Healthy Legacy Vision

We envision a future in which the wellness of Minnesotans is protected by creating safe products and safe ways to make them.

Developmental / Mental Disorders

- Estimated 17% of children have learning, developmental or behavioral disabilities
  - ADHD: ~ 8% (ages 4-17)
  - Learning disabilities: 5-10%
  - Mental retardation: 15.5/1,000
  - Autism: 1/91 (11/1000)

- Mental disorders
  - ~ 20%
  - 5 to 9% (ages 9 to 17)
    severe emotional disturbance

Between 1994 and 2006, the number of 6 to 17-year-old children with Autism Spectrum Disorder in special education programs increased from 22,664 to 211,610.1

Increases in prevalence of Autism:
- 2009: 1/91 or 11/1000
- 2007: 1/150 or 6.7/1000
- 1996: 1/238 or 4.2/1,000

Rise in Autism Prevalence v. Other Major Chronic Conditions in U.S.
Growing needs and costs of special education

- Nationwide, between 1977-94: 191% ↑ in special ed students
- Now 6.6 million students
- Minneapolis schools
  - In ‘97 12.7% to ‘03-14.7%
  - Autism increased from 2 to 5% of spec. ed students
- Costs 2X more to educate student in spec. ed program - $12,639 vs $6,556

(Special Education Expenditure Report, June 2004)

Lead as a case study for economic benefits of prevention

- Mid-1970s lead banned in gasoline and most paint products
- Between 1976-1999 blood lead levels in kids declined ~15.1 ug/dl
- Estimated IQ change 0.185-.323 points for each ug/dl blood lead concentration
- Estimated economic benefit for each year's cohort of 2-yr-olds = $110-319 billion

Lessons from Lead

- Effects on attention deficits, impulsiveness, poor school performance, aggression & delinquent behavior, reduced IQ
- Per CDC 300,000 kids ages 1-5 (2%) had blood lead level of 10 ug/dL or >
- Children of color and low income kids are at greater risk for high blood lead.
Economic benefits of reduced lead exposure

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Economic benefits of reduced lead exposure

- Estimated costs of c
  6.0 million "mentally retarded"
  6.0 million "gifted"

Social outcome

- Est. % increase in prevalence
  - Poverty- 1st 3 yrs life: +20
  - Bottom decile HOME scores: +13
  - Out-of-wedlock births: +15
  - Low-weight births: +12
  - Welfare recipiency: +18*
  - Children without parents: +20
  - High school dropouts: +28
  - Males interviewed in jail: +25**
  - Poverty rate: +25

- Estimated costs of c
  6.0 million "mentally retarded"
  6.0 million "gifted"

57% INCREASE in "Mentally Retarded" Population

- 9.4 million "mentally retarded"
- 2.4 million "gifted"
Chemicals in our homes
Chemicals in our children’s toys and baby bottles
Chemicals in our food and water
Chemicals in our communities

No safety testing prior to use
Levels of harm are accepted
Government action only after harm is proven and widespread
Powerful special interests obstruct government action to protect our health

PROBLEM: Chemicals in our bodies

- In cord blood – EWG study found average of 287 chemicals
- In breast milk (PCBs, dioxins, pesticides, mercury, flame retardants)

Toxic Substances Control Act

Of 2.5 billion pounds of toxic chemicals emitted by large industries in 1997 - almost half are neurotoxins

Developmental Toxicity Data for 2,863 high production volume chemicals (>million #/year)

Some Developmental Toxicity Data
No Data On Developmental Toxicity
Only 12 Tested for Toxicity to the Developing Brain, Nervous System

- In cord blood – EWG study found average of 287 chemicals
- In breast milk (PCBs, dioxins, pesticides, mercury, flame retardants)
Children are more vulnerable

- Children are still developing.
- Children have immature immune systems.
- Blood/brain barrier not fully developed
- Intestinal absorption of contaminants is greater e.g. lead
- Skin is more permeable
- Hand to mouth activity
- Close to the ground - high exposure to dust, pesticides
- Receive mother’s toxins through breast milk

Adult disease originating in the womb

- Critical sequence
- Immature DNA repair
- Blood brain barrier
- Detox enzymes
- Signaling chemicals, hormones
- Vulnerable to disruption

Also applies to developing reproductive organs
Problem:
Most data for a few chemicals. None for the majority.

- Pesticides ⇒ Substantial, but less extensive data
- Other solvents
- Manganese ⇒ Early warnings, but less data
- Fluoride, Brominated flame retardants, Perchlorate, Bisphenol A, Phthalates

- Lead ⇒ impaired IQ, learning, attention; hyperactivity, impulsiveness, aggression; school failure, delinquency
- Mercury ⇒ impaired IQ, memory and learning
- PCBs ⇒ Impaired IQ, memory, attention, hyperactivity, reflexes
- Alcohol ⇒ hyperactivity, cognitive deficits
- Nicotine ⇒ IQ deficit, learning and attention deficits
- Iron Deficiency ⇒ cognitive impairment
- Low thyroid ⇒ cognitive impairment

Known Neurotoxins
- PCBs
- Dioxins
- Lead
- Mercury
- Manganese
- Cadmium
- Bisphenol A
- Alcohol
- Brominated flame retardants
- Arsenic
- Fluoride
- PAH, air pollutants

Effects on the brain
- Learning disabilities
- Hyperactivity
- Hypoactivity
- Reduced IQ
- Motor, psychomotor dysfunction
- Attention deficit
- Visual impairment
- Mental retardation
- Memory impairment
- Speech deficits
- Behavior problems: Impulsive, Compulsive
- Violence, aggression
- Developmental delays
- Eating, sleeping disorders

