



## Sensory stimulation strategies for neonates in the hospital environment

### Estratégias de estimulação sensorial em neonatos no ambiente hospitalar

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#### ABSTRACT

The main objective of this study is to present sensory stimulation strategies for neonates in the hospital environment, as well as to address their benefits and importance. The stimulation is an intervention that includes a series of strategies with the objective of improving neuropsychomotor development by promoting sensory stimuli that facilitate typical development, preventing and minimizing the impacts caused by the hospital environment. **METHODOLOGY:** The methodological approach adopted for the development of this study consisted of conducting a literature review of the literature available in databases widely recognized by the scientific community, such as Pubmed, Electronic Library Online (SciELO), Latin American and Caribbean Health Sciences Literature (LILACS) and Google Scholar. The search was restricted to publications in the period from 2010 to 2024, in Portuguese and English, and was carried out using the Boolean descriptors "AND", "Tactile stimulation", "vestibular, kinesthetic", "neuropsychomotor development", "neonate", "NEO ICU", "kangaroo method" and "therapeutic octopus". After analyzing the database, 40 articles were initially selected. Subsequently, after a complete reading of all the studies, 18 were chosen based on the following criteria: Articles with a publication date of less than 10 years and that fit the objective of this study. Exclusion criteria were applied to articles that did not meet the research objectives or that were not within the stipulated study period.

**Keywords:** Sensory stimulation, Neonates, Neuropsychomotor development, Hospital environment, Intervention strategies.

#### INTRODUCTION

The neonatal area in a hospital environment requires special care due to the vulnerability of newborns, specifically premature infants and those with low birth weight. The hospital environment

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is essential in this circumstance, as it is where they receive all the care that is necessary for survival and development. Among the various therapeutic approaches used, sensory stimulation strategies stand out as specific resources to promote neurosensory development and general well-being of the neonate, in addition to intensifying the bond with family members. A welcoming environment for newborns hospitalized in the hospital environment is essential to minimize the traumas arising from the separation between mother and baby.

From the perspective of neonates in a hospital environment, at the point where complications arise during the development of sensory skills and can affect long-term quality of life, sensory stimulation is a promising alternative. This approach aims not only at the maturation of the central nervous system, but also at improving the adaptive response to the environment, providing significant advantages for neonates, such as: stabilizing vital signs, avoiding possible sequelae that prolonged immobility in bed can cause, accelerating daily weight gain and consequently reducing the length of stay in the hospital environment.

The main purposes of this study include the characterization and analysis of sensory stimulation strategies in neonates, the verification of the consequences of these strategies on the sensorineural development of these infants and the collaboration for the improvement of neonatal care procedures, based on data.

The basis of this study is the expanding need to optimize neonatal care in a hospital environment. Understand and improve sensory stimulation maneuvers not only to meet the immediate need, but also to offer direct benefits to neonates, their families and physical therapy professionals who play an important role in the execution of this practice.

## **DISCUSSION**

The number of neonates who are born and manage to stay for a long time in the hospital environment until they stabilize to be discharged has grown more and more, due to advances in the provision of perinatal care, the hospitalization process is filled with painful sensations, limitations of space and movements. This routine, along with the stay in the hospital, can cause broad impacts on development, being an event that usually brings risk implications to healthy development, therefore, it is extremely important to ensure that these neonates have an adequate development, which results in a better quality of life, in addition, it is important to highlight that when talking about adequate development, It is understood that it is something individual of each neonate, and it



is necessary to carry out early intervention as soon as possible, where sensory stimulation will be introduced.

