BEGIN ARTICLE

BY

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Medication and Learning Disabled Children

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We Need to Consider a Number of Questions:

1) What do we mean by the term "Learning Disabled?
2) What do we mean by "Specific Learning Disability?
3) What are the possible causes of 'specific learning disability?
4) How is the human brain constructed?
5) How does the human brain function or operate?
6) In what ways does the human brain malfunction?
7) What is normal and what is deviant at a given age?
8) How do nerve cells operate as individual cells, and as group cells?
9) What kinds of things influence nerve cell function, and in what ways?
10) How do biological growth and biological development influence nerve cell structure and nerve cell function?
11) What drugs or medications (or what dosage levels) cause permanent changes in nerve cells; and what drugs or medications cause temporary changes in patterns of nerve cell activity?
12) What side reactions are possible from medications; How serious are they; Are the side reactions reversible; and How long are the side reactions apt to last?

1) What Do We Mean by the term Learning Disability?
   Two areas of Learning Disability are recognized:
   A. General Learning Disability
   B. Specific Learning Disability

2) What Do We Mean by the term: "Specific Learning Disability"
   A. Federal Public Law 91-230, dated April 13, 1974 states:
   "The term children with Specific Learning Disabilities means those children who have a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken, or written; which disorder may manifest itself in imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations Such disorders include such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia".

   B. The term Specific Learning Disability "does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, or mental retardation; or emotional disturbances; or

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of environmental disadvantage".
General Impairments to Learning may include:
Blindness or Poor Vision
Deafness or Poor Hearing
Mental Retardation or Low I.Q.
Emotional Disturbance
Poor or Inappropriate Instruction in Basic Skill Areas
Environmental Disadvantage

C. Specific Learning Disabilities thus include immaturities or delays in development in how the brain processes, stores, and puts out information. If a child has significant delays or immaturities in most areas of brain function he would be considered retarded.

Children with Specific Learning Disabilities usually have average, near average, or above average intelligence(e.g. I.Q.). However, intelligenc is the summing and averaging of many things.

Children with Specific Learning Disabilities have a disorder in one or more of the basic psychological processes necessary for the age appropriate mastery of basic skills in: spoken language; the ability to lis ten; think; speak; spell; write; or perform mathematical calculations.

3) Possible Causes of Specific Learning Disability

A. Inherited Difference
B. Immature or Late Development for Age in Certain Functions
C. Damage, Destruction, or Imparement in Function of Nerve Cells
1) Toxins, allergies, or metabolic problems
2) Nutrition and oxygenation of nerve cells
3) Mechanical injury
4) Viral or bacterial injury
D. Any combination of the above(e.g. A,B, and/or C)

4) How is the Human Brain Constructed?

A. of nerve cells(10 to 15 billion)(65 different types)
B. of supporting or nurturing cells(Glial cells)
C. of a circulation system
D. of nerve fiber pathways
E. of systems organized for specific functions(vision, hearing, taste, touch, movement)
F. of systems organized for control functions
G. Mature nerve cells contain on an average:
1) 3,000 receiving fibers(dendrites)
2) 600,000 to 800,000 end buttons that form synapses
H. Immature nerve cells:
1) contain fewer receiving fibers and fewer end buttons
2) contain fewer knobs along dendrites and axons that act as receptor s:

I. Nerve cells and nerve cell systems organized for excitatory functions and the transmission of nerve impulses
J. Nerve cells and nerve cell systems organized for inhibitory functions, and the control, coordination and integration of excitatory cells and excitatory systems.

5) How does the human brain function or operate?

A. By a complex interaction of electrical and chemical processes
B. By specialized systems for specific sensory and specific motor functions
C. By specialized systems for control and regulation of other systems
D. By systems that enable different levels of consciousness, different levels of sleep, focusing of attention, and integration of information that comes from different sources
E. By the development of short term memory, intermediate memory, and long term memory through electrical, chemical, or physical growth processes in nerve cells
F. By specialized nerve cell function for specific sensory systems, motor systems, regulatory processes, integrative processes, attention processes, and memory processes
G. By processes of excitation and inhibition interacting to produce different states of consciousness, attention, and concentration.

6) In what ways does the human brain malfunction?

