

**CLYDE CITY AND GREEN CREEK TOWNSHIP AREA  
CHILDHOOD CANCER CASE REVIEW  
1996-2006**

**FINAL REPORT**

**February 29, 2008**

**Sandusky County Health Department  
Fremont, Ohio**

## **INTRODUCTION**

### **A. Background**

An analyses of cancer incidence among childhood residents (ages 0-19) of Clyde City and Green Creek Township, by anatomical site/type of cancer, for the years 1996-2006 and 2002-2006 was completed by the Sandusky County Health Department and the Ohio Department of Health in April, 2007.<sup>1</sup> This assessment revealed higher than expected numbers of childhood cancers for the 11-year time period 1996-2006 (10 cases observed, 5.32 cases expected, standardized incidence ratio [SIR] = 1.88, 95% confidence interval [CI] = 0.90-3.46) and the more recent five-year period 2002-2006 (8 cases observed, 2.47 cases expected, SIR = 3.24, 95% CI = 1.40-6.38), although statistical significance was found for only the 2002-2006 study period. The case counts increased from 1996-2006, with only one case diagnosed prior to 2001 and the majority diagnosed in 2005-2006. Thus, these data indicated a recent temporal (time) phenomenon in the pattern of childhood cancer in the region.

Brain and other Central Nervous System [CNS] cancer was found to be the most common among the Clyde City and Green Creek Township population with four cases and was significantly higher at the 95 percent confidence level than would be expected based on national data (4 cases observed, 0.92 expected, SIR = 4.35, 95% CI = 1.18-11.13). The remaining six cases were each of a different site/type and vary with respect to risk factors, latency, course of disease, and probability of survival. A review of risk factors for these seven cancer sites/types revealed some commonalities, although the causes of most childhood cancers are largely unknown. In regard to environmental risk factors for these cancers, radiation has been associated with the following sites/types: brain and other CNS cancer; leukemia; and osteosarcoma, Li-Fraumeni syndrome, a rare, inherited syndrome caused by a gene mutation, is common to brain and other CNS cancer; leukemia; osteosarcoma; and rhabdomyosarcoma.

A discussion of these results with the families of childhood cancer cases in April, 2007, resulted in a decision to conduct a case-review to attempt to identify factors that may have played a role in the development of these cancers.

Subsequent to the release of the 2007 surveillance report an additional eight cases of cancer among residents 19 years and younger in Clyde City, Green Creek, York, Townsend, and Riley Townships were reported to the Sandusky County Health Department. These cases were verified through the Ohio Cancer Incidence Surveillance System at the Ohio Department of Health.

The Sandusky County Health Department decided to attempt to include all 18 cases in the case-review.

## **METHODS**

The Sandusky County Health Department sent letters to the parents/guardians of the 18 cases inviting them to participate in the case review. Fourteen (78%) of the households agreed to participate in the case review.

The parents/guardians were interviewed using an instrument developed by the ODH – *Cancer Risk Factor Questionnaire for Cases 24 Years of Age and Younger*<sup>2</sup> – for childhood/young adult cancer case reviews such as this. The questionnaire addresses a variety of topics including: personal and family medical history; employment and residential history; possible exposures to chemicals, radiation, and other agents; home and workplace environments; and personal health behaviors such as tobacco use. The questionnaire was administered by Sandusky County Public Health Nurses.

## **RESULTS**

### Year of Diagnosis, Cancer Site/Type and Age at Diagnosis

The 14 cases by year of diagnosis, cancer site/type, and age at diagnosis are presented in Table 1. Five of the cases were malignancies of the brain and other central nervous system [CNS] while there were four cases involving the blood and lymphatic system. Two of the cases were melanoma of the skin; two were rhabdomyosarcoma, and one was osteosarcoma.

Seven (50%) of the cases were diagnosed in 2006, while two (14%) were diagnosed in 2005; one case in 2003 (7%); one case in 2002 (7%); two cases in 2001 (14%), and one case (7%) in 1996.

The range in age at diagnosis was <1 to 18 years while the mean age was 8.6 years.

### Family History of Cancer Among Blood Relatives

All 14 cases had at least one blood relative that has been diagnosed with some type of cancer. There were a total of 49 blood relatives with cancer for the 14 cases. The most frequent site/type of cancer among the relatives was cancer of the breast (6 cases), followed by four cases each of bladder, cervix, melanoma of the skin, and prostate cancers. This family history of cancer among blood relatives is presented in Table 2.

### Parental/Guardian Work History

The information regarding parental/guardian work history during fetal development and in the year prior to diagnosis is presented in Table 3. The most frequent occupation for mothers was clerical/office/secretarial/management (4 cases) followed by teaching/coaching/music directing (3 cases) and light manufacturing/machine shop (3 cases). The most frequent occupation for fathers was light manufacturing/machine shop (4 cases) and farming/pesticide applications (3 cases).

### Estimated Date of Conception, Age of Mom at Conception, Infectious Diseases/Illness, and Medications During Pregnancy

The age of mother at conception for the cases ranged from 17 to 35 years with a mean age of 25.1 years. Five (36%) of the mothers reported having some type of infectious disease or illness during the pregnancy (toxemia, pneumonia, vaginal infection, a cold, and Strep B). Thirteen (93%) of the mothers reported taking some type of medication during the pregnancy (prenatal vitamins, n=10, 71%; Tylenol, n=2, 14%; an iron supplement, n=1, 7%; and cough medication, n=1, 7%). This information is presented in Table 4.

