

## Assessment of Endoscopic Retrograde Cholangio-Pancreatogram Patient Journey

**Shaimaa Gaber Ismail Abdallah, Quality Coordinator**

*Medical Research Institute Hospital, Medical Research Institute, Alexandria University.*

**Gehan Galal El-bialy, Professor**

*Nursing Administration Department, Faculty of Nursing, Alexandria University*

**Nancy Sabry El-Liethey, Assistant professor**

*Nursing Administration Department, Faculty of Nursing, Alexandria University*

### **Abstract**

**Background:** Endoscopic retrograde cholangio-pancreatogram (ERCP) is a treatment which enables care providers to look into the tubes that carry bile from the liver into the bowel. Information regarding the pancreatic and bile ducts is provided by the technique, which can be either therapeutic or diagnostic (Mitra et al., 2012). **this study was aimed : to** Assessing the process / procedure of ERCP patient journey. Descriptive research design. **Setting:** the study was Alexandria University. **Subjects:** the data were collected from 50 patients who was undergoing ERCP procedure. **The tool:** Gemba walk, and process map were used. **Results:** finding of the current study represented that more than three quarters of ERCP patient time was wasted (78.03%) waiting time. **Conclusion:** patient was undergoing ERCP spent waiting time more than three quarters of procedure time. **Recommendations:** developing a clear policy and procedure for ERCP, providing training for healthcare providers about ERCP, increase healthcare providers awareness about importance of patient satisfaction and quality of service.

**Keywords:** Endoscopic retrograde cholangio-pancreatogram (ERCP), patient journey

Received 27 February 2024; Accepted 6 March 2024; Published December 2024

### **Introduction**

Endoscopic retrograde cholangio-pancreatogram (ERCP) is a diagnostic and therapeutic procedure for bile duct and pancreatic diseases. The endoscopist instruments that are used in ERCP are duodenoscope, which is a flexible tube about the same thickness as finger (Sinha et al., 2015). The duodenoscope's end is equipped with a light that can be used to illuminate the intestinal lining. Additionally, it includes a very small camera that transmits a live image to a screen where the endoscopist can examine it (Menon & Mathew, 2021).

Additionally, diagnostic catheters, sphincterotomes, extractor balloons,

Dormia catheters, mechanic lithotripters, mechanic dilators, pneumatic dilators, naso-biliary or naso-pancreatic cannulas are required during ERCP. During the ERCP the endoscopist must use x-ray and a special dye to show up bile duct on the screen (Fish et al., 2020).

The procedure is not painful, but to assist the patient in relaxing, sedation medication such as (propofol) is used because it is simple to administer, enables prompt awakening, has fewer side effects, reduces patient anxiety and discomfort, and improves the quality of endoscopic examinations and therapeutic procedure outcomes (Yusuff et al., 2016).

Although ERCP can be performed as an outpatient treatment, it often needs at least a brief hospital stay. This is an invasive surgery that requires informed permission from the patient (Farrugia et al., 2021). ERCP preparation entails abstaining from eating and drink beginning at 12 a.m. the night before the operation. This enables insertion of the endoscope into the stomach. Prior to the procedure, the endoscopist discusses the procedure, why it is being performed, and any potential complications (Gururatsakul et al., 2021).

Endoscopic retrograde cholangio-pancreatogram is one of endoscopic procedures at the hospital with high risk to patient as (pancreatitis, infection of bile duct, perforation, bleeding, cardiopulmonary complications.....etc), highly expensive, need more specific items, depend on healthcare providers skills and providing the diagnosis and management of benign and malignant biliary and pancreatic disease. The complications that may occur related to this procedure include: pancreatitis (an inflammation of the pancreas which can cause abdominal pain that often extended into the back) is consider the most common complication, bleeding, perforation (a tear in the gastrointestinal wall or bile system occurs very rarely), cholecystitis, nausea, respirator depression, sore throat, vomiting, abdominal pain, infection (Thomas et al., 2015; Jenner et al., 2020).

