

## CHAPTER TWO

# THE LOW BIRTH WEIGHT PREMATURE BABY, PARENTS' EMOTIONAL REACTIONS, PARENT-INFANT INTERACTION AND INFANT DEVELOPMENT

## 2.1 THE LOW BIRTH WEIGHT PREMATURE BABY

### 2.1.1 Introduction

For the Low Birth Weight premature baby's parents, the normal delivery and possible short hospital stay anticipated are suddenly replaced by a stressful birth, followed by feelings of shock, denial, sadness and anger (Varma, 1993 p.84). Parents need to be informed continuously on their baby's situation during the first few days after the birth. Information and the chance to share their own feelings may reduce their fear of the Neonatal Intensive Care Unit (NICU) and influence their future expectations positively. Initial opportunities for contact between the parents and the baby can therefore be encouraged. This contact, according to Ensher and Clark (1994 p.84), may be extremely important for the early adjustment of both the baby and the mother, as it stimulates and encourages normal development in the baby.

This chapter aims to deal with theoretical issues relating to the research. Definitions are given as a starting point, followed by the incidence of Low Birth Weight infants, aetiology of preterm birth, delivery of a LBW premature baby, effects of being born premature and of low birth weight, as well as the medical and aftercare of these babies. Also included in this chapter are the emotional reactions that parents experience after the birth of their Low Birth Weight premature baby. Parent-infant interaction is discussed as a prerequisite for infant stimulation, enhancing normal child development. The impact of a LBW premature baby on the rest of the family system is also discussed. Throughout this chapter, the baby is referred to as "he" for convenience.

### 2.1.2 Definitions

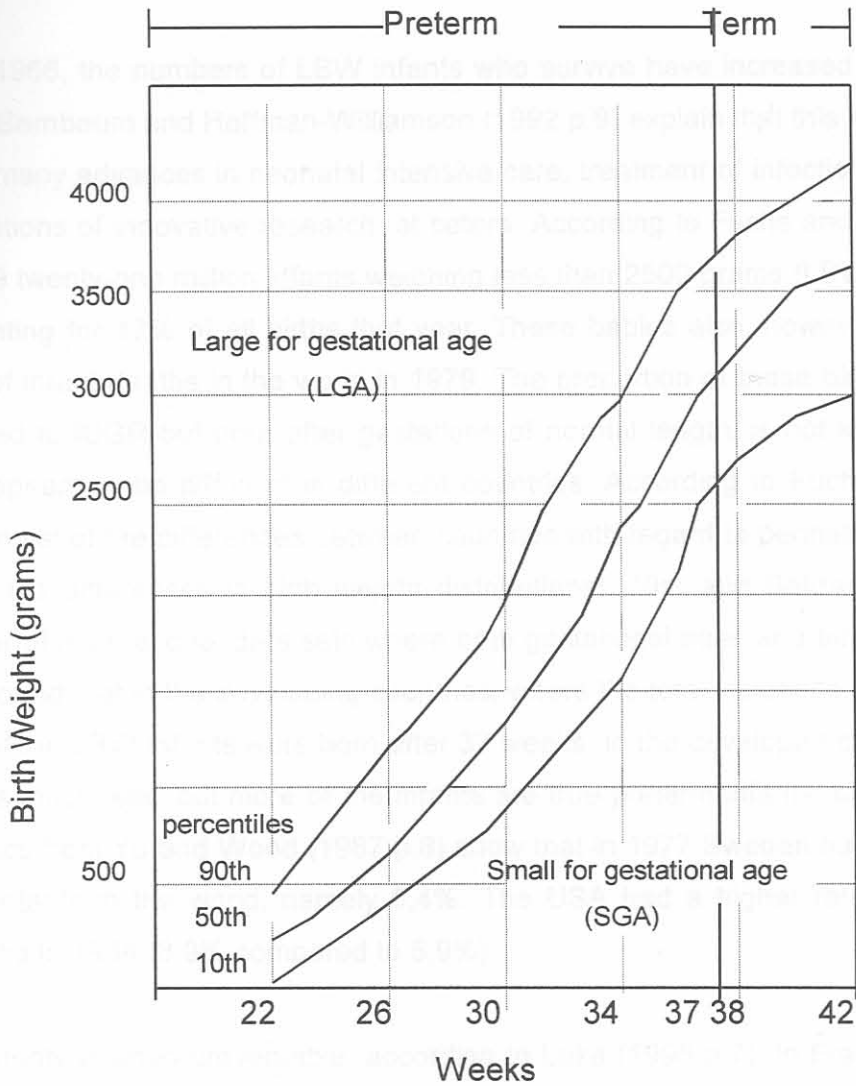
The terms *prematurity* or *preterm infants* were used (until the early 1960s) to describe babies born prior to 37 weeks (less than 259 days) from the first day of the mother's last menstrual period, as well as those with a weight of less than 2500 grams (Dominguez, 1992 p.3 and Knuppel & Drukker, 1986 p. 109). The appropriateness of the definition lay in the fact that birth weight was the most frequently- and reliably-recorded measure for infants and that these

infants, defined by weight, were at high risk of death and other adverse outcomes (Yu & Wood, 1987 p.5). Though the word *premature* implies an unreadiness for birth, the definition in fact delineated a group of infants with Low Birth Weight. By the early 1960s it was clearly recognized that Low Birth Weight infants were a combination of those born too soon (*preterm*) and those born too small (*growth retarded*). Distinguishing between them was clinically important, since their neonatal problems as well as their long-term outcomes, were different (Yu & Wood, 1987 p.6). There seems to be an agreement that birth weight is relatively more important than *gestational age* (number of completed weeks of pregnancy from the last menstrual period) in determining a prognosis, as well as an extensive literature supporting the use of Low Birth Weight as a marker for mortality and morbidity and recognizing the difficulties of determining gestational age at birth. Therefore this latter parameter became included in the definition (Bremner, 1994 p.25).

Luke (1995 p.4) agrees with these arguments, which imply that maturity is not the only factor influencing a baby's health, but that birth weight is also important. Low Birth Weight (LBW) is defined as a weight of 2500 grams or less. Dominguez (1992 p.4) subdivides LBW infants into the categories of Moderately Low Birth Weight (MLBW = 32-37 weeks' gestation and 1500-2500g), Very Low Birth Weight (VLBW = 28-31 weeks' gestation and 1000-1499g) and Extremely Low Birth Weight (ELBW = less than 28 weeks and less than 1000g).

The characterization of newborns both by birth weight (see Figure 1: Luke, 1995 p.6) and gestational age (see Table 1: Luke, 1995 p.4 and Knuppel & Drukker, 1986 p.109) is important for the identification of relatively overweight and underweight newborns. While most newborns are appropriately sized for their gestational ages, some are born large for gestational age (LGA) and others small for gestational age (SGA). The latter group is also referred to as having intrauterine growth retardation (IUGR). Identification of LGA and SGA newborns is critical because there are certain underlying diseases that are frequently associated with each size category (Dominguez, 1992 p.4).

Figure 1: Evaluating birth weight for gestational age



Infants with birth weights less than the 10th percentile for their gestational age (SGA) are at increased risk of death during the neonatal period or, if they survive, illnesses during infancy. Examples would be a 34-week infant weighing 1500 grams or a 36-week infant weighing 2000 grams.

*Low Birth Weight premature babies (LBW)* will be used throughout this study, to refer to babies born with a weight less than 2500 grams, prior to 37 weeks of gestation. The term *preterm* will be used when referring to a short gestation period associated with prematurity. When LBW is used in isolation, it refers to a baby less than 2500 grams, not necessarily born preterm, but SGA.

### 2.1.3 Incidence of LBW and preterm infants and normal development


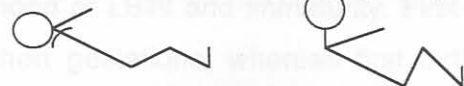
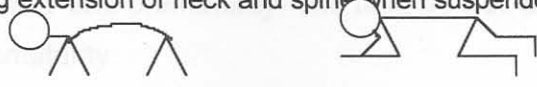
Since 1966, the numbers of LBW infants who survive have increased substantially all over the world. Bernbaum and Hoffman-Williamson (1992 p.9) explain that this increase can be attributed to the many advances in neonatal intensive care, treatment of infections with antibiotics, clinical applications of innovative research, et cetera. According to Fuchs and Stubblefield (1984 p.10), in 1979 twenty-one million infants weighing less than 2500 grams (LBW) were born in the world, accounting for 17% of all births that year. These babies also, however, accounted for 75% or more of infant deaths in the world in 1979. The proportion of these births that were preterm, as opposed to IUGR but born after gestations of normal length, is not known for the entire world and appears to be different in different countries. According to Fuchs and Stubblefield (1984 p.12), most of the differences between countries with regard to perinatal mortality are accounted for by the differences in birth weight distributions. Villar and Belizan (1982 p.795) studied a number of international data sets where both gestational ages and birth weights were available. They found that in the developing countries, where the total incidence of LBW is often very high, most of the LBW infants were born after 37 weeks. In the developed countries, the proportion of LBW is much less, but more of the infants are true preterm infants, born after short gestations. Statistics from Yu and Wood (1987 p.8) show that in 1977 Sweden had the lowest proportion of LBW infants in the world, namely 5,4%. The USA had a higher rate of LBW deliveries than Australia in 1984 (8,9% compared to 5,9%).

