ARTICULO DE INVESTIGACIÓN

INFLUENCIA DE LA CALIDAD EN LA HUMANIZACIÓN EN LOS SERVICIOS DE URGENCIAS DE INSTITUCIONES DE SALUD

INFLUENCE OF QUALITY ON HUMANIZATION IN THE EMERGENCY SERVICES OF HEALTH INSTITUTIONS

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RESUMEN

Objetivo. El constructo investigativo permitió evaluar estrategias para mejorar tanto la oportunidad como la calidad de la atención brindada y humanizada en el servicio de urgencias (SU). **Metodología.** El estudio se apalanco en el positivismo como filosofía, con metodología cuantitativa, y un enfoque exploratorio, descriptivo, la estrategia investigativa basada en la recolección de información retrospectiva del servicio de urgencias de la empresa Social del Estado (ESE) Hospital Emiro Quintero Cañizares (HEQC) durante el año 2022 y el primer semestre del año 2023, utilizando el informe "Ingresos" del sistema de información Kubapp (software administrativo y financiero ERP en la nube); realizando evaluación de los diferentes procesos como triage, consultorio clínico, trauma, urgencias obstétricas y pediátricas y se caracterizó 5 indicadores de calidad para monitorizar la oportunidad de la atención del servicio de urgencias. **Resultados**. Con la información consultada, se logró estimar el número de consultorios de Triage y asistenciales necesarios, como plan de mejora y ampliación de la institución por débil capacidad instalada por la demanda del SU. **Conclusiones.** Dado que el sistema de Triage colombiano, no establece metas de cumplimiento para las categorías de Triage, se determinó con base a las clasificaciones de Triage internacionales y el funcionamiento actual de la ESE-HEQC la creación de la guía de Triage para el personal asistencial.

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Palabras clave. Calidad de la Atención de Salud, Humanización de la atención.

Abstract
Aim. The research construct allowed us to evaluate strategies to improve both the opportunity and the quality of care provided and humanized in the emergency department (ED). Methodology. The study leveraged positivism as a philosophy, with quantitative methodology, and a descriptive approach, the investigative strategy based on the collection of retrospective information from the emergency service of the State Social Enterprise (ESE) Hospital Emiro Quintero Cañizares (HEQC) during the year 2022 and the first half of the year 2023, using the "Revenue" report from the Kubapp information system (ERP administrative and financial software in the cloud); evaluating the different processes such as triage, clinical office, trauma, obstetric and pediatric emergencies and 5 quality indicators were characterized to monitor the timeliness of emergency service care. Results. With the information consulted, it was possible to estimate the number of Triage and healthcare clinics necessary, as a plan to improve and expand the institution due to weak installed capacity due to ED demand. Conclusions. Given that the Colombian Triage system does not establish compliance goals for Triage categories, the creation of the Triage guide for healthcare personnel was determined based on international Triage classifications and the current operation of the ESE-HEQC.

Key words. Quality of Health Care, Humanization of care.

Introduction

Hospital emergency departments (EDs) constitute one of the primary entry points to the healthcare system and play a critical role, yet they often fail to ensure an efficient and high-quality response for patients. Of particular concern is the fact that the majority of ED visits are deemed nonurgent or inappropriate and are classified as low complexity cases across various countries [1]. One of the major challenges in recent times has been to mitigate the overcrowding of emergency departments. This phenomenon is driven by multiple factors, the most significant being inadequate patient outflow from hospital EDs, insufficient inpatient bed availability, which hinders the transfer of patients requiring hospital admission, and a shortage of healthcare personnel. ED overcrowding leads to delays in diagnosis and treatment initiation, which is associated with increased morbidity and mortality due to postponed prescription issuance and delayed administration of antibiotics and analgesics. Furthermore, emergency department saturation

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contributes to medical errors, prolonged hospital stays, and increased healthcare costs. Overcrowding in emergency services is, ultimately, a consequence of suboptimal quality of patient care [2][3][4].

In the hospital setting, according to [5], triage was introduced in the 1960s in response to a growing number of individuals seeking care in emergency departments. A five-level categorization system was developed, as it allowed for a highly accurate classification of patients. Furthermore, as noted by [6], triage assigns patients a level of clinical priority with the aim of identifying those in more serious condition who require the most appropriate and timely diagnostic or therapeutic interventions to address their health problem. In this regard, several validated scales exist for classifying patients upon arrival at the emergency department, including the Australasian Triage Scale (ATS), the Canadian Triage and Acuity Scale (CTAS), the Emergency Severity Index (ESI), the Manchester Triage System (MTS), and the Andorran Triage Model / Spanish Triage System (MAT/SET) [6][7]. According to [8], five-level risk stratification scales are generally recommended, as they are considered more reliable and valid for assessing patients' clinical status.

In this context, the prevailing scenario in emergency departments (EDs) is one of fully occupied beds, patients placed in hallways, waiting rooms filled with individuals awaiting care for hours, and healthcare staff feeling rushed and stressed [9]. The consequences are severe, as noted by [10]: patients leaving the ED before being seen, ambulance diversion and blocked access to medical services, prolonged stays in the ED and hospital, increased risk of iatrogenic events, delays in treatment and patient recovery, higher morbidity and mortality rates, increased operational costs, and reduced patient satisfaction.

Although the problem manifests in a dramatic and inhumane way within emergency services, overcrowding is, in fact, a systemic issue interconnected with broader challenges in healthcare delivery [11]. Accordingly, [12] proposed a theoretical framework for analyzing ED overcrowding through three structural components: input, throughput, and output. Input refers to the volume and nature of care demanded at the ED; output involves the discharge or transfer of patients to other care settings; and throughput pertains to internal processes and management within the ED itself [13].

From this perspective, ED overcrowding is a complex systemic process caused by specific bottlenecks not only within emergency services but also in primary care, hospital infrastructure, and the broader healthcare network [14]. Currently, healthcare institutions face an urgent need to strengthen the right to health and ensure equitable access to healthcare services with a human-centered approach. Humanized care is a strategy to enhance the quality of

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services provided by healthcare professionals, who are responsible for creating a safe environment and delivering respectful, dignified care to patients, their families, and the community. The impact of humanized care in the ED is essential to promoting patient well-being during treatment processes, as the hospital environment is often charged with emotional distress resulting from the suffering and anxiety experienced by patients and their loved ones [15].

Timely and high-quality care can be the difference between life and death for patients admitted to emergency departments. However, the high volume of users, capacity limitations, and complex internal processes make EDs particularly vulnerable to issues such as overcrowding, low patient satisfaction, and increased incidence of adverse outcomes. The ESE-HEQC is not exempt from this reality.

