

Foreign Body Aspiration

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THE STORY IN ONE SENTENCE

An object is stuck in your airway, blocking the path air normally takes to reach your lungs.

“When something gets stuck in your airway, you suddenly choke and cough hard. Always think of this first in anyone who was just eating, playing with small objects, or putting something in their mouth.”

Normal anatomy — the body's job

Your airway is a clear, open tube that carries air from your nose and mouth down into your lungs. It is guarded by reflexes that snap the epiglottis shut during swallowing and trigger a powerful cough if anything tries to enter the windpipe. Keep this picture in your head, because all the symptoms make sense only as a change from this normal flow.

BODY'S JOB

The epiglottis (a flap at the top of your windpipe) closes when you swallow to route food into the esophagus (food tube) instead of the trachea (windpipe). If anything touches the larynx (voice box) when it should not, the larynx instantly triggers a cough reflex to blast the object back out. The trachea then splits into two bronchi — one to each lung — and the right bronchus is straighter and wider, so gravity pulls objects into the right side more often.

1. Air enters through your nose or mouth.
2. The epiglottis stays open during breathing, letting air pass over the larynx (voice box) and into the trachea (windpipe).
3. The trachea is a smooth tube about the width of your thumb in adults and as narrow as a pinky in young children.
4. The trachea splits into the right and left main bronchi at the level of your breastbone.
5. The right bronchus is wider and more vertical, so objects drop into the right side more easily.

6. Each bronchus branches into smaller airways that carry air deep into the lungs, where oxygen moves into the blood.

What breaks

An object slips past the epiglottis and larynx reflexes and gets stuck in the airway, blocking the path air normally takes. That one break upstream explains every symptom you see.

CLINICAL TERM

Foreign body aspiration occurs when an object bypasses the protective laryngeal reflexes and lodges in the larynx, trachea, or bronchus, causing partial or complete airway obstruction. The right mainstem bronchus is the most common site in adults due to its more vertical angle. The downstream clinical picture — sudden choking, coughing, a high-pitched noise on breathing in (stridor), unilateral wheezing, low oxygen (hypoxia), and respiratory distress — all point back to this single mechanical blockage.

How the body compensates

Your body tries to keep oxygen flowing by breathing faster and making your heart beat faster, but these responses cannot fix a mechanical blockage. Vital signs may look okay at first, but a complete blockage will cause oxygen levels to crash within minutes. The key is to recognize the sudden choking and act immediately, not wait for the oxygen number to drop.

1. {'what': 'You cough violently and repeatedly', 'why': 'The larynx senses the object and fires the cough reflex over and over, trying to blast enough air upward to push the object out of the airway.'}
2. {'what': 'You breathe faster (tachypnea)', 'why': 'Your brainstem detects low oxygen or high carbon dioxide in the blood and tells your lungs to breathe faster to try to pull more air past the blockage.'}
3. {'what': 'Your heart beats faster (tachycardia)', 'why': 'Your body is trying to pump oxygen-carrying blood around faster to make up for the reduced oxygen coming into the lungs.'}
4. {'what': 'You may make a high-pitched squeaky sound (stridor) when you breathe in', 'why': 'Air squeezing through a narrow gap makes the airway walls vibrate, producing a high-pitched noise on breathing in (stridor) — the same way a whistle makes sound when air is forced through a small opening.'}
5. {'what': 'Oxygen saturation starts to drop if the blockage is severe', 'why': 'Not enough air can reach the alveoli (tiny air sacs in the lungs where oxygen moves into the blood), so the oxygen level in your blood falls.'}

6. {'what': 'If the blockage is complete, you cannot make any sound and your oxygen crashes within 3–5 minutes', 'why': 'No air can move past the object, so no oxygen reaches the lungs, and the brain begins to run out of oxygen — this is a life-threatening emergency.'}

