

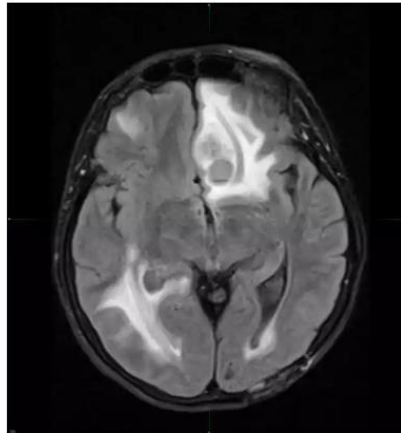
**Open Your Class with This Tomorrow KEY**  
***The Neuroscientist Who Lost Her Mind***

1. "I reach out to switch on my computer. My stomach clenches. My right hand is gone. I can't see it. It's disappeared. I move my hand toward the left. There it is! It's back! But when I slide it back to the lower- right quadrant of the computer keyboard, it vanishes again."
  - a. Brain part: "The tumor causing my symptoms is in the **primary visual cortex**, in the **occipital lobe** at the back of my head, which is why it's affecting my vision."
  - b. Mental illnesses: Homonymous hemianopsia can also result in right visual field blindness. It can be caused by a brain injury, such as stroke, trauma, or tumors.
  
2. Dr. Lipska tells the story of her train being delayed by continuously repeating, "Amtrak sucks!" "It's not only Amtrak that is the object of my ire. I'm irritated if our lunch is even five minutes later than Kasia (her daughter) promised. I can't stand how loud the boys are. I find everything my family does annoying, and I tell them so."
  - a. Brain part: "The **frontal lobe** is intricately connected to the ways in which personality is expressed. Like my headaches, the changes in my personality signal that something serious is going on."
  - b. Mental illnesses: Personality changes can be associated with anxiety, depression, bipolar, PTSD, substance abuse, stroke, dementia, Alzheimer's disease, etc.
  
3. A serviceman for termite inspection arrives at Dr. Lipska's door. He has been providing service for over 20 years. She becomes upset about the ants and then questions the chemicals he will be using. She thinks she is being poisoned.
  - a. Brain part: "My emotional overreactions- anger, suspicious, impatience- suggest that my **frontal lobe** is undergoing catastrophic changes. ...My six tumors and the swelling around them are shutting down the frontal cortex, the part of the brain that allows for self-reflection."
  - b. Mental illnesses: Emotional dysregulation can be associated with many mood disorders and PTSD.
  
4. Dr. Lipska has anosognosia- lack of insight.
  - a. Brain part: "Little is known about which brain regions are responsible for lack of insight, but some investigators suggest that it may be related to dysfunctions in the **midline of the brain**, which separates the right and left hemispheres. Damage to the right hemisphere may also be involved."
  - b. Mental illnesses: Lack of insight can be associated with schizophrenia and bipolar disorder, leading to a lack of medication compliance.

5. “As my confusion grows, my brain fills in the gaps between what’s in my head and what’s happening around me with conspiracy theories. I become increasingly suspicious of my family and my colleagues at work and increasingly dissatisfied with everyone’s performance of even simple tasks. I’m certain that people, especially the members of my family, are plotting against me.”
  - a. Brain part: “While neuroscientists don’t really understand the networks or parts of the brain related to paranoia, in some cases, this condition is attributed to **temporal lobe** damage.”
  - b. Mental illnesses: Paranoia can be associated with psychotic disorders, such as schizophrenia or major depression with a psychotic episode.
  
6. “I’m becoming the worst version of myself: selfish and unconcerned about other people’s feelings. I’ve lost empathy, the trait that was always so strong in me. Whereas once I listened patiently to Kasia (her daughter) on the phone as she described her workday or challenges with the kids, I now cut her off. I am losing my emotional connection to the people closest to me, especially my caring husband.”
  - a. Brain parts: “Empathy, like other complex behaviors, is not situated in one isolated part of the brain but regulated by a wide network of connections among many brain regions....However, some scientists think that some brain regions may be more involved in empathy than others, and these include the **frontal cortex, the temporal lobe, and the insula**, a cortical region located deep inside the brain between the frontal and temporal lobes.
  - b. Mental illnesses: A loss of empathy is often a core symptom of a kind of dementia called frontotemporal dementia (FTD). Lack of empathy can also be associated with autism and antisocial personality disorder.
  
7. “It’s around this time, in June, that I go for a run through the neighborhood without my prosthetic breast and with hair dye dripping all over me, surprising Mirek with my bizarre appearance when I return home. I see nothing off about the way I look.”
  - a. Brain part: “The **frontal lobes** give us the capacity to predict the consequences of our behavior and avoid actions with expected adverse reactions. Without the functional frontal lobe, my brain is like a horse galloping dangerously after the rider has lost the reins.”
  - b. Mental illnesses: “Lack of inhibition and judgment are common in people with frontal lobe problems due to dementia, stroke, injury, and swelling in the brain or any number of issues.”
  
