Standard of Care: Neonatal Intensive Care Unit (NICU)
Physical and Occupational Therapy Management of the high risk infant.

Case Type / Diagnosis:

The high-risk infant is defined as the baby with any event in prenatal, perinatal, or postnatal life that leads to a high probability of manifesting a sensory or motor deficit and/or mental handicap. Most common risk indicators for referral include: prematurity, asphyxia with low Apgars, bronchopulmonary dysplasia (BPD) or other lung disorders, intraventricular hemorrhage (IVH), feeding dysfunction, tone abnormalities, musculoskeletal abnormalities, hydrocephalus, prenatal drug or alcohol exposure, behavioral state abnormalities.

Indications for Treatment:

- Failure to meet normal physiologic development
- Abnormal tone or asymmetrical motor control
- Documented pathology predictive for developmental delay

Contraindications / Precautions for Treatment:

1. Orientation with NICU clinical specialist is mandatory before any NICU intervention
2. Generally a cluster care schedule is followed, where interventions and infant care take place around the feeding schedule, to allow the infant extended rest/sleep periods.
   a. Rehab services intervention generally takes place one half hour prior to the infant’s scheduled feed. Call ahead to arrange a therapy time with the infant’s nurse. Older infants may be on an ad-lib schedule.
   b. Always know the infant’s gestational age at birth and their current age to appropriately correlate treatment with developmental expectations.
3. Parameters – all NICU babies are required to be on cardiac monitors when unattended.
   a. Heart Rate (HR) – parameter (monitor) generally set at 100-200 with the ideal being 120-180, depending on the age of the infant. Usually the heart rate is lower in full term infants.
   b. Oxygen saturation (SpO2)– Maintain oxygen saturation between 90-100%. The alarm is generally set for 85%.
      i. Monitor the infant’s color, oxygen requirement, increasing/decreasing oxygen as needed – report changes in oxygen needs to the infant’s nurse.
      ii. Ventilated infants – orientation and discussion should take place with the NICU clinical specialist prior to initiating intervention.
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c. Temperature – in general, axillary temperature should be maintained at 36.5 – 37.5 °C (97.7 – 99.5°F) in term infants and 36.4 – 37.1 °C (97.6 – 98.8°F) in preterm infants.
   i. Discuss infant’s temperature control needs with nursing before taking infant out of incubator – does infant require a hat? Extra blankets? Warming lights?
   ii. Monitor infant’s skin temperature throughout the therapy session. Take infant’s axillary temperature if you note a change in skin temperature.
      • With low temperature, cool skin you may observe: color changes – pallor, lethargy, hypotonia, apnea
      • With high temperature, warm skin you may observe: color changes – redness, sweaty (> 36 weeks), irritability, lethargy, hypotonia, apnea, tachypnea (high respiratory rate, RR)

4. Stress Precautions
   a. Respect the infant’s stress signals, as they are a measurement of the infant’s tolerance to intervention. Pause to give the infant a time out period when stress signals are observed. Avoid engaging in intervention when the infant is displaying stress signals (especially physiological signals).
   b. Common stress reactions within in the various subsystems in fragile infants may include:
      i. Physiological (autonomic) subsystem – yawning, burping, hiccupping, gagging, spitting up, sneezing, color changes (pallor, mottling, flushing, cyanosis), changes in vital signs (HR, RR, SpO2)
      ii. Motor subsystem – sitting on air, saluting, finger splaying, squirming, frantic or disorganized movements, trunk arching, tongue thrusting, gape face, generalized hypotonia
      iii. State subsystem – gaze aversion, gaze locking, glassy eyed, irritability, lack of alertness, diffuse sleep states
      iv. Attention/interactional subsystem – inability to integrate social interaction with other sensory input, avoidance of social interaction.

5. If any question concerning instability, immediately stop intervention and discuss with nurse.
Examination:

Evaluation Tool: Specific Neonatal evaluation form

Medical History: Assess infant’s birth history by chart review
Know the infant’s gestational age at birth and their current corrected age.