### Cigarette Smoking, Second-Hand Smoke Exposure, Recreational Drug Use, Alcoholic Beverage Use, and Home Pest Exterminations During Pregnancy With Case

Three (21%) of the mothers reported smoking cigarettes during pregnancy with the case (10/day for one month; 20/day for one month; 12-15 day for nine months). Three mothers also reported exposure to second-hand smoke during the pregnancy with the case (20/day; 20-40/day; 5-6/day). None of the mothers reported consuming alcoholic beverages during the pregnancy. One mother reported a home pest extermination (flea bomb) during the pregnancy. This information is presented in Table 5.

### Potential Maternal Exposure to Hazardous/Toxic Substances During the Case Pregnancy

There is very little evidence of potential maternal exposure to hazardous/toxic substances during the case pregnancy. None of the mothers reported any exposure to chemicals or solvents. One (7%) reported having potential exposure to a pesticide/herbicide. Three (21%) reported using paints, lacquers or stains; three (21%) reported potential exposure to petroleum products; and three (21%) reported hair dye use. This information is presented in Table 6.

### Maternal Work Outside the Home During Case Pregnancy and Exposure to Environmental Tobacco Smoke at Work

Ten of the mothers (71%) reported working outside of the home during the case pregnancy. Two mothers (14%) reported exposure to environmental tobacco smoke at work. This information is presented in Table 7.

### Birth Weight of Case

The range in birth weight of the cases was 6 lbs. 1 oz. (97 oz.) – 10 lbs. 5 oz. (165 oz.). The mean birth weight was 7 lbs. 11 oz. (123 oz.). This information is presented in Table 8.

### Problems and Treatment at Birth or Within First Six Months After Birth

Four of the cases (29%) had jaundice and four (29%) had an infection at or shortly after birth (RSV, ear infection, colds, and allergies). Four (29%) had other problems including chickenpox, resuscitation at birth, collapsed lung, and epileptic forme seizures. Two (14%) had a problem with vomiting. This information is presented in Table 9.

Two of the cases (14%) received UV light treatment and two (14%) received oxygen treatment at or shortly after birth. Three (21%) received medications at or shortly after birth (nystatin and amoxicillin), while one (7%) required resuscitation at birth. This information is also presented in Table 9.

### History of Birth Defects and Hereditary Diseases

None of the cases had a history of having a known birth defect that increased the risk of developing cancer, e.g. Klinefelter's Syndrome. One case (7%) had a history of carrying a cardiomyopathy gene. This information is presented in Table 10.

### History of Breast Feeding

Eight (57%) of the cases had a history of being breast fed. The range of breast feeding was one week to 19 months, and the mean length of breast feeding was eight months. This information is presented in Table 11.

### History of Infectious Diseases and Vaccinations Against Infectious Diseases

Eight (57%) of the cases had a history of chickenpox while one (7%) had a history of cold sores [Herpes Simplex] and one (7%) had a history of mononucleosis [Epstein Barr Virus]. This information is presented in Table 12.

Fourteen of the cases (100%) had been vaccinated against diphtheria, pertussis/whooping cough, tetanus, polio, and hepatitis B. Thirteen (93%) of the cases had been vaccinated against measles, rubella, and mumps. Five of the cases (36%) had been vaccinated against chickenpox and one case (7%) had been vaccinated against hepatitis A. This information is also presented in Table 12.

### History of Exposure to Mononucleosis and History of Surgery Prior to Diagnosis

Two of the cases (14%) reported a history of exposure to mononucleosis [Epstein Barr Virus]. Three cases (21%) had a history of having tonsils or adenoids removed and three cases (21%) had a history of other surgery (liver transplant and ear tubes; ear tubes; and oral surgery). This information is presented in Table 13.

### Potential Radiation Exposure and Significant Health Problems and Medical Treatments Prior to Diagnosis

Seven (50%) of the cases had a history of x-rays prior to diagnosis (x-rays with dyes for urinary tract infection; x-rays of head; x-ray of arm; x-ray for liver failure; x-rays for collapsed lung; x-ray of thumb; and x-ray of chest). Ten of the cases (71%) had other health issues/treatments (RSV; recurrent strep throat; recurrent ear infections and seizures; liver transplant; rotavirus; thrush; RSV, and emergency C-section for birth; cardiomyopathy; learning disabilities; echocardiograms, EKGs; collapsed lung; swollen lymph node in neck; and, epileptic forme seizures, selected mutism, mutated pigment on legs). This information is presented in Table 14.

### Use of Alcohol, Recreational Drugs, Tobacco Products, and Exposure to Environmental Tobacco Smoke

None of the cases had a reported history of use of alcoholic beverages, recreational drugs, or tobacco products. Seven (50%) had a history of exposure to environmental tobacco smoke. This information is presented in Table 15.

