



Brain-Body — Foundation of Health 2016 Update

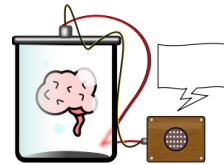
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Brain References



Three Updates

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1. Brain-Immune Connection



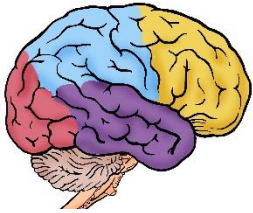
2. Brain-Suicide Connection

3. Brain shrinkage and memory



1. Brain-Immune Connection

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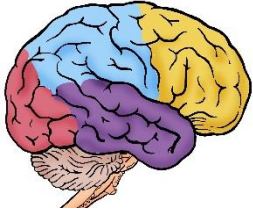


Prevailing belief has been that the ‘brain is closely connected with the immune system via immune messengers in the blood stream, since ‘there is no direct brain-immune system connection’

Anecdotally it seemed quite clear that what impacted the brain also tended to impact the immune system—strategies to strengthen the brain tended to strengthen the immune system

Assumption versus Proof

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A favorite metaphor is that the brain and the immune system have their hands shoved so deeply in each other's pockets that it's hard to tell who is who which is which

There was no actual proof of any physical connection except through white blood cells and immune system messengers in the blood stream . . .



U of Virginia – School of Medicine

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Researchers recently made a “stunning discovery that overturns decades of textbook teaching” — the brain is directly connected to the immune system by lymphatic vessels previously thought not to exist



According to Jonathan Kipnis, director of the Center for Brain Immunology and Glia, “This changes entirely the way we perceive the neuro-immune interaction . . . We believe that for every neurological disease that has an immune component, these vessels may play a major role.”

More Questions to Answer

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There is an array of other neurological diseases, from autism to multiple sclerosis to be reconsidered in light of the presence of something science did not know about or even believe existed



Dr. Kipnis also said, “In Alzheimer’s, there are accumulations of big protein chunks in the brain... that may be accumulating because they’re not being efficiently removed by these vessels.”

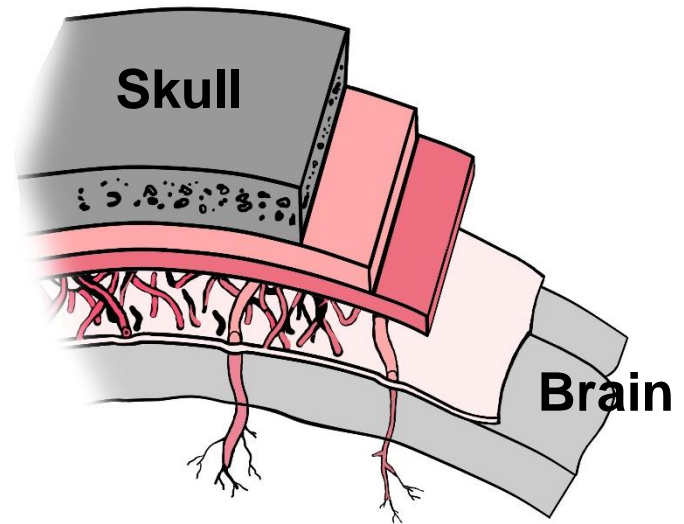
Brain-Immune Connection

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Lymph vessels are thin walled, valved structures—slightly larger than their capillary counterparts in the vascular system—that carry lymph fluid

There may be 250,000 miles of lymph vessels to the 60,000 – 100,000 blood vessels

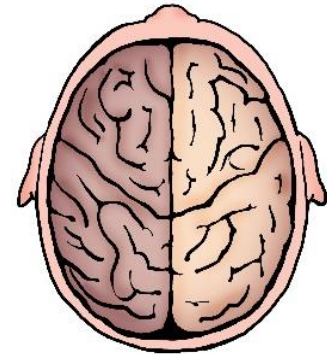
Lymph vessels go throughout the body, pass through the lymph nodes, and are in the meninges that cover the brain and spinal cord (Dura mater, arachnoid, and Pia mater)





Supplements

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This research shows that the brain and immune system are literally and physically connected with each other

