

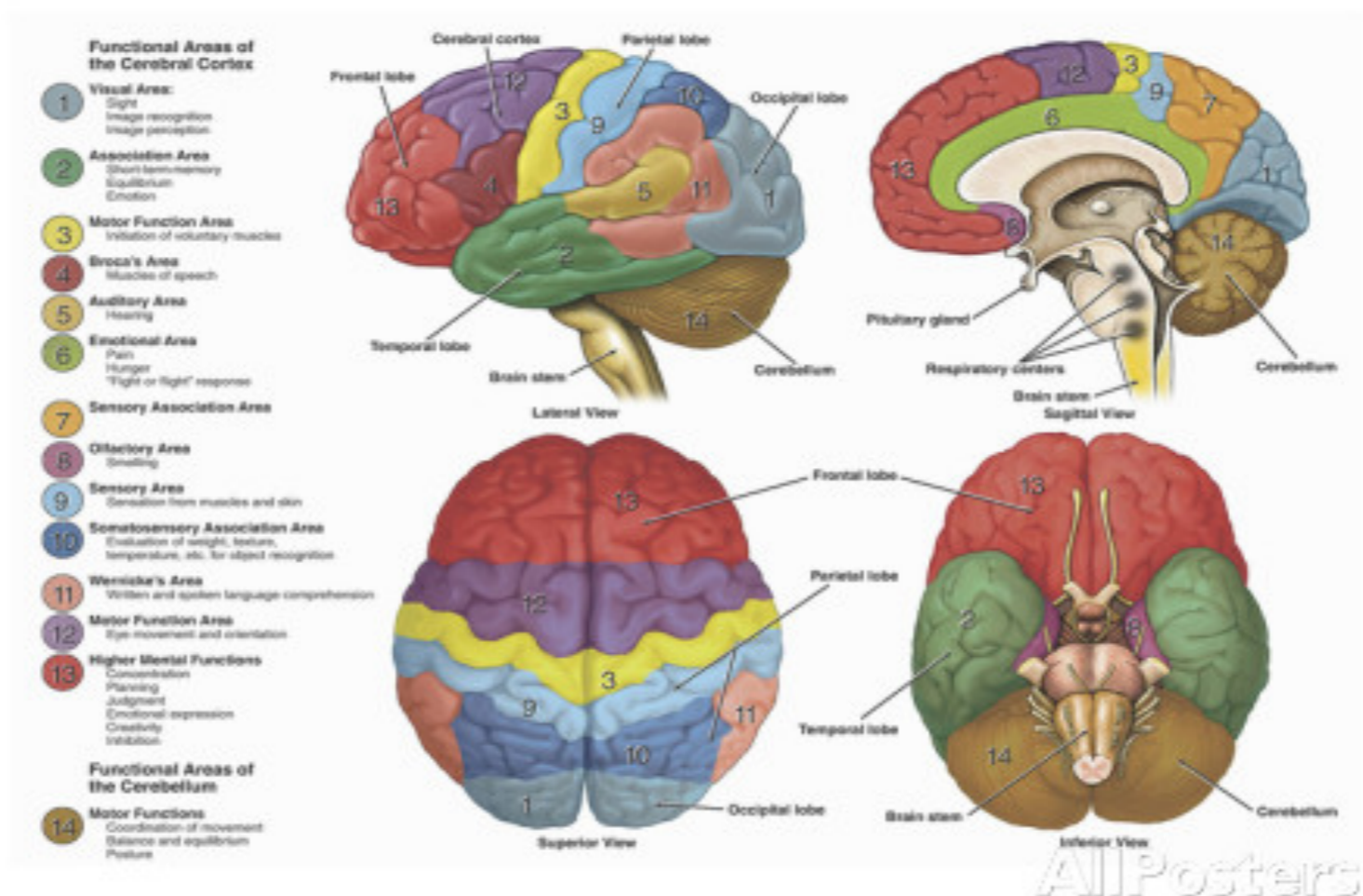


The Human Brain LEARNING OUTCOME B5

Localization of Function

Localization of Function

- The principle that certain areas in the brain are responsible for certain behaviors.

