

## Chapter 2 - Early Communication Impairment

### Chapter Overview

Chapter 2 begins with a discussion of established risk and at risk categories for early intervention services. The established risk discussion includes examples of etiologies associated with developmental delay and the at-risk discussion includes biological and environmental risk factors for developmental delay. Prematurity as a risk factor is discussed in depth with risk factors, environment of the neonatal intensive care unit, and potential impact of prematurity on aspects of infant development.

### Key Word Definitions:

**Anemia** – insufficient red blood cells. Occurs in almost all preterm infants within first two months of life. (p. 56)

**Apgar Scores** – Assessment made of infant at one minute and again at five minutes of color, heart rate, respiratory rate, muscle tone, and reflex irritability that yields a score between 0 and 10 indicating the infant's readiness for extrauterine environment. (p. 59)

**Apnea** –cessation of breathing for a period of at least 20 seconds due to immaturity and/or suppression of the central respiratory drive located in the brainstem. (p. 53)

**At Risk** – experience risk factor(s) that may result in development delay including any factor that interferes with child's ability to interact typically with the environment and develop typically. (p. 25).

**Autism Spectrum Disorder (ASD)** – heterogenous group disorders with a common core set of neurological dysfunction that manifest in deficits in social communication and the presence of ritualistic and repetitive behaviors that begin during early development. (p. 32)

**Bronchopulmonary dysplasia (BPD)** - chronic lung disease marked by scarring and inflammation in the lungs common in very preterm infants as a result of long-term oxygen dependence. (p.54)

**Cerebral palsy (CP)** – group of chronic but non-progressive brain disorders that impact movement, muscle tone, and muscle coordination. (p. 37)

**Communication impairment (CI)** – a disability characterized by difficulty sending, receiving, processing, comprehending concepts of verbal and nonverbal communication. (p. 23) \* Please look at wording on this page as they use “or” verbal and nonverbal communication not “of”. I think it should be “of” but please let me know.

**Continuous positive airway pressure (CPAP)** – technique to deliver slightly pressurized air through nose to help keep airway open. (p. 52)

**Deafness** –technically defined as profound hearing loss of 90dB or more but functional deafness is more dependent upon how an individual functions and can be defined as relying more on vision than hearing to learn language and garner information from the environment. (p. 39)

**Established Risk** – Due to presence of some biological condition, there is a strong likelihood of developmental disability due to a strong relationship between the condition and developmental delay. (p. 25)

**Fetal Alcohol Spectrum Disorder (FASD)** – condition resulting from prenatal exposure to heavy maternal drinking including episodic or “binge” drinking during pregnancy and includes a range of disorders from milder Fetal Alcohol Effects (FAE) to the more severe Fetal Alcohol Syndrome (FAS). (p. 44)

**Intellectual Disability (ID)** deficit in general intellectual functioning with onset during the developmental period and diagnosed through cognitive testing and testing of adaptive skills. (p. 26)

**Intraventricular Hemorrhage (IVH)** – most common neonatal intracranial bleed or hemorrhage with most resolving without long term effects but severe cases causing ventricles to fill and put pressure on the brain causing lasting damage. (p. 54)

**Jaundice** – yellowish color to eye and skin due to increased levels of bilirubin that is more common in preterm infants than in full term infants as a result of immature liver function. (p. 56)

**Legal Blindness** – defined as visual acuity with optimal correction in best eye of 20/200 or a visual field of less than 20 degrees.

**Low Birth Weight** – an infant born at less than 2500 grams or 5.5 pounds. (p. 49)

**Maltreatment** – physical and mental injury, sexual abuse, negligent treatment, or maltreatment of a child less than 18 years of age perpetrated by a person responsible for the child’s welfare under circumstances that child’s health or welfare is harmed or threatened. (p. 43)

**Morbidity** – illness or disability; more likely in preterm infants born before 32 weeks. (p. 46)

**Necrotizing Enterocolitis (NEC)** – serious intestinal problem characterized by temporary or permanent death to intestinal tissue more common in preterm infants of very low birth weight. (p. 57)

**Neglect** - defined as failure to provide the basic needs of a child. (p. 44)

**Patent Ductus Arteriosus (PDA)** – congenital heart defect with abnormal circulation of blood between two arteries near the heart because the ductus arteriosus remains open after birth. More likely to occur in preterm infants due to hypoxia resulting in insufficient bradykinin, a chemical that constricts the ductus arteriosus released once an infant begins to breathe with the lungs after birth. (p. 54)

