

Prenatal Development

One week:	a mass of 100 -150 cells
First month:	smaller than a grain of rice; mass divides into two layers of cells
Second month:	1¼ inch long; mass divides into three layers of cells
Third month:	2½ to 3 inches
Fourth month:	4 to 6 inches
Fifth month:	10 to 12 inches; one pound; cannot survive outside uterus
Sixth month:	11 to 14 inches, 1½ pounds; even with intensive medical care, about half do not survive if born now
Seventh month:	16 inches, 3 pounds
Eighth month:	18 inches, 5 pounds
Full-term:	baby is ready to be born at 38 weeks. The average American baby weighs 7– 8 pounds and measures about 20” long. A newborn has poor vision; clear only at about a 12” distance.

Birth defects occur about 3– 4 % of the time.

75% are due to genetic, or inherited factors. The most common genetic birth defects are:

Anencephaly

A baby is born with a hole in the skull through which brain tissue protrudes. Most children die at birth.

Cystic Fibrosis

The mucus producing glands do not work properly, producing thick sticky secretions that cause problems with breathing, digestion, and reproduction. Caused by a gene mutation, its risk is highest among Caucasian and Jewish ethnic groups. (1/2 the rate in Hispanics and African-Americans and 1/4 the rate in Asians)

Down Syndrome

causes mental retardation and physical deformities in 1 in 1000 births. Normally a person has 21 pairs of chromosomes; a person with Down Syndrome has three on chromosome #21.

Phenylketonuria (PKU)

caused by an enzyme deficiency that makes the body unable to metabolize protein. Excess protein is toxic and results in mental retardation. Occurs in 1 in 10,000 births and can be controlled by diet.

Sickle Cell Anemia

A person's red blood cells (RBCs) are crescent shaped instead of disk-shaped. This interferes with the ability to use oxygen, and can be fatal. Sickle Cell is found primarily in African Americans.

Spina bifida

Spine is incomplete and spinal cord protrudes through the opening. This often results in paralysis. Surgery is needed to repair the defect. Getting enough folic acid during pregnancy reduces the risk. 1 in 1,000 children are born with this defect.

Tay-Sachs disease

A gene mutation produces too much protein in the body. If onset in infancy, they do not gain motor skills, suffer paralysis, and die by about age five. If onset as child, live somewhat longer. Found primarily in Jewish and Cajun populations – 1 in 27 is carrier. 1 in 250 is carrier in general population.

continued

Prenatal Development, *continued*

About **25% of birth defects** occur because of damage to the fetus from environmental, or external hazards. For most of these hazards, **the time when they can do significant harm is brief: the window of time when the organ they affect is being formed.** For example, thalidomide only causes damage if exposure occurs in the first 52 days; rubella exposure causes damage only if it occurs in the first three months; carbon monoxide and ozone may cause heart defects, but only when exposure occurs during the second month, when the heart is forming. These hazards include exposure to:

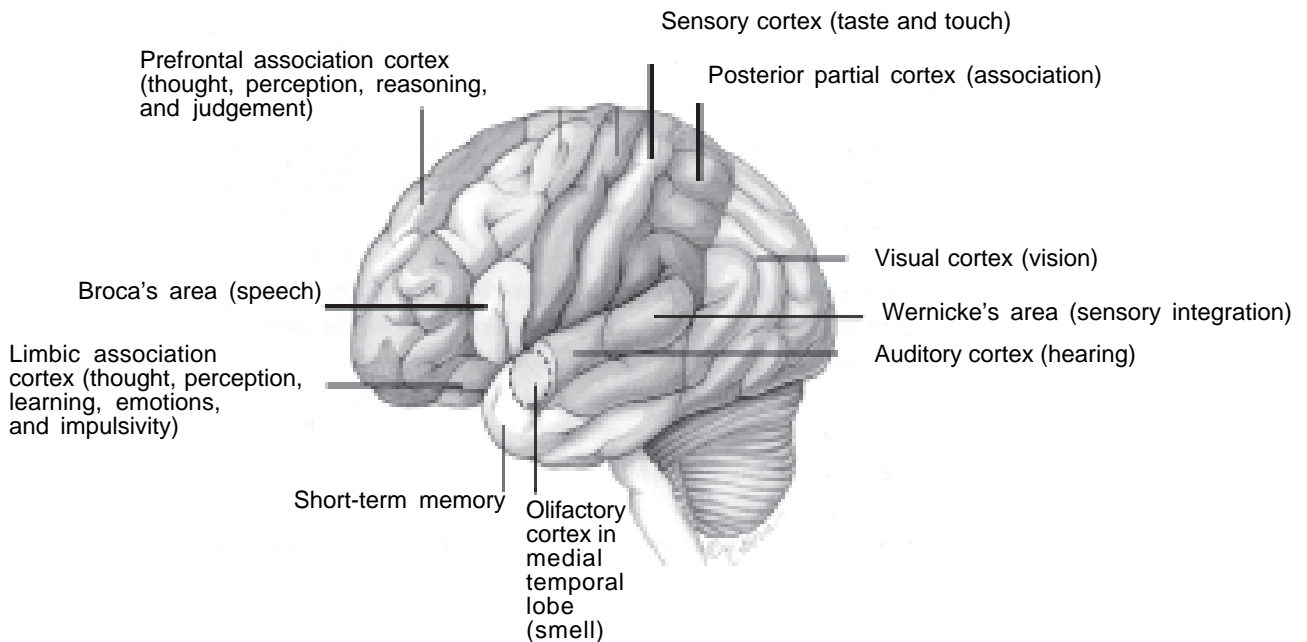
- **deprivation of nourishment** (inadequate amount overall or of specific nutrients, such as folic acid)
- **x-rays**
- **smoking** (prenatally and second-hand smoke)
- **heavy metals** (such as lead, mercury)
- **pollutants** (such as dioxin, PCBs, carbon monoxide, ozone)
- **drugs** (such as Thalidomide, Accutane, alcohol)
- **microbes** (such as rubella, cytomegalovirus)
- **excess of vitamins** (such as vitamin A)
- **high cholesterol**
- **loud noise** - after 4-5 months (like loud music, machinery)

Overall, the **greatest damage is done by lack of nourishment.** It stunts growth as a child and it causes susceptibility to illness as an adult. Malnourished infants are born with fewer kidney cells, so are more likely to have kidney problems when older; they are born with fewer pancreas cells, so are more likely to develop diabetes later in life.

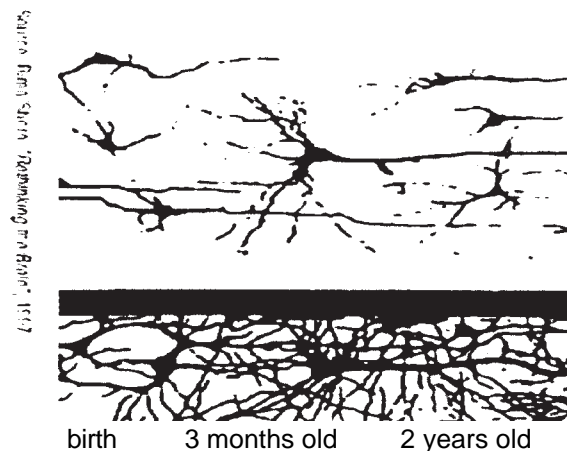
Sources: AARC (2002); Eisenberg, A., Murkoff, H., & Hataway, W. (1996); Mesa Community College. (2002-03); Nash, J.M. (2002); National Down Syndrome Society (2003); National Society for Phenylketonuria (2002); National Tay Sachs and Allied Disorder Association (1999); Sickle Cell Disorder Association of America (2003); Spina Bifida Association of America (2002); and Tsiaras, A. & Werth, B. (2002).

