

## THE BLOOD DROP SCREENING (GUTHRIE) TEST AND THE ROLE OF NURSES: A REFLECTION

### TESTE DO PEZINHO E O PAPEL DA ENFERMAGEM: UMA REFLEXÃO

### GUTHRIE PRUEBA Y EL PAPEL DE LA ENFERMERÍA: UNA REFLEXIÓN

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#### ABSTRACT

**OBJECTIVE:** to evaluate and possibly propose a repositioning of the role of nurses in the Blood Drop Screening (Guthrie) Test (GT). **METHODOLOGY:** this is a descriptive-reflexive study with theoretical grounds of the nursing practice in Neonatal Screening. **RESULTS:** the literature shows: 1) weak points in the performance of these professionals in neonatal screening and 2) limited understanding of mothers regarding the test, which may reflect the inadequate performance of the Nursing Team in Health Education. **CONCLUSIONS:** if nurses are to act effectively in health promotion and disease prevention, it is essential that they are aware of their social role and willing to continuously improve their knowledge and skills. This will enable them to provide better care both to the mother and the newborn.

**DESCRIPTORS:** Nursing; Neonatal Screening; Child Health; Health Education

#### RESUMO

**OBJETIVO:** refletir e re(pensar) a atuação da Enfermagem no Teste do Pezinho. **METODOLOGIA:** trata-se de um estudo descritivo-reflexivo com fundamentação teórica sobre a prática de enfermagem em Triagem Neonatal. **RESULTADOS:** a literatura mostra: 1) fragilidades na atuação desses profissionais em Triagem Neonatal e 2) entendimento limitado das mães sobre o teste, que pode ser reflexo da atuação inadequada da Equipe de Enfermagem na Educação em Saúde. **CONCLUSÕES:** para que a Enfermagem atue na promoção da saúde e prevenção de doenças, é indispensável que o profissional reflita sobre seu papel social e busque continuamente por capacitação, pois essa lhes proporcionará uma melhoria na qualidade da assistência prestada à mãe e recém-nascido.

**DESCRIPTORIOS:** Enfermagem; Triagem Neonatal; Saúde da Criança; Educação em Saúde

#### RESUMEN

**OBJETIVO:** reflexionar y volver a (pensar) el papel de la enfermería en la prueba de Guthrie. **METODOLOGÍA:** se trata de un estudio descriptivo-reflexiva con el marco teórico de la práctica de enfermería en el Tamizaje Neonatal. **RESULTADOS:** la literatura muestra: 1) debilidades en el desempeño de estos profesionales en Tamizaje Neonatal y 2) la comprensión limitada de las madres en la prueba, lo que puede reflejar el comportamiento inadecuado del equipo de enfermería en la Educación en Salud. **CONCLUSIONES:** para la actuación de enfermería en la promoción de salud y prevención de enfermedades, es esencial que los profesionales de la salud creen que su rol social y la búsqueda continua de la formación, ya que esto les dará una mejora en la calidad de la atención proporcionada madre y el recién nacido.

**DESCRIPTORIOS:** Enfermería; Tamizaje Neonatal; Salud del Niño; Educación en Salud

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## INTRODUCTION

### Guthrie test and Neonatal Screening

The Guthrie Test (GT) is a laboratory test that is part of the Neonatal Screening (NS), together with the tests of the ear, the eyes, the tongue and the heart, and are important to diagnose disorders that may impair the development of the newborn (NB). GT detects metabolic, genetic and / or infectious diseases before the symptoms become evident, facilitating the inclusion of the newborn in specific treatment in order to reduce or eliminate sequelae associated with each disease, allowing a better quality of life for the child.<sup>1-3</sup>

GT is the largest preventive public health program in the world. In Brazil, this is the largest initiative of the Unified Health System (SUS) in the Genetics area. It was implanted in our country in 1976 by Dr. Benjamin José Schmidt, pediatrician of APAE / SP (Association of Parents and Friends of the Exceptional) who implemented the diagnosis for Phenylketonuria. In 1986, screening for Congenital Hypothyroidism was included.