In light of the above, one proposed improvement is the implementation of advanced triage (AT). Although the concept of AT is not clearly defined in the literature, it is generally understood as the application of clinical protocols or practice guidelines previously agreed upon by the multidisciplinary team, whereby nurses act autonomously following the initial triage, in which patients are assigned a priority level. Based on these protocols, two types of actions can be undertaken to ensure safe and high-quality care. As described by [16], the first type of action falls entirely within the scope of nursing responsibility, without requiring medical intervention. The nurse conducts a focused and comprehensive assessment to determine the health issue (nursing diagnosis) and initiates appropriate pharmacological and non-pharmacological interventions to resolve it. The second type of action involves a thorough patient evaluation that may lead to the request for diagnostic tests and formulation of a presumptive diagnosis; however, addressing the issue requires both nursing and medical intervention. Referrals to a physician are made only when, in the nurse's professional judgment, a medical evaluation is necessary, particularly in cases involving diagnostic or therapeutic complexity [3].

Given these circumstances, EDs are susceptible to demands that exceed available resources, making it necessary to classify patients to prioritize those whose clinical condition does not permit extended waiting times [17]. Consequently, the Colombian Ministry of Health, with the objective of "reducing the risk of death, complications, or disability in patients seeking emergency services" [18], and with the aim of improving response times and promoting timely care for critically ill patients, established technical criteria in Resolution 5596 of 2015 for classifying patients based on the risk that their clinical condition poses to life, limb, or organ function, as well as the interventions required. This classification system, also known as triage, is designed to categorize patients upon admission to the ED in order to prioritize care for those in more severe condition, thereby

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reducing adverse outcomes associated with delays in treatment [18].

Triage in Colombia

The triage system established by the Ministry of Health in Colombia must assess, in a sequential manner, whether a patient falls into Triage Category I, which requires immediate attention. If not, the evaluation proceeds to determine whether the patient qualifies for Triage II, which mandates medical attention within less than 30 minutes, and so on, until reaching Triage Category V, which corresponds to the lowest priority level. For Triage Categories III, IV, and V, each healthcare service provider must define its own average response times and communicate them clearly to users. Below are the criteria that emergency services are legally required to follow when assigning a triage level to each patient [18].

First, patients classified as Triage I are those requiring resuscitation measures or who, by law, are designated as Triage I cases (e.g., victims of sexual violence). These cases demand immediate care, as response time is a critical factor that may determine life or death outcomes [18]. Patients in Triage II present a high risk of rapid deterioration in clinical condition or of life-, limb-, or organ-threatening conditions, and thus must receive care within a maximum of 30 minutes. Patients classified under Triage III are in stable condition upon arrival but require urgent resources for diagnosis or treatment. If these are not provided in a timely manner, there is a significant risk of clinical deterioration [18].

Patients classified as Triage IV do not exhibit major alterations in their general condition nor an evident risk to life, organs, or limbs. However, complications may arise if they do not receive appropriate medical attention. Finally, Triage V refers to patients whose clinical condition presents no evident threat to life, organ function, or limb integrity, and who show no significant abnormalities in their general state [18].

Other triage systems

In the same way as in Colombia, various triage systems have been established across the world. These are dynamic systems whose classification algorithms are continuously improved based on performance outcomes, with the ultimate goal of enhancing patient clinical outcomes through timely medical care. Currently, the five most widely implemented triage models globally are the Australian Triage Scale (ATS), the Canadian Emergency Department Triage and Acuity Scale (CTAS), the Manchester Triage System (MTS), the Emergency Severity Index (ESI), and the Spanish Triage System (SET) [17]. Each of these systems has defined specific

target response times for each triage category, according to the structure and characteristics of their respective healthcare systems. Moreover, there are variations in how triage is conducted across these models.

Triage quality assesment

The current five-level triage systems were introduced in the 1990s in Anglo-Saxon countries, as previous four-level systems were shown to be neither effective nor valid [11]. Although triage is not a diagnostic tool per se, it must be capable of identifying patients who are at greater risk of complications or death if not prioritized appropriately (Ramírez et al., 2015). However, triage objectives are not always fully met. For example, in the United States, only 31% of emergency departments met the response time goals set for each triage category. Therefore, it is essential to evaluate several quality indicators, including the time between a patient's arrival and triage classification, the duration of the triage consultation, the time from triage to medical evaluation, and the rate of patients who leave the emergency department without being seen by a physician (whether or not they were classified through triage). These indicators are crucial to assessing the overall quality of the triage system [17].

The Ethics Committee of the ESE HEQC in Ocaña approved this study. In this context, the following research question arises: How can quality and humanization improvements influence client satisfaction among those seeking care in the hospital emergency department?

From a literary and theoretical perspective, the humanistic training of healthcare professionals has led to varied interpretations, including understandings of "medical humanities" (MH). These range from perspectives that position MH as a field situated between technical objectivity and compassionate ethical behavior [19], to interdisciplinary approaches that facilitate the integration and interpretation of the human experience of illness [20], addressing the human condition in relation to health, disease, and medical practice [21]. The inclusion of the humanities in medical education can offer significant benefits to both future physicians and the broader medical community. In this sense, the concept of humanization carries an ethical connotation, as it refers to the evaluation of human actions based on values, particularly in interpersonal relationships. In the context of healthcare, a recently validated and published model [22] defines humanization as “a set of personal competencies that enable professional practice in the health sector while respecting and safeguarding the dignity and rights of human beings.” On the other hand, the term *“humanization of healthcare” (HAS)*

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originated in the scientific literature [23], but currently there is no universally agreed-upon definition [24]. The term HAS implies the consideration of all stakeholders involved in the healthcare process—patients themselves, their caregivers, healthcare professionals, and policymakers—as well as the interactions among these actors [25]. However, future healthcare providers, namely current healthcare students, are often excluded from this framework.

This omission is notable. As early as the 19th century, William Osler coined the phrase, *"The good physician treats the disease; the great physician treats the patient who has the disease"* [26]. More recently, Ronnie Mac Keith, in his essay *"The Tyranny of the Idea of Cure,"* warned that *"patients are not passive vehicles of interesting diseases"* [24]. These concerns are at the core of training future healthcare professionals, emphasizing the importance of embracing uncertainty and reestablishing a balanced integration of the sciences and the humanities.

Regarding the skills and attitudes of healthcare personnel, these are governed by ethical codes that regulate the therapeutic relationship with patients and their families. However, competence in the humanization of care, beyond ethical competence alone, also includes psychological competencies such as *empathic competence*, which is closely tied to ethical behavior. The concept of empathy toward patients, respect for patient dignity, and the recognition of patients as individuals have all been cited in multiple studies as fundamental aspects of "humanized care" [25]. Additionally, the concept of *moral sensitivity*—defined as the ability to recognize that one's actions may affect others—has also been linked to the concept of humanization [27].