Prematurity is often preventable, according to Luke (1995 p.7). In France she and a team took steps to see if they could lower the rate of prematurity. A prevention intervention programme was implemented and it succeeded in lowering the prematurity rate by 52% (from 8,2% in 1972 to 3,9% in 1989).

Table 1 reflects the survival rates, as well as the percentage of infants who develop normally according to gestational age (duration of pregnancy).

Every week prematurity is prevented, valuable time for the baby to grow and mature increases, as does the possibility that the baby will be healthy and well-developed at birth. At 24, 28, 32, 36 or 40 weeks' gestation, foetuses have different abilities to breathe, maintain their body temperature, digest food and see and hear.

**Table 1: Gestational age in weeks, survival and normal development**

Age in weeks	Behaviour and stage of tissue and organ development	Survival in %	Normal development in %
3-5	Central nervous system, lungs, and heart have developed. Primitive face visible. Crown-rump length 5-10mm Blood circulation starts.		
6-7	Heart begins to beat. Sex glands start developing. Nostrils forming, baby's eyes can be seen through delicate lids. Small "buds" where arms and legs are growing. Crown-rump length 8mm.		
8-9	Brain, heart and other main organs are developing rapidly. Eyes now more obvious. Face completely formed. Ridges appear on hands and feet - the beginnings of fingers and toes Teeth form in the jawbone. Crown-rump length 17mm.		
10-14	Muscles sufficiently developed to cause movement, but not yet discernible by the mother. The baby can open/close his fists. Tear ducts and nails develop. Swallowing of amniotic fluid and passing of urine now occur.		
14	Crown-rump length 56mm.		
15-22	Beginnings of hair, eyebrows and eyelashes. The fine hair is called lanugo. Eyelids fused, finger and toe nails are growing.		
18-20	Kicking felt in first pregnancy: noticed earlier in subsequent pregnancies.		
22-30	Vigorous movements occur, reacts to loud noises; hiccups! Becomes covered in white, greasy vernix to protect it from becoming waterlogged. Sucking activity now visible during ultrasound scanning. Finger and footprints develop as distinguishing characteristics Crown-rump length-400mm.	24 weeks= 10% 26 weeks= 20%	40% 60%
25-26	Eyelids open; eyes appear blue, skin still paper thin. Some bone now replacing cartilage in the skeleton. Brain shows little detailed structural differentiation; fluid-containing ventricles are large.	28 weeks= 50%	80%
30-36	Lung maturation in preparation for breathing air is advancing rapidly. Skin creases on soles of feet deepen and increase in number. Flat margin of ear becomes progressively more incurved Cartilage begins to give rigidity to previously floppy ears Subcutaneous fat layers still being deposited.	30 weeks= 75% 32 weeks= 85%	85% 90%
30-36+	Nipple areola becomes defined, breast tissue increases in volume beneath the nipple Posture becomes more flexed when lying on back:  Truncal tone increases: less head lag on pulling to sit:  Increasing extension of neck and spine when suspended prone: 	34 weeks= 95% 36 weeks= 99% 38-40 weeks= 99%	95% 99% 99%

Women of all races and social classes can potentially deliver prematurely, and their infants can suffer from the effects of being born too early and too small (Luke, 1995 p.6). Career women (experiencing workplace stress) run an increased risk of giving birth prematurely (Di Renzo, 1998 p.14). According to Brummer, Cronje, Grobler and Visser (1990 p.409), the incidence of LBW infants in South Africa was higher in black women than in white women in 1989, and their LBW births represented 11% of all deliveries in South Africa that year. This phenomenon could be explained by aetiological factors (maternal age, nutrition, prenatal care, et cetera) which black women experienced as part of a disadvantaged population at that time.

#### 2.1.4. Aetiology of LBW and preterm birth

Most of the factors associated with Low Birth Weight are also associated with short gestation, as would be expected, since many LBW babies are truly preterm. The risk factors for VLBW, however, are not identical with those of LBW (e.g. socioeconomic status is not associated with VLBW) (Yu & Wood, 1987 p.7)

Prematurity is a complex, universal problem, with no single cause. Many factors contribute. One of the most significant risk factors, according to Luke (1995 p.14), is a prior premature birth. Some risks cannot be changed (e.g. genetic background, obstetrical history and age), and care referred to as *nonmodifiable* risks. *Modifiable* risks (e.g. physical efforts of the mother and diet) can be changed. Di Renzo (1998 p.14), Fuchs and Stubblefield (1984 p.66) and Yu and Wood (1987 p.12) mention the risk factors most likely to cause prematurity (too small; LBW or too early; short gestation), which will be discussed briefly:

- Genetics: The mother's pre-pregnant weight is consistently found to be a determinant of birth weight and of gestational length. The mother's own birth weight influences the outcome of her pregnancies.
- Race: A number of factors associated with social deprivation are associated with race, incidence of low birth weight, and gestational age-defined prematurity. Black populations show higher rates of LBW than white populations. Low socioeconomic populations also show higher rates of LBW. Lower educational attainment by the mother and father is also associated with prematurity.
- Maternal age and birth order: The younger the mother in relation to the number of births, the higher is the likelihood of LBW and immaturity. First births to mothers under the age of 18 show a shift to short gestations, whereas first births to women older than 35 show an increase in both LBW and prematurity. The first, as well as the fifth pregnancy or more, is of higher risk for prematurity.

- Nutrition: Severe malnutrition, endemic in much of the third world, is associated with high rates of LBW. Evidence from times of famine reveals that it has a devastating effect on third-trimester foetuses, with increased foetal and neonatal deaths associated with LBW. Low maternal weight (less than 50,8 kg) is associated with prematurity.
- Gynaecological, obstetrical and medical history: certain maternal illnesses involving the blood vessels (e.g. chronic hypertension and diabetes) are associated with LBW. Multiple gestations are regularly associated with reduced birth weight and an increased risk of preterm birth. If one or more pregnancies ended before 24 weeks' gestation, the risk of prematurity may be increased. A mother is also more likely to give birth to an infant whose gestational age and birth weight are similar to those other earlier babies. Infertility treatment is also a risk factor for prematurity.
- Stress: Stress is a generalized adaptation to any stressor agent in an attempt to maintain homeostasis within the body (even at a cost to the body). Hormones released in stress (e.g. catecholamines) decrease uterine blood flow and increase uterine irritability, which explain the negative effects that stress has on conception, pregnancy, labour and delivery.
- Cigarette smoking: a consequence of cigarette smoking is a reduction in birth weight of about 200g. Tobacco is recognized as the main preventable cause of IUGR and term LBW. The effect on mean gestation at delivery is, however, very small. Smoking mothers are more prone to pregnancy complications, such as premature rupture of the membranes, which are precursors of preterm birth.
- Prenatal care: Lack of prenatal care is consistently associated with LBW. Prenatal care is the one intervention consistently associated with improved pregnancy outcome in all cultures.
- Present pregnancy: Bleeding, positional anomalies (e.g. breech presentation), congenital anomalies et cetera are associated with LBW and true prematurity. Infection is also linked to prematurity.
- Latrogenic prematurity: Accidental premature delivery also occurs at times because of failure to establish gestational age prior to elective induction or repeat Caesarean section.
- Alcohol and substance abuse: Dependency on drugs, narcotics or other substances is a risk factor for preterm delivery and IUGR.

The effects of the above mentioned factors are cumulative. The more risk factors that are present, the higher the likelihood of LBW and short gestation.

Knuppel and Drukker (1986 p.19) mention some factors which many parents believe might have been responsible for the preterm birth of their baby, but which are *not* usually considered to cause preterm births:

- Housework
- A small fall
- Climbing stairs
- Continuing work beyond 28 weeks - if physically non-demanding and psychologically non-stressful
- Lifting other children
- Traveling on a short plane journey
- Jogging

### 2.1.5 Preterm delivery and the emotional impact it has on parents

The causes of premature birth (as discussed previously on page 33) seem to be intertwined within social, personal and environmental factors. The well-being and condition of a baby at the moment of birth greatly influences the nature and severity of the problems that can occur later in the newborn period. Checking a preterm baby's condition throughout labour is recognized as being very important, according to Davis *et al.* (1983 p.177). Undesirable effects of the normal stresses of labour and birth are more likely to occur in a preterm than in a full-term baby.

Preterm delivery makes adaptation to extrauterine life a difficult process, according to Luke (1995 p.48). Immaturity poses problems, in acute cases resulting in both a higher mortality rate than is seen in full term infants, and in chronic difficulties of many organ systems.