**Preterm** – born before 37 weeks gestation. (p. 36)

**Respiratory Distress Syndrome (RDS)** – lack of lung development primarily present in preterm infants due to lack of surfactant presents as difficulty breathing, bluish coloring, or brief stoppage of breathing. (p. 52)

**Retinopathy of Prematurity (ROP)** – Abnormal growth of blood vessels in the eye that typically resolves itself with little to no permanent loss of vision. (p. 55)

**Total Blindness** – Complete lack of form and visual light perception with only being able to tell light from dark. (p. 40)

**Total Parenteral Nutrition** – a method of feeding very low birth weight and very fragile infants that bypasses the gastrointestinal track by providing nutrition through IV. (p. 56)

## Lecture Outlines

- I. Late Language Emergence (LLE)
  - A. Defined as late talking – most of those mature out of their difficulties
  - B. 15% of children ages 3-17 years of age have developmental disability with communication delays and feeding/swallowing problems are the most prevalent symptoms in young children
  - C. LLE is a hallmark characteristic of language impairment
  - D. Factors that may contribute to LLE include low birth weight and prematurity
    - i. Born earlier than 37 weeks or less than 85% of their optimum birth weight makes a child almost twice the risk for LLE compared with optimal birthweight and full term infants
    - ii. Late talkers do not have elevated rates of either fetal or birth complications
  - E. Males are almost three times the risk for LLE compared with females
  - F. Family history of LLE increases likelihood of LLE
  - G. Maternal Educational level not as positively associated with LLE in young children as with language impairment in school-age children.
  - H. Predictors among 24-month-old children of later language impairment include programs in gross and fine motor skills, poor adaptive and psychosocial development, and negative temperament or mood quality
  - I. Because of the variability in development in typically developing children and because many late talkers catch up, often a child is not referred by a professional for a communication evaluation until between 24 and 30 months
    - i. Begin to talk about risk for developing CI with risk defined as exposure to biological and environmental conditions that can increase the likelihood of negative developmental outcomes
    - ii. Biological risk factors included genetic or gestational disorder, prematurity, and low birth weight
    - iii. Environmental risk factors may include low socioeconomic status (SES), parental psychopathology, poor nutrition, poor health services, and abuse.
- II. Established Risk – condition that makes it likely that a developmental disability will be present; one category defined in PL 99-457 to be served by Early Intervention (EI) programs
  - A. Intellectual Disability – example of established risk; diagnosed by IQ of less than 70, and deficits in adaptive function.
    - i. IQ is gross estimate of function
    - ii. Newer movement to examine impact of IQ on conceptual domain, social domain, and practical domain
    - iii. See Table 2.2 for relationship between IQ score and domains of function
    - iv. Table 2.3 includes some causes of ID which vary considerably from

- B. Fragile X – leading biological cause of ID in males
  - i. Deficits include reciprocity, play skills, gestures, with relative strengths in vocal communication
  - ii. Genetic disorder caused by a mutation to a gene on the X chromosome responsible for a protein important in brain function (FMR1) gene
  - iii. Can be present in females but more severe in males
  - iv. Hahn et al. (2014) reported that maternal use of gestures in early childhood (24-36 months) is positively related to expressive language in kids with FXS in early school age.
- C. Prader Willi Syndrome – majority of individuals with Prader-Willi will exhibit ID with 40% of those with PWS having mild ID
  - i. Rare genetic disorder cause by gene deletion on chromosome 15
  - ii. Low muscle tone, short stature, cognitive disability, problem behavior, incomplete sexual development, an chronic feelings of hunger
  - iii. Poor speech sound development, poor oral motor skills, and poor phonological skills
  - iv. Delayed language, shorter utterances than TD children, and poor narrative skills which may result for linear sequencing difficulties
- D. Autism Spectrum Disorder (ASD) – set of heterogeneous disorders characterized by pervasive impairment in social communication paired with the presence of ritualistic and repetitive behaviors.
  - i. \*\*\*\* Note for the author – It is DSM-5 not DSM-V as indicated on page 32.
  - ii. Behaviors present in early childhood but may not be fully manifested until later when social demands exceed a child’s abilities.
  - iii. Deficits in social communication and presence of ritualistic and repetitive behaviors limit child’s everyday functioning.
  - iv. Early Identification is a point of emphasis in research in an effort to get children into services at an earlier age
    - 1. Early signs may include decrease motor gestures, excessive mouthing of objects at one year of age, aversion to touch, extreme irritability, lack of facial expression, cries that have less variation and more dys-phonation, fixation on objects, diminished eye contact with people, and less orientation when name is called
    - 2. Communication is often primary area of concern for families with still about 20-30% of those diagnosed with ASD remaining nonverbal.
  - v. Causes seem to be varied and numerous but general consensus of a genetic link most likely found on the X chromosome. Structure and neurological function are different in brains of children with ASD than with TD children.
  - vi. Regressive ASD occurs in percentage of individuals with ASD and involves loss of skills that on average begins around 28 months of age and is often accompanied ultimately by seizure disorder and intellectual disability

