



BCBSM Physician Group Incentive Program 2012 Program Year

Environmental Cancer Initiative

Initiative Plan



I. Initiative Overview

The Blue Cross Blue Shield of Michigan (BCBSM) Environmental Cancer Initiative is one of many initiatives of the Physician Group Incentive Program (PGIP). Since its inception in 2005, PGIP has supported and facilitated practice transformation using a wide variety of initiatives to reward physician organizations (POs) for improved performance in health care delivery. As of September 2011, PGIP includes 40 POs from across the state of Michigan, representing nearly 15,000 primary care and specialty physicians who are members of the BCBSM TRUST PPO and/or Traditional Networks. These physicians provide care to nearly two million BCBSM members.

BCBSM's Physician Group Incentive Program encourages all payer collaboration, catalyzing all payer system development, rather than payer-specific system development. Through PGIP, BCBSM is helping to improve the quality of care for all Michigan residents. Patients throughout the state, regardless of payer, benefit from the improved care processes developed through the PGIP provider community. Developing systems of care which are used for all patients helps assure that providers don't have to alter care processes based on whether patients have insurance, or which insurance they have. This is an important factor in ensuring that the best practices and care processes are reliably provided to all patients, all of the time. This all-payer approach to practice transformation is good for patients with coverage from BCBSM and BCN and helps further BCBSM's social mission of cultivating a healthier future for all Michigan residents.

In an effort to improve the quality of care provided to individuals with exposure to environmental toxins, BCBSM developed the Environmental Cancer Initiative in 2010. This initiative is designed to educate physicians on how to identify illnesses related to exposure to environmental toxins and diagnose health effects with fewer and more appropriate procedures in order to treat or refer for treatment at an early stage. Physicians learn how to diagnose and treat illnesses caused by arsenic, radon, asbestos, lead, and cholinesterase inhibitors through the completion of online case studies offered by the Agency for Toxic Substances and Disease Registry (ATSDR). ECI ultimately aims to reduce illness, cancer morbidity and mortality through primary prevention and early detection of diseases and ailments related to the aforementioned toxins.

Goals and Objectives

The goal of the Environmental Cancer Initiative is to elevate the standard of care pertaining to the diagnosis and treatment of patients with exposure to the environmental toxins asbestos, arsenic, radon, lead, and cholinesterase inhibitors. The proposed program aims to ultimately better treat those with exposure to environmental toxins and reduce cancer morbidity and mortality through primary prevention and early detection of diseases related to exposure to the aforementioned toxins.

Specifically this project will aim to:

- Increase number of PGIP physicians starting and completing all case studies.
- Promote a line of patient questioning designed to uncover environmental illnesses.
- Increase the awareness of inexpensive, yet sensitive diagnostic testing in developing the differential diagnosis.
- Increase use of 24-hour urine tests to detect arsenic levels
- Increase early diagnosis and treatment of illnesses related to environmental toxin exposure.

- Increase blood testing for lead
- Increase measurement of urine metabolites of toxic elements and improve on reporting techniques.
- Increase referral of patients difficult to diagnose to one of the two Association for Occupational and Environmental Clinics (AOEC) in Michigan.

Summary of Results

Since ECI's inception in July of 2010, over 406 PGIP physicians have completed all environmental cancer modules.

II. Background

Health Problem and Significance

The incidence of cancers associated with asbestos, arsenic and radon exposure in Michigan exceeds the national rate. The difference in incidence between Michigan and the US is pronounced when comparing Michigan's rate of lung and bronchus cancer (74.8 cases/100,000) with the national rate (69 cases/100,000) ¹

