Get the facts about reducing risk of childhood cancer

Childhood Cancer & the Environment

A project to raise awareness of environmental influences on childhood cancer

PEHSU
Pediatric Environmental Health Specialty Units

Welcome

I'd like to talk to you today about children's cancer, like leukemia, because it's been increasing a lot over the past years.

- I'm going to focus on environmental toxic chemicals.
- We'll start by looking at what is cancer and different types of childhood cancer.
- Some things that might contribute to the risk for getting it.

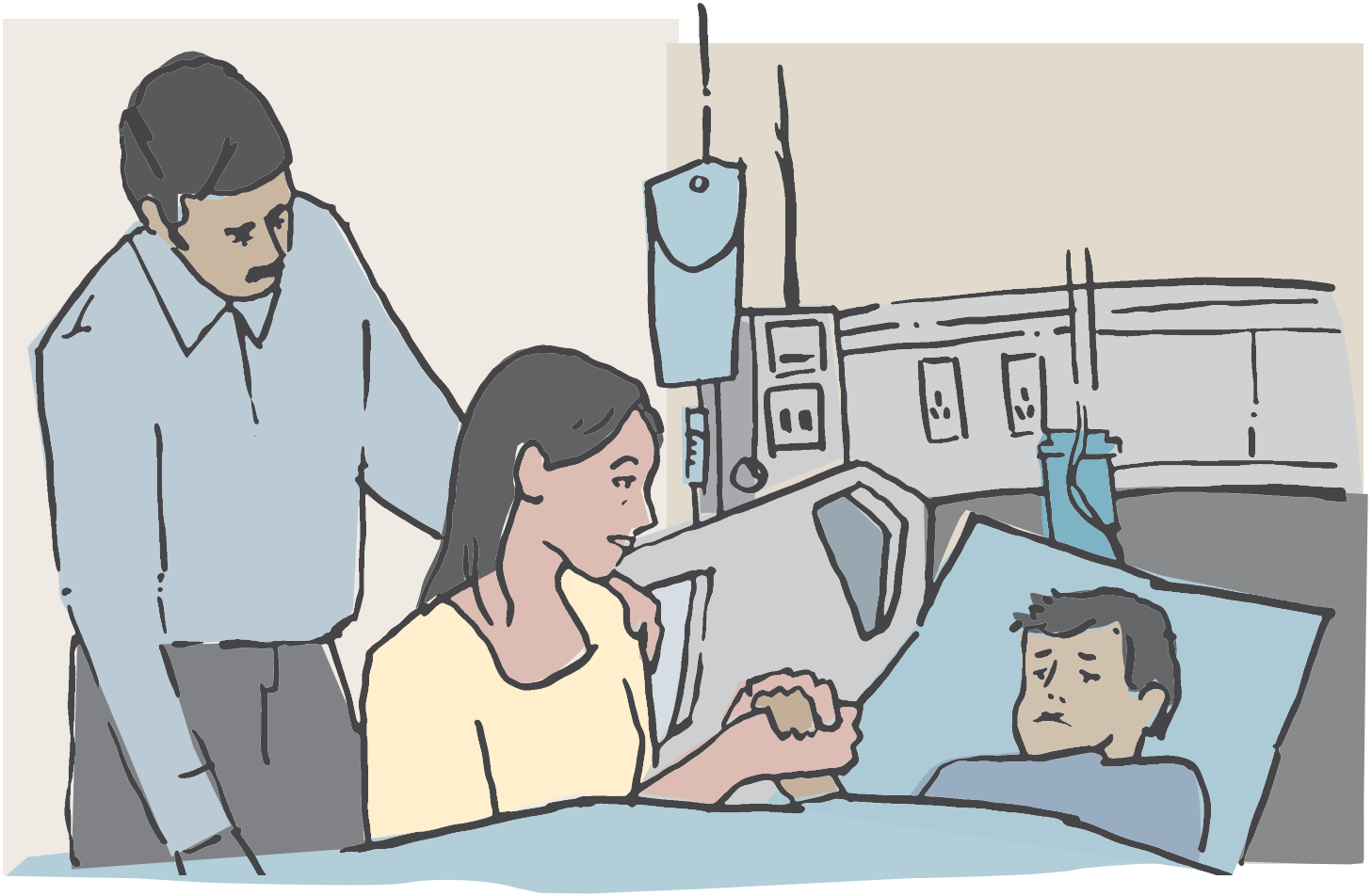
  Why children are at greater risk from toxic chemicals.
- Specific pollutants including outdoor and indoor air pollution,
- pesticides and solvents such as paints.

  Actions families can take to help reduce the risk of their kids
- developing cancer.

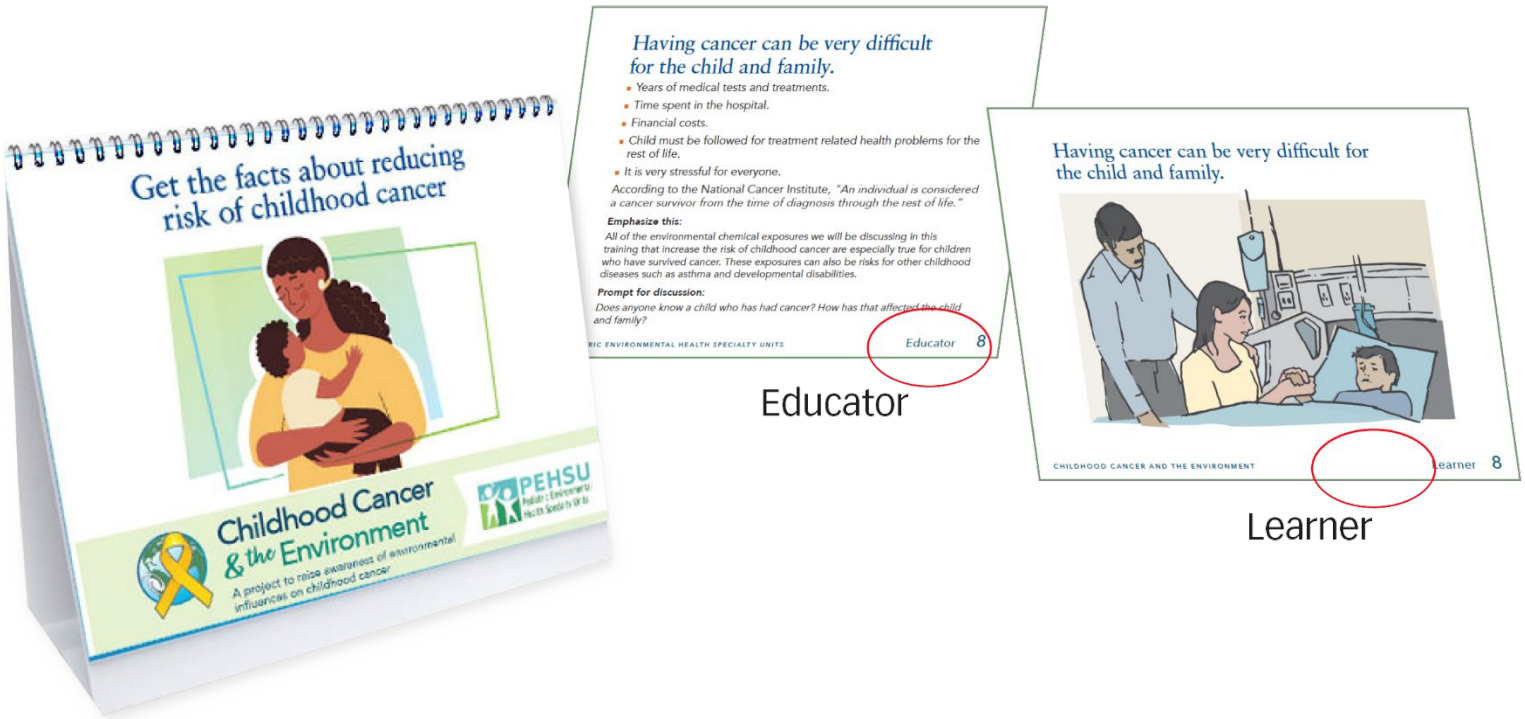
Let's take a look.

Welcome

I'd like to talk to you today about children's cancer, like leukemia, because it's been increasing a lot over the past years.

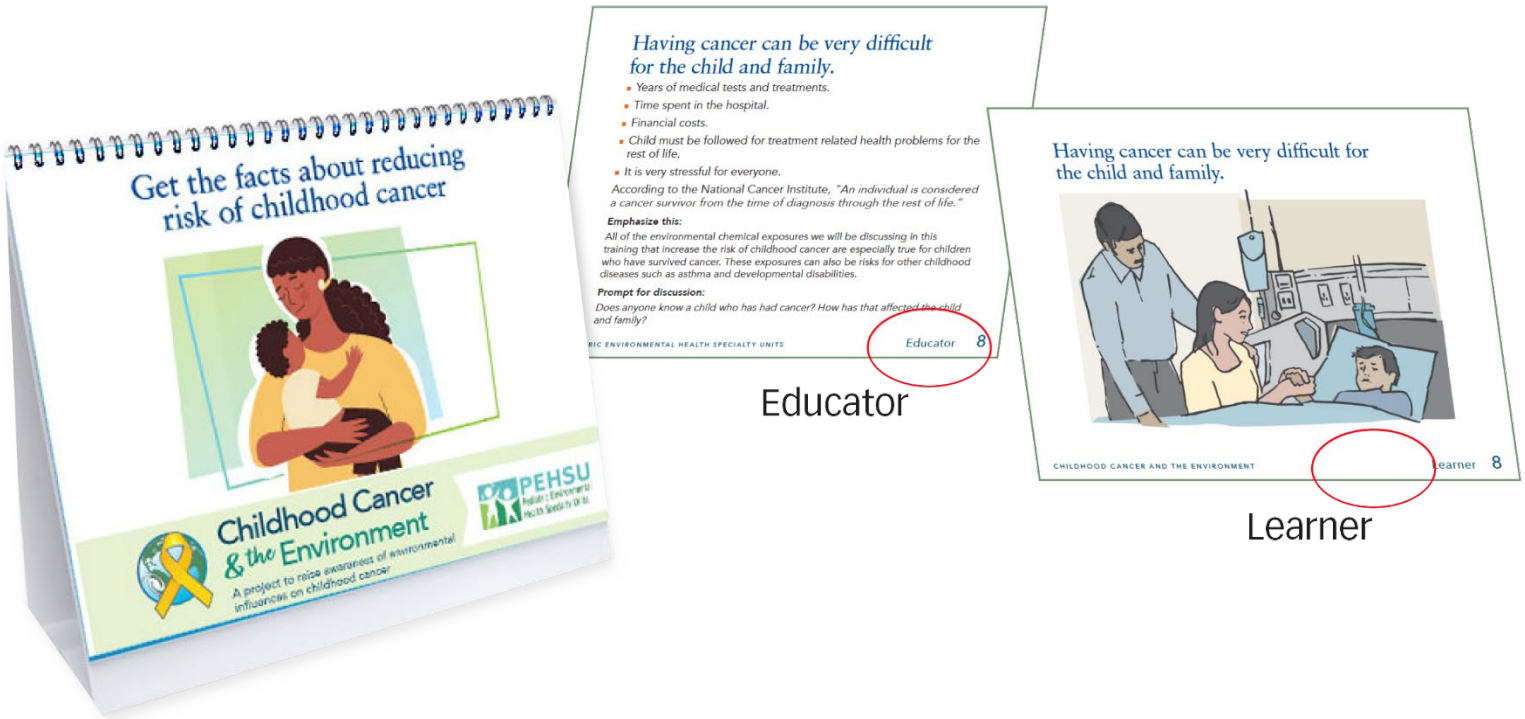


Flipbook: A Tool for Community Health Workers



- This is the flip book we created for *Childhood Cancer & the Environment*.
- The side facing you will have your "script" with the needed information.
- The side facing your audience/community members will have the simplified images and bullet points related to the information you will cover.

Flipbook: A Tool for Community Health Workers



- This is the flip book we created for *Childhood Cancer & the Environment*.
- The side facing you will have your "script" with the needed information.
- The side facing your audience/community members will have the simplified images and bullet points related to the information you will cover.

What is Cancer?