What you do for one benefits the other and vice versa

A Longevity Lifestyle is your best chance of keeping both of these healthier

2. Suicide—A Unique Entity

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Studies by Cornelius van Heeringen MD PhD of The Netherlands have pointed out that suicide may be a unique entity, reflecting the culmination of several complex processes including:

- ✓ Depression**
- ✓ Impulsivity**
- ✓ Disinhibition**
- ✓ Anxiety**
- ✓ Executive function dysregulation**



Brain-Suicide Connection

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Recently a woman contacted me—distraught because a close friend had died by suicide and church administrators refused to permit internment in the family mausoleum



Candace B. Pert PhD was very clear that when in the grip of a strong emotion, the brain is in an *altered state*, especially when the protective emotions of anger, fear, and sadness are involved

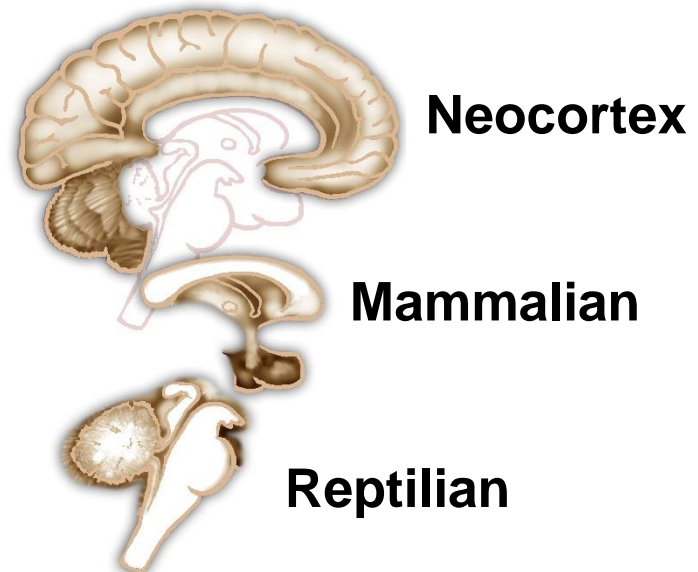
Suicide likely occurs only in a brain that is in an altered state—several things can alter the brain

Altered Brain – 1

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**Release of Corticotropin Releasing Factor (CRF)
both a hormone and neurotransmitter**

**In response to a stressor,
the hypothalamus (in the
mammalian layer) releases
CRF that binds to receptors
on cells in the locus
ceruleus (an alarm center
deep in the reptilian layer)—
which impacts emotions in the mammalian layer
and thinking in the neocortex**



CRF is Immensely Powerful!

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- **Can suppress appetite**
- **Can increase subjective anxiety**
- **Is linked with euphoric feelings that accompany alcoholism**
- **Triggers inflammation (a process being investigated in Multiple Sclerosis research)**
- **High levels have been found in the cerebrospinal fluid of individuals who committed suicide**



Altered Brain – 2

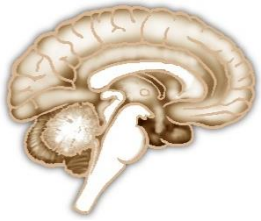
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An increase in levels of cortisol

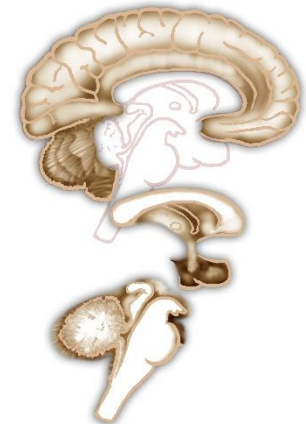
Cortisol—a powerful stress chemical—has many important functions including working with the thyroid gland and assisting with the fight-flight reaction to stress

Elevated 24-hour urinary cortisol production was found in patients who recently attempted suicide compared with patients who did not have a history of suicidal behavior



Altered Brain – 3

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Alterations in the serotonin system that regulates mood, sleep, etc.

Neurons in the reptilian layer produce serotonin that is carried to the prefrontal neocortex by long projections—abnormal levels (up or down) are associated with depression, anxiety, OCD, alcoholism, and suicidal tendency

In suicide, neurons appear to send less than normal amounts of serotonin to the prefrontal cortex (90% is found in the gut . . .)