Women at high risk for preterm delivery (e.g. when the baby is estimated to have had less than 32 weeks' gestation) should be advised to have themselves transported to a perinatal centre before delivery, if possible. Alternatively, the baby can be transferred following birth if he needs intensive care. High risk infants born in the perinatal centre are more likely to survive without handicaps than similar infants born in community hospitals and transferred after birth, according to Fuchs and Stubblefield (1984 p.281). They add that there is no justification for intentional home delivery of a preterm infant. The medical team should be prepared for immediate neonatal resuscitation.

About 20% of all mothers giving birth prematurely have a rupture of the foetal membranes before the onset of labour (Redshaw *et al.*, 1985 p.23). Infection may result, and contribute to preterm birth. Bleeding from the placenta also poses a threat for preterm labour, and needs immediate medical attention.



According to current literature (Yu & Wood, 1987 p.56; Fuchs & Stubblefield, 1984 p.281), not all preterm or LBW infants are delivered by Caesarian section. There seems to be a liberal intervention policy for foetal distress during labour or for Caesarian section for breech (or transverse position). The abdominal route (Brummer *et al.*, 1990 p.413) will deliver a substantial proportion of such infants. Attempts to change a baby's position by external manipulation (version) are sometimes considered. Vaginal delivery of the preterm infant presenting by the vertex will be considered only if labour progresses normally, without any complications and without asphyxia.

Preterm deliveries can easily be experienced as a crisis (or even trauma) by parents, because of their unexpected nature and all the possible associated complications which might follow (Roman *et al.*, 1995 p.385). Parents are faced with the multiple tasks of adapting to the unfamiliar environment of the NICU, and coping with their own feelings of anxiety, fear, grief, guilt, helplessness and depression.

Parents may experience fear and anxiety concerning the question of the survival of their infant (Bernbaum & Hoffman-Williamson, 1992 p.38). These fears are heightened by the whirlwind of activity of physicians in the delivery room, the speed with which the child is taken away from the mother, the possible need for transport and frequently the lack of information. Even when the infant survives, the parents continue to have ongoing fears and anxieties about the infant's future prognosis medically, developmentally and socially.

Regardless of the circumstances surrounding the pregnancy and delivery, most mothers of LBW premature infants feel guilty about not being able to carry the infant to term, and wonder whether they caused the early delivery and thereby produced a less-than-perfect baby (Bernbaum & Hoffman-Williamson, 1992 p.38). Guilt and anxiety may result in a feeling of failure and insecurity about parenting skills.

Anger is also a natural reaction to this stressful situation. The parents of a preterm infant express anger towards each other, the medical and nursing staff and their extended family, as a result of their fears, anxieties and helplessness. Often the people who are the most helpful (i.e. medical staff) become the target of parental anger. All parents of LBW premature infants struggle with feelings surrounding the inability to do anything to help their sick child (Bernbaum & Hoffman-Williamson, 1992 p.38). This feeling of helplessness often immobilizes parents, and they are unable to become involved with their child and his care.

Emotional support for the parents during this crisis period can be recommended by means of the implementation of an early intervention programme by educational psychologists. This programme should cover issues such as the management of parents' feelings and emotions, and knowledge about LBW premature infants and their needs.

### 2.1.6 The medical effects of being born premature and of LBW

One of the most likely effects of prematurity is death. Indeed, only a few decades ago the likelihood of death for a premature infant weighing between 2000 and 2500 grams was approximately six times greater than for an infant weighing 3000 grams or more. Currently, however, the majority of premature infants weighing 2000 grams or more survive. In fact, more than 90 percent of infants who weigh as little as 1000 to 1500 grams survive (Goldsmith, 1990 p.160). Most of these preterm infants spend the first two to three months of their lives in intensive care nurseries, often in incubators (Dusick, 1997 p.164).

Another effect of prematurity is immaturity of various physiological systems of the infant. In the following sections an overview of the medical effects of such immaturity is presented (Ensher & Clark, 1994 p.77-89; Dominguez, 1992 p.3-24; Brummer *et al.*, 1990 p.410; Yu & Wood, 1987 p.148-163; Fuchs & Stubblefield, 1984 p.333-345 and Dusick, 1997 p.164-177):

- Central nervous system (CNS) and the brain: Diseases of the CNS of the premature infant include periventricular haemorrhage (as well as other types of intracranial haemorrhage), periventricular leukomalacia, seizures, Spina Bifida, meningitis and encephalitis, mental retardation and cerebral palsy. The brain develops dramatically during the period from 25 weeks' gestation to term. The maturation of brain structures involves the disappearance of some areas, which are particularly rich in blood-vessels, and the appearance of many new brain cells. These processes can be disrupted by bleeding (intracranial haemorrhage, intraventricular haemorrhage) or by episodes of lack of oxygen (severe hypoxia). The consequences of these effects will depend on how far the brain has developed and on the extent of the problem.
- Cardiovascular system: The incidence of patent ductus arteriosus (PDA) correlates inversely with gestation and birth weight, and is higher in infants with hyaline membrane disease. Persistent PDA, as well as congenital heart diseases and persistent foetal circulation, are some of the diseases of the cardiovascular system of premature infants.
- Pulmonary: Most infants with persistent pulmonary hypertension (PPH), which is associated with parenchymal lung disease, are preterm. Diseases of the pulmonary system of premature infants are respiratory distress syndrome, transient tachypnea of the newborn, Wilson-Mikity syndrome and chronic pulmonary insufficiency, pneumonia, air leak

syndromes, congenital malformations, pulmonary haemorrhage, apnoea associated with prematurity, as well as bronchopulmonary dysplasia.

- **Gastrointestinal system:** Once a baby is delivered he is subjected to external influences and may be unable to compensate adequately. Before birth a baby relies on the placenta for receiving nutriment, and disposes of most waste products in the same way. Premature delivery of the foetus limits the capacity of the gastrointestinal tract to adapt to the extrauterine environment at all levels. The effects of premature delivery are also apparent in the liver, as evidenced by a decreased ability to detoxify and clear the body of endogenous toxins or drugs, as well as decreased synthesis of bile salts and other products of hepatic metabolism. Diseases of the gastrointestinal and hepatobiliary systems of the premature infant are necrotizing enterocolitis, gastrointestinal haemorrhage, abdominal wall defects, obstruction of the gastrointestinal tract, gastroesophageal reflux and hyperbilirubinemia.
- **Renal system:** Preterm infants adapt poorly to inadequate or excessive fluid intake, as they have a limited renal concentrating and diluting ability, a larger surface area in relationship to weight, and a higher insensible water loss through the skin. Diseases of the genito-urinary system of the premature infant are urogenital anomalies, renal insufficiency and failure, and renal tubular acidosis.
- **Haematopoietic system:** The haemoglobin or haematocrit and white blood cell counts of LBW newborns at delivery, are slightly lower than those of full-term newborns. Diseases of the haematopoietic system of premature infants are anaemia, polycythemia and abnormal hemostasis.
- **Immune system:** Premature infants are at high risk of developing bacterial sepsis after prolonged rupture of the amniotic membranes. Defenses against bacteria are less well-developed in a LBW baby than in one who is full term, and the early signs of infection are often unremarkable, when compared to the high fever which occurs in an older child or adult. A few LBW babies develop inflammation in a section of their bowel wall (necrotizing enterocolitis). This causes the abdomen to become distended, and the baby may vomit and pass a little blood in the stool. Some babies may need surgery for the complications of this condition, but many, when treated, will recover and be able to tolerate milk feeds again.
- **Endocrine/metabolic systems:** Preterm infants are prone to develop hypoglycaemia, especially if they are growth-retarded, or have had perinatal asphyxia or sepsis. Diseases of the endocrine systems of premature infants are inborn errors of metabolism, state screens, hypoglycemia, disorders of calcium metabolism, congenital hypothyroidism and adrenal disorders. In very LBW babies none of the functions of the pancreas may be adequate. Insulin injections may have to be given if the glucose in the bloodstream rises to a very high level. The inadequate release of insulin from the pancreas is usually transient. A lack of

digestive enzymes may contribute to the poor absorption of some of the constituents of the milk fed to preterm babies.

- **Musculoskeletal system:** The muscles of immature babies are weak. Young preterm babies tend to be relatively inactive. They tend to change position very little and lie with arms and legs outstretched. The movements that may occur are frequently jerky and sudden, compared to the slower, more controlled efforts of a term baby. Gradually, with maturation, overall activity increases and the movements become more expansive and smoother. The lack of space in the uterus, which encourages the flexed posture of full term babies, also results in a closer proximity between hands and mouth, enabling them to suck their fingers. This activity is important, as it is a way for a baby to quieten himself, stay alert and look around without fussing, or to fall asleep peacefully. Mineralization of the bones in LBW newborns is lower than in those of full term newborns. Diseases of the musculoskeletal system of the premature infant are malformations, skeletal dysplasias, congenital hip dislocation and club-foot.

