

HIGHER RATES OF OSTEOSARCOMA IN SOUTHWEST WASHINGTON

Statistically there are higher rates of Osteosarcoma diagnosed and deaths in children in Southwest Washington than what is expected in a population of this size

By James J Foote

Demographic Data

Osteosarcoma is an extremely rare form of bone cancer that primarily affecting children and adults. According to the American Cancer Society (2007) there are about 900 new diagnosed cases of Osteosarcoma in the United States each year, 400 being children under 20 years of age.

Demographic Data

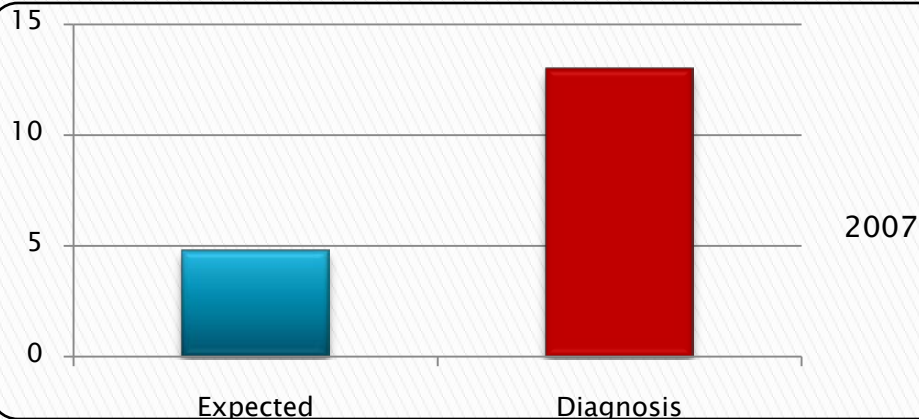
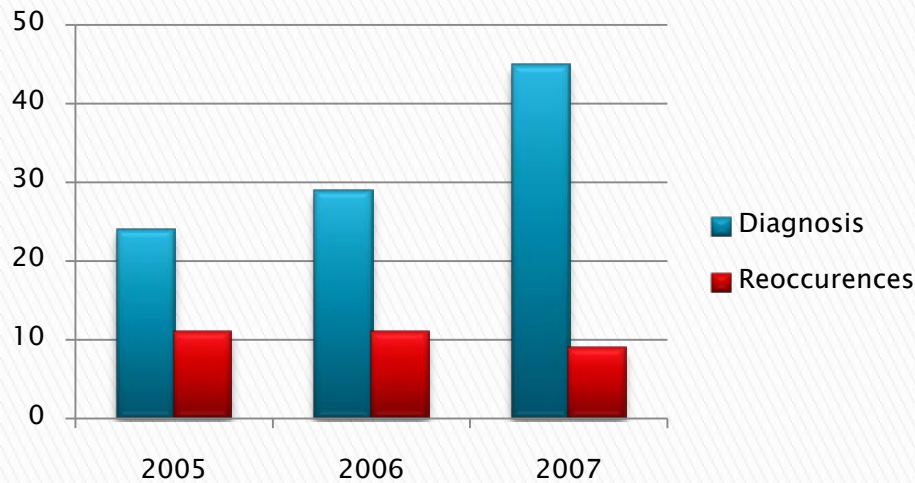
- ▶ U.S. Population \leq 19yrs
 - 82,334,583
- ▶ Washington State \leq 19yrs
 - 1,685,719
- ▶ Southwest Washington $<$ 19yrs
 - 115,843