Asbestos is a naturally-occurring fibrous substance that is widely used in a variety of industries.² "Asbestos has been the largest single cause of occupational cancer in the United States and a significant cause of disease and disability from nonmalignant disease."³ Hundreds of thousands of Michigan workers have been exposed to asbestos in their workplaces. Additionally, it is estimated that over 300,000 Michigan homes are insulated with asbestos-contaminated vermiculite. Exposure to asbestos is known to cause lung, colon and gastrointestinal cancers and mesothelioma. Mesothelioma is a rare and rapidly fatal type of cancer that affects the covering of the lungs, heart and abdomen and accounts for three percent of all cancer diagnoses. It has been estimated that the total number of asbestos-related deaths in the US will exceed 200,000 by the year 2030.⁴ Michigan ranks 12th among all states in terms of deaths due to asbestos-related disease.⁵

Exposure to high **arsenic** levels can come from certain fertilizers, animal feeding operations, industry practices such as copper smelting, mining and coal burning and ground water sources of drinking water.⁶ Arsenic is regularly found in the water table in Southeastern Michigan as a result of the erosion of natural rock that affects well water. Long-term exposure to arsenic has been linked to many illnesses including cancer of the bladder, lungs, skin, kidneys, nasal passages, liver and prostate, and increased risk of developing peripheral vascular diseases, coronary artery diseases, type 2 diabetes and gestational diabetes among pregnant women. Michigan has one of the country's largest natural deposits of arsenic located in the Marshall Sandstone Formation and its related aquifers. It is estimated that 230,000 people in Southeastern Michigan are exposed to arsenic in well water at levels that exceed Federal safety guidelines.⁷

Radon is a colorless, odorless and tasteless gas found in basements throughout Michigan. Radon invades indoor air primarily from soil under homes and other buildings. It is a known lung carcinogen and is the largest source of radiation exposure to the general public.⁸ The US Environmental Protection Agency (EPA) found that even very small exposures to radon can result in lung cancer. The national average indoor radon level is 1.3 pCi/L (picocuries per liter).

In Oakland County the average indoor radon level is 3.9 pCi/L; in Macomb County the average indoor radon level is 1.9 pCi/L; and in Wayne County the average indoor radon level is 2.4 pCi/L.⁹

Lead is a metal that is found naturally in the earth's crust, though much of it develops as a result of human activities such as burning fossil fuels, mining and manufacturing. Lead has been known to cause irreversible neurological and ocular damage, as well as renal disease, cardiovascular effects, and reproductive toxicity. Lead is especially damaging to children, who can experience severe developmental damage from contamination.¹⁰ Exposure to low levels of lead during pregnancy, detected at <2 micrograms/dL in cord blood, have a significant association with increased maternal blood pressure during labor and delivery.¹¹ Surveillance data from the Centers for Disease Control and Prevention (CDC) in 2004 found blood lead levels >5 micrograms/dl in 10.9 of every 100,000 women of childbearing age. Maternal and fetal blood levels are nearly identical because lead crosses the placenta unencumbered.¹² The CDC reports that approximately 250,000 U.S. children aged 1-5 years have blood lead levels greater than 10 micrograms of lead per deciliter of blood, the level at which CDC recommends public health actions be initiated.¹³ Over 1,800 children in Michigan were reported to have elevated blood levels in 2008.¹⁴

Cholinesterase Inhibitors are toxic substances that are found in pesticides and chemical weapons. Organophosphates and carbamates are potent cholinesterase inhibitors found in pesticides. In 2008, there were more than 8,000 reported incidents of poisoning from exposure to these compounds in the United States.¹⁵ Typical exposure results from accidental or intentional ingestion, inhalation, or skin exposure to agricultural pesticides. Other routes of exposure are from ingestion of contaminated fruits and vegetables.¹⁶ A 2008 survey by the U.S. Department of Agriculture found detectable levels of organophosphates in 28% of frozen blueberries, 19% of celery, and 25% of strawberries.¹⁷ A 2010 study of children with this low level exposure, typical of the at large population, and organophosphate metabolites higher than the median detectable in urine were twice as likely to be diagnosed with ADHD.¹⁸ Prenatal exposure to organophosphates has been associated with an increased risk of pervasive developmental disorders and delays in mental development.^{19, 20}

Possible Solutions

The best solution to the issue of exposure to environmental toxins is to remove them. Since many of these toxins are naturally occurring, this would be practically impossible. Agencies like the EPA are working toward the containment of these toxins.

