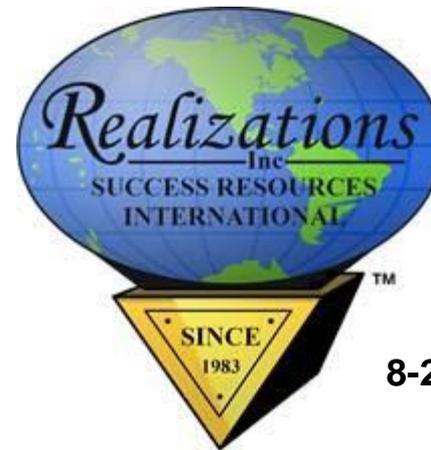




Brain-Body — Foundation of Health 2016 Update

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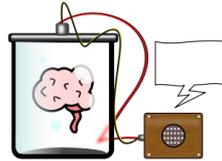


8-25-16

Three Updates

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**One: Brain-Immune
Connection**



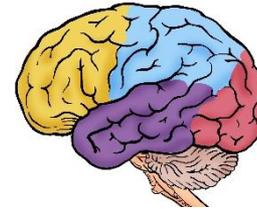
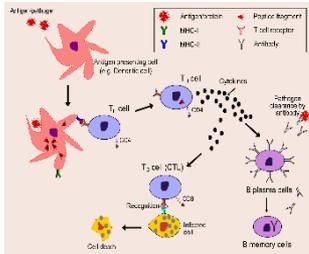
**Two: Suicidal
Brain**

**Three: Brain shrinkage
and memory**



1. Brain-Immune Connection

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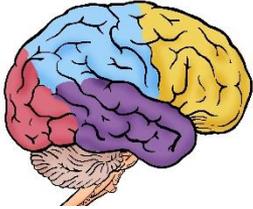
Prevailing belief has been that the ‘brain is closely

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

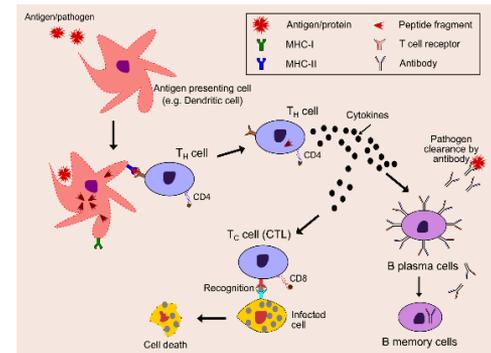
Assumption versus Proof

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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

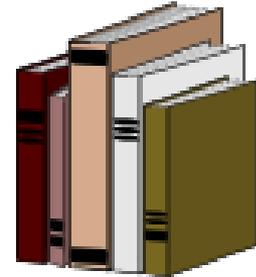
But there was no actual proof of any actual physical connection except through white blood cells and other immune system messengers in the blood stream



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

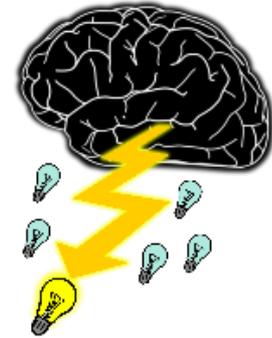


According to Jonathan Kipnis, director of the Center for Brain Immunology and Glia, “This changes entirely the way we perceive the neuro-immune interaction . . . We believe that for every neurological disease that has an immune component, these vessels may play a major role.”

More Questions to Answer

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There is an array of other neurological conditions, 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.”

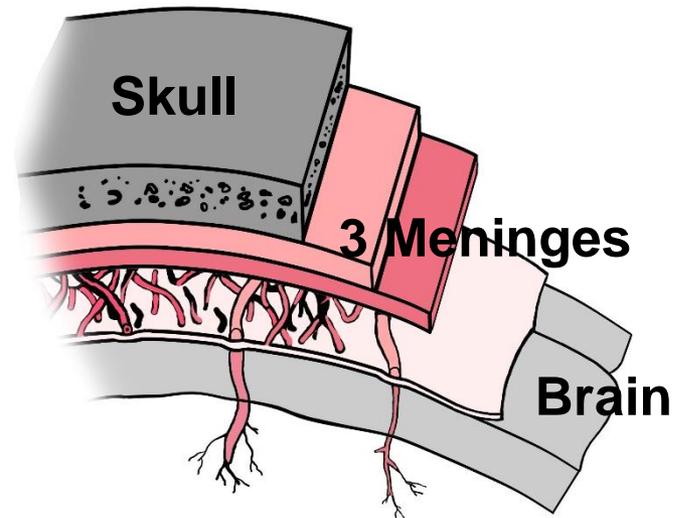
Brain-Immune Connection

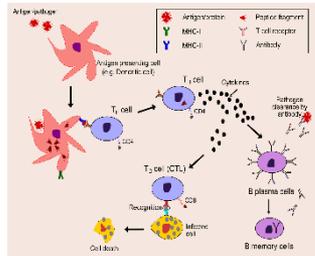
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Lymph vessels are thin walled, valved structures—slightly larger than their capillary counterparts in the vascular system—that carry lymph fluid