- vii. Discussion of alternative therapies and the role of the SLP in counseling parents on evaluating any alternative therapy. Suggest that any therapy be evaluated for the following: scientific evidence-based benefits, potential health risk, financial cost, and time commitment.

E. Cerebral Palsy (CP) – group of chronic brain disorders affective movement, muscle tone, and muscle coordination

- i. Characteristics include spasticity or muscle tightness, involuntary movement, disturbance in mobility, difficulty in swallowing, and problems with both speech and language
- ii. Large percentage but not all have co-morbid intellectual disability; percentage difficult to estimate due to difficulties in assessing intellectual function due to significant motor impairments
- iii. Non progressive
- iv. Most occur as a result brain damage in utero but also may occur during or around the time of birth
- v. Different types of CP featured in Table 2.4 on page 38
- vi. Dysarthria present in CP – contrasted with Childhood Apraxia of Speech on page 38-39.

F. Deafness

- i. Threshold for deafness is hearing loss of 90dB or more
- ii. Functional deafness occurs when a person relies on vision for environmental information and for learning language
- iii. Most common cause of deafness is genetic in the form of a recessive gene but can also be caused by disease or trauma
- iv. Pre-lingual deafness has greater impact on social communication and language but if a child with deafness is born into a family that sign, there is typically no delay in language development but speech will be impaired.
- v. Most hearing impairment occurs in hearing families
  - 1. Earlier identification and intervention (before 6 months) leads to better language outcomes
  - 2. Assistive devices include hearing aids and cochlear implants

G. Deaf-Blindness

- i. Legal blindness in the US is defined by vision of 20/200 or less in the better eye.
- ii. Total blindness is complete lack of form and visual light perception in which a person can only discriminate light from dark.
- iii. Usher syndrome is a syndrome in which children may have both deafness and blindness

H. Cleft Palate – congenital malformations resulting from failure of oral structure to fuse at the midline

- i. Cleft lip repaired around 10 weeks and cleft palate primary repair between 9 and 18 months
- ii. 80% will develop typical speech and language with speech intervention

III. At Risk Children

- A. International Adoption – children adopted from countries with different language and cultures represent a unique language learning profile and may be at risk for language disorder; recommend Glennen (2002) for excellent review
  - i. Language development is arrested in language of home country at the time of international adoption
  - ii. History of orphanage care also related to presence of developmental delay including delays in physical growth and other aspects of development.
  - iii. Most will develop normal language abilities in English but estimates are that about 57% of internationally adopted children will be seen by an SLP
- B. Low SES – increase risk of language impairment could be impacted by possible lack of continuous and stable childcare, lack of adequate nutrition, and access to medical care as well as environmental stress
  - i. Children from low SES backgrounds hear and use less language than children raised in middle class environments with estimates of about ¼ the words heard by low SES compared with middle SES (MSES)
  - ii. Early identification is important to reduce accumulated risk; factors most predictive of risk for LI for low SES families are higher birth order, low maternal education and single-parent homes.
- C. Maltreatment/Neglect/FASD – US spends more money fighting child abuse than any other country, but has the highest rate of child abuse in the industrialized world;
  - i. Mandated reporting of abuse or neglect included in 1974 Child Abuse Prevention and Treatment Act (CAPTA) updates include the 2003 Keeping Children and Families Safe Act which emphasizes infants experiencing prenatal drug exposure and HIV exposure
  - ii. Meta-analysis indicated that maltreated children exhibit consistently poorer language skills in receptive vocabulary and both receptive and expressive language.
  - iii. Direct relationship between the amount of language a child receives and what a child produces and maltreatment/neglect may lead to self-soothing or adaptive behaviors that are more reflective of sensory or repetitive behaviors observed in children with ASD although underlying cause is distinct
  - iv. Fetal Alcohol Spectrum Disorder occurs during prenatal exposure to alcohol and the result of the negative impact of maternal alcohol use
    - 1. Include range of disorders from more mild fetal alcohol effects to the more severe fetal alcohol syndrome (FAS)
    - 2. Diagnostic criteria detailed on page 45
  - v. Prenatal Cocaine Exposure – difficult to determine exact impact because often in conjunction to exposure to other toxins or combined with lack of prenatal care
    - 1. Disrupts regions of the brain associated with dopamine responses often negatively impacting sustained attention and auditory processing skills