Altered Brain - 4



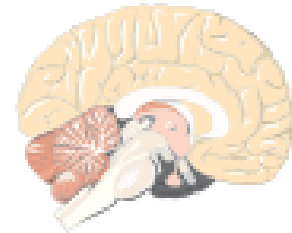
Low levels of cholesterol—precursor for the synthesis of cortisol, progesterone, testosterone, estrogen, and vitamin D; and it impacts memory functions

This waxy, fat-like substance found in all cells of the body is made by cells in the liver and also can be ingested in foods from animals

Lowered levels of cholesterol have been linked with increased suicide risk—whether the decrease occurred spontaneously or was due to drugs or diet

Altered Brain - 5

Excessive activity of the norepinephrine system



Both a neurotransmitter and a hormone, norepinephrine mobilizes the body for action (e.g., fight-flight) and increases restlessness and anxiety

Elevated levels of norepinephrine inhibit activity in the prefrontal cortex—the part of the brain that helps regulate conscience, willpower, decision-making, and behavior—and have been linked with increased risks for suicidal behavior

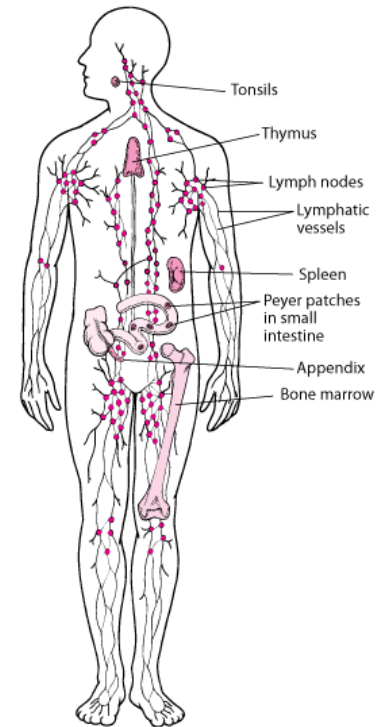
Grief and Depression

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Sadness is the emotion that arises in response to a loss . . . those who are grieving are often sad, which can lead to depression

Prolonged grief can lead to alterations in immune system functions

- **Cytokines are proteins released by IS cells—regulate immune responses**
- **Proinflammatory cytokines coordinate inflammation processes in the body**



PICs

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Increased levels of proinflammatory cytokines or PICs have been linked with depressive symptoms, such as: dysphoria—the opposite of euphoria, anhedonia, fatigue, apathy, and a sense of helplessness

People with depression have increased levels of pre-inflammatory cytokines—this may help to explain the reason inflammatory diseases and autoimmune diseases are often associated with depression

Grief Recovery

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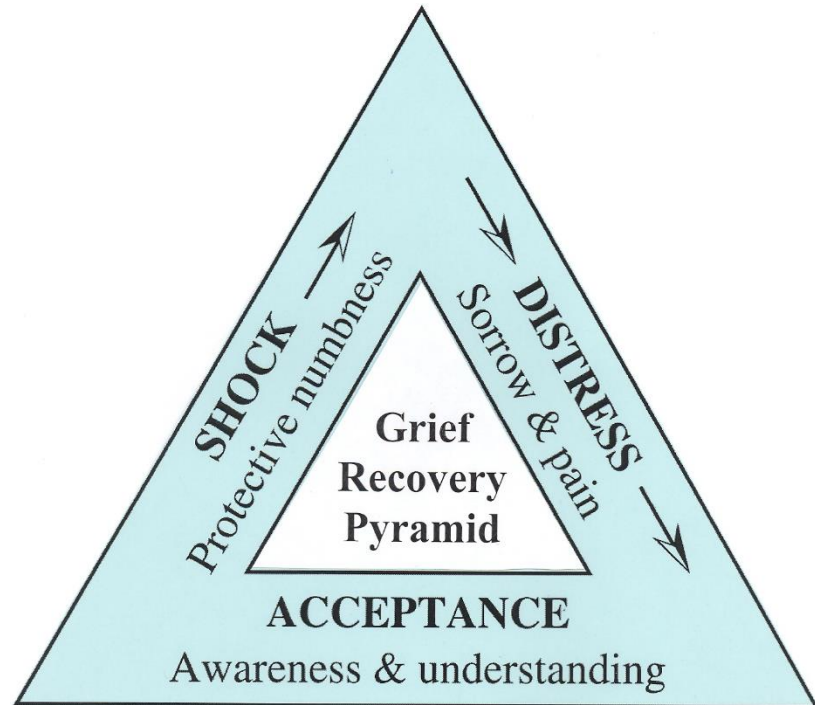
**Grief is the appropriate response to a loss—
every brain is unique
and so is its loss-grief
recovery experiences**

