

## Brain Case Studies Assignment

Directions: Use your knowledge of the human brain to answer the questions that follow each case study.

**Case 1** - It was very dark as Carol walked home from trick-or-treating. She was thinking about tomorrow's psychology quiz when she heard heavy breathing and then felt a hand on her shoulder. She turned and stared into the terrifying eyes of a huge man holding a chain saw. Without thinking, she swung her bag of candy with all her might, hitting the enormous man in his stomach and knocking out his breath. As he doubled over, Carol ran home faster than she had ever run before. When Carol got home, her heart was pounding, her breathing was rapid, her nerves were on edge, she was sweating, and her mouth was dry. It was not until several hours later that Carol finally calmed down enough to go to sleep.

- Which part of Carol's nervous system gave her the "get up and go" and the strength to knock out the man's breath and run home faster than the wind?
- Which part of Carol's nervous system helped calm down her body?

**Case 2** - It was Friday the 13th and Janice was being especially careful as she walked along busy Main Street. While stepping out on the street to avoid a construction ladder, leaping over a large crack in the pavement, and shielding her eyes from a stray black cat, Janice was hit by a city bus. EMTs arrived to find Janice unconscious and not breathing. They gave her CPR, but she did not start breathing.

- Which part of Janice's brain was damaged?
- What are some other functions of this brain part (besides breathing)?

**Case 3** - Here's a real horror story. There is a tiny bug that lives under beds and comes out at night when a person is sound asleep. The bug crawls into the person's ear and keeps on going until it reaches the brain. The bug begins to eat away its favorite part of the person's brain. The next morning, as the person gets up, he or she walks to the bathroom in a very clumsy way. The person has no trouble holding the toothbrush but has great difficulty making smooth, circular brushing strokes. At lunchtime, the person can hold a quarter but has great trouble making the fine movements needed to put the quarter into the vending machine's coin slot. Throughout the day, the person has no trouble starting movements, but has difficulty making smooth movements and walks as if intoxicated.

- Which part of the person's brain did the tiny bug eat away?
- What is the function of the above brain part?

**Case 4** - 9-year-old Calvin suffered a major stroke in the left hemisphere of his brain. After several months of therapy, Calvin is showing tremendous progress from the effects of his stroke.

- What behavioral effects would we most likely see in Calvin in the immediate aftermath of his stroke?
- Explain why therapy would facilitate Calvin's ability to regain some function lost as a result of the stroke?

**Case 5** - Harry was always one to accept a dare and this particular dare seemed like fun. All he had to do was put on a pair of roller skates and skate backward 100 feet. Harry had not been on skates since he was ten, but was confident he could still skate. He put on the skates, stood up, and took the first tentative steps. He was moving forward but then came the hard part - turning 180 degrees to skate backward. He tried to twist his body and turn his feet but everything got tangled up and he fell over backwards hitting his head on the concrete. When Harry sat up, he rubbed his head and wondered why he was seeing stars.

- What part of the brain was damaged?
- What would happen to Harry if the fall destroyed his entire lobe?

**Case 6** - Patti's goal was to be a world-class figure skater and compete in the Winter Olympics. During one of her practice sessions, while doing a spectacular double whirl, spin, and leap she caught an edge. Sadly, she fell into the path of an oncoming skater. The skater's skate hit Patti in the head. When Patti tried to get up and walk, she discovered that the right side of her body moved normally, but that her left leg and left arm were paralyzed.

- Which area (part) of Patti's brain was damaged?
- In which lobe is this area located?
- On what side of the head was Patti struck?

**Case 7** - At 8:00 PM last Saturday night, Bruno was pacing in the hallway. He heard the crowd cheer when his name was announced. He pranced down the aisle, climbed into the ring, and raised his gloved hands to greet the crowd. Bruno had earned a reputation as being fast and strong and most believed he would be the next heavyweight boxing champion. In the first two rounds, his punches matched his reputation. In the middle of the third round; however, Bruno caught an unexpected vicious punch knocking him unconscious and causing him to fall flat on his face. After a couple of days in the hospital, Bruno has returned home. Debbie, Bruno's wife, has noticed some interesting changes in her husband. He says inappropriate things and acts without thinking. A once thoughtful and considerate man, Bruno is now mean and vulgar.

- What part of Bruno's brain was damaged during the fight?
- What are the functions of this brain part?

**Case 8** - Susie was a very healthy happy baby. Despite being born deaf, she had no other sensory or motor problems. When she was 18-years-old, a neurosurgeon proposed an experimental brain operation. During this operation, tiny holes would be drilled into her skull, and then tiny wires would be implanted into certain parts of her brain. The neurosurgeon explained that these wires would be connected to a stimulator. When the stimulator was turned on, an electrical current flowed through the wires and stimulated the brain cells or neurons at the ends of the wires. Susie agreed to have the surgery, which was successful. After a two-week recovery period, the wires were connected to a stimulator. The stimulator was turned on, and what happened next brought tears to Susie's eyes, for the first time in her life, she heard sounds.

- In which lobe of Susie's brain were the wires implanted?

