A Guide for Completion of the British Columbia Neonatal Daily Classification

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Perinatal Services BC

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While every attempt has been made to ensure that the information contained herein is clinically accurate and current, Perinatal Services BC acknowledges that many issues remain controversial, and therefore may be subject to practice interpretation.

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Introduction

A common neonatal classification system across British Columbia which classifies babies according to their needs is critical for planning regionalized services. The Neonatal Daily Classification tool has been developed to facilitate the assessment of newborns in a structured, logical and standardized manner. It is a tool to facilitate communication and planning of care among health care providers.

The Neonatal Daily Classification tool:

- supports matching the care the baby requires with the level of care available and makes efficient use of provincial service capacity;
- facilitates transfers of patients from one facility to another through a common understanding of the baby's needs;
- reduces/eliminates transfers of mothers and babies out of province/country by optimizing capacity management;
- supports longer term planning by determining numbers of level 1a (normal), 1b, 2a, 2b, 3a, and 3b babies requiring care in facilities across the province; and
- supports the availability of appropriate funding and other resources for facilities.
- Perinatal Services BC coordinated the development of the daily classification tool. It is the result of
 extensive consultation with provincial stakeholders and is based on expert clinical consensus.

This completion guide will help the health care provider determine the classification level the baby should be given. Explanations are given for some of the more complex variables on the daily classification.

Guiding Principles

Several key principles guided the design and development:

- Applicable for all maternity (including single room maternity care), postpartum, pediatric, special care or neonatal intensive care units providing newborn care;
- Facilitate early recognition, timely communication, and intervention for changes in newborn well-being;
- Utilize standardized terminology and abbreviations;
- Facilitate provincial and regional data analyses of babies requiring neonatal care in the BC Perinatal Data Registry in; and
- Allow for possible future electronic archiving or formatting.

General Guidelines

The Neonatal Daily Classification is based on the needs of the baby and not on the maximum level of care that can be provided at the facility, actual bed assignment, or available staffing. It is appropriate that occasionally an infant will be assessed and classified higher than the services and resources available at that site. The daily classification tool is **not a workload measurement tool.**

WHO gets Classified?

- any baby admitted at birth to a maternity (including single room maternity care), postpartum, pediatric, special care, or neonatal intensive care unit;
- any baby who is transferred from a facility to a maternity (including single room maternity care), postpartum, pediatric, special care, or neonatal intensive care unit at a different facility;
- any baby readmitted from home and who is up to 28 days old at the time of admission to a maternity (including single room maternity care), postpartum, pediatric, special care, or neonatal intensive care unit.

WHEN and for HOW LONG is Classification done?

- on admission and daily at the start of the day shift;
- once in a 24 hour period;
- daily for the entirety of the baby's stay.

HOW is Classification done and charted?

- by performing a newborn physical, feeding, and behavioral assessment;
- the classification level reflects the highest classification variable assessed for the baby in the past 24 hours:
- once all the variables have been assessed and the Neonatal Daily Classification level determined, the healthcare provider (most often the nurse) enters the Neonatal Daily Classification level onto the baby's Neonatal Daily Classification Monthly Record, which then becomes part of the permanent chart.
- **Note:** A new version of the BC Newborn Clinical Path (v3 May 2014 PSBC 1593) will include an area where the daily classification level can be entered

EXCLUSIONS?

- daily classification is **not** required if the baby has been readmitted from home **and** is 29 or more days
 old at the time of admission:
- does not reflect resuscitation/stabilization within the first hour of life or "rescue" interventions.

Classification Levels

Level 1a (normal) baby requires routine newborn care.

Level 1b baby requires increased observation.

Level 2a baby requires increased observation and increased care.

Level 2b baby requires acute management.

Level 3a baby has high acuity.

Level 3b baby has or is at risk for high acuity and requires multi-specialty care.