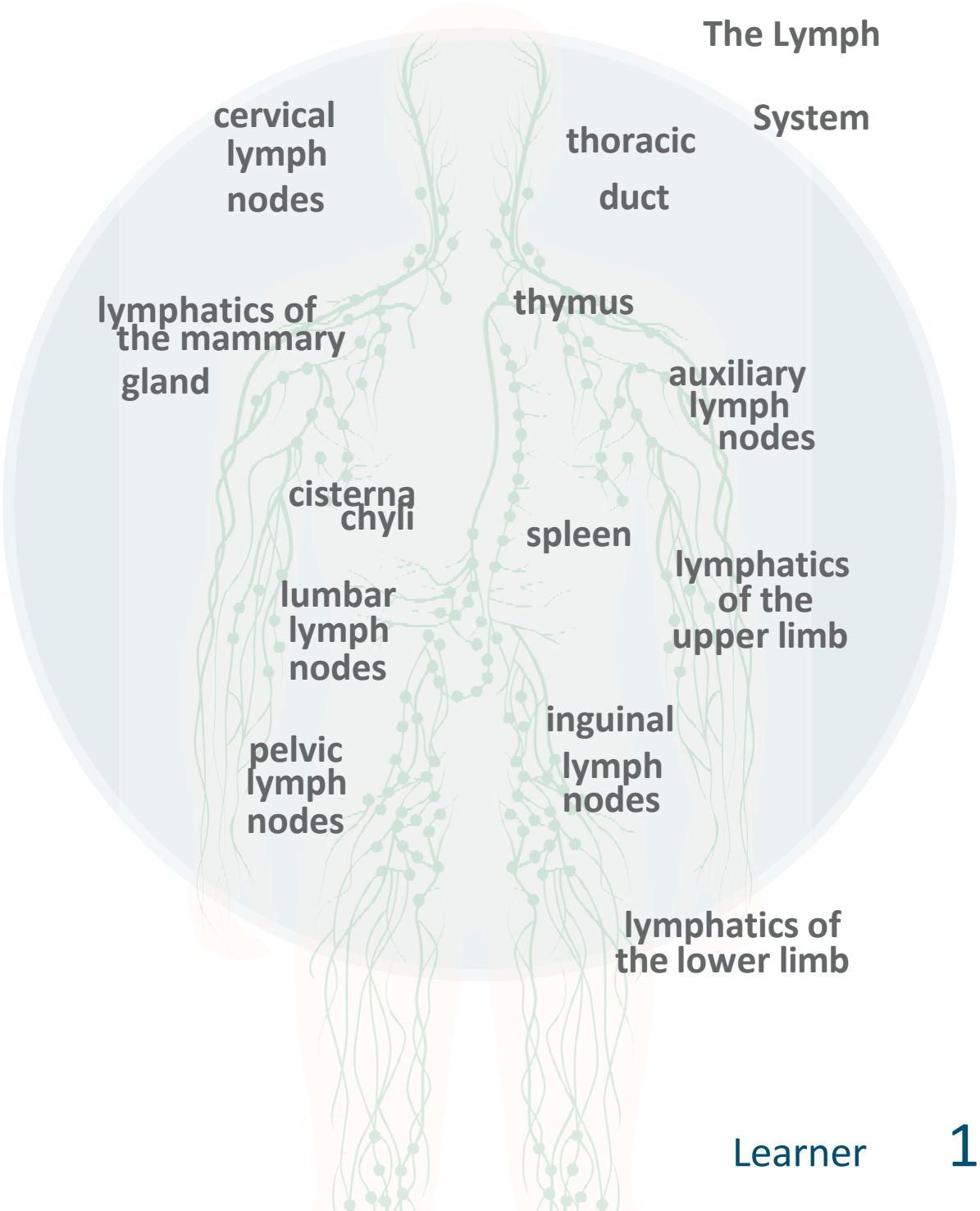
"Cancer" is used to describe a group of diseases in which abnormal cells reproduce without control and invade nearby tissues.

- Cells spread to other parts of the body through the blood circulation and the lymph system.
- The lymph system is part of the immune system and looks similar to the circulatory system as you can see in the drawing.
  - It collects waste products, bacteria, and damaged cells so that they can be destroyed or removed from the body.

What is Cancer?

"Cancer" is a group of diseases in which abnormal cells:

- Reproduce without control,
- Invade nearby tissues,
- Spread to other parts of the body through the blood and lymph systems.



What is Cancer?

Normally, cells grow and divide in an orderly process.

Cells are tiny structures that make up our organs and body. When normal cells grow old or get damaged, they die, and new normal cells take their place. The body makes more cells only when it needs them.

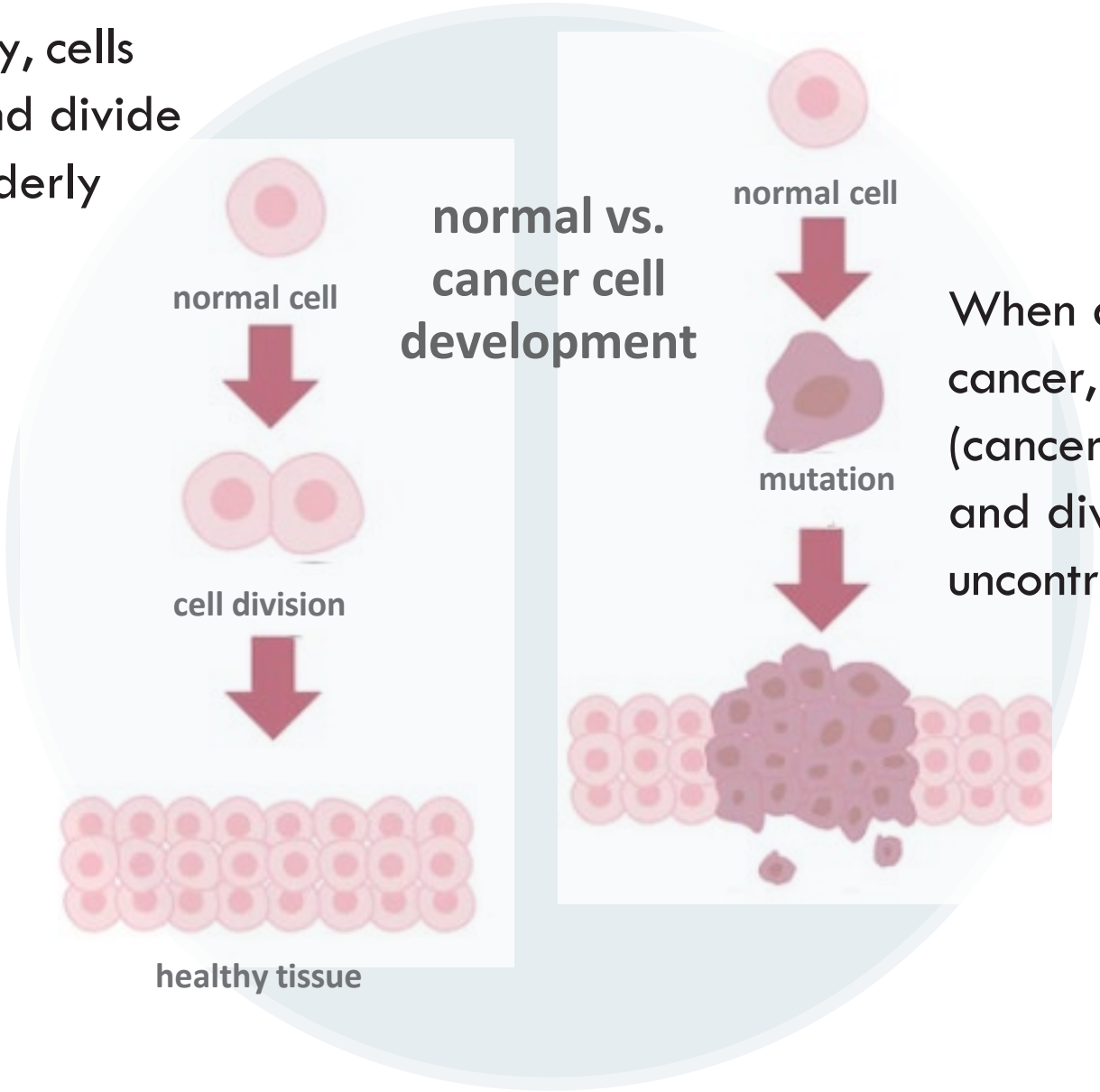
When a child has cancer, abnormal (cancer) cells grow and divide in an uncontrolled way.

For example:

- New, abnormal, cells form when the body doesn't need them.
- Old or damaged cells don't die when they should.
- Cancer cells invade and damage nearby tissues and spread to other parts of the body.

What is Cancer?

Normally, cells grow and divide in an orderly Process.



When a child has cancer, abnormal (cancer) cells grow and divide in an uncontrolled way.

What are the most common childhood cancers?

Cancer, and the health problems caused by cancer treatment, are among the leading causes of serious illness and death in children and teens.

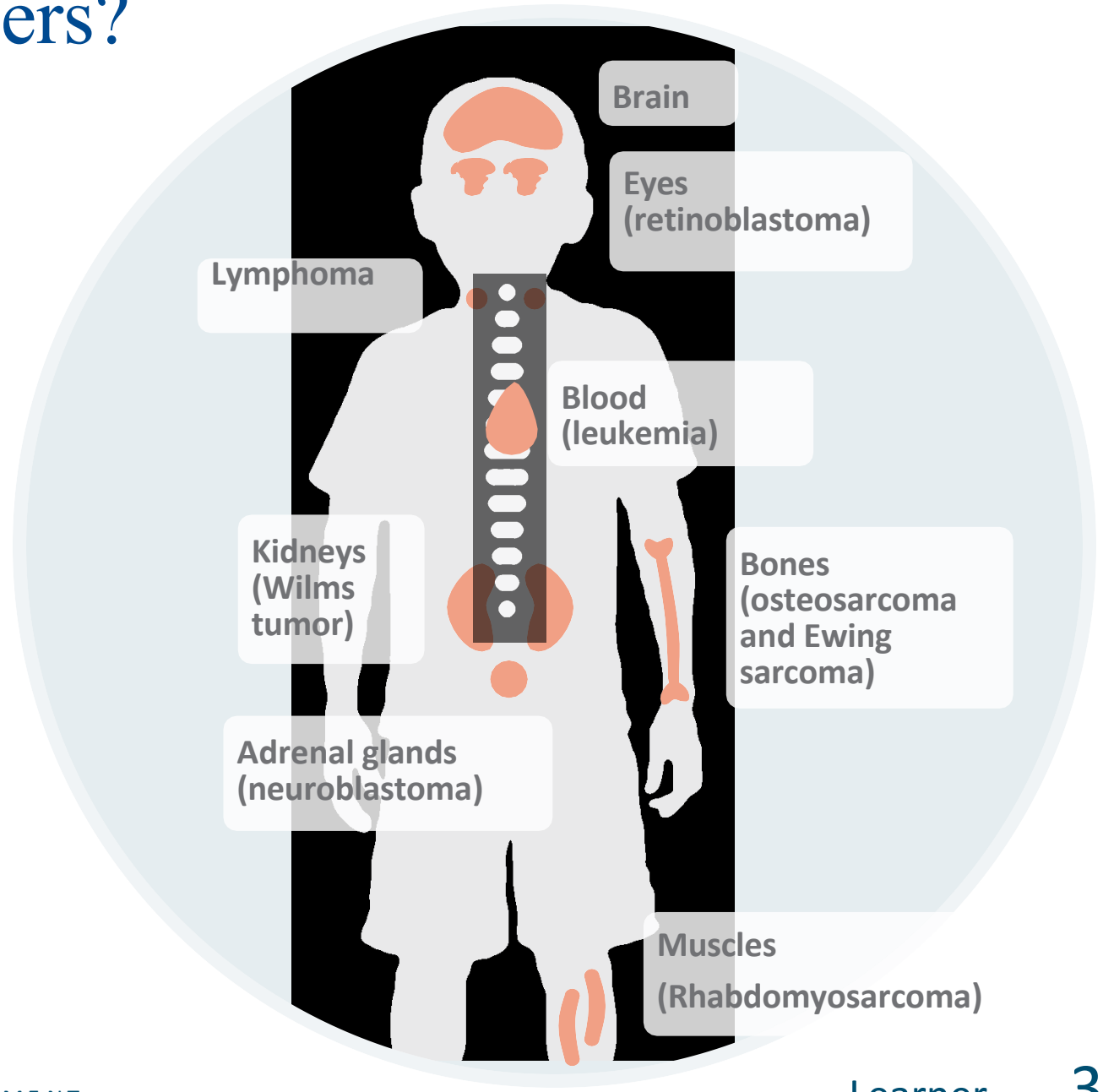
The most common childhood cancers are:

- **Leukemia** is the most common childhood cancer. It starts in the blood-forming tissue of the bone marrow.
- **Brain cancer** Brain and spinal cord tumors begin in the tissues of the brain and spinal cord.
- **Lymphoma** is the most common teen cancer. It starts in the lymphatic system, which is part of the body's immune system that fights disease.
- **Neuroblastoma** forms in nerve tissue in the neck, spinal cord, or adrenal glands (glands that help regulate systems in your body).
- **Sarcoma** is cancer that forms in the bone, muscle, or soft tissues.
- **Wilms tumor and other childhood kidney tumors**

What are the most common childhood cancers?

The most common childhood cancers are:

- **Leukemia**
- **Brain cancer**
- **Lymphoma**
- **Neuroblastoma**
- **Sarcoma**
- **Wilms tumor and other childhood kidney tumors**



Childhood cancer is increasing in the U.S.

46 DAILY - Kids are diagnosed each day 16,000

YEARLY - Kids are diagnosed each year

41% INCREASE - in childhood cancer since 1975

$1.9 BILLION - Cost per year due to hospitalizations which increases insurance costs for everyone

---

Reference: Childhood Cancer: Cross-Sector Strategies for Prevention. Cancer Free Economy, 2021

Childhood cancer is increasing in the U.S.

