

## Milliman Guidelines NICU Levels\*

### *Neonatal Intensive Care Unit Level IV*

*If the following conditions/procedures exist, in addition to the fulfillment of Level III Criteria, the approved inpatient days should be assigned at Level IV*

- *Nurse: Patient Ratio of 1:1 or 2:1*
- *Critically ill neonates with respiratory, circulatory, metabolic or hemolytic instabilities as well as conditions that require surgical interventions. These patients are usually on IV drips such as dopamine, morphine, Ativan and possibly:*
  - **ECMO** - Extra Corporeal Membrane Oxygenation
  - **INO** - Inhaled Nitric Oxide
  - **HFOV** - High Frequency Oscillating Ventilator
  - **Therapeutic Cooling**
- *Pre and post surgical repair for conditions such as:*
  - **Omphalocele repair**
  - **Tracheoesophageal Fistula or Esophageal Atresia**
  - **Bowel Resection for NEC**
  - **Myelomeningocele closure (within past 48 hours)**
  - **Organ Transplant**

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## Milliman Guidelines NICU Levels\*

<b>Admission and Discharge Criteria Level III</b>	
<i>Level III Admission Criteria</i>	<i>Discharge to Level II</i>
<p><b><i>Nurse: Patient Ratio of 1:1 or 1:2</i></b>  <b>Prematurity or other severe conditions requiring Level III care as indicated by:</b>  <b>One or more of the following:</b></p> <ul style="list-style-type: none"> <li>• Birth at less than 32 weeks of age</li> <li>• Birth at less than 1500 g birth weight</li> <li>• <i>Other</i> severe medical condition</li> </ul> <p><b><i>And</i></b>  <b>One or more of the following:</b></p> <ul style="list-style-type: none"> <li>• Mechanical ventilation or continuous positive airway pressure (CPAP) needed</li> <li>• Cardiovascular support (e.g. fluid resuscitation, IV blood pressure support) needed</li> <li>• Correction of severe electrolyte or acid base disorder needed</li> <li>• Pediatric subspecialty care of severe disorder or complication needed for 1 or more of the following:               <ul style="list-style-type: none"> <li>○ Respiratory distress syndrome</li> <li>○ Intraventricular hemorrhage</li> <li>○ Necrotizing enterocolitis</li> <li>○ Shock</li> <li>○ Frequent seizures</li> <li>○ Anuria</li> <li>○ Other condition requiring urgent pediatric subspecialty care not available at lower levels of care</li> </ul> </li> </ul>	<p><b>Discharge to Level II care for convalescent phase as indicated by ALL of the following:</b>            Condition stable or improved as indicated by <b>1 or more of the following:</b></p> <ul style="list-style-type: none"> <li>• Premature or low birth weight infant that is otherwise normal after initial observation</li> <li>• Infant admitted for evaluation but triaged to lower level of care</li> <li>• Patient's condition no longer requires urgent subspecialty services as indicated by <b>ALL of the following:</b> <ul style="list-style-type: none"> <li>○ Apnea or bradycardia episodes are absent or less frequent and require only stimulation intervention</li> <li>○ Pharmacologic support (e.g. caffeine) is on stable regimen</li> <li>○ No large weight loss (e.g. 10%)</li> <li>○ Subspecialty evaluation non needed or reveals no acute intervention expected</li> <li>○ No condition requiring continued intensive support; examples include active or recent: <i>necrotizing enterocolitis; intraventricular hemorrhage; shock; hypertension; frequent seizures; unexplained oliguria; major surgery</i></li> </ul> </li> <li>• No longer requires intensive support, including <b>All of the following:</b> <i>no surfactant replacement; no mechanical ventilation; no intensive cardiovascular support needed (e.g. IV fluids to support blood pressure; active diuresis and fluid adjustment for chronic lung disease; IV medications to control arrhythmias; extracorporeal membrane oxygenation)</i></li> <li>• No other support needed that is not available at the Level II care area</li> </ul>

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*Examples of conditions/therapies for infants at Level III might include:\**

