

Review Article

Nursing Care for Patients with Gastrointestinal Bleeding

Zeyrek Kurtoglu Seyma, RN, MSc

Lecturer, First and Emergency Aid Program, Inegol Vocational School, Department of Medical Services and Techniques, Bursa Uludag University, Bursa, Türkiye

Erbas Atiye, RN, PhD

Assistant Professor, Department of Surgical Diseases Nursing, Faculty of Health Sciences, Duzce University, Duzce, Türkiye

Correspondence: Seyma Zeyrek Kurtoglu, Lecturer, Inegol Vocational High School Medical Services and Techniques, First and Emergency Aid Program, Bursa Uludag University, Bursa, Türkiye
Email: seymakurtoglu@uludag.edu.tr

Abstract

Gastrointestinal bleeding refers to bleeding anywhere in the digestive system, starting from the mouth, esophagus, stomach, small intestines, large intestines, and anus. Causes of bleeding can be ulcers, diverticulitis, ulcerative colitis, polyps, gastrointestinal infection, tumors, Crohn's disease, liver disease, Mallory Weiss syndrome, angiodysplasia, neoplasms, or certain medications. Gastrointestinal bleeding can be either lower gastrointestinal bleeding or upper gastrointestinal bleeding. Most minor bleeding stops spontaneously, whereas significant bleeding from conditions such as esophageal varices or peptic ulcer perforation can be fatal. A patient who loses intravascular volume due to massive bleeding may go into hypovolemic shock. The basic principle in managing a patient with gastrointestinal bleeding is to restore hemodynamics and stabilize the patient rapidly. In order to manage patients appropriately, the nurse caring for the patient should know critical patient care, apply care standards, follow current guidelines, and contribute to the literature as a caregiver.

Keywords: bleeding, endoscopy, gastrointestinal tract, nursing care, nursing

Introduction

Acute gastrointestinal tract (GI) bleeding is the common name for bleeding in any or more than one localization of the esophagus, stomach, and small and large intestines, starting from the mouth. GI bleeding is seen as upper and lower GI bleeding. Upper GI bleeding is approximately 40 cases per 100,000 population per year, while lower GI bleeding is 20-30 cases per 100,000 population per year (Oakland, 2019).

Nurses, who are responsible for continuously monitoring vital signs, recognize bleeding signs and severity at an early stage and contribute to the guidance of the treatment process. Correctly managing fluid and blood transfusions during treatment helps restore the patient's hemodynamics. Nurses need to implement the patient's treatment plan meticulously, to know the endoscopic methods used for treatment at a basic level, to

understand the purpose of medical treatments, to follow the patient closely against the possibility of rebleeding, and to know the complications that may occur due to endoscopic procedures in order to improve clinical outcomes. Holistic and detailed care provided to the patient accelerates the healing process (Chapman et al., 2019).

Nursing Care of the Patient with GI Bleeding

The basic principle in the treatment of patients with GI bleeding is to rapidly establish hemodynamics and stabilize the patient (Yilmaz, 2017). A patient who loses intravascular volume due to massive bleeding may go into hypovolemic shock (Louis, 2017). Therefore, nurses should closely monitor the signs and symptoms of hypovolemic shock, such as respiratory rate and depth, pulse rate and characteristics, blood pressure, skin condition, desaturation,

and decreased level of consciousness (Blumlein & Griffiths, 2022).

Patients in hypovolemic shock or the pre-shock stage should be treated with the ABCDE (Airway, respiration, circulation, neurologic evaluation, physical examination) approach determined by the European Resuscitation Council (ERC, 2021) for each critically ill patient. For this purpose, the patient's airway, respiration, and circulation should be stabilized, and neurological and physical examination should be performed and recorded (Michels et al., 2022).

Airway: In unconscious patients with nausea, vomiting, and hematemesis, airway patency should be checked, and airway continuity should be ensured. If there is anything in the mouth that may interfere with breathing (dentures, stomach contents, blood, vomit, etc.), it should be removed. If necessary, intraoral aspiration should be performed so as not to cause gag reflex. Airway patency should be ensured and ventilated using the airway opening maneuver appropriate for the patient. If the patient cannot maintain airway patency and is unconscious, airway patency should be ensured by selecting the appropriate size airway for the patient (Higginson & Parry, 2013).