Known Neurotoxins

- GENETICS
- NUTRITION
- SOCIAL
- ENVIRONMENT
- TOXICANTS
- DRUGS
- ALCOHOL
- NICOTINE

Perhaps the brain is “caught in the crossfire” of whole-body changes related to environmental stress.
Dr. Martha Herbert, Harvard Medical School, Massachusetts General Hospital

Per Dr. Herbert- we need to:
- Predict risk
- Prevent harm
- Reverse injury

CHE Learning and Developmental Disabilities initiative
www.healthandenvironment.org/working_groups/learning

• LDDI Fact Sheet on Mental Health and the Environment
• LDDI Policy Consensus Statement on Environmental Agents Associated with Neurodevelopmental Disorders
• LDDI Scientific Consensus Statement on Environmental Agents Associated with Neurodevelopmental Disorders

Elizabeth Gillette’s study of Yaqui people in the Sonora Valley, Mexico

4 & 5 year old pesticide exposed children living in the valley had poorer eye hand coordination and less skill in drawing than unexposed children living in the foothills.

University of North Dakota Study Results
• Children living on or near farms tested an average of 5 IQ points lower (98 vs 103)
• They also had lower scores on verbal comprehension, visual perceptual reasoning, memory, mental processing speed

PCBs: PERVASIVE DEVELOPMENTAL EFFECTS

• Pesticides – exposure increases risk of cancer, birth defects, learning and behavior problems
• Exposure routine- MDH found 90% of households used pesticides in past year
• Increased risk from home and garden use and for communities adjacent to agricultural fields e.g. migrant farm workers

Infant: Birth weight, head circumference, gestational age, motor immaturity, poor lability, startle reflex
Early Childhood: Memory, attention, verbal ability, information processing, psychomotor development, sustained activity, high level play, withdrawn, depressed behavior, hyperactivity
Preteen: Word and reading comprehension, full scale and verbal IQ, memory and attention
Deca is a flame retardant used in TVs and other electronic equipment. Exposure through meat/dairy/fish, breast milk, dust inhalation. Animal studies find deca to be a developmental toxin. Deca degrades to more toxic forms. Crosses the placenta - infants and children at risk. Toddlers have 3X their mothers' burden of PBDEs.

Animal studies document adverse health effects:
- Hormone disruption
- Miscarriage
- Prostate & breast cancer
- Brain development, behavior
- Insulin resistance

New study in JAMA links human exposure to cardiovascular disease, diabetes and liver abnormalities. Yet FDA still says it's safe!
Braun et al., 2008: Environ Health Perspect

Based on NHANES 2001-2004

Brown, 2008: Schizophrenia Bulletin

- Depression, anxiety, violence
- Conduct disorder
- Irritability, restlessness
- Hyperactivity
- Memory loss, insomnia, fatigue

- Irritability, nervousness
- Dementia
- Depression, impotence
- Insomnia

- Hyperactivity
- Conduct disorder
- Irritability, nervousness
- Dementia
By making safer products using safer production methods.

Strategies:
- Consumer power
- Business leadership
- Regulation/policy

Healthy Legacy will educate and empower people to protect themselves, their families and their communities through supporting healthy businesses and products.

Design for whole life cycle of a product
- Products based on need, sustainability, not corporate profits

Green Chemistry uses a set of principles that reduces or eliminates the use, generation of hazardous substances in design, manufacture, application of chemical products.

“Green Chemistry Institute”

Largest non-profit health plan in U.S. (8.5 million members)

“We aspire to provide health care services in a manner that protects and enhances the environment and the health of communities now and for future generations.”

Green Ingredient Policy. At Aveda, we continually seek to increase the use of naturally-derived ingredients in our products.

Packaging. Aveda’s guiding packaging principles include:
- Considering the lifecycle analysis of packaging options
- Reducing the size, weight, production processes
- Offering packaging that can be recycled whenever possible
- Using the most environmentally sound materials - as much Post-Consumer Recycled (PCR) content as possible
- Using renewable energy to manufacture and fill
- Challenging our packaging partners to meet these standards as well
Safe products, made safely

Product life cycle

- Design
- Manufacture
- Use
- Disposal

Green chemistry reduces energy, waste & toxic chemical use to create:
- safer products
- safer workplaces
- safer communities
- safer environment

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Minnesota First State to Ban BPA in Baby Bottles and Sippy Cups

Chief authors:

Chicago, CT, WI, WA, MD, follow

Canada first country to ban BPA in baby bottles: "We have immediately taken action on bisphenol A because we believe it is our responsibility to ensure families, Canadians and our environment are not exposed to a potentially harmful chemical," Tony Clement, the minister of health, said in a statement.

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A Framework for Chemical Policy Reform

- Risk Data Gaps
- Reliable, Substitute
- Numerous

Healthy Legacy

Safer Chemicals
Healthy Families

bPPbP
hA
hA
bP

bPPbP
hA
hA
bP

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Healthy Families

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• Take steps to protect yourself and your family through informed consumer choices.
• Contact your elected officials and advocate for protecting public health from toxic chemicals.
• Sign up to get action alerts from Healthy Legacy.

Through better regulation and greening of our economy we can create...

• Safer communities
• Safer working conditions
• Safer homes
• Healthy environment
• Vibrant green economy
• Healthy children who reach their full potential

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