Connecting Environmental & Human Health
The Body Burden Studies

Umbilical cord blood analysis of 10 newborns from across the country finds an average of 200 chemicals in each baby:
• 180 cause cancer in animals or humans
• 217 are toxic to the brain and/or nervous system
• 208 cause birth defects or abnormal development in animals

Body Burden: The Pollution in Newborns
A benchmark investigation of industrial chemicals, pollutants, and pesticides in human umbilical cord blood

Hazardous Chemicals in Health Care
A Snapshot of Chemicals in Doctors and Nurses

Doctors and nurses across the US tested for 62 chemicals found in healthcare setting
• At least 24 found in each participant; including those connected to:
  • Miscarriage
  • Infertility
  • Cancer
  • Obesity
  • Heart Disease
  • Thyroid dysfunction
  • Diabetes
  • Learning, memory & behavior disorders
  • Hormone & immune disruption

REducing environmental cancer risk
What We Can Do Now
“The true burden of environmentally-induced cancer has been grossly underestimated.”

Recommends that pediatricians “familiarize themselves with the potential adverse health effects of chemicals in the environment.”
Waste Disposal

US hospitals generate **5.9 million tons** of waste annually.

Inova generates **15,840,000 lbs** of waste per year – that’s around **1,000 lbs of waste per employee**!

Americans make up only **5%** of the world’s population, but produce almost **25%** of its trash.

**Landfills.** Even the best-run landfills generate **harmful air emissions** that reduce air quality and lead to the formation of harmful smog. They also have the potential to **leach liquids and toxins** into the ground and water supplies.

**Incineration.** The burning of waste releases pollutants into the environment. Some of these are **highly toxic** and can cause health problems **including cancer, immune system damage, reproductive and developmental problems, and motor, sensory and cognitive function impairment**. Many incinerators use pollution control equipment to remove pollutants from the air, but this only moves these toxins from one medium to another.

**Environmental pollution.** Waste often enters the environment as litter. A disproportionate amount of this litter makes its way to the world’s poorest regions, who are least-equipped to manage it responsibly. As a result, the chemicals contained in waste can contaminate the environment and the humans living in it. Litter also harms the health of the delicate marine ecosystems that form the base of our food chain.

**Transport and treatment** of waste also have large environmental impacts because they rely on **energy produced by fossil fuels**. The **millions of miles** logged by waste transport trucks annually contribute to **air pollution** problems across the country.
Energy Consumption

• Buildings use almost half of energy in US
• Inpatient healthcare is the 2nd largest commercial energy user after food service
• Nearly 90% of US energy comes from fossil fuels → burning releases:
  – Toxins
  – Greenhouse gases
  – Particulate matter

Facts About Air Pollution

More than 4 of 10 people in the US already live where pollution levels are often too dangerous to breathe.

The US healthcare sector’s high level of electricity consumption contributes to more than $600 million per year in healthcare costs due to increased asthma and other respiratory illnesses.

Urban outdoor air pollution is estimated to cause 1.3 million deaths worldwide per year. Those living in middle-income countries disproportionately experience this burden.

The average adult breathes over 3,000 gallons of air every day. Children breathe even more air per pound of body weight and are more susceptible to air pollution.
Medical products designed to heal contain harmful and sometimes toxic chemicals that patients, visitors & healthcare workers are then exposed to.

The Worst Offenders

**Mercury**
- A potent neurotoxin that can harm the brain, spinal cord, kidneys, and liver
- **Used In**
  - Thermometers
  - Sphygmomanometers
  - Dental Amalgam
  - Lab Chemicals
  - Preservatives
  - Fluorescent Lamps
  - Computer Equipment

**DEHP/Phthalates**
- Can leach into patients, leading to adverse effects on the liver, reproductive tract, kidneys, lungs, and heart
- **Used In**
  - Medical products made from soft PVC plastic, including:
    - IV Bags and Tubing
    - Catheter tubing
    - Feeding sets
    - Respiration Equipment