The medical effects that have been mentioned may seem to constitute an oppressive list, but many can be prevented or resolved. Many of the problems outlined above do not arise during the first days of life. It is more common for a very LBW premature baby to pass through various periods, during each of which different kinds of care, such as ventilatory support, transfusions, oxygen or antibiotics, are required. It is the very unpredictable nature of a preterm baby's medical condition and progress during the first weeks of life that contributes to parental anxiety and stress. It often happens that as soon as one hurdle is apparently overcome, another one appears, and some babies may stay in hospital for many weeks before going home. Fortunately, many LBW premature babies have few medical problems or even none, and need to stay in hospital only until they are growing well and feeding normally.

### **2.1.7 The physical effects of being born premature and of LBW**

Possible effects of prolonged hospitalization following birth include a higher incidence of cerebral palsy, general developmental delay and possible limited intelligence (Youngblut, Loveland-Cherry, & Horan, 1994 p.331). These effects are not found amongst all preterm babies, and are less likely to occur the less premature the infant and the more he weighs at birth.

The physical appearance of a LBW premature baby is often unattractive, and parents may feel a little repulsed. Moore (1995 p.47) describe the LBW premature baby as having a thin, even transparent skin, and say it may be easy to see the blood vessels beneath it. Skin colouration

can vary dramatically from moment to moment, from pink to very pale. Babies of black parents may initially have quite pale complexions, but their skin becomes progressively more pigmented with age. Knuppel and Drukker (1986 p.214-230) describe preterm babies of less than 32 weeks' gestation as having prominent ribs and chest muscles, because there has been insufficient time for fatty tissue to accumulate beneath the skin. Before 32 weeks the skin may be covered with a coat of fine hair (*lanugo*). Small white "pinhead" spots are commonly present over the face and upper chest. These are known as *milia*, and are immature sweat glands. Accordingly, a very LBW premature baby's appearance may evoke feelings of fear, anxiety and even rejection in the parents. The parents may also be afraid to touch the baby, because of his fragile appearance.

The umbilical cord may seem quite large compared to the size of the baby, and the junction of the cord with the skin of the abdominal wall is quite prominent. The fontanel moves with the normal pressure changes in the head which accompany breathing and crying. Another feature of preterm babies is the floppiness of their ears. Their ears do not yet have the cartilage, which gives them firmness and shape (Bremner, 1994 p.30).

Observations of preterm babies indicate that they tend to have a less organized pattern of sleeping and waking than term babies (Yu & Wood, 1987 p.151). This may be partly owing to the lack of maternal rhythms, as well as to the fact that in the NICU a baby may be woken up at frequent intervals so that necessary medical and nursing procedures can be carried out. In such circumstances the difference between day and night is minimized, and babies are fed according to schedule, so it may be quite difficult for a baby to develop his own individual pattern. Most newborn babies sleep a great deal, and preterm babies perhaps even more. There are, however, large individual differences. Some babies tire more easily than others. Preterm babies, especially can find even simple medical procedures, like having blood samples taken, very exhausting, and quickly fall asleep afterwards. Parents may feel unsure whether to touch and handle their babies, afraid to wake or tire them.

Many young preterm babies cry infrequently, if at all. The lack of any response from the baby may unnerve parents (Moore, 1995 p.112). Once a preterm baby has grown bigger and stronger he is more likely to cry spontaneously, as well as in response to handling. By about 36 weeks these babies seem to have more energy, crying frequently and on less provocation than before.

Parents need to be involved in caring for their baby. Early intervention programmes can motivate parents to come to know their babies by means of observation, touching, handling, and caring.

## 2.1.8 Medical care of the LBW premature infant

In spite of the modern high technology surrounding neonatal intensive care, allowances for the baby's comfort and need for rest should receive high priority. It is therefore essential that staff and parents try to minimize the discomfort and/or pain that may arise from some of the medical procedures that have to be performed. A baby's comfort level is reflected in the stability of his breathing pattern and heart rate, in weight gain, in his level of restfulness and in his awareness of his surroundings when awake.

Bernbaum and Hoffman-Williamson (1992 p.34-67), Lefrancois (1995 p.20-50), Yu and Wood (1987 p.150-163), Fuchs and Stubblefield (1984 p.342-345) and Moore. (1995 p.41-60) mention a few medical conditions which may present problems for the LBW premature baby, and which need to be addressed in neonatal care wards:

- **Temperature control:** Cold stress leads to increased mortality and impairs growth, while high and fluctuating temperatures induce apnoea in preterm infants. Once the baby is born he has to maintain his body temperature and prevent it from fluctuating. An unstable temperature is common in preterm babies. Their temperature may rise too high (fever or hyperthermia), or fall too low (hypothermia), due to small changes in the environment. With careful and sustained monitoring apnoeic spells can be detected in almost every preterm infant. All babies born after less than 34 weeks' gestation should be routinely and continuously monitored from birth onwards until no apnoeic episodes have occurred for a week. Since impedance apnoea monitors do not detect obstructive apnoea, heart rate should also be monitored and an alarm set for bradycardia.
- **Respiratory monitoring:** The ability to inflate the lungs depends in part on the strength of the baby's respiratory muscles, and on the stimulation they receive from the brain. In a preterm baby the chest wall, consisting of ribs and muscles, is more flimsy than that of a term baby, with the result that, although he may make great efforts to fill his lungs with air, his chest may "recess" at every breath instead of expanding. Therefore the baby's efforts may be assisted by puffing with a bag and mask, or by intubation. Knowing the levels of oxygen and carbon dioxide in blood enables medical staff caring for the preterm baby to decide when extra oxygen or breathing support is needed, and when the amount of support may be reduced. Some preterm babies do not have enough surfactant during the first days of life and develop progressive collapse of the airspace. This condition is known as *respiratory distress syndrome (RDS)* or is sometimes referred to as *hyaline membrane disease (HMD)*. Following ventilation, some babies go through a time during which they need extra oxygen to breathe. Sometimes this requirement can last for weeks, or even months, and is associated with changes in the structure of the lungs called *bronchopulmonary dysplasia (BPD)*.

- **Blood transfusion:** Some LBW premature babies may need one or more blood transfusions at some time during their hospital stay. In LBW premature babies, anaemia results from having too few red blood cells to carry the haemoglobin, but the precise causes of this condition are not very well understood. The measurement of arterial blood pressure in preterm infants who require arterial catheterization for blood-gas monitoring is a routine part of neonatal intensive care.
- **Phototherapy:** In LBW premature babies the liver may not produce enough bloodclotting factors or protein for the baby's needs, and these may have to be provided by infusions. Immaturity of the liver cells results in a build-up of bilirubin in the bloodstream and body tissues, causing a yellow colour (jaundice) in the baby. Phototherapy accelerates the detoxification and elimination of bilirubin through a process of photooxidation and photoisomerization.
- **Nutrition and metabolism, as well as maintenance of the correct fluid balance:** At birth, the LBW premature baby has little in the way of energy reserves. Yet he has high energy requirements. A baby's nutrition must not only be adequate for growth and development, but must also be appropriate for digestive capability. The exact amounts of nutrients (e.g. glucose and amino-acids), electrolytes, minerals (e.g. calcium), vitamins (e.g. A, D, E and K), hormones and water which need to be administered, are calculated on the basis of a baby's weight and gestation, and on results from blood and urine tests. To reduce the effort that babies have to put into feeding, and to provide nutrition for those too immature to suck, feeds are given by tube (gavage feeding), either nasogastrically, orogastrically, naso-jejunally or intravenously. Preterm babies born before 32-34 weeks' gestation do not have a well-developed cough reflex, protective laryngeal reflex (choking response), or coordinated swallowing pattern. Saliva therefore accumulates in the mouth and may be inhaled into the lungs without the choking or coughing which would normally prevent this from happening. These babies may need frequent gentle mouth suctioning to clear away mucus and saliva. Continuous aspiration of stomach contents is also carried out whenever there is evidence of an obstruction to the passage of food through the digestive system. Breast-feeding (if possible) plays a significant role in the care of premature and sick babies, because it is a tangible way in which a mother can care for and quite literally provide for her child. It gives the mother, who is likely to have feelings of being inadequate and superfluous, an unique role in the care of her child (Davis *et al.*, 1983 p.172). The mother's expressed breast milk is digested well by most preterm infants. The living cells and antibodies in human milk are not present in artificial formulas. They help to minimize the growth of bacteria in the baby's digestive system, reducing the chance of diseases such as gastroenteritis. Colostrum (i.e. the first milk of the mother) contains more minerals, protein and vitamin A, and rather less fat and sugar than normal breast milk. Colostrum is easy to digest and transfers important

immunities from the mother to the baby. The recording of weight gain or loss is an important indicator of health and nutritional requirements, and whether they are being met. Knowledge of a baby's weight forms the basis for calculations of fluid volumes, nutrient and mineral requirements, as well as drug and antibiotic dosages. Intakes are often adjusted on the basis of the overall appearance of the baby, as well as on the results of blood tests. Continued weight loss requires investigation and appropriate treatment.