### History of Sexually Transmitted Diseases and Previous Diagnosis of Cancer

None of the cases had a history of a sexually transmitted disease or a history of diagnosis of cancer prior to 1996. This information is presented in Table 16.

### History of Prescription and Over-the-Counter Medications Within Three Years Prior to Diagnosis

Ten of the cases (71%) had a history of prescription medication use in the three years prior to diagnosis (antibiotics; antibiotics; antibiotics; drugs to control transplant rejection; antibiotics; antibiotics; allergy control medications; antibiotics; allergy control medications; seizure control medications; and, antibiotics). Eight of the cases (57%) had a history of over-the-counter medications within the three years prior to diagnosis (children's cough, cold and pain; child cough and cold; allergy medications; children's cough and cold; children's cough and cold; children's cough and cold; allergy medications; and, children's cold and pain medications). This information is presented in Table 17.

### Case Length of Residence in Clyde City and/or Green Creek Township and Drinking Water Source

The range of length of residence in Clyde City and/or Green Creek Township for the cases was less than one to 17 years with a mean of 5.6 years. The percent of the cases life to date in Clyde City or Green Creek Township ranged from 11% to 100% with a mean of 83%. Ten cases (71%) had spent all of their lives in Clyde City or Green Creek Township prior to diagnosis. This information is presented in Table 18.

Eight of the cases (57%) had a public water supply prior to diagnosis, while four cases (29%) used a private well and two cases (14%) used bottled water or a water service as a drinking water source. This information is also presented in Table 18.

#### Case History of Farm Residence, Pesticide Usage, and Household Pets With Leukemia Prior to Diagnosis

Six of the cases (43%) had a history of farm residence prior to diagnosis (grain, n=4; livestock and grain, n=1; and chickens, n=1). Four of these cases (67%) had a history of farm use of pesticides for weed/insect control. This information is presented in Table 19.

Four cases (29%) had a history of residential indoor use of insecticides for roach and/or flea control. None of the cases had a history of having a household pet with leukemia. This information is also presented in Table 19.

#### Case History of Potential Exposures to Hazardous/Toxic Chemicals Prior to Diagnosis

There is very little evidence of case exposure to hazardous/toxic chemicals prior to diagnosis. None of the cases had a history of exposure to chemicals or solvents. Three cases (21%) had a history of exposure to paints, lacquers, or stains. Two (14%) had exposure to petroleum products and three (21%) had exposure to wood dusts. Two (14%) had exposure to hair dye and two had exposure to weed and insect control products. One case (7%) related a history of exposure to excess chlorine in a swimming pool. This information is presented in Table 20.

#### Schools Attended and Years of Attendance Prior to Diagnosis

Not surprisingly, 13 of the 14 cases attended day care, elementary schools, middle schools, and high schools in Sandusky County prior to diagnosis. One case was diagnosed before attending any school. The schools attended and the years of attendance for each of the participating cases are presented in Table 21. A summary of the schools attended by the number of cases attending, the range in years of attendance, and the mean number of years of attendance are presented in Table 22.

Eleven different schools were attended by the cases and the year of attendance ranged from one to six years. The range in mean years of attendance was 1.0 to 4.0 years. These data do not suggest that place of school attendance played a role in the development of these cancer cases.

## **DISCUSSION**

This case review did not reveal any obvious factors that may have played a role in the development of these cancers. The actual causes or risk factors for most childhood cancer are largely unknown. While there were extensive family histories of cancer for the cases, this may be expected given that about one out of three persons will develop some type of cancer in his or her lifetime.

The information from the case review must be reviewed cautiously. Only 14 of 18 case families (78%) participated in the review. Thus there is missing information regarding the personal environment and health behaviors for four (22%) of the cases. Given the relatively small number of cases the information for each case is critical to the review process. However, it may be highly likely that the information from these four cases would be similar to the other 14.

The information gathered is also subject to the collective memory of the parents/guardians. Attempts to identify potential exposures when the case was undergoing fetal development become more difficult as time goes by. However, parents/guardians of children with cancer may be highly motivated to focus on such recollection as they go through the angst of caring for a child with such a dreaded disease.

## **CONCLUSIONS**

The case review did not reveal any explicit factors in the behaviors or home environment that may have played a role in the development of these cancers.

## **RECOMMENDATIONS**

- (1) Continue to monitor the incidence of childhood cancer among residents of Clyde City and Green Creek Township through the OCISS; and
- (2) Share the results of this case-review with the parents/guardians of the cases.

## **FOOTNOTES**

<sup>1</sup>Cancer Incidence Among Childhood Residents of Clyde City and Green Creek Township, Sandusky County, Ohio, 1996-2006. Chronic Disease and Behavioral Epidemiology Section and the Ohio Cancer Incidence Surveillance System, Ohio Department of Health/Sandusky County Department of Public Health, April 17, 2007.

<sup>2</sup>Cancer Risk Factor Questionnaire for cases 24 Years of Age and Younger. Ohio Department of Health, 2007.