Expected Cases of Osteosarcoma

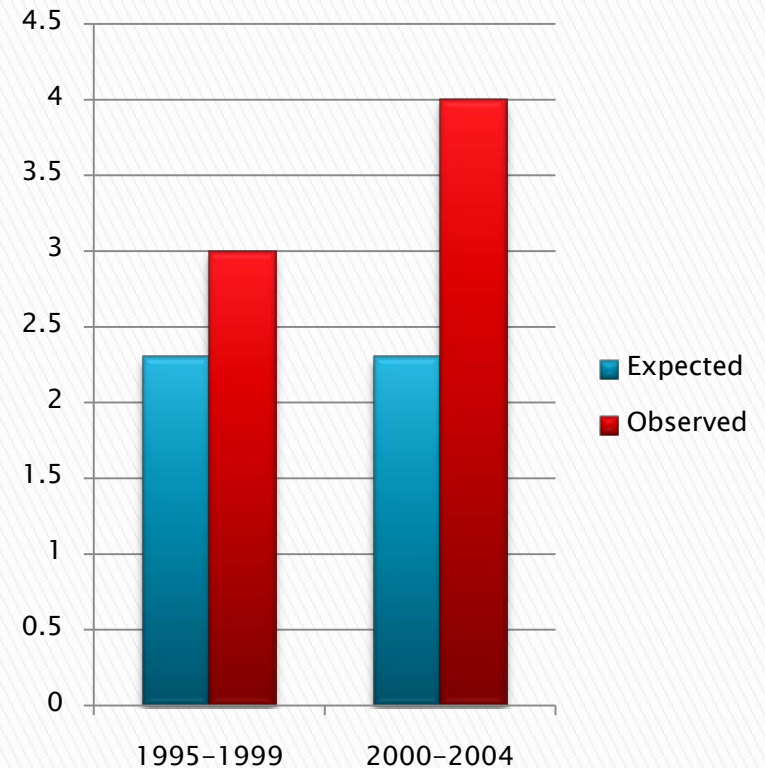
- ▶ U.S. Diagnoses \leq 19yrs
 - 400 cases or 1 in 205,837
- ▶ Washington State \leq 19yrs
 - 8 Cases or 1 in 210,714
- ▶ Southwest Washington $<$ 19yrs
 - .46 cases or 1 in 251,833