In the meantime, the ECI is designed to educate Michigan physicians on how to identify symptoms and illnesses related to exposure to environmental carcinogens and diagnose their health effects with fewer and more appropriate procedures in order to treat or refer for treatment at an early stage. The literature suggests that people with a history of exposure to arsenic, radon, asbestos, lead, and cholinesterase inhibitors should be provided with a management plan that identifies the current disease state and takes into consideration the risk of developing exposure-related diseases including malignancies in the future.

There are companies/members of the medical community developing blood tests to identify mesothelioma earlier in the disease process than current methods. Because diseases due to toxic exposures can take decades to manifest and most people are unaware of their exposure at the time it occurs, it is difficult for patients to associate symptoms/illness with exposure to

environmental toxins. Further, providers may not query patients regarding where they are/were employed or where they grew up/currently live to gather information on potential environmental toxin exposures.

The Blue Cross and Blue Shield of Minnesota Foundation awarded grants under two initiatives focused on improving health in Minnesota. One of these was the White Earth Land Recovery Project, with the goal of protecting children's health by addressing pesticide contamination issues, promoting reservation-wide strategies to reduce environmental pollution, increasing the consumption of fresh locally grown and organic foods, and strengthening the local economy.

The Agency for Toxic Substances and Disease Registry, based in Atlanta, Georgia, is a federal public health agency of the U.S. Department of Health and Human Services. ATSDR provides health information to prevent harmful exposures and diseases related to toxic substances including case studies designed for educating the medical community. The case studies are self-instructional courses designed to increase the primary care provider's knowledge of hazardous substances in the environment and to promote the adoption of medical practices that aid in the evaluation and care of potentially exposed patients. ATSDR indicates that early and correct diagnosis of illnesses resulting from toxic substances exposure improves morbidity and mortality rates.

Several health national plans support community initiatives that focus on reducing and treating lead exposure. Blue Cross Blue Shield of Western New York collaborated with the Community Foundation for Greater Buffalo on the Wipe Out Lead Campaign which tested 1,000 area children for lead poisoning.²¹ Blue Cross Blue Shield of Minnesota has Blue Plus Dedicated Nurses reach out to parents whose children have a high blood lead level to make sure that they know what steps to take to help lower their child's blood lead level and to remove any sources of lead exposure from their home.²² HEDIS has incorporated a preventive measure testing children under the age of two for exposure to lead in its Medicaid population.²³

BCBSM Experience

At this time, there are no other BCBSM solutions implemented that address the impact of toxic substances exposure on the health of its enrolled population.

III. Initiative Description

Specific Area of Focus

The Environmental Cancer Initiative is designed to help PGIP physicians identify patients with exposure to environmental toxins, correctly diagnose related illnesses and treat or refer for treatment patients with conditions associated with exposure to these toxins. Multiple specialties will learn how to diagnose and treat illnesses caused by arsenic, radon, asbestos, lead, and cholinesterase inhibitors through the completion of online case studies on offered by ATSDR.

General practice, family practice, internal medicine, pulmonary disease, geriatric medicine (family practice), pediatricians, and oncologists, will be able to complete modules to assess exposure history and asbestos, radon, and arsenic toxicity.

Beginning in 2012, pediatricians are able to complete an additional three modules focused on pediatric environmental health. Obstetricians/gynecologists will have four modules available,

which will focus on taking an exposure history, lead toxicity, cholinesterase inhibitors and reproductive/developmental toxicity. Neurologists will be able to complete modules on taking an exposure history, lead and arsenic toxicity and cholinesterase inhibitors.

Target Population

The target population includes all members, ages 0 to 64 years, who are assigned a primary care relationship with a primary care physician from the PGIP physician list.

