What is asthma?

How is asthma diagnosed in kids?

Controlling asthma is the goal

Signs of an asthma attack

When you need to call for help

Asthma triggers

Asthma medicines

Taking asthma medicines

Asthma action plan

Asthma at school and play

Resources for families

Seattle Children’s®
HOSPITAL • RESEARCH • FOUNDATION
**What is asthma?**

**Asthma** is a lung disease that makes it harder to breathe.

- **Asthma symptoms** can come and go
- Some people only get asthma symptoms with a cold
- An asthma attack can happen in a few minutes or over a few hours

Lungs are actually millions of tiny air bags called **alveoli** (al VEE oh lie).
They fill up with air to move oxygen into the blood.

The air you breathe goes in and out of your lungs through tubes.

- **Normal airway tube**
- **When you have asthma**
  - the small tubes deep in your lungs get swollen
- **When you have an asthma attack**
  - your lungs make extra mucus and the muscles around the tubes get tight

When these things happen, you feel some or all of the **symptoms of asthma**:

- It’s hard to breathe. You feel like you can’t get enough air, or you breathe faster than usual. It might be hard to talk.
- Your chest feels tight or heavy.
- You may cough. You might wake up at night coughing.
- You may “wheeze.” Wheezing is when you make a whistling sound when you breathe.
How is asthma diagnosed in kids?

**A diagnosis of asthma is based on:**

- Medical history
- Daytime and nighttime symptoms
- A physical exam
- Spirometry (for a school-age child)

**Spirometry** (spy-ROM-uh-tree) is a common test used to see how well your lungs work. You breathe into a tube, and the spirometer machine measures how much air you inhale, how much you exhale, and how quickly you exhale.

**When is asthma diagnosed?**

Sometimes babies and toddlers wheeze when they get a cold or virus because they have small airways. The same medicines we use in asthma can sometimes help with symptoms in these young kids. Most kids who wheeze as infants outgrow it and do not have asthma when they get older. So, doctors usually cannot make an asthma diagnosis until children are about age 4 or 5.

**If you get an asthma diagnosis:**

It’s important to see a healthcare provider twice a year, when you are feeling well, to go over the asthma management plan and adjust medicines as needed. Most kids don’t outgrow asthma. When you have asthma, your need for daily medicines may change, but your lungs often remain “twitchy,” or oversensitive to irritants.
Asthma can’t be cured, but it can be kept under control.

**Your asthma is under good control if you:**

- Can sleep through the night
- Can play and exercise without problems
- Miss no school or daycare because of asthma
- Have no hospital stays due to asthma
- Never need to go to the emergency room for asthma
- Have few medicine side effects
- Have close-to-normal or normal lung function test results
- Do not need oral steroids with colds

Take the Asthma Control Test at www.asthmacontrol.com.

**MY asthma goals:**

*Example:*

*I want to play basketball without my chest hurting.*
Controlling asthma is the goal

You can control your asthma!

Learn your unique signs and act early
Work with your medical team
Make an asthma plan and follow it
Take your medicines
Avoid your triggers

You will have help from your providers and family. With good asthma control, you should be able to do whatever you like to do.

What do you like to do?
Signs of an asthma attack

Physical signs show that you are starting to have trouble breathing because of narrowed breathing tubes. They are different for each person and depend a lot on their age.

Early signs of an asthma attack

These things could be a sign that asthma is flaring up:

• Cough, especially one that gets worse at night
• Wheezing while breathing out
• Using stomach muscles to push air when breathing out
• Less active than usual, resting often, not keeping up or playing with friends, very restless, listless
• Runny nose, tickle in throat. Itchy, watery eyes and runny nose from allergies or a cold. Frequent throat clearing
• Grumpy or irritable, fussy or agitated
• Refusing to eat or eating less than the usual amount of breast milk, formula or food. An infant taking longer to nurse or take a bottle, stopping often while nursing or sucking on a bottle to catch breath
• Sleeping changes: fussy, irritable, sleeping less, shorter naps, sleeping more than usual, unable to sleep lying flat. Waking up at night with cough, wheeze or shortness of breath
• Drop in peak flow meter (if you use one)
• Complaining of chest tightness or pain
What does an asthma attack look like?
Call your healthcare provider if you notice any of these signs.