46
Kids are diagnosed each day

16,000
Kids are diagnosed each year

41%
Increase in childhood cancer since 1975

$1.9
BILLION
Cost per year due to hospitalizations

The rate of childhood leukemia has been increasing, especially among Latino children.

In low-income countries many cases of childhood cancer go uncounted and unreported because there are no cancer registries.

This chart shows how from 1988 to 2012 the rates of ALL (leukemia, the most common childhood cancer) rose 35% for Latino children in California.

"From 1988 to 2012, the rate of lymphoblastic leukemia climbed 35% for Latino children in California and 12% for White children."

Footnote: "In 1998, there were 37 new acute lymphoblastic leukemia (ALL) patients for every 1 million Latino children in California and 32 new ALL patients per 1 million non-Latino White kids. For a particular year, each bed represents one extra new ALL patient per 1 million kids (e.g. there were 14 extra new ALL patients per 1 million Latino kids in 2012 vs. 1988)."

Graphic reproduced with permission from the Center for Integrative Research on Childhood Leukemia and the Environment (CIRCLE)

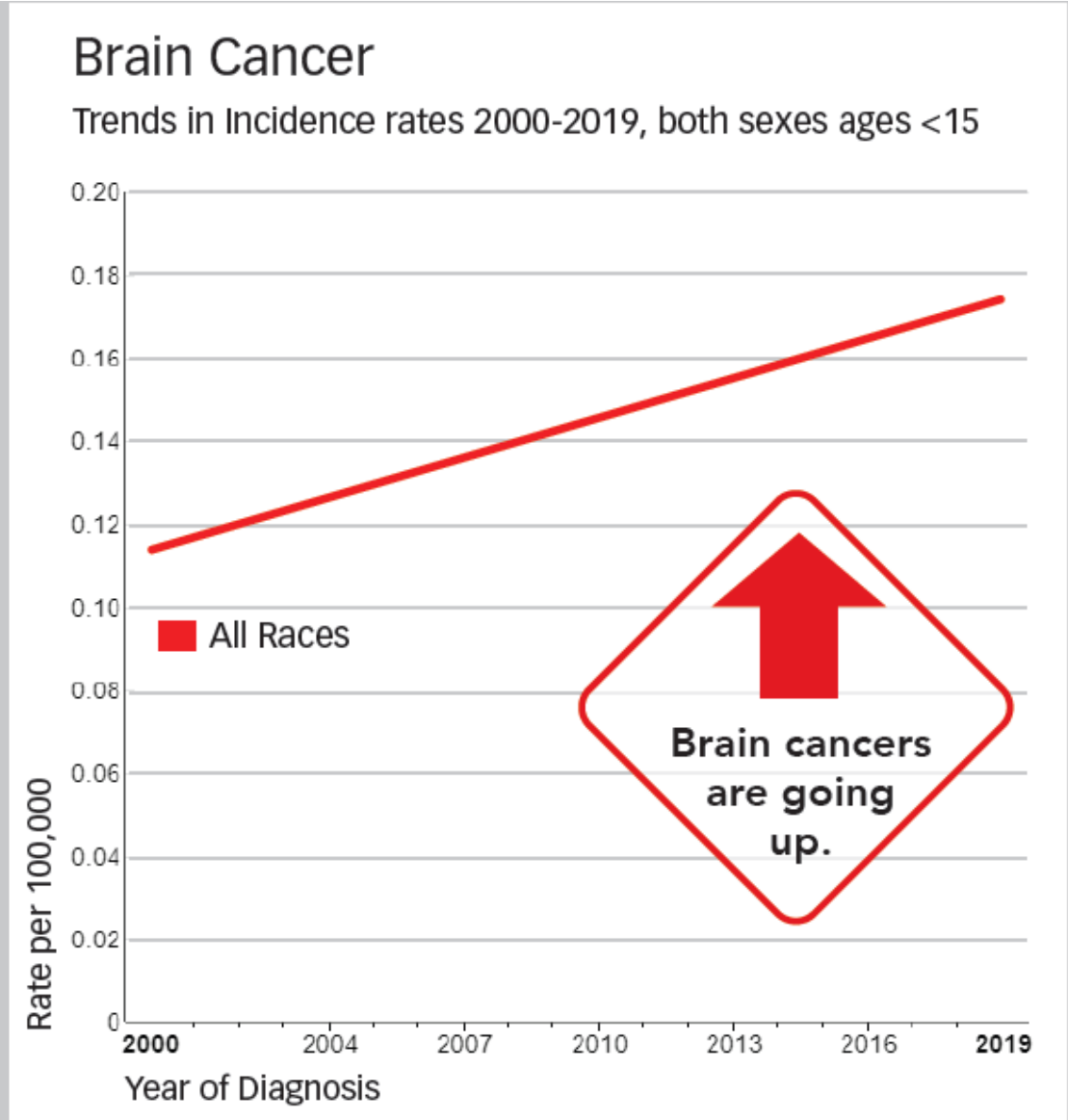
The rate of childhood leukemia has been increasing, especially among Latino children.

Each bed in the infographic represents an additional leukemia case per million kids.

Other cancers are also increasing, such as brain cancer, the second most common kids' cancer.

This chart shows a steady increase in brain cancer from 2000-2019 for all children, all races less than age 15.

Citation: SEER* Explorer - An interactive website for SEER cancer statistics [Internet]. Surveillance Research Program, National Cancer Institute. Available from https://seer.cancer.gov/statistics-network/explorer/



Other cancers are also increasing, such as brain cancer, the second most common kids' cancer.

More kids survive cancer than ever before, but survivors have greater health risks for the rest of their lives.

Children should be closely followed in survivorship clinics.

(Survivorship clinics are places that specialize in follow-up care for kids who have been treated for cancer.)

It used to be that only 1 in 10 children with leukemia survived for five years. Now it's 9 in 10 in high income countries (it is still much less than that in low-income countries). For some cancers, survival rates have not gotten much better.

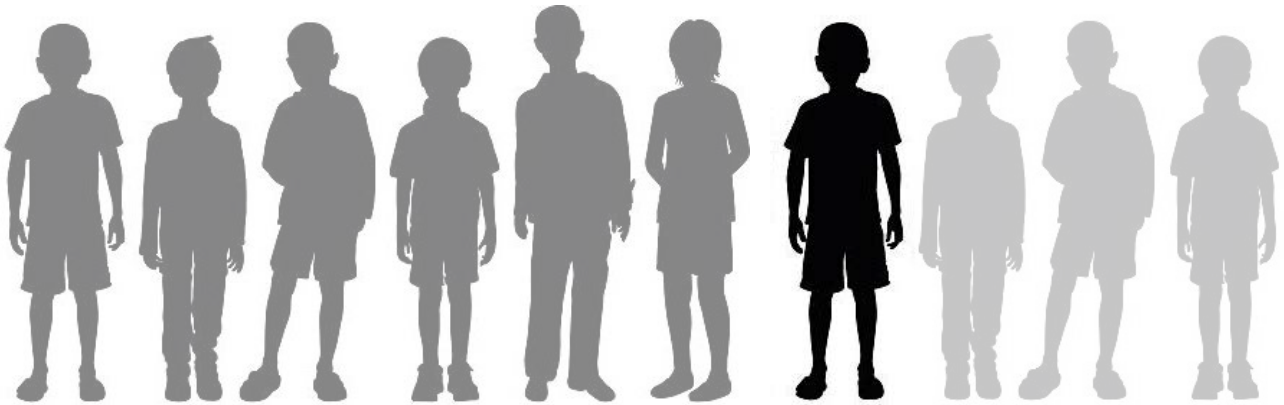
More kids survive cancer than ever before, but survivors have greater health risks for the rest of their lives.

Children should be closely followed in survivorship clinics.

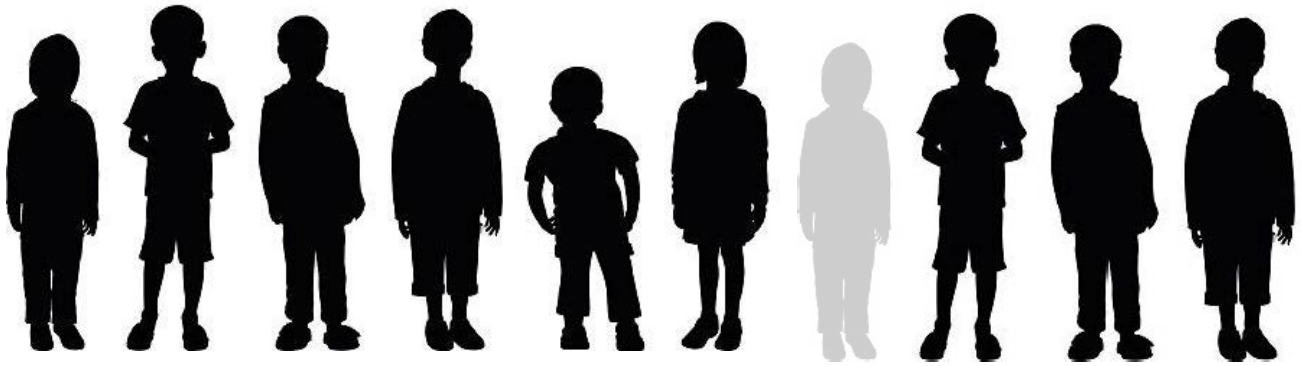
It used to be that only

1 in 10 children

with leukemia survived for five years.



Now it's 9 in 10 in high income countries



For some cancers, survival rates have not gotten much better.

Having cancer can be very difficult for the child and family.

- Years of medical tests and treatments.
- Time spent in the hospital.
- Financial costs.
- Child must be followed for treatment related health problems for the rest of life.
- It is very stressful for everyone.

According to the National Cancer Institute, *"An individual is considered a cancer survivor from the time of diagnosis through the rest of life."*

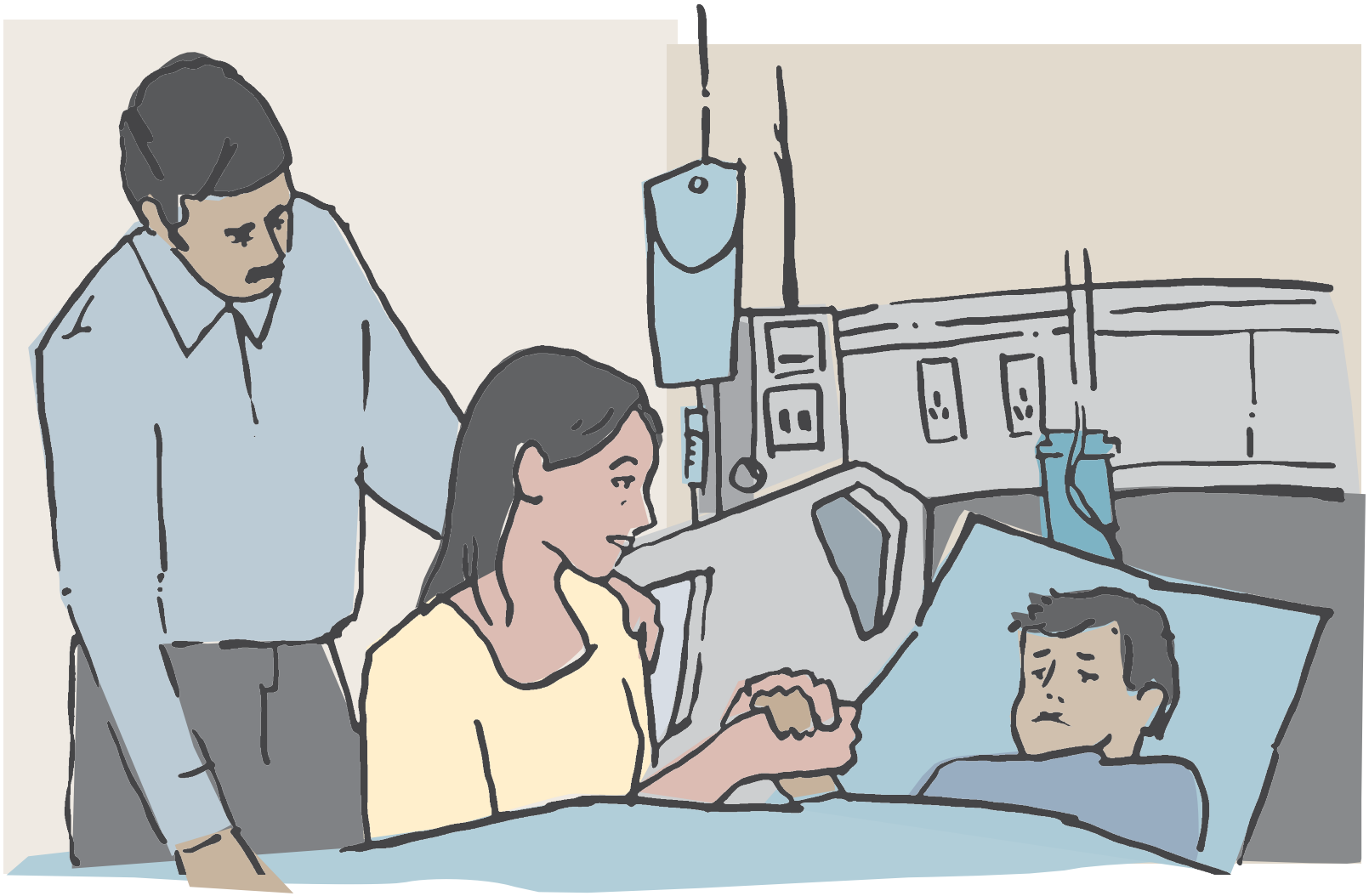
Emphasize this:

All of the environmental chemical exposures we will be discussing in this training that increase the risk of childhood cancer are especially true for children who have survived cancer. These exposures can also be risks for other childhood diseases such as asthma and developmental disabilities.