System Variables	Description
Postmenstrual Age (PMA) Formerly referred to	Determine the infant's postmenstrual age (PMA). The PMA takes into account the baby's gestational age at birth plus the postnatal age (days of life). Age is always in completed weeks.
as Corrected Age	Example: a baby born at 26 weeks + 5 days and is now 5 days old; the PMA is 27 weeks + 3 days which is then rounded down to 27 weeks.
	Postmenstrual age is an important indicator of risk. For example: babies whose gestational age is less than 26 weeks are at significant risk of morbidity and mortality. These risks differ on day one versus day 10 of life.
Today's Weight	Consider the most recent weight obtained on the baby. A loss in the baby's weight from his/her previous weight may result in a change in classification, even if it still falls within the expected weight loss range.
Respiratory Status	Assess the baby's respiratory status to appropriately reflect the highest respiratory requirement in the past 24 hours.
	 Under observation with continuous cardiorespiratory and/or SpO₂ monitoring by itself is a Level 1b procedure. (Classify as Level 1b)
	 Any time oxygen is administered, the concentration must be measured continuously with an oxygen analyzer. Babies are classified into one of the following:
	 Supplemental O₂ less than 30% and less than 4 hours of age. Anticipate resolution of respiratory distress within 24 hours. (Classify as Level 1b)
	 Supplemental O₂ 30% or greater. Anticipate escalation of care. (Classify as Level 2a)
	 Continuous supplemental O₂ at more than 4 hours of age. Anticipate escalation of care. (Classify as Level 2a)
	 CPAP (including biphasic CPAP) versus Heated Humidified High Flow by Nasal Cannula: As opposed to CPAP, heated humidified high flow by nasal cannula is a form of respiratory support administered with nasal cannula where the pressure delivered is not measured and where there is a large leak between the cannula and nostrils.
	*Please Note: High flow should never be administered without adequate warming humidification and outside of a protocol.
	 Heated humidified high flow by nasal cannula. (Classify as Level 2a)
	CPAP. (Classify as Level 2b)
	 On caffeine, or off within past 5 days considers the ongoing risk of apnea. (Classify as Level 2a)
	 The term ventilation includes all modes of ventilation.
	 A baby with respiratory distress who is intubated for administration of surfactant falls within this indicator. (Classify as Level 3a)
	 The term extubated for less than 24 hours considers the increased risk of requiring reintubation. (Classify as Level 3a)
	 Inhaled nitric oxide (iNO) is administered to babies with severe respiratory failure. (Classify as Level 3a)

System Variables	Description
Respiratory Status (cont'd)	 Chest tube whether inserted to drain air or fluid. (Classify as Level 3a) The term unstable airway indicates the baby is at risk for airway obstruction but does not require intervention beyond laryngoscopic intubation to stabilize the airway. Examples include choanal atresia and bilateral vocal cord paralysis. (Classify as Level 3a)
	 OI greater than 25 if greater than 34 weeks: OI refers to oxygenation index. It is a marker of severity of respiratory illness. Babies whose OI exceeds 25 are in severe respiratory failure and should be transferred to an ECMO/ECLS center. (Classify as Level 3b)
	 The OI should not be calculated for babies whose gestational age is less than 34 weeks.
	 The OI should be calculated after initial stabilization in any ventilated late-preterm or term baby needing more than 60% oxygen.
	$\frac{\text{percent of oxygen x mean airway pressure}}{\text{PaO}_2} = \text{OI}$
	 The term critical airway indicates there is a risk of severe airway obstruction and respiratory decompensation (may or may not be ventilated) that may require intervention beyond a laryngoscopic intubation (such as a bronchoscopy) to stabilize the airway. Examples include babies who may need an airway procedure, including a tracheostomy for subglottic stenosis, or extreme mandibular hypoplasia. (Classify as Level 3b)
	 Tracheostomy: These babies, even if stable, have a high incidence of complications including death and therefore require immediate access to subspecialty services. (Classify as Level 3b)
	 ECMO/ECLS is a technical procedure performed on babies requiring specialized intensive care whereby blood is circulated through a pump and oxygenator, external to the body, in order to support a failing heart and/or lung incapable of maintaining life. (Classify as Level 3b)
Cardiovascular Status	Assess the cardiovascular status by identifying the relevant cardiovascular condition or care requirement of the baby
	*Please Note: A patent ductus arteriosus (PDA) is not a CHD. The presence of a PDA is not used in classification as other system variables will appropriately capture that baby.
	Babies with a congenital heart defect are classified into one of the following:
	 Diagnosed, stabilized, and considered hemodynamically stable, including those awaiting eventual cardiac surgery: These babies are deemed stable by pediatric cardiology and the immediate presence of pediatric cardiology services is not needed. Examples: babies not in failure who have an ASD, VSD or AVSD. (Classify as Level 2b)
	 The baby is on inotropic/vasopressic support. Examples of this include: Dopamine, Dobutamine, Epinephrine, and Hydrocortisone. (Classify as Level 3a) A baby who does not stabilize and requires assessment for management by cardiology. (Classify as level 3b)

