How Robotics Can Help Brain Cancer

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Purpose of Study

The purpose of this study is to determine how robtics can benefit patients with brain cancer.

Introduction

Brain cancer is very important because over 16,616 people have died since 2016. Researchers at Worcester Polytechnic Institute have created a machine as an alternative to the current treatment of radiation and chemotherapy.

Background Info /Symptoms

- A brain cancer is a mass of abnormal and mutated cells in the brain that can metastasis into other forms of cancer in the body.
- Some brain tumors are noncancerous (benign), and other brain tumors are cancerous (malignant).
- Symptoms of brain cancer includes…
- Vision problems, such as blurred vision, double vision or loss of peripheral vision
- Gradual loss of sensation or movement in an arm or a leg
- Difficulty with balance
- Speech difficulties
- Confusion in everyday matters
- Personality or behavior changes
- Seizures, especially in someone who doesn't have a history of seizures

Discoveries and Innovations

- According to machinedesign.com researchers at Worcester Polytechnic Institute (WPI) and Albany Medical College have continued development for their brain tumor-destroying robotic system.
- This brain tumor destroying It is designed without ferrous metals.
  - The robot is mainly constructed from plastics and ceramics
    - Piezoelectric motors and custom motion-control electronics are used to generate very low levels of electrical noise to avoid interfering with the MRI imaging system.
- The parts that come in contact with the patient can be easily sterilized to operate safely within a surgical environment.
- The system is designed to provide very precisely, closed-loop control, they will use live MRI images and thermal imaging to control the pattern of the ablation.
- Additionally, they monitor and adjust it in real-time to confine the thermal effects to the area within the tumor boundaries, and to ensure that they are maximizing the odds that they are removing the entire tumor, During this process it minimizes the chances of damaging non-malignant tissue

Risk Factors and Screenings

- Radiation Exposure
- Family History/Genetics
- A weak Immune System
- Exposure to petroleum products, and other chemicals
- Age
  - Children are more likely to get a diagnosis of brain cancer rather than adults.

Data

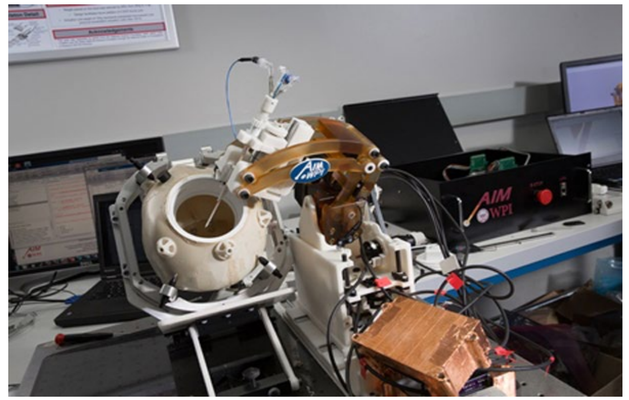

Figure 1: This image shows the robot that WPI created to help target brain tumors.

Conclusion

- How do you think scientists can use the information you found? What future problems may arise?
- What questions or problems still remain unanswered? What will scientists need to do in
- order to address these remaining problems?

References

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