Feeding is not only life-sustaining, but also has psychological, cultural and symbolic significance. When a mother is unable to feed her baby, it elicits negative feelings of concern, anxiety and frustration, and negative communication between mother and baby (Ramsey & Gisel, 1996 p.35 and Rosenthal & Sheppard, 1995 p.23). Nonnutritive sucking (NNS) may assist preterm infants to manage stressors encountered in the extrauterine world, to modulate their behaviour states, and to interact with the environment. Research indicates that NNS has a positive effect on oxygen tension, increases weight gain, and reduces the transition time from gavage to bottle-feedings (Pickler, Frankel, Walsh & Thompson, 1996 p.132). McBride and Danner (1987 p.110) suggest some guidelines to follow when implementing NNS. Stress signals should be observed carefully to see if the baby is relaxed. NNS is done approximately fifteen minutes before or after, or during tube feedings, on a finger, dummy or empty nipple.

The environment of the NICU is disagreeable. The parents may be overwhelmed by the experience of seeing their LBW premature infant in this unit. Its entire environment is difficult to absorb in initial visits, and not only must parents try to cope with the environment, but also with the experience of being around other sick children and their parents. They have to interpret complex medical information and terms and deal with various medical staff, and they have little or no privacy with their new infant.

Many parents may fear that they will bring infections into the hospital, which will jeopardize the health of their child. This may cause them to withdraw their involvement with the child altogether.

The focus of an early intervention programme should be to empower parents to be involved in their babies' care as soon as possible. Knowledge should be expanded and infant care and stimulation skills should be taught, to motivate parental involvement.



### 2.1.9 Emotional care of the LBW premature baby

In addition to important medical advances with regard to the care of LBW premature babies, research in the past 20 years has also investigated the possibility that at least some of the adverse psychological consequences of prematurity might be due to the lack of stimulation -or, perhaps more accurately, the inappropriateness of the stimulation- the preterm infant receives in a NICU (Lefrancois, 1995 p.185). Constant stimulation, pain and chaotic care in hospital prevent the infant from learning that each experience has a meaning. The infant does not learn to trust a caregiver (Bass, 1990 p.54).

Scarr-Salapatek and Williams (1973 p.99) compared two groups of premature babies. The first group was treated in the conventional manner; that is, the babies were kept in incubators, with a minimum of human contact. This treatment is based on the belief that premature babies are particularly susceptible to infection, and are highly vulnerable once infected. The second group was also kept in incubators, but these babies were taken out for feeding, and were talked to and fondled by their nurses. In addition, their incubators were decorated with mobiles, and in follow-up visits after they had left the hospital they were given numerous toys to take home. It is highly significant that after their first year these babies were heavier than the babies in the control group, and scored higher on developmental scales. Harrison (1985 p.73) summarizes 24 studies that have evaluated various forms of supplementary stimulation for preterm babies. Some investigated the effects of tactile stimulation (stroking and holding), others looked at auditory stimulation (taped recordings of the mother's voice), vestibular stimulation (waterbeds), gustatory stimulation (dummies) or, as in the study by Scarr-Salapatek and Williams (1973 p.100), multi-model stimulation. The studies support the conclusion that additional stimulation of preterm babies is beneficial to their development. Positive effects include greater weight gains, shorter hospital stays, greater responsiveness and higher developmental scores on various measures. The evidence is clear that the traditional hands-off treatment is not the best form of care for preterm babies.

It can be concluded that not only do parents need to be involved in the care of their babies, but also that the babies need to be cared for by their parents. This natural form of stimulation is important to ensure normal development after the baby's discharge from hospital.

### 2.1.10 Aftercare of the LBW premature baby following discharge from the NICU, as well as the emotional impact it may have on the parents

All children progressing from the helplessness of infancy to the independence of maturity, have certain physical needs (e.g. food, warmth and rest) without which life itself cannot continue, as well as certain psychological needs (e.g. affection and learning opportunities) without which an individual cannot attain contentment, self-reliance and good relationships with other people (Bremner, 1994 p.3). During the time spent in the NICU, the baby's needs are met mainly by the staff. When it is time for a LBW premature baby to be discharged from the NICU it may be a gratifying moment for the parents to start fulfilling their nurturing role to the fullest.

Discharge from a NICU is frequently viewed as a difficult and stressful task for the family and the hospital staff (Bernbaum & Hoffman-Williamson, 1992 p.3). The transition from hospital home can be more smooth and less stressful if an organized discharge planning process is implemented. Discharge planning is a method whereby the needs of the baby and family are identified and a care plan is designed and communicated to the appropriate people involved in providing care to the infant and family. The members of the discharge planning team may include a physician, a social worker, a physiotherapist, occupational therapist and/or a dietitian. (Bernbaum & Hoffman-Williamson, 1992 p.107).

The family's preparation for providing home care begins in the hospital when the medical stability of the infant has been insured. An informative teaching plan can provide the family with the information necessary to provide comprehensive care at home, in collaboration with their local primary physician and support services (Ensher & Clark, 1994 p.18, Bremner, 1994 p.7 and Einon, 1989 p.31). Parents should also learn or think about the following things while their baby is still in NICU:

- Learn to bath the baby. The parents should bath the baby on at least four or five occasions, or until they are comfortable with bathing their baby.
- Learn to feed the baby. The mother should try putting her hospitalized baby to the breast for at least one feeding a day, so that this will not be an entirely new experience. If the mother is bottle feeding, she should learn how to mix the baby's formula, learn any special feeding techniques, and find out how much formula the baby normally takes in a 24-hour period.
- Learn to change the baby's nappy. Parents should notice the normal frequency and consistency of the baby's stools so that constipation or diarrhoea can be recognized, notice how often the baby wets his nappy and observe the colour of his urine. If the baby passes less water at home or the colour of his urine is darker than normal, it may be a sign that he is not getting enough breast milk or formula. Parents should learn how to care for nappy rash.

- Learn to recognize the baby's normal breathing patterns. Parents should observe him many times during the day.
- Think carefully about circumcision. Approximately 2 out of every 100 infants experience complications from circumcision, including bleeding severely enough to require a transfusion, local or body-wide infection, or excessive scarring of the genitals resulting in deformity or the need for further surgery.

The following section consists of the most common questions (according to Moore, 1995 p.152) asked by parents in the first few months after their LBW premature baby has been discharged. Some answers to these questions can be included in an information booklet:

- What type of milk is best for my baby?
- How do I know my baby is getting enough milk?
- Can a preterm baby get too fat?
- Why does he make noises when he feeds?
- When will I be able to stop supplementing the breast feeds with formula?
- What should I do if I think my milk is drying up?
- What should I do if my baby refuses a feed?
- When should a preterm baby start on solid foods?
- How warm should my home be?
- How can I tell if he is too hot or too cold?
- What can my baby do?
- What should he sleep in?
- How much sleep does he need?
- What position should he sleep in?
- Why does he cry so much?
- Does he need any vitamin supplements?
- What immunizations should he have?
- When should I call a doctor?

After the discharge of a LBW premature infant, the family's stressors change. During the hospitalization, the stressors on the family are overt and dramatic. When the child is home, the stressors change and become more subtle, but nevertheless intrude into the family dynamics.

According to Bremner (1994 p.47), parents may also go through stages of emotional adjustment, namely euphoria, despair and acceptance. Euphoria occurs immediately after the infant comes home from the hospital. The family is thrilled to have the child at home and the

entire family is usually together. Once the infant is home, families start to worry about how their child is going to develop, about infections and exposure to other people, and about the general vulnerability of their child. Families of infants with ongoing home medical care needs often experience exhaustion from caring for the fragile high-risk infant. The severity of potential medical and developmental handicaps becomes clearer. The infant is integrated into the family, and normalization of the household occurs during the acceptance stage.

Common anxieties which parents may feel when taking their baby home are described by Bernbaum and Hoffman-Williamson (1992 p.40-43). Marital discord is possible. Often, the ongoing stress of caring for a child with a medical condition can cause strain on the relationship between the parents. This can be caused by the limited time they have for each other, the new roles they have to take on, financial stressors, disorganized life-styles, chronic worry about their infant's medical and developmental situation, exhaustion, lack of privacy, differing perceptions of their child's needs and problems, differing coping styles, and interference from the extended family. Bonding and attachment may also cause parents anxiety. Many mothers express the concern that their premature delivery and early separation from their infant may lead to a disruption in the process of bonding with their baby.

Financial problems can also make parents anxious after the baby has been discharged from hospital. Inadequate or lack of medical coverage needs to be reported to a social worker, who can be of assistance, as a child's discharge can be delayed because of insufficient home care funds. Many families experience extensive financial losses during and after the hospitalization of their infant (Hanline & Deppe, 1990 p.15). These losses stretch beyond the normal expenses of hospitalization (transportation costs, phone calls, baby-sitters, et cetera), and may include the loss of a job, a loss of income and the loss of possessions due to extensive hospital bills and expenses.

Having a child needing ongoing medical home care in the household may create a sense of isolation for the family. This isolation may be caused by reduced contact with family and friends to prevent infections, the curtailment of normal activities because of the restrictions posed by the child, friends and relatives' discomfort about interacting with the child, the parents' self-consciousness about the child's appearance, and reduced opportunities to spend time away from the infant (because of parents' exhaustion, which reduces the desire to go out, the inability to find competent baby-sitters, and fear of the child's falling ill while the parents are out).