Criteria for Participation

The following specialties will be invited to join this initiative: general practice, family practice, internal medicine, pulmonary disease, geriatric medicine (family practice), pediatricians, oncologists, obstetricians/gynecologists, and neurologists. Participating physicians must be a member of a PGIP PO.

Coordinating Center Role and Responsibilities

Michael Harbut, MD, and his staff serve as the Coordinating Center for this project. Dr. Harbut is an internationally-known expert in the diagnosis and treatment of environmental and workplace diseases, and is the director of the environmental cancer program at Karmanos. The Coordinating Center is responsible for tracking the completion of modules by targeted physicians, and recruiting PGIP physicians/POs to participate in their program. This information will be supplied to BCBSM so that BCBSM can make incentive payments to the POs on behalf of the PGIP physician participant.

To increase physician participation in 2012, the Coordinating Center will reach out to POs who select the initiative in late 2011 to make sure that their eligible physicians are aware of the program. The Coordinating Center will also ensure that there is a primary PGIP contact in each PO that can help promote the initiative. They will also maintain contact with participating physicians through periodic e-mailed "ECI Updates" covering current environmental toxin issues and research findings.

Additionally, the Coordinating Center will work with the Michigan Radon Officer to track available information on the purchase of radon kits by Michigan county.

The Coordinating Center will complete and submit to BCBSM quarterly reports that include information on key activities, successes, and challenges.

BSBCM Deliverables

BCBSM will provide POs payment for every eligible physician completing the ECI modules. POs are expected to pass incentive payments onto the physician participants that complete each set of modules in a timely manner.

BCBSM reserves the right to modify its evaluative and administrative processes related to the Initiative.

PO Expectations/Deliverables

POs electing to participate in this program will provide program participation information to their physicians. PGIIP physicians in one of the above noted specialties that elect to participate in this program must do the following:

1. Complete a registration form found in the following link:
http://www2a.cdc.gov/TCEOnline/registration/detailpage.asp?res_id=1535
2. Complete the relevant case studies.

After the completion of each case study, the provider is to forward proof of completion via email to Ms. Cynthia Noraian, at the Coordinating Center, noraianc@karmanos.org. or FAX 248-547-9336 Once the Coordinating Center receives confirmation from the ATSDR that each provider has completed all four case studies, a completion packet will be sent to the provider including:

1. Check-list to be used in the diagnosis of patients exposed to asbestos, arsenic, radon, lead, or cholinesterase inhibitors
2. Website links for downloadable patient information
3. Information on how to refer patients for treatment of asbestos, arsenic or radon-related illnesses
4. Certificate of completion and participation in the ECI suitable for framing
5. Information to provide to the patients inviting them to complete a larger survey and provide that information directly to Karmanos

Continuing education credits can be earned by physicians for each of the case studies.