- *Requires invasive therapies*
- *Exchange transfusions: partial or complete*
- *Chest tubes /Chest tube insertion*
- *IV antibiotics in the acute phase of infection including pending cultures AND symptomatic; or positive culture*
- *Infant of diabetic mother with abnormal glucose levels for >12 hours*
- *Blood products/volume expanders*
- *Neurological assessments > 6 times per 24 hours*
- *Invasive CPM*
- *Seizures requiring IV anticonvulsive medication*
- *Complicated admission requiring emergency care and multiple procedures*
- *Dopamine*
- *Acute hypovolemia requiring transfusion*
- *Surfactant therapy*
- *Uncontrolled seizures*
- *Initiation of Prostaglandin E*

- *PICC line insertion*

**IV Access/Fluids/Feeding**

- *IV treatment for apnea/bradycardia*
- *IV treatment requiring central line*
- *Central line hyperalimentation*
- *UAC, PAC, CVC*
- *IV bolus or continuous drips for severe physiological metabolic instability*
- *Continuous NG/OG tube feedings*
- *Tolerating <50% of feeds enterally*

**Respiratory Support**

- *O2 via nasal cannula or hood >30%*
- *Intubation for signs and symptoms of respiratory distress*
- *Positive pressure ventilation for respiratory failure or apnea*
- *Unstable vent settings/frequent changes*
- *Nasal CPAP or High flow nasal cannula  $\geq 3L/min$*

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# Milliman Guidelines NICU Levels\*

<b>Admission and Discharge Criteria Level II</b>	
<b>Level II Admission Criteria</b>	<b>Discharge to Level I</b>
<p><b>Level II neonatal care may be indicated for 1 or more of the following:</b></p> <ul style="list-style-type: none"> <li>• Premature birth with physiologic immaturity as indicated by <b>1 or more of the following:</b> <ul style="list-style-type: none"> <li>○ Apnea of prematurity</li> <li>○ Tachypnea (<i>&gt;60 breaths/minute</i>)</li> <li>○ Unstable body temperature</li> <li>○ Unable to take oral feeds</li> <li>○ Other abnormal vital sign or function indicating physiologic immaturity or instability</li> </ul> </li> <li>• Moderate severity condition (e.g. suspected sepsis, persistent hypoglycemia) as identified by <b>ALL of the following:</b> <ul style="list-style-type: none"> <li>○ Requires pediatric specialty care of services</li> <li>○ Not expected to resolve rapidly</li> <li>○ Not expected to require urgent pediatric subspecialty care</li> </ul> </li> <li>• Need for short-term (less than 24 hours) ventilatory support (mechanical ventilation or continuous positive airway pressure/<i>CPAP</i>)</li> <li>• Continued inpatient care during convalescence from condition(s) treated in Level III care</li> </ul> <p>*These guideline(s) have been revised from the Milliman Milliman Care Guidelines. The portions of the guideline(s) which have been revised are identified through the use of italics text, and Milliman has neither reviewed nor approved the modified material. Any statement to the contrary or association of the modified material with Milliman is strictly prohibited.</p>	<p><b>Discharge to Level I care for patients with ALL of the following:</b></p> <ul style="list-style-type: none"> <li>• Condition improved to the point that care only requires services available at Level I while awaiting resolution of specific issues (<i>eg. sustained weight gain; establishment of safe discharge destination and plan</i>)</li> <li>• Appropriate for discharge as indicated by ALL of the following: <ul style="list-style-type: none"> <li>○ Respiratory rate less than 60 and greater than 30 breaths per minute</li> <li>○ Heart rate greater than 80 per minute and less than 175 beats per minute for newborn, less than 190 beats per minute for age 1 week to 1 month</li> <li>○ Axillary temperature greater than 36.6 degrees C and less than 37.5 degrees C</li> <li>○ No apneic or bradycardic episodes</li> </ul> </li> <li>• Examination does not reveal any condition requiring urgent intervention</li> <li>• No jaundice present or treatment needs are appropriate for Level I care</li> <li>• Adequate nutritional intake as indicated by <b>1 or more of the following:</b> <ul style="list-style-type: none"> <li>○ Adequate intake by breast or bottle feedings (at least 2 successful episodes without cardiorespiratory compromise)</li> <li>○ Adequate intake using alternative or supplemental methods (e.g. cup or gavage)</li> </ul> </li> <li>• SaO2 greater than 93% on room air</li> <li>• Laboratory values normal or stable at values appropriate for follow-up care at home</li> <li>• Respiratory support not needed</li> <li>• Care is either not needed or an appropriate outpatient regimen is established for <b>ALL of the following: <i>infection, drug withdrawal, arrhythmias, seizures.</i></b></li> <li>• Specialty evaluation not needed or reveals no urgent intervention required</li> </ul>