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

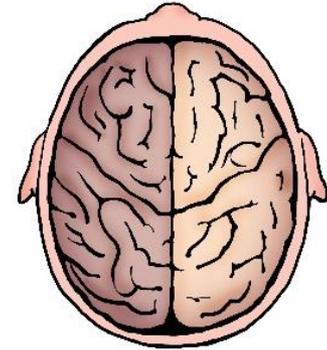
Lymph vessels go throughout the body, pass through the lymph nodes, and are in the meninges that cover the brain and spinal cord (Dura mater, arachnoid, and Pia mater)





Conclusion

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

What you do for one can benefit the other and vice versa

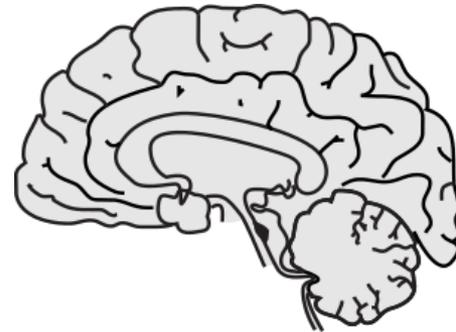
Creating and maintaining a Longevity Lifestyle may be your best chance of keeping both brain and body healthier

Two: Suicidal Brain

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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 had refused to permit internment in the family mausoleum



According to Candace B. Pert PhD, 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

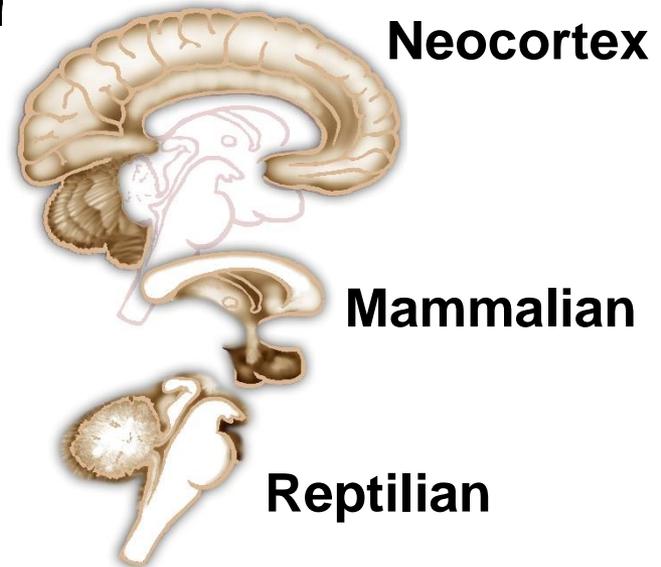
Suicide likely occurs only in a brain that is in an altered state—several things can alter the brain

1 – CRF

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Corticotropin Releasing Factor (CRF) is 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-cognition in the neocortex



CRF is Immensely Powerful!

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- **Can suppress appetite (a link with anorexia?)**
- **Can increase subjective anxiety that may lead to or exacerbate depression**
- **Is linked with the euphoric feelings that accompany alcoholism**
- **Triggers inflammation (a link with Multiple Sclerosis?)**
- **High levels have been found in cerebrospinal fluid of individuals who committed suicide**



2 - Cortisol

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Cortisol is a very powerful stress chemical



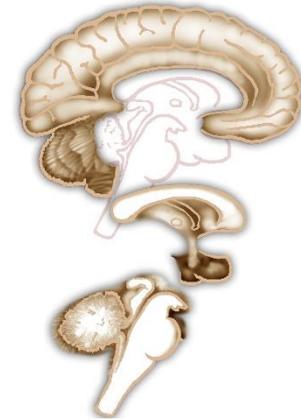
Its important functions include working with the thyroid gland and assisting with the fight-flight reaction to stress

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



3 - Serotonin

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The serotonin system helps to regulate mood, sleep, and etc.

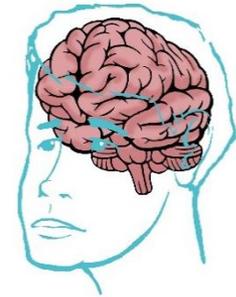
Neurons in the reptilian layer produce serotonin that is carried to the prefrontal neocortex by long projections—abnormal levels (up or down) are associated with depression, anxiety, OCD, alcoholism, and suicidal tendency

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

4. Cholesterol

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Cholesterol is a precursor for the synthesis of cortisol, progesterone, testosterone, estrogen, and vitamin D; and it impacts memory functions



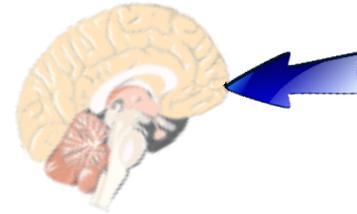
This waxy, fat-like substance found in all cells of the body is made by cells in the liver and also can be ingested in foods from animals