**Flame Retardants**
- Build up in the body over time, toxic to humans, linked to reproductive and developmental health impacts
- **Used In**
  - IV pumps
  - Televisions
  - Computers
  - Hospital Beds
  - Waiting Room Chairs
  - Hospital Privacy Curtains

**BPA**
- A hormone-disrupting chemical that can have health effects at extremely low exposure levels.
- **Used In**
  - Hard plastics, including:
    - Food and Drink Packaging
    - Compact Discs
    - Infant Bottles
    - Impact-Resistant Safety Equipment
    - Medical Devices
Chemicals in the Built Environment

Impacts in the Healthcare Setting

- **Paint**
  - May contain high quantities of VOCs, reducing indoor air quality and contributing to urban smog

- **Electronics**
  - Contain hundreds of metals & chemicals, some potentially or highly toxic
  - Difficult to dispose of responsibly
  - Use consumes large amounts of energy

- **Lighting**
  - May contain hazardous chemicals & require extra care during disposal (treated as universal waste)
  - Consume large amounts of energy

- **Wood Furniture**
  - Wood may not be sustainably grown or harvested
  - Glue in particle board contains formaldehyde → off-gassing can present health hazards

- **Linens**
  - Cotton – uses fertilizers & pesticides to grow; may be bleached with chlorine using a process that releases dioxins; may be treated with finishes that contain formaldehyde
  - Polyester – manufactured using petrochemicals; non-biodegradable; energy-intensive production process

- **Metal Fixtures – Bed Frame & Bed Head Panel**
  - Extracting metals such as steel & bauxite utilizes resource-intensive & environmentally invasive processes with toxic by-products
  - Processing & manufacturing metals requires large amounts of energy and produces large amounts of waste and other pollutants

- **Flooring**
  - PVC Tiles – difficult to recycle; manufacturing requires chlorine; can release dioxins if improperly disposed of
  - Floor Wax – reduces indoor air quality; can cause respiratory problems
Our Food System

- **Availability of nutritious foods**
  - Lots of calories, fat, salt, sweeteners
  - Few fresh, healthy fruits, veggies & whole grains
  - Nutrient loss during transport

- **Antibiotic resistance**
  - Antibiotics used to promote growth in livestock linked to antibiotic resistance in humans

- **Chemical exposure through packaging and pesticides**
  - The more it is processed & the farther it travels, the higher the likelihood of contamination
  - Pesticide use exposes farm workers, local communities & consumers

- **Air pollution**
  - Pesticide drift, field dust, waste burning, toxic gases from degrading manure, exhaust from production decrease air quality

- **Water availability and pollution**
  - High water consumption even during times of drought
  - Farming is leading source of water pollution in nation’s rivers & streams
  - Pollution in fish biomagnifies up the food chain

- **Livestock production impacts**
  - Typical diet is meat-heavy and produce-light
  - Meat has largest carbon footprint, requires most resources to produce
Transportation & Commuting

• Traffic exhaust becoming a **major health concern**, especially in **urban areas**

• Exhaust from vehicles contains a variety of pollutants that have been associated with **pulmonary, cardiac, vascular and neurological impairments**

• Smog from vehicles contains ground-level ozone that can **irritate the respiratory system, reduce lung function, aggravate asthma, and inflame and damage the lining of the lung**

• The annual miles commuted by Inova employees releases **emissions equivalent to 1,000 single-family homes**
Additional Resources: Environment & Health

- Body Burden Study - The Pollution in Newborns: [http://www.ewg.org/research/body-burden-pollution-newborns](http://www.ewg.org/research/body-burden-pollution-newborns)
- American Academy of Pediatrics statement: [http://pediatrics.aappublications.org/content/127/5/983.full](http://pediatrics.aappublications.org/content/127/5/983.full)
We welcome your questions, ideas, thoughts, comments, or concerns.

Feedback on environmental sustainability at Inova may be directed to the Office of Sustainability at gogreen@inova.org.