Domino effect

1. An object slips past the epiglottis and enters the trachea or bronchus instead of the esophagus — The person is eating, laughing, running, or distracted, so the epiglottis does not close in time or the object is inhaled during a sudden breath — gravity and airflow pull the object into the airway.
2. The object gets stuck in the larynx, trachea, or bronchus and blocks the airway partly or completely — The object is too big to pass through, or it wedges at a branch point or narrowing — now air cannot flow normally past it.
3. You suddenly choke, gasp, and cough violently — The larynx instantly senses the object and triggers a powerful cough reflex to try to blast it back out — this is your body's first-line defense.
4. If the blockage is partial, you hear a high-pitched noise on breathing in (stridor) (a high squeaky sound) when breathing in, and you may wheeze on one side — Air squeezes through the narrow gap around the object, making the airway walls vibrate and produce a high-pitched noise on breathing in (stridor). If the object is in one bronchus, that side gets less air and may wheeze or sound quiet while the other side sounds normal.
5. Your oxygen level starts to drop, and you breathe faster and faster — Not enough air is reaching the alveoli (tiny air sacs where oxygen enters the blood), so your brainstem tells your lungs to speed up to try to pull more air past the blockage.
6. If the blockage is complete, you cannot cough, speak, or make any sound, and your lips and fingertips turn blue (cyanosis) — No air can move at all — your oxygen level crashes, and the blood does not have enough oxygen to keep tissues pink, so they turn blue.
7. Without removal of the object, the brain runs out of oxygen within 3–5 minutes, leading to loss of consciousness, brain injury, and death — The brain needs a constant supply of oxygen to survive — once the oxygen is gone, brain cells start dying within minutes.
8. Removing the object (with back blows, abdominal thrusts, or bronchoscopy) opens the airway, and normal breathing returns immediately — The mechanical blockage is gone, so air can flow freely again — oxygen reaches the lungs, the oxygen level rises, and all the compensatory responses (fast breathing, fast heart rate, a high-pitched noise on breathing in (stridor)) stop because the root problem is fixed.

Symptoms · what the patient feels, and why

- Sudden coughing or gagging that starts while eating or playing: The object drops into the windpipe (trachea) or one of the breathing tubes (bronchi), and the body tries to kick it out with a strong cough reflex triggered by nerves in the airway lining.
- Wheezing (a high-pitched whistling sound when you breathe): The object partly blocks an airway tube, so air has to squeeze through a narrow gap—like blowing through a tiny straw—and that creates the whistling noise.
- A high-pitched noise on breathing in (Stridor) (a harsh, crowing sound when you breathe in): The object is stuck higher up in the voice box (larynx) or windpipe (trachea), making the opening very narrow; when air rushes through, it vibrates loudly, like wind through a narrow crack.
- Trouble breathing or breathing faster than normal: The blocked airway means less oxygen is getting to the lungs, so the brain tells the chest to breathe harder and faster to try to pull in enough air.
- Someone saw the person choke or put something in their mouth just before symptoms started: A witnessed choking episode tells you exactly when the object went down; the timing and the action together point straight to a foreign body as the cause.
- Drooling or refusing to swallow: If the object sits high in the throat near the voice box, swallowing hurts or feels blocked, so the person keeps spit in their mouth instead of swallowing it down.
- Blue lips or skin (cyanosis): The blockage is so tight that very little oxygen reaches the blood; without enough oxygen, the blood turns dark and the skin looks blue, especially around the lips and fingernails.
- Decreased or absent breath sounds on one side of the chest: The object lodged in one breathing tube (bronchus) stops air from flowing into that side of the lung, so when the doctor listens with a stethoscope, that side is quiet or silent.
- Coughing up blood (hemoptysis): Sharp edges of the object scrape and cut the delicate lining of the airway, breaking tiny blood vessels and mixing blood into the mucus that you cough up.

Focused exam

- History of sudden choking or coughing that started out of nowhere: Someone saw the child choke or put something in their mouth, or the coughing started suddenly with no cold or other reason. This history is the biggest clue that something is stuck in the airway, not asthma or infection.