**Table 1**

**Year of Diagnosis, Cancer Site/Type, and Age at Diagnosis: Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

<b>Year of Diagnosis</b>	<b>Cancer Site/Type</b>	<b>Age at Diagnosis</b>
<b>1996</b>	Optic Glioma	<5
<b>2001</b>	Medulloblastoma	5-9
<b>2001</b>	Melanoma of Skin	15-19
<b>2002</b>	Medulla Epithelioma	5-9
<b>2003</b>	Rhabdomyosarcoma	10-14
<b>2005</b>	Hodgkin's Lymphoma	10-14
<b>2005</b>	Medulloblastoma	<5
<b>2006</b>	Rhabdomyosarcoma	<5
<b>2006</b>	Acute Myelocytic Leukemia	10-14
<b>2006</b>	T-Cell Lymphoma	5-9
<b>2006</b>	Hodgkin's Lymphoma	10-14
<b>2006</b>	Medulloblastoma	5-9
<b>2006</b>	Melanoma of Skin	<5
<b>2006</b>	Osteosarcoma	15-19

<sup>1</sup>Source: Chronic Disease and Behavioral Epidemiology/Ohio Cancer Incidence Surveillance System; Bureau of Health Surveillance – Prevention; Ohio Department of Health, October, 2007.

**Table 2**

**Family History of Cancer among Blood Relatives of Cases: Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

<b>Family History of Cancer: Yes/No (%)</b>	<b>History of Cancer among Blood Relatives of Cases</b>	
	<b>Site/Type of Cancer</b>	<b>Number of Blood Relatives</b>
<b>Yes – 14 (100%)</b>	<b>Brain &amp; Central Nervous System</b>	2
	<b>Bladder</b>	4
	<b>Bone</b>	1
	<b>Breast</b>	6
	<b>Cervix</b>	4
	<b>Colon &amp; Rectum</b>	3
	<b>Esophagus</b>	1
	<b>Kidney</b>	1
	<b>Leukemia</b>	3
	<b>Liver</b>	1
	<b>Lung</b>	3
	<b>Lymphoma</b>	2
	<b>Melanoma of Skin</b>	4
	<b>Oral/Pharygeal</b>	1
	<b>Pancreas</b>	2
	<b>Prostate</b>	4
	<b>Stomach</b>	1
	<b>Testes</b>	1
	<b>Thyroid</b>	1
	<b>Uterus</b>	3
	<b>Unknown Site/Type</b>	1
<b>No – 0 (0%)</b>		
<b>Total - 14</b>		49

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.

**Table 3**

**Parental/Guardian Work History During Fetal Development and Year Prior to  
Diagnosis: Clyde City and Green Creek Township Area Childhood Cancer Case  
Review, 1996-2006, N=14<sup>1</sup>**

<b>Occupation</b>	<b>Mother</b>	<b>Father</b>
<b>*Clerical/Office/Secretarial/Management</b>	4	2
<b>*Nursing</b>	2	0
<b>*Teaching/Coaching/Music Directing</b>	3	1
<b>*Retailing</b>	1	0
<b>*Light Manufacturing/Machine Shop</b>	3	4
<b>*Food Preparation</b>	1	0
<b>*Farming, Pesticide Applications</b>	0	3
<b>*Concrete Work</b>	0	1
<b>*Woodwork, wood construction</b>	0	1
<b>*General Maintenance</b>	0	2
<b>*Unknown</b>	0	1
<b>Total</b>	14	15

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.

**Table 4**

**Estimated Date of Conception, Age of Mom at Conception, Infectious Diseases/Illness and Medications During Pregnancy: Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

Case #	Estimated Date of Conception	Age of Mom at Conception	Infectious Disease/Illness	Medications
3	04/83	27	No	Yes, Prenatal Vitamins
14	02/87	21	No	Don't know
5	05/90	26	Yes, Toxemia	Yes, Tylenol, Prenatal Vitamins
11	08/90	18	Yes, Pneumonia	Yes, Prenatal Vitamins, Gaviscon
9	06/92	25	No	Yes, Prenatal Vitamins
6	08/93	17	Yes, Vaginal Inf	Yes, Prenatal Vitamins
2	03/94	31	No	Yes, Prenatal Vitamins
1	01/95	35	No	Yes, Prenatal Vitamins
4	07/95	17	Yes, Cold	Yes, Iron Supplement, Cough Med
12	05/97	38	No	No
10	10/99	28	No	Yes, Prenatal Vitamins
8	04/00	17	No	Yes, Prenatal Vitamins
7	07/00	23	No	Yes, Tylenol, Prenatal Vitamins
13	06/03	29	Yes, Strep B	Yes, Prenatal Vitamins
	<b>Range = 1983-2003</b>	<b>Range = 17-35 Mean = 25.1 years</b>	<b>Yes = 5 (36%) No = 9 (64%)</b>	<b>Yes = 13 (93%) No = 1 (7%)</b>

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.

**Table 5**

**Cigarette Smoking, Second-Hand Smoke Exposure, Recreational Drug Use, Alcohol Beverage Use, and Home Pest Exterminations During Pregnancy With Case: Clyde City and Green Creek Township Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

	Yes	No	Don't Know
<b>Maternal Smoking</b>	3 (21%) <sup>2</sup>	11 (79%)	0 (0%)
<b>Second-Hand Smoke</b>	3 (21%) <sup>3</sup>	10 (79%)	0 (0%)
<b>Recreational Drugs</b>	0 (0%)	14 (100%)	0 (0%)
<b>Alcoholic Beverages</b>	0 (0%)	14 (100%)	0 (0%)
<b>Home Pest Extermination</b>	1 (7%) <sup>4</sup>	12 (86%)	1 (7%)

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.

