

# Risk of Secondary Malignancy from Computerized Tomography (CT) Scanning in Very Young (< 1 year old)

## Neurosurgical Patients: A Retrospective Cohort Study with a Minimum of 10-year Follow-up

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### Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the affects that radiation from CT scans have on age group less than 1 year of age, 2) Provide patients and parents with clinical data when presented with the concern of radiation exposure from CT imaging, 3) Identify the need for greater acquisition of clinical data in regards to this field

### Introduction

Mathematical models predict that the exposure to radiation from head CT's obtained each year will lead to a future 29,000 cancers and 14,500 deaths from these cancers. So far, there has been little clinical evidence to support these estimations. . Young children (< 1 year old) are theoretically the most susceptible to the damaging effects of radiation. Therefore, this study examines a cohort of children who we consider at highest risk in pediatric neurosurgery.

### Methods

We studied a cohort of 62 children who had a cerebrospinal fluid shunt placed before they were 1 year of age. The shunts were placed between 1991-2001, allowing at least 10 years (Range: 10 -21 years) of follow-up data. All patients were evaluated for suggestion of future tumors (benign or malignant) or leukemia.

### Results

The study group had a total of 260 head CTs performed in the first year of life and 992 scans throughout the study period. There were a total of 989 person-years of follow-up. All children were followed for at least 10 years. There were no future tumors or leukemia identified.

### Conclusions

Models predict a significant number of future cancers directly caused by CT scans. These models suggest significant potential clinical and medicolegal costs from a routine part of a pediatric neurosurgery service. However, there is very little correlative clinical data. In our study, there were zero future cancers associated with the use of CT scans in a very high-risk group. We hope this study furthers future collaborative efforts to collect large amounts of data to define the actual risk to patients.

### References

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