15

Clinical Questions

Clinical Question 1: For patients receiving EN, does cessation of routine GRV assessments lead to increases in total received EN as compared to performing routine GRV assessments?

An independent samples t-test was used to compare the overall percentage of EN delivered for patients in the routine and cessation groups. Percentages were recorded for each patient by recording the total amount of EN received and dividing this amount by the amount of prescribed EN. This percentage was then used as the dependent variable to compare the difference in routine and cessation groups as the independent variables. Data was also found to be normally distributed, with a negative skewness (-0.429). There was a significant difference in EN percentages between the routine group ($M = .60$, $SD = .17733$) and cessation group ($M = .81$, $SD = .12167$), $t(45) = -4.77$, $p = .00$, $CI = -0.305$ to -0.1238 .

These results reveal that by following the UVA Medical Center's guidelines and algorithm increased the total percentage of EN received from 60% in the routine group to 81.1% in the cessation group. Although other numerous health and nutritional factors can be considered, it is safe to hypothesize from this data that eliminating routine GRV assessments has a significant influence on the total amount of EN delivered.

Clinical Question 2: For ICU patients receiving EN, what effect does cessation of GRV assessments have on incidence of emesis as compared to performing routine GRV assessment?

Occurrences of emesis were recorded for each patient and then documented into SPSS as nominal value of No or Yes (No = 0, Yes = 1). Skewness and kurtosis were assessed, and the data was determined to not be normally distributed; therefore, a Mann-Whitney U test was conducted to compare occurrences of emesis between the routine and cessation groups. Results of the Mann-Whitney U test indicated that the occurrences of emesis for the routine group ($Mdn = 25.7$) were not considered to be statistically significant when compared to the cessation group ($Mdn = 22.07$), $U = 232.5$, $p = .117$.

Though there were five occurrences of emesis in the routine group compared to only one occurrence in the cessation group, results are not statistically significant to suggest that elimination of routine GRV assessments directly lead to a decrease in occurrences of emesis. More statistics are needed to determine the effectiveness of elimination of routine GRV assessments in relation to emesis occurrences.

Clinical Question 3: For ICU patients receiving EN, what effect does cessation of GRV assessments have on incidence of aspiration pneumonia as compared to performing routine GRV assessment?

The occurrence of aspiration pneumonia was recorded for each patient and then documented into SPSS as nominal value of NO or Yes (No = 0, Yes = 1). There was one occurrence of aspiration pneumonia in the routine group and no occurrences in the cessation group. Skewness and kurtosis were assessed, and the data was determined to not be normally distributed; therefore, a Mann-Whitney U test was conducted to compare occurrences of aspiration pneumonia between the routine and cessation groups. Results of the Mann-Whitney U

test indicated that the occurrences of aspiration pneumonia for the routine group ($Mdn = 24.44$) were not considered to be statistically significant when compared to the cessation group ($Mdn = 23.5$), $U = 264$, $p = .348$. Patients receiving routine GRV assessments had insignificantly higher occurrences of aspiration pneumonia than patients not receiving routine GRV assessments.

Clinical Question 4: Amongst nursing staff providing EN, what effect does participation in mandatory in-service training have on post-implementation compliance with the new GRV assessment guidelines and algorithm in the pilot critical care unit?

Upon review of the 22 post-implementation patient EMRs, a total of eight GRV assessments via direct aspiration were conducted during the 30-day post-implementation period. However, chart audits revealed only three of the eight GRV assessments were not warranted by the new guideline and algorithm. All three GRV assessments were conducted during the course of one 12-hour clinical shift by a singular nursing staff member. Of the 54 nurses educated on this project, only one was found to assess residuals outside of the UVA Medical Center guidelines, resulting in a 98% compliance with the project initiative.

Face to face in-service training was used as a foundational part of this project. This method was chosen as a way to possibly enhance staff awareness of the project, as well as give staff the ability to voice any concerns and opinions. Time was also allotted at the end of each in-service training sessions for any questions brought forth by the staff in relation to this project and its design.

