Research Article

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Health Science Journal
ISSN 1791-809X

2022
Vol. 16 No. S7: 957

DOI: 10.36648/1791-809X.16.S7.957

Approach to patient Management In Critical Condition

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Citation: Isaias GC, Duenas C, Perales K, Tafur Delgado Juan E, Andres SG, et al. (2022) Approach to patient Management In Critical Condition. Health Sci J. Vol. 16 No. S7: 957.

Abstract

Behaviors in the critical care unit are the fundamental pillar to reduce the morbidity and mortality of patients; diagnostic accuracy and the development of attitudes and skills of health personnel should be the reason for success, however there is little literature that guides the work to meet the desired objective, This publication makes an approach by proposing an easy-to-remember and use strategy when a patient is in critical condition, the most common pathologies are included, their exact diagnosis and how the interdisciplinary group participates in the comprehensive management in the Intensive Care Unit (ICU).

Keywords: Critical pathologies; ICU Intensive Care Unit; Clinic; Driving

Received: 17-May-2022, Manuscript No. Iphsj-22-12783; **Editor assigned:** 19-May-2022, PreQC No. Iphsj-22-12783(PQ); **Reviewed:** 15-Jun-2022, QC No. Iphsj-22-12783; **Revised:** 20-Jun-2022, Manuscript No. Iphsj-22-12783(R); **Published:** 27-Jun-2022, DOI: 10.36648/1791-809X.16.S7.957

Introduction

The intensive care unit or more commonly known by its acronym ICU, is part of the last link in a comprehensive system of care for patients with life-threatening injuries or traumatic damage. It is the place where patients are in critical condition presenting pathologies of high complexity and sometimes with the possibility of having a fatal outcome, in other words, in the intensive care unit, there are people or patients in a very delicate state of health; Their vital functions are severely altered, determining an imminent danger of death, so that the possibility of losing their lives is an important factor to take into account, even when there is a possibility of survival, of those who survive a year, between 26 and 63% die; and 33% of them never return to work [1,4]. For this reason, it is essential to emphasize that critical patients need adequate management with especially warm and comfortable care, since they are very vulnerable, especially because they are facing a terrible disease with many discomforts derived from it, adding, in most cases, the worry of their stay in the ICU [2, 3]. For this reason, and based on the acronym created by Jean Louis Vincent "fast Hug Bid", we intend to demonstrate in this article some key tasks in the attention, treatment and final measures of medical practice and critical care. For this purpose, we propose the acrostic "IN CRITICAL STATE" as shown in Table 1, which allows to remember in a simpler way the elements to be taken into account and that should be performed in the population in question (**Table 1**).

Nursing

One of the important elements is the role of the nursing corps,

Table 1. Acronym of the elements to be present in the patient in ICU.

I	infirmary
N	nutrition
E	scales de ingress UCI y prognostics
S	Sedoanalgesia
T	Roxboro filaxis
A	ntimicrobianos
D	diuresis y Depositions
O	B tener balance
C	abecera
R	evisar catéteres
I	nstaurar Metas
T	earlier antiulcer as
I	inotropicos/Vasoactivos
C	control metabolic
O	xigenación

since, the nursing professional has the ability to project and sensitize to the point of knowing when and how much a certain factor is stressful or not stressful in a patient, in addition, part of the functions of nurses is the clinical care, within it, monitoring the patient, compliance with medical treatment, performing procedures, care planning, monitoring vital signs, scheduling prevention of skin lesions, patient comfort, among others that promote the maintenance of a stable condition or early identification of possible complications [4]. In fact, they are very close to the patient and interact with the patient's family, either by providing information, explanation of procedures and education, being in the duty to focus their attention on the bio-psycho-socio-spiritual needs, with individualized care, which manage an ethic based on respecting the suffering of the other, being sensitive to his pain, protecting him and his family and making him feel as little as possible his disability or dependence [5-7]. However, individualized care guides the quality of care, with the aim of reducing or eliminating negative factors, thus facilitating the recovery process, reducing the length of hospitalization and, consequently, the rates of nosocomial infections [8]. Likewise, in this section, it is relevant to highlight the importance of preventing falls in ICU patients, this nursing function in hospital and geriatric units is very abundant, but research for specific ICU patients is very limited that is why it is usually little mentioned [9].

In the United States in 2017, more than 3,000,000 falls were recorded, with age 65 years and older being a risk factor that accounts for 85% of deaths after falling or, failing that, can lead to post-fall complications such as fractures, which are reported between 1-3% after the in-hospital fall, figures that have undoubtedly increased over the years [10-12]. Additionally, it should be known that the incidence of falls varies according to the type of ICU from which they originate according to the study carried out by Flanders et al. where patients derived from a medical ICU fell with a fall rate of 52.9 falls per 1000 patients, followed by neurological ICUs, where the rate was 40.1 per 1000 patients and the incidence of falls in those who came from a surgical and coronary ICU was considerably lower, with 15.6 falls per 1000 patients. However, we searched in databases such as PUBMED and several journals such as the NEJM, for predictive scales that classified and detected patients at risk of falls in the ICU, on which there seems to be no literature to date, and although there are several scales such as Morse, STRATIFY, Downton, Tullamore, and Tinetti that have been evaluated in acute patients and rehabilitation wards, these are not superior to clinical judgment to recommend it [13]. For all of the above, it is more effective to include the risk of falling in the care of ICU patients to avoid complications leading to death, which is why meta-analyses to date with the available information seem to recommend multifactorial interventions as a good strategy to reduce falls, Among these strategies it is recommended to identify risk factors inherent to the patient such as previous falls, use of sedatives, hypotension, fragility, agitation, and impaired control of urination, in addition, environmental factors such as poor lighting, carpets on the floor among others that favor falls should be considered [14,15].

Nutrition

Currently it is considered that nutritional support (NS) is part of the protocol of care for critical patients, in fact in ICUs parenteral nutrition (PN) is used in 6%, enteral nutrition (EN) in 72% and mixed nutrition in 12.4%. Nutritional replacement should be initiated 24-48 hours and generally 2 or 3 days are required to progressively increase feeding until the necessary requirements are reached [16]. During the stay in the ICU it is necessary to understand that patients, due to the severity of their illness, usually do not consume food like any other healthy person. For this reason, there are different feeding routes that become more important when the patient who is admitted to the critical care unit has an inadequate nutritional status, which can worsen the outcome and lead to major complications [17]. Although it is true that the oral route should be preferred, it is not possible to use it in all cases, and on the contrary, the enteral route will be used if there is no contraindication; in fact, enteral nutrition (EN) is the preferred nutrient supply route in critical patients. According to standard practice and the recommendations of different scientific entities, enteral nutrient delivery is preferable because it has advantages such as the maintenance of the structure and function of the intestinal barrier, as well as a lower rate of metabolic complications related to nutrient delivery such as hyperglycemia. Critically ill patients receiving EN have important benefits compared to those treated with parenteral nutrition, such as a lower frequency of infectious complications, shorter hospital stay and even lower mortality. However, it is not true to say that it is the only route that should be used, it all depends on the reason for the patient's admission to the ICU, since there are exceptions where NE cannot be used, such as >300 ml of gastric residue, intestinal obstruction, malabsorption, fistula, paralytic ileus, gastrointestinal ischemia, digestive hemorrhage, digestive tract surgery, etc. In this case, nutrition is suspended for 6 hours and restarted at half the dose, in addition prokinetics will be added for intestinal transit, a gastric residue value of 500 ml can be recommended as a limit in ICU patients under treatment with EN by nasogastric tube, this is used as an indicator of tolerance of the diet, if finally it is not tolerated, nutrition will be parenteral, preferably in the shortest possible time and only for life in patients with short bowel, since this route brings with

it important adverse effects; Gastroparesis should be avoided because although it is not serious, these patients require much more medical and nursing time and may change their prognosis in the unit [18]. The efficacy of nutrient delivery is calculated using the formula shown in Figure 1 based on the relationship between the volume of nutrients received by the patients and the volume prescribed according to the calculations made [19] (**Figure 1**).

Initially, the goal of nutritional support in critically ill patients is to maintain lean body mass, decrease catabolism and increase nutrient intake within the limitations imposed by the different degrees of organ failure [20]. The measurement of caloric requirements and determination of the need for nutrition is done through scales such as "NUTRIC SCORE", currently a total of 25 kcal/kg is recommended in patients with BMI<30, for a more accurate value some formulas can be used (MIFFLIN, PENN STATE), this result will be distributed in the different nutrients (CHOS 50-60% (7 GR/KG/DAY or 5MG/KG/MIN, LIPIDS 24-30% (1-1. 5 GR/KG/DAY), PROTEINS 15-25% (0.8-2 GR/KG/DAY). Now, to introduce these requirements in the enteral part, feeding tubes are used, the most common ones include nasogastric tubes (NG tubes) and gastrostomy tubes (G tubes) where the former correspond to a non-surgical measure and the latter is purely surgical. However, there are several types of feeding tubes depending on how and where they are placed in the digestive system as shown in Table 2, and in the enteral part, formulas are used to replace food and supply proteins, carbohydrates, lipids and other vital components for the body [21] (**Table 2**).

ICU admission scales and prognoses

Traditionally patients with severe processes, who have developed pathophysiological alterations that have become life threatening, are referred to the ICU for active assistance to stabilize and achieve recovery. The admissions scales are based on the American College of Critical Care and follow a variety of categories as presented in Table 3, but are not limited to the criteria described. Therefore, it is important to highlight some recommendations including developing a cardiac and vascular ICU design for the adult patient, diagnosis, parameters and prioritization should be used for admission and admission to the ICU. The request process should be addressed to the ICU office with its respective date and time. It is also based on a relationship with a high level of attention to the patient who requires interventions or is in a serious clinical condition [22-24]. Accordingly, all critically ill patients who require continuous monitoring (every hour) or invasive monitoring or who require interventions that cannot be provided in other services of the institution should be attended at the Intensive Care Unit level [25] (**Table 3**).

Fuente: Ehikhametalor K, et al. "Guidelines for Intensive Care Unit Admission, Discharge and Triage." West Indian Medical Journal 68 (2019).

Once the critically ill patient has been admitted to the ICU, every day different studies are carried out to evaluate his care and progress in his state of health. Therefore, there are tools such as scales that allow improving patient care, comparing variables

Table 2. Frequent nutrition pathways in the ICU patient.

Enteral route	Parenteral route
feeding which carries nutrients to the stomach or intestine as liquid instead of solid food	Feeding by supplying a special formula through a vein, which provides most of the nutrients the body needs.
Types of probes and their Access routes	**Access roads**
1. **Nasogastric tube (NG tube).** It is inserted into the stomach through the nose. The tube goes down the throat, through the esophagus and into the stomach	
2**. Nasojejunal tube (NJ probe)**. It is similar to an NG tube, but continues through the stomach into the small intestine.	1. **Intravenous route**: the preferred are the cephalic and the basilica in antecubital situation, not being recommended the veins of the lower limbs due to greater risk of thrombophlebitis. 2. **Central route:** The route of choice is the subclavian and in patients at risk in the placement of the catheter in the subclavian can be placed in the internal jugular. If the duration is not expected to exceed 12-15 days or direct puncture in large vessels is contraindicated, a catheter may be placed peripherally (brachial vein in the middle of the arm) and advanced to the superior vena cava (drum), but there is a risk of phlebitis and catheter bending
3. **Gastrostomy tube (G-tube).** It is inserted through a small cut in the skin. The tube passes through the abdominal wall directly into the stomach.	
4.**Gastrostomy-jejunostomy tube (GJ tube)** it is inserted into the stomach as a G-tube, but continues through the stomach into the small intestine.	
5. **Jejunostomy tube (J probe)**. Uses a small incision to place the feeding tube through the intestinal wall directly into the small intestine.	

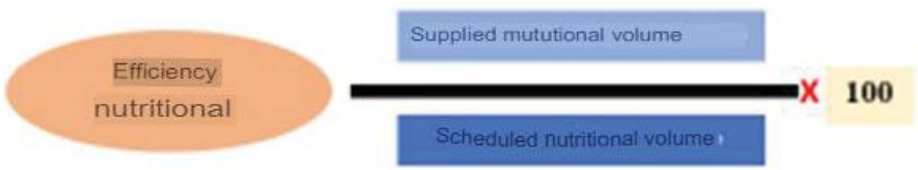

Figure 1 Formula to evaluate the efficiency of the patient's nutritional intake.

Source: Gonzalez, Juan Carlos Montejo, and Mercedes Catalán González. "New systems for the implementation of nutritional support in ICU patients." Hospital Nutrition 6.1 (2013): 60-67.

Table 3. ICU patient admission models under American college of critical care criteria.

