



NNNS - NeoNatal Neurobehavioral Scale

Overview: The NNNS (NeoNatal Neurobehavioral Scale) examines neurobehavioral organization, neurological reflexes, motor development of active and passive tone, and signs of stress and withdrawal of the at-risk infant (i.e. preterm and those exposed to maternal drugs in utero). It was designed to provide a comprehensive assessment of both neurological integrity and behavioral function. Additionally, the NNNS documents the range of withdrawal and stress behavior likely to be observed in assessment and intervention with substance-exposed infants. This neurobehavioral assessment is also applicable to assess healthy full-term infants. It is used worldwide not only for research but clinically, as part of standard of care for infants. The NNNS has been shown to predict long-term outcomes (Czynski, A. J., Davis, J. M., Dansereau, L. M., Engelhardt, B., Marro, P., Bogen, D. L., Hudak, M. L., Shenberger, J., Wachman, E. M., Oliveira, E. L., & Lester, B. M., 2020; Flannery, T., Davis, J. M., Czynski, A. J., Dansereau, L. M., Oliveira, E. L., Camardo, S. A., & Lester, B. M., 2020; Hofheimer, J. A., Smith, L. M., McGowan, E. C., O'Shea, M., Carter, B. S., Neal, C. R., Helderman, J. B., Pastynak, S. L., Soliman, A., Dansereau, L. M., DellaGrotta, S. A., & Lester, B. M., 2019).

The NNNS is performed on infants who are medically stable in an open crib or isolette. Although a precise lower gestational age limit has not been set, the exam is probably not appropriate for infants less than 33 weeks of age. The upper age limit may also vary depending on the developmental maturation of the infant. A reasonable upper age limit is approximately 48 weeks (adjusted or conceptional age).

Application of the NNNS

- Research with high-risk infants including pre-term and substance exposed infants
- Beneficial for consultation with parents, families and health care professionals
- Clinical assessment for management of infants in NICU or normal nurseries
- Assists in discharge planning
- Assists with the development of early intervention plans (IEPs)

Invaluable To: Pediatricians, Neonatologists, Neurologists, Psychiatrists, Nurses, Psychologists, Occupational Therapists, Physical Therapists, & Early Intervention Professionals

How to contact us: NNNSTrainingProgram@CareNE.org

Website: <https://www.brown.edu/research/projects/children-at-risk/about>