

# Optimal Health for Future Generations

Lessons from History &  
Current Research

# Key Question

What can I do to give my child the best opportunity for optimal development physically, mentally & emotionally?

- Environment
- Nutrition



# Vital Health for Future Generations

- What We Know, What We Don't Know
  - Endocrine System (hormonal development)
  - Immune System
- What You Can Do to Protect Yourself, Your Family & Your Future Generations

# Wingspread Consensus

*Wingspread Conference Center, Racine, Wisconsin*

- Chemically-induced alterations in sexual development: the wildlife/human connection – 1991
- Chemically-induced alterations in the developing immune system: the wildlife/human connection - 1995

([Colborn, Dumanoski, & Myers, 2010](#))



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([Colborn, Dumanoski, & Myers, 2010](#))

# Wingspread Consensus 1991

Chemically-induced Alterations in  
Sexual Development: The  
Wildlife/Human Connection

(Colborn, Dumanoski, & Myers, 2010)

# Wingspread Consensus 1991

## Chemically-induced Alterations in Sexual Development: The Wildlife/Human Connection

We are certain of the following...

- A large number of man-made chemicals that have been released into the environment
  - Have the potential to disrupt the endocrine system of animals, including humans.
  - Among these are pesticides (fungicides, herbicides, and insecticides) and industrial chemicals, other synthetic products, and some metals.

(Colborn, Dumanoski, & Myers, 2010)

("Toxic Chemicals Released by Industries this Year," 2011)



# Wingspread Consensus 1991

## Chemically-induced Alterations in Sexual Development: The Wildlife/Human Connection

We are certain of the following...

- Many wildlife populations are already affected by these compounds.
  - thyroid dysfunction in birds and fish
  - decreased fertility in birds, fish, shellfish, and mammals
  - decreased hatching success in birds, fish and turtles
  - gross birth deformities in birds, fish, and turtles
  - metabolic abnormalities in birds, fish, and mammals
  - behavioral abnormalities in birds
  - demasculinization and feminization of male fish, birds and mammals
  - defeminization and masculinization of female fish and birds
  - compromised immune systems in birds and mammals.

([Colborn, Dumanoski, & Myers, 2010](#))



# Wingspread Consensus 1991

## Chemically-induced Alterations in Sexual Development: The Wildlife/Human Connection

We are certain of the following...

- The pattern for effects vary among species and among compounds. Four general points can nonetheless be made:
  - the chemicals of concern may have entirely different effects on the embryo, fetus, or perinatal organism than on the adult;
  - the effects are most often manifested in offspring, not in the exposed parent;
  - the timing of exposure in the developing organism is crucial in determining its character and future potential; and
  - although critical exposure occurs during embryonic development, obvious manifestations may not occur until maturity.

([Colborn, Dumanoski, & Myers, 2010](#))

# Wingspread Consensus 1991

## Chemically-induced Alterations in Sexual Development: The Wildlife/Human Connection

We are certain of the following...

- Humans have been affected by compounds of this nature, too.
  - The effects of DES are estrogenic.
  - Daughters born to mothers who took DES now suffer increased rates of vaginal clear cell adenocarcinoma, various genital tract abnormalities, abnormal pregnancies, and some changes in immune responses.
  - Both sons and daughters exposed in utero experience congenital anomalies of their reproductive system and reduced fertility.
  - The effects seen in in utero DES-exposed humans parallel those found in contaminated wildlife and laboratory animals, suggesting that humans may be at risk to the same environmental hazards as wildlife.

([Colborn, Dumanoski, & Myers, 2010](#))

# Thyroid Threat

*" Maternal T4 is the only source of thyroid hormone for the fetus in the first trimester. Recent studies have shown that the cognitive development of the fetus is impaired in mothers with even mild disruptions in thyroid hormone levels."*

("Thyroid Threat: Under Proposed Rocket Fuel Standards, Many Women Would Need Treatment To Protect Baby," 2006)



# Thyroid Threat

*"...infants and children may be at more risk than the fetus. Infants and children have even higher iodine requirements than adults or even pregnant women. Perchlorate (from rocket fuel) interferes with the thyroid's ability to take up iodine, a necessary building block for thyroid hormones."*

([Abraham, 2002](#))

(["Thyroid Threat: Under Proposed Rocket Fuel Standards, Many Women Would Need Treatment To Protect Baby," 2006](#))



# Rodent Tests on BPA Exposure

- Maternal exposure of Agouti mouse to BPA in diet pre-conception and during gestation leads to dramatic changes in coloration of litters.
- Supplementation with methyl donors (Folic Acid, B12, choline & betaine) or phytoestrogens (genistein) ***counteracts*** these effects

([Dolinoy, Huang, & Jirtle, 2007](#))

([Dolinoy, Weidman, Waterland, & Jirtle, 2006](#))

# Primate Tests on BPA Exposure

*"Our data indicate that BPA completely abolishes the synaptic response to estradiol. Because remodeling of spine synapses may play a critical role in cognition and mood, the ability of BPA to interfere has profound implications."*

(Leranth, Hajszan, Szigeti-Buck, Bober, & MacLusky, 2008)

# Wingspread Consensus 1995

Chemically-induced Alterations in the  
Developing Immune System: The  
Wildlife/Human Connection

([Colborn, Dumanoski, & Myers, 2010](#))

# Wingspread Consensus 1995

## Chemically-induced Alterations in the Developing Immune System: The Wildlife/Human Connection

We are certain of the following...