(A) The Priority Model
Priority 1: Those unstable and critically ill patients, who require immediate monitoring and intensive therapy. As in the case of patients with ventilator support in the face of acute respiratory dysfunction. Patients who need treatment with vasoactive drugs due to shock or hemodynamic ally unstable
Priority 2: Patients limited to intensive monitoring and likely to require rapid investments. There is usually no therapeutic limit. In the case of patients with chronic diseases who develop serious surgical complications.
Priority 3: In this group are immersed patients who have few options to recover because of their initial disease, who are unstable and critical, therefore they can receive treatment to manage the acute disease without requiring essential cardiopulmonary resuscitation or intubation. As in the case of a patient with cardiac tamponed.
Priority 4: Those patients who did not receive any benefit from their stay in the ICU because their state of health does not merit it, or failing that, those who are in a clinical picture of terminal illness where death is irreversible.
B) DIAGNOSTIC MODEL
Circulatory system
● Cardiac arrest.
● Cardiogenic shock.
● Acute congestive heart failure with respiratory dysfunction and/or need for hemodynamic support.
● Hypertensive emergencies.
● Acute myocardial infarction (AMI) with complications.
● Unstable angina, with arrhythmias, hemodynamic instability, or persistent chest pain.
● Pericardial tamponade with hemodynamic instability.
● Aortic aneurysm dissection.
● Complex arrhythmias with hemodynamic instability or congestive heart failure.
● Complete heart block.
Respiratory system
● Acute respiratory dysfunction requiring ventilatory support or imminent intubation.
● Pulmonary embolism with hemodynamic instability.
● Massive hemoptysis.
Neurological disorders
● Coma: metabolic, toxic or anoxic.
● Acute stroke*.
● Meningitis with altered level of consciousness or dysfunction of another organ or system.
● Neuromuscular or CNS disorders and dysfunction of another organ or system.
● Status epilepticus.
● Brain death or its possibility in patients who could donate their organs.
● Severe head injuries
Poisoning
● Hemodynamic instability.
● Alteration of the level of consciousness with inadequate protection of the airway.
● Seizures.
Gastrointestinal disorders
● Vitally threatened gastrointestinal bleeding, including hypotension, angina, continuous bleeding, or coexisting pluripathology.
● Fulminant liver dysfunction.
● Severe pancreatitis.
● Esophageal perforation.
Endocrine
● Diabetic ketoacidosis complicated with hemodynamic instability, altered level of consciousness, respiratory dysfunction or severe acidosis.
● Thyroid storm or hypothyroid coma with hemodynamic instability.
● Hyperosmolarity with coma or hemodynamic instability.
● Adrenal crisis with hemodynamic instability.
● Severe hypercalcemia with altered level of consciousness, requiring hemodynamic monitoring.
● Hypo or hypernatremia with seizures or altered level of consciousness.
● Hypo or hypermagnesemia with hemodynamic involvement or arrhythmias.
● Hypo or hypercalcemia with arrhythmias or muscle weakness.
● Hypophosphatemia with muscle weakness.
Surgical

- Postoperative patients who require ventilatory support, hemodynamic monitoring or extensive nursing care.

Miscellany

- Septic shock or severe sepsis.
- Hemodynamic monitoring.
- Patients who need a lot of nursing care.
- Environmental accidents.
- Experimental treatments with potential complications.

C) **MODEL OF OBJECTIVE PARAMETERS**

vitals

- FC 150 beats pm.
- SAD < 80 mmHg or 20 mmHg below your usual TAM < 60 mmHg TAD >120 mmHg
- FR > 35 breaths pm.
- Severe hypo or hyperthermia

Laboratory values

- Na + 170.
- K+ 7
- PaO2 < 50 mmHg pH 7.7 Glycemia > 800 mg/dL
- Calcemia > 15 mg/dL
- Toxic levels of drugs or other chemicals in hemodynamic or neurologically compromised patients.

Radiological signs

- Cerebral hemorrhage, contusion or H. subarachnoid with altered level of consciousness or neurological focus.
- Rupture of viscera, bladder, liver, esophagus or uterus with hemodynamic instability.
- Aortic aneurysm dissection.
- Electrocardiographic signs
- Sustained ventricular tachycardia or ventricular fibrillation.
- Complex arrhythmias that require close monitoring and treatment.
- Complete AV blockade with hemodynamic instability

signs (acute onset)

- Coma.
- Pupillary asymmetry in unconscious patient.
- Burned on more than 10% of the body surface (*).
- Anuria.
- Airway obstruction.
- Cyanosis.
- Cardiac tamponade.

Immediate postoperative period of the following Surgical Procedures

General surgery

- Esophaguectomy
- Duodenopancreatectomy
- Partial hepatectomy
- Pheochromocytoma resection

Thoracic surgery

- Chest Wall resections
- Major lung resecciones (pneumonectomy, lobectomia)
- Mediastinal resection or sternotomy.

Vascular surgery

- Abdominal aortic surgery
- Endovascular thoracic surgery: stents in aneurysms or in some chronic dissection.
- Intra-arterial fibrinolysis through catheter.

ORL

- Command (Tongue-based cancer)
- Skull base surgery
- Oropharyngeal tamponade due to bleeding (24-48 h)
- Prolongad post-surgical intubation (24-48 h) to avoid tracheostomy
- Interventions with potential airway involvement (e.g. stenosis

Urology

- Radical cystectomy

and thus building a diagnostic and management criteria and, as the name itself indicates, their prognosis, so that medical and nursing staff can compare certain groups of patients and their state of severity and consequently predict their clinical condition. They are mainly translated into numerical values and assigned to severity scales from variables. A mathematical equation is then produced whose solution is the possibility of an outcome, usually mortality [26]. In Intensive Care Units, 4 scales are mainly used, although there is a great variety as shown in Figure 4: Acute Physiology and Chronic Health Evaluation or APACHE, Simplified Acute Physiology Score or commonly known as SAPS, Mortality Probability Models or MPM and finally, among the most widely used, the SOFÁ or Sequential Organ Failure Assessment. Acute Physiology and Chronic Health Evaluation or APACHE arose in 1981 by William Knaus in response to the need to systematically collect information on patients hospitalized in the ICU and to improve their results. It allows the severity of patients to be established through the study of 33 physiological variables that express the magnitude of the disease and therefore the prognosis. In 1985, APACHE II emerged, an updated version based on 12 physiological variables to predict mortality, which are assigned 0 to 4 points according to their standard deviation from normality, which is scored as 0. This assessment is based on the quantification of the acute state of severity of clinical and biochemical parameters, which reflect the degree of alteration of the cardiovascular, respiratory, gastrointestinal, renal, metabolic, hematological and neurological systems. Thus, patients are classified into 4 groups:

- Group A: Absence of previous functional limitation in patients.
- Group B: Mild presence of previous functional limitation in patients.
- Group C: Moderate presence of previous functional limitation in patients.
- Group D: Patients with severe previous functional limitation, including patients confined to hospital institutions.

In 1991 APACHE III was introduced, it also has a scoring system and a computerized predictive model, so software is required to implement the predictive design. It includes variables similar to the previous version and are the sum of an acute illness component, which studies neurological, acid-base, vital signs and laboratory test alterations, while a new variable was introduced for surgical status. Finally, an update of APACHE IV was published in 2006. The essential change consists of the introduction of new categories. Most relevant to the accuracy of the APACHE IV model was the successful use of risk-adjusted physiological variables, since it demonstrated that mortality increased as physiological variables were altered [27-29]. Since then, it has been very useful in patients with acute cholecystitis, sepsis, cardiogenic shock, among other clinical conditions [30-32].

The SAPS (Simplified Acute Physiological Simplified Score) transforms its numerical value, by means of a logit function, into the possibility of hospital mortality. This predictive scale arises from the analysis of large series of cohorts of patients with different medical-surgical diseases. Its main limitations are its lack of individual prediction or its use on patient populations not included in the studies developed for its design or groups of patients with specific diseases [33]. Conceptually, the SAPS 3 admission core comprises the following parts: First, the SAPS 3 admission score, represented by the sum of three subscores:

Box I: What we know about patient characteristics prior to admission and ICU admission: age, previous health status, comorbidities, location prior to ICU admission, length of hospital stay prior to ICU admission, and use of major therapeutic options prior to ICU admission.

Box II: What we know about the circumstances of ICU admission: reason(s) for ICU admission, anatomic site of surgery, planned or unplanned ICU admission, surgical status, and infection on ICU admission.

Box III: What we know about the presence and degree of physiologic disturbance on ICU admission (within 1 hour before or after admission).

Secondly, the SAPS 3 Possibility OF DEATH over a defined time span (in the situation of the primordial model, the possibility of death at hospital discharge) [34]. Moreover, results from other studies suggest that the SAPS III score has better predictive ability than the APACHE II, according to the area under the curve and the receiver operating characteristic curve: 0.81 and 0.80, respectively [35]. For its part, the Mortality Prediction Model (MPM0) was created to estimate the likelihood of in-hospital mortality among ICU patients. Although this score is widely accepted, its applicability in patients with primary cardiac conditions has not been thoroughly evaluated [36]. In this situation, it is the model used for the initial evaluation on admission to the ICU. It is based on 15 easily available, changeable variables, since, with the exception of heart rate and AT, the rest can be obtained from the patient's clinical history. In relation to other models (SAPS, APACHE, etc.), it has the virtue of being the only one that has a tool to evaluate the feasible survival of the patient on admission, since all the others are evaluated 24 hours after admission. In addition, it is advantageous that it requires uncomplicated changes or those that can only be obtained by means of previous explorations or laboratory tests [37]. Therefore, the use of MPM0-III will leave more accurate comparisons of actual versus expected outcomes in functionality of the patient's condition at the instant of ICU admission [38]. Because MPM prognoses are based on the results of multicenter studies; 12,500 patients from all over the world. Finally, SOFA: the Sequential Organ Failure Assessment; uses basic measurements to calculate the failure of major organs and assigns a severity score, so it is used to track the patient's condition during ICU stay [26]. 6 scores are used to measure the various critical systems of a patient: respiratory, cardiovascular, hepatic, coagulation, renal and nervous systems. It includes criteria that are simple and quick to calculate. With 2 criteria of the q-SOFA, the danger of sepsis is identified, and actions such as rigorous monitoring of vital signs and laboratory borders are taken [39,40] (**Figure 2**).

Sedoanalgesia

Sedoanalgesia is an essential component of treatment for many critically ill patients, especially those requiring mechanical ventilation (MV), which helps to improve their health, decrease

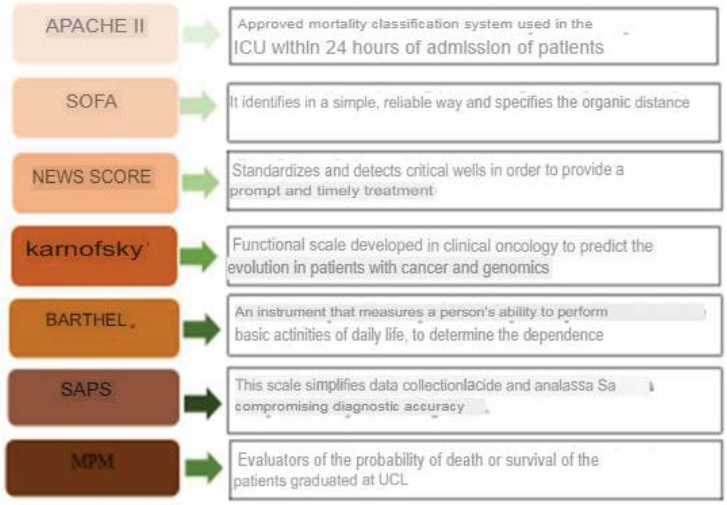

Figure 2 Escalas maenads en la unaided de cuidados intensivo.

Table 4. Scales to measure the degree of sedation.

Richmond Sedation-Agitation Scale (RASS)	Sedation-agitation scale (SAS)	Motor Activity Assessment Scale (MAAS)	Ramsay scale
It mesures the sedation status of patients and is highly used in Intensive Care Units with patients under medical sedation. This scale was designad in 1999 at Richmond Hospital in the States of Virginia, United States.	It was described by Riker in 1994 to describe agitation and sedation of both mechanically ventilated and unventilated critical patients. The description was for the use of haloperidol and was the first scale validated in critically ill patients	Developed by Clement's group in Salt Lake City (Utah) in 1999 and derived from the SAS, it employs a clear and concise description of each category and classifies critical patients through their motor activity, as the main marker of sedation.	First described by Dr. Michael Ramsey as part of a study on the effect of a steroid anesthetic and published in 1974, it is a subjective scale used to measure the level of sedation in patients, with the aim of avoiding insufficient or excessive sedation.

anxiety and facilitate certain procedures [41]. It is important to keep in mind that sedation should be neither too little nor too much, as both can cause potentially serious adverse effects. On the other hand, insufficient neural regulation can lead to severe arousal leading to myocardial ischemia, poor ventilator adaptation, extubation or extubation or catheter removal, associated with increased length of stay in the intensive care unit (ICU), increased costs, increased morbidity and even mortality. On the other hand, excessive sedation increases the duration of mechanical ventilation and intensive care unit stay, which increases the risk of complications, including MV-associated pneumonia or neuromuscular alterations, promotes the increased performance of neurological diagnostic tests that bring risk and high costs, and a higher incidence of cognitive alterations. In addition, the provision of higher doses of sedatives also involves an inherent risk of producing adverse and toxic effects such as hemodynamic, gastrointestinal, infectious, metabolic disorders, withdrawal symptoms, etc. [42] For this reason, achieving an adequate degree of sedoanalgesia to the pathophysiological state of the patient and to the needs of ventilatory support is a fundamental aspect of the correct therapeutic management and evolution of the critically ill patient.