Expected vs. Observed Diagnoses of Osteosarcoma

Doernbecher Children's Hospital Data



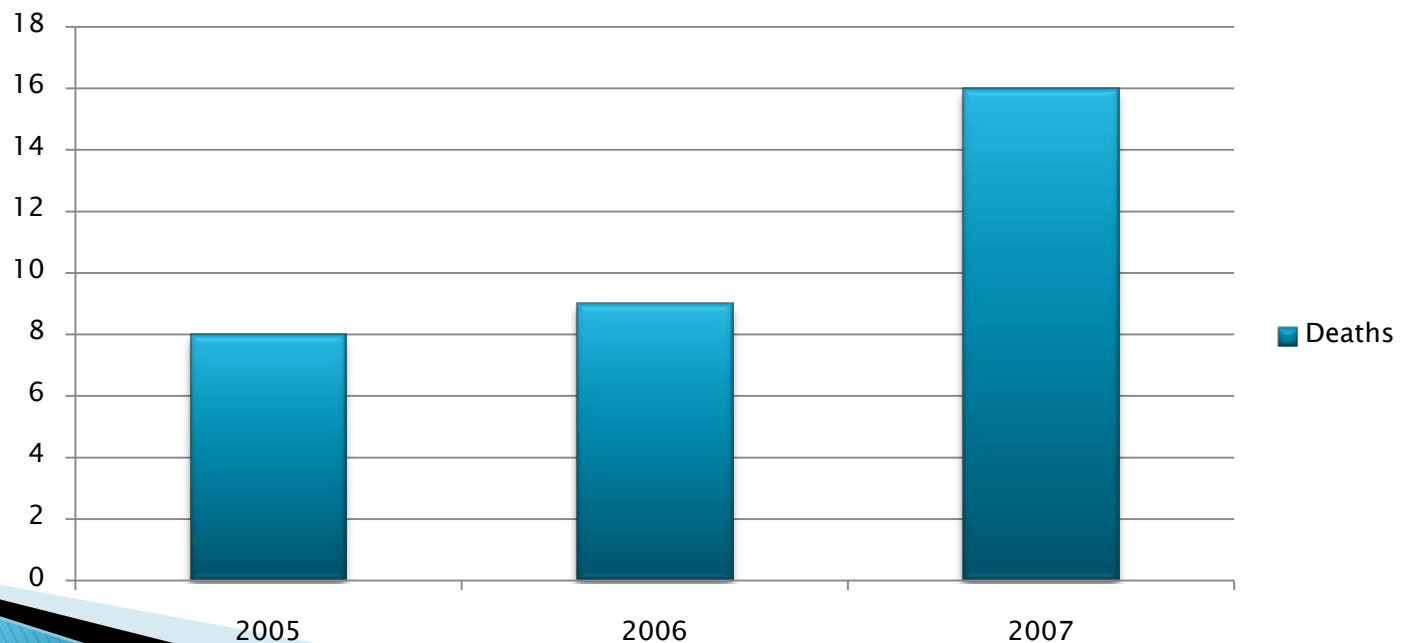
Southwest Washington



Higher Death Rates in Southwest Washington

The American Cancer Society (2007) states the 5-year survival rate for patients with non-metastatic Osteosarcoma is over 70%. They go on to say “for those patients whose cancers respond well to chemotherapy and surgery the survival rates is even better, increasing to between 80% and 90%.”

Doernbecher Children’s Hospital Data



Environmental Factors linked to Osteosarcoma

▶ Radon in the water

- New Jersey's Department of Environmental Protection released a report of a case study demonstrated an association between elevated levels of radium (Radon) in the drinking water and a rare type of bone cancer. In areas with elevated levels of radon the rate was approximately 70% higher risk of developing Osteosarcoma (Burger et al, 2003).

▶ Fluoride in the water

- In 2001, Harvard researcher Dr. Bassin introduced an important addition to the scientific literature on fluoride exposure and Osteosarcoma.

▶ Dioxin

- In a study published by the Center for Disease Control (National Center for Environmental Health, 2003), they identified environmental exposures and the linkages to different cancer clusters. Specifically, the report (National Center for Environmental Health, 2003) calls out 2,3,7,8, TCDD (Dioxin) and the links to Sarcoma and Hematopoietic.

Environmental Factors linked to Osteosarcoma Present in Southwest Washington

▶ Radon in the water

- Radon has been identified in the water in Southwest Washington. According to Clark County Public Utilities website (2006) “We tested our supply wells for radon in 2006, and found levels of this gas ranging from 155 to 610 picocuries per liter.”


▶ Fluoride in the Water

- In an analysis of municipal water systems in the United States (Miller et al, 2003) 24 water systems were sampled for Fluoride content. Vancouver and Longview Washington were two of the 24 cities in the US examined. Vancouver and Longview were both in the top 8 of municipalities with highest levels out of the 24 surveyed. Vancouver Washington was specifically called out as having the “smallest variability was seen for Vancouver, WA where fluoride levels over the three phases averaged 0.8870.04 mg/ml (RSD of 4.6%). “

▶ Dioxin

- In 2007 there was a study of possible PCBs and Dioxins in the waters of Vancouver Lake (Washington State Department of Ecology, 2007). The study found that contaminate levels in fish from the lake exceeded the National Toxics Rule(NTR) human health criteria for total PCBs, 4,4'-DDE, 2,3,7,8-TCDD, Toxaphene, and Dieldrin. Total PCBs were elevated in all fish tissue samples.