<sup>2</sup>10/day for one month; 20/day for one month; 12-15 day for nine months.

<sup>3</sup>20/day; 20-40/day; 5-6/day.

<sup>4</sup>Flea bomb.

**Table 6**

**Potential Maternal Exposure to Hazardous/Toxic Substances During Case  
Pregnancy: Clyde City and Green Creek Township Area Childhood Cancer Case  
Review, 1996-2006, N=14<sup>1</sup>**

<b>Potential Exposure</b>	<b>Yes (%)</b>	<b>No (%)</b>	<b>Don't Know (%)</b>	<b>Total</b>
<b>Chemicals or solvents (e.g. laboratory chemicals, benzene, acetone)</b>	0 (0%)	13 (93%)	1 (7%)	14
<b>Paints, lacquers, stains</b>	3 (21%)	10 (71%)	1 (7%)	14
<b>Gases (e.g. chloride, nitrous oxide, ether)</b>	0 (0%)	13 (93%)	1 (7%)	14
<b>Engine exhaust fumes</b>	0 (0%)	13 (93%)	1 (7%)	14
<b>Petroleum products (e.g. gasoline, oil, propane)</b>	3 (21%)	10 (71%)	1 (7%)	14
<b>Dusts (e.g. coal, wood, silicon, asbestos, talc)</b>	2 (14%)	11 (79%)	1 (7%)	14
<b>Dyes, including hair dye</b>	3 (21%)	11 (79%)	0 (0%)	14
<b>Metals in molten or dust form (e.g. lead, aluminum, iron, nickel, zinc, mercury)</b>	0 (0%)	14 (100%)	0 (0%)	14
<b>Pesticides, herbicides</b>	1 (7%)	11 (79%)	2 (14%)	14
<b>Cleaning compounds (e.g. bleach, detergent, ammonia, borax)</b>	1 (7%)	13 (93%)	0 (0%)	14
<b>Other</b>	1 (7%) <sup>2</sup>	12 (86%)	1 (7%)	14

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.  
<sup>2</sup>Possible radiation exposure during 1<sup>st</sup> month of pregnancy.

**Table 7**

**Maternal Work Outside the Home During Case Fetal Development and Exposure to  
Environmental Tobacco Smoke: Clyde City and Green Creek Township Area  
Childhood Cancer Case Review, 1996-2006<sup>1</sup>**

	<b>Work Outside the Home</b>	<b>Exposure to Environmental Tobacco Smoke at Work</b>
<b>Yes</b>	10 (71%)	2 (14%)
<b>No</b>	4 (29%)	8 (57%)
<b>Don't Know</b>	0 (0%)	0 (0%)
<b>Not Applicable</b>	0 (0%)	4 (29%)

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.

**Table 8**

**Birth Weight of Case: Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

<b>Range of Birth Weight: 6 lbs. 1 oz. (97 oz.) – 10 lbs. 5 oz. (165 oz.)</b>
<b>Mean Birth Weight: 7 lbs. 11 oz. (123 oz.)</b>
<sup>1</sup> Source: Sandusky County Health Department, June, 2007.

**Table 9**

**Problems and Treatment at Birth or Within First Six Months of Birth for Cases in Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

	<b>Yes</b>	<b>No</b>	<b>Don't know</b>	<b>Total</b>
<b>Problems at Birth or Within Six Months After Birth</b>				
<b>Jaundice</b>	4 (29%)	9 (64%)	1 (7%)	14 (100%)
<b>Vomiting</b>	2 (14%)	11 (79%)	1 (7%)	14 (100%)
<b>Infection</b>	4 (29%) <sup>2</sup>	9 (64%)	1 (7%)	14 (100%)
<b>Other</b>	4 (29%) <sup>3</sup>	9 (64%)	1 (7%)	14 (100%)
<b>Treatment at Birth or Within Six Months After Birth</b>				
<b>UV Light</b>	2 (14%)	11 (79%)	1 (7%)	14 (100%)
<b>Oxygen</b>	2 (14%)	12 (86%)	0 (0%)	14 (100%)
<b>Blood Transfusion</b>	0 (0%)	14 (100%)	0 (0%)	14 (100%)
<b>Medicines</b>	3 (21%) <sup>4</sup>	10 (71%)	1 (7%)	14 (100%)
<b>Other</b>	1 (7%) <sup>5</sup>	13 (93%)	0 (0%)	14 (100%)

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.

<sup>2</sup>Includes RSV, ear infections, colds, allergies.

<sup>3</sup>Includes chickenpox, resuscitation at birth, collapsed lung, and epileptic forme seizures.

<sup>4</sup>Includes Nystatin, Amoxicillin, and one case where meds were given but not certain what they were.

<sup>5</sup>Resuscitation at birth.