- A high-pitched noise on breathing in (Stridor) (high-pitched squeaky sound when breathing in) or one-sided wheeze: A high-pitched noise on breathing in (Stridor) means the object is blocking the upper airway near the voice box. A wheeze heard on only one side of the chest means the object is lower, stuck in one of the main air tubes (bronchi). In asthma, both sides wheeze the same way because the whole airway squeezes down everywhere.
- Low oxygen level (pulse oximetry below 90%) or signs of breathing trouble (fast breathing, flaring nostrils, grunting): The object is blocking air from reaching the lungs, so oxygen cannot get into the blood. The body tries to fix this by breathing faster and working harder. These are alarm bells that the brain and heart are not getting enough oxygen.
- Drooling, trouble swallowing, or muffled voice: If the object is stuck high in the throat or voice box (larynx), it hurts to swallow and the voice sounds different. Drooling happens because the person cannot swallow their own spit due to pain or blockage.
- Asymmetric breath sounds—one side of the chest is quiet when you listen with a stethoscope: When you listen to the lungs, air moving makes a soft whooshing sound. If one side is quiet, it means air is not flowing through that side because the object is blocking the main air tube. This tells you exactly which side is blocked.
- Retractions (skin pulling in between the ribs or at the base of the neck), panic, or bluish skin (cyanosis) (blue lips or skin): These mean the airway is severely blocked and the body is running out of oxygen. Retractions show the body is using every muscle to pull air in. Blue skin means oxygen in the blood is dangerously low. This is a life-threatening emergency—the brain and heart are at risk.

Diagnostics · every test answers a question

- Pulse oximetry (oxygen saturation) → Is the body getting enough oxygen right now?
- Chest X-ray (inspiratory and expiratory views) → Is there air trapped on one side, or is part of the lung collapsed?
- Chest CT scan (computed tomography) → Can we see an object that did not show up on X-ray, or is there damage to the airway?
- Direct laryngoscopy or rigid bronchoscopy → Where exactly is the object, and can we remove it?
- Arterial blood gas (ABG) if the child is in severe respiratory distress → Is the body holding carbon dioxide in because breathing is failing?
- Complete blood count (CBC) if there are signs of infection → Is there an infection brewing in the lung after the aspiration?

Treatment logic

- Heimlich maneuver (abdominal thrusts) for children and adults, or back blows and chest thrusts for infants under 1 year → These maneuvers create sudden pressure that pushes air up from the lungs with force, like a cough on steroids. This burst of air can dislodge the object and push it out of the airway. In infants, back blows and chest thrusts are safer because abdominal thrusts can damage soft organs.
- Do NOT interfere if the person is coughing forcefully and air is still moving in and out → A strong cough is the body's most powerful tool to push the object out—it can generate more force than any external maneuver. Letting the cough work gives the best chance of clearing the object on its own. Interfering (like slapping the back) can cause the object to move deeper or completely block the airway.
- Rigid bronchoscopy under general anesthesia to visualize and remove the object → This is the definitive treatment. The doctor inserts a rigid metal tube down the airway, looks directly at the object with a camera, and removes it with forceps or a basket. Rigid bronchoscopy is preferred over flexible because it controls the airway, protects it during removal, and allows larger tools. Success rate is over 95%.
- Supplemental oxygen by nasal cannula or face mask during and after the event → Raises the oxygen level in the blood while the airway is partly blocked and while the child recovers after removal. This keeps the brain, heart, and other organs safe from damage due to low oxygen.
- Antibiotics (such as amoxicillin-clavulanate, ceftriaxone, or clindamycin) if pneumonia or lung abscess develops → Kills bacteria that moved into the lung when the airway was blocked or that came in on the foreign object itself (especially with food or dirty objects). This stops the infection from spreading and prevents sepsis (infection in the blood).
- Corticosteroids (such as dexamethasone) if there is severe airway swelling after removal → Reduces swelling (edema) in the airway tissues that happens after the object irritated or scraped the lining. This makes breathing easier and lowers the risk that swelling will re-block the airway.