Chapter V

A discussion of findings from this project and implications for future practice will be discussed in this chapter. A review of patient demographic characteristics is included, as well as statistical significance, and effects of the implemented practice change. Furthermore, the success

of the nursing education sessions, nursing compliance with process change, implications to clinical practice, strengths, and limitations of this project are also included in this chapter.

Patient demographics indicate consistency with those of other facilities of the same size, with 51% identified as male and 49% as female. Average patient age for both pre-and post-intervention groups was 58.28 years and 65.27 years, respectively. This similarly follows expected demographic data as seen in other acute-care facilities (Sun, Karaca & Wong, 2018). Additionally, the identified primary diagnoses indicate consistency with ICU admissions nationwide. According to the Society of Critical Care Medicine, the five primary ICU admission diagnoses nationally are respiration failure, acute myocardial infarction, cerebral infarction, cardiovascular procedures, and septicemia (Society of Critical Care Medicine, n.d.). Three of these diagnoses were mirrored in patient demographics, with 43% of patients admitted with a primary respiratory diagnosis, followed by sepsis (23%), and cardiac (11%). The remaining identified common diagnosis, renal (21%), is often a complication of previously referenced diagnoses and therefore remains representative of typical ICU patient populations.

Vasopressor and narcotic use are also commonly noted in patient demographics, with a total of 25 of 47 (53%) of patients requiring intravenous vasopressors during the ICU stay and 24 of 47 (51%) of patients requiring intravenous narcotics. This again aligns with standards of ICU care which indicate routine use of intravenous vasopressors to achieve hemodynamic stability and narcotics for patient comfort. (Aderinto-Adike & Quigley, 2014).

This project provides additional data in the evolving clinical practice and management of enteral nutrition. While guidelines recommend practice change, it is often difficult to enact. Demonstrated compliance and statistically significant increases in total EN volume received support nursing practice change acceptance. By adopting the UVA guidelines and algorithm

regarding routine GRV assessments, this project demonstrated that GRV elimination successfully increased overall volume of EN received without clearly contributing to adverse outcomes.

Strengths

Adoption of the practice change led to statistically significant increases in total volume of EN received. The difference in EN percentages received compared to ordered in the routine group ($M = .60$, $SD = .17733$) versus cessation group ($M = .81$, $SD = .12167$) indicates that use of a GRV cessation algorithm leads to an increase in total volume of EN ($t(45) = -4.77$, $p = .00$). Additionally, the results of the routine group remain in line with internal research conducted by the southeastern acute care facility in 2015. Intervention results are similar to results by Reignier et al. (2013) which found a statistically significant increase in overall EN volume received when routine GRV assessments are eliminated. This is important, especially when considering the benefits of adequate nutrition that are clearly demonstrated in the literature.

Despite critical care guidelines suggesting the cessation of routine GRV monitoring, there is a lack of current literature demonstrating successful adoption of the practice change and effects on patient EN intake and tolerance. Therefore, this study aids in filling a gap in the literature by examining adoption of the practice change within a specific patient population. The scope of this research also fills a void in the literature, as it examines both complications as well as gains in EN provision.

Additionally, by utilizing a closed ICU adoption of the practice change was more easily tracked. By limiting the in-service training to a specific group of nursing staff members, compliance to the new guidelines were deemed to be more successful and controlled.

The use of mandatory point-of-care in-servicing was found to be an effective tool for practice change, with chart review indicating a total of eight GRV assessments completed over the 30 day post-implementation period, of which only three were found to fall outside of algorithm guidelines. These outliers were all traced back to one staff member indicating that of the 54 nurses who received in-servicing education, 53 demonstrated full compliance with the practice change. This resulted in a 98% efficiency rate relating to the mandatory in-service education. Although in many cases it can be more time consuming, the use of face-face point of care training has been found to be effective and motivational (Bluestone et al., 2013). This is again seen in the results and commitment of the nursing staff to the practice change.