Breathing: The patient's respiratory rate, pattern, depth, and chest movements should be monitored. Oxygen saturation should be monitored, and oxygen should be started in individuals with low saturation (Higginson, 2009).

Circulation: At least two wide-lumen vascular accesses should be available for rapid intervention and fluid therapy. If shock is present, a Foley catheter should be inserted to monitor the patient's urine output, and the volume of urine output should be monitored. Blood should be drawn from the patient for laboratory findings such as cross-match compatibility, complete blood count, renal function, and coagulation factors, and an electrocardiogram (ECG) should be taken and monitored. Fluid resuscitation should be continued by physician orders. Since aggressive fluid therapy in patients with GI bleeding may cause rebleeding, fluids should be given in a controlled manner at an appropriate rate. Elderly patients with heart

and renal failure should be monitored for fluid overload (pulmonary edema) (Mayo, 2017; Smith & Bowden, 2017).

Disability (Neurological Assessment): The patient's neurologic status should be evaluated with AVPU and Glasgow Coma Scale (GCS) at appropriate intervals. Remember that patients with a GCS score below seven may need resuscitation (Basauhra et al., 2016). Since hepatic encephalopathy may be seen, especially in patients with GI bleeding due to an underlying liver disease, changes in the patient's consciousness should be closely monitored. Blood glucose should be checked in unconscious patients. Neurologic evaluation should include a pupil reflex examination. A different response of the pupils from ordinary may indicate neurological damage (Evans & Morrow, 2015).

Exposure (Body Examination): On physical examination, it is essential to look for findings indicating dehydration (dry mucous membranes, pale skin color, cold extremities, cyanotic peripheries, decreased skin elasticity, collapsed eyeballs). These findings may indicate shock (Louis, 2017; Smith & Bowden, 2017). A high body temperature during physical examination should suggest a sepsis picture (Bleakley & Cole, 2020). Jaundice and the presence of ascites in the abdomen may indicate liver cirrhosis. Alcohol use should also be questioned in such patients (Ohmiya et al., 2015).

Nasogastric Catheter Application

The use of a nasogastric tube provides convenience in terms of monitoring how much bleeding the patient has. However, nasogastric tube use is not preferred in all patients with upper gastrointestinal bleeding because it may cause erosion or damage to the mucosa of the upper gastrointestinal tract (Yilmaz, 2017). If the color of the bleeding from the nasogastric tube is fresh, red, and bright, it should suggest that the bleeding is active, and if it has the consistency of coffee grounds, it should suggest that the bleeding has stopped or may be milder. While following the patient, the nurse should carefully monitor the amount, color, and characteristics of the fluid coming from the nasogastric tube (Farrar, 2018).

Since the patient's oral intake is monitored closely in patients with GI bleeding, if the patient has a nasogastric tube, oral care should be given to the patient to prevent disruption in the integrity of the oral cavity, and the nasogastric catheter should be monitored. Nasogastric catheter fixations should be changed daily, nasal skin should be evaluated, and nasal care should be given (Wang & Yu & Sung, 2022).

Transfusion of Blood Products

If the patient is to receive a blood transfusion, it should be ensured that a blood group compatibility study is performed, the compatibility test form of the prepared blood product, which includes information such as the patient's identity information, blood group, serial number, and test compatibility, is checked by at least two people, the patient's vital signs are taken before starting the transfusion and the patient is closely monitored during the transfusion period. It should be kept in mind that the patient may develop a hemolytic reaction during and after transfusion. If the product to be administered according to the patient's need is fresh frozen plasma (FFP), it should be used within 24 hours after thawing and should not be frozen again. It should be sent at most 200 ml per hour. If the product to be used is platelets, the product should be requested from the blood bank immediately before application, as platelets may clump when left for 30 minutes without shaking (Goray & Peker, 2022).

Medical Treatment

Proton pump inhibitors, blood products, and antibiotics are used in non-variceal GI bleeding. Treatment may vary according to the etiology of bleeding.