2. In infants seems to have direct impact on sensorineural processing often leading infants to overreact to stimuli
  3. Can adversely impact language development
- II. Prematurity - born before 37 weeks gestation
- A. Important risk factor for neurological impairment and disability
  - B. 84% of preterm infants born between 34 and 37 weeks gestation; 10% born between 28 and 31 weeks; 6% before 28 weeks
  - C. Viability changes with advancing technology but currently between 21-22 weeks gestation
  - D. Morbidity defined as living with disability and many infants born between 22 and 27 weeks will live with lifelong health problems; infants born before 32 weeks at biggest risk for morbidity
  - E. Overall rise in prevalence of preterm birth in the US likely due to several factors including increasing rates of multiple births, increasing use of assistive reproductive techniques, and more obstetric intervention but also due to differences in reporting such as differences in when gestational age is estimated and what defines preterm birth from spontaneous abortion
  - F. Figure 2.3 represents aspects of the preterm infant's care in the NICU
  - G. Birth weight is important indicator for morbidity and mortality
    - i. Low birth weight defined as less than 5.5 lbs
    - ii. Very low birth weight defined as less than 3.3 lbs
    - iii. Extremely low birth weight defined as less than 1.1 lbs
    - iv. Small for gestational age (SGA) defined as below the 10<sup>th</sup> percentile in birth weight based on gestational age
  - H. Preterm delivery can be caused by spontaneous labor or induced due to risk for the fetus or mother; list of lifestyle factors on page 50 and medical health problems that can lead to preterm delivery listed on Figure 2.4; early and regular prenatal care may reduce or prevent preterm delivery
  - I. Respiratory Complications from preterm delivery includes respiratory distress syndrome (RDS), apnea, and bronchopulmonary dysplasia (BPD)
    - i. RDS – primarily impacting babies born before 28 weeks due to lack of surfactant production that enables lungs to remain inflated; typical treatment includes artificial surfactant applied directly to the infants and oxygen support through either continuous positive airway pressure (CPAP) or through a respirator
      1. Can lead to other complications such as bleeding in the brain or collapse of the trachea requiring a tracheostomy
      2. Long-term complications can also occur as a result of long-term exposure to oxygen support
    - ii. Apnea – periods in which an infant stops breathing for more than 20 seconds, most common problem in premature neonates and increases as weight decreases
      1. Caused by immaturity or depression of the central respiratory drive in the brain
      2. Need to rule out other possible causes such as sepsis, bacterial infection

3. Treatment includes behavioral such as stroking the soles of the foot during an episode, medications to stimulate breathing, and oxygen support
- iii. BPD – long term chronic lung condition similar to asthma as a result of long term oxygen support damages the lung tissue; more common in infants under 3.3 lbs or born before 30 weeks gestation
  1. If RDS symptoms persist for more than 28 days postnatal, then considered BPD due to long term exposure to oxygen at a higher concentration than in the air we breathe and pressure from the ventilation
  2. Can outgrow more serious symptoms of BPD needs to be monitored closely during first two years of life for conditions such as asthma and pulmonary infection
- J. Circulatory complications from preterm delivery – most common include intraventricular hemorrhage (IVH), patent ductus arteriosis (PDA), retinopathy of prematurity (ROP), anemia, jaundice
  - i. IVH – bleeding the brain but most episodes are mild and resolve themselves with no or minimal lasting problems. Severe IVH includes fluid buildup in the brain that causes pressure and that can lead to damage
    1. Typically occurs in first three days of life with diagnosis confirmed using cranial sonography, or a CT scan
    2. Recommended that all infants under 30 weeks receive imaging to screen for IVH
    3. For severe cases a shunt may be used to drain fluid and alleviate pressure
    4. Milder cases may involve medicine to decrease fluid buildup
  - ii. PDA – congenital heart defect due to lack of closure of the ductus arteriosis after birth that allowed blood from the placenta to bypass the lungs during prenatal development
    1. Premature babies are often hypoxic meaning that too little oxygen reaches to the lungs to produce the chemical, bradykinin that triggers the close of the ductus arteriosis
    2. Symptoms include increase labor to breath which may lead to fatigue during feeding and lack of weight gain
    3. Treatment is usually medicine first followed by surgery if medicine is unsuccessful
    4. Image demonstrating PDA found Figure 2.5 on page 55
  - iii. ROP – abnormal growth of blood vessels in the eyes; primarily impacting babies born before 32 weeks gestation and every baby born before 28 weeks
    1. Most cases mild and resolve themselves
    2. Monitored by ophthalmologist until blood vessels decrease
  - iv. Anemia - occurs in almost all preterm infants within the first two months of life; not enough red blood cells; treated with blood transfusions, iron added to diet, or medication to produce more red blood cells