Sensory stimulation in neonates refers to therapeutic practices that have strategies in order to contribute to neuropsychomotor development (NPMD), promoting adaptation to extrauterine life, since some neonates respond to stimuli differently depending on the maturation of the central nervous system, usually in the context of neonatal physiotherapy, these interventions are designed to optimize the baby's sensory perception and processing, including stimuli related to touch, sight, hearing, taste, and smell. When referring to the newborn who is in the hospital environment, sensory stimulation has numerous benefits such as: reducing pain, adjusting tone, trophism, motor pattern, in addition to stimulating movement patterns that favor weight gain and warming up and, as a consequence, favoring the baby's cognitive and affective, as well as his integration with the family. It is essential to emphasize that sensory stimulation approaches in infants who stay for a prolonged time in the hospital environment aim to restore optimal development or a condition closer to normality, through specific practices after a thorough evaluation. During this evaluation, possible challenges are identified and a personalized treatment plan is designed for each patient, this plan is adapted to the individual needs of each baby, considering factors such as: Gestational age, neurological development, reaction to stimuli, maturation of the nervous system, environment, birth weight and size. Generally, the musculoskeletal structure of preterm neonates exhibits a decrease in motor ability, reduced reactivity, loss or absence of strength for voluntary contractions, limited reflex responses, along with reduced muscle tone, since the reduction of intrauterine time contributes to the absence of physiological flexion, as well as the action of gravity on the weak muscles of the preterm infant. reinforcing the extension posture.

## STRATEGIES FOUND

There are no established guidelines to determine the type of stimulus, its duration, or the technique to be used. The main focus is to ensure that the neonate is in stable condition, both from a hemodynamic and clinical point of view, before starting sensory stimulation. In such situations, it is important not to exceed the recommended manipulation time (usually 5 minutes) and to limit the application to no more than two stimuli per session.

Sensory stimulation is extremely important from when the baby is in the NEO ICU to the outpatient clinic, and can be performed through tactile, auditory and vestibular stimulation.



## TACTILE STIMULATION

Tactile stimulation is indicated to reduce stress and consequently assist in the maintenance of vital functions, facilitate food absorption, thus contributing to a more effective weight gain, prevent immobility syndrome, which can occur for a prolonged time in bed, altering all organs and systems, in addition to generating experiences that promote adequate stimuli for motor development. During this stimulation, it is important to perform precise, light, slow and continuous bilateral touches, following the cephalium-caudal and proximity-distal direction. Areas with medical devices (such as drains, catheters, etc.), swelling, or injuries should be avoided. It is important to highlight that due to the routine and constant handling by professionals, neonates receive various stimuli in the hospital environment, and it is necessary to be careful with the excess of tactile stimulation so that it does not become something harmful, it is recommended to carry out the individual evaluation of each patient before starting the stimulation, so that it does not cause crying, irritability or discomfort.

## AUDITORY STIMULATION

Auditory stimulation is extremely important for all babies, especially for premature babies, because early adaptation to extrauterine life exposes premature infants to a greater number of stressful situations, hindering their development. Auditory stimulation helps to promote homeostasis, facilitating the tolerance of neonates to stimuli, assisting in cognitive development, strengthening the affective bond and promoting stress reduction through music, which can be used as an accessible, simple and low-cost therapeutic tool, being another agent that aims to facilitate the development of premature infants and minimize the negative effects of neonatal hospitalization. It is recommended to use the mother's voice to strengthen the affective bond and/or classical music with low intensity, in order to promote relaxation, in addition, auditory stimulation promotes the release of endorphins, resulting in a reduction in pain perception. Finally, it is important to highlight that intense and loud noises in the incubator or neonatal ICU should be avoided, as these sounds can be amplified by the incubator, causing stress and discomfort to the newborn.

## VESTIBULAR STIMULATION

Physiotherapy seeks to facilitate body movement in order to achieve several objectives, such as body organization, facilitation of the flexor pattern, regulation of muscle tone and promotion of postural centralization. Sensory stimulation is performed through techniques aimed at stimulating



the vestibular system responsible for spatial orientation, these techniques can include gentle movements such as spinning, rocking, and moving the baby in different directions to help with sensory and motor development. A common technique to stimulate the vestibular system of neonates is through the gentle movement provided by the network, which simulates intrauterine movements in a certain way. It is essential to take precautionary measures when attaching the hammock to the incubator, ensuring that it is done in a safe and comfortable manner for the neonate.