**Table 10**

**History of Birth Defects and Hereditary Diseases among Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

	<b>Yes</b>	<b>No</b>	<b>Don't know</b>	<b>Total</b>
<b>*Downs Syndrome</b>	0 (0%)	14 (100%)	0 (0%)	14 (100%)
<b>*Klinefelter's Syndrome</b>	0 (0%)	14 (100%)	0 (0%)	14 (100%)
<b>*Fraconi's Anemia</b>	0 (0%)	14 (100%)	0 (0%)	14 (100%)
<b>*Bloom's Syndrome</b>	0 (0%)	14 (100%)	0 (0%)	14 (100%)
<b>*Turner's Syndrome</b>	0 (0%)	14 (100%)	0 (0%)	14 (100%)
<b>*L. Fraumeni's Syndrome</b>	0 (0%)	14 (100%)	0 (0%)	14 (100%)
<b>*Other</b>	1 (7%) cardiomyopathy gene	13 (93%)	0 (0%)	14 (100%)

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.

**Table 11**

**History of Breast Feeding among Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

<b>History of Breast Feeding = 8 (57%)</b>
<b>*Mean Length of Breast Feeding = 8 months</b>
<b>*Range of Breast Feeding = 1 week to 19 months</b>
<b>No History of Breast Feeding = 5 (36%)</b>
<b>Don't know if Breast Fed = 1 (7%)</b>

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.

Table 12

History of Infectious Disease and Vaccinations Against Infectious Disease among  
Clyde City and Green Creek Township Area Childhood Cancer Case Review,  
1996-2006, N=14<sup>1</sup>

	Diagnosed With			Vaccinated Against		
	Yes (%)	No (%)	Don't know (%)	Yes (%)	No (%)	Don't know (%)
<b>Diphtheria</b>	0 (0%)	14 (100%)	0 (0%)	14 (100%)	0 (0%)	0 (0%)
<b>Pertussis/ Whooping Cough</b>	0 (0%)	14 (100%)	0 (0%)	14 (100%)	0 (0%)	0 (0%)
<b>Tetanus</b>	0 (0%)	14 (100%)	0 (0%)	14 (100%)	0 (0%)	0 (0%)
<b>Measles</b>	0 (0%)	14 (100%)	0 (0%)	13 (93%)	1 (7%)	0 (0%)
<b>Rubella (German Measles)</b>	0 (0%)	14 (100%)	0 (0%)	13 (93%)	1 (7%)	0 (0%)
<b>Mumps</b>	0 (0%)	14 (100%)	0 (0%)	13 (93%)	1 (7%)	0 (0%)
<b>Polio</b>	0 (0%)	14 (100%)	0 (0%)	14 (100%)	0 (0%)	0 (0%)
<b>Smallpox</b>	0 (0%)	14 (100%)	0 (0%)	0 (0%)	14 (100%)	0 (0%)
<b>Chicken Pox</b>	8 (57%)	6 (43%)	0 (0%)	5 (36%)	7 (50%)	2 (14%)
<b>Hepatitis A</b>	0 (0%)	14 (100%)	0 (0%)	1 (7%)	13 (93%)	0 (0%)
<b>Hepatitis B</b>	0 (0%)	14 (100%)	0 (0%)	14 (100%)	0 (0%)	0 (0%)
<b>Hepatitis C</b>	0 (0%)	14 (100%)	0 (0%)	N.A. <sup>2</sup>	N.A.	N.A.
<b>Cold Sores (Herpes Simplex)</b>	1 (7%)	13 (93%)	0 (0%)	N.A.	N.A.	N.A.
<b>Rheumatic Fever</b>	0 (0%)	14 (100%)	0 (0%)	N.A.	N.A.	N.A.
<b>Mononucleosis (Epstein Barr Virus)</b>	1 (7%)	13 (93%)	0 (0%)	N.A.	N.A.	N.A.

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.  
<sup>2</sup>N.A. = Not applicable.

**Table 13**

**History of Exposure to Mononucleosis and History of Surgery Prior to Diagnosis among Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

	<b>Yes</b>	<b>No</b>	<b>Don't know</b>	<b>Total</b>
<b>Exposure to Mononucleosis</b>	2 (14%)	12 (86%)	0 (0%)	14
<b>Tonsils or Adenoids Removed</b>	3 (21%)	11 (79%)	0 (0%)	14
<b>Appendix Removed</b>	0 (0%)	13 (93%)	1 (7%)	14
<b>History of Other Surgery</b>	3 (21%) <sup>2</sup>	11 (79%)	0 (0%)	14
<sup>1</sup> Source: Sandusky County Health Department, June, 2007.				
<sup>2</sup> Includes: Liver transplant and ear tubes; ear tubes; and oral surgery.				