The measurement and adjustment of the level of sedoanalgesia are key to ensure patient comfort and safety, avoiding pain, agitation, withdrawal, delirium and delayed extubation. Generally, conscious sedation with drugs such as fentanyl, remifentanil, propofol or dexmedetomidine is recommended instead of sedative hypnotics in patients on noninvasive mechanical ventilation or invasive ventilation in spontaneous mode when extubation is planned, thus reducing days of ICU stay, early extubation, reducing the frequency of delirium and the need for some tracheostomies. Measuring the degree of sedation is possible with different scales observed in Table 4, such as the Richmond sedation-agitation scale "RASS" (Table 5), the sedation-agitation scale "SAS" (Table 6), the motor activity assessment scale "MAAS" (Table 7), and the Ramsay scale (Table 8); however, the RASS scale is recommended and Intensive Care [43, 44] (**Tables 4-8**).

Thromboprophylaxis

Thromboprophylaxis is an important clinical care process in healthcare institutions to prevent a venous thromboembolic event (VTE), by means of tactics that allow its adherence in hospital units. The main drugs available are shown in Table 9. Hospitalized patients show at least one hazard element for a venous thromboembolic event (VTE), of which about 40% show 3 or more hazard components. It is important to evaluate the thromboembolic risk in each patient before deciding whether or not to use preventive measures and, in parallel, which are the most appropriate for implementation. The non-pharmacological (mechanical) thrombo-prophylactic treatments currently used are graduated compression stockings (GCS) and mechanical

Table 5. Richmond Sedation-Agitation Scale (RASS).

Points	Category	Description
4	Combative	Openly combative or violent. Immediate danger to staff
3	Very hectic	Removes tube(s) or catheter(s) or has aggressive behavior toward staff
2	Rough	Unintentional frequent movement or patient-ventilator asynchrony
1	Restless	Anxious or fearful, but without aggressive or vigorous movements
0	Alert and calm	
-1	Drowsy feeling	Not fully alert, but has stayed awake (more than 10 seconds) with eye contact, to voice (call)
-2	Light sedation	Briefly, wake up with eye contact (less than 10 seconds) to the call
-3	Moderate sedation	Some movement (but no eye contact) to the call
-4	Deep sedation	There is no response to the voice, but to physical stimulation there is some movement
-5	Does not wake up	No response to voice or physical stimulation

Source: Bartolomé, Santiago Mencía, and Rocío Tapia Moreno. "Scales of sedoanalgesia in the Pediatric Intensive Care Unit

Table 6. Sedation-agitation scale (SAS).

Points	Category	Description
7	Dangerous agitation	The endotracheal tube is torn off. Pull the catheters. Lash out at the staff. Throws himself out of bed
6	Very hectic	He is not calm, despite explaining it verbally, he requires physical restraint. Bite the endotracheal tube
5	Rough	Anxious or moderately agitated, trying to sit down. Calms down with verbal instructions
4	Quiet and cooperative	Calm, wakes up easily and obeys simple commands.
3	Sedated	Tendency to sleep, wakes up with verbal stimuli but goes back to sleep. Respond to simple commands
2	Very sedated	Responds to physical stimuli. Unable to communicate or obey orders. Has spontaneous movements
1	Arreactive	Minimal or no response to pain, does not communicate or obey orders.

Source: Tobar Almonacid, Eduardo, et al. "Protocol-guided sedation versus conventional management in critically ventilated patients." (2008).

Table 7. Motor Activity Assessment Scale (MAAS).

Points	Category	Description
0	Non-reactive	not respond to pain
1	Pain response	Opens eyes or locates pain or moves limbs to painful stimuli
2	Responds when touching or talking to you	Opens eyes or locates stimuli or moves limbs by touching or calling you
3	Quiet and cooperative	spontaneously, puts on sheets, obeys orders
4	At rest and collaborator	Does not require stimuli to move, obeys orders
5	Rough	Does not require stimuli to move, tries to sit or get up, does not obey orders
6	Dangerously agitated	Does not require stimuli to move, lashes out, tries to tear off probes, does not calm down when talking to him, does not obey orders

Source: Oliva Ramos, Alicia. "Sedation in flexible bronchoscopy. Study of the safety and efficacy profile in two work cohorts: Pneumology and Anaesthesiology." (2021).

Table 8. Ramsay scale.

Points	Category	Description
1	Awake	Agitated, anxious, restless
2	Awake	Collaborator, quiet
3	Sleepy	Responds to verbal commands
4	Asleep	Responds to strong commands
5	Asleep	Responds to pain
6	Asleep	No response

Source: Duran-Nah, Jaime Jesus, et al. Knowledge and level of application of the Ramsay scale by Mexican nurses specializing in intensive care. Intensive nursing 17.1 (2006):19-27.

compression devices (MCD). The mechanism of action is to minimize venous stasis of the lower limbs, simulating the impact of muscle spasm and increasing the volume and speed of venous flow. They are recommended in patients at high risk of bleeding or as an adjunct to pharmacological measures. On the other hand, pharmacological thrombo-prophylactic measures according to studies of unfractionated heparin (5,000 IU subcutaneous), subcutaneous nadroparin reduces the incidence of Severe Venous Thrombosis, enoxaparin showed that the application of 40 milligrams every 24 hours significantly reduces (63%) in VTE [45,46]. In specific situations such as major orthopedic surgeries like Total Knee Arthroplasty (TKA), Total Hip Arthroplasty (THA) and Hip Fracture Surgery (HFS), where there is a high thromboembolic risk, it is also important to evaluate the risk of bleeding. In addition to the pharmacological options mentioned above, in these specific cases bemiparin, fondaparinux, dabigatran, rivaroxaban, apixaban are used as alternatives. In cases of hip fracture surgery, the same prophylaxis mentioned above is recommended EXCEPT for the use of the new oral anticoagulants (OAC) and dicoumarinics, which have not been evaluated for this indication, so mechanical prophylaxis is recommended. In cases of patients with knee arthroscopy without a history of VTE or active neoplastic, it is suggested not to use pharmacological thromboprophylaxis. The 2012 consensus

of the American College of Chest Physicians on VTE prophylaxis does not recommend the use of systematic prophylaxis in this group of patients, because the risk of PTE is 0.3% and that of symptomatic DVT is 2.4%. It is estimated that the incidence of DVT in ICU patients varies between 25 and 32%, most of them have a variety of risk factors for VTE and up to 5% already have DVT at the time of admission to the ICU, as well as an increase in hemorrhagic complications, Therefore, in this group of patients, regardless of the reason for hospitalization, we suggest the use of pharmacological thromboprophylaxis with LMWH or UFH, and in the case of active bleeding or increased risk of bleeding, studies suggest that mechanical prophylaxis with CNI (IC) or MCG (IIaC) is effective [47]. Moreover, a systematic review published in 2015 states that of the LMWH used for thromboprophylaxis, both tinzaparin and dalteparin are safe in patients with renal failure, do not require dose adjustment, and do not bioaccumulate; however, pharmacological thromboprophylaxis with enoxaparin, bemiparin and certoparin shows accumulation in patients with Cl Cr less than 30ml/min [48] (**Table 9**).

Antimicrobials

Hospital infection (IHD) is one of the most common complications in health care and has been recognized to influence both increased morbidity and mortality and hospitalization costs [49]. In icUs there are patients with disruptions in their mechanical defensive barriers due to the use of catheters, tracheal tubes, etc. In addition, they are more vulnerable to infections, especially resistant bacteria that are usually transmitted between patients, by hand-carrying or vectors. For this reason, the proper use of antimicrobials is important to avoid possible complications such as sepsis in the critical patient. Mortality from sepsis increases from 56 to 78% when the antimicrobial initially administered is not adequate [50]. For the correct and optimal use of these drugs, a set of standards and strategies developed to improve the use of antimicrobials was created, this entity is known as antibiotic policy. Patients in critical condition admitted to intensive care services have special characteristics that justify the use of antibiotics in a differential way to that of other hospitalized patients, characteristics such as severity, pathogens, and alteration of organs or systems. That is why in some ICUs they propose standards as observed in Table 10, which promote the appropriate use of antibiotics in critical patients [51] (**Table 10**).

Antibiotics should only be used for therapeutic purposes when there is clinical or microbiological suspicion of infection, although, in critical patients, it may be difficult to differentiate sepsis and systemic inflammatory response syndrome, compared to other inflammatory stimuli of a non-infectious nature such as trauma, polyarthritis, pancreatitis, hemorrhage, among others that, initially, occur with the same clinical expressiveness [52]. As for its applications, there are three general applications that correspond to experimental therapy, definitive therapy and prophylactic or prophylactic therapy. Empirical treatment covers all probable pathogenic microorganisms, since the causative agent is not yet defined, therefore, a combination of several drugs proposed by the doctor can be used or if a single broad-spectrum antimicrobial is considered more appropriate; on the other hand, in the case of definitive treatment, it is carried out when the causative agent is identified, with a low-toxic and reduced spectrum antimicrobial until the therapeutic scheme is finished and finally, in the absence of a clear indication, prophylactic treatment is used, which uses antimicrobials when the disease requires it and when there is a probability that the treatment will be harmful to a serious or potentially serious infection. Additionally, Table 11 contains the most commonly used antimicrobials, however, to administer some type as the scenario corresponds, the pharmacokinetics and pharmacodynamics of the drug must be taken into account, in order not to make errors in terms of adverse reactions, duration of treatment, etc. [53] (**Table 11**).

Table 9. Available drugs, dosages, application intervals and route of administration.

Group	Drug	Dose	Interval	Route Of Administration
	Enoxaparin	40 Mg	24 H	SC
Surgical And	Nadroparin	0.3 Ml	24h	SC
Orthopedics		0.4 Ml	24h	SC
Column And	Nadroparin	0.4 Ml	24h	SC
Clinical		0.6 Ml	24h	SC
	Bemiparin	3500 UI	24h	SC
Moderate	Heparin No	5000 UI	12h	SC
	Fractional	-	-	--
High	Heparin No	5000 UI	8h	SC
-	Fractional	-	-	-
	Fondaparinux	2.5 Mg	24h	SC
		220 Mg	24h	ORAL
	Dabigatran	150 Mg	24h	ORAL
	Rivaroxaban	10 Mg	24h	ORAL
	Apixaban	2.5 Mg	12h	ORAL
	Acenocumarol	Individual Adjustment (International Ratio Normalized Between 2-3)	24h	ORAL
	Aspirin	160 Mg	24h	ORAL

Source: Javier Vázquez, f. e. r. n. a. n. d. o., et al. "Guía de recomendaciones para la prophylaxis de la enfermedad tromboembolica venosa en adultos en la Argentina." medicina (buenos aires) 73 (2013).

Table 10. Basic rules for the use of antimicrobials in critically ill patients. Decalogue of standards.

1	Use antibiotics only when there is clinical or microbiological suspicion of an infection
2	Obtain samples of infected tissues before starting antibiotic treatment
3	empirical antibiotics using consensual therapeutic protocols
4	Achieve a rapid response from the microbiology laboratory
5	Select a targeted treatment when the etiology of the infection is known
6	treatment effectiveness
7	Monitor for the occurrence of adverse effects or multidrug-resistant emerging flora
8	Limit the duration of treatment based on clinical or microbiological response
9	Holding an intensivist physician accountable for the control, surveillance, and treatment of infections
10	Co-responsible to all health personnel for adequate compliance with the rules

Source: Lerma, F. Álvarez, et al. "Antibiotic Policy in Critical Patients." Intensive care 34.9 (2010): 600-608.

Table 11. Main antimicrobials.

B-lactamicos	• Amoxicillin+clavulanic acid • Ampicillin • Ampicillin sulbactam • Benzyl penicillin sodium • Benzylpenicillin procainica • Benzyl penicillin Benzathine • Dicloxacillin • Phenoxymethyl • penicillin • Oxacillin
Cefalosporin	• Cephalexin • Cefazolin • Cefuroxime • Ceftazidime • Ceftriaxone
Carbapenems	• Imipenem + cilastatin • Meropenem
Macrolides	• Azithromycin • Clarithromycin • Erythromycin
Lincosamides	• Clindamycin
Aminoglycosides	• Amikacin • Gentamicin
Sulfonamides with diaminopyrimidines	• sulfamethoxazole + Trimethoprim
Quinolones	• Ciprofloxacin
Tetracyclines	• Doxycycline
Amphinenic	• Cloranfenicol
Miscellany	• Furazolidone • Metronidazole • Nitrofurantoin • Vancomycin

Source: Cordova Tacza, Isabel Rosario, and Maria Orejon Cuadros. "Incidence of reserve antimicrobials used in patients with Bacterial Resistance Hospitalized in ICU of the Ramiro Priale Essalud Huancayo National Hospital-2019." (2020).