*Examples of conditions/therapies for infants at Level II might include:*

- *Physiologic immaturity with **medical instability***
- *Sepsis evaluation with treatment with IV antibiotics*
- *NAS greater or equal to 8*
- *Stable hypoglycemia on IV fluids*
- *Environmental control for <35 weeks gestational age*
- *Apnea and bradycardia needing stimulation <2 times per hour and resolved without need for O2*
- *LBW>1500<2000 grams not ill but require frequent feedings*

#### **IV Access/Fluids/Feeding**

- *IV hep lock meds*
- *Peripheral IV fluids/ Continuous IV therapy*
- *TPN via PIV*
- *Difficult feeder*
- *Tube feedings*
- *No central lines*

#### **Respiratory Support**

- *Supplemental Ox < 30% via hood/Nasal Cannula*
- *Nasal cannula <3L/min*
- *Continuous O2 greater than 30 days*
- *Neurological observation: Seizure disorder under treatment-stable*
- *Infant with chronic respiratory disease on low flow 100% nasal oxygen in preparation for discharge home.*

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## Milliman Guidelines NICU Levels\*

### Discharge to Home From Level II Criteria

- Discharge to home for patients with **ALL of the following**:
  - Sustained weight gain pattern and fluid balance established
  - Vital signs normal and stable for 12 hours, as indicated by **ALL of the following** :
    - Respiratory rate less than 60 and greater than 30 breaths per minute
    - Heart rate greater than 80 beats per minute and less than 175 beats per minute for newborn, less than 190 beats per minute for age 1 week to 1 month
    - Axillary temperature greater than 36.6 degrees C (97.8 degrees F) and less than 37.5 degrees C (99.5 degrees F) (in open crib with appropriate clothing) E
  - Cardiorespiratory status acceptable as indicated by **1 or more of the following** :
    - No apneic or bradycardic (heart rate less than 80 beats per minute) episodes
    - Otherwise stable patient with post-discharge monitoring and follow-up arranged for persistent apnea
  - Adequate nutritional intake as indicated by **1 or more of the following** :
    - Adequate intake by breast or bottle feedings (at least 2 successful episodes without cardiorespiratory compromise)
    - Adequate intake using alternative or supplemental methods (e.g. cup or gavage)
    - Alternative feeding regimen (e.g. enteral or gastrostomy feeding) established for GI abnormalities
  - Nutritional plan established that addresses any supplementation needs
  - No jaundice present or treatment needs are appropriate for next level of care
  - Bowel sounds present
  - No ileus, signs of obstruction, or peritonitis
  - Infant has voided and passed stool.
  - Infection absent or resolving under treatment
  - SaO<sub>2</sub> greater than 90% on room air or home O<sub>2</sub> arranged

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## Milliman Guidelines NICU Levels\*

### Discharge to Home from Level II Criteria, continued

- Essential evaluations and treatments addressed (e.g. performed or plans made); examples include:
  - *PKU* and other metabolic testing
  - Hearing and fundoscopic examinations
  - Maternal and fetal hepatitis B status and vaccine schedule
  - Routine immunizations
  - Palivizumab administration and schedule for at-risk neonates
- Laboratory values normal or stable at values appropriate for follow-up at home
- Respiratory support not needed or acceptable for home or next level of care
- Neurologic abnormalities absent or acceptable for support at home or next level of care
- Specialty evaluation (e.g. for significant congenital anomaly) not needed or reveals no urgent intervention is required
- Social risk assessment completed and risks are absent or plan addressing them has been formulated; examples include:
  - Child abuse or other home violence
  - Substance abuse
  - Homelessness
  - Immature or mentally ill parent or caregiver
- Discharge planning completed; component examples include:
  - Follow-up plan and appointments scheduled
  - Caregiver education completed
  - Home evaluation and necessary modifications completed (if needed for high-risk neonate)
  - Home care plan completed (if needed for high-risk neonate)
  - Home care equipment, medications, and supplies ready (if needed)