Limitations

Secondary data collection was used in this project. Because of the fact that this collection relies on the accuracy and completion of data recorded in the EMR by staff members, inconsistencies in information must be considered. Accuracy of the information collected was determined through examination and cleansing. Another inconsistency could be that of incomplete documentation. If a healthcare provider does not record data properly, these results (or lack thereof) have the ability to skew or corrupt data analysis (Rebeiro, 2018).

Sample size and time frame could also be considered weaknesses of this study. As stated earlier, a total of 47 chart reviews were included for analysis within this project. These reviews were conducted over two consecutive 30 day periods of time. The sample size and length of study were sufficient to collect and analyze data within a reasonable time period. Further research efforts are warranted with a larger sample size and/or longer length of time.

Review of data was also limited to one critical care area. Consistent staffing was beneficial in providing initial education and follow-ups throughout the study, however extending

the research into multiple acute-care healthcare units and/or facilities where EN is delivered routinely would also provide beneficial data related to this project. Obtaining more data in the future regarding the newly instituted UVA Medical Center guidelines and algorithm will be very beneficial for analysis of this new protocol.

Though incidence of adverse outcomes was studied, results were not statistically significant to support a correlation between elimination of GRV assessments and development of aspiration pneumonia or incidence of emesis. This again coincides with results from previous studies finding no association between GRV measures and adverse events, outcomes, or complications (Reignier et al., 2013).

Although this project focused on adult patients within an intensive care environment, statistical information from this project will be made available for review to all appropriate entities in the southeastern hospital facilities' patient care area. This will include pediatrics, medical-surgical, and outpatient care areas.

Implications to Practice and Research

This change project examined the implications of a new EBP protocol to align with current evidence-based EN support guidelines. As with many medical and nutritional therapies, nursing staff compliance is key to institutional culture changes and improvement of patient care; this project indicates one method for increasing compliance is the use of face-to-face point of care training. The high level of nursing staff compliance with the new protocol mirrors literature recommendations that didactic education is beneficial to learners. By examining future education opportunities and methods to increase didactic content, a high rate of nurse compliance can be achieved. Tracking patient outcomes as well as practice change compliance rates can

more easily identify the success of practice changes (Bluestone et al., 2013). This information can then be utilized to support widely-adopted practice change within healthcare organizations.

While two of the clinical questions did not have statistically significant outcomes, inclusion of a larger patient population and/or a wider range of patient conditions could provide additional information. However, the statistically-significant increase in total volume of EN received with GRV elimination highlights the importance of examining current practice in order to achieve optimal outcomes. By utilizing algorithms and protocols one could more easily transition the practice change across multiple patient populations, facilities, and/or geographic regions. The practice change also emphasizes the importance of outcomes tracking to ensure patient safety and optimal patient outcomes, although a gap remains in the literature for outcomes tracking of practice changes related to EN monitoring.

It is encouraging to see such statistically significant results regarding overall volume of EN delivered related to the elimination of routine GRV assessments. A compliance rate of 98% illustrates that face-to-face education via mandatory in-service training was highly beneficial regarding the overall success of this project. It also suggests that providing face-to-face instructions could be beneficial for future nursing practice change education sessions. However, further studies are needed to support this as a new practice of providing EN support to the acute and long-term care population.

Conclusion

EN is a very important medical treatment and is necessary for patients who are unable to feed themselves naturally. Proper nutrition and caloric intake can be considered even more important within the critical care environment, where a person's body is often in a more stressful state and requires extensive recovery from injury and/or illness. In fact, many times caloric

needs are increased depending on the extensiveness of one's injury and/or illness. For these reasons it is vital that patients receive as much of his/her clinically appropriate nutrition amount as possible (Aderinto-Adike & Quigley, 2014). As is illustrated in the literature review, there is an essential need to provide adequate nutrition support in a safe manner to those patients in ICU. While new practice guidelines have been released that no longer call for the routine measurement of GRVs, adoption of this practice change has been slow. Adoption of an algorithm for assessment of EN tolerance allows nursing staff to understand perceived tolerance concerns and proactively provide EN as ordered.