Brain Development

The Cortex

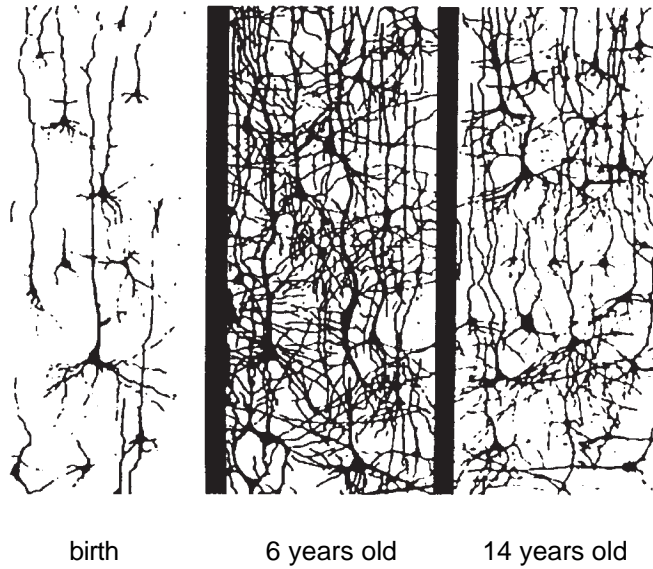


Brain Cell Development from Birth to Age Two



Figures Source: © J.L. Conel. (1939). The postnatal Development of the Human Cerebral Cortex, Vol. I-VIII. Cambridge: Harvard University. Reprinted with permission.

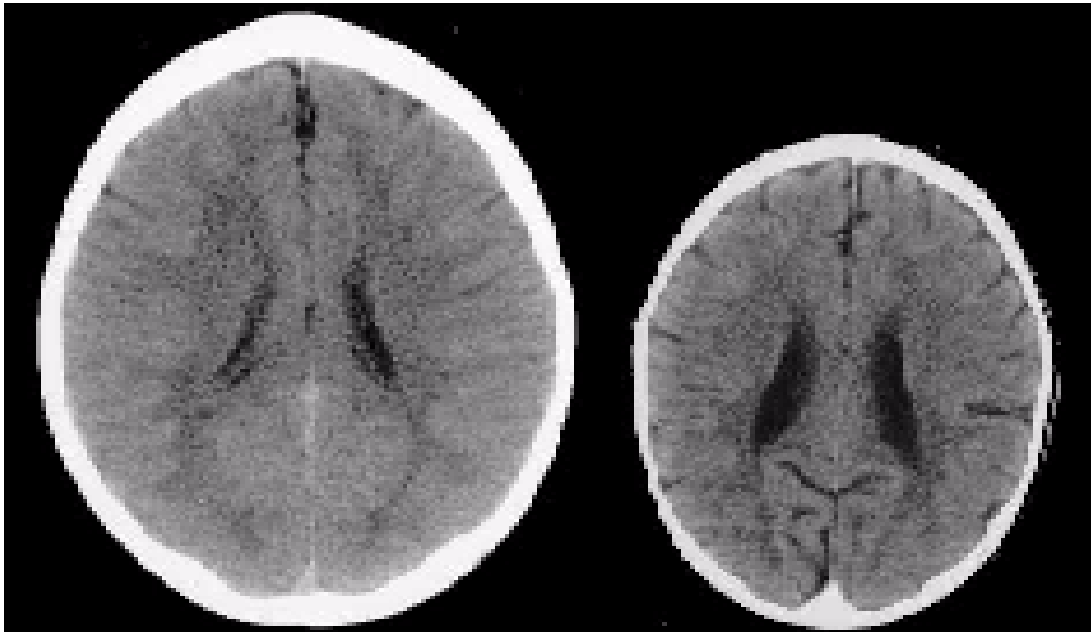
Brain Cell Development from Birth to Age Fourteen



Source: Shore, R. (1997). *Rethinking the Brain*.

Healthy vs. Neglected Brains

3-Year-Old Children



Normal

Extreme Neglect

Source: Perry, B. & Pollard, D. Altered brain development following global neglect in early childhood. *Society for Neuroscience: Proceedings from Annual Meeting*, New Orleans, 1997.