- v. Jaundice – too much bilirubin in blood causes yellowish skin tone; treated with phototherapy and occasionally a blood transfusion
- K. Feeding/digestive problems – swallowing develops around 32 weeks gestation. Alternative nutrition is provided for infants younger than 32 weeks of 32 weeks and older with complications limiting oral feeding capabilities
  - i. IV nutrition provided often referred to as total parenteral nutrition ( TPN) as it bypasses the gastrointestinal tract
  - ii. Tube feedings are non-oral feedings that do utilize the gastrointestinal tract
  - iii. Additional feeding challenges can be fatigue during oral feeds or acid reflux
  - iv. Necrotizing enterocolitis (NEC) – is an intestinal problem caused by death to intestinal tissue that may occur within 2-3 weeks after birth; can be very serious and lead to infant death if impact extends to multiple organs
    - 1. Treatment includes cessation of oral feed, antibiotics, and surgery possible to remove damaged sections of intestines
    - 2. IV feedings until resolves and a child can be returned to oral feeding

### III. Going home

- i. Preterm infants are typically transitioned home once they can maintain body temperature in an open crib, orally feed, and apnea free for one week
- ii. Very stressful time for parents
- iii. Long-term outcomes vary based on gestational age, birth weight, gender, ethnicity, and additional environmental factors
- iv. 80% of infants born at 26 weeks and 90% of infants born at 27 weeks survive but about 25% live with morbidity
- v. At risk for communication development delays in part because of disruption in early attachment, turn-taking, and pairing sound with referents
- vi. Attempts at very early identification of development begins at birth with the Apgar, an assessment given immediately after birth – see Apgar scoring in Table 2.7 on page 60.

## Chapter 2 - Early Communication Impairment Test Bank Questions

1. Infant morbidity is BEST described as which of the following?
  - a. Infant death prior to one year of age
  - b. Infant death within one month of birth
  - c. Infant lives but is at risk for developmental delay due to environmental
  - d. Infant lives at but with disability
  
2. Which baby is considered premature?
  - a. A baby born at 39 weeks
  - b. A baby born at 38 weeks
  - c. A baby born at 36 weeks
  - d. A baby born at 37 weeks
  - e. Any baby born less than 40 weeks
  
3. Which best describes the difference in use of a CPAP machine and a ventilator
  - a. A CPAP mechanically breathes for you but a ventilator does not
  - b. A CPAP provides oxygen support but a ventilator mechanically breathes for you
  - c. A CPAP means you cannot obtain oral nutrition but a ventilator enables oral nutrition
  - d. A CPAP is used to treat bronchopulmonary dysplasia but a ventilator is used for respiratory distress syndrome.
  
4. Which of the following syndromes discussed in class includes the following physical characteristics: short stature, obesity, narrow chin

- a. Autism spectrum disorder
  - b. Fragile X syndrome
  - c. Fetal alcohol syndrome
  - d. Prader Willi syndrome
5. Treatment of respiratory distress syndrome (RDS) typically involves which of the following?
- a. Synthetic surfactant applied to the lungs
  - b. Cessation of oral feedings
  - c. Surgery to repair the heart
  - d. Introduction of bradykinin
6. This umbrella term is utilized to describe neurological damage sustained in utero or around the time of birth that primarily impacts motor skills.
- a. Spina bifida
  - b. Cerebral palsy
  - c. Bradycardia
  - d. Inter-cranial hemorrhage
7. A baby born before 28 weeks would be expected to participate in what type of feeding routine?
- a. Variable depending upon birth weight
  - b. Intravenous feeding
  - c. G tube feeding
  - d. Oral feeding
8. Patent ductus arteriosis is caused by what?
- a. Inability for premature babies to close the duct between heart and lungs after birth
  - b. Scar tissue in lungs
  - c. Apnea
  - d. Bradycardia
9. The first intervention for apnea is typically?
- a. Behavioral to arouse a child
  - b. Wait and see
  - c. Medicine
  - d. Surgery
10. Late-language emergence is best defined as which of the following?
- a. Delays in phonology but appropriate semantic development
  - b. Late talking
  - c. Delays in social communication
  - d. Language impairment