In conclusion, the enacted practice change found that an acute care facility can successfully implement practice change related to routing GRV assessment through the use of mandatory nurse in-service training sessions. This change led to statistically significant increases in overall volume of EN received as compared to ordered. Thus, providing a larger number of nutritional requirements to ICU patients. Future implications fall within other various patient populations as well as the development of EN protocols to further drive nursing practice changes. The implementation of this practice change in a southeastern acute care facility has illustrated positive improvement in nursing education delivery methods and the overall nutritional status of ICU patients.

References

- Aderinto-Adike, A., & Quigley, E. (2014). Gastrointestinal motility problems in critical care: a clinical perspective. *Journal of Digestive Diseases, 15*(7), 335-344.
- Ahmed, S., Le, V., Kaitha, S., Morton, J., & Ali, T. (2012). Nasogastric tube feedings and gastric residual volume: a regional survey. *Sothorn Medical Journal, 105*(8), 394-398.
- Bhaumik, S. (2017). Use of evidence for clinical practice guideline development. *Tropical Parasitology, 7*(2), 65-71.
- Bluestone, J., Johnson, P., Fullerton, J., Carr, C., Alderman, J., & BonTempo, J. (2013). Effective in-service training design and delivery: evidence from an integrative literature review. *Human Resources for Health, 11*(1), 1–26. <https://doi.org/10.1186/1478-4491-11-51>.
- Kueny, A., Shever, L., & Titler, M. (2015). Facilitating the implementation of evidence-based practice through contextual support and nursing leadership. *Journal of Healthcare Leadership, 7*, 29-39. doi: 10.2147/JHL.S45077.
- Kuppinger, D., Rittler, P., Hartl, W., & Ruttinger, D. (2013). Use of gastric residual volume to guide enteral nutrition in critically ill patients: a brief systematic review of clinical studies. *Nutrition, 269*(9), 1075-1079.
- McClave, S., Taylor, B., Martindale, R., Warren, M., Johnson, D., Braunschweig, C., McCarthy, M., Davanos, E., Rice, T., Cresci, G., Gervasio, J., Sacks, G., Roberts, P., & Compher, C. (2016). Guidelines for the provision and assessment of nutrition support therapy in the adult critically ill patient: Society of critical care medicine (SCCM) and American society for parenteral and enteral nutrition (A.S.P.E.N.). *Journal of Parenteral and Enteral Nutrition, 40*(2), 159-211.

- Navicent Health. (2018). About Us. Retrieved from: <https://www.navicenthealth.org/about-us.html>.
- Navicent Health. (2018). Service & Centers. Retrieved from: <https://www.navicenthealth.org>.
- Melnyk, B., Gallagher-Ford, L., & Fineout-Overholt, E. (2016). Improving healthcare quality, patient outcomes, and costs with evidence-based practice. *Reflections of Nursing Leadership, 42*(3), 1-8.
- Methany, N., Mills, A., & Stewart, B. (2012). Monitoring for intolerance to gastric tube feedings: a national survey. *American Journal of Critical Care, 21*(2), 33-40. doi: 10.4037/ajcc2012647.
- Minju, L., & Jiyeon, K. (2014). Nutritional support, gastric residual volume and nutritional status during enteral nutrition in intensive care unit patients. *Korean Journal of Adult Nursing, 26*(6), 621-629.
- Mitchell, G. (2013). Selecting the best theory to implement planned change. *Nursing Management, 20*(1), 32-37.
- Ozen, N., Blot, S., Ozen, V., Arikan D., Ayse G., Pinar; C., Fatma I., & Labeau, S. (2018). Gastric residual volume measurement in the intensive care unit: an international survey reporting nursing practice. *Nursing in Critical Care, 23*(5), 263-269.
- Ozen, N., Tosun, N., Yamanel, L., Altintas, N., Kilciler, G., & Ozen, V. (2016). Evaluation of the effect on patient parameters of not monitoring gastric residual volume in intensive care patients on a mechanical ventilator receiving enteral feeding: a randomized clinical trial. *Journal of Critical Care, 33*, 137-144. doi: 10.1016/j.jcrc.2016.01.028.
- Parrish, C., & McCray, S. (2019). Part I enteral feeding barriers: Pesky bowel sounds & gastric residual volumes. *Practical Gastroenterology, 43*(1), 35-50.