From an educational psychological perspective, intervention can also provide support for parents by means of parent support groups. In these groups parents can share their feelings

and their experiences and practices in dealing with everyday problems. The premature birth of an infant, the impact of separation on the parent-child relationship, and the emotional response of parents, according to McCluskey-Fawcett *et al.* (1992 p.148) as well as Miles and Holditch-Davis (1997 p.254), represent a life crisis. Starting with the baby's birth and followed by care in the NICU, the baby's discharge, and every subsequent developmental phase, everyday is a challenge. Parents experience emotional reactions which will now be discussed briefly.

## **2.2 EMOTIONAL REACTIONS WHICH PARENTS EXPERIENCE AFTER THE BIRTH OF THEIR LBW PREMATURE BABIES**

### **2.2.1 Introduction**

In the normal pregnancy period, the last trimester is a time filled with great expectations and with physical and emotional effort preparing for the birth. It is a time when the unborn baby becomes very real to the parents, and the couple slowly and gradually moves toward becoming parents. This is most dramatic for first-time parents, but occurs to some extent with every pregnancy. The unexpected arrival of a preterm baby deprives the parents of this gradual period of adjustment and preparation.

Parents of LBW premature babies often have feelings of resentment or guilt about not having everything running smoothly, being cheated out of their preparation time and having this happening to them (Bernbaum & Hoffman-Williamson, 1992 p.38). The guilt and anxiety may result in feelings of failure and insecurity about parenting skills. According to Miles and Holditch-Davis (1997 p.256), the most commonly-reported emotional responses are anxiety, helplessness and loss of control, and fear, uncertainty and worry about the outcome for their infant. Parents also commonly report guilt and shame, depression and sadness, and a sense of failure and disappointment.

Few studies (Meyer, Coll & Seifer *et al.*, 1995 p.414) focus on positive feelings, but several report feelings such as amazement, confidence, love and hope.

### **2.2.2 The stages of emotional reactions**

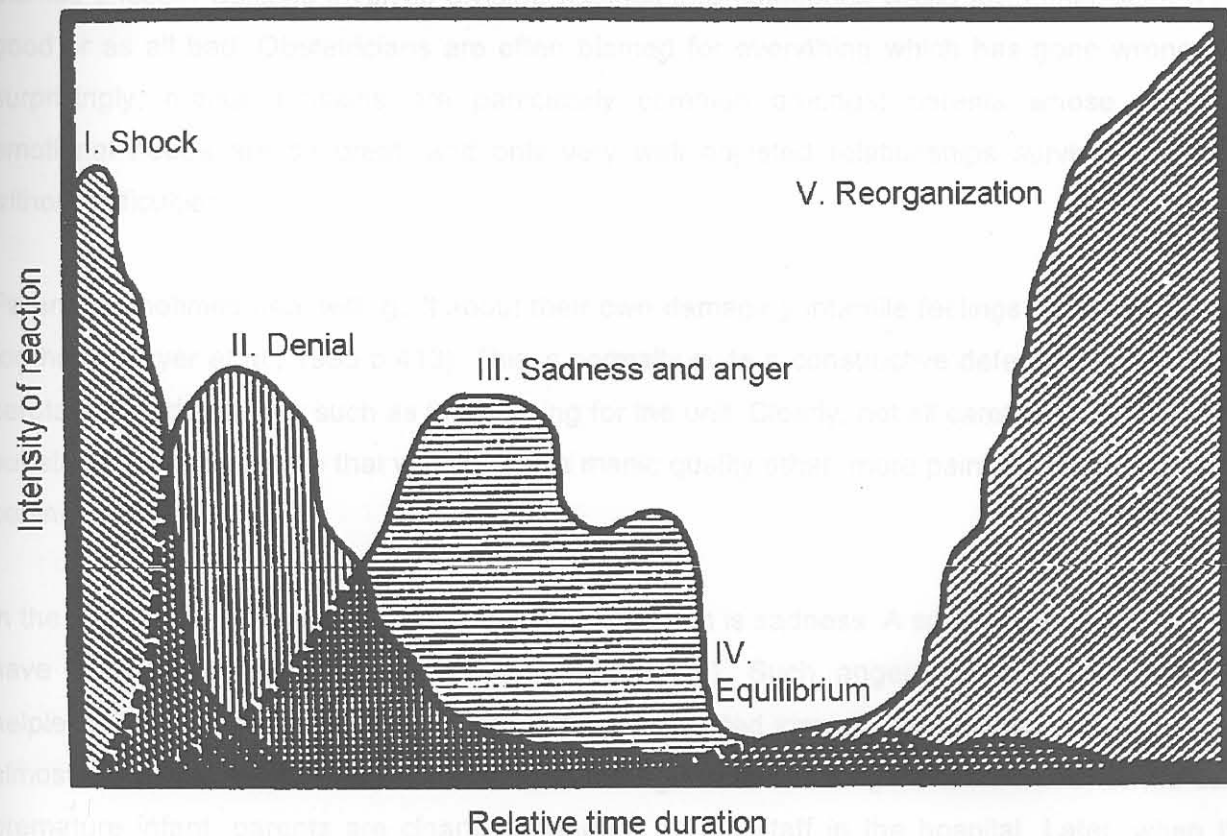
McCluskey-Fawcett *et al.* (1992 p.154) and Miles and Holditch-Davis (1997 p.255-257) mention that, despite wide variations among premature babies' conditions and the backgrounds of their parents, a number of surprisingly similar themes appear. Generally, parents go through identifiable stages of emotional reactions, shown in Figure 2, which is a generalization of the

complex reactions of individual parents (Webster & Ward, 1993 p.193). Although the amount of time which individual parents need to deal with the issues of a specific stage varies, the sequence of stages reflects the course of most parents' reactions to their LBW premature infant.

The first stage is shock. This early period involves irrational behaviour characterized by much crying, feelings of helplessness and, occasionally, an urge to flee. Both parents may be horrified at the appearance of their baby. All parents of preterm infants (according to Bernbaum & Hoffman-Williamson, 1992 p.38) struggle with feelings of helplessness because they cannot help their ill child. These feelings often immobilize parents, and they are unable to become involved with their child and caring for him.

When faced by the possibility of handicap, the reaction of many parents is to withdraw from medical services altogether (Bass, 1990 p.55 and Anastasiow & Havel, 1993 p.86). They feel let down by the staff because they could not prevent the handicap. The parents also experience frustration and sadness when seeing other parents with normal children.

**Figure 2: Stages of emotional reactions of parents of LBW premature babies**



The educational psychologist may choose to apply two principles during the first phase of shock, namely, to help the parents to face the normality of their reactions, and to identify and reflect specific emotions (Warden, 1991 p.66). According to Bass (1990 p.55), parents need constant reassurance and help in dealing with medical personnel and treatment for the child. If the parents are young or have not successfully completed their own development, they may need special help learning and adjusting to the nurturing skills they will need. They need to understand the child's fear of pain, anxiety about hospital procedures, and needs for security.

During the second stage, which is denial, each parent either wishes to be free, or denies the impact of the situation. The intensity of the denial varies considerably, and denial and avoidance may take on several forms. Some parents sometimes do not name their babies, avoiding attachment in case of loss. Other parents may begin saying that they are too busy to visit their baby. A common phenomenon is that parents ask questions about their babies and are then unable to take in the answers, so that the staff has to be infinitely patient in repeating simple information. Some parents deal with their feelings by transferring them to other things or events.

Projection and splitting are complex defense mechanisms (Gersie, 1991 p.13). Projection consists of blaming other things and people for those things for which one unconsciously blames oneself. Splitting involves dividing feelings into categories which are either seen as all good or as all bad. Obstetricians are often blamed for everything which has gone wrong. Not surprisingly, marital tensions are particularly common amongst parents whose individual emotional needs are so great, and only very well adjusted relationships survive the stress without difficulties.

Parents sometimes deal with guilt about their own damaging infantile feelings by compensating for them (Meyer *et al.*, 1995 p.413). This is normally quite a constructive defense, as it involves caretaking and activities such as fund-raising for the unit. Clearly, not all caretaking is defensive, but staff should be aware that when it has a manic quality other, more painful, feelings might be behind it.

In the third stage, the most common emotional reaction is sadness. A smaller number of parents have feelings of anger (Meyer *et al.*, 1995 p.414). Such anger stems from feelings of helplessness and powerlessness. It can either be directed inwardly, at oneself, or outwardly, at almost anyone else, including medical staff. During the critical stage after the birth of the LBW premature infant, parents are clearly dependent on the staff in the hospital. Later, when the situation is more stable and they would like to be involved in their baby's care, they may find that some staff members resist giving up part of the caretaking role. The natural anxiety of most new

parents is heightened in these circumstances in which they have no clearly-defined role, and in which highly-trained personnel necessarily undertake the bulk of their baby's care. Here the educational psychologist may want to focus on parental empowerment and/or problem-solving techniques, to ensure that parents realize that they do have some control; they are not as helpless as they feel.