Proton pump inhibitors may decrease the risk of bleeding by suppressing gastric acidity and increasing platelet aggregation. After an intravenous (IV) bolus dose of 80 mg in the first treatment, treatment is continued at 8 mg/hour. Blood transfusion may be required in actively bleeding patients in whom hemodynamic stabilization cannot be achieved (Barkun et al., 2019). Fresh frozen plasma and platelet transfusion may be necessary in patients with coagulation disorders. The European Society for Gastrointestinal Endoscopy (ESGE) also

recommends intravenous vitamin K administration in patients without hemodynamic instability (Triantafyllou et al., 2021).

In addition to these treatments, medical treatment is recommended against *Helicobacter pylori* infection, which colonizes the mucosal layer of the stomach and causes peptic ulcers. At least two antibiotic combinations, such as clarithromycin, amoxicillin, metronidazole, tetracycline, and levofloxacin, are preferred in treatment (Fischbach, 2018).

In varicose vein-induced bleeding, medical treatment aims to reduce portal vein pressure and stop bleeding (Yilmaz, 2017). Pharmacologic agents used in the treatment are beta-blockers, somatostatin, vasopressin, and nitroglycerin. Beta-blockers aim to reduce the heart rate by 20-25%. Somatostatin and vasopressin decrease portal vein pressure by providing splenic vasoconstriction. Somatostatin is administered as a 250 ug bolus followed by a 250/500 ug/hour infusion. Vasopressin is recommended to be started at 2 mg every 4 hours and continued at 1 mg every 4 hours for five days after the patient is stable. Nitroglycerin is used to prevent renal and coronary ischemia. Nurses may cause excessive volume load in patients with acute variceal bleeding; crystalloid fluids and blood product transfusions should be given to the patient in a controlled manner at an appropriate rate, as they may increase portal pressure and cause rebleeding (Diaz Soto & Garcia Tsao, 2022; Abraldes et al., 2023).

Nursing care in Endoscopy Diagnosis and treatment

Before the procedure, the patient should be informed about the benefits of endoscopy, procedures to be performed during endoscopy, types of sedation, and risks related to the procedure, and written informed consent should be obtained from the patient (Aveyard. et al., 2022).

Oral intake should be closed 4 hours before the procedure in patients undergoing upper GI endoscopy. In lower GI endoscopy, it is recommended that the patient's diet should consist of pulp-free foods the day before the procedure, and oral intake should be closed after dinner. For colon cleansing, the colon is

washed using enemas and oral cathartic drugs, starting the night before and continuing until the morning of the procedure. Polyethylene glycol (PEG) or sodium phosphate (NAP) is used for bowel cleansing. PEG is a solution that cannot be absorbed from the intestines and provides a cathartic effect by increasing secretion. PEG solution is mixed in 4 liters of water and is used to drink approximately 250 ml every 10 minutes. If the procedure is planned for the next day, 3 liters of the drug is used on the night of the procedure, and the remaining 1 liter is used on the morning of the procedure. Since PEG preparations have a bad odor and taste, it reduces the patient's compliance with the procedure. Sulfate-free PEG preparations have been produced for this purpose, but drinking the drug mixed with 4 liters of water continues to pose a problem in terms of patient compliance because the amount is too much. PEG is safer than NAP solution and other osmotic laxatives in patients who may be prone to fluid electrolyte disturbances such as renal failure, heart failure, and liver failure (Parra-Blanco et al., 2014; Cai et al., 2023).

Sodium phosphate is a low-volume hyperosmolar drug that acts by drawing fluid into the intestinal lumen. This mechanism may increase susceptibility to fluid electrolyte disturbance. Therefore, it should be used with caution in hypertensive patients who are of advanced age, have renal failure, and use ACE (angiotensin-converting enzyme) inhibitors. When sodium phosphate is to be used, only clear liquids should be consumed from the evening before the procedure. The American Society for Gastrointestinal Endoscopy (ASGE) recommends taking 45 ml of the drug in the evening before and 45 ml 3 hours before the procedure. Although the liquid form of NAP is usually used, a tablet form is also available (Curran & Plosker, 2004).