- Reignier J, Mercier E., Le Gouge A., Boulain T., Desachy A., Bellec F., Clavel M., Frat J., Plantefevre G., Quenot J., & Lascarrou J. (2013). Effect of not monitoring residual gastric volume on risk of ventilator-associated pneumonia in adults receiving mechanical ventilation and early enteral feeding: a randomized controlled trial. *Journal of the American Medical Association*, 309(3), 249-256. doi: 10.1001/jama.2012.196377.
- Ribeiro, F. (2018). Secondary data in research – Uses and opportunities. *Revista Ibero-Americana de Estratégia*, 17(4), 1-4.
- Shirey, M. (2013). Lewin's theory of planned change as a strategic resource. *The Journal of Nursing Administration*, 43(2), 69-72. doi: 10.1097/NNA.0b013e31827f20a9.
- Singer, P., Blaser, A., Berger, M., Alhazzani, W., Calder, P., Casaer, M., Hiesmayr, M., Mayer, K., Montejo, J., Pichard, C., Preiser, J., van Zanten, A., Oczkowski, S., Szczeklik, W., & Bischoff, S. (2019). ESPEN guideline for clinical nutrition in the intensive care unit. *Clinical Nutrition*, 38(1), 1-32. doi: 10.1016/j.clnu.2018.08.037.
- Society of Critical Care Medicine. (n.d.). Critical care statistics. Retrieved from: <https://www.sccm.org/Communications/Critical-Care-Statistics>.
- Sun, R., Karaca, Z., & Wong, H. (2018). Trends in hospital inpatient stays by age and payer, 2000-2015. <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb235-Inpatient-Stays-Age-Payer-Trends.jsp>.
- Tume, L., Latten, L., & Kenworthy, L. (2017). Paediatric intensive care nurses' decision-making around gastric residual volume measurement. *Nursing in Critical Care*, 22(5), 293-297.

Appendix A

UVA Medical Center Gastric Residual Check Guideline and Algorithm

TITLE: Adult Gastric Residual Check Guideline

This is a Guideline (recommended best practice)

OBJECTIVE:

The purpose of this guideline is to establish a set of evidence-based parameters for checking gastric residual volume (GRV) in an effort to reduce the number of unnecessary gastric residual checks in patients who are tube fed into their stomachs. This does not apply to patients who are enterally-fed into the small bowel.

PATIENT POPULATION:

- Adult Acute Care
- Adult Critical Care

PATIENT ASSESSMENT**Rationale:**

Despite the lack of evidence to support checking gastric residual volume in enterally-fed patients, this practice has been used for years as a presumed surrogate for gastric motility and the potential risk for aspiration pneumonia events.

The current evidence indicates:

- Minimal correlation exists between GRV and clinical signs of intolerance such as gastric emptying and abdominal distention.
- GRVs do not correlate with incidences of pneumonia, regurgitation, or aspiration pneumonia.
- Use of GRVs leads to increased enteral-access device clogging, inappropriate cessation of enteral nutrition (EN), consumption of nursing time and healthcare resources, and may adversely affect outcome if volume of EN delivered is reduced through delayed or held feeds.
- Eliminating the practice of GRV checks improves delivery of enteral nutrition without jeopardizing patient safety.
- The Society of Critical Care Medicine and the American Society for Parenteral and Enteral Nutrition no longer recommend GRV be used as part of routine care to monitor ICU patients receiving enteral nutrition.