Diuresis and bowel movements

Critically ill patients undergo important physiological changes during their stay in the intensive care unit as a consequence of the course of the disease. Monitoring hourly fluid intake and output, urine flow control and urine characteristics during hospital stay is of vital importance in order to assess renal and circulatory function, as well as transcutaneous loss by electrophoresis. Diuresis depends on fluid intake and patient weight and in this case hourly diuresis should not be less than 80 cc, in fact, diuresis is a useful biomarker and continues to be so today, it is measured in mL/kg/hour, considering oliguria or low production when it is <0.5 mL/kg/hour for 6 or more consecutive hours [54] although according to Mobeen Z. Haider and Ahsan Aslam in 2020, they consider changing the definition to <0.3 mL/kg/hour for at least 24 hours [55,56]. A low urine output is recognized as an early predictor of mortality in the intensive care unit when it is altered in isolation, i.e. without increasing serum creatinine, compared to those without acute renal injury 8.8% vs. 1. 3%, in addition to increasing hospitalization times and costs [57] Within the management approach for oliguria, volume replacement should be initiated when the etiology is suspected and the maintenance of adequate hemodynamic stability should be sought, and if there is no response, a diuretic (furosemide 1-1. 5 mg/kg) and if urinary production is less than 100 mL/hour in the following 2 hours, it suggests with high sensitivity and specificity diuretic failure due to lack of functional integrity of the tubule and risk of progression of acute renal injury to advanced stages, reaching up to 75% of those who required renal replacement therapy [58]. In the first case, it refers to diarrheal processes, which represent a frequent finding in critically ill patients, whatever the cause of their admission to an ICU, generally through this parameter can be reflected those gastrointestinal complications, not hemorrhagic, more frequent that usually occur in such subjects causing hydro electrolytic imbalances, interruption of enteral nutrition schemes, malnutrition, worsening of the morbid condition, prolongation of hospital stay, and even death, therefore, it is considered by some authors as a factor of poor prognosis, which can prevent the delivery of an adequate amount of nutrients by enteral route, thus prolonging the days of hospitalization, and generating greater morbimortality, in addition to an increase in the costs related to medical care [59,60]. On the other hand, when bowel movements are reduced, we speak of constipation, some authors define it as the absence of bowel movements for 3 or more days, for others 6 or more days, however, speaking of the ICU patient, the best definition is "absence of bowel movements after 3 days from the beginning of enteral nutrition" [61]. Among the conclusions of several studies it is suggested that constipation

is associated with risk factors such as: sedation, analgesia, poor motility or lack thereof, surgery, sepsis, delay in starting enteral feeding, changes in motility induced by commonly administered drugs, and considering that in the ICU it is difficult to eliminate any of these factors from the beginning, it is important to suggest to the reader to monitor this parameter during the follow-up and monitoring of patients in the unit [62]. In short, diuresis and bowel movements provide valuable information that can evaluate the ICU patient's condition and prevent or treat possible diseases or infectious processes.

Get balance

The objective of intensive care units is to take care of the patient's life regardless of its severity, so it is important to train specialized health personnel who can help to make an appropriate record of the monitoring sheet of the water balance and adequate care of patients; above all, it is necessary to be alert and make a decision about the balance of fluids and electrolytes in order to avoid at all costs complications derived from the alteration of homeostasis that can cause renal injury, changes in the heart rhythm and above all can compromise the life of this type of patients [63]. It is for them that, keeping a record of daily and accumulated balances, helps in making daily decisions, seeking to impact for the benefit of the patient and more considering that this is a modifiable variable as Anupama Upadya et al in 2005 suggested when seeing a possible relationship between a previous positive daily and / or accumulated balance with failure in some procedures that are vital for the critical patient [64]. And, other antecedents such as the study of Boyd, John et al, in 2011 which found that when the positive water balance was increased more than 3L in 12 hours, survival decreases, and having an accumulated balance greater than 4 days presents a greater risk of mortality in patients with septic shock [65]. Likewise, Claure-Del Granado et al in 2016 report that a positive cumulative balance or water overload is associated with higher mortality, congestive heart failure, deterioration of intestinal function, delayed scarring, and pulmonary edema [66].

For the monitoring of the balance, it is previously important to take into account the weight of the patient in each shift, since this allows assessing the income and discharges of the hospitalized patient in the intensive care service [67]. Such information must be contrasted with other data that also contribute to the knowledge of the patient's hydro electrolytic balance, such as the individual's clinic, the electrolytes present in plasma and urine, blood gases, blood count and blood biochemistry [68]. For this, it is important to recognize normal values according to age, sex and BMI. Therefore, it is proposed by authors to use Table 12, to have a daily, accurate record and make the necessary modifications to avoid a positive accumulated water balance (over hydration) or failing that, a negative accumulated water balance (dehydration) (**Table 12**).

Table 12. Balance sheet records.

Weight
Income in 24 hours
Expenses in 24 hours
balance (Income-Expenses)
Accumulated balance (Total Income-Total Expenditures)

Headboard

The posture of the head of the bed proved to be an efficient measure to prevent pneumonia linked to mechanical ventilation and for the functioning of the Neurocritical patient. The semi-integrated posture of the patient on mechanical ventilation (VM), with height of between 30 and 45° of the head, decreases the incidence of aspiration and secondary pneumonia [69]. A study that quantified the hours of the bedside ≥ 30° of patients with mechanical ventilation, its results showed that the mean of theoretical hours that patients should remain at ≥ 30° was 21h15'(3 h), and the real ones, of 14 h (5 h) ($p < 0.001$) [70]. Underlying the fact that the group of critically ill patients staying in the ICU often needs a machine to help maintain breathing. However, this could leave sequelae such as ventilator-associated pneumonia so the bedside position can prevent infection, so moderate-quality evidence from eight studies involving 759 participants showed that the semi-lying position (30° to 60º) reduced clinically suspected ventilator-associated pneumonia by 25.7% compared to the supine position from 0° to 10°. However, sufficient evidence to draw definitive conclusions on other outcomes and the comparison of alternating semi-recumbent positions does not remain accessible. Adverse events, especially venous thromboembolism, were underreported [71].

Catheter review

Bloodstream infection associated with the central catheter is defined as a primary bloodstream infection. Recommendations for the prevention of sepsis generally refer to two well-defined procedures to consider: 1) the introduction of central vascular equipment and 2) their care or maintenance. Therefore, post-implantation surveillance lies in the control of blood pressure every 2 hours for the first 8 hours and check for bruises in the area of pressure. If they occur, compress and apply the cooler locally. Monitor bleeding regularly, keep the head of the bed elevated if you tolerate it for the first 6 hours, administer analgesics as prescribed if the patient needs them, change the sterile dressing after 24 hours, and check the status and level of fluid retention. In addition, each lumen should be sterilized and the catheter with smaller diameter lumen should be used as far as possible [72, 73]. This is important since, the 2018 nosocomial infection incidence study in Spain (EPINE) considered vascular catheter-associated sepsis as the fourth (15.17%) cause of nosocomial infection (NI), after respiratory, surgical and urinary infections. Although it ranks fourth, vascular catheter-related NI can be considered among the most serious, with deaths ranging from 25 to 60% of cases. So studies suggest that proper hand hygiene is required before and after any operation using a vascular catheter access point, such as sterilization or removal. Please note that the use of gloves does not affect the operation. The use of chlorhexidine for disinfection prior to catheterization and each dressing change with the corresponding therapy is reasonable and should be done systematically. The reduction of the sepsis rate will be achieved through the use of septal measures in the management of catheters and the implementation of aseptic technique with sterile barriers such as hats, gloves, gowns, masks and clothing. This will help us achieve our goal, which is to reduce the number of catheter manipulations and make only the

most necessary connections. In addition, eliminate unnecessary central vascular catheters and reduce the number of days our patients use the above devices [74, 75]. Following this model and with the aim of reducing the incidence of catheter-associated sepsis in Spanish intensive care units, the Spanish Society of Intensive Care Medicine and Coronary Artery Units (SEMICYUC) collaborated with the WHO Global Alliance for Patient Safety to develop the Bacteremia Zero project [76].

Set goals

This point refers to the establishment of final parameters that promote the improvement of the patient, that is, propose treatments, processes, strategies and others to return to the normal values of the patient and seek homeostasis. Considering the heterogeneity of the disease of patients in ICU, it is evident that each patient must be prepared exclusive goals that improve their specific condition; however, there are goals that can be addressed in a general way by the existence of specifically established parameters. That is why, setting the scene in front of an adult patient, the following goals are proposed.

- **Glycemic target**: between 140-180 mg/dL (see metabolic control below).
- **Mean arterial pressure (MAP) goal:** An adequate MAP should be monitored in patients in the ICU and then it is not proposed to classify a MAP for each diagnosis, but to set a minimum MAP that serves as an alert to take early behaviors in favor of the patient. In healthy people, a MAP <50 mm Hg begins to compromise the self-regulation of cerebral blood flow with the consequent decrease in cerebral perfusion [77]. It is therefore proposed that in patients following successful cardiopulmonary resuscitation and septic shock, a MAP≥65 mm Hg through the use of fluids and/or vasopressor such as norepinephrine [78]. The SEPSISPAM study found no difference in mortality between low target 65-70 mmHg and high target 80-85 mmHg, however, in hypertensive patients with high target, they had less renal impairment and need for renal replacement therapy and having low goals had less frequency of atrial fibrillation [79]. Therefore, the initial goals are to maintain a mean arterial pressure of 65 to 84 mmHg with systolic blood pressure not less than 90 mmHg, a cardiac index of 3 l.min.m2, with central venous pressure of 8-12 mmHg and pulmonary capillary pressure of 12-15 mmHg. By laboratory tests, hematocrit greater than 30%, serum lactate levels less than 2 mg and venous oxygen saturation greater than 70% [80].
- **Oxygen saturation target:** Values between 88-95% [81] are recommended, higher goals were associated with worse clinical outcomes, including death and longer ICU time in patients with ARDS [82].
- **Goal of minimizing risk of ulcers:** To do this, you should opt for changes of position from time to time (See pressure ulcers in anti-ulcer therapy)
- **Infection Avoidance Goal:** Proper compliance with biosecurity regulations must be carried out, in order to limit possible transmissions between health personnel and patients, and even between patients, in addition, the use of antimicrobials is recommended (Check section on antimicrobials)
- **Nutrition Goal:** The primary goals of nutritional support for critically ill patients are to maintain lean body mass, reduce catabolism, and increase nutrient intake within the limits of use with varying degrees of organ failure. (Check the nutrition section)
- **Water Balance Goal:** Procure homeostasis, Avoid positive accumulated balances or negative accumulated balances (Check the section obtaining balances)

Anti-ulcer therapy

Pressure ulcers (UPPs) are a common, arduous-looking problem in hospitalized patients. This requires constant vigilance by experts who cannot afford the challenge of preventing and treating it. Once the ulcer is established, it increases the morbidity and mortality of patients and slows down the healing process. In addition, among those admitted to intensive care that required mechanical ventilation (MRA), the presence of PPL was identified as an independent predictor of mortality [83]. These ulcers are localized damage to the skin and/or underlying tissue, which often protrudes above the bone, due to the pressure or pressure associated with the breastbone. Sometimes it can also appear in soft tissues under external pressure by various materials or examination equipment. Therefore, 20 mmHg can be considered the maximum capillary occlusion pressure. Once a pressure greater than 20 mmHg is generated in a confined area and over a long period of time, the ischemia process begins to block the supply of oxygen and nutrients, causing the blood vessels to deteriorate. Tissue damage due to anaerobic respiration, which induces changes in the cell membrane and the release of active amines which, if not reversed over time, leads to necrosis and death of cells in this region [84, 85]. The GNEAUPP proposes to classify UPPs as shown in Table 13. Among the tools for the early detection of UPP risks, we have the Braden Scale (Table 14), which is based on 5 risk factors: sensation, humidity, activity, movement, nutrition, friction and shear. With scores ranging from 6 to 23, remember that the lower the score, the higher the risk [86, 87]. However, some studies conclude that the Braden scale shows predictive insufficiency and poor accuracy for both a cut-off point of 18 and 16, which are accepted in the different clinical scenarios [88] (**Tables 13 and 14**).

The main goal of treating UPPs is to find a way to cure or close them as quickly as possible. The first thing to get is a clean granulation fabric. To achieve this, you must follow these steps [89].

- Establish prevention measures to prevent the emergence of new UPPs.
- Debridement of devitalized tissue and, if necessary, extensive debridement under surgical intervention.
- Management of infection where necessary.
- Control pain, secretions, and odors.

The treatment has several dimensions. In patients in good general condition, ulcers can heal well with topical treatments. Use of platelet growth factors to stimulate the formation of granulation

Table 13. Classification of Pressure Ulcers.

Category I: Non-bleachable erythema	The skin is intact with non-bleaching redness of an area usually located on a bony prominence. The affected area can be painful, firm, soft, and hotter or colder compared to adjacent tissues and may be more than 15mm in diameter.
Category II: Partial thickness ulcer	Partial loss of the thickness of the dermis, presenting as an open superficial ulcer with a pink-reddish base and without erosion. This category does not include injuries caused by adhesives, abrasions, or tears on the skin.
Category III: Total loss of skin thickness	Complete loss of skin tissue. Subcutaneous fat is visible, but no bones, tendons, or muscles are seen. There may be scabs and/or necrotic tissue that does not mask the depth of tissue loss. These can be compartments and/or tunnels.
Category IV: Total loss of tissue thickness	There is a total loss of tissue thickness with exposed bone, tendon, or muscle. They may have sfacements and/or necrotic tissue. It is often associated with cavitations and/or tunneling.

Table 14. Braden scale.