Enemas flush the distal colon as an adjunct to oral cathartic drugs. They are used at bedtime before the procedure and on the morning of the procedure. The patient's compliance with the procedure decreases since oral cathartic drugs are mixed with a large volume of water. In order for bowel cleansing to be effective, the patient should be given the necessary information about the use of oral cathartic

drugs. Patient compliance is important in terms of good bowel cleansing. After poor bowel cleansing, lesions may be missed, and colonoscopy may fail. This requires re-planning colonoscopy for the patient, thus increasing the patient's stress and the healthcare professionals' workload (Hernández et al., 2019).

Immediately before the endoscopy, the endoscopy nurse should briefly explain the procedure to the patient and provide information on the necessary issues. The nurse gives the patient the appropriate position according to the type of endoscopy to be performed. In upper GI endoscopy, the patient is given a left lateral position, and the chin is slightly flexed. However, in cases where visualization is impossible, the patient's position can be changed to reveal the lesion or bleeding focus. During colonoscopy, the position of the patient changes significantly to visualize different structures. Research suggests the left lateral position for the visualization of organs on the right lateral side, the supine position for the visualization of the transverse colon, and the left lateral position for the visualization of right-sided organs. Positioning the patient prone may also be necessary when visualization is not good. The patient's position also changes significantly when the colonoscope is retracted. Although the prone position has a positive effect on respiration, intubation in a patient in need of resuscitation can be difficult and time-consuming. In propofol sedation, a lower incidence of hypoxemia was observed in the left lateral position than in the supine position. The nurse should determine if the patient has had hip or shoulder surgery before the procedure. While positioning the patient, the nurse should protect the patient's head, neck and spine (Polese & Giugliano & Valmasoni, 2023).

Midazolam, propofol, and opioid analgesics are usually used during endoscopy. The most common side effect of midazolam is respiratory depression. The antidote is flumazenil. Among opioid drugs, meperidine and fentanyl are most preferred. The most common side effects are respiratory depression, nausea, vomiting, and cardiovascular problems. The antidote for opioids is naloxone. Propofol is another drug

used for sedation during endoscopy. It is used in combination with other drugs because it has no analgesic effect. Propofol has a general anesthetic effect and has no antidote. Since the most common side effect of drugs used for sedo-analgesia is respiratory depression, the patient's respiration and oxygen saturation should be closely monitored. Drug side effects should be well known and necessary materials for resuscitation and drug antidotes should be available (Oztas & Etik & Oguz, 2009).

Endoscopy-induced esophageal perforation is rare but fatal. Clinical symptoms are non-specific. Symptoms vary according to the time elapsed after perforation, the site, and the extent of the injury, but the most common symptoms are pain, fever, and dyspnea. Contamination of the mediastinum by perforation can lead to high mortality. In case of perforation, chest radiography and abdominal CT are evaluated to confirm the diagnosis. Broad-spectrum antibiotics are started. Perforation requires surgical intervention. Fluids accumulated in the chest cavity are drained by inserting a chest tube to prevent further contamination (Chaudhry et al., 2022).

Small bowel perforation can also be rarely seen in capsule endoscopy retention. Generally, retention is more common in Crohn's disease or neoplasms. Retention can be predicted by performing patency tests before the procedure (Fernández-Urién et al., 2015).

Minimal large bowel perforations can be seen depending on the procedure performed. The critical situation for the patient is the leakage of intestinal contents into the peritoneal cavity, causing peritonitis and sepsis. Findings such as pain, fever, and deviation of vital signs from normal should be carefully monitored. In such cases, closure is usually performed with endoscopic intervention, but surgical intervention may be required when this is impossible. It is possible for microorganisms to pass from one patient to another through the endoscope due to perforation of the mucosa.

Therefore, attention should be paid to the disinfection of flexible endoscopes, and antibiotics should be administered

prophylactically, if necessary, before the procedure (Raju, 2019).

Although rebleeding after a diagnostic colonoscopy is rare, it may occur more frequently after a polypectomy. Patients at risk for rebleeding after endoscopy should be closely monitored (Lau et al., 2019).