Furthermore, the humanization movement within emergency departments (EDs) must adopt *person-centered care* principles in order to provide a holistic perspective that includes all actors involved in the care process and the interactions among them. In this context, we describe the following concepts:

Person: Refers to an individual belonging to the human species, male or female, who, from a legal and moral perspective, is also considered a conscious and rational subject with the ability to exercise discernment and accountability for their own actions [28].

Dignity: Human dignity signifies that an individual possesses self-respect and self-worth, while also being respected and valued by others. It implies the imperative that all human beings be treated equally and enjoy the fundamental rights inherent to their condition [29].

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Users: The term client or user generally refers to the recipient of an action and can be any individual or organization that receives the output of a process, either directly or indirectly. It also refers to someone who regularly makes use of a particular service, regardless of the sector to which that product or service belongs [30].

Right to Health: Bogotá, Colombia, 1948, Article XI: "Everyone has the right to have their health preserved through sanitary and social measures related to food, clothing, housing, and medical care, as determined by the level of resources available from the public and the community."

Humanization in Healthcare: According to [31], humanization in healthcare involves approaching the patient from an integrative perspective that combines scientific and human dimensions. It entails considering the human being holistically—across physical, emotional, rational, spiritual, social, and intellectual dimensions.

Humanized Care: This interaction occurs through any communication channel established by a healthcare institution to engage with patients. It may involve a call center with staff trained to provide optimal service. However, it is not limited to human interaction; ideally, it includes automated services that are personalized and efficient [32].

Humanization of Care: This is a key element for promoting well-being during care processes within healthcare systems, as the hospital environment is often characterized by emotional distress caused by illness and the anxiety experienced by patients and their families [15].

Humanization: To humanize healthcare means to personalize care, recognizing that behind every disease is a person experiencing a unique situation that must be integrated into their life. *Humanized care* requires acknowledging patients as people [31].

Dehumanization: Medical dehumanization, recognized as a prevalent process in contemporary medicine, refers to treating patients as objects, disregarding their personal and individual characteristics, and ignoring their emotions and values [31].

Materials and methods

This scientific research adopts a secondary data method, with its source derived from data recorded in the Emergency Department (ED) of the *ESE Hospital Emiro Quintero Cañizares* (ESE HEQC). Ethical approval was not required for this study, as it involves data from registered patients that is publicly available in the public domain and consists of open-source datasets, where the information has been properly anonymized. The dataset

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includes records from 135,337 patients.

Accordingly, the authors conducted an exploratory and descriptive study, using a research strategy based on the collection of retrospective and quantitative data, grounded in a positivist paradigm. In this regard, [33] emphasizes that exploratory researchers must have “flexibility in seeking data and an open mind about where to find it,” while [34] suggests that the descriptive researcher may employ techniques that allow the subject under investigation to be observed as though it were not under study. In this context, the data analysis was based exclusively on patient records from the ED during the year 2022 and the first half of 2023, whose care took place in Risk Classification Reception Rooms, Clinical Consultation Rooms, Trauma Rooms, Observation Units, Hospitalization Wards, and Referral Services. Additionally, a dataset named “opportunity-Triage-Consultation” was utilized. This dataset contains information regarding the patient’s admission number, age group, and timestamps of admission, triage, and care, based on completed medical records by healthcare personnel at this public hospital—recognized as a regional referral center for emergency and urgent care (ESE HEQC).

Results and Discussion

The Emergency Unit (EU) is divided into the departments of gyneco-obstetric emergencies, pediatric emergencies, general emergencies, and the emergency expansion area. The latter was established in response to the SARS-CoV-2 pandemic and is located in a different area of the hospital. The other departments of the emergency service are located contiguously within the same hospital block and share a common access point for patients.

The installed capacity of the general EU includes a trauma area and consultation rooms for medical care, as well as various observation areas for temporary patient stays, also referred to as the transition area, as described in Illustration 1. On average, it comprises 18 individual chairs for patients awaiting initial assessment and 45 hospital beds or stretchers with side rails. The location of these units is detailed below, with the identification number used by the healthcare service provided in parentheses.

- Special care: 3 beds (Care 1, 2, and 3).
- First observation room: 5 beds (1–5).
- Male observation: 9 beds (11–19).
- Female observation: 8 beds (21–28).
- Corridor: 17 stretchers (6, 7, 8, 9, 10, 20, and from 29 to 39)

In addition, an extra stretcher is always available in the Triage waiting area in case a patient needs to be transferred to any of the treatment areas. Accordingly, various personnel interact within the EU of the ESE-HEQC, including both healthcare and

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administrative staff, whose coordination enables the execution of essential processes for appropriate patient care. These actors include: security guards or security personnel, patient transport assistants, admissions or billing staff, personnel from the Emergency and Urgency Regulation Center (CRUE), clinical staff such as registered nurses, nursing assistants, psychologists, social workers, physiotherapists, general practitioners, medical specialists, and medical interns. The latter are final-year medical students assigned to the hospital under a teaching-service agreement. All functions performed by interns must be supervised by the physicians of the respective assigned areas, and their roles primarily involve support for clinical care or training.

It is important to note that the availability of medical specialists in the EU varies. Specialties such as orthopedics, surgery, internal medicine, neurosurgery, and urology are available 24 hours a day. In contrast, specialties including ophthalmology, otolaryngology, maxillofacial surgery, vascular surgery, cardiology, dermatology, gastroenterology, geriatrics, and psychiatry provide outpatient consultation services at ESE-HEQC. The following section details each of the operational processes for patient care in the general emergency service, as illustrated in Illustration 1.

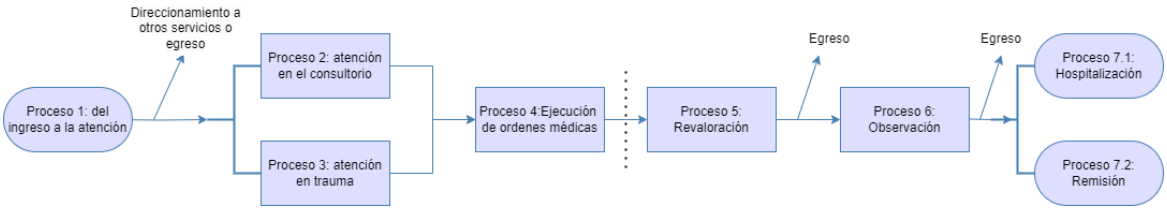

Illustration 1. Process flow

In Process 1, which encompasses admission through to the beginning of medical care, the patient enters through the emergency service gate and proceeds until being attended by the physician assigned to the appropriate care area. Due to the operational dynamics of the Triage service, Process 1 differs between work shifts. It also varies depending on the area to which the patient is directed. For example, patients presenting with gyneco-obstetric pathologies are initially directed to the corresponding area by the admissions staff, while trauma patients are directed by security personnel based on their clinical condition. In these cases, the general practitioner assigned to the area is responsible for conducting both the Triage assessment and the initial medical consultation. Based on this assessment, the physician classifies the patient into one of the five Triage categories and assigns them to the appropriate care area: trauma, consultation, gyneco-obstetric

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emergencies, or pediatric emergencies.