	1 POINT	2 POINTS	3 POINTS	4 POINTS
Sensory Perception	Completely Limited	Very Limited	Slightly Limited	No Limitation
Exposure To Moisture	Always Wet	Often Wet	Occasionally Wet	Rarely Wet
Physical Activity Wandering	Scaling	In Chair	Wander Occasionally	Wander Frequently
Mobility Postural Changes	Motionless	Very Limited	Slightly Limited	No Limitation
Nutrition	Very Poor	Probably Inadequate	Adequate	Excellent
Shear And Rubbing	Maximum	Potential Risk	No Apparent	-
Rubbing	-	Risk	Risk	-

Source: villamea, Silvia martínez, and Beatriz brana marcos. "Prevention of pressure ulcers in the care of patients placed in prone position. Lessons derived from the covid-19 crisis." Jan Journal of Nursing 15.1 (2021).

tissue. The fastest methods yielded very varied results. In circumstances where there is the impossibility of closing, a surgical treatment is chosen, focused on a reconstructive technique with cutaneous, fasciocutaneous or randomized muscle flaps according to the patient's conditions. In addition, the application of stem cell cultures induced by platelet mediators to accelerate the healing of pressure ulcers of torpid evolution open a totally new field and a future to be able to definitively cure these ulcers without going through surgery [90]. Therefore, a summary of evidence gives indications on critically ill patients; reported that exercise every 2 hours may not reduce the risk of developing pressure ulcers compared to exercise every 4 hours, but may increase the risk of adverse events in adults requiring mechanical ventilation (at level 2 [moderate]); this recommendation is based on a randomized clinical trial, conducted in a Spanish hospital with 330 adults, all of whom had special surfaces for active pressure management and required invasive mechanical ventilation for 24 hours. Eligible participants are randomly assigned to fill every 2 hours (n = 165) or every 4 hours (n = 164). The primary endpoint was the occurrence of at least one grade 2 pressure ulcer during intensive care unit stay [91]. New evidence proposes that olive oil is shown as an alternative to hyper oxygenated fatty acids for prevention since they are equally effective in prevention and with respect to the use of dressings prophylactically, hydrocolloid dressings and transparent polyurethane dressings show greater effectiveness [92].

Additionally, gastric ulceration in critically ill patients should also be taken into account as these can cause exponential and permanent damage to the gastric mucosa, increase the incidence of clinically significant gastrointestinal bleeding, prolong hospital stay in the intensive care unit and increase the risk of death. To prevent these types of complications, there are several pharmacological options. Some studies have shown that 75% of patients in the intensive care unit develop gastric mucosal abnormalities within a few hours of admission [93]. It is known that patients with shock, sepsis, severe burns, severe trauma, or traumatic brain injury may have ulcers or stress gastritis [94]. Its main component is splanchnic hypo perfusion; however, progressing to a more significant lesion requires an associated acidic medium. Other agents involved are the release of catecholamine's and subsequent reperfusion with free radical release and increased nitric oxide levels [95]. We group patients into four categories: low risk, moderate risk, high risk, and highest risk. In patients at higher risk (>8%), PPIs and H2RAS reduce clinically important bleeding by 3-5%. In critically ill patients at low risk (<2%), PPIs and H2RA reduce clinically important bleeding by less than 1% [96]. The modification of gastric pH as a prophylaxis against gastric bleeding in critical patients, which decreased the incidence of this entity and became a routine practice in intensive care units; multiple studies were subsequently conducted to try to establish which patients benefit most from this measure. Gastric acid suppression with proton pump inhibitors (PPIs) or histamine-2 receptor antagonists (H2RAS) is commonly performed to prevent gastrointestinal bleeding in critically ill patients. Existing guidelines vary in their recommendations on which population. Histamine H2 receptor inhibitors (Ranitidine) their mechanism of action is based on binding to the histamine receptor in the parietal cell to inhibit gastric acid secretion; reduces hydrogenion concentration and gastric volume. Proton pump inhibitors (omeprazole) are drugs that block acid secretion by irreversibly binding to the cysteine residue from the H+/K+ ATPase pump found on the luminal face of the parietal cell [97].

Onotropics/vasoactives

Many patients admitted to the ICU will need to use vasopressors during their stay in the unit. These agents can be broadly

classified as vasopressors, which increase blood pressure, and inotropics, which improve myocardial function, while improving oxygen availability and reducing tissue ischemia and organ failure, due to their effect on the caliber of blood vessels (dilation or contraction). Some patients will need both medications at the same time or at different times during their hospital stay. They are used daily in the treatment of hemodynamic instability in critical patients in the intensive care unit. The different drugs have an inhibition or stimulation effect on different receptors, therefore the response will be specific according to the required objective as in the case of sympathomimetic, in addition to these, and there are phosphodiesterase III inhibitors, prostaglandins, vasopressin antagonists, and calcium sensitizers [98]. In the case of sympathomimetic have effects on α-1 receptors that cause smooth muscle contraction, glycogenolysis and gluconeogenesis, α-2 receptors decrease the production of aqueous humor and insulin secretion. The β-1 increase frequency, contractility and cardiac conduction while there is an increase in renin secretion. The effects on β-2 are relaxation of bronchial, gastrointestinal, uterine, bladder and vascular smooth muscle in skeletal muscle, hepatic glycogenolysis and skeletal muscle. Finally, there is δ, which causes smooth muscle relaxation in renal, splanchnic, coronary and cerebral arterioles [99]. The drugs supplied are shown in Table 15, with the aim that critical patients restore and maintain adequate tissue oxygenation, since tissue hypoxia plays an important role in the development of multiple organ dysfunctions, a frequent cause of death in the critical patient population [100] (**Table 15**).

Metabolic control

Dysglycaemia in acute patients (hyperglycemia, hypoglycemia, variability and duration of glycemia) is an indicator of the severity of severe disease in relation to mortality. However, this effect appears to be weak in diabetic patients. Diabetes, especially in people who had poor glycemic control before the disease, is known as the "diabetes paradox." Changes in glucose metabolism during severe illness are caused by a variety of factors, including increased insulin resistance, impaired insulin production, and cytokine activation. In critically ill patients, the hyper metabolic state shows a strong activation of anti-regulatory hormones and cytokines, such as tumor necrosis factor alpha (TNF-α), interleukin-1 (IL-1) and interleukin-6 (IL-6), is an important mediator of insulin resistance and, therefore, hyperglycemia. Stress-induced hyperglycemia is a common disorder in hospitalized patients without pre-existing diabetes Diabetes mellitus (DM), defined by fasting blood sugar above 126 mg/dL or results greater than 200 mg/dL. High blood glucose levels are associated with increased morbidity and mortality in patients with burns, surgery, stroke, acute coronary syndromes, and traumatic brain injury. Intravenous insulin therapy is suggested in this group of patients, once a multidisciplinary team has made the decision. In turn, the authors differ in the definition of hypoglycemia in the intensive care unit, but patients with levels below 70 mg/dl were taken into account. Associated symptoms include headache, weakness, altered state of consciousness, sweating, seizures, and others. Risk factors for its development are sepsis, diabetes mellitus, and severe severity of the disease, kidney damage or liver dysfunction, the need for a vascular plug, discontinuation of therapeutic feeding during insulin infusion. The third domain of glycemic control in ICU is given by the variability of glycemia. Blood glucose levels in critically ill patients fluctuate widely, even when continuous feeding and insulin infusions are used, this is an independent risk factor for Intensive Care Unit Mortality, usually expressed as the standard deviation (SD) of the mean glycemic value or the mean amplitude of glycemic fluctuations. Time in target range has been introduced more recently as the 4th domain or "unifier" domain (TERO) of disglycemia in ICU, this is defined as the time accumulated in the target range and represents the percentage of time your blood sugar level is in the target range. The presence of a TERO above 70% is statistically significantly related to an increase in survival in critical disease [101-103].

Table 15. Inotropic/Vasoactive Drugs Used in the Critically Ill Patient.

Drug	Dosis Típica	β-1	β-2	α
Isoproterenol	0,01-0,1 µg/kg/min	+++	+++	0
Norepinephrine	0,05-1 µg/kg/min	++	0	+++
Epinephrine	0,05-2 µg/kg/min	+++	++	+++
Phenylephrine	0,5-5 µg/kg/min	0	0	+++
Dopamine	1-5 µg/kg/min	+	+	+
Dopamine	5-20 µg/kg/min	++	+	++
Dobutamine	2,5-20 µg/kg/min	+++	+	´+

0: no effect; +: minimal effect; ++, moderate effect; +++, substantial effect

Source: Lovesio, Carlos. "Intensive medicine. Chapters 1 through 90." (2008).

Oxygenation

Oxygen transport in critically ill patients is often affected because the coping mechanisms to maintain an adequate tissue supply can become inadequate, so assessment and correction are essential. Therefore oxygen has become the cornerstone in critically ill patients, in the literature it is estimated that up to 15% of hospitalized patients received supplemental oxygen, to avoid complications such as hypoxemia and cellular hypoxia. In clinical practice, the main objective of oxygen therapy is to avoid hypoxemia in critically ill patients, the recommendation of the British Thoracic Society (BTS) for titration is based on ventilator insufficiency and hypercapnia, especially in clinical pictures of cardiac arrest or resuscitation, shock, sepsis, major trauma, anaphylaxis, major pulmonary hemorrhage, severe head injury and carbon monoxide poisoning. However, care must be taken not to exceed the adjustment for the appearance of hyperoxia PaO2 >16 kPa (equivalent to >120 mmHg) and FiO2 >0.21, can lead to serious adverse effects on inflammation, oxidative stress, lung function, micro vascular perfusion and coronary and cerebral blood flow [104, 105]. In addition, conservative use of oxygen was associated with a decrease in infection (bacteremia) (RAR 5%, 95% CI 0-9%, p = 0.049) and a decrease in the incidence of shock episodes (RAR 6.8). 95% CI 2-12%, p = 0.006). In a patient with acute respiratory failure, in addition to treating the underlying disease, there are two treatments that cause an immediate increase in PaO2 (and SatO2): oxygen administration and excess pressure. The latter mainly depends on the level of the profile, which largely reflects the severity of the ventilation support. Thus, to reverse hypoxia in patients on mechanical ventilation,

we can increase FiO2 and/or PEEP, while conducting diagnostic studies to reverse the cause In one study they concluded that the main prognostic factors of oxygen therapy in critical patients were: oxygen blood pressure, total oxygen concentration, P50, Px index (reflects the suitability of the contribution of arterial blood to the oxygen supply to the cells), tracheostomy and orotracheal intubation.

Characteristics Of The Round In ICU

In the ICU round, initially a series of rehabilitation processes of the patient must be carried out, this process is divided into 5 phases, which, in this review, we propose the acronym "LIVE" as seen in Figure 3. In the first case, having a patient in the ICU, the health situation of the internalized individual, his level of functionality and the deficits he presents, as well as some limitations to carry out certain activities of daily living, must be assessed. In addition, treatment objectives and goals should be implemented in favor of patient improvement, the validation of a management plan adjusted to the specific needs of each patient, monitor the patient's evolution and, above all, evaluate results, reevaluate and make adjustments that are considered pertinent (**Figure 3**).

Speaking of the duration of the round, each shift has a duration of 12 hours; are divided into Day Shift (7AM – 7 PM) and Night Shift (7PM –7AM 9), Once each shift is reached, the initial activity carried out by the incoming doctor, is the reception of the shift to the outgoing partner, thus, with the delivery and receipt of each shift, the continuity of patient care by the medical staff is guaranteed as well as the existence of the necessary elements for their care

Diagnostic Accuracy Of The Patient In Icu

The great challenge in the ICU is to face the heterogeneity of patients, taking into account the complexity and ambiguity

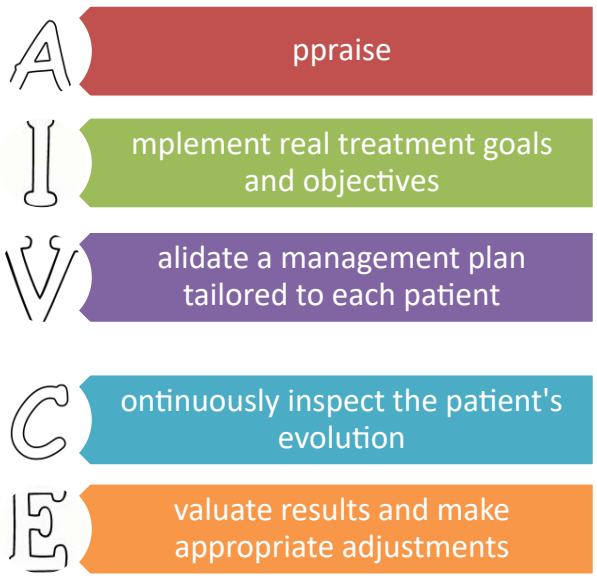

Figure 3 Acronym of the main characteristics of the round in ICU.

Source: authors of this study

that can occur in different syndromes and critical diseases, which are why the diagnostic accuracy in this group of patients becomes somewhat complex and even the health professional body can act in an imprecise way. For the attending physician there are multiple challenges that must be taken into account when making decisions about the approach and therapy of each patient, among the most common challenges are infrastructure, availability of diagnostic resources, the identification and execution of urgent interventions, ethical dilemmas and assertive communication with the patient's relatives to explain the clinical status. Diagnostic precision goes hand in hand with interdisciplinary and team work; where nursing staff, respiratory therapy, physiotherapists, general practitioners and specialists must act synchronously and safely around the same goal, a systemic and holistic approach of each patient. Likewise, in this article, we highlight the management and treatment of the main pathologies that are usually grounds for hospitalization in the intensive care unit.