System Variables	Description
Cardiovascular Status (cont'd)	 Unstable or stable, including arrhythmia, during diagnosis and stabilization: These babies require the immediate presence of pediatric cardiology services to confirm the diagnosis and determine the level of service required. (Classify as Level 3b)
	 Prostaglandin dependent: These babies require the immediate presence of pediatric cardiology services. (Classify as Level 3b)
Neurological Status	Assess the baby's neurological status and identify any variable that applies.
	 Prenatal substance exposure includes maternal SSRI/SNRI use. Babies can be classified into one of the following:
	 Prenatal substance exposure and is asymptomatic and not requiring drug therapy. (Classify as Level 1a)
	 Prenatal substance exposure and is symptomatic but not requiring drug therapy. (Classify as Level 1b)
	 Prenatal substance exposure, requiring drug therapy. (Classify as Level 2a)
	 Hypoxic Ischemic Encephalopathy (HIE): Babies are classified into one of the following:
	 HIE stage 1 (mild) less than 72 hours. The baby's condition is expected to resolve but special observation/monitoring is required. (Classify as Level 2a)
	 HIE stage 2 (moderate) or 3 (severe), older than 10 days. These babies are likely to require feeding support by OT, PT, speech therapy and/or others. (Classify as Level 2b)
	 HIE stage 2 (moderate) or 3 (severe), less than 10 days of age. These babies require resources including therapeutic hypothermia and specialized neuroimaging. (Classify as Level 3a)
	Seizures: Babies are classified into one of the following:
	 On anticonvulsant therapy for less than 10 days with controlled seizures. (Classify as Level 3a)
	 Uncontrolled seizures despite anticonvulsants. These babies require ongoing support of neurology, EEG and other subspecialties for investigation. (Classify as Level 3b)
	 Neurosurgical (1st week postop): Conditions such as spina bifida, VP shunt or hydrocephalus require the immediate availability of pediatric surgical services. (Classify as Level 3b)
Nutritional Requirements	Determine the baby's nutritional requirements and identify the most appropriate variable(s).
	 Ad lib feeds (feeding on demand). (Classify as Level 1a)
	 At-risk for hypoglycemia with glucose greater than 2.6 mmol/L. Healthy term babies who require blood glucose monitoring for risk of hypoglycemia and their blood glucose is greater than 2.6 mmol/L do not need a higher classification. (Classify as Level 1a) Measured oral feeds. This includes babies who are being fed a measured amount for hypoglycemia. (Classify as Level 1b)