Taking An Exposure History: 1.5 credits for physicians

http://www2a.cdc.gov/TCEOnline/registration/detailpage.asp?res_id=1766

For course material: <http://www.atsdr.cdc.gov/csem/csem.asp?csem=17&po=0>

Asbestos Toxicity: 2 credits for physicians

http://www2a.cdc.gov/TCEOnline/registration/detailpage.asp?res_id=1535

For course material: <http://www.atsdr.cdc.gov/csem/csem.asp?csem=4&po=0>

Radon Toxicity: 1.75 credits for physicians

http://www2a.cdc.gov/TCEOnline/registration/detailpage.asp?res_id=2338

For course material: <http://www.atsdr.cdc.gov/csem/csem.asp?csem=8&po=0>

Arsenic Toxicity: 2 credits for physicians

http://www2a.cdc.gov/TCEOnline/registration/detailpage.asp?res_id=2338

For course material: <http://www.atsdr.cdc.gov/csem/csem.asp?csem=1&po=0>

Lead Toxicity: 2 credits for physicians

http://www2a.cdc.gov/TCEOnline/registration/detailpage.asp?res_id=1562

For course material: <http://www.atsdr.cdc.gov/csem/csem.asp?csem=7&po=0>

Cholinesterase Inhibitors: 3.5 credits for physicians

http://www2a.cdc.gov/TCEOnline/registration/detailpage.asp?res_id=1690

For course material: <http://www.atsdr.cdc.gov/csem/csem.asp?csem=11&po=0>

Taking a Pediatric Exposure History: 2 credits for physicians

http://www2a.cdc.gov/TCEOnline/registration/detailpage.asp?res_id=2786

For course material: <http://www.atsdr.cdc.gov/csem/csem.asp?csem=26&po=0>

Pediatric Environmental Health Toolkit: 1.5 credits for physicians
http://www2a.cdc.gov/TCEOnline/registration/detailpage.asp?res_id=1996
For course material: <http://www.atsdr.cdc.gov/emes/training/page9.html>

As Environmental Cancer Initiative participants, physicians agree to identify patients exposed to environmental toxins, perform diagnostics for early disease identification and provide appropriate treatment or refer cases for treatment to the appropriate AOEC. There are two AOECs available in Michigan for secondary and tertiary referrals and clinical support.

For patients that are referred to one of the two AOECs for cancer diagnosis/treatment, these providers provide a multi-disciplinary thoracic oncology team to help develop a patient treatment plan. Additionally, the multi-disciplinary team arranges ongoing care with a patient's local oncologist for patient comfort and convenience, where appropriate.

The two AOECs in Michigan are:

1. The Occupational and Environmental Medicine Program at Michigan State University led by Ken Rosenman, MD, 117 West Fee, East Lansing, Michigan, 48824, 517-353-4941, rosenman@msu.edu.
2. The Center for Occupational and Environmental Medicine (COEM), affiliated with Wayne State University and Karmanos Cancer Institute (KCI) led by Michael Harbut, MD, 118 North Washington Ave., Royal Oak, Michigan, 48075, 248-547-9100, harbutm@karmanos.org.

Pediatricians can refer their patients to one of two AOEC Pediatric Environmental Health Specialty Units in Chicago or Cincinnati.

1. Great Lakes Centers' Pediatric Environmental Health Specialty Unit
Academic Affiliation: University of Illinois at Chicago, School of Public Health
Hospital Affiliation: Stroger Hospital of Cook County
Location: Chicago, Illinois
www.uic.edu/sph/glakes/kids
IL: (312) 864-5526
Toll Free (866) 967-7337
2. Satellite location
Academic Affiliation: University of Cincinnati

3. *Hospital Affiliation:* Cincinnati Children's Hospital & Medical Center
Location: Cincinnati, Ohio
 OH: (513) 803-3688
 Toll Free (866) 967-7337

Quality Improvement Model

It is expected that the BCBSM members who are attributed to participating POs that complete the case studies exhibit higher quality of care and improved care outcomes. With respect to diagnosing and/or treating conditions resulting from environmental toxin exposures, there are several areas where improvement could occur that would contribute to timely preventive care and appropriate and efficient use of services. They are:

1. To test for asbestos exposure, increase the use of lab procedures for diffusing capacity of the lungs for carbon monoxide.
2. To test for arsenic exposure, increase the use 24-hour urine tests
3. To test for awareness of radon exposure, increase the number of radon kits purchased in counties where BCBSM members reside