Frequent neurological pathologies in the patient in icu, treatment and proper management

Neurological diseases represent an important part in intensive care units, especially when talking about the pediatric population (PICU) where they are considered a cause of morbidity and mortality. Neurological patients in the ICU may be internalized as a result of a wide variety of pathological conditions that require, due to their lethality and severity, medical care with permanent monitoring. In the case of adult patients, diseases such as cranioencephalic trauma and cerebral vascular disease usually occur, which include ischemic, hemorrhagic, anoxia and brain death conditions. In addition, other conditions such as infections of the central nervous system can also occur, where meningitis is very common.

Cranioencephalic trauma: This pathology is defined as physical injury or functional deterioration of the cranial contents due to a sudden exchange of mechanical energy. There are different types of TBI ranging from mild to severe, however, the patient with severe traumatic brain injury (GTCT) constitutes a global pandemic and one of the leading causes of death and disability, especially in young adults. It is characterized by a high complexity, so it is important that an adequate specialization in care is maintained. Pathophysiology, monitoring and familiarization are paramount to provide quality care and promote patient safety, thus reducing adverse effects and fatal consequences in such a population. Therefore, it is essential to carry out general measures such as those mentioned above throughout this research, as well as the performance of the basic care used in patients with cranioencephalic trauma.

For management is included what is proposed in the acronym "IN CRITICAL CONDITION" in addition, a very detailed neurological control is recommended that includes an initial assessment of the levels of consciousness, in fact, severe cranioencephalic trauma (EGCT) is considered to those patients who present a score on the Glasgow Scale less than or equal to 8 points within the first 48 hours after the accident, additionally, an examination of the pupils is recommended; as well as monitoring of intracranial

pressure, tissue oxygen pressure, jugular saturation, and Spectral monitoring (Table 16). This aspect is essential to avoid complications and mitigate secondary damage at the brain level. (**Figure 4**).

Initially, performing a correct assessment of the EGCT allows quickly implementing an appropriate treatment. Additionally, the proper treatment of severe traumatic brain injury necessarily requires an adequate understanding of the pathophysiology of the different types of injuries and to monitor the hemodynamic parameters on which attention should be focused, above all, on achieving an adequate cerebral supply of oxygen and avoiding all those factors that increase intracranial pressure (ICP). For them, it is that there is no treatment as such described, if not, resort to surgical processes and carry out a correct management, keeping rest and medicating sedatives and analgesics of which the most used are: sedatives such as Midazolam (0.04-0.2 mg / kg / h) or Propofol (0.8-4 mg / kg / h) and analgesics such as Morphine EV (0.07-0.5 mg / kg / h) and Fentanyl (0.7-10mcg / kg / h) being the latter the least used (**Table 16**).

Cerebrovascular disease

Cerebrovascular disease (CVD) or stroke is defined by the World Health Organization as the rapid development of focal or global signs of functional compromise at the brain level, with the presence of symptoms lasting 24 hours or more that can lead to death. This pathology, represents the third cause of mortality of the adult population and the first of resulting disability, for this reason, it constitutes an important health problem worldwide, in addition, it should be noted that it is currently considered by many authors as a syndrome that includes a group of heterogeneous diseases with a common point based on the alteration in the vasculature of the central nervous system, which leads to an imbalance between oxygen supply and oxygen requirements, the immediate consequence of which falls on the brain tissue, where it causes focal dysfunction. CVD can occur in two forms: a hemorrhagic form, which represents 15% of cases and is defined as the rupture of a blood vessel that leads to a blood accumulation, either within the cerebral parenchyma or in the subarachnoid space, and the other form is ischemic, which takes place by the occlusion of an arterial vessel and involves

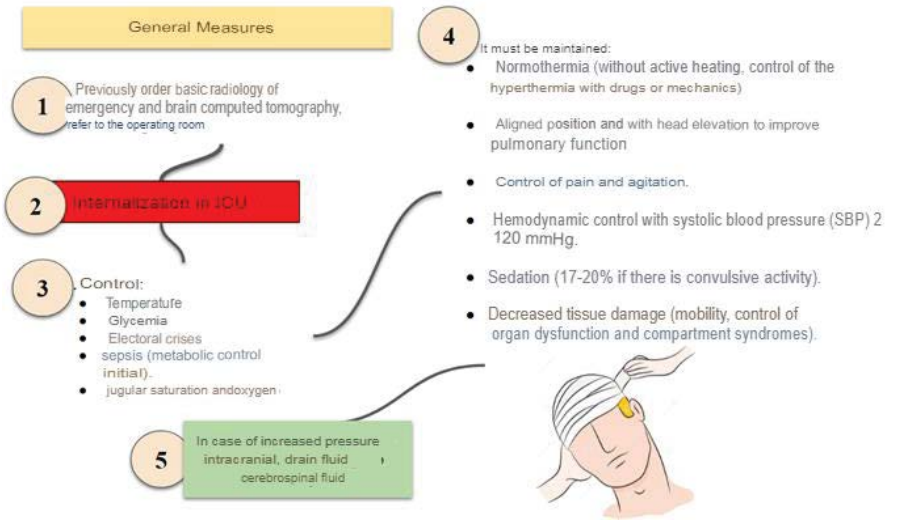

Figure 4 Management of the patient with EGCT.

Taken and modified from: López, Emilio Alted, Susana Bermejo Aznárez, and Mario Chico Fernández. "Updates on the Management of Severe Traumatic Brain Injury." Intensive care 33.1 (2009): 16-30.

Table 16. Monitoring to be taken into account in the management of the patient with EGCT.

Intracranial pressure (ICP) monitoring	oxygenation monitoring	of brain metabolism
Normal values are considered those that are less than or equal to 15mmHg. Its measurement is performed to diagnose intracranial hypertension and as a therapeutic guide in the treatment of the patient	Normal oxygen tissue pressure values are between 15-40mmHg. Less than 15mmHg are indicators of tissue hypoxia.	Various metabolites derived from physiological metabolic processes or as a result of tissue injury such as glucose, lactate, pyruvate, glycerol and glutamate can be quantified. Glucose, lactate and pyruvate are markers of cerebral ischemia.
	Oxygen saturation in the jugular bulb consists of the measurement of blood oxygen saturation obtained through a catheter placed in the jugular bulb.	

Source: Rada Martín, Sarai. "Nursing care recommendations for patients with severe traumatic brain injury admitted to the ICU-A of the Hospital Complex of Navarra." (2014).

permanent damage by ischemia; but, if the occlusion is transient and self-resolved, momentary manifestations will occur, which is called transient ischemic attack, which is defined as that episode of focal neurological deficit due to cerebral ischemia, of less than 60 minutes of duration, complete subsequent resolution, and without changes in neuroimaging, additionally, in general, ischemic pathology represents 85% of cases. In addition to the proposed management "IN CRITICAL CONDITION" table 17 shows in summary form the therapeutic scheme that should be provided to patients with cerebrovascular/ischemic disease and cerebrovascular/hemorrhagic disease (**Table 17**).

Cardiovascular pathologies in the patient in the ICU, treatment and proper management

Cardiovascular diseases are those that constitute a group of entities that involve the heart and blood vessels. When it affects blood vessels, it can affect organs such as the brain (cerebrovascular disease described above), lower limbs, kidneys, and heart. These diseases have been reflecting figures very similar to those of global epidemics, and have been identified as the leading cause of disability and millions of early deaths worldwide; account for 60% of all deaths, of which 80% are common in low- or middle-income countries. In Colombia, in 2010 according to data from WHO and PAHO there were 28,996 deaths from chronic no communicable disease (CNCD) in men between the ages of 30 and 69 years, of which 48% corresponded to cardiovascular diseases, on the other hand, in women between 30 and 69 years there were 26,203 deaths from CNCD, and 37.8% of these correspond to these disorders, which indicates that diseases associated with alterations at the cardiac and vascular level are one of the main causes of deaths nationwide. Among the cardiovascular diseases the ones with the highest occurrence according to studies are: coronary heart disease and cerebrovascular disease, however, in view of the fact that this last pathology has a great impact on the CNS, it was decided to describe it in the section on neurological pathologies. Therefore, in this section of cardiovascular pathologies, the 3 most frequent heart diseases in the ICU will be described.

Coronary syndrome: Acute coronary syndrome (ACS) refers to the abrupt interruption of the arrival of blood to a specific area of the heart and as a consequence of the obstruction of a coronary artery by the rupture of an athermanous plaque, for this reason, many authors mention myocardial infarction when talking about ACS since, commonly the frequently affected part is the myocardium. Likewise, as mentioned before, it is part of one of the sets of diseases of greatest interest in emergencies, both in its pre-hospital and hospital phases; due to the need for immediate therapeutic action and the need to make the differential diagnosis of other processes. For the correct management and treatment of this, it must be identified whether or not there is an increase in the ST segment, for this an Electrocardiogram, cardiac markers (troponins), chest x-ray and a coronary angiography must be previously performed, in addition to taking into account what is reflected in the acronym "In Critical Condition".

Currently, management guidelines for acute myocardial infarction with and without ST elevation report that effective treatment in the younger population may usually also be recommended in critically ill elderly patients (**Table 18**).

Pulmonary pathologies frequent in the patient in ICU, treatment and proper management

Any alteration that prevents proper functioning in the lungs is considered a lung disease. There are mainly three types: Airway diseases, lung tissue diseases, and lung circulation diseases (Table 19). Common lung diseases include: asthma, atelectasis, bronchitis, COPD, lung cancer, pneumonia, pulmonary edema, and pulmonary embolism (**Table 19**).

First, acute atelectasis (ALA) is the collapse of the main pulmonary compartments that presents as a frequent complication of intubated patients when mechanical ventilation is used in the intensive care unit (ICU), especially when there are predisposing

Table 17. Management and treatment used in the patient ischemic stroke and haemorrhagic stroke.

Stroke	Hemorrhagic Stroke
An intravenous injection of recombinant tissue activator of plasminogen or antiplatelet agents: Aspirin 325 mg daily (if intolerance or history of allergy to aspirin Ticlopidine or Clopidogrel is used,preferentemente éste último)	Diuretics: 20 percent mannitol (0.5 to 1 g per kilogram of body weight) and follow-up with furosemide at the rate of 20 mg every 6 hours
400 mg every 8 hours	Nimodipine in constant infusion by central venous catheter (first choice in Subarachnoid Hemorrhage)
General supportive measures depending on the patient's requirements (ventilation, blood pressure and cardiovascular status, fluids, control of homeostasis, nutrition, analgesics, etc.)	General supportive measures depending on the patient's requirements (ventilation, blood pressure and cardiovascular status, fluids, control of homeostasis, nutrition, analgesics, coagulation status, etc.)
nursing surveillance of neurological status with special attention to the level of consciousness and progression of motor deficit	Investigations for diagnosis and location of the damaged cerebral vessel and surgical procedures for possible surgical evacuation or prevention of cerebral hemorrhage in cases that required it
complementary tests (electrocardiogram, Doppler echocardiogram, brain mapping electroencephalogram, bilateral carotid Doppler)	Strict nursing surveillance of neurological status with special attention to the level of consciousness and progression of motor deficit
Physiotherapy and Rehabilitation (if stable evolution and non-progression of CVD was started within 72 hours of the onset of symptoms)	Physiotherapy and Rehabilitation (if stable evolution and non-progression of CVD was started between the third and fifth day of the onset of symptoms)

Source: Turrent, Jose, et al. "Behavior and management of cerebrovascular disease in an intensive care unit." Cuban Journal of Intensive Medicine and Emergencies.

Table18. Pharmacological management of ACS.

Medicament	Evidence
Anticoagulants	-**Fondaparinux** is of choice, as it is associated with lower risk of bleeding and lowers mortality in the long term. Not recommended in STEMI taken to primary percutaneous coronary intervention (PCI) -**Enoxaparin:** do not use bolus in people over 75 years of age, Use according to glomerular filtration rate. In clinical trials it has been administered at doses of 0.75 mg/kg every 12 hours in people over 75 years of age, instead of 1 mg/kg every 12 hours used in the younger population. -Unfractionated heparin is the leading medicine in the treatment of patients with advanced chronic kidney disease (GFR< 30 ml/min/1.73 m2)17. Patients over the age of 60 may require lower doses
Inhibidores G IIb/IIIa	• Eptifibatide is the preferred agent for the observed benefit. Reduce infusion doses of eptifibatide and tirofiban according to renal function. Increasing age can increase the risk of bleeding. • In general, there are no age-related treatment interactions, although greater adverse events occurred in women12.
Antagonistas de receptors P2Y12	• It is suggested to use ticagrelor as the medicine of choice, followed by clopidogrel as the second option. As for this, although the evidence is inconclusive, it is suggested not to administer loading doses in people over 75 years of age because it may increase the risk of major bleeding. • **Prasugrel:** the Food and Drug Administration (FDA) issued
Fibrinolytic	Alert message for excess bleeding without benefit clinical. It is not recommended in ≥ 75 years or < 60 kg or patients with a history of stroke or transient cerebral ischemia, except in those at high risk such as diabetics or with previous infarction • They are effective in older patients; in patients ≥ 75 years undergoing this therapy, there is a reduction in relative mortality of 15%1. • As a serious adverse effect, intracranial hemorrhage occurs in 2.9% in > 85 years 1. Tenecteplase was associated with a lower frequency of intracranial hemorrhage than with tissue plasminogen activator, although none showed superiority in cardiac outcomes. • They should be used, preferably, with anticoagulants such as enoxaparin as it has been shown that in > 75 years the risk of bleeding decreases with a dose of 0.75 mg / kg every 12 hours omitting the loading dose

Source: Pemberthy-López C, et al. Treatment of the elderly with acute coronary syndrome. Rev Colomb Cardiol. 2016.