11. Established risk is defined as which of the following?
  - a. At risk for developmental disability due to several environmental or biological factors
  - b. The presence of a genetic syndrome
  - c. The impact of prematurity on development
  - d. Expectation of developmental delay due to the presence of a condition that is characterized by delays in development
  
12. Which of the following is NOT a condition that would be defined under Established Risk category for Early Intervention?
  - a. Intellectual disability
  - b. Autism Spectrum Disorders
  - c. Maltreatment
  - d. Cleft Palate
  
13. When getting a referral for speech therapy with a new client recently diagnosed with autism spectrum disorder (ASD) under the age of three, an SLP would anticipate always seeing which of the following?
  - a. Deficits in aspects of early social communication including diminished eye contact, diminished joint attention, and language delay
  - b. Intellectual disability
  - c. Seizure disorder
  - d. Oral motor deficits
  
14. A chronic lung condition associated with prematurity and characterized by lung scarring and inflammation is best known as which of the following?
  - a. Respiratory distress syndrome
  - b. Patent ductus arteriosus
  - c. Bronchopulmonary dysplasia
  - d. Sepsis
  
15. Jaundice is best treated by which of the following?
  - a. Phototherapy
  - b. Wait and see approach
  - c. CPAP
  - d. Cessation of oral feedings
  
16. In addition to gestational age, which of the following has the largest impact on prematurity outcomes?
  - a. Head circumference
  - b. Birth weight

- c. Gender
  - d. Ethnicity
17. A clinician has a client that he feels needs early interventions services for late language emergence. The client has a history of neglect and is now in foster care but no known etiology for the language delay. What category could the clinician use to justify early intervention services?
- a. Established risk
  - b. At risk
  - c. Prematurity
  - d. Neglect
18. You ask a family regarding what treatment was provided for their preterm infant for an inter-ventricular hemorrhage (IVH). The family responds that no direct treatment was provided for the IVH. This is expected information based on which of the following?
- a. Most cases of IVH are mild and resolve themselves
  - b. We have no effective interventions for IVH
  - c. A preterm infant is too young for shunt
  - d. IVH is often not detected at birth due to poor screening procedures
19. In a typically-developing fetus, the ability to swallow develops around what gestational age?
- a. 38 weeks
  - b. 35 weeks
  - c. 32 weeks
  - d. 26 weeks
20. The threshold for deafness is which of the following?
- a. Hearing loss of 60 dB
  - b. Hearing loss of 90 dB
  - c. Hearing loss of 100 dB
  - d. Any hearing loss of more than 20 dB

### Essay

1. Select one syndrome discuss in Chapter 2 and describe the following: characteristics, cause, and impact on overall development.
2. Define and distinguish between established risk and at risk categories for developmental delay.
3. Discuss the impact of prematurity on areas of development including respiration, circulation, and feeding.

Essay #1: Prader Willi, Fragile X, and Down syndrome all listed as syndromes in Chapter 2

- a. Prader Willi – physical features discussed, consistent hunger, poor speech/phonology/oral motor skills caused by gene deletion on chromosome 15; delays in language with poor narrative skills
- b. Fragile X – physical features discussed, deficits in social communication, eye contact, at risk of intellectual disability caused by mutation to a gene of the X chromosome
- c. Down syndrome – physical features, cognitive delay, language often a relative strength compared with cognition by still delayed in development caused by extra genetic material on 21<sup>st</sup> pair of chromosomes

Essay #2: Expectation of disability in Established Risk due to known etiology but at risk there is possibility of delay. Established risk automatically qualify for EI but at risk is often dependent upon degree of delay.

Essay #3: Should include discussion of impact of gestational age and birth weight with possible respiration complications including RDS, BPD, and apnea. Complications related to circulation include PDA and ROP. Feeding impact based on degree of prematurity as swallow develops around 32 weeks gestation age but may also be complicated by NEC if present.