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# Milliman Guidelines NICU Levels

<b>Admission and Discharge Criteria Level I</b>	
<b>Level I Admission Criteria</b>	<b>Discharge to Home</b>
<p><b>Level I neonatal care may be indicated for a newborn or neonate that is ALL of the following:</b></p> <ul style="list-style-type: none"> <li>• Physiologically stable (e.g. no apnea, bradycardia, or unstable temperature)</li> <li>• In need of care that is 1 or more of the following:               <ul style="list-style-type: none"> <li>○ Routine newborn care</li> <li>○ Evaluation and care of neonates with conditions that require inpatient services available at Level I</li> <li>○ Continued inpatient care during convalescence from condition(s) treated in Level II, III <i>or</i> IV while awaiting resolution of specific issues; examples include:                   <ul style="list-style-type: none"> <li>▪ Sustained weight gain</li> <li>▪ Establishment of safe discharge destination and plan</li> </ul> </li> </ul> </li> </ul> <p><small>*These guideline(s) have been revised from the Milliman Milliman Care Guidelines. The portions of the guideline(s) which have been revised are identified through the use of italics text, and Milliman has neither reviewed nor approved the modified material. Any statement to the contrary or association of the modified material with Milliman is strictly prohibited.</small></p>	<p><b>Discharge to home or another non-acute level of care is indicated when ALL of the following criteria have been met:</b></p> <ul style="list-style-type: none"> <li>• Sustained weight gain pattern and fluid balance established</li> <li>• Vital signs normal and stable for 12 hours, as indicated by <b>ALL of the following:</b> <ul style="list-style-type: none"> <li>○ Respiratory rate less than 60 and greater than 30 breaths per minute</li> <li>○ Heart rate greater than 80 beats per minute and less than 175 beats per minute for newborn, less than 190 beats per minute for age 1 week to 1 month.</li> <li>○ Axillary temperature greater than 36.6 degrees C and less than 37.5 degrees C in open crib with appropriate clothing</li> </ul> </li> <li>• Adequate nutritional intake, as indicated by <b>1 or more:</b> <ul style="list-style-type: none"> <li>○ Adequate intake by breast or bottle feedings (at least two successful episodes without cardiorespiratory compromise)</li> <li>○ Adequate intake using alternative or supplemental methods (e.g. cup or gavage)</li> </ul> </li> <li>• Nutritional plan established that addresses supplementation needs</li> <li>• Examination within acceptable limits with no abnormalities requiring immediate attention; examples include:           <ul style="list-style-type: none"> <li>○ No jaundice present or treatment appropriate for next level of care</li> <li>○ Circumcision absent or healing without excessive bleeding (<i>greater than 2 hours</i>)</li> </ul> </li> <li>• Infant has voided and passed stool</li> <li>• Essential evaluations and treatments addressed:           <ul style="list-style-type: none"> <li>○ <i>PKU</i> and other metabolic testing</li> <li>○ Hearing and fundoscopic examinations</li> <li>○ Maternal and fetal hepatitis B status and vaccine schedule</li> <li>○ Routing immunizations</li> </ul> </li> <li>• Laboratory values normal or stable at values appropriate for follow-up at home</li> <li>• Social risk assessment completed and risks are absent or plan addressing them has been formulated</li> <li>• Discharge planning <i>and documentation</i> completed</li> </ul>



*Examples of conditions/therapies for infants at Level I care include:*

- *Healthy neonate, Stable SGA, LGA, Post Dates IDM Infants*
- *Physiologically stable Infants 36+ weeks gestation.*
- *Routine evaluation and observation*
- *Temperature instability observation*
- *Hypoglycemia maintained with feeding*
- *Diagnostic work-up otherwise stable*
  - *Initial sepsis workup*
- *Neonatal Abstinence Score <8*
- *Photo therapy*

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<b>APPROVAL HISTORY</b>		
<b>Date Approved by RUMC</b>	<b>Date filed with the State of MD</b>	<b>Date of Implementation</b>
6/6/2011	6/7/2011	6/18/2011
5/23/2012	5/24/2012	6/4/2012
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