In the 1990s, screening for these two pathologies was known as GT because blood samples are obtained from the heel of the NB, because it is a highly vascularized region and practically

painless for the baby. In 2001, the federal government implemented, through the Administrative Rule no. 822 of 06 June, the National Neonatal Screening Program (PNTN), which establishes that every child born in the national territory must be submitted to the free and compulsory TP.<sup>4</sup>

The implantation of NS in Brazil was performed in phases (I, II and III), according to the level of organization and coverage of each state, and therefore, the investigated disorders vary from state to state. In 2012 there was expansion to Phase IV and the inclusion of two more diseases to be screened.<sup>5</sup> Currently, the diseases diagnosed by PD are six and include Phenylketonuria, Congenital Hypothyroidism, Sickle Cell Anemia and other Hemoglobinopathies, Cystic Fibrosis, Congenital adrenal hyperplasia and Biotinidase Deficiency. Such diseases are asymptomatic in the neonatal period and, therefore, do not arouse medical attention, being, therefore, essential the early diagnosis by the GT. Thus, PNTN has as its main goal the prevention and reduction of morbidity and mortality caused by the diseases and, if so, early treatment before the emergence of irreversible sequelae such as intellectual disability. The pathologies detected by GT are incurable, but they present a good prognosis if

diagnosed and treated since the neonatal period.<sup>1-3</sup>

In this context, the present theoretical work has a descriptive-reflexive character and aims to re (think) the Nursing performance in the GT. For this purpose, published journals on this subject have been consulted to date and the results presented by these studies were critically discussed and constituted the theoretical basis of this research.

### **Guthrie and Nursing Test**

Nursing, Obstetrics and Pediatrics are fundamental for the success of NS since these professionals work in the care of the pregnant woman, the parturient woman, the newborn and the puerperium and must be aware of the metabolic disorders, as well as the importance of the early diagnosis of the diseases studied in the PNTN. Parents need to be aware of the existence of NS and be previously oriented on: the benefits of early detection of the diseases to be screened and what they are; The risks to the newborn who is not submitted to the test; The appropriate age for its accomplishment; The need for subsequent confirmatory exams for those who were positive; The possibility of false positives; The process of monitoring and receiving the results.<sup>3</sup> Among these health professionals, the nurse interacts most with the target clientele: the mother and the newborn. From the prenatal, in the Basic

Health Units, the nurse must inform and advise the pregnant woman that when her baby is born he will make an examination, called GT, that can be performed in the public or private healthcare system. At maternity / hospital, Nursing should again reinforce such information to parents, especially to primigravida mothers.<sup>6</sup> The importance of the examination, clarification about the purpose of the collection and the procedure itself, and the need to seek the result of the examination are guidelines that During the care allow the mother a sense of security by providing her with knowledge that consolidates responsibility for promoting the well-being and support of her child's health.

The correct technique for collecting blood samples for GT is a Nursing procedure. This professional must correctly fill out the collection form to facilitate the placement of the child if necessary, such as repetition or altered exam result. With the aid of a lancet a few drops of blood are obtained from one of the sides of the baby's heel and these are deposited on filter paper. The period to perform the examination should be from the 3rd to the 7th day of life of the newborn, preferably on the 5th day, since the same has been in the presence of breast milk, which is a source of protein nutrition. Therefore, it must be performed with at least 48 hours of life of the RN and never more than 30

days. It is important for the health professional to inform the parents that if the result is positive, the diagnostic test should be done, since the NS is not confirmatory so there may be false positives and false negatives.<sup>1,2</sup>

Although the collection of GT is a procedure of competence of the nurse, studies have demonstrated a failure in the performance of these professionals.<sup>6,8,9</sup> One of them showed that of the 222,366 blood samples collected on filter paper for GT in the state of Paraná, 2,787 (1.25%) had errors in collection.<sup>6,8</sup> The main reasons were: 1198 blood tests were insufficient, 500 examinations for aged blood and 490 for dried blood. These data point to a lack of scientific technical knowledge and devaluation regarding the importance of the examination by nursing professionals.<sup>6,8</sup> Another study, conducted in a University Hospital of Paraná, showed a high number of 2nd, 3rd and 4th collections of GT samples, totaling n = 110 (11.3%). This number of unrecorded retrieval evidenced flaws during the

examination either in the collection, storage or recording.<sup>9</sup> The material retrievals for the GT physically and emotionally affect the baby and his family and show the need for specific training for the nursing professional.<sup>9</sup> Still, a poor sample collection for GT, that is, when a sample of blood is not collected with the required quality, the mother is recalled to repeat the examination of her baby as urgently as possible and this causes, in addition to Anxiety, insecurity, discomfort and stress to the family and the baby, a significant delay in the diagnosis and late initiation of treatment in cases that are positive for some of the diseases studied, especially if there is difficulty in locating this mother and her baby.<sup>6</sup>