An endoscopy unit for surgical patients providing diagnostics and treatment services and providing upper, lower gastrointestinal endoscopy and endoscopic retrograde cholangio-pancreatogram (ERCP). All of the component users and directorates must integrate clinical, administrative, and trust management in order to schedule effectively and use expensive equipment and highly skilled personnel (Improvement, 2012; Deas & Sinsel, 2014).

### ***Magnitude of the study***

ERCP is one of endoscopic procedures at the hospital with high risk to patient as (pancreatitis, infection of bile duct, perforation, bleeding, cardiopulmonary complications.....etc), increasing waiting time of patient, highly expensive, need more specific items, depend on healthcare providers skills and providing the diagnosis and management of benign and malignant biliary and pancreatic disease (Johnson et al., 2020).

Hence, this study was assessed ERCP patient journey and develop a new one based on related literature (Dumonceau et al., 2013) and healthcare providers interview. Hoping to decrease time and improve safety and increase efficiency and usage of ERCP unit.

### ***Aim of the study***

This study aims to assessing patients in endoscopy unit for undergoing endoscopic retrograde cholangio-pancreatography (ERCP), Alexandria University through:

- Assessing the process / procedure of ERCP patient journey.

### ***Materials***

#### **: Research design**

Descriptive research design was used to conduct this study.

#### **Setting:**

This study was conducted at Alexandria University

#### **Subjects:**

Patients undergoing ERCP around 50 that was available at the time of the study using convenience random sample.

#### ***Inclusion criteria:***

- a) Patient more than 20 years
- b) Patient willing to participate in research
- c) ERCP procedure
- d) Patient received procedure

**Tools:** to collect the required data for the research two tools were used.

**Tool 1: Gemba Walk Tool:**

It was developed by the researcher based on actual process and related current literature (Aprill & Rafael, 2018; Micieta et al., 2021) to observe and assess actual process of patient undergoing ERCP to determine the value-added and non-value-added activities. As it was viewed as an initial stage in the development and structuring of this observational tool, which is the result of the process shadowing by GEMBA walk; it supports the development of the endoscopy unit' efficiency practices observational checklist. It was divided into two parts.

- **The first part** was observational sheet to observe and document actual process. It includes what, when, where, who was involved in the process for each patient undergoing ERCP.
- **The second part** is a direct observational sheet to record all procedures and practices carried out in accordance with the guidelines for safe ERCP procedure developed by European Society of Gastrointestinal Endoscopy (ESGE) and American Society of Gastrointestinal Endoscopy (ASGE), respectively (Calderwood et al., 2018; Hassan et al., 2020).

**Tool 2: Simple Process Map**

It was developed by the researcher based on a visual presentation of the actual process of patient undergoing ERCP and related current literature. The process phases include three phases (pre procedure phase, during or peri-procedure phase, post procedure phase). The pre procedure phase starting from patient arrived to registration room at the day of endoscopy till patient called to endoscopy room. Peri-procedure phase starting from patient arrived to endoscopy room and starting to procedure till Finish endoscopy and remove all patient attachment. Post procedure phase starting

from recovery of patient and transferring to recovery room until patient discharged to home.

***Methods***

The research plan was accepted by research Ethics committee at Faculty of Nursing, Alexandria University. An official permission was obtained from Faculty of Nursing, Alexandria University directed to the administrative authority at Alexandria University after explanation the aim of the study. A pilot study was carried out on 5 patients who were included in the study to ensure clarity, applicability and identify obstacles and problems that may encountered during data collection of tool 1 estimate the time needed to fill the related tool. In the light of the findings of the pilot study, it was found that much better to shadowing the patients during procedure.