A. For short periods of time or for longer
B. Impared processing of sensory information
C. Impared processing of motor information
D. Impared attention span or impared ability to sustain focused attention
E. Impared memory - short term, intermediate, or long term
F. Impared integrative ability(e.g. cannot synthesize or form abstractions from available data)
G. Impared mood
H. Mood dominating thought processes(cognition) and controlling thought and behavior
I. Autistic determinants of perception dominating thought processes and imparing reality perception and judgement
J. Poor ability to reorganize perceptions and thought patterns to fit new data that contradicts current patterns of thinking and knowing

7) What is normal and what is deviant at a given age?

A. Normal in terms of the "mean" or average
B. Normal in terms of what is adaptive for that individual
C. Normal in terms of what is expected or demanded by the family, culture, or other institution(e.g. school)
D. The difference between nomothetic psychology and ideographic psychology
E. Deviant - as deviating away from average

F. Deviant - as maladaptive
G. Deviant - in terms of the demands of the family and culture(or its institutions)

8) How do nerve cells operate as individual cells and as groups of cells?

A. Types of known synapses:
   1) electrotonic
   2) chemical(the most common type)
   3) mixed electrotonic and chemical
B. Types of chemical synapses:
   1) Those containing micro-sacks(vesicles) in the end buttons
   2) Those not containing micro-sacks in the end buttons
C. Micro-sacks containing neurotransmitter:
   1) Five different types of micro-sacks are known
   2) Micro-sacks differ in size
   3) Micro-sacks differ in shape
      a. some are spherical
      b. some are egg shape or ellipsoid
   4) Micro-sacks contain granules of neurotransmitter; these granules differ in size and chemical make up.
   5) Electrical impulses that reach the end button cause the content of micro-sacks to be emptied into the synaptic space
   6) Neurotransmitters then act on receptor sites
D. Known neurochemical transmitters include:
   1) Acetyl Choline
   2) Epinephrine(Adrenaline)
   3) Norepinephrine(Noradrenaline)
   4) Serotonin(5-hydroxy tryptamine)
   5) Dopamine

   } The Amine Group of Neurotransmitters

   6) G A B A(gama-amino-butyric-acid)
   7) Glycine
   8) Glutamate
   9) L-Aspartic Acid(Aspartate)
   10) Transmitters that influence the Pituitary Gland.

9) Nerve cell function is influenced by:
A. The type and location of the nerve cell
B. The maturity of that nerve cell
C. The quality of nutrition of that nerve cell
D. The activities of other nerve cells acting on that nerve cell(e.g. the summing of excitatory and inhibitory impulses)
E. The effects of toxins acting on that nerve cell
F. The actions of drugs influencing the activity of that nerve cell
G. The previous activity of that nerve cell(e.g. learning)

10) How do biological growth and biological development influence nerve cell structure and nerve cell function?

A. The maturity of a nerve cell influences its function:

B. Different nerve cells mature at different rates

C. Immature nerve cells:

1) are smaller
2) have fewer receiving fibers(dendrites)
3) have fewer transmitting fibers
4) have fewer end buttons
5) transmit fewer impulses per second
6) transmit impulses at a slower speed
7) have a less well developed myelin(insulation) sheath
8) have fewer dendritic knobs
9) have a less well developed blood supply

11A) Actions of Drugs:

Drugs may:

a) imitate the action of a neurotransmitter
b) prevent the synthesis(production) of a neurotransmitter
c) prevent the storage of a neurotransmitter in micro-sacks
d) increase the rate of synthesis(production) of a neurotransmitter
e) increase the rate of breakdown of a neurotransmitter
f) decrease the rate of breakdown of a neurotransmitter
g) block receptor sites of neurotransmitters
h) alter electrical membrane permeability of nerve fibers
i) alter electrical membrane conduction of nerve fibers

11B) Classes of Medication that effect nerve cell function:

a) Analgesics - relieve pain
b) Narcotics - dull the senses, relieve pain, may induce sleep
c) Anesthetics - cause stupor or coma
d) Analeptics - stimulants
e) Sedatives - tending to calm, to quiet
f) Antihistamines - to lessen histamine reaction - may sedate
g) Anticonvulsants - to counteract proneness to convulsive seizures
h) Major tranquilizers
i) Minor tranquilizers
j) Antidepressants
k) Anti-emetic(anti-vomiting)
l) Anti-nausea
m) Anti-spasmotics
n) Precursors of building blocks of neurotransmitters

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