8. “I’m also suffering from loss of visuospatial memory, which makes it hard for me to remember my location and navigate my way through space.”
  - a. Brain part: “Spatial orientation involves multiple regions of the brain and a network of connections among neurons in different areas. Two regions, however, stand out as crucial for spatial memory: the **prefrontal cortex** and the **hippocampus**.”

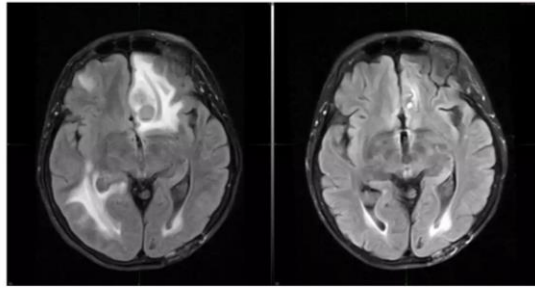
- b. Mental illnesses: “These problems are similar to those described in people with a condition called developmental topographical disorientation (DTD). From very early on in their lives, perhaps from birth, people with DTD don’t recognize very familiar environments. Just as I could not find my way home in a place where I’ve lived for almost thirty years. For me, this was short and transient; for them, it is permanent.”
- 9. Dr. Lipska gains an obsession with food and quickly gains ten pounds. She is taking steroids, but that’s only part of the problem. She can’t stop herself from eating. “It’s not about being hungry, it’s just that these treats look so good that I’m going to eat them! Why not?”
  - a. Brain part: “Obsession with eating is a classic sign of **frontal lobe** problems, which in my case are compounded by steroids that by themselves increase appetite.”
  - b. Mental illnesses: “People with frontotemporal dementia (FTD) often gain significant amounts of weight very quickly, since they have no inhibitor on their drive to eat. When the frontal cortex is operating as it should, people have the ability to weigh the pros and cons of fulfilling their desires. But when that function is silenced or gone, they just do what they want with zero concern about the consequences. I love sweets so I’m going to eat them- period!”
- 10. Dr. Lipska stopped at a restaurant to pick up dinner for her husband’s birthday. She was trapped at the counter for over 20 minutes staring at the bill and trying to figure out the tip. “I see lots of numbers scrawled on a small sheet of paper but they mean nothing to me. I read the numbers but don’t understand what to do with them. I do remember that a tip should be 20%- that concept springs to mind- but I don’t understand the notion of percentages. I remember only a bare fact: 20%. Without more context, it is meaningless. What does 20% signify? How does one calculate it?” When her daughter finds out, they experiment with simple arithmetic problems all the way home. She can add, as long as the numbers are simple. But she cannot subtract, multiply, or divide no matter how basic the question.
  - a. Brain part: “My compromised math ability- which is called dyscalculia or acalculia- is most likely related to the lesion and inflammation in the **parietal lobe**. Scientists have been able to trace different aspects of numerical processing, such as multiplication and subtraction, to different subregions of the parietal lobe. Thus, people with lesions in a particular area of the parietal lobe may show deficits in the ability to perform one type of calculation but not others. In my case, I seem to be able to add simple numbers. But I cannot handle division, subtraction, or multiplication. It may well be that the swelling in my brain is affecting the function of specific subregions of the parietal lobe while leaving others relatively unscathed.”
  - b. Mental illnesses: “Lesions or defects in the frontal and parietal lobes have been linked with dyscalculia in patients with early stages of dementia.”

11. A local grocery store has a grand opening. “I begin shouting over the music. This is horrible! It’s too loud!” Dr. Lipska runs to tell the manager how loud the music is. “I rush past the band, and the music causes me physical pain. The notes are like knives stabbing my body.”
- Brain part: “We also know that a complex network of neuronal connections between **many regions of the brain** must operate properly to guide a person successfully through the jungle of human experience, which presents all kinds of stressors.”
  - Mental illnesses: “My extreme reaction to sensory overload is common in people with brain trauma, autism, and many other brain conditions.” It is also associated with ADHD and PTSD.
12. “My left leg starts to twitch uncontrollably. I try to hold it still but it can’t. Although it’s a very short episode, lasting maybe 30 seconds, I am very frightened.”
- Brain Part: I’ve had a small seizure. An MRI reveals a small but disturbing crater in part of my **right motor cortex**, the site that controls the motor movements of my left leg and arm.”
13. Brain scan: the white areas show swelling; the tumors are circular blobs. Where do you see tumors?



- “The clearest of these, in the upper half of the image, sits squarely in the **frontal cortex**.”
- They found 18 tumors. “The largest tumors are in my **frontal and parietal lobes**. They also lurk in the **temporal and occipital lobes**, and in the **basal ganglia**, a group of brain structures in the base of the brain that coordinate movement. The largest tumor is in the frontal lobe and is the size of an almond.”

14. Dr. Lipska's brain scans from June 19 (left) and July 21 (right). What differences do you see?



- a. "The swelling (the areas in white) has decreased dramatically, and the tumors, including the one in my frontal cortex, have all but disappeared.