Still, other studies have demonstrated some weaknesses regarding the knowledge of the Nursing Team about the GT (Chart 1).<sup>10-12</sup>

**Chart 1** – Summary of the main results about Nursing knowledge on GT.

Reference	Objective	Casistry	Main Results
Benincasa et al. 10	To identify the theoretical perception of the nursing team about TN in Neonatal Intensive Care Unit of a public hospital in the interior of São Paulo.	21 nursing professionals (4 nurses, 14 technicians and 3 nursing assistants)	- 19 staff members did not associate the term TN with TP; - None of the 21 interviewees answered correctly the recommended period for collection; - None of the 21 mentioned the real importance of TN, which is the prevention of complications that the pathologies that are triaged cause to the life of the

			<p>child if, however, not diagnosed and treated early;</p> <ul style="list-style-type: none"> <li>- Name of the pathologies (SP: three pathologies): <ul style="list-style-type: none"> <li>6 mentioned a pathology</li> <li>3 mentioned two</li> <li>8 did not mention any of the three pathologies</li> <li>4 answered this question correctly</li> </ul> </li> </ul>
Acosta et al.11	To know the orientations about NT, shared by nurses with parents	13 nurses who work in the Basic Units of Family Health (UBSF)	<ul style="list-style-type: none"> <li>- Only three nurses use teaching-learning strategies to facilitate family members' understanding of PD. The orientations were given from the previous knowledge and the capacity of absorption of the caregiver;</li> <li>- Only one nurse reported the importance of approaching the topic even before the baby's birth, that is, during prenatal care;</li> <li>- Misconception about the time indicated for the collection of the exam.</li> </ul>
Strefling et al.12	Describe nurses' knowledge about TN and its operationalization	13 nurses who work in the Basic Units of Family Health (UBSF)	<ul style="list-style-type: none"> <li>- Need for further study on the subject;</li> <li>- Fragility regarding the orientation of the appropriate period for exam collection;</li> <li>- Reporting of wrong procedures during the collection of the exam;</li> <li>- Fragile knowledge treated succinctly and with little theoretical support.</li> </ul>

The main problem was in relation to the period for the collection of GT. This test is only a screening test, that is, an altered result does not imply a definitive diagnosis of any of the diseases requiring confirmatory tests. Therefore, it is important to perform the test in a timely manner, that is, in the first week of life of the neonate so that in positive cases, initiate the treatment early avoiding sequels such as intellectual disability and / or even death. Research has also shown low understanding of GT by mothers. This superficial knowledge is related to the importance of the test, how it is performed, what diseases are detected, what is the correct period, among others.<sup>7,13-18</sup> Some mothers confused the GT with the "stamp" of the baby's foot (Planting) collected shortly after birth at the Hospital / Maternity Hospital and believed they had already been tested on their child.<sup>17</sup> One of these studies revealed that 97% of mothers had already heard about PD, but did not know its purpose and importance. This result is worrying because mothers are unaware of a simple but extremely important examination for the child's health. The findings of this research also showed flaws in prenatal care, in the collection and maternity clinics, since it is not enough to inform the need for the test, but rather to explain its benefits when performed early.

Regarding the information about GT, a survey showed that only five mothers (10%) reported receiving prenatal guidance, although 40 (80%) of them were consulted during that period. Other important data were: 1) 70% (35) of the women obtained information about the test when they were discharged from the maternity ward where they gave birth; 2) 50% (25) of the interviewed mothers took their children to the Basic Health Unit to perform the TP between the 7th and 15th day of life of the newborn and 3) 80% (40) of them did not know which diseases the gt detects.<sup>16</sup> Another study with 55 multiparous puerperae showed that some did not perform GT on their son because they found the procedure painful and 42.8% (21) of them did not know how to do the recommended age for the test.<sup>17</sup> This last result was confirmed by A previous study, which evaluated NS in the State of Mato Grosso and showed that: 1) only 22% of the samples were collected at the recommended age and 2) the majority of them performed the screening test between 8 and 30 days of life of the newborn. Still, about 10% of the children had samples collected over the age of 30 days. Thus, the age at collection and the delay in the diagnostic confirmation phase were the main reasons for the delay in starting the treatment of the cases detected by the service.<sup>19</sup>