Additionally, the Triage service has functioned as a secondary screening mechanism for referring patients presenting with respiratory symptoms to the emergency expansion area, in cases where the admissions staff did not previously direct them there. However, such referrals to the expansion area are currently infrequent, as most of these patients are now directed to consultation or pediatric areas.

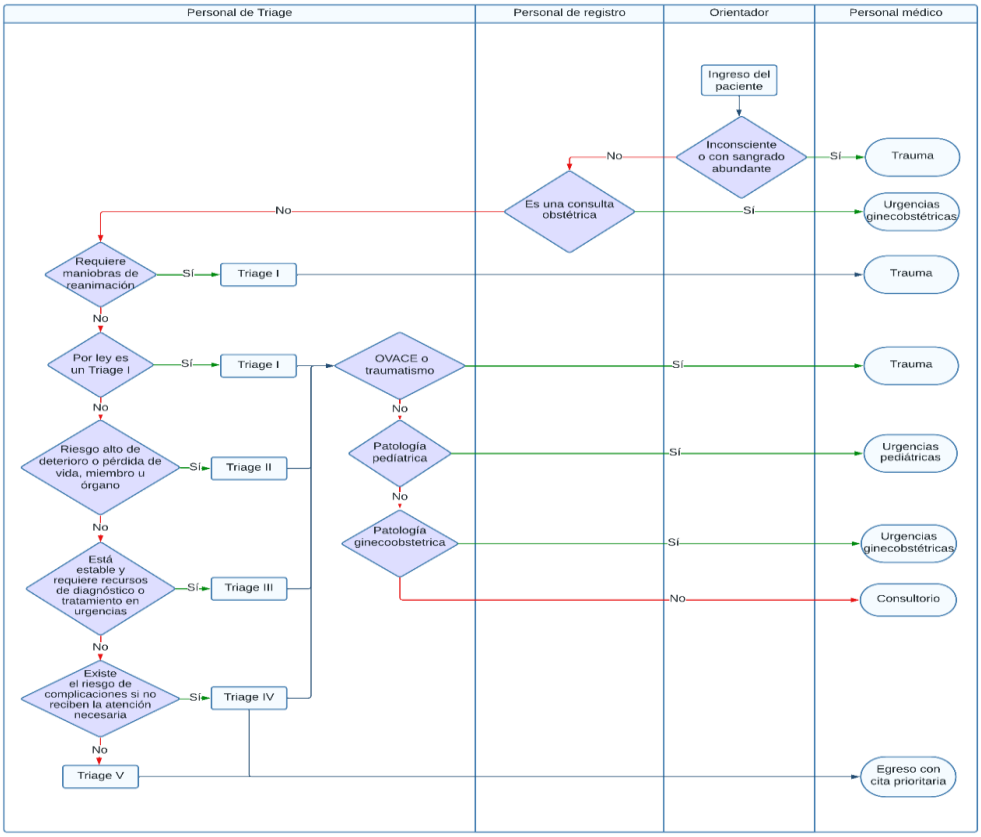

Illustration 2. Flowchart Process 1 in the Day Shift.

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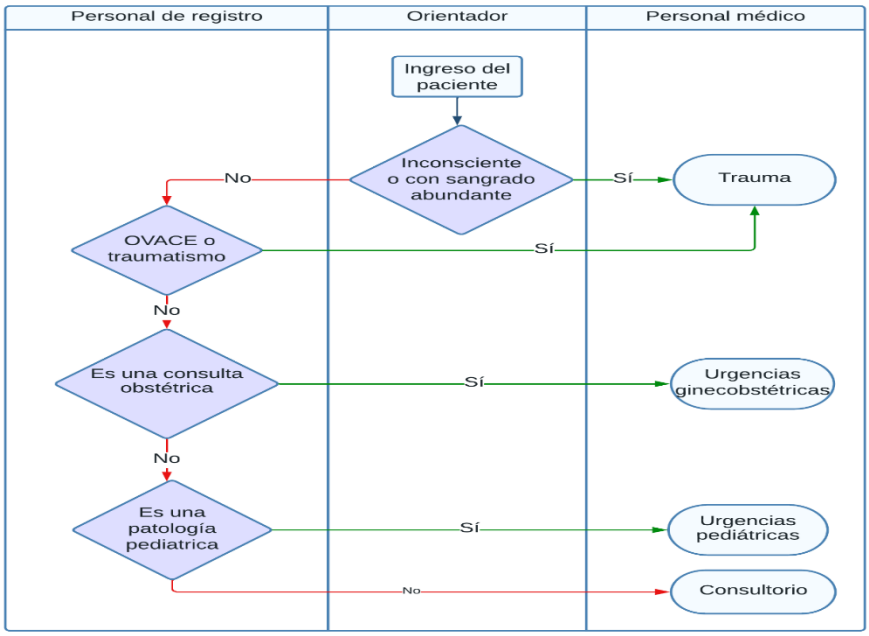

Illustration 3. Flowchart Process 1 in the Night Shift.

Initial consultation in Process 2: The physician accesses the Kubapp information system to verify the Triage category assigned to the patient and to review the specifications provided by the Triage nurse. Priority is given to patients according to their Triage classification, and they are called in order based on this categorization. Subsequently, for patients within the same Triage category, the physician may choose to call a specific patient based on age group, the presence of any relevant factors noted in the nursing records, or if nurses have previously provided information regarding the patient's condition that warrants prioritizing their care.