System Variables	Description
Nutritional	 Gavage feeds by gravity. (Classify as Level 1b)
Requirements (cont'd)	 Intravenous fluids whether for an infusion or TKVO. This also includes babies who have an IV infusion initiated for hypoglycemia. (Classify as Level 2a)
	*Please Note: If a baby with a consistent history of hypoglycemia requires an intravenous infusion rate greater than 100 ml/kg/d in order to maintain glycemia, he/she is classified higher. (Classify as Level 3a)
	 Gavage feeds by pump. A feed administered by an infusion pump is a more complex procedure than a feed by gravity and reflects a baby with increased needs. (Classify as Level 2a)
	Colostomy. (Classify as Level 2a)
	 Parenteral nutrition. Babies on parenteral nutrition require acute management regardless of the standard solution administered. (Classify as Level 2b)
	 Specialized additives beyond human milk fortifiers (HMF). (Classify as Level 2b)
	 Subspecialty feeding support by OT, PT, speech therapy and/or others. This term does not include lactation consultants. (Classify as Level 2b)
	 Babies with a stable gastrostomy tube greater than 10 days post-op. (Classify as Level 2b)
	 Dextrose concentration greater than 12.5% for hypoglycemia, even if under subspecialty care. (Classify as Level 3a)
	 Medications for hypoglycemia such as glucagon or diazoxide, even if under subspecialty care. (Classify as Level 3a)
	 Post-op with enteral feeds less than full feeds. These are post-op babies whose enteral feeds are less than 100 % but more than 50% of total fluid volume. (Classify as Level 3a)
	 Gastrostomy tube less than 10 days post-op. (Classify as Level 3a)
	 Jejunal tube. (Classify as Level 3a)
	 Ileostomy. Babies with an ileostomy are at risk for fluid-electrolyte imbalance. (Classify as Level 3a)
	 Jejunostomy. Babies with a jejunostomy have complex nutritional needs and require immediate access to subspecialty and surgical services because of medical and surgical complexities. (Classify as Level 3b)
	 Post-op with enteral feeds less than 50%. These are post-op babies whose enteral feeds are at less than 50% of their total fluid volume. (Classify as Level 3b)
	 Mucous fistula refeeds. Babies with mucous fistula refeeds have a high complication rate and require immediate access to subspecialty and surgical services. (Classify as Level 3b)

System Variables	Description
Other	Determine if there are other variables, which when assessed, classify a baby at a specific level.
	 Phototherapy, regardless of how intensive. (Classify as Level 1a) Please refer to: Canadian Paediatric Society Guidelines for detection, management and prevention of hyperbilirubinemia in term and late preterm newborn infants Figure 2 - Guideline for Intensive Phototherapy in Infants of 35 or More Weeks' Gestation Paediatr Child Health 2007;12(Suppl B):1B-12B
	Post-cesarean section. (Classify as Level 1a)
	 Terminal palliative care, with no invasive interventions required. Palliative measures are as per local protocols. (Classify as Level 1a)
	 Boarder baby. A boarder baby is a healthy term baby who is not discharged because of social or maternal medical reasons. (Classify as Level 1a)
	 Antibiotics. Babies who are clinically asymptomatic who have risk factors are classified as follows:
	 Prophylactic antibiotics for a well baby with risk factors; this includes babies awaiting blood culture results. (Classify as Level 1b)
	 Therapeutic antibiotics for a baby with positive cultures. (Classify as Level 2a)
	Retinopathy of prematurity (ROP).
	 Less than weekly checks. (Classify as Level 2a)
	 Weekly checks. (Classify as Level 3a)
	 More than weekly checks by ophthalmologist. (Classify as Level 3b)
	 Transfusion of blood/ IVIG: includes blood products such as fresh frozen plasma and packed red blood cells. (Classify as Level 2a)
	 Babies diagnosed with hemolytic disease of the newborn under phototherapy, including those who receive IVIG. (Classify as Level 2a)
	 Wound care: includes babies who require frequent dressing changes by nursing. (Classify as Level 2a)
	 PICC/CVC/UVCs require acute management; although in themselves do not increase classification level beyond 2b. (Classify as Level 2b)
	 Hyperbilirubinemia: at phototherapy level in the first 24 hours of life. (Classify as Level 3a)
	 Day of and up to 24 hours after exchange blood transfusion. (Classify as Level 3a)
	 Total serum bilirubin at exchange level (Appendix A–Canadian Paediatric Society Guideline for Intensive Phototherapy in Infants of 35 or More Weeks' Gestation). (Classify as Level 3a)
	 Day of advanced diagnostic imaging refers to diagnostic imaging, usually in the radiology department with/without anesthesia/ sedation. Examples include MRI, GI studies with contrast, and cystourethrograms. Excluded are non-contrast radiology, ultrasound and ECHO. (Classify as Level 3a)

