



Spectrum of disease in low birthweight infants

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Immaturity increases the severity but reduces the distinctiveness of the clinical manifestations of most neonatal disease.

Immature organ function, complications of therapy, and the specific disorders that caused the premature onset of labor contribute to the neonatal

Neuromuscular maturity

	-1	0	1	2	3	4	5
Posture							
Square window (wrist)	 $<90^\circ$	 90°	 60°	 45°	 30°	 0°	
Arm recoil		 180°	 $140-180^\circ$	 $110-140^\circ$	 $90-110^\circ$	 $<90^\circ$	
Popliteal angle	 180°	 160°	 140°	 120°	 100°	 90°	 $<90^\circ$
Scarf sign							
Heel to ear							



Morbidity and mortality associated with premature, LBW infants. Among VLBW infants, morbidity is inversely related to birthweight. Respiratory distress syndrome is noted in approximately 80% of infants weighing 501-750 g; in 65% of those weighing 751-1000 g; in 45% of those weighing 1001-1250 g; and in 25% of those weighing 1251-1500 g.



severe intraventricular hemorrhage (IVH) is noted in approximately 25% of infants weighing 501-750 g; in 12% of those weighing 751-1000 g; in 8% of those weighing 1001-1250 g; and in 3% of those weighing 1251-1500 g;



Overall, the risk of late sepsis (24%), bronchopulmonary dysplasia (23%), severe IVH (11%), necrotizing enterocolitis (7%), and prolonged hospitalization (45-125) is high in VLBW infants. Problems associated with IUGR LBW infants are noted in Table 97-5; these added problems are often superimposed on those noted in Table 97-6 if an infant with IUGR is also premature. Poor postnatal growth is an important problem for both preterm and IUGR infants.

Table 97-6: Neonatal Problems associated with premature infants



RESPIRATORY

Respiratory distress syndrome (hyaline membrane disease)*
Bronchopulmonary dysplasia
Pneumothorax, pneumomediastinum; interstitial emphysema
Congenital pneumonia
Apnea*

CARDIOVASCULAR

Patent ductus arteriosus*
Hypotension
Bradycardia (with apnea)*

HEMATOLOGIC

Anemia (early or late onset)

GASTROINTESTINAL

Poor gastrointestinal function—poor motility*
Necrotizing enterocolitis
Hyperbilirubinemia—direct and indirect*
Spontaneous gastrointestinal isolated perforation

Table 97-6: Neonatal Problems associated with premature infants



METABOLIC-ENDOCRINE

Hypocalcemia*

Hypoglycemia*

Hyperglycemia*

Late metabolic acidosis

Hypothermia*

Euthyroid but low thyroxine status

CENTRAL NERVOUS SYSTEM

Intraventricular hemorrhage*

Periventricular leukomalacia

Seizures

Retinopathy of prematurity

Deafness

Hypotonia*

Table 97-6: Neonatal Problems associated with premature infants

RENAL

Hyponatremia*

Hypernatremia*

Hyperkalemia*

Renal tubular acidosis

Renal glycosuria

Edema

OTHER

Infections* (congenital, perinatal, nosocomial: bacterial, viral, fungal, protozoal)





Prognosis

- Infants born weighing 1,501-2,500 g have a 95% or greater chance of survival, but those weighing still less have significantly higher mortality .Intensive care has extended the period during which a VLBW infant is at increased risk of dying of complications of prematurity, such as bronchopulmonary dysplasia, necrotizing enterocolitis, and nosocomial infection (Table 97-8).



The postdischarge mortality rate of LBW infants is higher than that of term infants during the 1st 2 yr of life. Because many of the deaths are attributable to infection (e.g., respiratory syncytial virus), they are at least theoretically preventable.



In addition, premature infants have an increased incidence of failure to thrive, sudden infant death syndrome, child abuse, and inadequate maternal-infant bonding.



The biologic risk associated with poor cardiorespiratory regulation as a result of immaturity or complications of underlying perinatal disease and the social risk associated with poverty also contribute to the high mortality and morbidity of these infants. Congenital anomalies are present in approximately 3-7% of LBW infants.



In the absence of congenital abnormalities, central nervous system injury, VLBW, or marked IUGR, the physical growth of LBW infants tends to approximate that of term infants by the 2nd yr; the approximation occurs earlier in premature infants with larger birth size. VLBW infants may not catch up, especially if they have severe chronic sequelae, insufficient nutritional intake, or an inadequate caretaking.

Table 97-8: Sequelae of Low Birthweight

IMMEDIATE	LATE
Hypoxia, ischemia	Mental retardation, spastic diplegia, microcephaly, seizures, poor school performance
Intraventricular hemorrhage	Mental retardation, spasticity, seizures, hydrocephalus
Sensorineural injury	Hearing, visual impairment, retinopathy of prematurity, strabismus, myopia
Respiratory failure	Bronchopulmonary dysplasia, cor pulmonale, bronchospasm, malnutrition, subglottic stenosis
Necrotizing enterocolitis	Short-bowel syndrome, malabsorption, malnutrition, infectious diarrhea
Cholestatic liver disease	Cirrhosis, hepatic failure, malnutrition
Nutrient deficiency	Osteopenia, fractures, anemia, growth failure
Social stress	Child abuse or neglect, failure to thrive, divorce
Other	Sudden infant death syndrome, infections, inguinal hernia, cutaneous scars (chest tube, patent ductus arteriosus ligation, intravenous infiltration), gastroesophageal reflux, hypertension, craniosynostosis, cholelithiasis, nephrocalcinosis, cutaneous hemangiomas