- **Website Article:**

 - Grief Recovery
Pyramid***

- **Mini-monograph**

 - Loss, Grief,
and Recovery***



3. Brain and Memory

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A major concern for many as they grow older is a desire to hang onto their memory functions

Shrinkage of brain tissue has been linked with memory problems

Some brain shrinkage is considered 'normal' with aging, but it appears that those with the greatest reductions in brain volume are most at risk of developing dementia and Alzheimer's disease—both of which have altered memory functions



Risk Factors

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- 1. Overweight and obesity is linked with brain-tissue shrinkage, associated with memory problems — MRI studies:**
 - Brains of overweight individuals showed 4 percent less brain tissue and looked 8 years older than brains of normal-weight persons**
 - Brains of obese individuals showed 8% less tissue and looked 16 years older than brains of normal-weight persons**

—Paul Thompson PhD, Professor of Neurology, UCLA

Risk Factors, Cont'd

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- 2. B12 deficiency has been linked with brain-tissue shrinkage and decline in memory in older persons individuals**

Researchers at Rush University Medical Center in Chicago found that older people with blood markers associated with vitamin B12 deficiency had the smallest brains and the lowest scores on tests measuring thinking, reasoning, and memory

—Journal *Neurology*

Risk Factors, Cont'd

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3. **Aging—the stomach produces less of the acid that breaks down B12 and makes it available for absorption**



Medications that suppress stomach acid (including certain antacids) or that inhibit absorption (e.g., metformin)—study participants who had taken heartburn and ulcer medications for over two years were at 65% greater risk for vitamin B12 deficiency

**—Dr. Douglas A. Corley,
Kaiser Permanente Division of Research**

Risk Factors, Cont'd

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- 4. Surgery that removed part of the stomach or the last part of the small intestine or ileum**
- 5. Strict vegetarians and vegans who do not eat B-vitamin enriched cereals or take appropriate B12 (and B6 and folate) supplements**
- 6. Small intestinal diseases (e.g. Crohn's disease, sprue or celiac disease) and autoimmune disorders (e.g. Graves' disease, lupus)**
- 7. Moderate or higher levels of alcohol use**

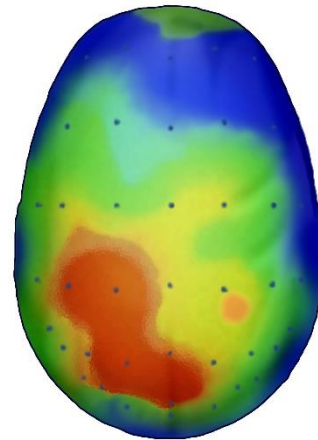
B12 – the ‘Brain Vitamin’

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Nickname came from its potential impact on brain health—it works with folate to make DNA, helps keep homocysteine levels under control, and assists in producing red blood cells—a B12 deficiency can have serious effects on health, including anemia, nerve damage, and dementia

B12 may be preventive against:

- **Macular degeneration**
- **Brain shrinkage**
- **Memory problems**



Optimize Brain Function

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In order to optimize brain function over your lifespan, high amounts of brain nutrients are required from both food and supplements

—Gary W. Arendash PhD

Research Professor at Florida Alzheimer's Research Center

Individuals (especially vegetarians and vegans) need to make certain they have a good source of B12 . . . Not everything can be prevented, but nothing can be prevented unless you implement appropriate preventive strategies