Table 19. Classification of lung diseases.

Airway diseases	Lung tissue diseases	Diseases of the pulmonary
These diseases affect the ducts (airways or airways) that carry oxygen and other gases to and from the lungs. They often constrict or block the airways. These include asthma, chronic obstructive pulmonary disease (COPD), and bronchiectasis. People with respiratory illnesses often say they feel like they're "trying to exhale through a straw."	They affect the structure of lung tissue. Scarring or inflammation of the tissues that prevents the lungs from expanding completely (restrictive lung disease). This makes it difficult for the lungs to absorb oxygen and expel carbon dioxide. People with this type of lung disorder often say they feel "like they're wearing a jacket or jacket that's too tight." As a result, he couldn't breathe deeply. Pulmonary fibrosis and sarcoidosis are examples of lung tissue diseases.	They affect the blood vessels in the lungs. They are caused by blood clotting, scarring, or inflammation of these vessels. It affects the ability of the lungs to absorb oxygen and expel carbon dioxide. It can also affect the functioning of the heart. An example of this type of disease is pulmonary hypertension. People with these conditions often find it difficult to breathe during exercise.

diseases such as old age and obesity. In addition to excess bronchial secretion, weakness of the respiratory muscles or pulmonary edema. Traditionally, treatment of atelectasis in intensive care patients has focused on aspiration of airway secretions, supplemented with chest physiotherapy and bronchoscopy. For ALA, bronchoscopy should be considered, especially in relation to changes in oxygen in the context of failed conventional catheter aspiration. The main goal is to reconstruct the affected lung. There are specific treatments such as humidification hydration, respiratory physiotherapy techniques directed by a rehabilitation specialist, breathing with ventilation with intermittent positive pressure, ventilation with continuous expiratory positive pressure and positive pressure at the end of expiration and bronchoscopy, previously mentioned. However, there is a specific treatment directed according to the etiology (**Table 20**).

Severe chronic obstructive pulmonary disease (COPD) is one of the reasons why large numbers of patients are admitted to intensive care units. This is a group of lung diseases that make it difficult to breathe and get worse over time. Normally, the airways and alveoli are flexible or distended. As for treatment strategies, for bronchodilators, the authors found that β2-adrenergic drugs and anticholinergic drugs are equally effective, because anticholinergic bronchodilators have fewer side effects and are milder and should be considered as first-line drugs. They

Table 20. Specific treatment for atelectasis.

Treatment	Etiology Of Atelectasias
Non-Surgical	
• Bronchodilators.	• Asthma, Cystic Fibrosis.
• Antibiotics.	• Bacterial infections (pneumonia, TB, sinusitis, bronchiectasis)
• Chemotherapy and radiation therapy.	• Intrathoracic tumors (lymphoma, osteogenic sarcoma, Wilms tumor)
• gamma globulins	• Hypogammaglobulinemia,
	• Immunodeficiency's.
• Steroids.	• Inflammatory processes.
• Postural treatment and thickening of the diet.	• Gastro esophageal reflux and aspiration.
Surgical	
• Resection	• Bronchiectasis, vascular ring, bronchial adenoma and others.
• Extraction	• Foreign body aspiration.
• Correction	• Congenital heart disease, tracheotic fistula.
• Dilatation	• Tracheal stenosis
• Gastrostomy	• Swallowing and esophageal motility disorders with aspiration.

also found that inhalation was more effective than injection, and the benefits of adding a second inhaled bronchodilator were only noticed after the maximum dose of the first drug was reached. Overall, a large proportion of COPD exacerbations were attributed to infection (51% infection, 26% heart failure, 43% pneumonia, and 24% heart failure in SUPPORT2). Therefore, decompensating can be seen as antibiotic therapy may be beneficial for the initial treatment of COPD exacerbations. Another very important aspect is the recommendation to use non-invasive mechanical ventilation, since several studies support this strategy. According to the results of several studies, this mode of ventilation reduces the need for intubation and mortality in patients with copd respiratory failure. It is also important to perform laboratory tests to search for criteria for systemic inflammatory response syndrome, sepsis or severe sepsis. Some of the drugs indicated such as corticosteroids could cause metabolic alterations such as metabolic alkalosis, hyperglycemia. In addition, it is important to consider leukocytosis as a risk factor for exacerbations. For specific treatment it is recommended to perform PCR, pharyngeal swab, Gram, cultures and procalcitonin. Likewise, evaluating the existence of cardiovascular alterations allows a more specific treatment.

On the other hand, pneumonia is the second most frequent infectious complication in hospitals and the first in intensive care units. Eighty percent of nosocomial pneumonia episodes that occur in patients with artificial airways are known as ventilator-associated pneumonia (NAV). VAP is the most common cause of death among hospital infections in the ICU, primarily due to Pseudomonas aeruginosa and methicillin-resistant Staphylococcus aureus (MRSA). In addition, the number of days on mechanical ventilation and the average stay in ICU and hospital increased. Although classically the four disease pathways for developing VAP (aspirations local secretions of the oropharynx contiguous, bloody and through vessels or ducts) have been distinguished, aspiration of secretions from the oropharynx is the predominant and almost the only route. The management involves 2 simultaneous treatments. On the one hand the supportive treatment and on the other, the antibiotic treatment. The purpose of mechanical ventilation is to find the best possible oxygen for the tissue while reducing secondary damage. To do this, it is important to remember that the best oxygen fraction (FiO2) is the lowest FiO2, as high concentrations of oxygen can be toxic. In fact, in patients with lung infections, only 50% of FiO2 can be toxic, although studies that clearly identify the threshold of FiO2 that can be considered toxic to humans are lacking. The use of positive expiratory pressure (PEP) improves oxygenation, but requires a balance between oxygenation, pulmonary over distension, and patient needs. With antibiotic therapy, it is very important not to delay effective treatment, as inadequate initial empirical treatment is associated with increased mortality (**Table 21**).

Finally, we consider Covid 19 among the most frequent diseases in ICU patients, where all countries have created their own treatment and action protocols against this disease. The replication cycle of the SARS-COV-2 virus provides a potential target for developing effective treatments for the disease. It is a single-stranded RNA virus whose cycle begins with the binding of the viral structural mutant protein (S) to the angiotensin-converting enzyme 2 (ACE2) receptor, followed by the passage of serine protease 2 (TMPRSS2) through the host membrane. Cells facilitate cellular entry after binding to receptors through intracellular mechanisms. Studies have shown that the ACE2 receptor can be inhibited with the use of chloroquine/hydroxychloroquine because it interferes with its terminal glycosylation and therefore the drug can act at various stages of the SARS-COV-2 virus replication period. Likewise, other drugs have been used according to the replication cycle as shown in Table 22 (**Table 22**).

In the exacerbation stages, aerosols or micro droplets are avoided through the use of low-risk procedures such as; the placement of the Guide tube and oxygenation facial mask with expiratory filter, chest compression, defibrillation, cardio version, and transcutaneous pacemaker placement, insertion of venous or arterial route, administration of drugs or intravenous fluids. In addition, according to the Association of Respiratory Care Physiotherapists in the UK, the need to apply bronchial drainage techniques in SARS-COV2 infected patients can be decided if the following criteria are met:

- Evidence of retention of secretions with difficulty expectorating

- Ineffectiveness of cough or drainage capacity

Table 21. Terraria con antibiotics para pneumonia associate al ventilator

Microorganisms	Therapy
Central microorganisms	Aminoglycosides (Gentamicin, tobramycin, amikacin) or quinolones (Ciprofloxacin, Levofloxacin)
P. aeruginosa	Beta-lactams anti pseudomonas: ceftazidime, cefepine, piperacillin, ticarcillin, mezlocillin.
Acinetobacter sp.	Beta-lactam inhibitors of beta-lactamases: ticarcillin, clavulanate, piperacillin-tazobactam.
	Aztreonam (efficacy limited to gram-negative bacilli with or without Vancomycin/teicoplanin.
Consider Staphylococcus aureus methicillin resistant High rate of polymicrobial infections	

Table 22. Drugs for the management of covid 19.

envelope membrane fusion inhibitor	Umifenovir (also known as Arbidol) is a promising antiviral agent with a potent mechanism of action during most phases of the viral replication cycle of various viruses. First study showing efficacy against SARS-CoV-2 with a clear benefit for the patient.
TMPRSS2 inhibitors	Kamostat and Nafamostat (Mesylate) are protease inhibitors. They inhibit trypsin (Ki = 1 nM) and several inflammatory proteases, including plasmin, kallikrein, and thrombin. Camostat inhibits the binding of severe acute respiratory syndrome coronavirus (SARS-CoV) and SARS-CoV-2 surface glycoproteins in vesicular stomatitis virus (VSV) into vero cells, Calu-3 cells, and primary pulmonary epithelial cells in the form of pseudo granules. To date, there have been no clinical trials demonstrating its efficacy against COVID-19, but based on the mechanism of action described above and experience with SARS-COV, it may have broad potential..
Entry inhibitors and endocytosis	Chloroquine and its derivative, hydroxychloroquine, have traditionally been used in the treatment of malaria and some autoimmune diseases, however, these drugs may be active against SARS-CoV 1 and SARS-CoV 2 similarly in vitro and in clinical practice. A 2005 study showed that chloroquine's ability to raise intraatomic pH, thereby inhibiting the pH-dependent viral replication phase, was effective in limiting the spread of infection to other host cells
3-chymotrypsin inhibitors such as protease	At this stage, antiviral drugs that inhibit this enzyme act, such as lopinavir/ritonavir and darunavir. The justification for use is based on in vitro studies in animal models showing potential activity for SARS-CoV and MERS-CoV; because lopinavir and ritonavir can bind to M pro, a key enzyme for coronavirus replication, suggesting that it may suppress coronavirus activity.
Viral RNA-dependent RNA polymerase inhibitors.	The antiviral drugs that inhibit this enzyme, currently under study in their effectiveness against COVID-19, are Ribavirin, Favipiravir and Redemsevir.
Interferon's	Interferon means that it interferes with viral multiplication. It is a natural compound whose function is aimed at creating an inhibition mechanism at the first level of response of the organism; it is divided into three types: beta, alpha (which groups a large number of these) and gamma. In ICU (3 million units, intramuscularly, on alternate days, for one month)

Another important aspect is the prone position of the patient, as it improves oxygenation and increases survival in patients with a clinical picture similar to ARDS. Recommendations are made when PaO2/FiO2 <150 even with protective ventilation (tidal volume <6 ml/kg ideal body weight and high PEEP). Exercises should be performed by a well-coordinated group with as few people as possible, and an experienced physical therapist may participate. It is important to prevent and maintain complications of treatment (extubation), accidents, onset of medium and/or peripheral intubation, shoulder dislocation, pressure ulcers and hemodynamic changes in the most sensitive areas).

Risk and prognostic factors in COVID-19 patients requiring mechanical ventilation with or without ARDS are not fully understood, and more clinical research is needed in this area to improve outcomes. Nor have the data analyzed by artificial intelligence been published in the group of patients in intensive care. On the contrary, the respiratory, cardiovascular and long-term quality of life consequences of admission to the ICU are unknown, so CIBERESUCICOVID aims to identify the risk and prognostic factors of COVID-19 patients admitted to Spanish ICUs since the beginning of the Spanish pandemic in October 2020 using artificial intelligence analysis. Patients discharged were followed up and one year after discharge, mortality at 6 months and one year, effects on respiratory and cardiovascular function, and effects on quality of life were determined. The accelerated discovery of this new infection has allowed studies to highlight that in patients admitted to the ICU, high-flow nasal cannulas, invasive mechanical ventilation (IMV), the use of prone position and corticosteroids have been used more frequently, reducing the number of patients in VMI and the time spent in ICU and hospital stay.

Frequent gastrointestinal pathologies in the patient in the ICU, treatment and proper management

The most frequent pathologies that enter the ICU are digestive problems, compartmental abdominal syndrome, intestinal ischemia, and digestive hemorrhage, postoperative complications of digestive surgery, peritonitis and acute pancreatitis. First, gastrointestinal problems in the ICU can be classified into non-surgical and surgical, which include problems in intestinal motility to ischemia and inflammation as presented in (**Table 23**).

Diarrhea is a cause of hydroelectrolytic imbalances, interruption of enteral nutrition schemes, malnutrition, aggravation of the morbid picture, prolongation of hospital stay, and even death.

Table 23. Classification of gastrointestinal problems in ICU.