Incentive Model and Payment Methodology

Specialty	Taking an exposure history (1.5 CME)	Asbestos toxicity (2 CME)	Radon toxicity (1.75 CME)	Arsenic Toxicity (2 CME)	Lead toxicity (2 CME)	Cholinesterase Inhibitors (3.5 CME)	Case Study in Reproductive /Developmental Toxicity (in development)	Taking a Pediatric Exposure History (2 CME)	Pediatric Environmental Health Toolkit: (1.5 CME)	Pediatric Principles of Environmental Health (in development)	TOTAL CME Opportunity	TOTAL Payment Opportunity
General Practice	X	X	X	X							7.25 CME	\$250
Family Practice	X	X	X	X							7.25 CME	\$250
Oncologist	X	X	X	X							7.25 CME	\$250
Pulmonary Disease	X	X	X	X							7.25 CME	\$250
Internal Medicine	X	X	X	X							7.25 CME	\$250
Geriatric Medicine (Family Medicine)	X	X	X	X							7.25 CME	\$250
Pediatricians	X	X	X	X				X	X	X	10.75 CME	\$500
Obstetricians/Gynecologists	X				X	X	X				7 CME	\$250
Neurologists	X			X	X	X					9 CME	\$400

For the 2012 program year (1/1/12 – 12/31/12), the incentive model will incentivize physicians at different levels depending on which combinations of modules they complete.

General practice, family practice, internal medicine, pulmonary disease, geriatric medicine (family practice), pediatricians, and oncologists completing the four original modules – Taking An Exposure History, Asbestos Toxicity, Radon Toxicity, and Arsenic Toxicity – will receive \$250 and be able to receive 7.25 CME credits.

Pediatricians will have an additional 3 modules (and at least 3.5 CME credits) available—the Pediatric Environmental Health Toolkit, Pediatric Exposure History, and Pediatric Principles of Environmental Health (in development)—and will be paid \$250 for those modules' completion in 2012, for a total payment opportunity of \$500.

Obstetricians/gynecologists will have four modules available—Case Study in Reproductive/Developmental Toxicity (in development), Taking an Exposure History, Lead, and Cholinesterase Inhibitors —and will receive \$250 for the completion of these four modules and at least 7 CME credits.

Neurologists who complete their four target modules—Taking An Exposure History, Arsenic Toxicity, Lead Toxicity, and Cholinesterase Inhibitors – will receive \$400 once all modules are completed and 9 CME credits.

Payments will be made by BCBSM to the PO at the regularly scheduled PGIP payment dates in July 2012 and January 2013. POs are expected to, in a timely manner, pass incentive payments onto the physician participants that complete each set of modules.

BCBSM reserves the right to use discretion in making incentive payments based on the data and relative PO performance.

IV. Evaluation

Participant Evaluation

Category	Metric	Data Source	Measurement	Metric
Process Measures	Physician participation	PGIP Physician List and Coordinating Center's list of physician's completing their respective modules	Participation in the ECI initiative	Number of physicians completing ECI modules
		Number of radon kits purchased by county	Physician engagement	Number of radon kits purchased by county

Intermediate Measure	Initiative Impact	ECI Participant Survey	BCBSM will distribute a survey to physicians completing ECI modules. Participants will share the impact of the program on their practice through reporting on number of patients with exposure to environmental toxins identified, treated, etc. and will indicate procedural changes made within their practices on account of the training provided within the modules.	Various pieces of self-reported data
----------------------	-------------------	------------------------	---	--------------------------------------

Progress Reporting

The Coordinating Center will submit quarterly progress reports (see Appendix I).

V. Results

Since its inception in July of 2010, over 406 PGIP physicians have completed all environmental cancer modules.

Appendix II

PGIP Contacts

Lauren Henrikson, MPA
Healthcare Analyst
(313)448-4419
LHenrikson-Warzynski@bcbsm.com