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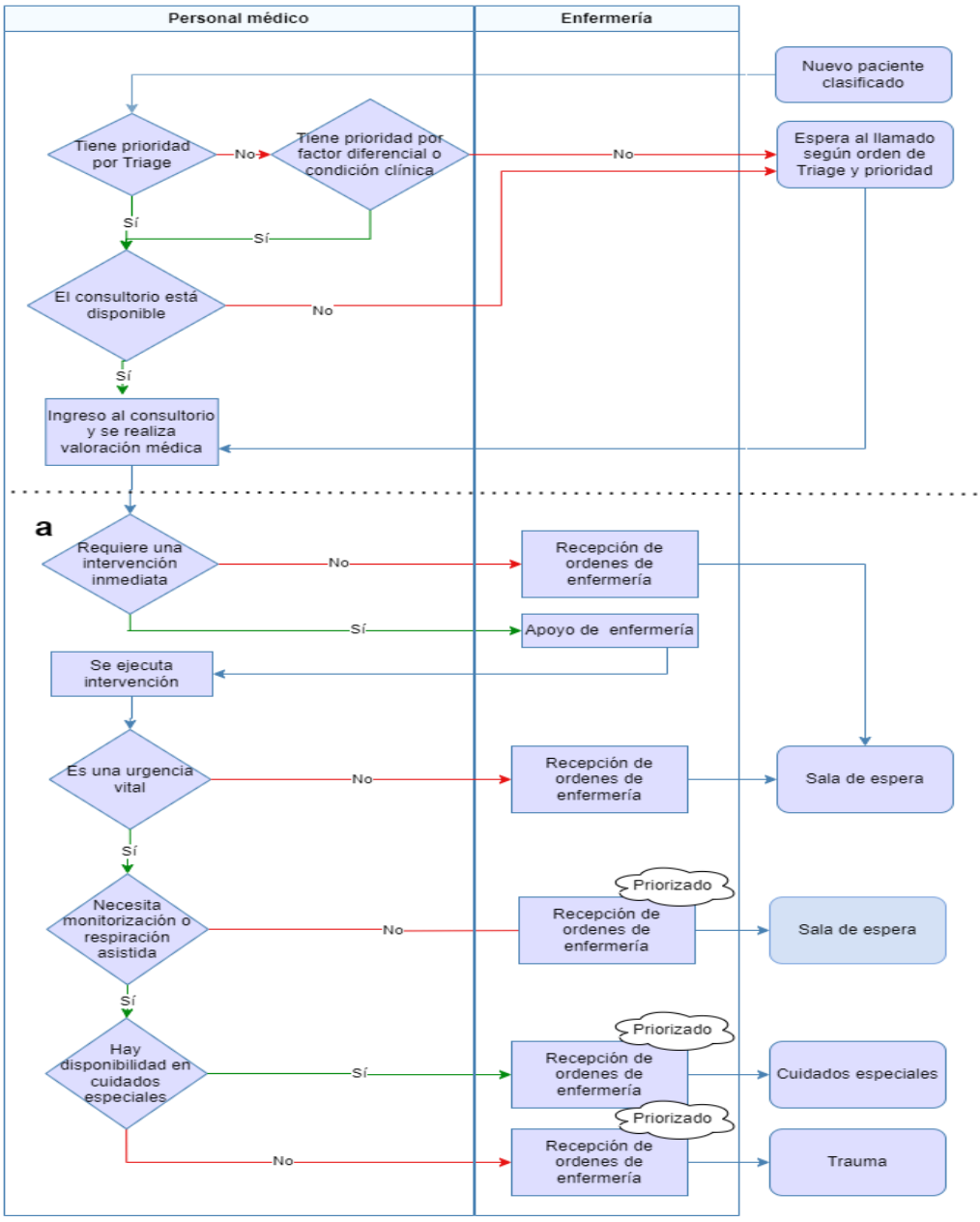

Illustration 4. Flowchart, Consultation Process in the Doctor's Office.

On the other hand, initial care in the trauma area, as outlined in step 6 of the Process 3 flowchart, refers to the procedure followed for patients who are admitted directly to the trauma area during any shift. For patients with a prior Triage classification, the process is like that in the consultation area. In cases of emergency, such as when a patient arrives unconscious or with profuse bleeding from wounds, the physician conducts a comprehensive assessment of the patient's overall clinical condition. If the patient is in cardiorespiratory arrest, resuscitation and stabilization

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maneuvers are initiated immediately. The physician is always supported by two nursing assistants, and in critical situations, requests the involvement of a professional nurse.

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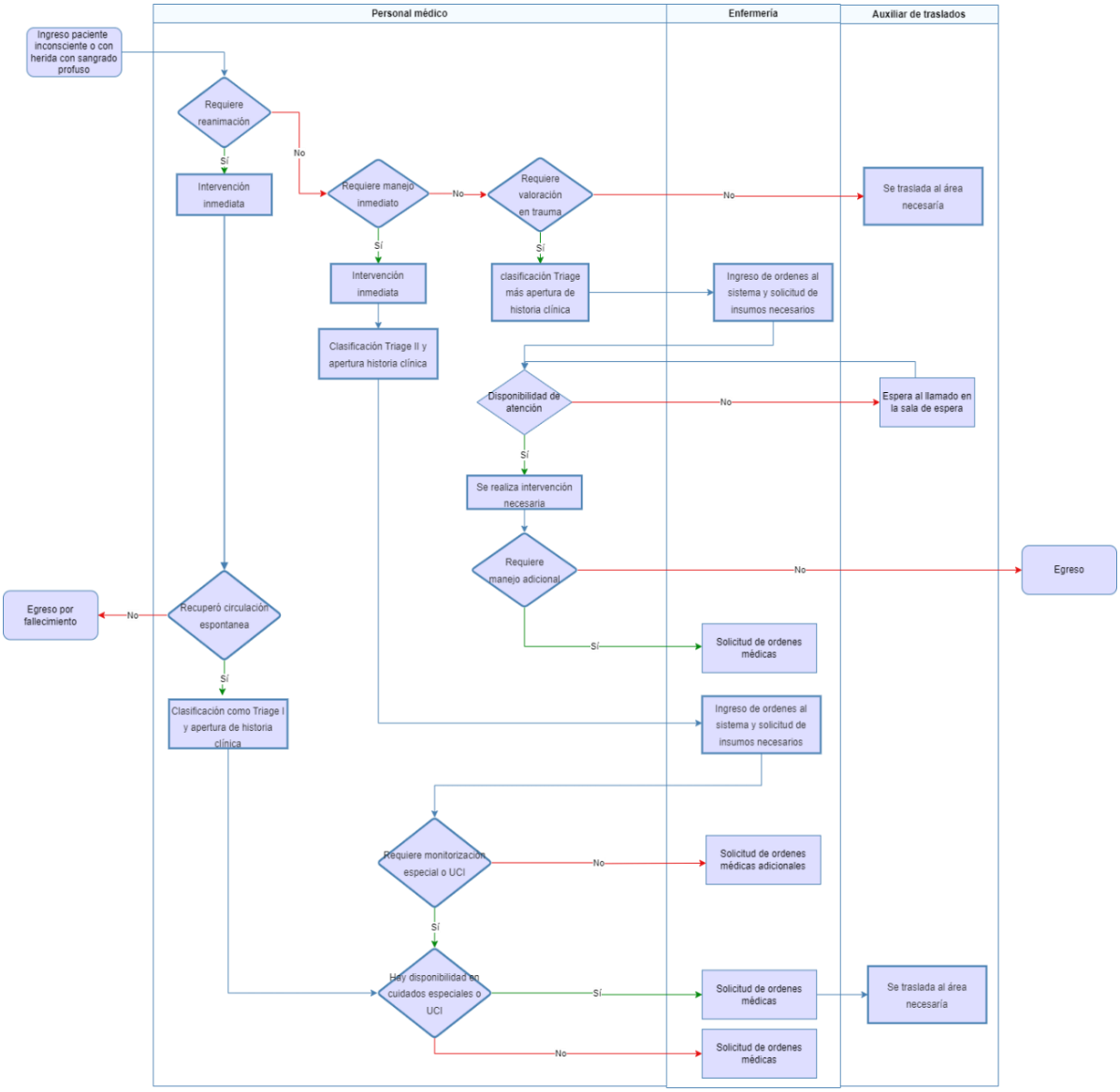