**In a baby:**
- Sweating or clammy skin
- Open mouth
- Stomach sucking in more than usual with breathing
- Bones may show more than usual (skin “retracts”)
- Flaring of nostrils
- Head moving back and forth or up and down with each breath (head bobbing)
- Increased breathing rate (see page 8)
- Wheezing, grunting, high-pitched noise when breathing in or out
- Increased coughing or mucus
- Vomiting from hard coughing

**In a child:**
- Sweating or clammy skin
- Bones may show more than usual (skin “retracts”)
- Abdominal muscles tense when trying to breathe
- Increase or decrease in breathing rate (see page 8)
- More trouble breathing when lying flat
- Grunting or wheezing
- Increased coughing or mucus
- Vomiting from hard coughing
- Rescue medicine does not help in 15 minutes. Using rescue medicine more often than every 4 hours
When you need to call for help

You need to know the amount of “work” or effort a child is using to breathe. Along with knowing the warning signs, you can measure breathing trouble.

1. Know your child’s normal breathing rate
2. Find your child’s breathing rate

When asthma is flaring up, you need to call your healthcare provider. Here is a script for your parent or caregiver to use.

My child is having an asthma attack.

Their symptoms are: ____________________________________________
The symptoms started: ____________________________________________
In the past 24 hours, they’ve taken these medicines:

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Time of dose</th>
<th>Amount of dose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

These medicines:
- Did not help (or)
- Helped, for this long: __________________________________________

My child’s maintenance medicines are: __________________________________________

We think this might have been a trigger: __________________________________________

My child has these other health problems: __________________________________________

In the past,
- They have needed prednisone at these times: __________________________________________
- They’ve had emergency room visits at these times: __________________________________________
- They’ve had hospitalizations or intensive care stays due to asthma at these times: __________________________________________
Call 911 now if your baby has any of these signs:

- Stops breathing for 15 seconds or longer
- Has severe difficulty breathing
- Has skin-tone changes, sometimes seen as more blue or gray, especially noticeable around the lips, fingernails and gums
- Does not wake up when you try to wake them

Call 911 now if your child has any of these signs:

- Has skin tone changes, sometimes seen as blue-gray color, around lips and under eyes
- Can’t walk or complete a sentence
- Becomes anxious or scared
- Has unusual drowsiness or confusion

Normal breathing rates during sleep

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Normal breaths per minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>30-40</td>
</tr>
<tr>
<td>1-2</td>
<td>22-30</td>
</tr>
<tr>
<td>2-4</td>
<td>20-26</td>
</tr>
<tr>
<td>5-10</td>
<td>18-22</td>
</tr>
<tr>
<td>10-18</td>
<td>16-20</td>
</tr>
</tbody>
</table>
Asthma triggers

Common triggers

Asthma flares or episodes can come and go, often “triggered” by something that the lungs come into contact with.

Infections
- Colds or upper respiratory infections
- Ear infections
- Sinus infections
- Viruses like Influenza (respiratory flu) and RSV (respiratory synticial virus)

Allergies
- House dust mites, mold
- Cats, dogs, hamsters, birds, other furry or feathered warm-blooded animals
- Cockroaches
- Grass, pollen, trees, weeds
- Some foods

An allergy is an unusual reaction by the body to a usually harmless substance. Some symptoms of allergies can include sneezing, watery/itchy eyes, runny nose, headaches, vomiting or diarrhea, and skin rashes or eczema. And if you have allergies, they might make your asthma worse.

Irritants
- Secondhand smoke. Anything that is lit – tobacco, marijuana or illegal drugs that are smoked, E-cigs and vapor cigarettes
- Wood smoke from a fireplace, campfire, barbeque, or fireworks
- Smoke from candles
- Household or personal products (cleaning products, paint, paint thinner, furniture polish, starch and cleaners, air fresheners, perfume)
- Air pollution

Others
- Cold air
- Weather changes
- Hard exercise
- Heartburn or gastroesophageal reflux disease (GERD), especially in babies
- Strong emotions (laughing, crying, yelling, fear, stress)

MY asthma triggers:
To help control my triggers, what can I do?

Stay away from others who have colds.
Cold viruses are the most common asthma trigger in children.

Washing hands often is one of the best ways to stop the spread of germs. Whenever possible, use water and soap.

Choose machine-washable curtains and area rugs, and wash them often.
Place a filter between air ducts and vent covers. Change furnace filters monthly.
Dust and vacuum carpets often, when the person with asthma is not home. Wash floors with a sponge mop weekly.