The drugs administered to the patient during the procedure, the equipment used, and the type of sedation administered should be recorded. When the patient is handed over, how long the procedure lasted, whether any complications developed, all information recorded during the procedure, and the patient's vital signs should be transferred to the ward nurses (Voynarovska & Cohen, 2008).

Mobilization

In patients with GI bleeding, mobilization should be done carefully, as falls and injuries may occur due to hypotension. For this, the patient and the patient's relatives should be informed. The patient's fall risk should be determined, and mobilization should be limited, especially in patients with massive bleeding.

If immobilization is necessary in patients with a high risk of falling, antiembolic stockings should be used, and ROM exercises should be performed according to the individual needs of the patient to prevent muscle atrophy (Kearon et al., 2012; Huang et al., 2023).

Ensuring Nutrition

In patients with gastrointestinal bleeding, oral intake is closed until hemodynamic stabilization is achieved and the patient is hydrated with normal saline according to his/her needs. Blood glucose should be closely monitored in patients with diabetes mellitus and patients receiving tamponized fluid.

The oral intake of patients who are stabilized after endoscopy should be opened with clear liquids, gradually switched to dense and soft foods, and then to a normal diet. The nurse should inform the patient about the diet (Celik & Olgun, 2016; Busch & Collier & Kaspar, 2022). Since enteral nutrition may be limited after endoscopic intervention in patients with

esophageal variceal bleeding, total parenteral nutrition is recommended (Kim et al., 2022).

Discharge

Before discharge, the patient should be educated to prevent rebleeding and support the healing process. The patient should be informed about the causes of gastrointestinal bleeding, the treatments administered, and the medications to be used. Evaluation of the efficacy of varicose vein treatment is vital to prevent rebleeding. The importance of returning for a repeat endoscopy should be explained if a follow-up endoscopy is planned for the patient. In order to prevent rebleeding, the patient should be told that he/she should use his/her medications regularly and avoid non-steroidal anti-inflammatory drugs. If the patient needs to receive anti-aggregant therapy due to cardiovascular diseases, it should be explained to the patient with expert opinion (Lanas et al., 2015; Fabrellas et al., 2020).

Patients with variceal bleeding may be associated with liver cirrhosis. If these patients use alcohol, they should be referred to the relevant unit to make lifestyle changes (Zhang et al., 2019).

The recommended diet and eating habits should be explained to the patient. Patients should be informed about the symptoms they may encounter in case of rebleeding and in which cases they should consult a doctor. It is crucial for patients and their relatives to understand and apply the information and to participate in the patient's self-care in order to accelerate the healing process (Yang & Wang & Ye, 2022).

Conclusion and Recommendations: Acute gastrointestinal bleeding is a genuine life-threatening emergency. The primary approach in patients with GI bleeding is hemodynamic stabilization of the patient. The nurse must manage a patient with GI bleeding and provide high standards of care regarding the prognosis of the disease. For this purpose, it is vital to ensure airway safety, ensure the continuity of respiration and circulation, monitor changes in the state of consciousness, and perform physical examinations in critically ill patients. Close monitoring of the vital signs of the patients, interpretation of the changes that occur and taking appropriate

measures will help the patient regain hemodynamic stabilization. Therefore, nurses should follow the guidelines for the care of patients with GI bleeding and improve their skills for critically ill patients.