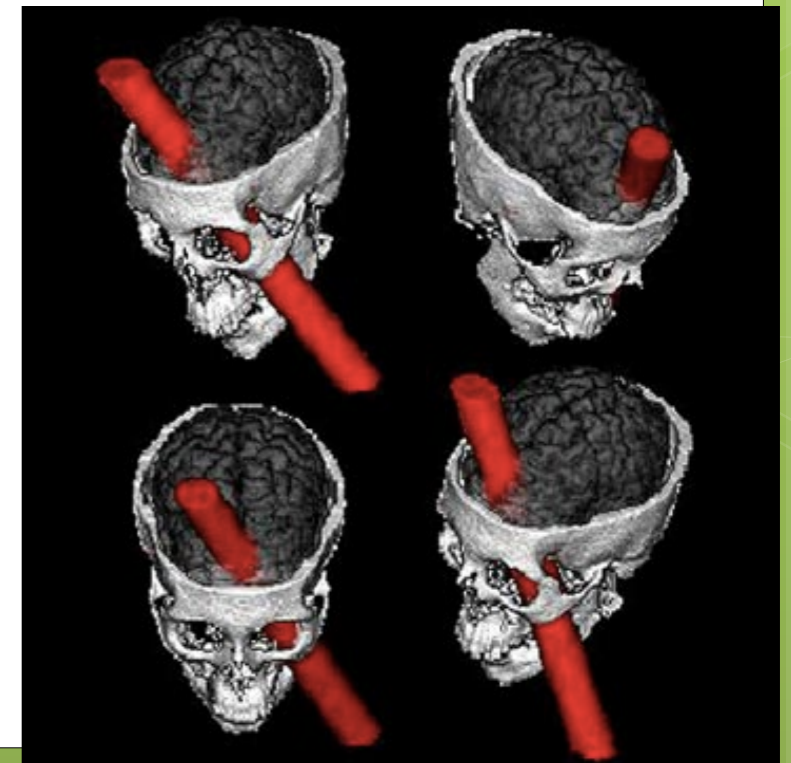


How do Neurologists study the brain?

- Throughout history Neurologists have used a variety of tools to study the brain
 - **Post-Mortem Examination**
 - **Brain Damage Case Studies**
 - **Modern Technology (MRI, fMRI, PET)**
- *Key Question: Why might each of these methods have been used? What are the strengths and limitations of each?*

Brain Damage Cases

- The close examination of individuals with traumatic brain damage.
- By studying how their behavior has changed, we can understand what that part of the brain is responsible for.
- Example: Dimasio et al (1994) – The case of Phineas Gage
- [Gage Video](#)



Dimasio et al (1994)

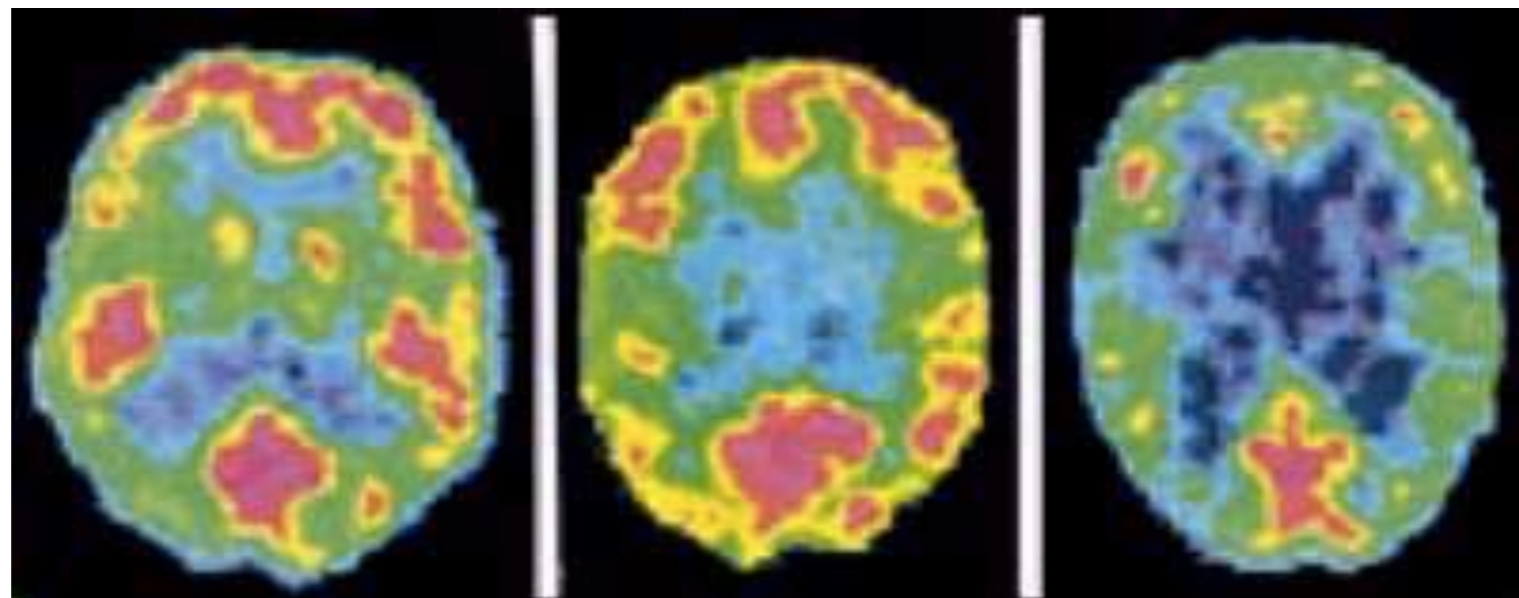
- **Aim:** To determine what areas of Phineas Gage's brain was damaged in the accident
- **Method:** Used MRI technology to create a model of the accident and determine what areas were damaged

Dimasio et al (1994) cont.