Prompt for discussion:

Does anyone know a child who has had cancer? How has that affected the child and family?

Having cancer can be very difficult for the child and family.

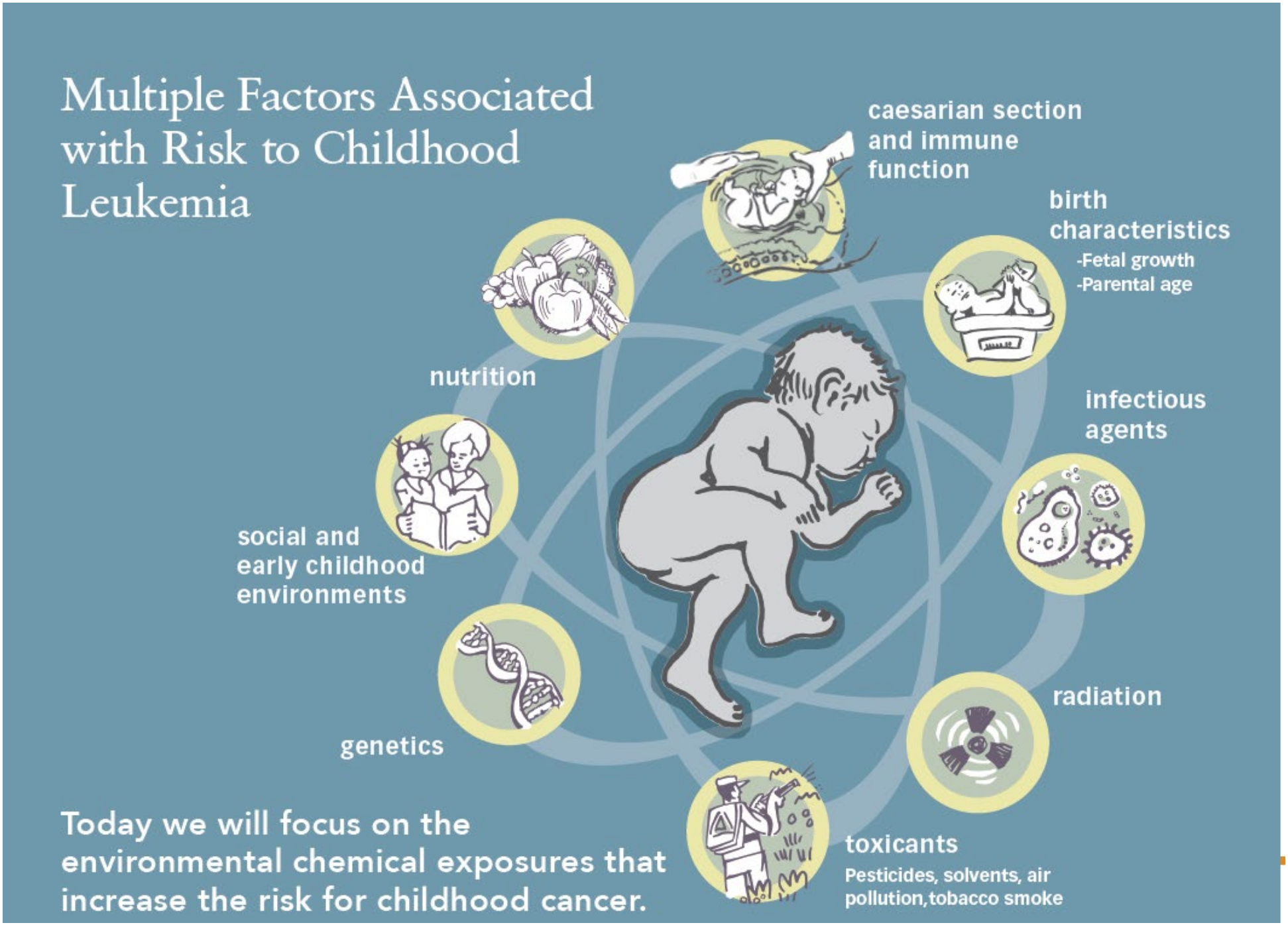


Although the exact cause of any individual child's cancer may be difficult to determine, many factors may contribute, including genetics, social environments and exposure to toxic chemicals in the environment.

Today we will focus on the environmental chemical exposures that increase the risk for childhood cancer.

Factors that may contribute to childhood cancer include the genes we inherit, our social and economic environments, our food and nutrition, infections, and exposure to toxic chemicals.

Multiple Factors Associated with Risk to Childhood Leukemia



Today we will focus on the environmental chemical exposures that increase the risk for childhood cancer.

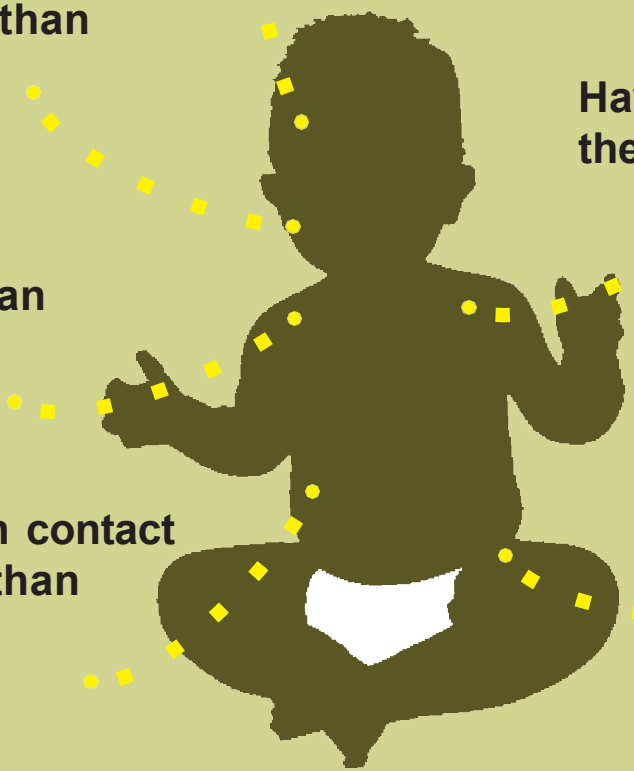
Why are kids more exposed to toxic chemicals?

Babies in the womb, kids and teens are both

- more **exposed** to toxic chemicals because they eat, drink and breathe more for their size than adults
  - Young children put their hands in their mouths after touching the floor where dust and toxic chemicals gather.
- they are more **vulnerable** to those exposures because they are growing and developing rapidly.

Why are kids more exposed to toxic chemicals?

Pound for pound, children:



Drink more water, breathe more air and eat more food than adults

Put their mouths on more objects than adults

Have more skin covering their bodies than adults

Eat more dust than adults

Absorb more chemicals due to thinner skin than adults

Have more skin contact with the floor than adults

Why are toxic chemicals more dangerous to kids than adults?

Babies in the womb, kids and teens are more vulnerable to these toxic chemicals because their bodies, especially their brains, are growing and developing rapidly. Development during these "windows of vulnerability" can be disrupted by very small amounts of chemical exposure. Adults have no similar "windows of vulnerability."

Children are more likely to be harmed by toxic chemicals because they:

- Have higher exposures to many chemicals
- Are still developing and their bodies cannot get rid of toxic chemicals easily

Toxic chemicals are more dangerous to children than adults.

Children are more likely to be harmed by chemicals because:

Children's bodies are still developing and changing.

- Hazardous chemicals can harm a child's development, especially their brain development.
- A child's body is less able to get rid of some toxic chemicals than an adult's because their organs are not yet fully functional like those of an adult.

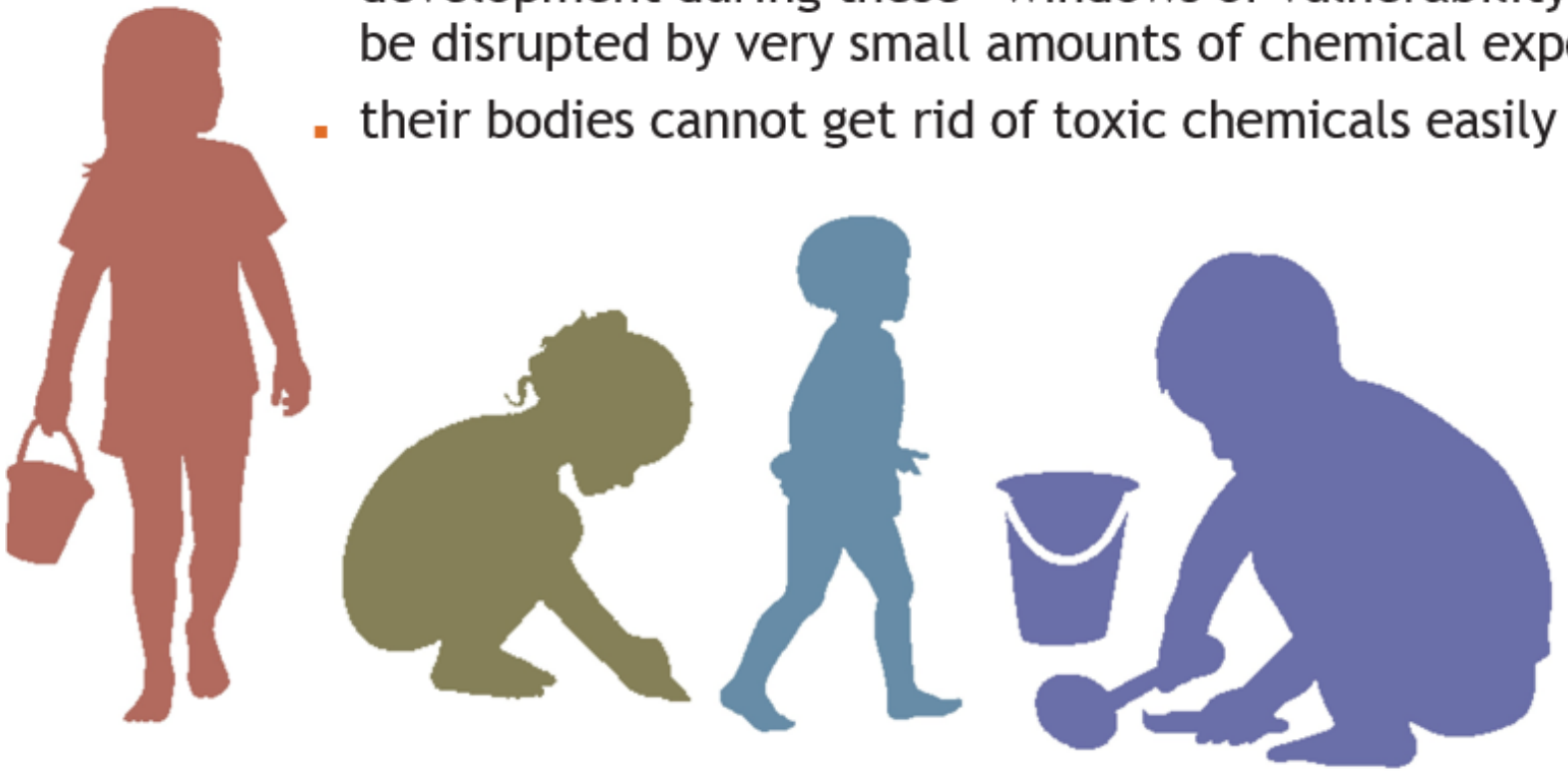
Exposure to chemicals used in many homes, schools and child care settings where children spend most of their time have been shown to increase the risk of:

- Learning Disabilities
- Cancer
- Birth defects
- Early puberty
- Hormonal disruption
- Asthma and other respiratory ailments
- Kidney disease

Why are toxic chemicals more dangerous to kids than adults?