References

- Abraldes, J. G., Caraceni, P., Ghabril, M., & Garcia-Tsao, G. (2023). Update in the Treatment of the Complications of Cirrhosis. *Clinical gastroenterology and hepatology : the official clinical practice journal of the American Gastroenterological Association*, 21(8), 2100–2109.
- Aveyard, H., Kolawole, A., Gurung, P., Cridland, E., & Kozłowska, O. (2022). Informed consent prior to nursing care: Nurses' use of information. *Nursing ethics*, 29(5), 1244–1252.
- Barkun, A. N., Almadi, M., Kuipers, E. J., Laine, L., Sung, J., Tse, F., Leontiadis, G. I., Abraham, N. S., Calvet, X., Chan, F. K. L., Douketis, J., Enns, R., Gralnek, I. M., Jairath, V., Jensen, D., Lau, J., Lip, G. Y. H., Loffroy, R., Maluf-Filho, F., Meltzer, A. C., Bardou, M. (2019). Management of Nonvariceal Upper Gastrointestinal Bleeding: Guideline Recommendations From the International Consensus Group. *Annals of internal medicine*, 171(11), 805–822.
- Basauhra Singh, H. K., Chong, M. C., Thambinayagam, H. C., Zakaria, M. I., Cheng, S. T., Tang, L. Y., & Azahar, N. H. (2016). Assessing Nurses Knowledge of Glasgow Coma Scale in Emergency and Outpatient Department. *Nursing research and practice*, 2016, 8056350. <https://doi.org/10.1155/2016/8056350>
- Bleakley, G., & Cole, M. (2020). Recognition and management of sepsis: the nurse's role. *British journal of nursing (Mark Allen Publishing)*, 29(21), 1248–1251.
- Blumlein, D., & Griffiths, I. (2022). Shock: aetiology, pathophysiology and management. *British journal of nursing (Mark Allen Publishing)*, 31(8), 422–428.
- Busch, R. A., Collier, B. R., & Kaspar, M. B. (2022). When Can we Feed after a Gastrointestinal Bleed?. *Current gastroenterology reports*, 24(1), 18–25.
- Cai, M. X., Gao, Y., Li, L., Feng, W., Wang, Y. L., Li, Z. S., Xin, L., & Wang, L. W. (2023). Four-Hour Fasting for Semifluids and 2-Hour Fasting for Water Improves the Patient Experience of Esophagogastroduodenoscopy: A Randomized Controlled Trial. *Gut and liver*, 17(3), 382–388.
- Chapman, W., Siau, K., Thomas, F., Ernest, S., Begum, S., Iqbal, T., & Bhala, N. (2019).