**Table 14**

**Potential Radiation Exposures and Significant Health Problems and Medical Treatments Prior to Diagnosis among Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

	<b>Yes</b>	<b>No</b>	<b>Don't know</b>	<b>Total</b>
<b>Radiation Treatments</b>	0 (0%)	14 (100%)	0 (0%)	14
<b>X-Rays</b>	7 (50%) <sup>2</sup>	7 (50%)	0 (0%)	14
<b>Treatment for Ringworm</b>	0 (0%)	14 (100%)	0 (0%)	14
<b>Treatment for Head Lice</b>	0 (0%)	14 (100%)	0 (0%)	14
<b>Other Health Issues/Treatments</b>	10 (71%) <sup>3</sup>	4 (29%)	0 (0%)	14
<sup>1</sup> Source: Sandusky County Health Department, June, 2007.				
<sup>2</sup> Includes: x-rays with dyes for urinary tract infection; x-rays of head; x-ray of arm; x-rays for liver failure; x-rays for collapsed lung; x-ray of thumb; and x-ray of chest.				
<sup>3</sup> Includes: RSV; recurrent strep throat; recurrent ear infections and seizures; liver transplant; rotavirus; thrush; RSV, and emergency C-section for birth; cardiomyopathy; learning disabilities, echocardiograms, EKGs; collapsed lung; swollen lymph node in neck; and, epileptic form seizures, selected mutism, mutated pigment on legs.				

**Table 15**

**Use of Alcohol, Recreational Drugs, Tobacco Products, and Exposure to Environmental Tobacco Smoke Prior to Diagnosis among Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

	<b>Yes</b>	<b>No</b>	<b>Don't know</b>	<b>Total</b>
<b>*Alcoholic Beverages</b>	0 (0%)	14 (100%)	0 (0%)	14
<b>*Recreational Drug Use</b>	0 (0%)	14 (100%)	0 (0%)	14
<b>*Tobacco Products</b>	0 (0%)	14 (100%)	0 (0%)	14
<b>*Exposure to Environmental Tobacco Smoke</b>	7 (50%)	7 (50%)	0 (0%)	14

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.

**Table 16**

**History of Sexually Transmitted Diseases and Previous Diagnosis of Cancer among Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

	<b>Yes</b>	<b>No</b>	<b>Don't know</b>	<b>Total</b>
<b>*History of Sexually Transmitted Diseases</b>	0 (0%)	14 (100%)	0 (0%)	14
<b>*History of Diagnosis of Cancer Prior to 1996</b>	0 (0%)	14 (100%)	0 (0%)	14

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.

**Table 17**

**History of Prescription and Over-the-Counter Medications Within Three Years Prior to Diagnosis among Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

	<b>Yes</b>	<b>No</b>	<b>Don't know</b>	<b>Total</b>
<b>*Prescription Medications</b>	10 (71%) <sup>2</sup>	4 (29%)	0 (0%)	14
<b>*Over-the-Counter Medications</b>	8 (57%) <sup>3</sup>	6 (43%)	0 (0%)	14

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.

<sup>2</sup>Includes: antibiotics; antibiotics; antibiotics; drugs to control transplant rejection; antibiotics; antibiotics; allergy control medications; antibiotics; allergy control medications; and seizure control medications; and, antibiotics.

<sup>3</sup>Includes: children's cough, cold and pain; child cough and cold; allergy medications; children's cough and cold; children's cough and cold; children's cough and cold; allergy medications; and, children's cold and pain medications.

**Table 18**

**Length of Residence in Clyde City and/or Green Creek Township and Drinking Water Source for Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006<sup>1</sup>**

<b>Length of Residence Prior to Diagnosis</b>	<b>Percent of Life Prior to Diagnosis</b>	<b>Drinking Water Source</b>
Range: <1 to 17 years Mean: 5.6 years	Range: 11% to 100% Mean: 83%	Private Well: 4 (29%)
	10 cases (71%) had spent all of their lives in Clyde City/Green Creek Township prior to diagnosis.	Bottled Water/Water Service: 2 (14%) Public Water Supply: 8 (57%)

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.

**Table 19**

**History of Farm Residence, Pesticide Usage, and Household Pets With Leukemia Prior to Diagnosis for Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

<b>Farm Residence</b>	<b>Type of Farm</b>	<b>Pesticide Use</b>	<b>Residence Extermination</b>	<b>Household with Pet Leukemia</b>
Yes = 6 (43%)	Grain x 4 (67%)	Yes = 4 (67%) <sup>2</sup>	Yes = 4 (29%) <sup>3</sup>	Yes = 0 (0%)
No = 8 (57%)	Livestock/Grain x 1 (17%)	No = 2 (33%)	No = 10 (71%)	No = 13 (93%)
	Chicken x 1 (17%)			Don't know = 1 (7%)
	Not Applicable = 8	Not Applicable = 8		

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.  
<sup>2</sup>Pesticides for weed/insect control.  
<sup>3</sup>Insecticide for roach, flea control.

**Table 20**

**History of Potential Exposure to Hazardous/Toxic Chemicals Prior to Diagnosis among Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006, N=14<sup>1</sup>**

	<b>Yes</b>	<b>No</b>	<b>Don't know</b>	<b>Total</b>
<b>*Chemicals or solvents</b>	0 (0%)	14 (100%)	0 (0%)	14
<b>*Paints, lacquers, stains</b>	3 (21%) <sup>2</sup>	11 (79%)	0 (0%)	14
<b>*Gases</b>	0 (0%)	14 (100%)	0 (0%)	14
<b>*Engine Exhaust Fumes</b>	0 (0%)	14 (100%)	0 (0%)	14
<b>*Petroleum Products</b>	2 (14%)	12 (86%)	0 (0%)	14
<b>*Dusts</b>	3 (21%) <sup>3</sup>	11 (79%)	0 (0%)	14
<b>*Dyes</b>	2 (14%) <sup>4</sup>	12 (86%)	0 (0%)	14
<b>*Metals</b>	0 (0%)	14 (100%)	0 (0%)	14
<b>*Pesticides</b>	2 (14%) <sup>5</sup>	12 (86%)	0 (0%)	14
<b>*Cleaning Compounds</b>	0 (0%)	14 (100%)	0 (0%)	14
<b>*Others</b>	1 (7%) <sup>6</sup>	13 (93%)	0 (0%)	14