Medications

Rigid bronchoscopy (tube with a camera and grasping tools) · Procedural intervention (not a medication)

A metal tube is passed through the mouth into the windpipe while the person is asleep under anesthesia. The doctor looks through the tube with a camera and uses tiny forceps (grabbing

tools) to grip the object and pull it out. This is the main way to remove a foreign body that is stuck in the airway.

1. The person is put to sleep with general anesthesia so they do not move or cough.
2. The rigid metal bronchoscope is gently pushed through the mouth and into the trachea.
3. The camera at the tip lets the doctor see exactly where the object is stuck.
4. Forceps or a basket tool is passed through the bronchoscope to grab the object.
5. The object is pulled out through the tube, keeping the airway safe.

SAFETY WATCH

Anesthesia risks (rare problems with breathing or heart rhythm while asleep) · Airway swelling after the tube is removed (watch for new a high-pitched noise on breathing in (stridor) or trouble breathing) · Bleeding if the object scraped the airway wall · Pneumothorax (collapsed lung) if the bronchoscope accidentally pokes through the airway wall (very rare)

Albuterol (a beta-2 agonist bronchodilator) · Short-acting beta-2 agonist (SABA)

Albuterol is a rescue inhaler that relaxes the tight bands of muscle wrapped around the small air tubes in the lungs. When a foreign body gets stuck, the airways downstream often clamp down (bronchospasm) because they are irritated. Albuterol flips a switch on the muscle cells (the beta-2 receptor) that tells them to relax and let the tube open wider. This makes it easier to breathe and can help the doctor see past the spasm during bronchoscopy.

1. Albuterol is breathed in as a mist through a nebulizer or inhaler.
2. It lands on the lining of the small airways and soaks through to reach the muscle layer.
3. It locks onto beta-2 receptors on the smooth muscle cells.
4. This triggers a chemical chain inside the cell that lowers calcium levels.
5. Less calcium means the muscle relaxes and the airway opens wider.

SAFETY WATCH

Fast heart rate (the drug can also tickle heart beta receptors) · Jitteriness or shakiness in hands · Low potassium in the blood if used in very high doses (rare in single rescue use)

Dexamethasone or Methylprednisolone (corticosteroids) · Corticosteroid (anti-inflammatory)

After a foreign body irritates or scrapes the airway, the lining swells up with inflammation (the body's alarm response). Steroids like dexamethasone or methylprednisolone turn down that

alarm by blocking the production of inflammatory chemicals (prostaglandins and leukotrienes) and by shrinking the number of white blood cells rushing to the area. This shrinks the swelling and keeps the airway open after the object is removed.

1. The steroid is given by mouth, through an IV, or as a shot into muscle.
2. It travels through the bloodstream and crosses into airway cells.
3. Inside the cell nucleus, it binds to a glucocorticoid receptor.
4. That receptor moves to the DNA and shuts off genes that make inflammatory chemicals.
5. Fewer chemicals means less swelling, less redness, and less mucus.

SAFETY WATCH

High blood sugar, especially in people with diabetes · Mood changes (irritability, trouble sleeping) with repeated doses · Stomach upset or increased appetite · Slightly higher infection risk if used for many days (but short courses for airway swelling are generally safe)

Antibiotics (Ampicillin-Sulbactam, Ceftriaxone, or Amoxicillin-Clavulanate) · Beta-lactam antibiotic (with or without beta-lactamase inhibitor)

If the foreign body sat in the airway for a while, bacteria from the mouth or the object itself can seed an infection in the lung tissue downstream (post-obstructive pneumonia). Antibiotics kill bacteria by breaking open their cell walls. The beta-lactam ring in these drugs jams the enzymes (penicillin-binding proteins) that bacteria use to build and repair their walls, so the bacteria burst and die. The added inhibitor (sulbactam or clavulanate) blocks enzymes that some bacteria make to chew up the antibiotic.