Illustration 5. Flowchart Process 3

Regarding the reception and execution of medical orders by nursing staff, which forms part of Process 4, the physician prints the clinical orders and delivers them to the head nurse, who receives and carries them out. If a patient arrives with high priority due to their Triage category or a worsening clinical condition, the physician typically informs the nursing professional so that care for these patients can be prioritized. In the absence of prioritization criteria, orders are executed based on the

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order of arrival. An exception is made for patients undergoing cardiopulmonary resuscitation, in which case resuscitation maneuvers and administration of stabilizing medications are carried out immediately through verbal orders to the nursing staff. In such cases, once the patient is stabilized, these orders are retrospectively entered into the clinical record by both medical and nursing personnel. Common medical orders issued in the emergency service include: sample collection and medication administration; radiographic and ultrasound examinations; paraclinical procedures (such as MRI or CT scans); and gastrointestinal endoscopy procedures.

In Process 5, which concerns medical re-evaluation, physicians assigned to consultation during the day shift divide their responsibilities between initial evaluations and re-evaluations. During the night shift, the physician performs both functions. The physician responsible for re-evaluations monitors the timing of patient care and repeatedly assesses whether paraclinical test results are available and whether medications have been administered by nursing staff. Once the results are available and initial medical management has been implemented, the physician re-evaluates those patients who do not require specialist consultation.

In the trauma area, the physician is responsible for initial care, resuscitation, and re-evaluation. In cases where patients only require suturing, the physician proceeds with the procedure once the necessary materials are available and time allows, then discharges the patient with appropriate outpatient care instructions. For all other cases, the physician proceeds similarly to the consultation physician responsible for referrals to specialists.

Process 6 corresponds to Observation, which includes all patients who have already undergone an initial evaluation and, due to their clinical condition, need to remain in the hospital for ongoing monitoring or while awaiting admission to an inpatient unit, intensive care unit (ICU), or referral. In this context, the continuation of Process 6, concerning hospitalization and referrals, begins once the attending physician issues the admission order. The search for an available inpatient bed is then initiated. If no bed is available at the time, the patient remains under observation until one becomes available. If the patient requires admission to a higher complexity service, the referral process is initiated through the Emergency and Urgency Referral Center (CREU).

Indicadores de atención

Reference [11] defines an indicator as a measurement that reflects a specific situation. These are used in healthcare settings to monitor performance and to generate proposals for continuous improvement. In the emergency department of ESE-HEQC, as of May 2023, five quality indicators were being utilized to monitor the timeliness of care on a monthly basis.

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Tabla 1. Indicadores de calidad en urgencias originales

	INDICATOR	**INDICATOR OBJECTIVE**	***CALCULATION FORMULA***	***TARGET***
1	Average waiting time for Triage II patient care in the emergency service (minutes)	Improve access conditions and timeliness in service provision	Sum of minutes elapsed between Triage II care request and time patient is attended / Total users attended in Triage II.	10 minutes
2	Average waiting time for Triage II emergency consultation care (minutes)	Improve access conditions and timeliness in service provision	Sum of minutes elapsed from Triage II classification and time patient is attended in emergency consultation by the doctor / Total users attended classified as Triage II in emergency consultation.	20 minutes
3	Percentage of occupancy in emergencies	Improve access conditions and timeliness in service provision	Sum of days of stay in emergencies during the period * 100 / Total days of stay available in emergencies during the period.	90%
4	Percentage of patients with stays longer than 24 hours in emergencies	Improve access conditions and timeliness in service provision	Number of patients with stays longer than 24 hours * 100 / Total number of patients in emergencies	0%
5	Opportunity in emergency consultation care	Evaluate the care component of opportunity as input to determine accessibility and sufficiency of service offering.	Sum of minutes elapsed between Triage classification (I, II, III) and subsequent medical attention in the emergency service --------- x 100 Total users attended in the emergency service	Triage I: immediate, Triage II: < 30 minutes, Triage III: < 2 hours

Source: Own Production

In 2022, the emergency unit (EU) recorded a total of 89,610 patient admissions. For the purposes of analysis, data related to admissions in emergency, inpatient, and outpatient services at rural branches were excluded. As a result, the remaining 84,414 patients are considered to correspond to admissions at the main EU facility of ESE-HEQC. Additionally, during the first half of 2023, a total of 50,923 patient admissions were recorded, of which 8,347 occurred in June across all institutional locations.

In this context, the monthly admission trends for 2022 and 2023 show a consistent increase in the number of admissions in 2023 compared to the previous year for each corresponding period.

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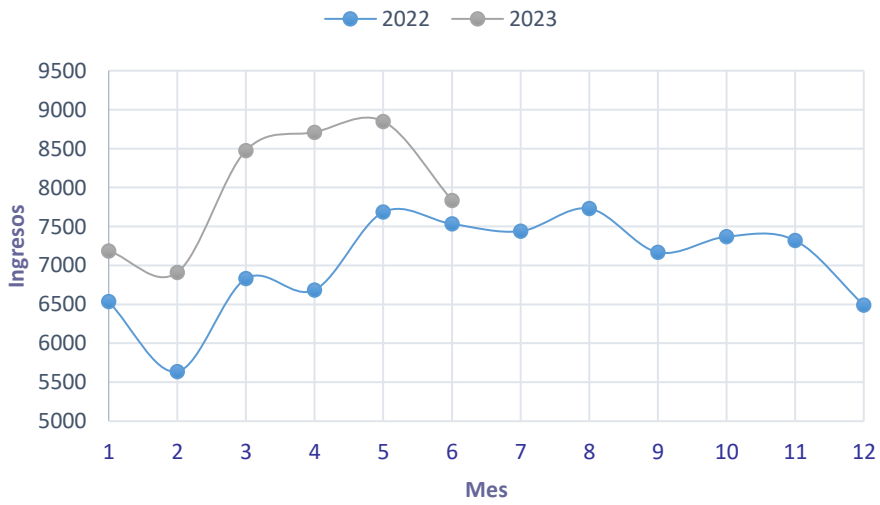

Chart 1: Monthly Revenue for 2022 and the First Half of 2023

Admissions by day of the week for the year 2022 and the first half of 2023 are shown in Chart 2, which presents a box-and-whisker plot. In both subgroups, an analysis was performed to determine whether significant differences exist in the number of admissions according to the day of the week. For this analysis, the Kruskal-Wallis statistic was used, as these are independent samples with a distribution that deviates from normality. The results can be observed in Table 1, and because both data groups analyzed yielded a p-value < 0.05, a statistically significant difference in admissions according to the day of the week is demonstrated.

