

as cytomegalovirus, toxoplasmosis, and *Treponema pallidum* (syphilis), which cross the placental barrier during the latter half of pregnancy. Intrapartum infection may occur via contact with an infected mother; examples of such infections include herpesvirus and human immunodeficiency virus (HIV).

Early-onset sepsis (less than 3 days after birth) is acquired in the perinatal period; infection can occur from direct contact with organisms from the maternal gastrointestinal and genitourinary tracts. The most common infecting organism in term infants is group B streptococcus (GBS); in preterm infants, it is *Escherichia coli* (Sgro, Shah, Campbell, et al, 2011). Despite the development of maternal screening and prophylaxis, infection rates for early-onset GBS infection remain at approximately 0.3 per 1000 live births (Verani, McGee, and Schrag, 2010). *E. coli*, which may be present in the vagina, accounts for approximately half of all cases of sepsis caused by gram-negative organisms. GBS is an extremely virulent organism in neonates, with a high (50%) death rate in affected infants. Other bacteria noted to cause early-onset infection include *Haemophilus influenzae*, *Neisseria meningitidis*, coagulase-negative *Staphylococcus* (ConS), and *Streptococcus pneumoniae* (Venkatesh, Adams and Weisman, 2011). Other pathogens that are harbored in the vagina and may infect the infant include gonococci, *C. albicans*, HSV (type II), and *Chlamydia*.

Late-onset sepsis (1 to 3 weeks after birth) is primarily nosocomial, and the offending organisms are usually staphylococci, *Klebsiella* organisms, enterococci, *E. coli*, and *Pseudomonas* or *Candida* (Stoll, 2011). ConS, considered to be primarily a contaminant in older children and adults, is the most common cause of late-onset septicemia in ELBW and VLBW infants. Bacterial invasion can occur through sites such as the umbilical stump; the skin; mucous membranes of the eye, nose, pharynx, and ear; and internal systems, such as the respiratory, nervous, urinary, and gastrointestinal systems. Risk factors for ConS include low birth weight and early gestational age, poor hand hygiene, previous antibiotic exposure, and the presence of central IV lines (Downey, Smith, and Benjamin, 2010).

Postnatal infection is acquired by cross-contamination from other infants, personnel, or objects in the environment. Bacteria that are commonly called “water bugs” (because they are able to grow in