Data presented previously emphasize that GT, despite its extreme importance for the promotion of the health of the newborn, seems to be in second place, both by the nursing professionals and the mothers, who focus their concerns mainly on the care of the newborn. In relation to breastfeeding and personal hygiene.<sup>18</sup> Thus, the disinformation or incipience of understanding about GTs of parents and health professionals can negatively influence the performance of the test, compromising early diagnosis and initiation of treatment. Knowledge about the damage caused by the diseases and the need for immediate treatment can positively influence the performance of the exam in an adequate period and in the interest in seeking the result.<sup>17</sup>

Still, other intriguing findings reported in the literature are that information on NT was passed to mothers after hospital discharge in most cases,<sup>7,14,17</sup> and guidance was performed by physicians.<sup>14</sup> Only one of the 15 pre-mothers was considered during the period.<sup>14</sup> Considering that the nurse is the professional who maintains direct contact with the mother from the prenatal period until the puerperium and has the attribution of Health Education, these guidelines should be given by her. She is a qualified professional during the pregnancy- puerperal cycle and is not restricted only to

the postpartum period and the time of the examination. In short, the GT examination is a preventive measure that is incumbent on Nursing, which has a fundamental participation in the PNTN implementation process, and should inform the caregivers about the importance and purpose of the examination, the procedure itself, and the limited understanding of mothers about NS is undoubtedly a reflection of the information they received about the test and highlights the fragility of the Nursing Team's role in Health Education.

The results of the studies presented above<sup>6,8,9-12</sup> emphasized the need for training for Nursing professionals, with instruction on collection, importance, purpose of the test, collection period, triadic disorders, among others. The nurse plays an essential role in NS, as it should promote health and prevent diseases. Therefore, it is indispensable to the implementation of Permanent Health Education in order to effectively qualify these professionals. The nurse qualified for the professional exercise performs its functions efficiently and effectively, guaranteeing a global and humanized assistance.

The findings of the previous studies are worrying, they make us rethink the Nursing practice in TN11 and it sends the following questions to us: 1) is it that the Nursing professionals have a solid

knowledge to transfer this information to the parents? 2) Are these professionals prepared to assist and provide families with comprehensive health care for the newborn relative to TN? 3) How is NS and GT addressed in Nursing Undergraduate Courses in Brazil? 4) would it not be necessary to continuously promote training courses for these professionals so that they can be assured of guidance and performance of the examination? In response to this last question, a recent study showed a significant change in the knowledge of Nursing professionals after educational actions in Neonatal Auditory Screening in most of the analyzed variables.<sup>20</sup> Another health professional who occupies a prominent place in TN is the pediatrician, However, their knowledge of the diseases treated, treatment and prognosis was also limited.<sup>3</sup>

### **FINAL CONSIDERATIONS**

This work aims to reflect and re (think) the Nursing performance in the GT. This professional should have a broad knowledge of NS, aiming at the question of the orientation of the mothers, in view of their direct interaction with the target clientele: mother (pregnant and / or puerpera) and NB. This deeper reflection on the subject is necessary, considering that Nursing is a profession that can contribute to the effectiveness of this program, favoring the increase of coverage

and number of exams. However, in order for Nursing to work in health promotion and disease prevention, it is essential that professionals reflect on their social role and continually seek training.

In summary, GT is an issue of unquestionable importance because it allows the early diagnosis of genetic diseases, asymptomatic in the neonatal period and allows the specific early treatment. Data presented above showed that mothers / fathers do not have the knowledge of the relevance of the examination for the future of their children. Add to this the fact that nurses seem to be uninformed about NS and need training to better spread and carry out preventive and educational actions around this issue. The encouragement of continuing education in health for these professionals will provide them with an improvement in the quality of care provided.

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Received March 13, 2016

Approved August 29, 2016

Published December 29, 2016