Put your pillow, mattress and box springs in a zippered plastic allergy cover.
Wash all bedding often, in hot water. Keep only one or two stuffed toys in your bedroom and wash them often. Do not sleep with them.

Keep pets outside, or at least out of your bedroom.
Wash your pet weekly to decrease the amount of dander. Even an animal you are not allergic to can still cause an irritation reaction. Choosing a shed-free pet can help.

Controlling your allergies may help you control your asthma!
There is no “cure” for allergies, but you can reduce allergens and treat your allergies.

If you think you have an allergy, speak with your healthcare providers. They might suggest that you see an allergist, a healthcare provider who specializes in allergies. The allergist may suggest allergy testing — skin tests or blood tests — and recommend allergy medicine.

Do not allow any kind of smoking in your home or car.
Avoid wood smoke from a wood stove or fireplace.
Avoid using perfumes or cleaning products with strong odors.

Prevent mold growth:
• Fix leaky faucets and pipes.
• Do not use vaporizers or humidifiers.
• Limit house plants.
• Scrub surfaces often with X-14 or bleach and water.
There are 2 kinds of asthma medicines:

**Rescue medicines**

Everyone with asthma should have a rescue medicine, taken with an inhaler or in a nebulizer. Rescue medicines work right away to relax the muscles around the airways.

Use your rescue medicine for quick relief:

- When asthma symptoms occur (coughing, wheezing, out of breath, or feeling fatigue or chest tightness.)
- Before exercise or activity, if needed
- About a half-hour before you are going to be around one of your triggers

**Controller medicines**

Your provider may prescribe a controller medicine, too. These reduce swelling inside the airways and help prevent asthma episodes and symptoms. By decreasing the number of asthma attacks, you may need fewer oral steroid bursts. For these medicines to work, you must take them every day, even when you look or feel well.

Take your controller medicine on a regular schedule to prevent asthma symptoms.

Important! Use your rescue medicine when you have asthma symptoms. Don’t wait until it is an attack or emergency!
Rescue medicines

Relax the muscles on the outside of your breathing tubes for 3 to 4 hours

Fast-acting bronchodilators

AccuNeb (albuterol)  ProAir HFA (albuterol)  Proventil HFA (albuterol)  Ventolin HFA (albuterol)  Xopenex HFA (levalbuterol)

Anticholinergic/bronchodilators

Atrovent HFA (ipratropium bromide)  Nebulized Atrovent (ipratropium bromide)

Oral steroids

Strong medicine that reduces swelling inside breathing tubes for several hours

Orapred (prednisolone)  Prednisolone  Prelone (prednisolone)

Decadron (dexamethasone)  Decadron (dexamethasone)  prednisone pills  prednisone pills
Asthma medicines

Controller medicines

A small dose once or twice a day will decrease swelling inside the breathing tubes, and may help reduce need for oral steroids.

**Inhaled steroids**

- **Asmanex Twiskhaler** (mometasone)
- **Alvesco** (ciclesonide)
- **Azmacort** (triamcinolone)
- **Flovent HFA** (fluticasone)
- **Pulmicort Respules** (budesonide)
- **Pulmicort Flexhaler** (budesonide)
- **Qvar** (beclomethasone)

**Long-acting combinations of inhaled steroids and bronchodilators**

Always combined with inhaled steroids and **never** taken separately:

- **Advair Diskus** (fluticasone and salmeterol)
- **Advair HFA** (fluticasone and salmeterol)
- **Dulera** (budesonide and formoterol)
- **Symbicort** (budesonide and formoterol)

**Leukotriene modifiers**

Always combined with inhaled steroids and **never** taken separately:

- **Singulair granules** Montelukast sodium
- **Singulair tablets** Montelukast sodium
Using a Spacer with a Metered Dose Inhaler (MDI)

Using a spacer with your MDI makes the treatment easier.
A spacer holds the medicine until you are ready to breathe it in.
It helps the medicine get down to the small airways and can help reduce side effects.
Without a spacer, unless your technique is really good, most of the medicine is likely to hit your tongue or the back of your throat.