System Variables	Description
Other (cont'd)	 Day of surgery and up to 48 hours after surgery. (Classify as Level 3a) Acute pre-surgical and surgical NEC, GI obstructions (includes any interruption between the esophagus and anus), urologic, etc. if daily access to surgical services is required. (Classify as Level 3b)
	 Acute metabolic disorder being stabilized with daily visits by metabolic services. (Classify as Level 3b)
	 Others requiring immediate in-unit access to multispecialty care beyond neonatology. (Classify as Level 3b)

Abbreviations

ASD atrial septal defect

AVSD atrioventricular septal defect

CPAP continuous positive airway pressure

CHD congenital heart defect

CVC central venous catheter

ECHO echocardiogram

ECLS extracorporeal life support

ECMO extracorporeal membrane oxygenation

EEG electroencephalography

HMF human milk fortifier

iNO inhaled nitric oxide

IVIG intravenous immunoglobulin

MRI magnetic resonance imaging

NEC necrotizing enterocolitis

OI oxygenation index

PICC peripherally inserted central catheter

PMA post menstrual age

PT physiotherapy

ROP retinopathy of prematurity

SNRI serotonin-norepinephrine reuptake inhibitors

SSRI selective serotonin re-uptake inhibitors

TKVO to keep vein open

OT occupational therapy

UVC umbilical venous catheter

VP ventriculoperitoneal

VSD ventricular septal defect

Neonatal Daily Classification Tool

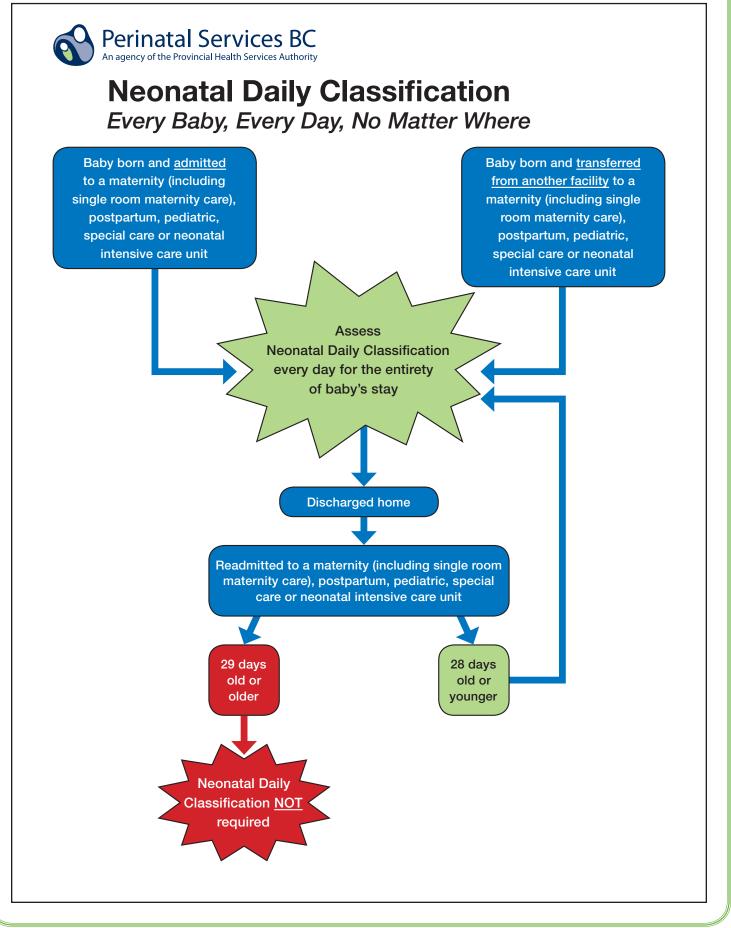
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Neonatal Daily Classification

The nurse enters the daily classification score onto the baby's Neonatal Daily Classification Monthly Record