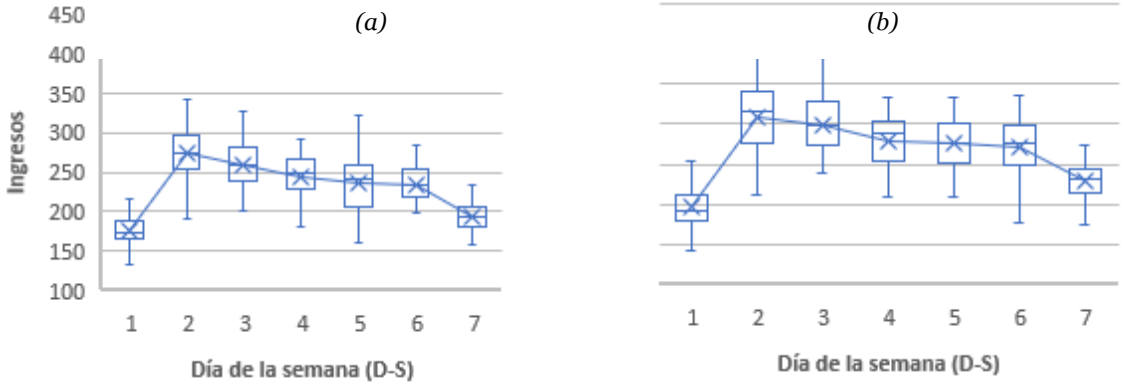

Chart 2. Admissions by day of the week for 2022 (a) and the first half of 2023 (b)

Upon analyzing both groups, it was found that Monday is the day with the highest patient influx, followed by Tuesday, whereas Sunday shows the lowest influx, followed by Saturday.

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Tabla 2. Estadístico Kruskal-Wallis, análisis multivariado por día de la semana

Year	Kruskal-Wallis Statistic	P-Value
2022	205.49	1.29e-41
2023	83.87	5.65e-16

Similarly, admissions by hour of the day were analyzed to understand the institution's behavior for admissions in 2023 and 2022. In chart 3, the proportion of average admissions by shift, day or night, is observed to be identical in both years. It was found that on average, 76% of patients are admitted during the daytime shift.

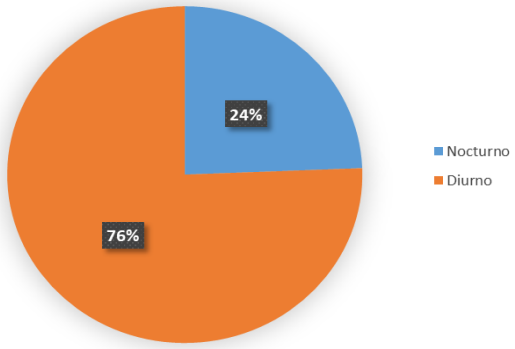

Chart 3. Average admissions by shift

On the other hand, Chart 4 shows the pattern of admissions by hour of the day for both years. Since the number of admissions in 2023 was higher compared to 2022, each individual value was divided by the total number of admissions corresponding to its respective year in order to enable a comparative analysis. It is evident that the patterns for both years are identical. Beginning at 06:00, there is a noticeable increase in admissions, reaching a peak between 08:00 and 10:00, followed by a secondary peak between 13:00 and 15:00, and then a gradual decrease in arrivals, with the lowest values occurring after 00:00. The yellow bands indicate the shift change times (07:00 and 19:00).

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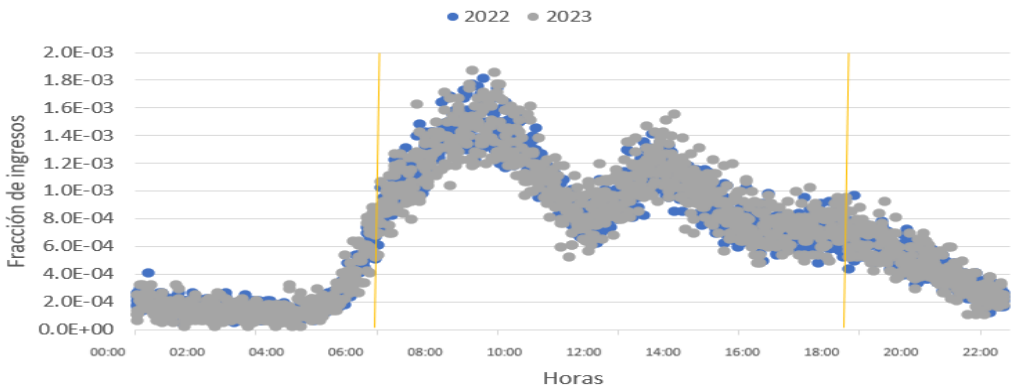

Chart 4. Admissions by hour for 2022 and 2023

In fact, Chart 5 shows the number of admissions per hour of the day by care area. C corresponds to Consultation, P to Pediatrics, T to Trauma, R to the Emergency Expansion Area, and G-O to the Gyneco-Obstetric area. C-P-T represents the aggregated data for the areas with independent Triage prior to medical care. This disaggregated analysis allows for the observation that peak admission hours occur in a similar pattern across all areas.