Directions
Read through all steps before beginning.
Step 1......Prepare your metered dose inhaler (MDI) as usual.
    Remove the cap on the spacer’s mouthpiece.
Step 2......Shake the MDI rapidly for five seconds.
Step 3......Insert the MDI (inhaler) into the spacer.
Step 4 ......Blow air out of your lungs and put the spacer in your mouth.
Step 5......Press down on the inhaler, releasing medicines to fill the spacer.
Step 6 ......Seal your lips around the mouthpiece of the spacer.
    Take in a slow, deep breath to inhale the medicine.
    There should be no whistle sound.
Step 7 ......Hold your breath and slowly count to 10. It is important to hold your breath for the whole 10 seconds!
Step 8 ......Release your breath and breathe normally.
Step 9 ......Wait 15 seconds.
Step 10.....Repeat the steps for each additional prescribed puff.
    Begin with shaking the MDI again and go to Step 4.

Wash your spacer and mouthpiece in warm, soapy water once a week.
Using a Spacer with Mask

Using a mask with a spacer is helpful for very young children or anyone who is having trouble using a regular spacer.

Directions

Read through all steps before beginning.

Step 1......Prepare your metered dose inhaler (MDI) as usual. Remove the cap on the spacer’s mouthpiece.
Step 2......Shake the metered dose inhaler (MDI) rapidly for 5 seconds.
Step 3......Insert the MDI into the spacer.
Step 4......Put the mask over your nose and mouth, but breathe normally.
Step 5......While keeping a good seal on the mask around your mouth and nose, press down on the canister once to release the medicine.
Step 6 ......Hold the mask in place and take 3 to 6 breaths to empty the chamber.
Step 7 ......Remove the mask/spacer unit from your face and wait 15 seconds.
Step 8 ......Repeat the procedure for each additional prescribed puff. Shake the inhaler and begin with Step 5.
Step 9 ......After using a mask, always wipe the skin around your mouth with a wet cloth.

Keep it clean!
Wash your spacer and mask in warm, soapy water once a week.
Using a Nebulizer

Another way to take asthma medicine is through a nebulizer.

A small electric motor sends air through a medicine cup. This turns the medicine into a fine mist that is inhaled through a mouthpiece or mask. You might use this instead of an MDI.

Your healthcare provider needs to order nebulizer treatments by a prescription. You get the machine and medicine from a medical supply company.

Peak flow

You can measure your “peak flow rate”– how fast air moves out of your lungs during one quick, hard outward breath – with a peak flow meter. Find your personal best peak flow by measuring it when you are feeling well.

Once you know your personal best peak-flow score, you can figure out your green, yellow and red peak-flow zones. See the next page to find out how your scores help you to follow your asthma management plan.

- **Green (normal zone):** Scores within 80-100% of your best score
- **Yellow (caution zone):** Scores within 50-80% of your best score
- **Red (danger zone):** Scores less than half (50%) of your best score
Asthma action plan

The asthma action plan (or asthma management plan) is a tool you complete with your provider. Most plans look similar to the plan below. You can share this plan with caregivers, including your school.

### ASTHMA MANAGEMENT PLAN

*Bring this Management Plan with you to ALL doctor and Emergency Room visits along with peak flow, spacer and medicines.*

<table>
<thead>
<tr>
<th>Date of Management Plan:</th>
<th>Best Peak Flow Is:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordered by:</td>
<td>Your follow up appointment with:</td>
</tr>
</tbody>
</table>

- **GREEN** means **GO**. Use controller medicine.
- **YELLOW** means **SLOW DOWN**. Add rescue medicine.
- **RED** means **STOP**. Get help from a healthcare provider.

**Avoid these Triggers:** Cigarette smoke, Colds, Strong odors, Air pollution/Smog and Smoke.

**Your known Triggers:**

<table>
<thead>
<tr>
<th>Classification of Severity:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Peak Flow is: above (Above 80% of Best Peak Flow)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Breathing is good</em></td>
</tr>
<tr>
<td><em>No cough or wheeze</em></td>
</tr>
<tr>
<td><em>Can run and play</em></td>
</tr>
<tr>
<td><em>Sleeps through the night</em></td>
</tr>
</tbody>
</table>

*I feel good. I take these asthma controller medicines every day.*

<table>
<thead>
<tr>
<th>Medicine</th>
<th>How much</th>
<th>How often</th>
</tr>
</thead>
</table>

*If you have symptoms during exercise, take 2-4 puffs of albuterol through a metered dose inhaler with spacer 15-30 minutes before activity.*

