COMMENTS ABOUT THE BRAIN

Information About the Brain and Effects of Brain Changes Summarized

Shelly Weaverdyck

MODELS OF BRAIN FUNCTION

Ways of conceptualizing how the brain works in general:

1. **Localization**: Identification of specific areas of the brain associated with specific cognitive abilities
2. **Neurochemical**: Correlation of neurotransmitters (type and amount) with function
3. **Neural circuitry**: Information received follows a path through the brain as it enters and is processed
4. **Grid**: Information received goes to various areas of the brain simultaneously or nearly so
5. **Neuroconnections – Network with Hubs**: The neurons' ability to communicate with each other
6. **Whole Brain**: Interaction of multiple brain areas especially for complex functions

EVIDENCE OF BRAIN DIFFERENCES AND CHANGES

This is what we look for to discern how healthy the brain is and how it is changing.
We examine the **whole brain** and **specific areas** for evidence of health, change, and differences.

7. **Volume** (increased or decreased)
8. **Hyperactivity** or **Hypoactivity** (too much or too little activity)
9. **Tissue**: health, condition, appearance, texture
10. **Neurotransmitters**: type, amount, activity
11. **Blood vessels** (internal and external)
12. **Neuronal connections**: health, number, activity of:
    axons (including external myelin covering), dendrites, receptor sites, locations, speed, hubs

BRAIN AND BODY DIRECTION TERMS

Terms used to describe the location of parts of the brain:

13. **Anterior** (ventral) = front (toward face)
14. **Posterior** (dorsal) = back (toward back of head)
15. **Superior** = above or top (toward top of head)
16. **Inferior** = beneath or lower (toward human feet)
17. **Medial** = middle (toward interior)
18. **Lateral** = toward outside (toward skull)
19. Proximal = closest to middle or torso of body (navel or abdomen)
20. Distal = farthest from middle or torso of body (fingertip)
21. Cranial = toward head in human body
22. Caudal = toward tail (toward feet in human body)
23. Rostral = above or top (toward the top of head) (toward front of animal body's mouth or nose)

BRAIN CHANGES AND DISORDERS

24. Various disorders affect (that is, change) different areas of the brain.
25. A progressive disorder (e.g., Alzheimer's Disease) spreads across the brain over time, affecting new areas of the brain in a particular order, causing stages.
26. Specific cognitive abilities are associated with specific areas of the brain, so when those specific brain areas become affected, specific cognitive abilities are affected.
27. Each stage of a progressive disorder such as dementia, has specific cognitive abilities that are affected. Cognitive abilities affected in previous stages continue to worsen because the brain changes in areas of the brain previously affected continue to increase in number.

CHANGES IN BRAIN AREAS AND COGNITIVE ABILITIES

28. Brain changes in any area of the brain generally result in changes in cognitive abilities specific to that area, regardless of the reason that area of the brain is changing. (For example, whether a person has a stroke in the left temporal lobe or is living with Frontotemporal Dementia, the left temporal lobe is changing and thus likely to cause changes in this person's language abilities.)

COGNITION AND BEHAVIOR VARY WITH THE DISORDER

29. Various disorders affect cognitive abilities differently, due to different areas of the brain changing.
30. Changes in cognitive abilities play a significant role in behavior.
31. Behavior will vary with the type of disorder and severity of disorder.
32. Behavior is also affected by factors **unique** to **this** particular **person** (e.g., their pattern of cognitive strengths and needs, their specific brain strengths and weaknesses, age, general health, pain, family changes, emotions, habits formed over time, reactions and results of behavior, and preferences).

DISTRESS RESULTING FROM MISMATCH

When the environment, interactions with other people, or the task and daily routines **overestimate or underestimate** a person's cognitive abilities, (are too challenging or not challenging enough) the following may occur:

33. Fatigue, withdrawal, lethargy
34. Distress, anxiety, irritation
35. Confusion, surprises, errors in interpretation and action
36. Difficulty communicating or performing a task or a task step
37. Frustration from unmet needs and desires, or from surprises and changes they encounter

INTERVENTION AND SUPPORT STRATEGIES

38. **Specific brain areas** play a role in specific cognitive abilities.
39. Brain changes affect a person's **cognitive abilities** (the ability to think, understand, and respond).
40. **Distress** and behavior that causes distress **result** in part from changes in cognitive abilities, including **confusion**, **uncertainty**, and **misinterpretation**.
41. Intervene by **addressing cognitive abilities**.
42. Focus on the **causes** and triggers of the distress, behavior, or action (**address** the "**mismatch**").
43. **Modify** the **conditions** to make them accurately estimate and **address** this person's **cognitive abilities (use** the cognitive **strengths** and **meet** the cognitive **needs). Adapt** the environment, interactions with this person, task and daily routines.