**Data collection**

- 1- Introductory session was done to all healthcare providers to inform them about the purpose of the study in Alexandria University.
- 2- The researcher observed and shadowing a round (50) patients undergoing ERCP using Gemba walk (observational sheet) to detect what, when, where, who will be involved in the actual process.
- 3- Visual presentation of the actual process was done for patients undergoing ERCP using process map to identify the start and end point of the process and break process into tasks and decision points. The researcher wrote down the time of patients' arrival. Observations ranging from 2 hours and 30 minutes to 12 hours. Depending on the length of stay of the patient under Observation. The patient journey has 6 main processes that were observed including: arrival followed by registration, assessment that involving nursing and medical assessment, the endoscopy that means ERCP done to patients, and followed by recovery, and ended with

discharge or admission to hospital. In each phase, the researcher used record note, pencil, and stopwatch to record what was actually done to each patient and time taken in each task within each process (Figure 1).

### ***Ethical considerations:***

Written informed consent was obtained from patient after explaining the aim of the study and the right to refuse to participate in the study and/ or withdraw at any time. Privacy of the patients was assured, and confidentiality of the collected data was maintained during implementation of the study.

### ***Statistical Analysis***

The collected data were organized, tabulated and statically analyzed using the statistical package for social studies (SPSS). The Shapiro-Wilk test was used to verify the normality of distribution Quantitative data were described using range (minimum and maximum), mean, standard deviation, median

### ***Results***

**Table (1)** illustrates that, more than one third (38%) of the studied sample are patients between age 40-49 years, more than half of them (56%) are female, and two third of them (32) are with chronic diseases.

**Table (2)**, it can be seen that more than three quarters of ERCP patient time was wasted (78.03%) waiting time.

### ***Discussion***

The current study aimed to assess patients undergoing endoscopic retrograde cholangio-pancreatography (ERCP) at Alexandria University through: Assessing the actual process / procedure of ERCP journey.

As regard to descriptive analysis of the studied patients according to time of procedures the present study demonstrated that, the highest mean is related to “After endoscopy till discharge” and the lowest

mean was related to “Registration waiting time”. This is because of the time that the patient takes to recover is differ from one patient to another.

This result was in the same line with Heyzer et al. (2022), they found that When compared to baseline, there were improvements in process and outcome measures following the route procedure, including a shorter average duration of stay at the acute hospital for patients treated conservatively or surgically and decreased 30-day readmission rate. Also, this result was compatible with Flikweert et al. (2014), They demonstrated that the length of hospital stay and the preoperative fasting period were significantly reduced in correlation with the complete care pathway.

Regarding descriptive analysis of the studied patients according to time of procedures the current study showed that, the highest mean was related to “Endoscopy time” and the lowest mean is related to “Recovery time immediately after endoscopy “.This may be due to that Endoscopy is a surgical procedure that requires accuracy and concentration and certain precautions to avoid mistakes which make it takes more time than other procedures.

This result was in the same line with Heyzer et al. (2022), they showed that When compared to baseline, there were improvements in process and result measures following the pathway process, including a decrease in non-operated patients and an increase in surgeries carried out within 48 hours of admission. This result was in contrast with Smith and Armstrong (2019), They stated that there was a clear improvement in the outcomes of duration of stay and time to mobilization following surgery.

Concerning descriptive analysis of the studied patients according to time of procedures the study findings revealed that, more than three quarters of the time of procedure are related to waiting time and

more than one fifth of the time of the procedure is related to service time. This may be due to the high procedure rates and large number of patients who register to undergo the procedure.

4. increase healthcare providers awareness about importance of patient satisfaction and quality of service.

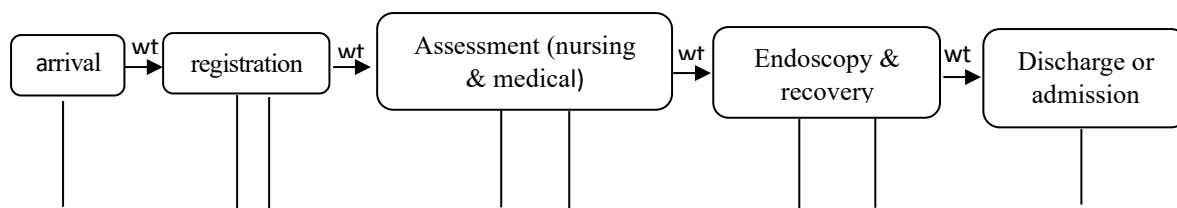
**Conclusion**

Based on the results of the current study, it could be concluded that, more than three quarters of ERCP patient time was wasted (78.03%) waiting time.