<table>
<thead>
<tr>
<th>Peak Flow is: to (50 to 80% of Best Peak Flow)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Cough</em></td>
</tr>
<tr>
<td><em>Wheeze</em></td>
</tr>
<tr>
<td><em>Tight chest</em></td>
</tr>
<tr>
<td><em>First signs of a cold</em></td>
</tr>
<tr>
<td><em>Waking up at night due to coughing</em></td>
</tr>
</tbody>
</table>

*I do not feel good. I need to take rescue medicines and my controller medicines listed above to keep from getting worse.*

<table>
<thead>
<tr>
<th>Medicine</th>
<th>How much</th>
<th>How often</th>
</tr>
</thead>
</table>

*Call your provider if you have these symptoms frequently or if relief medicine does not work!*

<table>
<thead>
<tr>
<th>Peak Flow is: below (Below 50% of Best Peak Flow)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Medicine is not helping</em></td>
</tr>
<tr>
<td><em>Breathing is fast and hard</em></td>
</tr>
<tr>
<td><em>Can’t walk</em></td>
</tr>
<tr>
<td><em>Can’t talk well</em></td>
</tr>
</tbody>
</table>

*I need help now! I need to take these medicines and call my provider.*

<table>
<thead>
<tr>
<th>Medicine</th>
<th>How much</th>
<th>How often</th>
</tr>
</thead>
</table>

*If my breathing gets worse I will call 911 or go to the emergency department.*

**FOLLOWUP CARE INSTRUCTIONS**

Contact your child’s regular health care provider with further asthma questions. Your child’s breathing needs to be checked and the asthma management plan reviewed within 48 hours of discharge from the hospital.
Asthma at school

Since most children spend a lot of time in school or daycare, it is a good idea to work closely with the school nurse, teachers and daycare providers. School nurses and daycare leaders will inform all teachers, coaches, bus drivers and other school personnel about your asthma plan.

Make sure they have your asthma management plan — and make sure you give them updates regularly!

What is exercise-induced asthma?

Exercise is good for any child, but it is especially good for children with asthma. Exercise fine-tunes the lungs and heart so they can work better. Yet, for some children, such activity causes asthma symptoms.

This is called “exercise-induced asthma.” You may have had these symptoms with exercise for so long that you don’t know it is not normal to cough a lot after playing, or to get more tired than others.

How is it treated?

You take an inhaled short-acting rescue bronchodilator 10 to 15 minutes before starting exercise or activity. It prevents asthma symptoms for up to 4 hours.

Write your asthma care plan to include pretreatment with a bronchodilator before P.E. to avoid confusion about symptoms.
Resources for families

KidsHealth
kidshealth.org
Go to Kids’ Asthma Center for kid-friendly handouts, interactive games, asthma dictionary, movies and more!

Allergy and Asthma Network/Mothers of Asthmatics, Inc.
aanma.org
1-800-878-4403
Website has asthma information in simple terms and speaks to families living with a child who has asthma. Offers useful newsletter to families, asthma equipment products, books and videos.

American Lung Association
lungusa.org
Lung Helpline
1-800-lung usa (1-800-586-4872)
Call this number to speak with a nurse or respiratory therapist to get your asthma questions answered 7 a.m. to 9 p.m. Central Time, Monday through Friday. Calls are free, and in Spanish, too. Families can receive free asthma information packets and help to quit smoking.

Master Home Environmentalist program
In Seattle, call 206-441-5100
Speak with an asthma outreach worker for a free home visit on how to reduce indoor air pollutants and improve indoor air quality. Find a do-it-yourself assessment at alaw.org under Master Home program.

National Heart, Lung, and Blood Institute (NHLBI) Information Center, National Asthma Education and Prevention Program (NAEP)
nhlbi.nih.gov
301-592-8573
Links to the national asthma guidelines.

Allergen hypoallergenic products, mattress encasings
• allergycontrol.com
• natallergy.com
• Bed, Bath & Beyond or Target department store

Note: The inclusion of any resource or link does not imply endorsement by Seattle Children’s. Ask your healthcare provider before you act or rely upon any information from these resources.

To Learn More
• Ask your child’s healthcare provider
• seattlechildrens.org

Free Interpreter Services
• In the hospital, ask your nurse.
• From outside the hospital, call the toll-free Family Interpreting Line, 1-866-583-1527. Tell the interpreter the name or extension you need.