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.  
<sup>2</sup>Includes household paint, paint stripper, brush cleaner.  
<sup>3</sup>Includes wood dust.  
<sup>4</sup>Hair dye.  
<sup>5</sup>Chemicals for weed and insect control.  
<sup>6</sup>Excess chlorine in swimming pool.

**Table 21**

**Schools Attended and Years of Attendance Prior to Diagnosis, Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006 (N=14).<sup>1</sup>**

<b>Case #</b>	<b>Age at Diagnosis</b>	<b>Year of Diagnosis</b>	<b>Schools Attended</b>	<b>Years Attended</b>	<b>Total Years</b>
1	<5 year	1996	*None	Not Applicable (N/A)	N/A
2	5-9	2001	*Preschool – Fremont *Vine Street Elementary – Clyde	1997-1999 1999-2001	2
3	15-19	2001	*Day Care – Clyde *Townsend Elementary – Vickery *Bogart Elementary – Castalia *Townsend Elementary – Vickery *Margaretta Jr. & Sr. High School – Castalia	1988-1989 1989-1991 1991-1992 1992-1996 1996-2001	1 2 1 4 5
4	5-9	2002	*Day Care – Green Springs *Day Care- Bellevue *St. Ann’s – Fremont *Day Care – Clyde *Green Springs Elementary – Green Springs	1996-2001 1996-1997 2000-2001 2000-2001 2001-2002	5 2 1 2 1
5	10-14	2003	*Day Care – Fremont *Day Care – Clyde *Vine Street Elementary – Clyde *Green Springs Elementary – Green Springs *McPherson Middle School – Clyde	1991-1996 1996-2000 1996-2001 2001-2003 2003	6 5 5 2 1
6	10-14	2005	*Day Care – Clyde *South Main Elementary – Clyde *Green Springs Elementary – Green Springs	? 1999-2005 2005	N/A 6 1
7	<5	2005	*Day Care – Fremont	2005	1
8	<5	2006	*Day Care – Fremont *Head Start – Clyde *Vine Street Elementary – Clyde	2004 2005 2006	1 1 1
9	10-14	2006	*Lakota Preschool – *St. Mary’s – Clyde *Green Springs Elementary – Green Springs *McPherson Middle School – Clyde	1997-1998 1998-2000 2000-2006 2006	1 2 5 1
10	5-9	2006	*Day Care – Bellevue *Bogart Elementary – Castalia	2003-2004 2005-2006	1 1
11	10-14	2006	*Head Start – Sandusky *Bogart Elementary – Castalia *Townsend Elementary – Vickery *Margaretta Jr. & Sr. High – Castalia	1994-1995 1996-2000 2000-2003 2003-2006	1 4 3 3
12	5-9	2006	*South Main Elementary – Clyde	2003-2006	3
13	<5	2006	*Day Care – Fremont *South Main Elementary – Clyde	2004-2006 2006	2 1
14	15-19	2006	*Fremont Middle School – Fremont *Ross High School – Fremont *Clyde High School – Clyde *Terra Community College – Fremont	2000-2003 2003 2003-2006 2004-2006	3 1 3 2

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.

**Table 22**

**Schools Attended by Cases, Range and Mean Years of Attendance Prior to Diagnosis, Clyde City and Green Creek Township Area Childhood Cancer Case Review, 1996-2006 (N=13)<sup>1</sup>**

<b>School</b>	<b>Number of Cases Attending<sup>2</sup></b>	<b>Range of Years of Attendance</b>	<b>Mean Number of Years of Attendance</b>
<b>*Vine Street Elementary – Clyde</b>	3	2-5	2.7
<b>*Townsend Elementary – Vickery</b>	3	2-4	3.0
<b>*Bogart Elementary – Castalia</b>	3	1-4	2.0
<b>*Margareta Jr. &amp; Sr. High Schools – Castalia</b>	2	3-5	4.0
<b>*Green Springs Elementary – Green Springs</b>	4	1-5	2.3
<b>*McPherson Middle School – Clyde</b>	2	1	1
<b>*South Main Elementary – Clyde</b>	3	1-6	3.3
<b>*Fremont Middle School – Fremont</b>	1	3	N.A. <sup>3</sup>
<b>*Ross High School – Fremont</b>	1	1	N.A.
<b>*Clyde High School – Clyde</b>	1	3	N.A.
<b>*Terra Community College – Fremont</b>	1	2	N.A.

<sup>1</sup>Source: Sandusky County Health Department, June, 2007.  
<sup>2</sup>Several cases attended more than one school, one case did not attend school at all prior to diagnosis.  
<sup>3</sup>N.A. = Not applicable.