Emotional Intelligence

Emotional intelligence involves five competencies:

1. Knowing one's emotions: recognizing a feeling
2. Managing emotions: handling feelings so they are appropriate
3. Motivating oneself: learning how to delay gratification and stifle impulsiveness
4. Recognizing emotions in others: empathy is the fundamental "people skill"
5. Handling relationships: skill in managing emotions in others

Source: Goleman, (1995).



Resiliency

- The ability to bounce back stronger and more resourceful
- An active process of endurance, self-righting, and growth in response to crisis and challenge
- The capability of individuals and systems to cope successfully in the face of adversity, stress, and risk

Risk Factors

A *risk factor* is anything that increases the probability that a problem will occur, continue, or get worse. Risk factors are the influences that interfere with a person's ability to cope during times of stress. Just because you are exposed to risk factors, doesn't mean you are doomed to a life of problems. Risk factors are those things that increase the probability of a particular outcome – make it more likely, but not certain.

It doesn't matter as much which risk factors you are exposed to but, rather, how many. It is the amount and length of exposure to stressful events that has such a damaging effect on a child's development. Some risk factors are highly interconnected and so, they often occur together, which increases risk. For example, adolescent substance abuse often clusters with other problems such as delinquency, pregnancy, or school failure.

To offset the impact of risk factors, a person needs to possess just as many, if not more, protective factors.

Protective Factors

Protective factors are the influences that seem to buffer against the impact of risk factors. They are the strengths that help us cope with stress or trauma. Protective factors are the influences that promote hope, love, and support when there are challenges.

Many researchers now believe that if risks are removed, and if later experiences in a child's life are positive, then adverse, traumatic or depriving experiences in early childhood may not permanently alter development.

Source: Walsh, F. (1998). *Strengthening family resilience*. New York: Guilford Press.

Risk and Protective Factors

Risk Factors

Early Developmental

Premature birth or complications
Fetal drug/alcohol exposure
“Difficult” temperament
Long-term absence of caregiver in infancy
Poor infant attachment to mother
Shy temperament
Siblings within two years of child
Developmental delays

Childhood Disorders

Repeated aggression
Delinquency
Substance abuse
Chronic medical disorder
Behavioral or emotional problems
Neurological impairment
Low IQ < 70

Family Stress

Family on public assistance or living in poverty
Separation/divorce/single parent
Large family, 5 or more children
Frequent family moves

Parental Disorders

Parent with substance abuse
Parent with mental disorders
Parent with criminality

Experiential

Witness to extreme conflict/violence
Removal of child from home
Substantiated neglect
Physical abuse
Sexual abuse
Negative relationship with parent(s)

Social Drift

Academic failure or dropout
Negative peer group
Teen pregnancy, if female

Protective Factors

Early Developmental

“Easy” temperament
Positive/secure attachment to mother
First born
Independence as a toddler

Family/Home

Child lives at home
Parent(s) consistently employed
Parent(s) with high school education or better
Other adults or older children help with childcare
Regular family involvement in church
Predictable rules, routines, chores in home
Family discipline with discussion and fairness
Warm/positive relationship with parent(s)
Monitoring/parent aware of child’s activities
Monitoring, of child by adults in neighborhood

Child Competencies

Good reasoning, and problem solving skills
Use of planning skills
Good reader
Good student
Has skills, extracurricular activities, or hobbies
IQ > 100

Child Social Skills

Gets along with other children
Gets along with adults outside the family
“Likable” child
Sense of humor
Empathy

Extra-Familial Social Support

Adult mentors outside immediate family
Support for the child from someone at school
Support for the child from peers/friends
Involvement in church or community groups

Outlooks and Attitudes

Perception that parent(s) care
Perception of skills and competencies
Sense of internal locus of control
Positive and realistic expectations for future
Use of inner faith or prayer
Independent mindedness, if female teen

Source: Thomlison, B. (1997). Risk and protective factors in child maltreatment. In M.W. Fraser (Ed.), *Risk and resilience in childhood: An ecological perspective* (pp. 50-72). Washington, DC: NASW Press.

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