1. The antibiotic is given by mouth or through an IV.
2. It travels in the blood to the infected lung tissue.
3. The drug crosses into the bacteria and binds to penicillin-binding proteins on the inside of the bacterial cell wall.
4. This stops the bacteria from linking together the building blocks of their wall.
5. The bacteria swell, leak, and die because their wall falls apart.

SAFETY WATCH

Allergic reaction (rash, hives, or in rare cases anaphylaxis—life-threatening throat swelling and shock). Always ask about penicillin allergy before giving. · Diarrhea (antibiotics can upset the gut's normal bacteria) · Yeast infections in the mouth or genitals after a long course

Red flags

- A high-pitched noise on breathing in (Stridor) (harsh crowing noise when breathing in)—means the object is high in the airway and may fully block it any second
- Severe trouble breathing, blue lips or skin, or can't speak—the airway is nearly or completely blocked and the person is not getting enough oxygen
- Sudden silence after choking (no crying, no coughing)—may mean complete blockage; the person cannot move any air at all
- Fever, thick yellow or green mucus, or worsening cough days after the choking—may mean infection (pneumonia or abscess) has started in the blocked lung

Nursing priorities

1. Position the patient upright and leaning slightly forward; do NOT lay them flat — Gravity keeps the foreign body from moving deeper into smaller airways and reduces aspiration (breathing in) of secretions pooling above the obstruction; supine position lets the object migrate downward
2. Apply pulse oximetry continuously and start supplemental oxygen by nasal cannula or face mask to keep oxygen saturation above 92 percent — The foreign body blocks airflow to part of the lung causing ventilation-blood flow (perfusion) mismatch (blood flows to lung areas not getting air), which drops oxygen levels; supplemental oxygen increases the amount available to reach unblocked lung tissue
3. Keep the patient NPO (nothing by mouth) including water, food, and medications — Anything swallowed can go down the wrong pipe into the already compromised airway because protective reflexes are disrupted; also the patient will need procedural sedation for bronchoscopy which requires an empty stomach to prevent vomiting and aspiration
4. Prepare rigid bronchoscopy equipment and alert the operating room or procedural team immediately — Rigid bronchoscopy uses a metal tube inserted through the mouth into the trachea under anesthesia to directly see and grab the object with forceps; flexible scopes cannot provide the suction power or large grasping tools needed for most foreign bodies
5. Have emergency airway equipment at bedside including bag-valve mask, suction, laryngoscope, and endotracheal tubes of multiple sizes — The foreign body can shift suddenly and cause complete obstruction; laryngospasm (vocal cord spasm) or airway swelling (edema) (swelling) after manipulation may prevent normal breathing and require intubation (placing a breathing tube) to bypass the blockage

6. Monitor respiratory rate, work of breathing, and breath sounds every 15 minutes until the object is removed — Fast breathing (Tachypnea) (fast breathing), retractions (chest pulling in), and decreased or absent breath sounds on one side signal worsening obstruction or pneumothorax (collapsed lung from object poking through airway); early detection allows intervention before respiratory arrest
7. After removal, continue oxygen and monitor for at least 2 hours watching for a high-pitched noise on breathing in (stridor), increased work of breathing, or desaturation — Post-procedure laryngeal swelling (edema) and bronchospasm (airway muscle tightening) can develop from instrumentation trauma causing delayed airway narrowing; tissue injury also triggers mucus production that can plug small airways
8. Teach caregivers of young children to cut food into pieces smaller than one-half inch and avoid giving hard round foods like grapes, hot dogs, and nuts — Objects the size and shape of the pediatric airway diameter create ball-valve obstruction (air in but not out) or complete blockage; prevention education stops repeat episodes in high-risk populations

Sources

- American Academy of Pediatrics (AAP) Clinical Practice Guideline on Foreign Body Aspiration
- American College of Chest Physicians (ACCP) Guidelines on Airway Foreign Bodies
- Cochrane Review: Interventions for Inhaled Foreign Bodies in Children
- UpToDate: Foreign Body Aspiration in Children

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