Parents often see staff as rivals, because they feel that their baby has been "taken over" by them (Gersie, 1991 p.14). They feel that the staff spend more time with their baby than they do, they feed him, they understand the technology involved and they seem to be more confident with the baby. Their guilt and anxiety may result in feelings of failure and insecurity and may lead to an identity crisis about their parenting skills (Liebenberg, 1993 p.33). When parents experience such feelings, they need not only to be able to express their feelings to another person, but also to be supported in small, practical ways. Icons, lucky charms and prayers have different meanings to different people, and are often extremely important to parents to give them a feeling of hope and security.

In most instances, mothers are hesitant about becoming attached to their babies (Webster & Ward, 1993 p.194). The feeling of not being able to handle everything they need to can make parents feel very guilty. A distorted form of this guilt can be over-protectiveness of the child. It is as if these parents fear that if they are not overly careful they could be the cause of harm to their children. It is also possible that over-protectiveness can be a characteristic of parents whose guilt stems from repressed anger and resentment.

The mothers' own physical problems (e.g. bleeding or hypertension) may make it difficult for them to visit the baby as often as they would like to. As a result, they may feel guilty or resentful that the medical staff doesn't make it easier for them to have contact with their baby. Another problem may occur when the mother and baby are in separate hospitals. Medical staff needs to be aware of the distress of the mother whose baby is far away in another hospital, as feelings of helplessness, remoteness and depression are exacerbated in this situation. The dilemma of whether to remain in hospital or return home while separated from the baby must also be addressed. It is easy to underestimate the cost of travelling to and from the hospital. These problems can sometimes be solved by advice from the unit's social worker. With everyone's attention focussed on the baby, it is easy to forget the rest of the family's needs during this period. While the mother is in hospital, the father will have many additional responsibilities and the other children in the family also have special needs.



The fourth stage is that of equilibrium. Parents now experience a gradual decline of both their intense emotional reactions and their anxiety (Webster & Ward, 1993 p.193). As their feelings of emotional upset lessen, they note an increased ease in their situation and confidence in their ability to care for the baby. Some parents reach equilibrium within a few weeks after the birth, whereas others may take many months.

In the final stage, that of reorganization, parents actively begin to deal with their responsibility with regard to their children's problems (Bass, 1990 p.55). Some mothers have to reassure themselves that the baby's problems are not the result of anything they have done. Positive long-term acceptance of the child involves the parents' mutual support throughout the time after birth. A lack of opportunity to discuss the baby's diagnosis can create a situation in which the parents feel overwhelmed, and unable to gauge the reality of their baby's situation. Parents learn to care for the infant. As they gain confidence, they make a clear decision to care for the child at home. Adaptation may take much longer because parents may be afraid of making a mistake. Parents may also be upset if the infant is not developing properly. Thus, long-term support from the educational psychologist is recommended (Warden, 1991 p.34).

Knowledge about the usual course of parents' reactions should be taken into account when planning interventions. For example, a physician who knows about the disorganization which parents experience during the stages of shock and denial will realize that information about the child's condition and progress may have to be repeated many times. Another factor to be taken into account in planning interventions is the correct identification of which stage of crisis reaction a parent is experiencing at a given time.

### **2.2.3 The emotional dynamics within the family**

In the early days after the birth of the LBW premature baby, parents can be very upset and show feelings of sadness, anger and impatience, or over-protective behaviour, which are difficult for their other children to understand. One of the biggest problems that these parents have, according to Roman *et al.* (1995 p.386), is that of trying to keep a balance between their own grief and anxiety and the need to appear calm in front of their children.

A sibling may feel threatened by the birth of a new baby, particularly when he/she was previously an only child. Until now, he/she has been the focus of everyone's attention. This attention now suddenly shifts. The older child's needs, routines and belongings are now of secondary importance in comparison to the more immediate demands of the new baby. According to Moore (1995 p.76), the age and personality of the child, the degree of

preparedness for the baby, and the sensitivity of the parents to his/her feelings, will all affect his/her adaptation to the new situation.

Although a visit to the NICU can be beneficial for the older children (helping them to become aware of the new arrival, and preventing distress and anxiety about the baby who has not come home), it can also be frightening, and needs to be dealt with carefully (Warden, 1991 p.45). Children of pre-school age may imagine that all actions and events are somehow related to themselves, and may therefore feel responsible for the condition of the new baby. These feelings of guilt may lead to various behavioural patterns (e.g. being extremely good or being uncontrolled). Siblings may also be anxious that the baby may die. They may therefore revert to more immature behaviour and habits (e.g. returning to breast-feeding). These are all signs that a child needs extra reassurance and empathy, rather than any punishment for their behaviour (Schaefer & Millman, 1983 p.74).

In studies done by Blanchard (1991 p.82), many parents of LBW premature infants remarked that their older children served as an encouragement to them, cheering them up and making them laugh again in the midst of their anxiety. Meeting their other children's needs helped the parents to draw additional support. The educational psychologist can make use of this natural support system when planning an intervention programme. Roman *et al.* (1995 p.386) state that the availability of social support has been shown to influence the adaptation of mothers to caring for their preterm infants.

When parents start to be actively involved in taking responsibility for the development of their infant, the reorganization phase has been reached. Parent-infant interactions, as prerequisite for infant stimulation with the view of enhancing normal child development, will be discussed in the following section.

## **2.3 PARENT-INFANT INTERACTION**

### **2.3.1 The process of bonding and attachment**

The term "bonding" has been widely used to designate the process whereby mothers form an emotional relationship with their baby (Bernbaum & Hoffman-Williamson, 1992 p.41, and Lefrancois, 1995 p.262). Bonding takes place immediately after birth through physical closeness, including skin-to-skin contact, nursing, closeness to the mother's heartbeat and eye contact. More specifically, it has come to refer to certain rapid, irreversible changes said to take place in the mother within a short period following birth, during which prolonged contact between

mother and baby must occur if maternal feelings are to be properly mobilized. Whether the baby does act as a stimulus for the mother and elicit her mothering and caretaking behaviours can, however, be a contentious question. A lack of contact, caused by separation during this crucial period, is said to interfere with the formation of this bond, leading to inadequate mothering. This causes the mother to feel less confident in her parenting skills (Kennell & Klaus, 1984 p.276-279). According to Schaffer (1990 p.36) and Etaugh and Rathus (1995 p.145), however, it is an oversimplification to assume that a lack of early, extended contact after birth will produce these effects. The establishment of the mother's bond with her baby is a highly complex, gradual and ever-changing process, especially for the mothers of LBW premature babies. There is no evidence, according to Schaffer (1990 p.61), to suggest that the rate of the bonding process predicts the quality of the subsequent relationship between mother and child. It has, however, been proven (Abidin, 1980 p.72) that a disproportionately high incidence of conditions such as LBW and neonatal complications tend to have occurred in cases of abuse and neglect, and that early separation from the mother is more likely to interrupt the process of mother-infant bonding. Abidin maintains that any threat to the integrity of the mother-infant bond increases the likelihood of problems in the later emotional well-being of the child. The prevention of an unsatisfactory bonding process is therefore likely to be rather more complex than is suggested by single-factor explanations.

Modern medical practice and the separation of baby and mother in cases where the baby is premature or of LBW may definitely affect the bonding process (O'Callaghan *et al.*, 1996 p.917). In such cases, the baby is placed in an incubator and given special medical attention. To avoid infections or other medical complications, the infant has less contact with his parents and caregivers, and usually remains in the NICU beyond the time the mother goes home. These babies have a greater chance of suffering from a variety of problems, such as delayed development, emotional disturbances and learning disabilities (Kennell & Klaus, 1984 p.276-279). While it is probably not the case that early separation alone, as Abidin says (1980 p.10), accounts for these problems, it is most likely that it contributes to them. Many parents of LBW premature babies report that they feel distant from their babies when the baby finally goes home. This is true even in cases where the parents have often visited the baby in hospital.

The term *attachment* (as a broader concept than bonding), has traditionally been used to refer to the child's part of the mother-child relationship, where the term *bonding* has come to be used for the parent's part (Heidt-Kozisek, Pipp-Siegel, Easterbrooks & Harman, 1997 p.311 and Cunningham, 1993 p.82). It may refer to the overall quality of an infant-parent relationship. Attachment has to be learned, in the sense that it is based on experiences with another person. A familiarization process has to take place after birth. There is evidence, according to Schaffer,

(1990 p.60), that familiarization occurs very quickly, and infants of two or three months old are capable of distinguishing familiar from unfamiliar people. However, recognition of the mother does not in itself signify that an attachment with her has been formed. Studies (Etaugh & Rathus, 1995 p.605; Kennell & Klaus, 1984 p.276-279) show that by the second half-year (with individual variations), separation from the mother becomes a psychologically meaningful and emotionally disturbing event, as a result of which changes in the mother figure are no longer tolerated. A definite attachment occurs. Attachment develops over the first two years of life and is based on reciprocal encounters involving empathy, support and sensitivity (Bremner, 1994 p.213). Disruptions in the attachment process (e.g. having a LBW premature baby) may be caused by (Cooper, 1990 p.87):

- The mother's feelings of having failed at having a normal delivery.
- The fragile, vulnerable appearance of the LBW premature infant.
- Anticipatory grief as a result of parents' preparation for the possible loss of their child whose life is in jeopardy, which may create withdrawal from the relationship with the child.
- The lack of responsiveness and interaction of a preterm infant.
- The ongoing question of how the infant is going to develop, which enhances feelings that of the infant is different, sick and special.