Babies in the womb, kids and teens are more vulnerable to these toxic chemicals because:

- their bodies, especially their brains, are growing and developing rapidly
- development during these "windows of vulnerability" can be disrupted by very small amounts of chemical exposure
- their bodies cannot get rid of toxic chemicals easily

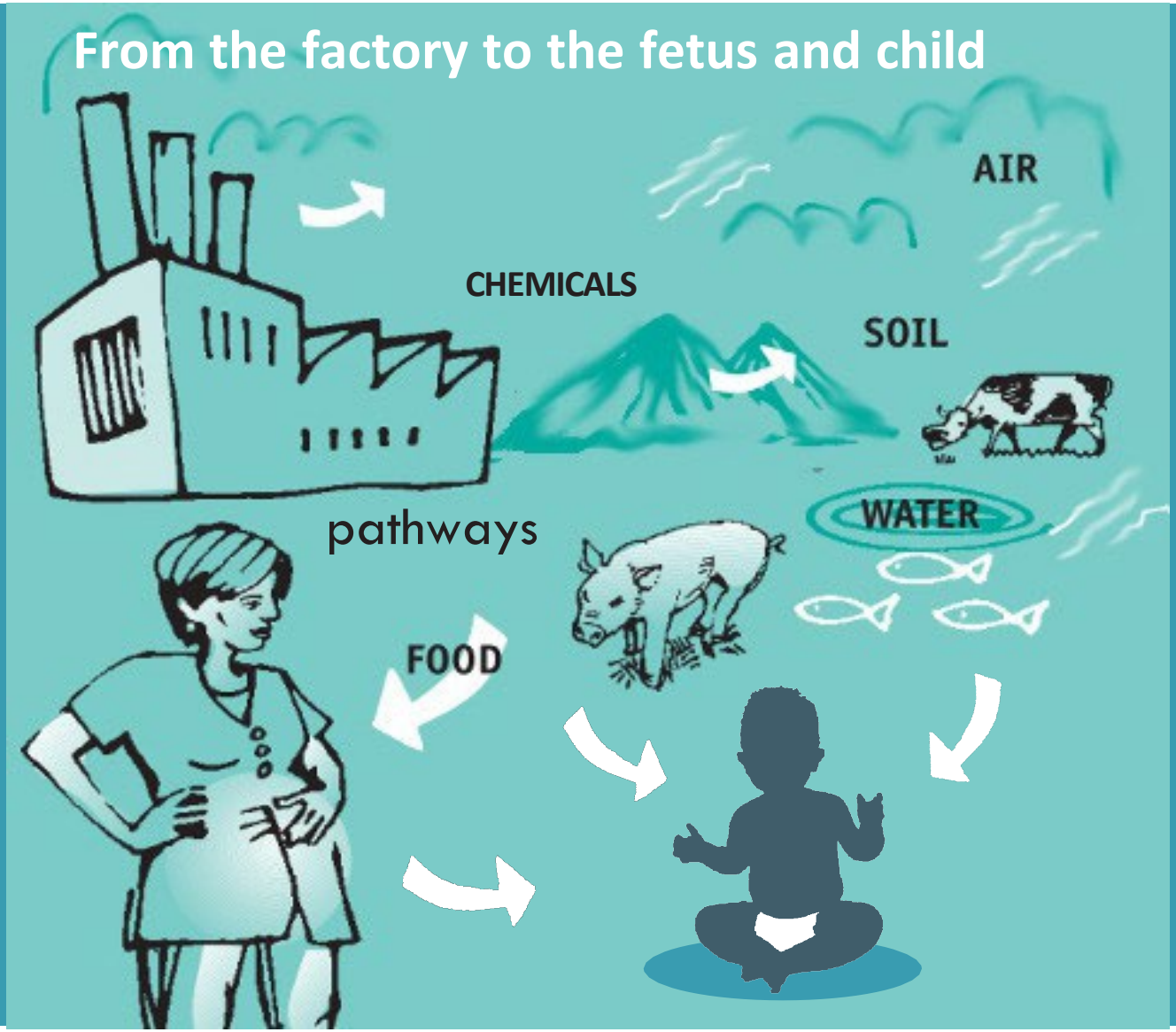


How are kids exposed to environmental hazards?

- Children and adults may be exposed to environmental chemicals anywhere:
  - Indoors (at home, school, childcare, etc.), outdoors,
  - through air, water, soil and food.
  -
- Toxic chemicals can enter a person's body through breathing, eating, drinking and through the skin.
- Pregnant people can pass toxic chemicals from the mother to the child.

Early life exposures to environmental chemicals can have lifelong effects.

How are kids exposed to environmental hazards?



What can we do to lower children's risk?

Minimizing children's exposure to environmental chemicals can lower their risk for childhood cancer and other health problems such as:

- asthma,
- learning disabilities, and
- immune system problems.

It's also important to protect children who have been treated for cancer from these same exposures.

- They are at higher risk for secondary cancers and other health problems later in life.

Let's look at some ways we can protect them.

What can we do to lower children's risk?

Minimizing children's exposure to environmental chemicals can lower their risk for childhood cancer and other health problems. It's also important to protect children who have been treated for cancer from these same exposures.

You can start protecting your children's health even before they are conceived, and during pregnancy.

Healthier choices include quitting smoking, eating healthier foods like lots of fruits and vegetables, and avoiding toxic chemicals in your home, workplace and play areas

---

Graphic reproduced with permission from the Center for Integrative Research on Childhood Leukemia and the Environment (CIRCLE)

You can start protecting your children's health even before they are conceived, and during pregnancy.

When's the best time to START protecting your child's health?

Before Conception.

During Pregnancy.

Early in Childhood.

Right this Minute.

Times when you can impact your child's health:

- Cigarette **smoking** before conception can damage baby's DNA – quit now.
- A healthy **diet** very early in pregnancy can protect baby from birth defects and cancer.
- Toxic **chemicals** can hang around for years – start cleaning up before you bring baby home.

Start Protecting Your Children's Health BEFORE They Are Conceived!

You can start protecting your children's health even before they are conceived, and during pregnancy.

Even *before* you get pregnant, and during pregnancy, it's important to:

- Eat healthy foods.
- Take prenatal vitamins including your doctor's recommended amount of folic acid (which is very important to prevent birth defects and protects babies from childhood cancer).
- Eat lots of green leafy vegetables, beans, fresh fruits, and whole grains which are some foods with folate.
- Avoid alcohol and caffeine.
- Breastfeed - If it's possible, breastfeeding for six months or longer is best after baby is born because it protects the baby from infections, provides important protective nutrients, and reduces the risk of childhood leukemia.

Prompt for discussion:

Discuss fresh foods that are culturally appropriate. Emphasize vitamins and folate. Provide resources if possible to healthy food programs such as the Women's Infants and Children's (WIC) food subsidy access.

Graphic reproduced with permission from the Center for Integrative Research on Childhood Leukemia and the Environment (CIRCLE)

You can start protecting your children's health even before they are conceived, and during pregnancy.

Today we will focus on the following environmental exposures:

- **Outdoor air pollution**
- **Indoor air pollution, including tobacco smoke**
- **Pesticides**
- **Solvents/volatile organic compounds (VOCs)**

We'll be discussing preventive actions for each topic.

Today we will focus on the following environmental exposures:

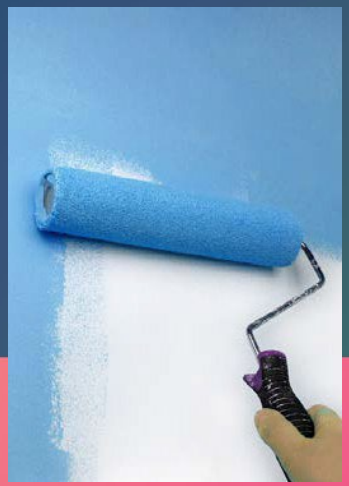
We'll be discussing preventive actions for each topic.

Outdoor air pollution

Indoor air pollution, including tobacco smoke

Pesticides

Solvents/volatile organic compounds (VOCs)



Air pollution

What is outdoor air pollution?

- Outdoor air pollution is caused by solid and liquid particles and cer- tain gases that can come from car and truck exhaust, factories, dust, pollen, mold spores, volcanoes and wildfires.
- Exposure to exhaust from vehicles is a particularly concerning risk factor for childhood cancer.
- Concern has been growing about living near oil and gas wells and the chemicals that they produce that can cause cancer.

Air pollution

What is outdoor air pollution?

- Outdoor air pollution is caused by solid and liquid particles and certain gases that can come from car and truck exhaust, factories, dust, pollen, mold spores, volcanoes and wildfires.
- Exposure to exhaust from vehicles is a particularly concerning risk factor for childhood cancer.
- Concern has been growing about living near oil and gas wells and the chemicals that they produce that can cause cancer.

How you can decrease exposure to outdoor air pollution. Here are some tips.

- Check the **Air Quality Index** (AQI) (airnow.gov) and limit outdoor activity when air quality is poor. A rating in the "Green" is considered good.*

Scan the code to access airnow.gov.

- Limit wood fires and backyard burning.
- Carpool, use public transporta- tion, or if the air quality is good outside and it is safe, bike or walk to reduce outdoor air pollu- tion from cars and other vehicles.
- Avoid walking near idling vehicles.
- Close windows during heavy traffic.
- Maintain a working heating, ventilating and air conditioning (HVAC) system.

***Prompt for discussion:**

Show how to use the AQI app.

How you can decrease exposure to outdoor air pollution. Here are some tips.

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201 to 300	Health warnings of emergency conditions. The entire population is more likely to be affected.
Hazardous	301 to 500	Health alert: everyone may experience more serious health effects

- Check the **Air Quality Index** (AQI) (airnow.gov)
- Carpool, use public transit, and bike.
- Limit wood fires and backyard burning.
- Avoid walking near idling vehicles.
- Close windows during heavy traffic.

Scan the code to access airnow.gov.

How you can decrease exposure to wildfire smoke pollution. Here are some tips.

In the event of wildfires:

- Keep children indoors with the doors and windows closed.
- If you have an air conditioner, run it with the fresh-air intake closed (recir- culate mode).
- Use portable air cleaners if available.
- Have children wear an N95 or KN95 mask, but only if they are fitted tightly to the face. Use masks only for short periods when children must be outdoors.
- Before being active outdoors, make sure the local air quality report has improved or the air no longer smells or looks smoky.

How you can decrease exposure to wildfire smoke pollution. Here are some tips.

In the event of wildfires:

- Keep children indoors with the doors and windows closed.
- If you have an air conditioner, run it with the fresh-air intake closed (recirculate mode).
- Use portable air cleaners if available.
- Have children wear an N95 or KN95 mask, but only if they are fitted tightly to the face. Use masks only for short periods when children must be outdoors.
- Before being active outdoors, make sure the local air quality report has improved or the air no longer smells or looks smoky.

What is indoor air pollution?

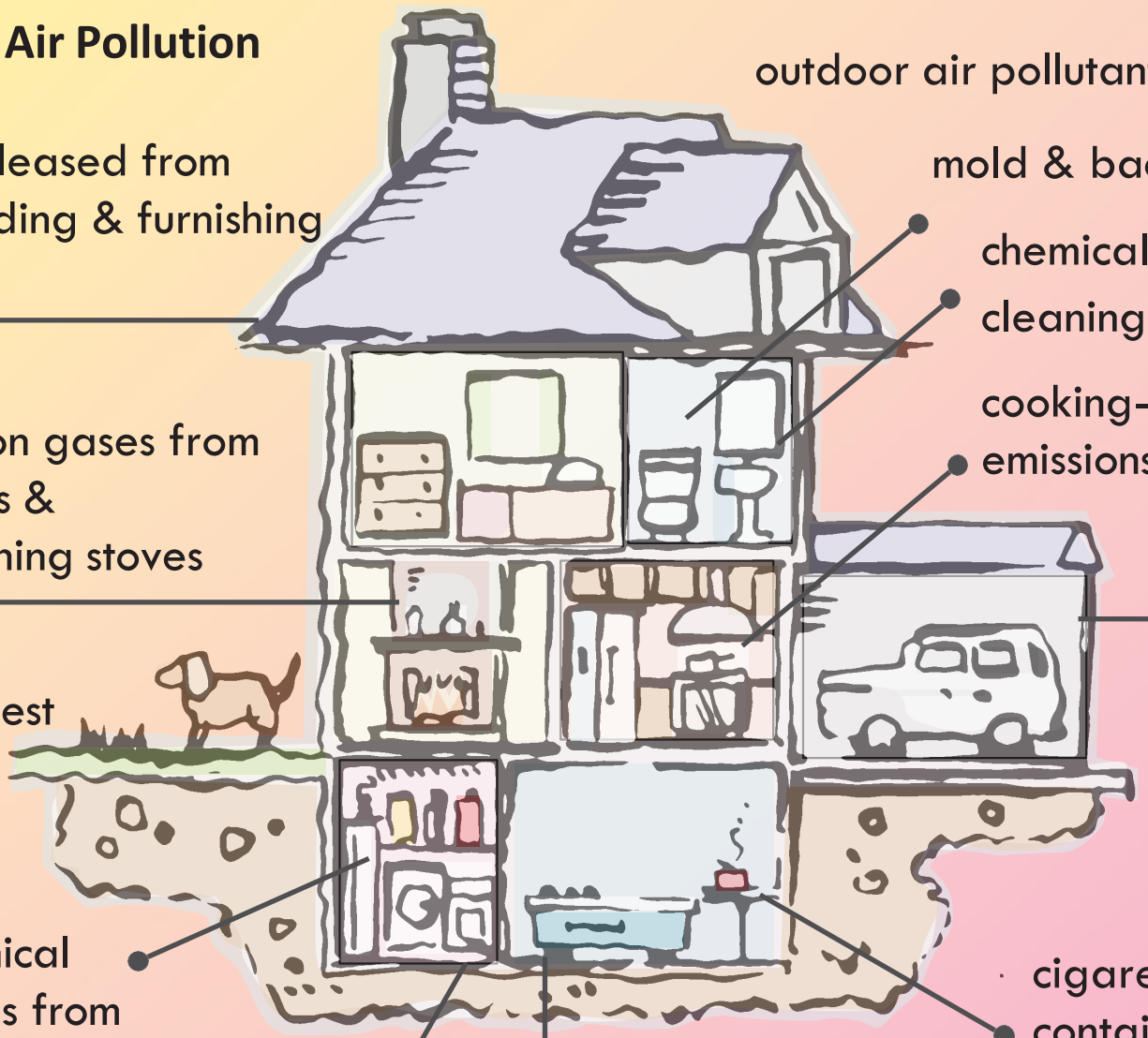
Potential Sources of Indoor Air Pollution

- chemicals released from modern building and furnishing materials including tapestries, electronics and the housing structure itself
- combustion gases from fireplaces and wordburning stoves
- animal hair & dander, pest droppings
- chemical fumes from paints and solvents, air fresheners, incense and candles
- gases including radon seeping through foundation

National Radon Hotline: 1-800-SOS-RADON

- outdoor air pollutants
- mold & bacteria
- chemicals from cleaning products
- cooking-related emissions
- carbon monoxide fumes from attached garage
- cigarette smoke contains some 4,000 chemicals

What is indoor air pollution?