SYSTEM	LEVEL la Baby requires normal newborn care	LEVEL Ib Baby requires increased observation	LEVEL 2a Baby requires increased observation and increased care	LEVEL 2b Baby requires acute management	LEVEL 3a Baby has high acuity	LEVEL 3b Baby has high acuity, or is at risk of high acuity, and requires multispecialty care
Post Menstrual Age	Greater than or equal to 37 weeks	☐ 35 to 36 ⁺⁶ weeks	☐ 32 to 34 ⁺⁶ weeks	☐ 30 to 31 ⁺⁶ weeks	☐ 26 to 29 ⁺⁶ weeks	☐ Less than 26 weeks
Today's Weight	☐ Greater than or equal to 2500 g	☐ 1800 to 2499 g	□ 1500 to 1799 g	□ 1200 to 1499 g	☐ Less than 1200 g	
Respiratory Status		☐ Under observation with continuous cardiorespiratory and / or \$p0₂ monitoring ☐ Supplemental 0₂ less than 30% and less than 4 hours of age	Supplemental 0₂ 30% or greater Continuous supplemental 0₂ at more than 4 hours of age Heated humidified high flow by nasal cannula On caffeine, or off within past 5 days	□ CPAP	Nentilated (includes IPPV) Extubated for less than 24 hours Inhaled nitric oxide Chest tube Unstable airway	☐ 01 greater than 25 if greater than 34 weeks ☐ Critical airway ☐ Tracheostomy ☐ ECM0 / ECLS
Cardiovascular Status				☐ CHD: diagnosed, stabilized and considered hemodynamically stable, including those awaiting eventual cardiac surgery	□ Inotropes/vasopressors	☐ CHD: unstable or "stable," including arrhythmia, during diagnostic and stabilization phase ☐ Prostaglandin dependent
Neurological Status	☐ Prenatal substance exposure not requiring drug therapy and is asymptomatic	☐ Prenatal substance exposure and is symptomatic	 □ HIE stage 1 (mild) less than 72 hours □ Prenatal substance exposure requiring drug therapy 	☐ HIE stage 2 (moderate) or 3 (severe) older than 10 days	 IIIE stage 2 (moderate) or 3 (severe) less than 10 days of age IIII Anticonvulsant therapy less than 10 days 	 □ Neurosurgical (1st week post-op) □ Uncontrolled seizures despite anticonvulsants
Nutritional Requirements	☐ Ad-lib feeds ☐ At-risk of hypoglycemia with blood glucose greater than 2.6 mmol/L	 ☐ Gavage feeds by gravity 	 □ Intravenous fluids □ HMF □ Gavage feeds by pump □ Colostomy 	☐ Parenteral nutrition ☐ Specialized additives beyond ☐ HMF ☐ Subspecialty support for ☐ ipple feeding ☐ Stable gastrostomy greater ☐ than 10 days post-op	□ Dextrose concentration greater than D12.5%W for hypoglycemia Medications for hypoglycemia Post-op with enteral feeds less than full feeds est stan full feeds days post-op less than 10 days post-op	☐ Jejunostomy ☐ Post-op with enteral feeds less than 50% ☐ Mucous fistula refeeds
Other	☐ Phototherapy ☐ Post cesarean section ☐ Terminal palliative care, no invasive interventions required ☐ Boarder baby	☐ Antibiotics in a well baby with risk factors	☐ ROP: less than weekly checks ☐ Antibiotics in a baby with positive cultures ☐ Transfusion of blood / IVIG ☐ Hemolytic disease of the newborn under phototherapy ☐ Wound care	□ PICC/CVC/UVC	□ ROP: weekly checks □ Bili at exchange level □ At phototherapy level in first 24 hours of life per CPS charts □ Day of and up to 24 hours after exchange transfusion □ Day of advanced diagnostic imaging □ OR day and up to 48 hours post-op	☐ ROP: more than weekly check by ophthalmologist a Acute pre-surgical and surgical NEC, GI obstructions, urologic, etc (daily access to surgical services) ☐ Acute metabolic disorder being stabilized ☐ Others requiring immediate in-unit access to multispecialty care
Classification do	Classification does not reflect resuscitation/stabilization within first hour of life	bilization within first hour of life				MAY 2013 © Perinatal Services BC

Classification Algorithm



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