March 2001

WHATCOM COUNTY CHILD HEALTH NOTES

Whatcom County Child Health Notes is distributed by Whatcom County Health and Human Services / Children with Special Health Care Needs. This newsletter is intended to provide physicians and nurse practitioners with current information regarding identification and management of special needs conditions. Contributing agencies and programs include: Washington State Department of Health - Children With Special Health Care Needs Program (Contract #N08400), University of Washington - Center on Human Development and Disability, Whatcom County Medical Home Training and Resource Project, the Whatcom County Interagency Coordinating Council, and the Whatcom County Parent to Parent Support Group. Additional Child Health Notes are available at http://depts.washington.edu/medhome

Continuing Education:

How Infants Learn:
New Science & Implications for Infants with Atypical Development

Duncan Seminar
April 27, 2001

Children's Hospital and Regional Medical Center

For more information call (206) 527-5706

A parent pamphlet:

Ten Simple Ways to Encourage a Child's Ability to Learn

is available at no charge; contact:

Children's Hospital and Regional Medical Center: (206) 528-2500 or 1-877-526-2500.

Early Brain Development

New more powerful research tools have increased scientific knowledge about human brain development. These new tools confirm that genetic endowment, early experiences and the environment, including the quality of relationships with caregivers, directly impact early brain development. The brain is vulnerable to developmental problems if the environment is especially impoverished or non-nurturing.

A newborn baby's brain is still very much a work in progress:

- At birth, the infant's brain is the most undifferentiated organ in the body.
- Although almost all neurons in the cerebral cortex are produced before birth, they are poorly connected.
- A newborn's brain is only about one quarter the size of an adult's brain, and grows to 90% of an adult size by age 5 years. This growth is due primarily to the increase in the number of dendrites and synapses, as well as myelination.

Brain development is gene- and activity-dependent. Experience determines which genes become expressed, how, and when.

- Neural pathways that are used consistently are strengthened and those rarely used may be "pruned" away (a "use it or lose it" principle).
- The final number of synapses may increase or decrease by as much as 25 % depending on early childhood experiences.

Experience actually changes the structure of the brain. In experimental animals, enriched environments lead to an increased density of synaptic connections, and especially to an increased number of neurons and volume of the hippocampus, a region important for learning and memory. In addition, there are critical periods during which some elements of development must happen or impairment will occur.

Children's early attachments and relationships with adults have a vital influence on their brain development. Make parents aware of the critical importance of early nurturing and interactive experiences that promote optimal brain development – including interaction with human faces, voices, touch, and dependable relationships.

Where to Start: Links to local, regional and internet resources

Reviewed and updated: 01/31/2003