History of Present Illness: Assess hospital course by chart review and documentation with baby’s nurse.

Social History: Assess mother’s obstetrical history, prenatal care and social history as pertinent by chart review.

Examination
This section is intended to capture the most commonly used assessment tools for this case type/diagnosis. It is not intended to be either inclusive or exclusive of assessment tools.

Assess:
1. Neurobehavioral state
2. Musculoskeletal status, including anomalies and/or contractures
3. Level of motor ability and tone
4. Oral motor abilities
5. Reflexes, as tolerated

Evaluation / Assessment:

The primary goal of rehabilitation services is to provide consistent rehabilitation intervention for the high-risk infant in the Neonatal Intensive Care Unit to facilitate appropriate developmental activities and facilitate ability to foster parental bonding.

Problem List, as based on evaluation, can include:
1. Hypertonicity, hypotonicity
2. Poor state transitions/organization
3. Aversive behaviors
4. Irritability
5. Poor coordination of feeding mechanisms
6. Asymmetric or abnormal movement patterns and positions
7. Joint contractures or other musculoskeletal abnormalities
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Goals

1. Treatment goals
   a. Short term goals
      i. Modify sensory stimulation to promote behavioral organization and physiological stability
      ii. Reduce active reinforcements of abnormal movement patterns and positions
      iii. Normalize tone
      iv. Minimize contractures and deformities
      v. Facilitate normal patterns of movement
      vi. Promote appropriate feeding behaviors
      vii. Develop social interaction behaviors
      viii. Foster attachment to primary caregivers/parents
   b. Long Term Goals
      i. Promote developmental progression

Age Specific Considerations: Maximize age appropriate activity

Treatment Planning / Interventions

Established Pathway  ___ Yes   _X__ No
Established Protocol   ___ Yes   _X__ No

Interventions most commonly used for this case type/diagnosis.
This section is intended to capture the most commonly used interventions for this case type/diagnosis. It is not intended to be either inclusive or exclusive of appropriate interventions.

1. Body Positioning
2. Graded sensorimotor intervention/neurobehavioral activities
3. Neonatal hydrotherapy
4. Oral-motor activities/feeding
5. Education – parents/caregivers
6. Range of motion – with caution
7. Extremity splints- refer to Neonatal Splinting Procedure

Treatment progression
1. Based on age appropriateness and infant’s tolerance
2. Neurobehavioral activities – concerned with autonomic or physiologic stability, motor control and then behavioral stability
3. Neurodevelopmental activities – concerned with motor control and appropriate developmental progression.
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Frequency and Duration
Will be individually assessed with each infant.
Treatment duration will be determined by resolution of identified problems
Consider: musculoskeletal, severe tone and feeding issues often benefit from therapy 3-5 times per week.

Recommendations and referrals to other providers.
Communication with primary team is ongoing. Recommendations are documented in the medical record as well as discussed with appropriate team members. Referrals can be requested as needed.

Re-evaluation / assessment
Re-evaluation is recommended every 2 weeks.
Other indicators for re-evaluation are changes in medical status or presentation of new clinical signs such as tremors or irritability

Discharge Planning
Discharge date varies with level of prematurity and medical issues. Anticipated date will be approximately 38-40 weeks corrected age.

Commonly expected outcomes at discharge:
The outcome goal at time of discharge is age appropriate behavior that will foster parental bonding. This includes the ability to “mold” when held, ability to seek sound, ability to console, and ability to bring hands to mouth. In addition, parents will be able to perform appropriate positioning, appropriate consoling, and appropriate relaxation techniques or other procedures to meet any special needs their baby may have.

Parent’s discharge instructions:
Discharge education is provided as determined by the extent of the baby’s or parental needs/concerns. Written activity list is provided.

Transfer of Care:
Complete patient referral form as needed for the following:
1. Inpatient rehab facility
2. Early intervention program – community follow-up for development
3. Home Health Agency, i.e. VNA, etc.
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Bibliography / Reference List


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