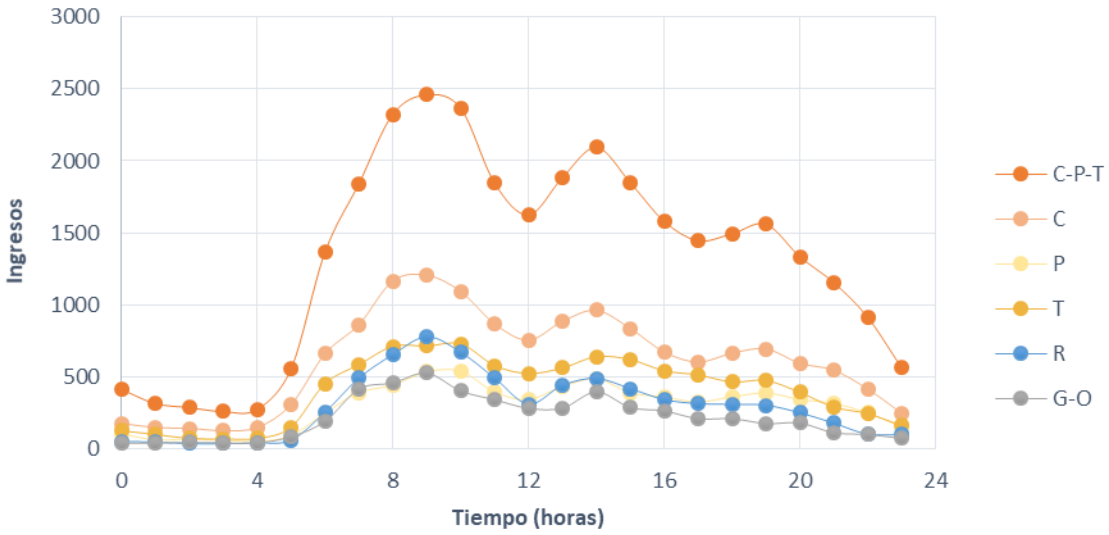

Chart 5. Admissions by Hour of the Day by Area, Year 2023

Lastly, regarding admissions by age and sex in the emergency unit of ESE-HEQC, it was observed that, on average, 57 percent of admissions in 2023 and 58 percent in 2022 corresponded to female patients across all months analyzed. However, this proportion varies by age group, as shown in Chart 6.

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In the early childhood and childhood age groups, a higher proportion of male patients was observed, with 52 percent and 53 percent, respectively. In contrast, in all other age groups, a higher proportion of female patients was recorded. This pattern remains consistent for both the year 2022 and the first half of 2023.

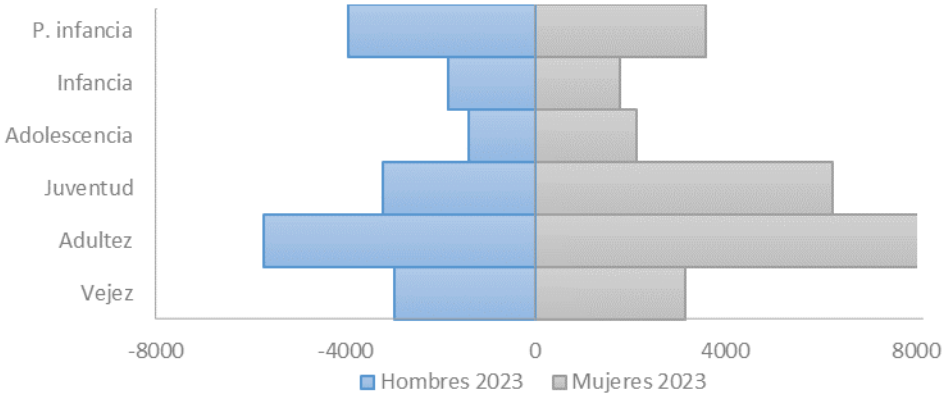
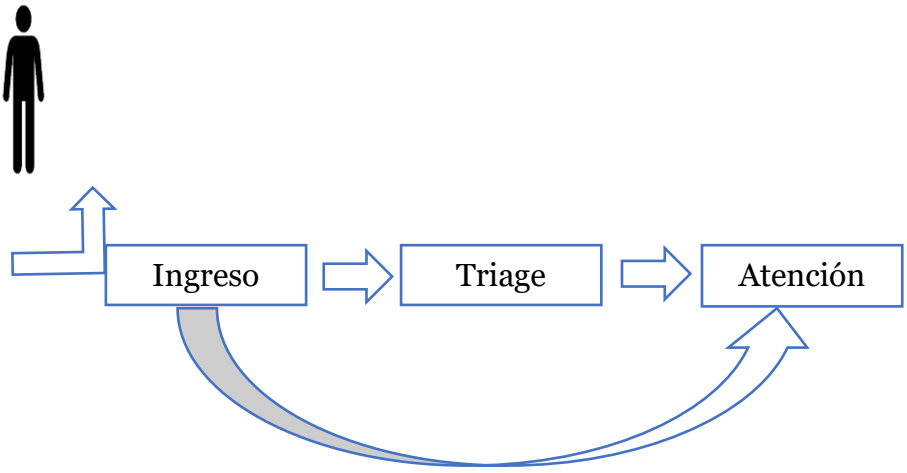


Chart 6. Admissions in 2023 by Age Group and Sex

Considering the ongoing discussion and the challenges faced by the emergency unit (EU), a detailed analysis of the demographics of users who attend the EU and are seen by a physician was conducted. Additionally, quality indicators related to timeliness were examined, specifically the measurement of average times between Triage and medical attention (A-T) for patients classified as Triage categories 1, 2, and 3, as these are an integral part of the care process.



Illustración 7. Diagram of Process 1

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Conclusion

It must be established that the institution's installed capacity, in terms of access to critical care areas—such as the resuscitation room and surgical suites—requires direct access from the point of entry into the emergency department. Similarly, access to diagnostic imaging areas must be broad, unobstructed, and direct, as these are essential paraclinical services in emergency care. The institution is considered to have an infrastructural advantage due to the current location of the laboratory, which minimizes delays and logistical issues in the delivery and processing of fluid samples requiring analysis.

International triage classification systems not only define time targets for patient evaluation according to triage category but also include target compliance rates. This is the case of the Australian Triage Scale (ATS). Given that the Colombian triage system does not define compliance benchmarks for each triage category, the following targets are suggested based on international standards and the current operational context of ESE-HEQC:

- ✓ Triage I: ≥95% compliance, target time < 5 minutes
- ✓ Triage II: ≥80% compliance, target time < 20 minutes
- ✓ Triage III: ≥75% compliance, target time < 2 hours

These targets should be periodically revised in the pursuit of continuous quality improvement. Measuring compliance percentages provides a straightforward method to monitor the behavior of outliers, particularly positive outliers, as there is an inverse relationship between these and the overall compliance rate.

In addition, there is a deficiency in the alert system integrated within the Kubapp information system. Specifically, the system lacks indicators to prioritize care for certain patients, alerts for when paraclinical test results are available for review, or visual aids (e.g., color-coded indicators) to notify staff when a patient's waiting time has exceeded target thresholds. Moreover, there is no systematic assessment of the time elapsed between patient arrival and triage assessment. This interval is a key quality measure for the triage system and should ideally be less than 10 minutes to ensure timely initial classification.

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