Conclusion

- ▶ Statistically Southwest Washington has higher rates of Osteosarcoma
 - ▶ Deaths from Osteosarcoma are higher in Southwest Washington
 - ▶ There is a linkage between environmental factors and higher rates of Osteosarcoma diagnoses
 - ▶ Those environmental factors are present in Southwest Washington and could be the cause behind the higher rates
 - ▶ More research needs to be conducted
- 

References

1. American Cancer Society, (March 19, 2007). *What are the key statistics about Osteosarcoma*. Retrieved July 29, 2008, from American Cancer Society Web site: http://www.cancer.org/docroot/CRI/content/CRI_2_4_1X_What_are_the_key_statistics_for_Osteosarcoma_52.asp?rnav=cri
2. Gruney, JG (1999). *Cancer incidence and survival among children and adolescents*. National Cancer Institute SEER Program, Pub No. 99-4649, Retrieved July 29, 2008, from http://www.uptodate.com/patients/content/topic.do?topicKey=stb_tumr/10616
3. United States Census, (2006). *United States Age and Sex*. Retrieved July 29, 2008, from United States Census Data Web site: http://factfinder.census.gov/servlet/STTable?_bm=y&-geo_id=01000US&-qr_name=ACS_2006_EST_G00_S0101&-ds_name=ACS_2006_EST_G00_
4. United States Census, (2000). *Washington DP-2 Profile of Selected Social Characteristics*. Retrieved July 29, 2008, from Washington DP-2 Profile of Selected Social Characteristics Web site: http://factfinder.census.gov/servlet/QTTable?_bm=y&-geo_id=04000US53&-qr_name=DEC_2000_SF3_U_DP2&-ds_name=DEC_2000_SF3_U&-redoLog=false
5. United States Census, (2000). *Profile of General Demographic Characteristics*. Retrieved July 29, 2008, from Profile of General Demographic Characteristics Web site: http://factfinder.census.gov/servlet/QTTable?_bm=y&-geo_id=04000US53&-qr_name=DEC_2000_SF1_U_DP1&-ds_name=DEC_2000_SF1_U&-redoLog=false
6. Clark County Department of Assessment, (2005). *Population and Economic Handbook. Demographics*, 1, Retrieved July 29, 2008, from http://gis.clark.wa.gov/applications/gishome/publications/popecon_docs/12-ccpop1.pdf
7. Clark County Public Utilities, (2006). Clark County Public Utilities Current Issues. Retrieved July 29, 2008, from Current Issues Web site: <http://www.clarkpublicutilities.com/yourhome/water/waterQuality/currentIssues>
8. Connett, P, Neurath, Chris, & Connett, Michael (2005). *Revisiting the Fluoride-Osteosarcoma connection in the context of Elise Bassin's findings: Part 1*. Commentary on Elsie Bassin's PhD Dissertation Harvard University. Part 1, 3-15.
9. Burger, S, Cohn, P, Fagliano, J, Klotz, J, & Skinner, R, (2003). *Radium in Drinking Water and the Incidence of Osteosarcoma*. State of New Jersey Department of Environmental Protection. Division of Epidemiology, 1-17.
10. Cutrifelli, R, Holden, J, Miller, N, Pehrsson, P, (2003). *Fluoride content of municipal water in the United States*. Journal of Food Composition and Analysis, 16, 621-628.
11. Washington State Department of Ecology. (2007). *Vancouver lake PCB, Chlorinated Pesticides, and Dioxins in Fish Tissues and Sediment (07-03-017)*. Olympia, WA: Publications Coordinator.
12. National Center for Environmental Health. (2003). *Cancer Clusters and Related Activities at CDC (Cancer Clusters)*. Atlanta, GA: CDC.
13. Acosta, R (2008). Pediatric Solid Tumor Conference. In R Acosta (Ed.), *Doernbecher Children's Hospital Solid Tumors 2005-2007* (pp. 1-9). Houston: Pediatric Solid Tumor Conference.
14. Stiller, C. (2007, November 27). *International patterns of cancer incidence in adolescents*. Cancer Treatment Reviews, 33(7), 631-645. Retrieved July 30, 2008, from MEDLINE with Full Text database. <http://web.ebscohost.com>