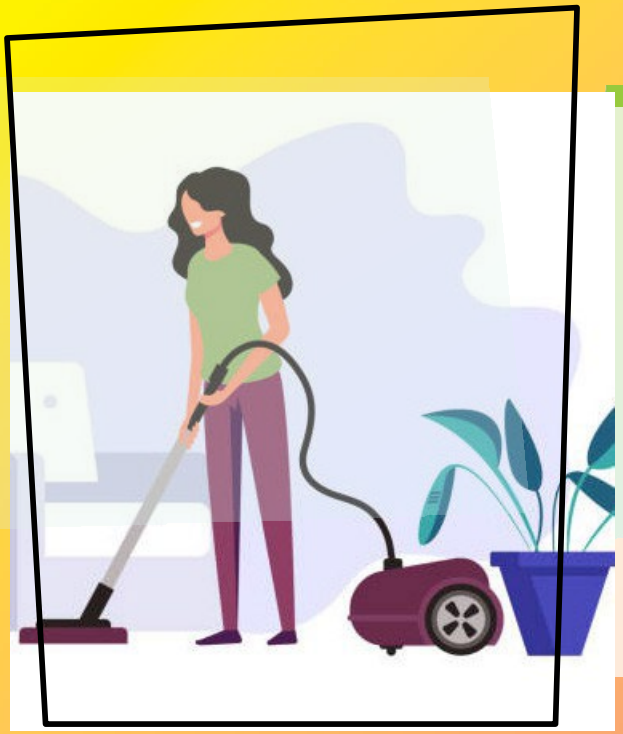


How you can decrease indoor air pollution

- Limit sources of indoor air pollution such as tobacco smoke, cleaning products, air fresheners, candles, dust, emissions from gas stoves.
- Clean the air through ventilation and filtration.
  - Open windows when weather and outdoor air quality permits,
  - Turn on exhaust fans when cooking, and
  - Filter indoor air with "HEPA" filter labeled MERV 11 or higher if possible.*
  - Use a vacuum cleaner with a HEPA filter.
  - Change your heating, ventilation and air conditioning (HVAC) system filters regularly. Make sure you put them in the correct way. When possible, get regular maintenance to clean your HVAC systems.
  - Check the EPA Care for Your Air website for tips on improving indoor air quality.
  - Test your house for radon.

***What are HEPA filters?**

HEPA are air filters which filter out more pollution particles. These filters are very helpful when the air quality outside is poor, or in wildfire season, when you can't open the windows. (A "HEPA" filter is a high efficiency particulate air filter that can remove at least 99.97% of dust, pollen, mold, bacteria, and many other airborne particles.)



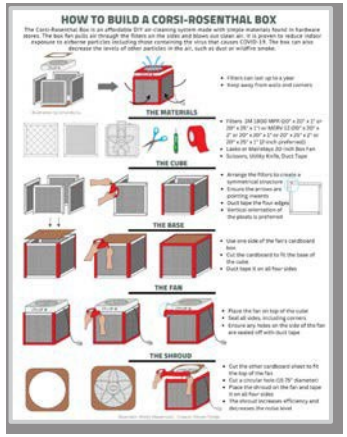
How you can decrease indoor air pollution

- Limit sources of indoor air pollution such as tobacco smoke, cleaning products, air fresheners, candles, dust, emissions from gas stoves.
- Clean the air through ventilation and filtration.

You can make your own indoor air filter.

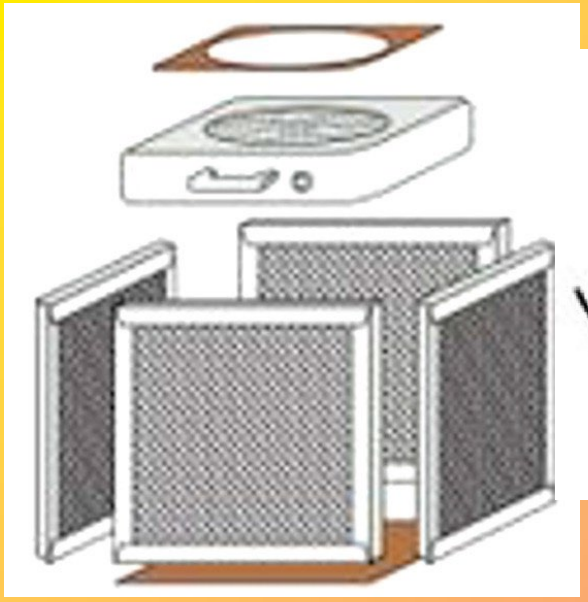
These do-it-yourself boxes using a fan and 4 filters are much cheaper and more effective than most commercial air filters. To download the guide to make your own air filter, scan the QR code at right.

You can also watch a video demonstration, visit https://www.youtube.com/watch?v=hluH-2naozI or scan the QR code below.

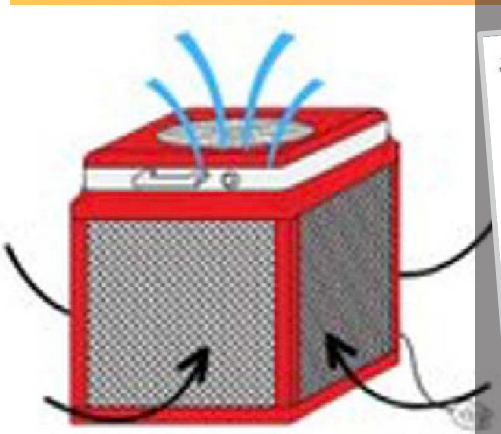


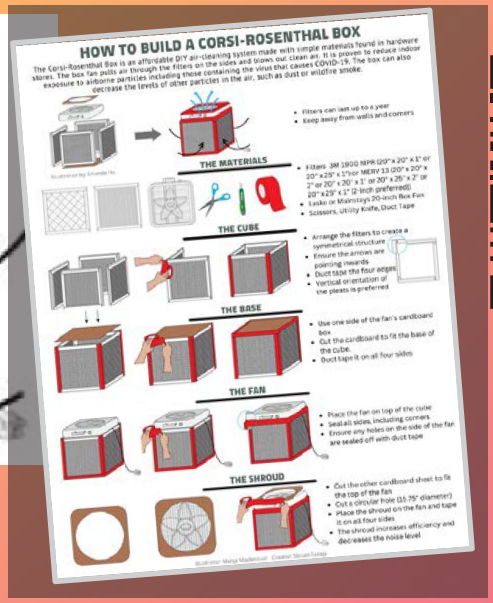
DIY air filter guide

DIY air filter video instuctions



DIANA HU ILLUSTRATION





DIY air filter guide

DIY air filter video instuctions

You can make your own indoor air filter.

These do-it-yourself boxes using a fan and 4 filters are much cheaper and more effective than most commercial air filters. To download the guide to make your own air filter, scan the QR code above.

You can also watch a video demonstration, visit https://www.youtube.com/watch?v=hluH-2naozI or scan the QR code at left.

House dust is a magnet for toxic chemicals

This graphic shows that house dust is a magnet for toxic chemicals, some of which may be risks for childhood leukemia. Chemicals can get stuck to dust particles and remain in your home for years. Children tend to swallow dust because they're on the floor a lot and they put their hands and toys in their mouths. One very easy thing you can do to protect your child is to keep your house clean and free of dust. Start cleaning up around your home before your baby is born.

Some practical tips for avoiding exposure to settled dust include:

- Leave your shoes at the door so you don't track in toxic chemicals and dirt.
- Wash your child's hands before eating.
- Quit smoking/don't smoke indoors (smoke particles can also stick to dust).

In addition:

- Open windows, run fans especially while cleaning to increase airflow.
- Keep dust levels down by damp dusting and mopping using microfi- ber cloths and mops.
- Vacuum area rugs often with a high-efficiency particulate air (HEPA) filter vacuum cleaner. These types of filters are able to trap extremely small particles of dust or chemicals.

We will cover safer cleaning products later on.

Graphic reproduced with permission from the Center for Integrative Research on Childhood Leukemia and the Environment (CIRCLE)

House dust is a magnet for toxic chemicals

Indoor air: What's in tobacco/vaping smoke; secondary, third-hand smoke

Tobacco smoke is made up of thousands of chemicals, including at least 70 known to cause cancer. These cancer-causing chemicals are referred to as *carcinogens*.

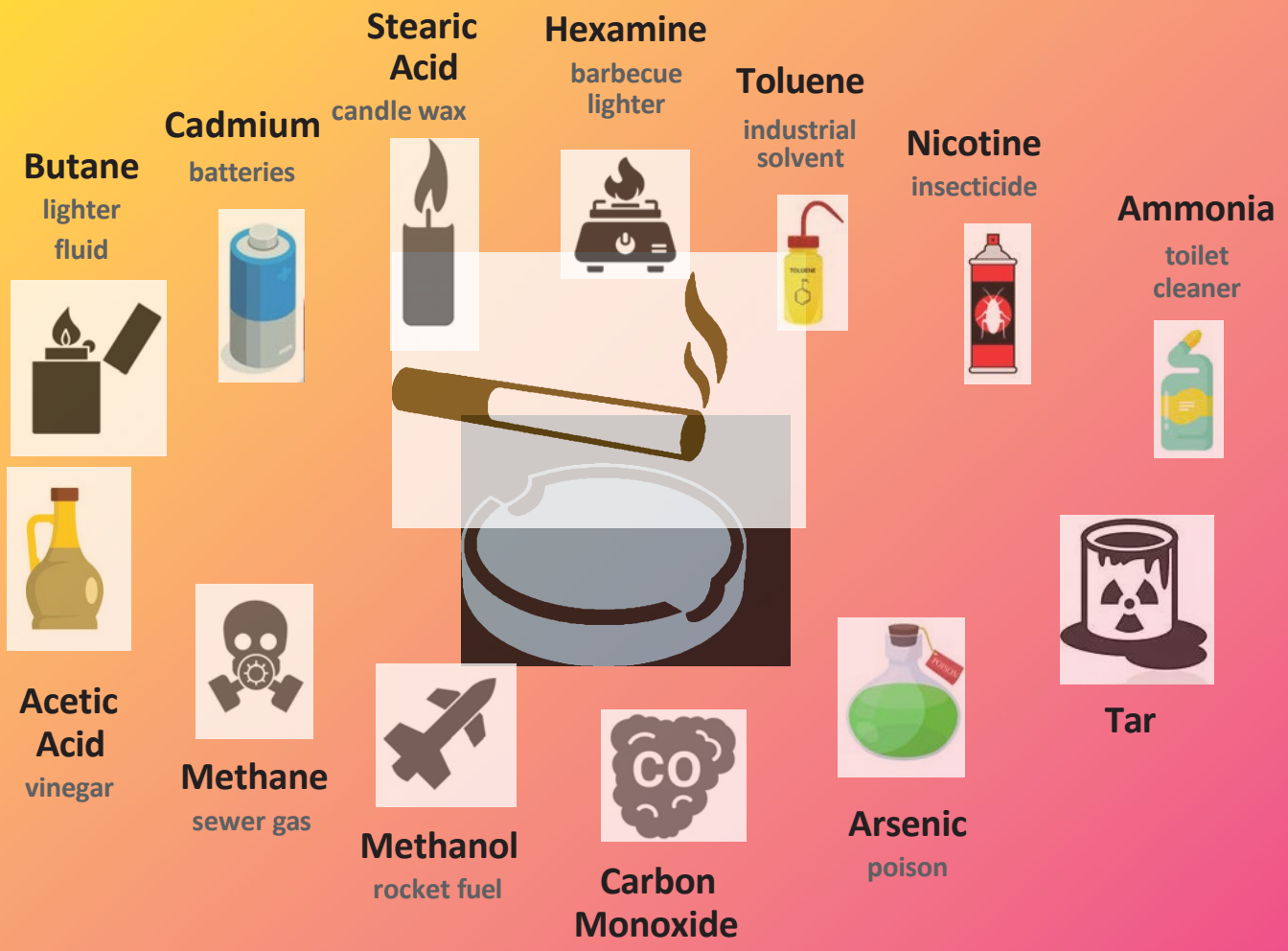
Some of the chemicals found in tobacco smoke include:

- Nicotine (the addictive drug in cigarettes)
- Carbon monoxide
- Hydrogen cyanide
- Formaldehyde
- Lead
- Arsenic
- Ammonia
- Benzene

Some of these chemicals can also cause heart disease, lung disease, or other serious health problems.