**Case 9** - David sustained an injury in a car accident that is affecting his ability to communicate. David can begin with what seems like a normal sentence but after a few words he starts talking about an entirely different topic and after a few more words he again goes off on another topic. The result is that David never seems to finish a sentence or make any sense, although he talks in a very fluent manner. For example, David might sound like this: "It's all sunny, cause books cost a lot, but there's no reason for a car, and don't buy shoes, and I like hamburgers on sale except in bad times."

- Which area of Dave's brain was damaged causing him to speak in a fluent way but make no sense?
- In which lobe is this area located?

**Case 10** - Bob was getting off an elevator when he dropped an important folder. As he reached down to pick it up, the doors closed squeezing his head between them. Ever since the elevator accident, Bob has not been the same. For example, he goes to the same video store every Sunday. He hands the clerk the same beat up note with one word on it, *Batman*. The clerk asks Bob if he's ever seen *Batman* before. Bob then shakes his head and replies, "No, it's the first time. Is it any good?" The clerk always replies, "It's really great. You'll love it." Bob has rented *Batman* 74 times, yet can't remember ever having seen it. Although he can't remember ever seeing *Batman*, he has no sensory motor problems.

- Which part of Bob's brain was damaged, causing this particular kind of memory problem?
- What is the function of this part of the brain?

**Case 11** - During orientation, Sam meets his new roommate Harry. Sam is shocked to see that Harry has scattered his things all over the floor, beds, desks, and chairs of the dorm room. When Sam asks Harry to clean up the mess, Harry gets incredibly angry and yells, "Go to hell!" However, within the next minute Harry is smiling and saying, "I'm sorry; I'll clean it up." Sam watches as Harry picks up his things and moves them around the room but can't figure out how to organize his things. Sam is frustrated and shouts, "Get this stuff cleaned up now, or you're out of here!" To your surprise, Harry starts to cry and explains that he cannot seem to plan and organize or get things done right. He says that people don't understand him so they just yell at him. Just then, Harry's father walks in and explains that when Harry was younger he was in a car accident and his brain was damaged.

- Which part of Harry's brain had been damaged?
- Identify two functions of this brain part.

**Case 12** - Just before world-famous dancer Agnes DeMille was to perform on stage, she felt an incredible pain in her head and then lost consciousness. She woke up in an ambulance on her way to the emergency room. She looked around and asked, "What's happened to me? The paramedic answered, "I think you've had a stroke. Just lie quietly until the neurologist has a chance to examine you." The neurologist determined that Agnes did have a stroke. Following the stroke, Agnes can't dance because she cannot feel where her right foot nor her right hand are. However, she is able to move her right hand or right foot.

- What area in Agnes' brain did the stroke damage?
- In which lobe is the area located?
- On which side did the damage occur?

**Case 13** - From the time that she was a little girl, Marci had epileptic seizures. However, when she was younger, the seizures occurred infrequently because they were treated by medication. As she grew older, the seizures became worse and the drugs no longer worked. By the time she was 21, she was having five to six major seizures a day. During a major seizure, Marci would fall to the floor and lose consciousness, while her arms and legs would move in violent spastic motions. Many times her limbs were sprained and bruised. After the seizure, she would have no memory of what happened, and she usually felt very drowsy. Because the seizures were so frequent and so bad and drugs no longer worked, she chose to have a radical brain surgery called a split-brain operation. After the split-brain operation, Marci's seizures were greatly reduced.

- What part of Marci's brain did the neurosurgeon cut to produce a split brain?
- What is the function of the part that was cut?
- Which hemisphere of the brain has superior language skills?
- Which hemisphere of the brain has superior mathematical skills?

**Case 14** - Marci, whose speech area is in her left hemisphere, appears and behaves relatively normal after her operation. She can carry on a normal conversation, read a book, dress herself, drive a car, and do hundreds of other things. In fact, if you met Marci, you would have a very difficult time telling that she had a split-brain operation. However, when she is given special tests, it becomes very clear that her left and right hemispheres are not communicating. For example, suppose we show a photo of a dog to only her right hemisphere, and we ask Marci, "What did you see?"

- Would Marci be able to say what she saw? Why?
- How could we help Marci identify what her right hemisphere saw?

**Case 15** - Marci, who you know has a split brain, is asked to do another task. She is asked to look at pictures of facial images made up of various objects, such as books or animals. When she looks at the images with her left eye she reports seeing faces; however, when she looks at images with her right eye, she reports seeing books or animals.

- Why does Marci see the images differently with each eye?

**Case 16** - You were chatting your 83-year-old grandmother about school when she said that something strange was going on in her head and stopped talking. When the doctor examined granny, he explained that she had had a stroke: one of the arteries in her brain became blocked. As a result, part of her brain was damaged by a lack of blood and oxygen. The stroke affected granny's ability to speak. The good news is that she will be able to understand most of what is spoken to her. The bad news is that she will not be able to speak in a fluent fashion. Instead, her speech pattern will be very broken. Before the stroke, granny could say, "I need to go to the grocery store to buy several cans of chicken soup. I also want to see if the lettuce is fresh." After the stroke, granny can only say, "Go store, buy soup, see lettuce."

- Which part of granny's brain was damaged causing her to speak in a broken manner while not interfering with her ability to understand what was said?
- In which lobe of the brain is this part located?