**Recommendation**

In the light of finding of the study, the following recommendations are suggested:

1. Developing ERCP guidelines or algorism.
2. developing a clear policy and procedure for ERCP.
3. , providing training for healthcare providers about ERCP.



**Figure (1): Patient flow in endoscopy unit**

**Table (1): Frequency distribution of patients undergoing ERCP**

Patient characteristics	No (50)	%	Comment
<b>Age</b>			
20-29	8	16%	
30-39	12	24%	
40-49	19	38%	
≥ 50	11	22%	
<b>Sex</b>			
Male	22	44%	
Female	28	56%	
<b>Chronic diseases</b>			
Yes	32	64%	
No	18	36%	

**Table (2): Distribution of procedure time in ERCP procedure (n = 50)**

Total time (minutes)	Min. – Max.	Mean ± SD.	Median
<b>Overall time</b>	160.1 – 735.0	313.6 ± 132.1	280.0 (250.5 – 335.0)
<b>Overall waiting time</b>	<b>105.1 – 655.0</b>	<b>249.9 ± 127.5</b>	<b>220.6</b> (185.2 – 261.0)
<b>% Waiting time</b>	44.05 – 95.15	78.03 ± 8.72	79.36 (73.60 – 82.26)
<b>Stage 1</b>			
Registration waiting time	0.0 – 55.0	5.80 ± 10.76	0.0 (0.0 – 10.0)
Assessment waiting time	0.0 – 70.0	16.28 ± 14.93	15.0 (5.0 – 20.0)
Pre-Endoscopy waiting time	0.03 – 495.0	76.76 ± 115.2	60.50 (0.15 – 115.0)
<b>Stage 2</b>	–	–	–
<b>Stage 3 (After endoscopy till discharge)</b>	60.0 – 250.0	151.0 ± 39.26	140.0 (125.0 – 185.0)
<b>Overall Service time</b>	<b>32.0 – 169.0</b>	<b>63.74 ± 28.02</b>	<b>55.0</b> (47.0– 70.0)
<b>%Service time</b>	4.85 – 55.95	21.97 ± 8.72	20.64 (17.74 – 26.40)
<b>Stage 1</b>			
Registration time	0.0 – 130.0	20.14 ± 20.18	15.0 (10.0 – 20.0)
Nursing assessment time	3.0 – 15.0	8.42 ± 3.57	9.0 (5.0 – 10.0)
<b>Stage 2</b>			
Endoscopy time	5.0 – 120.0	28.90 ± 21.58	25.0 (15.0 – 30.0)
Recovery time immediately after endoscopy	0.0 – 30.0	6.28 ± 3.98	5.0 (5.0 – 5.0)

SD: Standard deviation

**References:**

- Aprill, S., & Rafael, A. (2018). *Discovering gemba walks good practices within industrial lean applications* [Master Thesis]. Universidad del País Vasco.
- Calderwood, A. H., Day, L. W., Muthusamy, V. R., Collins, J., Hambrick, R. D., 3rd, Brock, A. S., Guda, N. M., Buscaglia, J. M., Petersen, B. T., Buttar, N. S., Khanna, L. G., Kushnir, V. M., Repaka, A., Villa, N. A., & Eisen, G. M. (2018). ASGE guideline for infection control during GI endoscopy. *Gastrointest Endosc*, 87(5), 1167-1179. <https://doi.org/10.1016/j.gie.2017.12.009>.
- Deas, T., & Sinsel, L. (2014). Ensuring patient safety and optimizing efficiency during gastrointestinal endoscopy. *AORN Journal*, 99(3), 396-406. <https://doi.org/10.1016/j.aorn.2013.10.022>.