Beth Goldman, MD, MPH
Clinical Lead
bgoldman@bcbsm.com

Endnotes

- ¹ National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program. 2011. Retrieved from: <http://seer.cancer.gov/>
- ² Mesothelioma. Retrieved from <http://www.asbestos.com/mesothelioma/>
- ³ (2004). Diagnosis and Initial Management of Nonmalignant Diseases Related to Asbestos, *American Thoracic Society Documents*, 170, 691-715.
- ⁴ Nicholson, W., Perkel, G., Selikoff, I. (1982). Occupational exposure to asbestos: Population at risk and projected mortality—1980-2030. *American Journal of Industrial Medicine*, 3(3), 259-311.
- ⁵ Government Statistics on deaths due to Asbestos related diseases. Retrieved from http://www.ewg.org/sites/asbestos/tables/deathdetails_state.php
- ⁶ Arsenic in Drinking Water. Retrieved from <http://www.epa.gov/safewater/arsenic/basicinformation.html>
- ⁷ Meliker, J., AvRuskin, G., Slotkin, M. et al. (2008). Validity of spatial models of arsenic concentration in private well water. *Environmental Research*, 106 (1), 42-50.
- ⁸ Radon Risk Assessment Fact Sheet, Retrieved From http://www.epa.gov/radon/risk_assessment_factsheet.html
- ⁹ Oakland County Radon Information. Retrieved from <http://county-radon.info/MI/Oakland.html>
- ¹⁰ Lead Poisoning. Retrieved from <http://www.med.umich.edu/yourchild/topics/leadpois.htm>
- ¹¹ Wells EM, Navas-Acien A, Herbstman JB, et al. (2011) Low-level lead exposure and elevations in blood pressure during pregnancy. *Environmental Health Perspective*, 119(5), 664-669.
- ¹² Centers for Disease Control and Prevention. (2007). Lead exposure among females of childbearing age--United States, 2004. *MMWR Morb Mortal Wkly Rep*, 56(16), 397-400.
- ¹³ Lead. Retrieved from <http://www.cdc.gov/nceh/lead/>
- ¹⁴ The Centers for Disease Control and Prevention. (2008). *Number of children tested and confirmed EBLs by state, year, and BLL group, children < 72 months old* [Data file]. Retrieved from http://www.cdc.gov/nceh/lead/data/StateConfirmedByYear_1997_2008Excel.htm
- ¹⁵ Bronstein AC, Spyker DA, Cantilena LR Jr, Green JL, Rumack BH, Giffin SL. (2009). Annual report of the American association of poison control centers' national poison data system (NPDS): 26th Annual Report. *Journal of Toxicology-Clinical Toxicology*, 47(10), 911-1084.
- ¹⁶ Wu ML, Deng JF, Tsai WJ, Ger J, Wong SS, Li HP. (2001). Food poisoning due to methamidophos-contaminated vegetables. *Journal of Toxicology-Clinical Toxicology*, 39(4), 333-6.
- ¹⁷ (2009) Pesticide data program: annual summary, calendar year 2008. *U.S. Department of Agriculture*
- ¹⁸ Bouchard MF, Bellinger DC, Wright RO, Weisskopf MG. (2010) Attention-deficit/hyperactivity disorder and urinary metabolites of organophosphorus pesticides. *Pediatrics*, 125(6),1270-1277.
- ¹⁹ Rauh VA, Garfinkel R, Perera FP, et al. (2006). Impact of prenatal chlorpyrifos exposure on neurodevelopment in the first 3 years of life among inner-city children. *Pediatrics*, 118(6).

²⁰ Eskenazi B, Marks AR, Bradman A, et al. (2007). Organophosphate pesticide exposure and neurodevelopment in young Mexican-American children. *Environmental Health Perspectives*, 115(5), 792–798.

²¹ Blue Cross Blue Shield of Minnesota. (2009). Investing in America's health. Retrieved from http://www.bcbs.com/about/investing-in-americas-health/2010-Investing-in-Americas-Health_FINAL.pdf

²² Blue Cross Blue Shield of Minnesota. (2011). Kids with high blood lead levels: Resources for parents and providers. Retrieved from http://www.bluecrossmn.com/bc/wcs/groups/bcbsmn/@mbc_bluecrossmn/documents/public/post71a_159977.pdf

²³ 2011 HEDIS Measures. Retrieved from <http://www.fchp.org/providers/resources/hedis-measures.aspx>