### **THERAPEUTIC POVOL, KANGAROO CARE AND THERAPEUTIC POSITIONING**

There are also other well-known therapeutic approaches that can help in the sensory stimulation of premature infants, in addition to promoting relaxation, improving the bond with the family and facilitating weight gain.

### **THERAPEUTIC POWDER**

The use of Octopurs, popularly known as therapeutic octopus, is one of the humanization initiatives that has been implemented in the hospital environment. It is based on an octopus that is made of crochet and cotton and can be used both in the hospital and home environment, providing tranquility and security to the newborn, since the tentacles evoke the image of the umbilical cord, transmitting a sense of protection. By promoting relaxation in the hospital environment, it is possible to prevent babies from pulling the wires out of monitors and probes, as well as slowing their heart rate.

### **AGDO**

Created in Colombia at the end of the 1970s, it is part of the national public policy of humanization, referring to the norm of humanized care for premature infants and recognized by the World Health Organization. It is one of the most used therapies when it comes to humanized care for low birth weight newborns, such as premature infants or other neonates who, for some reason, have not reached their ideal weight. Through skin-to-skin contact with the mother/father, the premature infant receives positive sensory experiences, facilitating breastfeeding that reduces the chance of hospital infections, helps control body temperature, reduces pain during painful procedures, shortening the length of hospital stay.



## THERAPEUTIC POSITIONING

Proper positioning and change of decubitus of hospitalized neonates are crucial to improve the clinical picture and provide adequate stimuli for appropriate motor development. Diaper rolls or blankets can be used around the baby, reducing contractures and deformities, also serving as a source of tactile stimulation, as well as offering greater comfort and safety to the newborn. In neonatal intensive care units, the following positions can be adopted: The supine position should be avoided as much as possible in premature babies, as it is demanding and can be detrimental to the development of various systems. The most suitable position is the prone position, as it favors respiratory function and improves the quality of sleep in premature babies. The lateral postures facilitate the work of the intercostal muscles on the side where the baby is lying, providing an expansion on the opposite side, in addition to allowing visual contact with the hands and the movement of the hands towards the mouth, promoting a more flexed posture, and this posture is suitable for neonates, as they spend a lot of time in the incubator that, because it is larger than the uterine environment where they were used to, end up feeling the difference and thus increasing their motor activity, adopting a harmful positioning, and the continuous permanence of the same in extension, which may result in a picture of hypertonia in the lower limbs, retracted scapula and deficiency in maturation and transmission to the central nervous system. It is recommended to change position every one to three hours to avoid pressure ulcers, discharge buildup, and cranial deformities. Position switching can be synchronized with routine procedures such as bathing, feeding, examinations, and checking vital signs. The protocol suggests that the decubitus position be changed every two hours to promote pulmonary function, promote neuropsychomotor development (NPMD), prevent pressure ulcers, vascular problems, and musculoskeletal deformities. The prone or ventral position improves oxygenation, reduces the frequency of crying, promotes a more restful sleep, increases lung compliance and tidal volume, and provides greater use of the extensor muscles.

## CONCLUSION

Neonates who need to go through the hospitalization process in the hospital environment become vulnerable to the effect of the environment, which hinders the typical neuropsychomotor development, however, over the years and with the advancement of technology and medicine, it is possible that the neonate who is hospitalized in addition to having the best conditions to achieve survival, Also have the opportunity to have a follow-up that will help in the quality of life after



hospitalization. Sensory stimulation is extremely important and has numerous benefits for neonates, such as reducing the stress that is caused by the environment, reducing the intensity of pain, favoring brain maturation, improving heart rate, respiratory rate and sleep quality, helping in the weight gain that is so expected so that this neonate can achieve the best performance of motor behavior. It improves maternal-infant interaction, mainly through skin-to-skin contact, favoring the maturation of muscle tone and consequently reducing hospitalization time. It is important to highlight that in order to perform sensory stimulation, the newborn needs to be clinically stable, in good behavioral state and not be considered an extremely low weight baby, it is necessary to perform the individual evaluation of each patient so that the conducts are adapted, becoming more assertive.



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