Ref: National Cancer Institute. (Scan code to access site.)

Indoor air: What's in tobacco/vaping smoke; secondary, third-hand smoke



Tobacco smoke is made up of thousands of chemicals, including at least 70 known to cause cancer. These cancer-causing chemicals are referred to as *carcinogens*.

Dad's smoking before pregnancy can harm the child too, including increasing the risk of his child getting leukemia.

From the graphic:

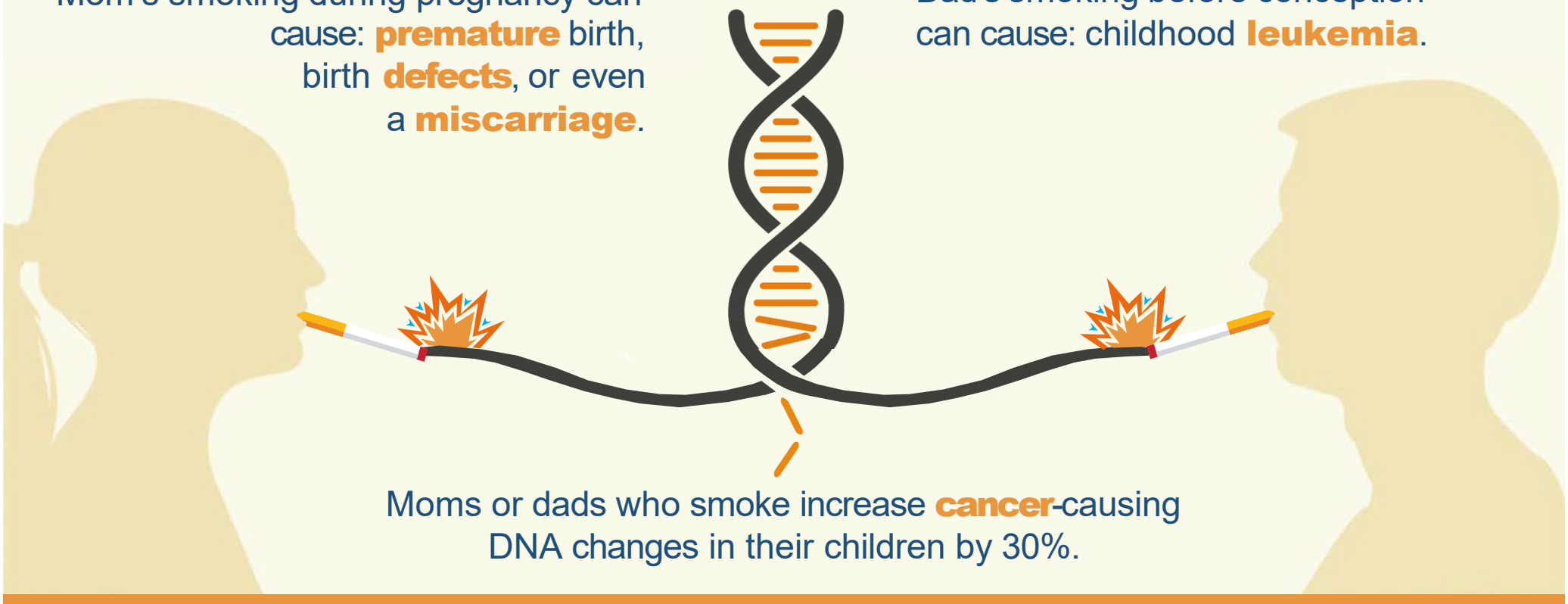
- Mom's smoking during pregnancy is bad for baby, but did you know that dad's smoking before pregnancy can harm the child too?
- Mom's smoking during pregnancy can increase the risk of: premature birth, birth defects, or even miscarriage.
- Dad's smoking before conception can cause leukemia.
- Moms or dads who smoke can increase cancer-causing DNA changes to their children by 30%.
- Start protecting your children's health before they are conceived!

Mom's Smoking During Pregnancy is Bad for Baby, but DID YOU KNOW?

Dad's Smoking *Before* Pregnancy Can Harm the Child, too.

Mom's smoking during pregnancy can cause: **premature** birth, birth **defects**, or even a **miscarriage**.

Dad's smoking before conception can cause: childhood **leukemia**.



Moms or dads who smoke increase **cancer**-causing DNA changes in their children by 30%.

Start Protecting Your Children's Health BEFORE They Are Conceived!

The Dangers of Second-hand and Third-hand Smoke Exposure

- Second-hand smoke exposure occurs when people breathe in smoke exhaled by other smokers, or from burning tobacco products.
- Third-hand smoke is the chemical residue left behind after someone smokes. The residue can cling to clothes, hair and skin, floors, walls, bedding, curtains, toys, and other surfaces.
- Second-hand and third-hand smoke contain harmful, toxic and cancer- causing chemicals that can be breathed in, absorbed through the skin, or swallowed, when children put their contaminated hands or other objects into their mouths.
- Reduce or eliminate your kid's exposure to tobacco smoke or vapors (including e-cigarettes and other vaping devices).
  - Do not allow smoking inside buildings or in the car. Help
  - to quit smoking resources:
    - Quitline (1-800-QUIT-NOW)

The Dangers of Second-hand and Third-hand Smoke Exposure

- Second-hand and third-hand smoke contain harmful, toxic and cancer-causing chemicals that can be breathed in, absorbed through the skin, or swallowed, when children put their contaminated hands or other objects into their mouths.
- Reduce or eliminate your kid's exposure to tobacco smoke or vapors (including e-cigarettes and other vaping devices).
  - Do not allow smoking inside buildings or in the car. Help
  - to quit smoking resources:
    - Quitline (1-800-QUIT-NOW)

Pesticides – What are pesticides?

- A pesticide is a poison that is designed to kill or control living things (pests) such as weeds (herbicides), insects (insecticides), rodents (like rats - rodenticides) or anything that you do not want to live in your home or yard, or in agricultural fields.
- Roach and ant spray, flea bombs, rat poison, weed killer or mothballs are all examples of pesticides.
- All pesticides are potentially harmful.

PESTICIDE	PEST
Insecticides	Insects and related pests such as spiders
Herbicides	Weeds or other unwanted plants
Rodenticides	Mice, rats and other rodents

Pesticides – What are pesticides?

- A pesticide is a poison that is designed to kill or control living things such as weeds, insect, and rodents.
- Roach and ant spray, flea bombs, rat poison, weed killer or mothballs are all examples of pesticides.
- All pesticides are potentially harmful.

Why you should be careful about buying and using pesticides

- Even though pesticides are widely available to buy, they can still be dangerous to children and adults.
- Pesticides can contribute to poisoning or health effects right away ("acute effects").
- They can also cause illnesses or affect development long after exposure, sometimes decades later.
- Pesticide exposure during pregnancy and early childhood has been linked to increased risk for getting leukemia, brain tumors, and other childhood cancers.
- Fathers' exposure to pesticides *before conception* has also been linked to their future child developing childhood leukemia.

Typically, the harmful effects of a pesticide depend on:

- How poisonous it is. Some are more poisonous than others.
- How long a person is in contact with the pesticide.
- How much of the pesticide gets inside the body of the exposed person.

Pesticides can be swallowed, breathed in, or absorbed through the skin.

Why you should be careful about buying and using pesticides

- Pesticides can cause poisoning or health effects right away ("acute effects"). They can also cause illnesses or affect development long after exposure, sometimes decades later.
- Pesticide exposure during pregnancy and early childhood has been linked to increased risk for getting leukemias, brain tumors, and other childhood cancers.
- Fathers' exposure to pesticides *before conception* has also been linked to their future child developing childhood leukemia.

Children and babies in the womb are especially at risk from pesticide exposure.

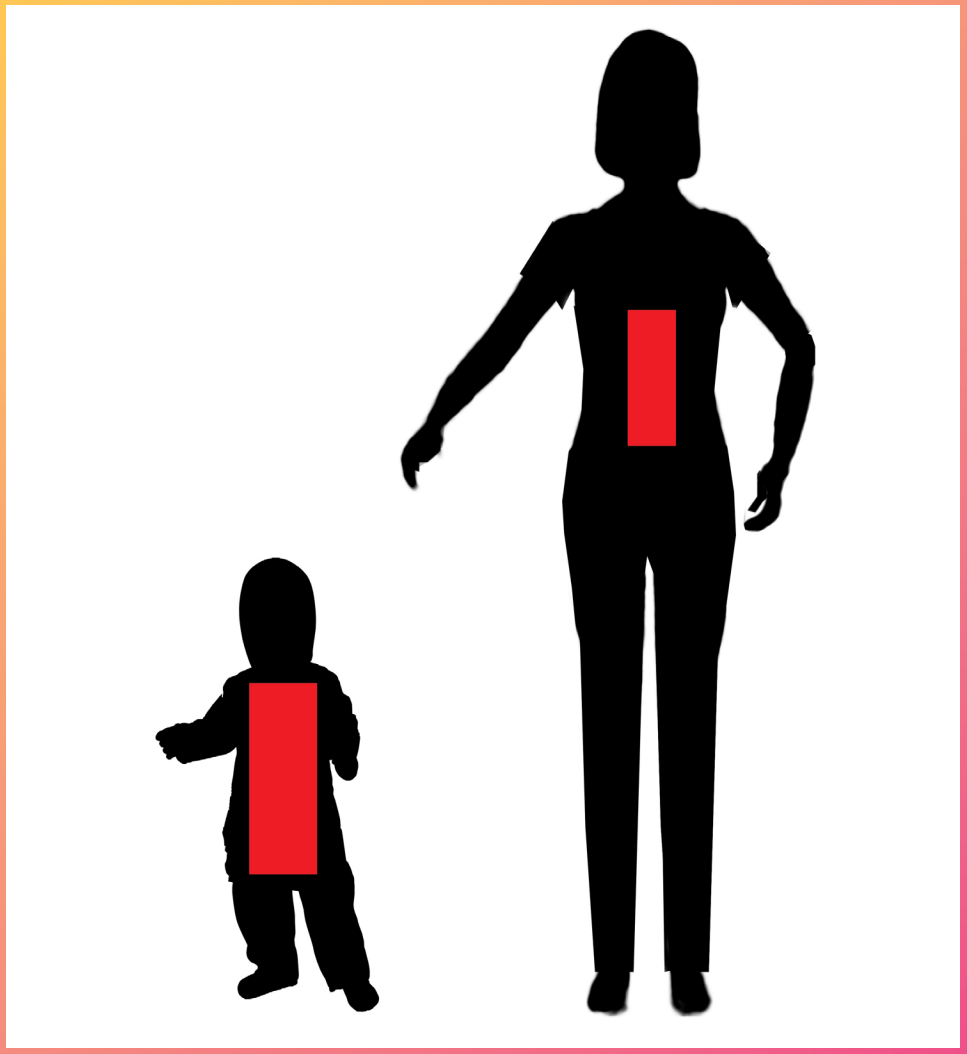
Possible long term health effects of pesticides include:

- Asthma
- Cancers
- Low birth weight and length Birth
- defects
- Learning disabilities
- Hormonal changes (disruption of the endocrine system)

From the graphic:

If a pesticide is present in air, food or water, a greater amount will be taken in by a child in proportion to their body size or weight than by an adult.

If a pesticide is present in air, food or water, a greater amount will be taken in by a child in proportion to their body size or weight than by an adult.