- A competent immune system is essential for health.
- Experimental lab studies demonstrate that certain synthetic chemicals affect the immune system.
  - manifested as alterations in the immune system
  - may lead to a decreased quality of life
  - alterations include immune modulation expressed as an increase (auto-immune) or decrease (immune deficiency) and hypersensitivity (allergies, asthma, food intolerances)

([Colborn, Dumanoski, & Myers, 2010](#))



# Wingspread Consensus 1995

## Chemically-induced Alterations in the Developing Immune System: The Wildlife/Human Connection

We are certain of the following...

- Impairment of the immune system can result from alterations in the development of the immune system and may be long-lasting.
- Life-long capacity for immune response is determined early in development, during prenatal and early postnatal development in mammals.
- Alterations in the developing and mature immune systems may not be recognized as an adverse health effect until long after exposure.

([Colborn, Dumanoski, & Myers, 2010](#))

# Wingspread Consensus 1995

## Chemically-induced Alterations in the Developing Immune System: The Wildlife/Human Connection

We are certain of the following...

- The widespread exposure of populations of humans and wildlife to many man-made chemicals has made it difficult, if not impossible, to find control populations that have no exposure level. True control populations for human and wildlife epidemiological studies are thus lacking.

([Colborn, Dumanoski, & Myers, 2010](#))

# Cancer rates

“Since passage of the 1971 National Cancer Act, launching the ‘War Against Cancer,’ the incidence of childhood cancer has steadily escalated to alarming levels.

Childhood cancers + 26% overall”

- acute lymphocytic leukemia +62%
- brain cancer +50%
- bone cancer +40%

([Epstein, 2010](#))

([EWG, 2011](#))

# Auto-Immune Gluten Sensitivity/Celiac Disease

*"The presence of undiagnosed celiac disease seems to have increased dramatically in the United States during the last 50 years, increasing from 1:700 to 1:100. Undiagnosed celiac was associated with a nearly 4-fold increased risk of death."*

([Rubio-Tapia et al., 2009](#))



# Asthma

*"The percentage of children with asthma has doubled over the past two decades, and is now the number one cause of school absenteeism attributed to chronic conditions."*

("Key Concepts in Pediatric Environmental Health," 2006)

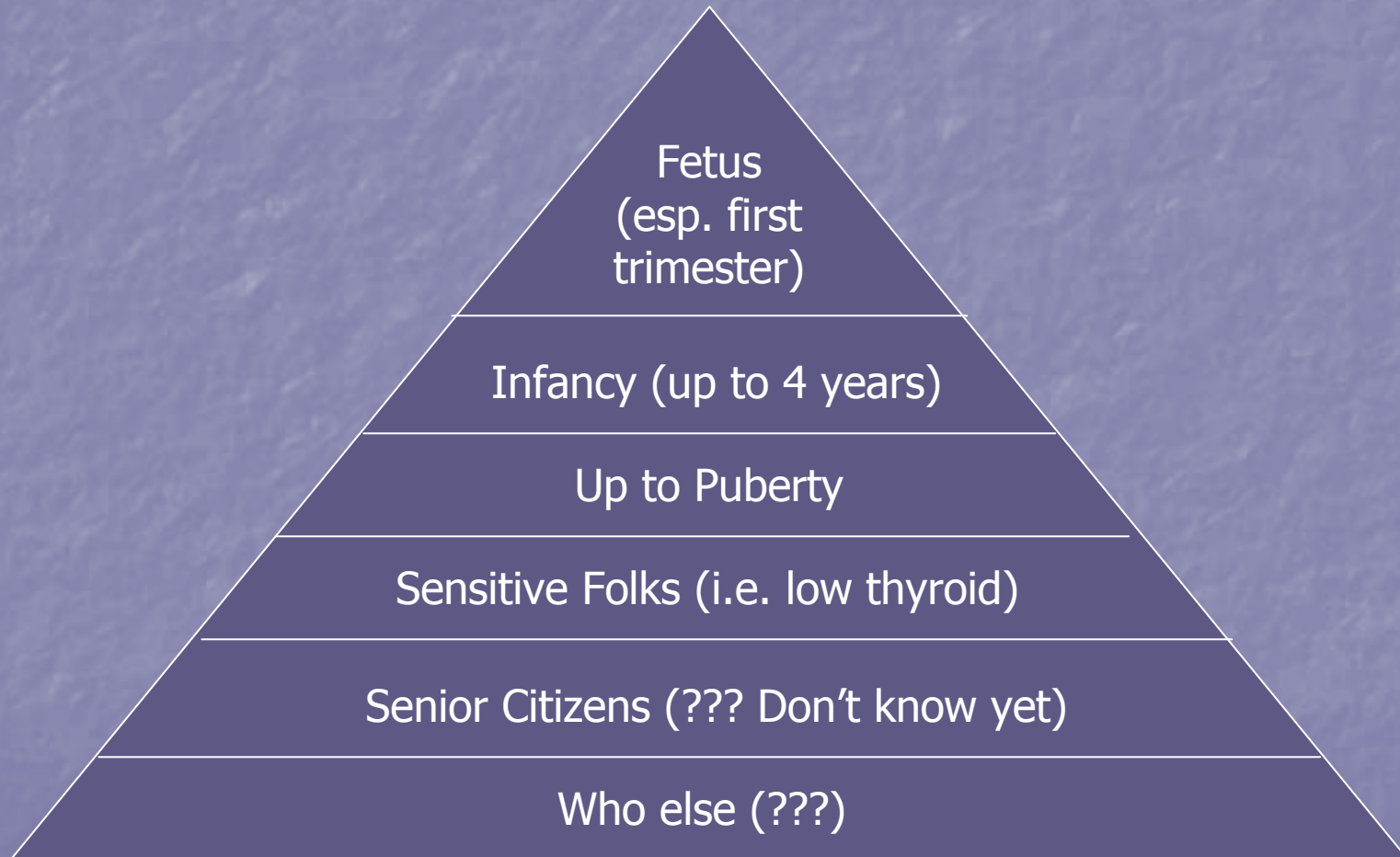
# What You Can Do to Protect Yourself, Your Family & Your Future Generations