- Acute upper gastrointestinal bleeding: a guide for nurses. *British journal of nursing* (Mark Allen Publishing), 28(1), 53–59.
- Chaudhry, I. U. H., M Al Ghamdi, A., M Al Fraih, O., Al Maimon, H., A Alqahtani, Y., Tariq Khan, F., A Al Rasheed, F., & A Al Abdulhai, M. (2022). Two-stage surgery for delayed esophageal perforation and concomitant chylothorax secondary to upper gastrointestinal endoscopy. *Annals of medicine and surgery* (2012), 77, 103623. <https://doi.org/10.1016/j.amsu.2022.103623>
- Curran, M. P., & Plosker, G. L. (2004). Oral sodium phosphate solution: a review of its use as a colorectal cleanser. *Drugs*, 64(15), 1697–1714.
- Celik, S., Olgun, N. (2016). Hypoglycemia and Hyperglycemia in Intensive Care. *Journal of Critical Care Nursing*. 20(1):57-64.
- Diaz-Soto, M. P., & Garcia-Tsao, G. (2022). Management of varices and variceal hemorrhage in liver cirrhosis: a recent update. *Therapeutic advances in gastroenterology*, 15, 1–12. <https://doi.org/10.1177/17562848221101712>
- Evans, M. R., & Morrow, J. M. (2015). The pupillary examination. *British journal of hospital medicine* (London, England : 2005), 76(4), C50–C54. <https://doi.org/10.12968/hmed.2015.76.4.C50>
- Fabrellas, N., Carol, M., Palacio, E., Aban, M., Lanzillotti, T., Nicolao, G., Chiappa, M. T., Esnault, V., Graf-Dirmeier, S., Helder, J., Gossard, A., Lopez, M., Cervera, M., Dols, L. L., & LiverHope Consortium Investigators (2020). Nursing Care of Patients With Cirrhosis: The LiverHope Nursing Project. *Hepatology* (Baltimore, Md.), 71(3), 1106–1116.
- Farrar F. C. (2018). Management of Acute Gastrointestinal Bleed. *Critical care nursing clinics of North America*, 30(1), 55–66.
- Fernández-Urién, I., Carretero, C., González, B., Pons, V., Caunedo, Á., Valle, J., Redondo-Cerezo, E., López-Higueras, A., Valdés, M., Menchen, P., Fernández, P., Muñoz-Navas, M., Jiménez, J., & Herrerías, J. M. (2015). Incidence, clinical outcomes, and therapeutic approaches of capsule endoscopy-related adverse events in a large study population. *Revista española de enfermedades digestivas*, 107(12), 745–752.
- Fischbach, W., & Malfertheiner, P. (2018). *Helicobacter Pylori Infection*. *Deutsches Arzteblatt international*, 115(25), 429–436.
- Gaspar, R., Andrade, P., Ramalho, R., Santos-Antunes, J., & Macedo, G. (2019). Bowel preparation: modifiable factors to improve bowel cleansing. *European journal of gastroenterology & hepatology*, 31(1), 140. <https://doi.org/10.1097/MEG.00000000000001298>
- Goray, M., Peker, S. (2022) Kan ve kan ürünleri hizmetleri yönetimi. [Blood and blood products services management]. *Disiplinlerarası Yeni Araştırma Dergisi*. 2(1):15-28. <https://dergipark.org.tr/tr/pub/dyad/issue/66035/1030971>
- Hernández, G., Gimeno-García, A. Z., & Quintero, E. (2019). Strategies to Improve Inadequate Bowel Preparation for Colonoscopy. *Frontiers in medicine*, 6, 245. <https://doi.org/10.3389/fmed.2019.00245>
- Higginson, R., & Jones, B. (2009). Respiratory assessment in critically ill patients: airway and breathing. *British journal of nursing* (Mark Allen Publishing), 18(8), 456–461.
- Higginson, R., & Parry, A. (2013). Emergency airway management: common ventilation techniques. *British journal of nursing* (Mark Allen Publishing), 22(7), 366–371.
- Huang, L., Li, M., Deng, C., Qiu, J., Wang, K., Chang, M., Zhou, S., Gu, Y., Shen, Y., Wang, W., Huang, Z., & Sun, H. (2022). Potential Therapeutic Strategies for Skeletal Muscle Atrophy. *Antioxidants* (Basel, Switzerland), 12(1), 44. <https://doi.org/10.3390/antiox12010044>
- Kearon, C., Akl, E. A., Comerota, A. J., Prandoni, P., Bounameaux, H., Goldhaber, S. Z., Nelson, M. E., Wells, P. S., Gould, M. K., Dentali, F., Crowther, M., & Kahn, S. R. (2012). Antithrombotic therapy for VTE disease: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *Chest*, 141(2 Suppl), e419S–e496S. <https://doi.org/10.1378/chest.11-2301>
- Kim, S. J., Chun, I. A., Cho, J. Y., Lee, J. H., Lee, J., Kim, Y. D., & Park, C. G. (2022). ω-3 fatty acid-enriched parenteral nutrition shortens hospital stay in acute variceal bleeding cirrhotic patients. *Medicine*, 101(14), e29128. <https://doi.org/10.1097/MD.0000000000000291>
- Lanas, Á., Carrera-Lasfuentes, P., Arguedas, Y., García, S., Bujanda, L., Calvet, X., Ponce, J., Perez-Aisa, Á., Castro, M., Muñoz, M., Sostres, C., & García-Rodríguez, L. A. (2015). Risk of upper and lower gastrointestinal bleeding in patients taking nonsteroidal anti-inflammatory drugs, antiplatelet agents, or anticoagulants. *Clinical gastroenterology and hepatology : the official clinical practice journal of the American Gastroenterological Association*, 13(5), 906–12.e2. <https://doi.org/10.1016/j.cgh.2014.11.007>