Assessment:

- Do NOT check gastric residual routinely.
- Assess for enteral feeding tolerance every 12 hours, see symptoms in algorithm below.
- If gastrically-fed, the following patient populations* qualify for GRV checks until tolerance is established, per recommendations below:

- o Critically ill surgery patients
- o Critically ill trauma patients
- o Head injury patients
- o Abdominal surgery pts until tolerance established
- o Obtunded patients or patients in vegetative state initially

* The order set will indicate these patient populations may benefit from GRV checks. If GRV checks are clinically necessary, the LIP will order.

University of Virginia Medical Center
Clinical Decision Tool for Transitioning Away From GRV Checks

ADULT TUBE FEEDING INTOLERANCE ALGORITHM
 (Ensure backrest elevation > 30 degrees)

<u>Abdominal Signs</u>	<u>Nausea</u>	<u>Emesis</u>
Distention	Antiemetics	Hold Feeding
Firm	Minimize Narcotics	Check for Constipation
Tense	Check for Constipation	Notify LIP
Guarding	Notify LIP	
Discomfort		

GASTRIC RESIDUAL CHECKS MAY BE USEFUL IN SOME PATIENT POPULATIONS (IF GASTRICALLY FED):

- Critically ill (ICU) surgery patients
- Critically ill (ICU) trauma patients
- Head injury
- Post op abdominal surgery
- Obtunded/Vegetative state

If so:

- Maintain a semi-recumbent position with the backrest elevation >30–45°, or place patient in reverse Trendelenburg at 15-20° if no contraindication exists for that position.
- Patients with femoral lines can be elevated up to 30°.
- Assess patient for abdominal distension, discomfort, fullness, nausea, vomiting
- Check GRV every 8 hours or per ordered frequency. Place patient on their right side first (while backrest elevation remains at >30°) for 15–20 minutes before checking a GRV (to take advantage of gravity and to promote gastric emptying).
- Flush tube with water after any GRV check, per Lippincott
- If gastric residual is >500 ml on 2 consecutive residual checks, hold tube feeding and contact LIP.
- Discontinue order after 48 to 72 hours, if < 500 mL, and no abdominal signs (see above)
- If clinical status changes, can resume gastric residual checks.

If GRVS are high on 2 consecutive checks:

- Check for constipation.
- Minimize use of narcotics or consider use of a narcotic antagonist to promote intestinal contractility.
- If on bolus feeds, switch to nocturnal or continuous infusion.
- Consider post-pyloric feeding access.
- Initiate aggressive regimen for oral hygiene.

EDUCATION

Nurses and LIPs will be educated on this guideline through nursing huddle, newsletter, and medical staff communications.

Appendix B

In-service Training Staff Acknowledgement Form

I have read and understand the new gastric residual volume (GRV) recommendation set forth by Medical Center Navicent Health.

Printed Name: _____

Signature: _____

Date: _____

Appendix C

Stop Sign

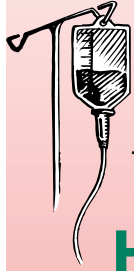


******Effective September 17, 2019 it is no longer a recommended nursing practice to routinely assess gastric residual volumes.******

Appendix D

In-service Handout for Clinical Staff

Did you know...



Studies show that on average, patients receive only 55% of the tube feedings they are ordered.

This impacts mortality rates, length of stay, and more!

Here's how you can help...

- **Do not routinely check residuals unless specifically ordered.**
 - **The Society of Critical Care Medicine (SCCM) and The Journal of Enteral & Parenteral Nutrition (JPEN) no longer recommend routine gastric residual assessments!**
- **Do Not turn off feedings for dressing changes, turnings, bathing or any other routine nursing care.**
- Keep head of bed elevated at ≥ 30 degrees.
- When feedings must be turned off for ordered procedures, resume as soon as possible post-procedure.