#### Activity 10

Cooper (1991 p.88) also states that it is important to focus on the interaction between the baby and the mother *per se*, rather than on the individuals in isolation, in order to prevent disruptions in the attachment process. He continues that it is a high priority to bring the baby to the mother as soon as possible after birth, so that both parents can see him and observe his normal features as well as possible abnormalities. Any period of delay, during which the parents may suspect or know that their baby may have a problem, but are unable to see him, heightens their anxiety tremendously and allows their imaginations to run wild. According to Davis *et al.* (1983 p.181), whatever is said to the parents initially is usually indelibly imprinted on their minds. This places a great responsibility on the shoulders of everyone caring for the mother and baby, because the words used in discussing the baby with the mother may affect her initial attachment process.

### 2.3.2 Factors influencing parent-baby interaction

This section outlines some of the characteristics of an infant which may influence the interaction between him and the parent (e.g. temperament, gender and birth order). Some of the characteristics of the parent are also discussed briefly (e.g. attitudes and perceptions).

(1) Infant temperament

According to Schaffer (1996 p.79), the infant's behaviour influences the parent's behaviour as much as the parent's past experiences do. If just this fact can be communicated to parents, there will surely be less desperate searches for the perfect way to bring up children and less guilt associated with perceived failure, and in their place far more freedom to perceive the infant as he really is.

According to Chapieski and Evankovich (1997 p.222), the term "temperament" refers to individual differences in the infant's expressions of arousal and emotion. "Temperament" has been used to describe neurophysiological characteristics such as self-regulation, reactivity and modulation (Goldsmith, 1990 p.507). "Temperament" has also been used to refer to a fairly persistent psychological trait that is believed to organize the infant's or child's approach to cognitive tasks and to affect the quality of the relationship with caregivers (Schraeder & Tobey, 1989 p.120). Temperament is characterized in terms of specific traits and behaviours, as well as global diagnostic categories. Chapieski and Evankovich (1997 p.222) mention nine specific dimensions of temperament that are consistently assessed in studies of premature infants:

1. Activity level (motor activity)
2. Rhythmicity (pattern of feeding et cetera)
3. Approach/withdrawal (response to a new stimulus)
4. Adaptability
5. Intensity
6. Threshold of responsiveness
7. Quality of mood
8. Distractibility
9. Attention span and persistence

Therefore the relationships between infants and parents affect the variability of states related to stimulation. Certain infants may be easy to arouse, others not. Certain infants may be easily soothed, while others may take a long time to respond. Infants who respond to any type of stimulation with rapid changes of state may be highly responsive to stimulation generally, and may be easily over-stimulated. Feelings of competence as a parent must surely be related to these variables.

(2) Gender of the infant

When parents have hoped and prepared for a child of a particular gender, but given birth to one of the opposite gender, the relationship between that infant and the parents may be affected.

Cooper (1991 p.27) says that the data on sex differences in infant behaviour are contradictory. Early differences related to gender are moderate, but not enough to be categorized according to magnitude.

(3) The auditory and communicative capabilities of the infant

The infant's first cry may provide the mother with a sense of well-being and assurance that her infant is well. Crying later serves a communicative function, signalling discomfort.

Zeskind and Marshall (1988 p.193) conducted a study designed to determine whether increases in the pitch of infant crying were related to how urgent, arousing, distressing or sick the cries were perceived to be, even when all the cries were in response to the same eliciting stimulus. They hypothesize that the increased adult arousal and distress which is elicited by higher-pitched crying sounds could contribute to the development of abuse and neglect.

Keller and Scholmerich (1987 p.66) classify infant vocalizations into four types, according to their affective expression. They demonstrate that infants produce different kinds of vocalizations from birth. Different interactional states lead to different rates of vocalization. Positive vocalizations occur most frequently during eye contact, and parents respond to them with verbal or vocal reactions. Physiological, negative and effort vocalization result primarily in tactile and vestibular behaviours with concomitant verbalizing by the caregiver. Infants who express more positive vocalizations, receive more verbal feedback. Interaction between infant and parent is determined by the communicative nature of the infant, and the way in which the parent responds.

(4) Visual capabilities of the infant

Infants appear to be inherently prepared for visual responsiveness within a few hours of birth. In the first hours after birth, infants have shown visual distinction, and a preference for human facial configurations as opposed to non-facial configurations (Schaffer, 1996 p.101). Periods of visual attentiveness in infants are very important, especially in the first few months of life when the visual field is limited due to the infant's immobility and extended periods of sleep. The extent

of the infant's visual responsiveness depends on the amount of time spent in an alert state, and those infants who are frequently in an alert state are more capable of visual pursuit than other infants (Abidin, 1992 p.410).

The infant helps regulate stimulation within the infant-parent relationship mainly through the control of gaze. The infant's gaze initiates and terminates interaction as he engages in eye contact or turns away.

#### (5) The infant's capacity for emotional response

Brambring *et al.* (1996 p.65) conclude that infants are neither indifferent to the emotional experiences of others, nor incapable of understanding them. This conclusion is based on the results of studies of three areas: reactive crying in newborn infants, affective synchrony in mother-infant play and the onset of social referencing in infants. Studies have found that two- to four-day old infants produce significantly more reactive crying than those who are five-months old. In parent-infant play, which begins to occur regularly at about two to three months, positive *affective attunement* engages the infant emotionally, and may also contribute to a resonant emotional response in the infant.

According to Heidt-Kozisek *et al.* (1997 p.311), a comparative study between full-term and premature infants shows that premature infants are less evidently "social partners", tending to be less organized and alert, to communicate needs less clearly, and to show greater immaturity in signalling and responding to social stimuli than full-term infants. Perhaps as a result of the preterm infant's responses to social stimuli, infant-caregiving relationships have been shown to be significantly different for preterm and full-term infants. Mothers of preterm infants are more active and directive in interactions with their infants than mothers of term infants, and preterm infants are less active in infant-caregiving interactions than term infants.

It is clear that the infant possesses many characteristics and capabilities which have a great influence on the relationship between infant and caregiver. These responses also shape the responses of the caregiver, to set up a mutual feedback system.

#### (6) The attitudes and perceptions of the parent

Usually the first contact between a mother and a LBW premature infant after birth is not satisfying, and subsequent opportunities for developing the relationship often depend on the convenience of the hospital staff, rather than on the needs of the mother or the infant. This may

result in negative affective behaviour on the mother's behalf (cannot touch or hold her baby), which may lead to a negative caretaking attitude (a feeling of helplessness) and a negative mood, influencing the pattern of interaction adversely.

## 1.1 Introduction

The attitudes, perceptions and personal histories of the parents are considered to be of vital importance to their ability to provide an environment which is conducive to a relationship that promotes optimal affective development, according to Cooper (1991 p.34). He regards this area as a very important target for early intervention in promoting affective development.

## 1.2 Developmental Theory and Theory of Mind

Research findings (Mullin, Quigley & Glanville, 1994 p.169) indicate that self-esteem may be linked to general well-being, both physical and psychological. These findings also indicate that self-esteem may be a critical variable in effective parenting.

## 1.3 Parental Beliefs

### (7) The behaviour of the parent

#### 1.3.1 Maternal facial expression

Gusella, Muir and Tronick (1988 p.1120) suggest that maternal facial expression is important in generating positive infant attention. When the mother is affectively positive and responsive, with an animated or a smiling face, she elicits smiling from the infant. Conversely, a sad or angry face seems to elicit a negative response. They conclude that the infant's affective responses are social by nature, showing great sensitivity to changes in the quality of the mother's affective expressions.

#### 1.3.2 Maternal vocalisation

Haviland and Lelwica (1987 p.103) report that infants of ten weeks and older can respond differentially to three expressions of maternal affect when the presentation is simultaneously facial and vocal. These results are supported by a study (Termine & Izard, 1988 p.227) in which infants were found to express more joy and to look longer at their mothers when the mothers were expressing joy. In contrast, infants showed more sadness, anger and gaze aversion when their mothers were expressing sadness.

When there is a good social relationship between mother and infant, positive emotions are generated. Mothers experience growing self-esteem, and infants develop a sense of competence. When the mother feels good about herself, it is likely that she will be more sensitive to her infant, and less likely to either under- or over-control the relationship.

There is evidence that the quality of the interaction between mothers and their 18-24 month old infants differs from that between mothers and their full-term infants. The level of interaction with preterm infants is generally lower. (Grewal, 1990 p 5)