- Lau, J. Y. W., Pittayanon, R., Wong, K. T., Pinjaroen, N., Chiu, P. W. Y., Rerknimitr, R., Holster, I. L., Kuipers, E. J., Wu, K. C., Au, K. W. L., Chan, F. K. L., & Sung, J. J. Y. (2019). Prophylactic angiographic embolisation after endoscopic control of bleeding to high-risk peptic ulcers: a randomised controlled trial. *Gut*, 68(5), 796–803.
- Louis M. (2017). The Nurse's Management of Shock and Hemorrhage. *The American journal of nursing*, 117(10), 43–44.
- Mayo P. (2017). Undertaking an accurate and comprehensive assessment of the acutely ill adult. *Nursing standard (Royal College of Nursing (Great Britain) : 1987)*, 32(8), 53–63.
- Michels, G., Bauersachs, J., Bottiger, B. W., Busch, H. J., Dirks, B., Frey, N., Lott, C., Rott, N., Schöls, W., Schulze, P. C., & Thiele, H. (2022). Leitlinien des European Resuscitation Council (ERC) zur kardiopulmonalen Reanimation 2021: Update und Kommentar [Guidelines of the European Resuscitation Council (ERC) on cardiopulmonary resuscitation 2021: update and comments]. *Der Anaesthetist*, 71(2), 129–140.
- Oakland K. (2019). Changing epidemiology and etiology of upper and lower gastrointestinal bleeding. *Best practice & research. Clinical Gastroenterology*, 42-43, 101610. <https://doi.org/10.1016/j.bpg.2019.04.003>
- Ohmiya, N., Nakagawa, Y., Nagasaka, M., Tahara, T., Shibata, T., Nakamura, M., Hirooka, Y., Goto, H., & Hirata, I. (2015). Obscure gastrointestinal bleeding: diagnosis and treatment. *Digestive endoscopy : official journal of the Japan Gastroenterological Endoscopy Society*, 27(3), 285–294.
- Oztas, E., Etik, D.O., & Oguz, D. (2009). Endoskopik sedasyon ve premedikasyon. [Endoscopic sedation and premedication]. *Endoskopi*. 17(1):52-60.
- Parra-Blanco, A., Ruiz, A., Alvarez-Lobos, M., Amorós, A., Gana, J. C., Ibáñez, P., Ono, A., & Fujii, T. (2014). Achieving the best bowel preparation for colonoscopy. *World journal of gastroenterology*, 20(47), 17709–17726.
- Polese, L., Giugliano, E., & Valmasoni, M. (2023). Patient Position in Operative Endoscopy. *Journal of clinical medicine*, 12(21), 6822.
- Raju G. S. (2019). Closure of Defects and Management of Complications. *Gastrointestinal endoscopy clinics of North America*, 29(4), 705–719.
- Smith, D., & Bowden, T. (2017). Using the ABCDE approach to assess the deteriorating patient. *Nursing standard (Royal College of Nursing (Great Britain) : 1987)*, 32(14), 51–63.
- Triantafyllou, K., Gkolfakis, P., Gralnek, I. M., Oakland, K., Manes, G., Radaelli, F., Awadie, H., Camus Duboc, M., Christodoulou, D., Fedorov, E., Guy, R. J., Hollenbach, M., Ibrahim, M., Neeman, Z., Regge, D., Rodriguez de Santiago, E., Tham, T. C., Thelin-Schmidt, P., & van Hooft, J. E. (2021). Diagnosis and management of acute lower gastrointestinal bleeding: European Society of Gastrointestinal Endoscopy (ESGE) Guideline. *Endoscopy*, 53(8), 850–868.
- Voynarovska, M., & Cohen, L. B. (2008). The role of the endoscopy nurse or assistant in endoscopic sedation. *Gastrointestinal endoscopy clinics of North America*, 18(4), 695–viii. <https://doi.org/10.1016/j.giec.2008.06.014>
- Wang, W. H., Yu, J. L., & Sung, H. C. (2022). Hu li za zhi The journal of nursing, 69(1), 33–40.
- Yang, F., Wang, M., & Ye, J. (2022). Effects of dietary nursing and high-quality nursing intervention in emergency patients with gastric bleeding. *Minerva gastroenterology*, 68(4), 497–499.
- Yilmaz Ş. (2017) Current Approach to Gastrointestinal Bleeding. *Journal of Clinical Medical Sciences*, 5(2):1-7.
- Zhang, X., Xi, W., Liu, L., & Wang, L. (2019). Improvement in Quality of Life and Activities of Daily Living in Patients with Liver Cirrhosis with the Use of Health Education and Patient Health Empowerment. *Medical science monitor : international medical journal of experimental and clinical research*, 25, 4602–4608.