



Brain Tumors

Psychology 372

Physiological Psychology

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Background

- More than 120 types
- Can occur in any part of the brain or SC
- Only 31% survive five years after diagnosis.
- Often requires treating the entire brain rather than just some parts.

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The Brain

- Contains both Neurons and glial cells
- Is covered by the meninges
- Also contains blood vessels
- Also contains cavities.

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Tumors

- Many types
- Are classified according to the type of cell which causes the tumor.
- Can be fast or slow growing
- Are often different in children
- Can arise from several places

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Tumors in the Brain

- Start in the brain itself
- Called Primary Tumors
- Often involve many types of tumor cells
 - Makes it difficult to kill
 - Each type of cell is resistant to different drugs.
- Many types
 - Astrocytoma
 - Glioblastoma
 - Oligodendroglioma
 - Ependymoma

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Location

- Most tumors come from Astrocytes 65%
- When come from glial cells called gliomas
 - Astrocytoma
 - Anaplastic Astrocytoma
 - Glioblastoma

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Tumors in the Meninges

- Meningiomas

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Tumors in Nerves at the Base of the Brain

- Come from Schwann Cells
- Acoustic neuromas
- Schwannomas

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Tumors that Come from Outside the Brain

- Called Secondary Tumors
- Metastatic brain tumors
- Come from other body areas
 - Liver
 - Breast
 - Lung
- Resemble the cells where the tumor started.

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Symptoms of Brain Tumors

- Symptoms depend on where the tumor is located
- Frontal lobe – muscle weakness, confusion, etc.
- Temporal Lobe – Seizures, types of aphasia, etc
- Occipital Lobe – Visual problems
- Parietal Lobe – Loss of sensation

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Enlargement

- As becomes larger, more tissue is destroyed
- Tumors can also infiltrate between tissue
 - Makes it harder to remove

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Other Issues

- Some tumor cells live in low oxygen environments
- Cells tend to be radio-resistant and away from blood supplies
- Decrease probability for success

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Treatment

- Many types of treatment (Over 400 Protocols)
- Standard treatment
- Use a combination of
 - Surgery
 - Radiotherapy
 - Chemotherapy

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Other Procedures and Technologies

- Lasers
- Stereotactic computers
- Radiosurgery
- Gamma Knife
- X-Knife
- Boron Neutron Capture
- Others

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Treatment Issue for Physicians

- 1 gram of tumor contains approximately one billion cells (1,000,000,000)
- Remove 99% (990,000,000) of the tumor by some sort of surgery
 - Ultrasonic Aspiration
 - Computer Assisted Stereotactic surgery
 - Others
- Regardless of best technique,
- Still have 10,000,000 cells

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Soooo

- Use other techniques
 1. Radiation at the site
 - If 99% effective = 9,900,000 gone
 - Remaining cells left 100,000
 2. Use Chemotherapy at the site
 - If 99% effective = 99,000 gone
 - Remaining cells left 1,000

Problem, rarely do you get 99% removal rate

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Consequence

- Cells grow in other locations
- Result, must treat the entire brain

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Newer Models

- To increase success must treat the whole brain.
- How?
- Surgery first (Depending on the type of Tumor)
 1. Radiotherapy for the whole brain
 2. Chemotherapy for the whole brain
 - Usually need other substances to help the molecules cross the blood brain barrier.
 3. Immunotherapy way of the future
 - Use the immune system

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Conclusion

- Lots of work being done.
- Much better success rates than even 10 years ago.
 - Better techniques, better technology, better drugs