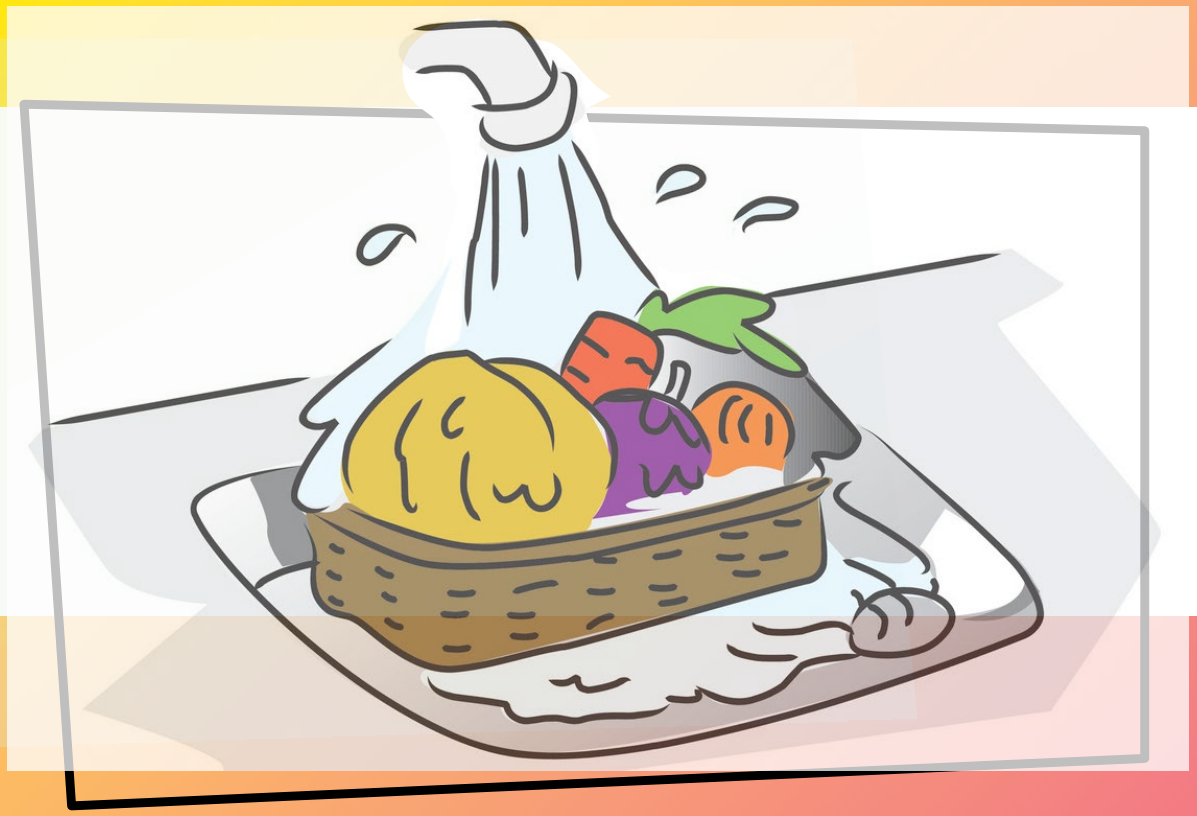
Children and babies in the womb are especially at risk from pesticide exposure.

Decrease pesticide exposure from food.

- Wash and scrub produce with water.
- Throw away the outer leaves of leafy vegetables where pesticide residues are highest.
- Trim the skin and fat from poultry, fish and meats where pesticides can collect.
- Purchase organic foods when possible, but not at the expense of a diet rich in a variety of fresh fruits and vegetables.
- Search the Environmental Working Group (EWG) "Shopper's Guide to Pesticides in Produce" (Dirty Dozen/Clean 15) tool to help make decisions about choosing organic produce.

DIRTY DOZEN / CLEAN 15

Scan the code to download the Environmental Working Group (EWG) "Shopper's Guide to Pesticides in Produce"



How you can decrease your exposure to pesticides

Decrease pesticide exposure from food.

DIRTY DOZEN / CLEAN 15

Scan the code to download the Environmental Working Group (EWG) "Shopper's Guide to Pesticides in Produce"

How you can decrease your exposure to pesticides

Decrease pesticide exposure in and around the home, school or child care.

- Use the least toxic options possible to control pests in and around buildings.
- Learn about "Integrated Pest Management" (IPM), which involves chemical use only after several other steps are taken to remove pests from the home.
- Leave shoes outside your home to prevent tracking in pesti- cides and other contaminants on shoes.
- Wash hands with soap and water often, especially before eating. Consider using a nail brush.
- Read warnings on labels and always follow instructions when pesticides are used.
- If pesticides are being applied outdoors nearby, shut windows and doors to prevent it from drifting indoors.
- If hiring a professional pest control company, search for li- censed companies that practice IPM and ask for the name(s), ingredient(s) and potential haz- ards of any products they will be using.
- Choose a pesticide of lowest toxicity; always be sure products are EPA registered.

Prompt: *Include local resources on Healthy Homes*

Decrease pesticide exposure in and around the home, school, or child care.

How you can decrease your exposure to pesticides

If someone in your family works with pesticides they can bring home residues on hands and clothes (what we call "take home exposures").

Pesticide residues can stick to skin, clothing, hair, and equipment and can remain on surfaces long after pesticides are applied. You can't always see and feel the residues. If someone in your family works with pesticides or other chemicals, here are some tips for avoiding "take home exposures":

- Change your clothes at work and shower before you leave work.
- Remove your shoes at the door before entering your home.
- Wash your hands when you get home.
- Launder work clothes separately.
- Don't use chemicals at home that are meant to be used in the workplace.

How you can decrease your exposure to pesticides

Here are some tips for avoiding "take home exposures":

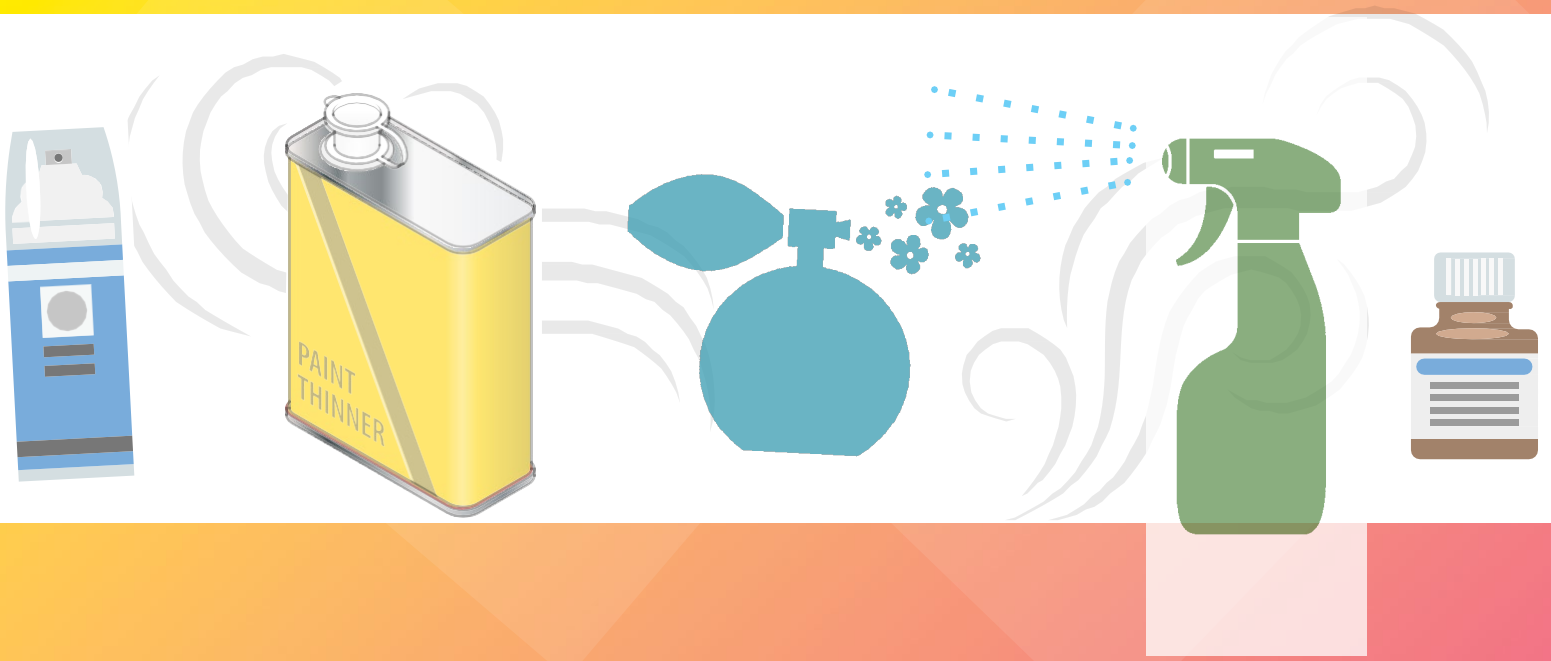
- Change your clothes at work and shower before you leave work.
- Remove your shoes at the door before entering your home.
- Wash your hands when you get home.
- Launder work clothes separately.
- Don't use chemicals at home that are meant to be used in the workplace.

What are Solvents and Volatile Organic Compounds (VOCs)?

VOCs and solvents are chemicals that are widely used as ingredients in household and personal care products. We are exposed by inhaling the vapors. Solvents can also be absorbed through your skin or mouth.

Examples of products containing solvents/VOCs that people can be exposed to:

- Paints, lacquers, paint strippers, adhesive remover
- Cleaning and disinfecting products, 'odor-masking' products, dry cleaning
- Personal care products, cosmetics (ex. nail polish and remover, hair spray, perfume/ cologne)
- Fuel (ex. gasoline, kerosene)
- Pesticides
- Building materials and furnishings
- Crafting materials like glues & adhesives, permanent markers, photography solutions



What are Solvents and Volatile Organic Compounds (VOCs)?

VOCs and solvents are chemicals that are widely used as ingredients in household and personal care products. We are exposed by inhaling the vapors. Solvents can also be absorbed through your skin or mouth.

How you can lower your exposure to harmful solvents/VOCs.

- **Shop Smart:** Look for these logos when buying household products. These logos tell you that the products have been tested for effectiveness and safety for human health and the environment.
- **Choose products labeled "Low- VOC":** Many products in these categories, like paints and personal care products, have Low-VOC alternatives (look on the label).
- Choose unscented products and water-based glues or paints.
- **Safely dispose of any unneeded or unused products containing VOCs:** If storing products for future use, store products in their original labeled containers, sealed, and away from the living space. Keep products locked and/or out of reach of children. Many of these products are considered household hazardous waste and should be disposed of at special facilities.
- Another way to lower VOC exposure is to avoid dry-cleaning clothes when possible, or look for dry-cleaners that provide 'wet cleaning' or 'CO2 cleaning' instead. Air out dry- cleaned clothing before storing or wearing.

EcoLogo

Green Seal

Design for the Environment

How you can lower your exposure to harmful solvents/VOCs.

Shop Smart: Look for these logos when buying household products. These logos tell you that the products have been tested for effectiveness and safety for human health and the environment.

How you can lower your exposure to harmful solvents/VOCs (continued)

The concentration of many VOCs can be much higher – up to 10x higher – indoors compared to outdoors. People also spend a majority of their time inside, up to 90% – so it's important to focus on a simple step to improve indoor air quality – letting the fresh air in!

Let the fresh air in!

- Increase ventilation indoors by opening windows and doors, and using exhaust fans.

  Examples of situations when increasing ventilation is important:

  - When using solvent/VOC contain- ing products indoors, like when cleaning or painting.
  - After installing new furniture, new carpeting, rugs or other textiles or products that contain VOCs such as manufactured pressed wood products (ex. new compos- ite wood flooring or furniture may contain formaldehyde), allow the space to sit unoccupied and ventilated for as long as possible.

- Ventilation can help prevent these harmful gases from building up in the indoor air.
- There are some circumstances in which the outdoor air can be more harmful than indoor air, like if there is wildfire smoke outside. In this case if you cannot ventilate your home safely, consider holding off on activities where you would use VOC-containing products (cleaning, painting, etc.) until the outdoor air is safer and you can ventilate your home appropriately.

How you can lower your exposure to harmful solvents/VOCs (continued)

Let the fresh air in!

The concentration of many VOCs can be much higher – up to 10x higher – indoors compared to outdoors. People also spend a majority of their time inside, up to 90% – so it's important to focus on a simple step to improve indoor air quality – letting the fresh air in!

Childhood Cancer & the Environment

A project to raise awareness of environmental influences on childhood cancer

PEHSU Pediatric Environmental Health Specialty Units

For more information on the Childhood Cancer and the Environment program, visit the Western States PEHSU website.

https://wspehsu.ucsf.edu/

WESTERN STATES PEHSU Pediatric Environmental Health Specialty Unit

This flip book was supported by cooperative agreement FAIN: NU61TS000296 from the Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry (CDC/ ATSDR). The U.S. Environmental Protection Agency (EPA) provided support through Inter- Agency Agreement DW-75-95877701 with CDC/ATSDR. The American Academy of Pediatrics supports the Pediatric Environmental Health Specialty Units as the National Program Office. The findings and conclusions presented have not been formally disseminated by CDC/ATSDR or EPA and should not be construed to represent any agency determination or policy. Use of trade names that may be mentioned is for identification only and does not imply endorsement by the CDC/ATSDR or EPA.