Diagnosis of Disorganized and Dysfunctional Suck Patterns in the Neonate Based upon the NOMAS®

Disorganized

Definition: "the lack of rhythm of the total sucking activity" Crook, 1979

Characteristics: Arrythmical suck:

-Too much variability in the number of sucks/burst
-Transitional
-Inconsistent suck/swallow/breathe ratio

Dysfunction

Definition: "the interruption of the successful sucking activity by abnormal movements of the tongue and jaw" Palmer, 1983

Characteristics:

-excessively wide excursions of the jaw
-Minimal excursions; clenching
-Flaccid tongue with absent tongue groove
-Retracted tongue with posterior humping

NOMAS® ONLINE: Day 1

Neonatal Oral-Motor Assessment Scale (NOMAS)

JAW		
Normal	Disorganization	Dysfunction
_____ Consistent degree of jaw depression _____ Rhythmical excursions _____ Spontaneous jaw excursions occur upon tactile presentation of the nipple up to 30 minutes prior to a feed _____ Jaw movement occurs at the rate of approximately one per second (1/2 the rate of NNS) _____ Sufficient closure on the nipple during the expression phase to express fluid from the nipple	_____ Inconsistent degree of jaw depression _____ Arrhythmical jaw movements _____ Difficulty initiating movements: ___ Inability to latch on ___Small, tremor-like start-up movements noted ___ Does not respond to initial cue of nipple until jiggled _____ Persistence of immature suck pattern beyond appropriate age ___Under 40 weeks PC (transitional suck)	_____ Excessively wide excursions that interrupt the intra-oral seal on the nipple _____ Minimal excursions; clenching _____ Asymmetry; lateral jaw deviation _____ Absence of movement (% of time) _____ Lack of rate change between NNS and NS (NNS = 2/sec; NS = 1/sec)
TONGUE		
Normal	Disorganization	Dysfunction
_____ Cupped tongue configuration (tongue groove) maintained during sucking _____ Extension-elevation-retraction movements occur in anterior-posterior direction _____ Rhythmical movements _____ Movements occur at the rate of one per second _____ Liquid is sucked efficiently into the oro-pharynx for swalllow	_____ Excessive protrusion beyond labial border during extension phase of sucking without interrupting sucking rhythm _____ Arrhythmical movements _____ Unable to sustain suckle pattern for two minutes due to: ___ Habituation ___ Poor Respiration ___ Fatigue _____ Incoordination of suck/swallow and respiration which results in nasal flaring, head turning, extraneous movement	_____ Flaccid; flattened with absent tongue groove _____ Retracted; humped and pulled back into oro-pharynx _____ Asymmetry; lateral tongue deviation _____ Excessive protrusion beyond labial border before/after nipple insertion with our/down movement _____ Absence of movement (% of time)

Evaluation of Neonatal Sucking and Swallowing

Presented by Marjorie Meyer Palmer, M.A.
Speech Pathologist
Neonatal and Pediatric Feeding Specialist

What you should know about the Nutritive Suck

- swallowing emerges in utero at 13 weeks gestation
- sucking emerges in utero at 18 weeks gestation
- coordination of suck and swallow develops at 32 to 34 weeks gestation or PCA
- coordination of suck, swallow, and breathing occurs at 37 weeks gestation or later
- deglutition apnea episodes reduce as infants mature
- maturation is related to developmental age (gestation) rather than feeding experience
- episodes of deglutition apnea remained more frequent in preterm infants reaching term compared to term infants
- there is a decrease in ventilation during sucking which improves with maturation
- sucking activity is a reflection of increased neurologic maturation in preterm infants
- preterm infants often have difficulty in coordinating the demands of suckle feeding and ventilation
- optimal suckle feeding should logically occur when a regular relationship/coordination exists between pharyngeal swallow and respiration
- non-nutritive sucking has no effect on nutritive suck

"International Congress of Pediatrics 2013" (ICP); 27th Congress of the International Pediatric Association; Melbourne, Australia, August 24, 2013.

H. Yin and C. Zhang, Children's Hospital of Chongqing Medical University, Chongquing, China

Poster Session 2.

Methods: 91 preterm infants of 30-36 weeks PMA were assessed. A video recording was made for these infants (Palmer Method) during the first two minutes of nutritive sucking and assessed by two NOMAS® assessors.

Results: The NOMAS has acceptable internal consistency for less than 35 weeks PMA. Moderate correlation was found between scores on the NOMAS® and feeding performance for less than 35 weeks PMA. The NOMAS® scores for evaluation at 30 seconds and two minutes were not consistent. The former scores were higher.

Conclusion: The reliability of the NOMAS® was acceptable in assessing the oral-motor function of preterm infants for less than 35 weeks PMA. We suggest that he evaluation time of NOMAS® was suitable for 2 minutes.

Palmer Comments: These findings indicate how difficult it is for the preterm infant to feed for even two minutes. Think about the length of time most infants are fed in the NICU. Skill levels for sucking deteriorate quickly in this population which is why we limit the time for NOMAS® assessment. The NOMAS® was designed to evaluate the infant's potential, i.e., best performance.

"Early Sucking and Swallowing Problems as Predictors of Neurodevelopmental Outcome in Children with Neonatal Brain Injury: a Systematic Review"

Slattery J., Morgan, A., and Douglas, J.
Developmental Medicine and Child Neurology, 54 2012, p. 796-806.

The main aims of this systematic review were: 1) to describe the concurrent relation of early sucking and swallowing outcomes associated with neonatal brain injury and 2) to evaluate the predictive relationship between early sucking and swallowing measures and later neurodevelopmental outcomes in this population.

Nine studies relevant to these two aims were identified through systematic searching of the literature published from 1980 to May 2011.

"….instrumental measures of early sucking and swallowing functions reported high sensitivity and specificity in terms of predicting later developmental outcomes, these tools are not accessible to all and are not routinely used in neonatal units. The NOMAS® could arguable be used more readily in clinical practice, het the user must obtain the necessary certification and training"

"the psychometric properties of the NOMAS® continue to be debated"….and further validation of the components of the NOMAS® that identify infants with neurological abnormalities is needed.

Palmer Comments: Unfortunately those professionals who have published articles which question the predictive value of the NOMAS® are either not trained in the administration and scoring of the NOMAS® or have not achieved reliability.