- **Finding:** The frontal lobe, and only the frontal lobe, was damaged in the accident.
- **Conclusion:** The frontal lobe is responsible for self-control and social processing; this is consistent with reports of Gage's changed behavior.
- **Critical Thinking:**
 - Reliable?

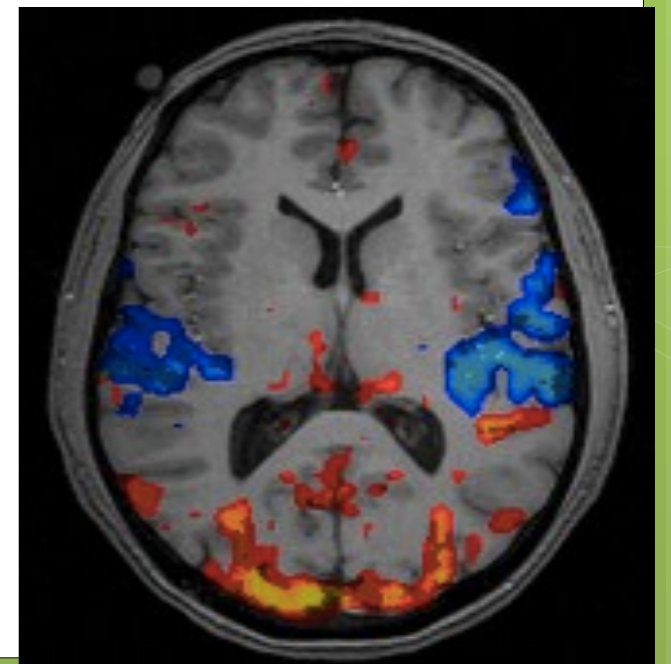
Localization of Function: The Frontal Lobe

- Responsible for self-control, planning, social judgment & higher-order thinking tasks
- [Gage Video](#)
- Sociopaths (Far Right) have been shown to have less activity in their frontal lobe



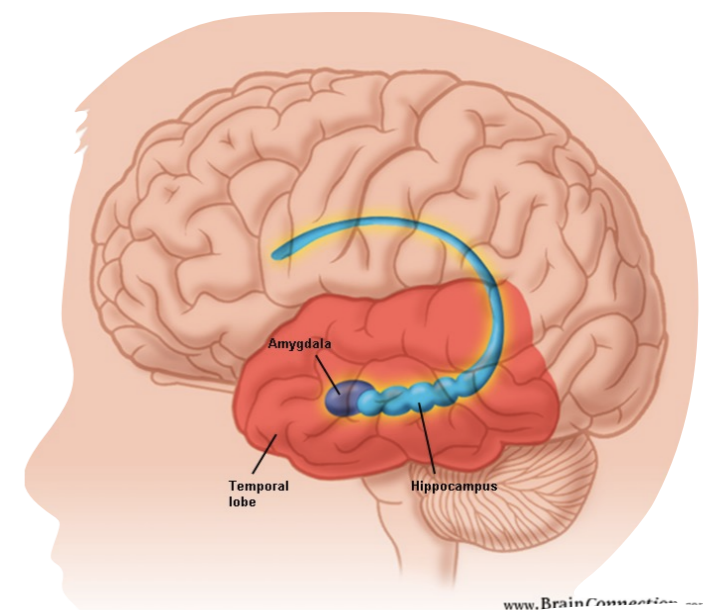
Brain Imaging Technology

- In recent decades, scientists can use non-invasive technology to take images of the brain of functioning brains.
- MRI- Creates an Image of the structure of the brain
- fMRI- Shows activity in the brain.
- Tools of Neuroscience
- Example: Corkin et al. (1997): H.M.



Localization of Function: Hippocampus

- Area deep in the brain responsible for the storage of long-term memories
- Damaged Hippocampus = No new memories
- The Story of HM



Corkin et al (1997)

- ◉ **Aim:** To determine the extent of damage done to HM's brain.
- ◉ **Method:** Performed an MRI on H.M.
- ◉ **Finding:** All of HM's hippocampus and amygdala were removed in 1953 surgery.
- ◉ **Conclusions:** The hippocampus is responsible for the storage of new memories.
- ◉ **Critical Thinking:**
 - ◉ Ethical?
 - ◉ Reliable?

<https://quizlet.com/167210816/corkin-et-al-1997-flash-cards/>