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

5. Norepinephrine

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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

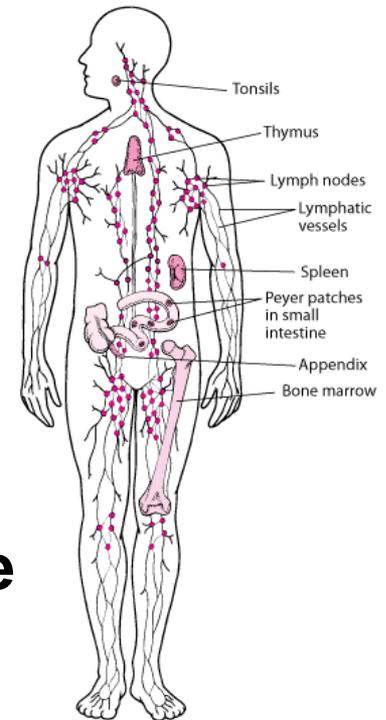
6 - Grief and Depression

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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

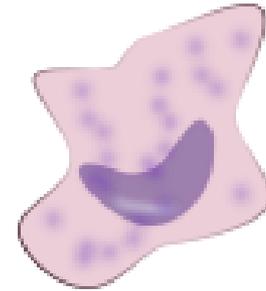
Prolonged grief can lead to alterations in immune system functions

- **Cytokines are proteins released by cells that regulate immune responses**
- **Pro-inflammatory 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 pro-inflammatory cytokines or PICs—which may help to explain the reason inflammatory diseases and autoimmune diseases are often associated with depression

Grief Recovery

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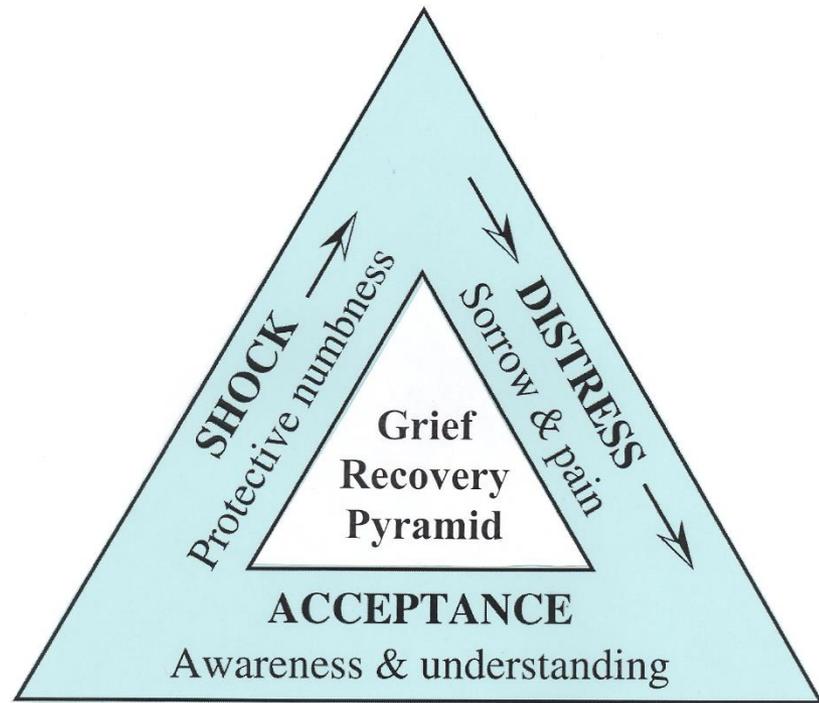
**Grief is the appropriate response to a loss—
every brain is unique
and so is its loss-grief
recovery experiences**

- **Website Article:**

***Grief Recovery
Pyramid***

- **Mini-monograph**

***Loss, Grief,
and Recovery***



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Three: Brain and Memory

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

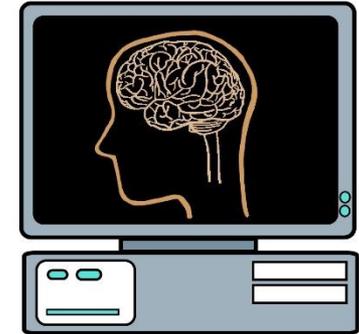
Shrinkage of brain tissue is linked with memory problems



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 are linked with brain-tissue shrinkage that is 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**

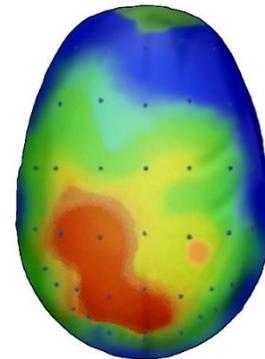
B₁₂ – the ‘Brain Vitamin’

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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**



Consider Appropriate Supplements

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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 Florida Alzheimer's Research Center

Individuals (especially vegetarians and vegans) need a good source of B₁₂ and other B-vitamins

Not everything can be prevented, but nothing can be prevented unless you implement preventive strategies