- Farrugia, A., Muhammad, Q. R., Ravichandran, N. T., Ali, M., Marangoni, G., & Ahmad, J. (2021). Proposed training pathway with initial experience to set up robotic hepatobiliary and pancreatic service. *Journal of Robotic Surgery*, 1-7.
- Fish, R., Hogan, A., Lowery, A., McDermott, F., Selvasekar, C. R., Seow, C. S., ... & Tsang, T. (2020). General Surgery. In *Cracking the Intercollegiate General Surgery FRCS Viva* (pp. 415-502). CRC Press.
- Flikweert, E. R., Izaks, G. J., Knobben, B. A., Stevens, M., & Wendt, K. (2014). The development of a comprehensive multidisciplinary care pathway for patients with a hip fracture: design and results of a clinical trial. *BMC Musculoskeletal Disorders*, 15, 188. <https://doi.org/10.1186/1471-2474-15-188>.
- Gururatsakul, M., Lee, R., Ponnuswamy, S. K., Gilhotra, R., McGowan, C., Whittaker, D., ... & Boyd, P. (2021). Prospective audit of the safety of endoscopist-directed nurse-administered propofol sedation in an Australian referral hospital. *Journal of Gastroenterology and Hepatology*, 36(2), 490-497.
- Hassan, C., Ponchon, T., Bisschops, R., Van Hooft, J. E., Messmann, H., Gralnek, I. M., & Dinis-Ribeiro, M. (2020). European Society of Gastrointestinal Endoscopy (ESGE) Publications Policy—Update 2020. *Endoscopy*, 52(02), 123-126. <https://doi.org/10.1055/a-1067-4657>.
- Heyzer, L., Ramason, R., De Castro Molina, J. A., Lim Chan, W. W., Loong, C. Y., & Kee Kwek, E. B. (2022). Integrated hip fracture care pathway (IHFCP): reducing complications and improving outcomes. *Singapore Medical Journal*, 63(8), 439-444. <https://doi.org/10.11622/smedj.2021041>.
- Improvement, N. (2012). *Rapid review of endoscopy services*. Department of Health.
- Jenner, D. C., Klimovskij, M., Nicholls, M., & Bates, T. (2020). Occlusion of the cystic duct with cyanoacrylate glue at laparoscopic subtotal fenestrating cholecystectomy for a difficult gallbladder. *Acta Chirurgica Belgica*, 1-6.
- Johnson, K. D., Perisetti, A., Tharian, B., Thandassery, R., Jamidar, P., Goyal, H., & Inamdar, S. (2020). Endoscopic retrograde cholangiopancreatography-related complications and their management strategies: a “scoping” literature review. *Digestive diseases and sciences*, 65, 361-375.
- Menon, S., & Mathew, R. (2021). PTU-10 Botulinum toxin injection in the management of type II sphincter of oddi dysfunction.
- Micieta, B., Howaniec, H., Binasova, V., Kasajova, M., & Fusko, M. (2021). Increasing work efficiency in a manufacturing setting using gemba walk. *European Research Studies Journal*, XXIV, 601-620. <https://doi.org/10.35808/ersj/2792>.
- Mitra, V., Mitchison, H., & Nylander, D. (2012). Endoscopic retrograde cholangio-pancreatography services can be accessible and of a high standard in a district general hospital. *Frontline Gastroenterology*, 3(3), 152-156. <https://doi.org/10.1136/flgastro-2011-100084>.
- Sinha, R., Gardner, T., Padala, K., Greenaway, J. R., & Joy, D. (2015). Double-duct sign in the

- clinical context. *Pancreas*, 44(6), 967-970.
- Smith, P. J., & Armstrong, S. (2019). *An integrated care pathway for total knee Arthroplasty in a private hospital in South Africa* [Master Thesis]. WITS University.
- Thomas, S. E., Lee, M. J., Sivaramakrishnan, N., & Lambert, K. (2015). A district general hospital experience of palliative biliary stenting. *BMJ supportive & palliative care*, 5(3), 297-300.
- Yusuff, H., Prakash, A., & Webb, S. (2016). *Safe sedation for the non-anaesthetist. Clinical Medicine*, 16(2), 161.