# Chapter 01

*Nursing Management in Blood Sample Collection. Organization, Preanalytical Phase, and Quality of Care (English Version)*
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# Clinical and Organizational Fundamentals of the Preanalytical Phase

## Fundamentos clínicos y organizativos de la fase preanalítica

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The blood collection procedure performed by the nursing staff was carried out for laboratory analysis and subsequent examination. Blood collection allows us to collect blood samples so that the laboratory can perform hematology, biochemistry, coagulation, and microbiology analyses.(1)

Venous blood collection is a technique performed by nursing professionals, as it is part of their duties. To do this, the material for venipuncture must be prepared, the patient must be informed of the procedure and placed in the correct position, hands must be washed and gloves put on, the compressor or smarch must be applied, and the veins must be palpated to select the most suitable one. The area must be cleaned with a suitable antiseptic, and the chosen vein must be punctured by inserting the needle with the bevel facing upward, extracting the blood sample, removing the tourniquet and then the needle, and finally applying pressure to the puncture site for 2–5 minutes to prevent bruising.(2)

It is also necessary to distinguish between tubes that contain anticoagulant and are therefore used for tests that require plasma and those that do not contain anticoagulant and are used for tests that require serum. Serum tubes usually have a gelatin or gel separator at the bottom that is inserted after extraction between cells and fluids.(2)

Authors agree that quality of care is a combination of best practices, efficient use of resources, and achieving a degree of patient satisfaction with the care received.(3,4)

The quality of care management will be expressed through excellence to the extent that clinical practice bases its actions on research but at the same time validates it with the aim of creating a single body of knowledge that offers applicable and relevant results that improve the quality of health service provision, increase user satisfaction, and enable the formulation of health policies.(5,6)

According to the WHO, the quality of healthcare ensures that each patient receives the most appropriate set of diagnostic and therapeutic services to achieve optimal healthcare, taking into account all the factors and knowledge of the patient and the medical service and achieving the best outcome with the minimum risk of iatrogenic effects and maximum patient satisfaction with the process.(7)

Therefore, it is necessary to understand what factors influence the ability of nurses to carry out evidence-based clinical practice (EBCP) to evaluate the quality of nursing care at the hospital level. Quality is then achieved to the extent that a process based on scientific evidence is applied to the patient, which implies that “the right thing must be done and it must be done well”.(6,8)

This process is actually the nursing process, and decision-making in clinical practice must be based on or supported by scientific evidence as a source of nursing knowledge, to the detriment of other ways of acquiring knowledge, such as traditional methods based on the principles of custom, authority, trial and error, and logical reasoning, which correspond to methods of acquiring knowledge specific to the sciences.[6,8]

**Institutional context and workflow**

The total number of nursing staff in the service, comprising the neonatal intensive care unit, pediatric intensive care unit, neonatal intermediate care unit, and pediatric ward, is 54.

Pediatrics has 11 beds and 15 nurses distributed across different shifts and 3 PC terminals. The neonatal intensive care unit (NICU) has 10 units and 20 nurses from different shifts with 4 PC terminals. The neonatal intermediate care unit has 4 nurses and 1 PC terminal. Finally, the Pediatric Intensive Care Unit (PICU) has 4 beds, 15 nurses, and 2 PC terminals.

Blood samples from pediatric patients (in general hospitalizations) are taken by a laboratory technician, but in the neonatal and pediatric intensive care unit, samples are taken by a nurse.

Previously, laboratory sample requests were made in writing on paper by the doctor, and nurses proceeded to perform the extraction at the appropriate time and then called the laboratory technician to collect and process the sample. The results were then reported by the system.

Owing to the computerization of medical records, the request is now made through the system, the laboratory validates it, and the nurse performs the extraction and radios the technician to collect the sample, which is then processed and the result is reported. Unlike the paper order form, which includes the patient's name and episode, the collection technician now brings a sticker with the patient's data and a barcode, verifies their identity, and takes the samples.

There are differences in criteria that arise when performing a blood draw, raising the question of which would be most appropriate to ensure the safety and quality of this procedure in its many dimensions, taking into account the characteristics and environment of the institution.

This study aims to address one of the problems that arise in the private institution in Buenos Aires regarding the collection of blood samples in the neonatal and pediatric intensive care units, since this procedure is performed by the nurses in these services.

This institution is highly complex and recognized for its track record and prestige. It has modern infrastructure and technology for the treatment of complex pathologies and medical emergencies.

Laboratory tests of blood samples are essential for the diagnosis and treatment of patients.

Seventy percent of objective information is obtained from blood tests. The quality of a blood test result is only as good as the quality of the sample analyzed. Therefore, reports of a suboptimal sample can result in treatment that may be potentially harmful to the patient by over- or undermedicating, with death being the worst outcome for the patient.

While obtaining a sample is important, failure to follow the procedure properly during

collection can compromise its integrity, resulting in the sample being rejected by the laboratory.

**Purpose and operational questions of the study**

This study aimed to analyze the factors that influence nursing organization and management in relation to the practice of blood sampling in neonatal and pediatric intensive care units within a private hospital. The research was conducted during a defined observation period, considering both organizational dimensions and aspects related to the preanalytical phase of the diagnostic process.

The analysis focused on understanding how the availability—or absence—of standardized protocols, working conditions, staff training, and the dynamics of interaction with the clinical laboratory can affect the quality and consistency of this practice. It also explored the nursing team's perception of the laboratory service's performance, particularly in terms of response times and operational coordination.

In addition, the relationships between the time intervals between sample collection and sample collection by laboratory staff and the time required to obtain results were examined. This approach allows blood collection to be viewed not only as a technical procedure but also as a process integrated into the organization of care and diagnostic safety.