Non-Surgical	Surgical
Motility problems	Intestinal obstruction
Diarrhea	Ischemia
• Infectious	Perforation
• No- Infectious	Stress-related bleeding or mucosa
constipation	Haemorrhage
Malabsorption	Intra-abdominal compartment syndrome
Hepatitis	Pancreatitis
Hepatic impairment	Cholecystitis (calculus and calculus

The occurrence of diarrhea is multifactorial (related to enteral nutrition, medications, altered gastrointestinal motility, or secondary to antibiotics and/or the disease itself) and can have serious and important consequences for the patient. In its most common form, diarrhea is any change in bowel habits that a patient identifies as their own. Therefore, any definition of diarrhea should include an increase in stool volume, a change in appearance, and an increase in frequency. Diarrhea, as defined by the World Health Organization, is the evacuation of three (or more) bowel movements in 24 hours in a container, or even liquid; it may be accompanied by blood. Severe diarrhea responds to different pathophysiological mechanisms. Some of the most frequent would be as follows: osmotic diarrhea, secretory diarrhea and exudative diarrhea. Physical examination should indicate the determination of abdominal pain and pain, fever and anemia are a sign of diarrhea. The impact of diarrhea on patients' hydro electrolytic status should also be evaluated, looking for internal mass spasms, hypertension, and arterial hypotension, among others. Additional tests include: 1) Number of white blood cells, 2) copolytics to determine microorganisms, 3) determine the A and B variety of toxins calculated by translation of exempt enzyme analysis (ELISA). 4) other laboratory methods may be necessary to assess the level of hydro electrolytic involvement and modification and modify the plasma ion concentration as well as the acid balance. 4) The calculation of the remaining osmosis of the fertilizer material is an important step before starting any specific treatment and can be made of the concentrations of NA and KIS in the fecal matter (Equation 1).

Ecuation 1.

Osmolar Remaining Anion = 290 mOsm – (Na+ + K+) * 2

It is important to consider that the only cause of DANE that can be controlled with specific treatment is cl infection. Difficile, in persistent cases antibiotic therapy (metronidazole, vancomycin or teicoplanin) and endoscopy are necessary. The use of antidiarrheal medication should be reserved for cases of DANE that are not controlled despite other measures.

In another order of ideas, the European Society of Clinical Nutrition and Metabolism (ESPEN) published in 2015 the recommendations on "Definition and classification of intestinal insufficiency in adults". Intestinal insufficiency is defined as intestinal activity that falls below the minimum required to absorb such macronutrients and/or water and electrolytes, intravenous (IV) supplementation to maintain health and/or growth. Reduced intestinal absorption function that does not require IV supplementation can be considered as intestinal insufficiency or dysfunction. Expert group to classify intestinal insufficiency into three categories, by presentation and duration and intensity.

Type I: It is deep, usually lasts a short time and is self-limiting. It usually occurs after abdominal surgery, but can also occur in critically ill patients (pneumonia, traumatic brain injury, acute pancreatitis).

Type II: Long-term, often in metabolically unstable patients, requires multimodal care and intravenous supplementation (i.e.) for weeks or months.

Type III: Chronic disease in metabolically stable patients, requiring months or even years of treatment. It can be reversible or irreversible.

Resuscitation to ensure an abdominal perfusion pressure greater than 50 mmHg and hydro mineral and acid-base balance are recognized as actions for treatment. Also the strict glycemic control, since these conditions a better metabolic control, but also improves intestinal motility. In addition, a treatment that includes intestinal dysmotility to minimize the use of medications that produces it (alpha-agonists, proton pump inhibitors, calcium channel blockers, sedatives, muscle relaxants, analgesics and vasoactive drugs). The efficacy of metoclopramide has been shown. Another important point is the control of sepsis, if surgical treatment is necessary; and indicates antibiotics, especially according to the result of the crops. Finally, nutritional support is recommended to start in the first 24-48 hours, once the patient is hemodynamic ally stable, to reduce the effects of increased catabolism and avoid malnutrition. Early EN is suggested (48-72 hours), although it is difficult to initiate it because the patient does not tolerate it initially. The severe patient with IF usually presents with high-expenditure fistula or enterostomy, sepsis and problems associated with SIC (dehydration, malnutrition, and hydro electrolytic alterations) in the context of FIA type II, so Figure 5 shows some of the commonly used solutions and their composition in relation to plasma (**Figure 5**).

Another point is Abdominal Compartment Syndrome, which is the end result of a continuum that begins with a persistent increase in intra-abdominal pressure (IAP) that can alter blood flow to the region and potentially lead to multi-organ failure. (FOM). Due to abdominal trauma, acute pancreatitis, hypovolemic shock and secondary peritonitis. Values below 10 mmHg are generally considered normal. The increase in IAP in critical patients is usually multifactorial, reaching 15 mmHg in the presence of visceral edema and pain after surgery and 20-50 mmHg after intensive resuscitation (shock), severely affecting other systems. Measurement of IAP in clinical situations indirectly confirmed by nasogastric tube, bladder catheter, gastrostomy or vascular probe placed in the inferior vena cava, all well correlated with direct measurements. The treatment of choice is decompression. Therefore, decompressive medical measures such as nasogastric and rectal catheter, nasogastric and colonic catheterization, rectal enema, aspiration, 20% human albumin combined with furosemide, positive continuous venous hemodialysis, ultrafiltration, continuous negative extra peritoneal dialysis should be considered. Pressure, increased sedatives and

Fluid	Composition and osmolality of plasma and crystalloids Na	K	Cl	Mg	Ca	CHO:	Glucose	Lactate	Acetate	Osmole	Gluconate-lity (mOsm/L)
Plasma	142	4,3	103	1,25	2,5	24	0,8				291
0.9 % of births	154	0	154								308
0.18% NaCl/ 4% Dextrose	30	0	30				40				284
0.45% NaCl/ 5% Dextrose	77	0	77				50				406
Hartmann	131	5	111		2			29			278
Ringerlactate	130	4	109		1,5			28			273
Plasmalyte 148	140	5	98	1,5					27	23	294
5% Dextrose	0	0	0				50				278

Ions in mmol/1; osmolality in mOsm/1; Glucose g/l.

Figure 5 IF Management.

From: Agüero, Aldo, and Kenia Infante. "Intestinal failure in the critical patient." Revista Medical del Uruguay 37.2 (2021): e37209-e37209.

eventual neuromuscular blockade before attempting surgical decompression. Improvement is sometimes seen with percutaneous drainage of peritoneal fluid before attempting to decompress the abdomen using laparotomy. In addition, there is the option of surgical treatment with the following indications:

1. Decompression with PIA values ³ 20 mmHg is recommended.
2. The concept of damage-controlled laparotomy has gained wide acceptance among trauma surgeons.
3. The abdomen cannot be closed due to the high risk of severe HIA, and when a second examination is planned immediately, the patient should be transferred to the intensive care unit for overheating to correct the entanglement. Coagulation disorders, optimizing hemodynamics and oxygen transport.
4. If during the operation there is still clear evidence of HIA, some temporary abdominal closure technique is preferred to prevent the development of an ACS.

Intra-abdominal infections (IAI) are common surgical emergencies and, despite advances in surgical techniques, antibiotic therapy and resuscitation, are characterized by morbidity, mortality and complications impose high costs on health systems. Acute peritonitis (AP) includes any acute inflammatory process of the peritoneal serous, regardless of its etiology. It should be noted that, if not treated properly, these patients can quickly develop sepsis, and the involvement of organs and systems will vary depending on the different factors we will analyze. The surgical management of intra-abdominal infections is based on: the elimination of the source of contamination, reduction of contamination of the peritoneal cavity and treatment of residual infection. Fluid and electrolyte replacement is a priority, and saline infusion is started immediately. Vasopressors (norepinephrine, dopamine, and epinephrine) are necessary in patients with inadequately compensated hemodynamic ally compensated volumes (septic shock). Pathogens associated with secondary BP are often derived from the patient's own flora and typically include enter bacteria (mainly Escherichia coli and Klebsiella), Streptococcus viridans, and anaerobes (especially Bactericides fragile), enterococci, and gram-positive bacteria. Established. Therefore, amino penicillin in combination with a beta-lactamase inhibitor is usually included in the management plan.

Renal pathologies and frequent in the patient in ICU, treatment and proper management

Acute renal failure (AKI) is defined as a sudden drop in the glomerular filtration rate, resulting in the accumulation of urea, creatinine, and other toxic waste products and changes in water and electrolyte balance. There are different definitions and stages of severity of AKI, and the most commonly used measures in clinical practice are the KDIGO, RIFLE and AKIN criteria. There are three types of renal failure as shown in (**Table 24**).

Several studies suggest that early hemodialysis may improve mortality outcomes. As with any other treatment in the ICU, the dose of Renal Replacement Therapy should be determined in an attempt to optimize solute clearance and fluid and electrolyte balance. There is considerable heterogeneity between variables, such as inclusion criteria or start time, such as the use of time criteria (6, 8 or 12 hours) in some studies, or analytical criteria (serum urea or creatinine) in others). The time periods used are also significant, with some settings starting in the first 6 hours and some in the first 12 hours. Clearly, there are large temporal differences in the severity of rapidly progressing patients, and temporal factors can be decisive for the prognosis of the disease. Technically, we emphasize that ultrasound should be the method used for central or arterial venous catheterization because it reduces the risk of complications. We believe that in critical patients with AKI, the dilemma of continuous or intermittent HRT modalities should not be considered, but a dynamic approach to adapt the technique to the clinical and hemodynamic status of the patient over time. In this context, techniques such as intermittent hemodialysis should be an additional RRT to ICU patients, as there were no differences in mortality or renal recovery. Because it can be beneficial for some patients who may benefit compared to treatment. Mobility and recovery after cessation of TRS.

Table 24. Classification of renal failure and its pathophysiology.

Pre-renal Renal Insufficiency
There is a decrease in renal perfusion, which will be compensated by hormonal mechanisms and nerve stimuli that condition the elimination of electrolytes and therefore also the decrease in urine flow. This urine is concentrated in urea, cretonne, phosphates, ammonium. All this is if the urine volume of 500 ml / day is low, although the kidney works properly and focuses on maximum capacity, it is not possible to eliminate all waste and part of the maintenance of nitrogen products producing azotemia.
Intrinsic Renal Insufficiency
It may be affected by other causes not directly attributable to renal hypo perfusion, such as: systemic or local immune causes, such as Vasculitis or acute interstitial nephritis due to drug-induced immune hypersensitivity; vascular problems, such as atherosclerotic disease, renal artery or thrombosis, or venous thrombosis.
Post-renal Or Obstructive Renal Failure
The kidneys adequately fulfill their missions of filtering, absorbing and secreting, an obstruction to the urinary flow ends up affecting these functions and can cause anuria. In this case, we speak of acute obstructive or pre-renal renal failure. The degree of reversibility is high and renal function quickly returns to its initial values when the cause is corrected or simply facilitates the exit of urine (by probing, catheterization or nephrostomy).

Frequent metabolic pathologies in the patient in the ICU, treatment and proper management.

Some authors argue that the caloric needs in critical condition are very high, assuming that they are accompanied by a substantial increase in basal metabolic expenditure, that is, in critical patients, it is important to strongly increase metabolism. However, some authors have indicated that the degree of hyper metabolism is actually mild. The early stages of stress, usually no more than 10% higher than resting metabolic rate, as opposed to being highly catabolic, this is represented by increased excretion of nitrogen and urea. Usually, severely ill patients develop hyperglycemia and, in some cases, hyperinsulinemia. Once a patient has hyperglycemia of unknown cause, glucose distribution appears to be a physiological paradox and insulin resistance is thought to be one of the causes. Evidence that hyperglycemia in acute medical or surgical diseases increases morbidity and mortality in the ICU, and increases length of hospital stay and days on mechanical ventilation. Intravenous insulin therapy is suggested, the advantages of using an algorithm or protocol include greater glucose control, less error in treatment, so it provides guidance on how to achieve specific blood glucose levels, adjust insulin doses, and stop or slow the rate of infusion based on the individual patient's blood glucose level and dietary pattern and avoid hypoglycemia [101]. During trauma and stress, two major changes have been observed in relation to insulin, a hormone that also plays an important role in amino acid and protein homeostasis. These changes include inhibition of catecholamine-mediated secretion and insulin resistance, followed by the release of amino acids from skeletal muscle for gluconeogenesis and decreased glucose utilization by insulin-dependent tissues. To determine and determine protein requirements, it is necessary to understand protein metabolism and quantify daily protein turnover by determining the turnover of various measurable proteins, such as plasma, muscle and urinary protein excretion. Under normal circumstances, lipid homeostasis depends on a balance between anabolic (insulin) and catabolic (catecholamines and glucagon) stimuli. During sepsis, the predominance of catabolism occurs transiently, which involves the breakdown of lipids into free fatty acids, which are therefore precursors of hepatic ketone bodies and primary fuel for cells to consume glycogen. As sepsis progresses and leads to a lack of nutrients, glucose and amino acid consumption is reduced, making lipids the main source of energy. Glucose oxidation can also be inhibited by altering lipid metabolism.

Conclusion

In conclusion, having knowledge of the steps, management and approach of the behaviors that health personnel must have in the intensive care unit, are essential to reduce the morbidity and mortality of patients, therefore, the acronym "IN CRITICAL CONDITION" and the recognition of the most frequent pathologies found in the ICU, are a very useful proposal for the fulfillment of a comprehensive care of the critical patient with a previous and adequate precision Diagnostic.

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