# So What Can You Do?

- Protect Sensitive Populations
- Reduce Exposure
  - Environment
  - Food
- Mitigate Damage of Toxins
- Educate Yourself (& your children)
- Vote with Your \$\$\$ and Your Vote

# Populations Most Vulnerable to Hormone Disruption



([Berkson, 2000](#))



# Unique Vulnerability of Children

- Exposure Compared to Adults
  - Infant's respiratory rate 2x
  - 0-6 months drink 7x water
  - 1-5 years consume 3-4x food
- Toxicology Testing & Decreased Excretion
  - Nearly 75% commercial chemicals have undergone little or no testing
  - Adult absorbs 10% ingested lead, toddler 50%
- Differential Susceptibility
  - WHEN the embryo, fetus & perinatal child is exposed is critical – more than dose

# Reduce Exposure: Environment

- Cosmetics & Personal Care
  - Women use average of 12/day
  - Men use average of 6/day
  - Minimize Children's Exposure & Choose Clean Products
- Household Products
  - Indoor
  - Outdoor
- Water
  - Filter Drinking Water
  - Filters for Shower to Remove Chlorine
  - Minimize Chlorine Pool Exposure
- Dust
  - Vacuum 2x/week
  - Remove Shoes at the Door

# Reduce Exposure: Food

- Sugar, HFCS
- Non-organic Foods
- Processed Foods
  - Trans-fats (hydrogenated/partially hyd.)
  - Chemical additives (incl. food coloring)
- Growth Hormone in Meats & Dairy
- GM/GMO, GE Foods
  - Soy, Corn, Cottonseed, Canola...

# Mitigate Effects: Nutritional Sufficiency

- Iodine Protective of Thyroid in Perchlorate Exposure
- Methyl Donors Protective of Endocrine System
  - Cruciferous Veggies
  - Carrots, Beets & All Dark Green Veggies
  - Dried Beans
  - Eggs, Fish, Seafood, Liver, Nutritional Yeast

(Dolinoy, Huang, & Jirtle, 2007)

("Thyroid Threat: Under Proposed Rocket Fuel Standards, Many Women Would Need Treatment To Protect Baby," 2006)



# Mitigate Effects: Nutrient Dense Foods

- Hormone-free Meats & Dairy
- Fish (preferably ocean caught)
- Fruits & Vegetables – local & organic where you can get them – Dark Greens,
- Whole Grains – brown rice, quinoa, barley, oats
- Eggs
- Nuts & Seeds
- Legumes – lentils, white northern beans, etc...
- Soup Stocks (homemade with bones)

# Mitigate Effects: Whole Food Supplements to Fill the Gaps

- Recommendation for Veggies & Fruits keep going up – why?
  - We Don't Know an Optimal Daily Requirement
  - Nutrient Depletion
- What do you (and your kids) really eat on a weekly basis?

# Educate Yourself (& your children)

- Environmental Working Group
  - “10 Americans” Video
  - “Shoppers Guides to Pesticides in Produce”
  - “Skin Deep – Cosmetics Database”
  - “Sunscreen Safety Guide”
- Cancer Prevention Coalition
  - The STOP Cancer Now Campaign (2002)
  - Lists of Avoidable Exposures to KNOWN Carcinogens

# Vote With Your \$\$\$ and Your Vote

- Informed Consumer
  - Buy products that support your beliefs on these issues.
  - Be vocal with store management about products you want and why.
- Voice Your Concern to Elected Officials
- Vote According to Your Beliefs



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