

A Health Professional's Guide to Clean Cooking



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Minimizing the Health Risks of Gas Stoves

Health risks from gas stove pollution are [well documented](#).¹ Gas stoves produce indoor pollutants including carbon monoxide (CO), nitrogen dioxide (NO₂), and particulate matter (PM_{2.5}). Numerous studies over the past 40 years have shown that indoor air pollution from gas stoves can reach levels that would be [illegal outdoors](#).² Exposure to elevated NO₂ emissions from gas stoves can exacerbate respiratory conditions like asthma and is linked to other health risks like cardiovascular disease, diabetes, cancer, and reproductive effects.

The [Environmental Protection Agency](#) estimates that the air indoors is often more polluted than outdoor air.³ And because we spend nearly [90 percent](#) of our time indoors, there are several actions homeowners and renters can take to reduce their exposure to gas stove pollution.⁴



1. Install a carbon monoxide monitor.

A gas stove can be one of the main sources of indoor carbon monoxide. Install a CO monitor to ensure safe air quality and prevent carbon monoxide poisoning. For more sensitive populations, such as people with underlying cardiovascular problems, sensors that detect CO at lower levels may be a good option.



2. Check ventilation.

[Studies](#) show that most people do not use the exhaust hoods over their stoves—the main reason being that they don't believe the hoods are necessary.⁵ While ventilation cannot eliminate gas stove pollution, using exhaust hoods (either recirculating hoods or those that vent outdoors) can reduce exposure to indoor pollutants and benefit health. In one California utility district, the annual public health burden of not using a range hood while cooking has been estimated at nearly [\\$1 million per 100,000 people](#).⁶ There are [resources](#) available to help people determine how well their range hood removes particulates from the air.⁷



3. Cook on back burners.

The exhaust hood is likely to remove more cooking fumes if people cook on the back burners as opposed to the front burners.



4. Open a window.

If you don't have a range hood, consider opening a window to allow for better air circulation. Opening windows for even five minutes can help decrease indoor air pollution, although the usefulness depends on outdoor temperature and air quality.



5. Eliminate gas cooking.

Research has shown that when properly vented to the outdoors, many exhaust hoods can be effective at removing PM_{2.5} but [not all NO₂](#) from gas stoves.⁸ In order to remove pollutants like NO₂ from the home environment, gas stoves need to be eliminated. Long-term, induction stovetops are preferable to electric resistance-coil stoves and gas stoves because they're also more energy-efficient.

Switching to Induction Stoves for Better Health

Induction stove technology creates an electromagnetic field below the glass cooktop surface that transfers current directly to magnetic cookware, causing it to heat up. Induction stoves are compatible with any pot or pan that has magnetic properties. It's easy to find compatible cookware. Switching to an induction stove is a preferred long-term solution for the following reasons:



1. Safety

Induction stoves don't have hot coils or open flames, meaning the stovetop surface stays cool around the pot even when the stove is on. This makes them more child-safe compared to both gas and electric coil stoves. They also have [additional safety features](#) that help avoid cooking fires by turning off burners if no pot or pan is detected.⁹



2. Speed and efficiency

Induction stoves offer more than twice the heat-up efficiency of gas stoves. They can bring water to a boil [in minutes](#).¹⁰ This is because induction transfers most of the energy directly to the pan and food that's being cooked, rather than the less efficient transfer of energy that occurs through radiant heat or convection of the surrounding air when using an electric heating element or open flame.



3. Increasingly affordable

Due to the low adoption rate in the United States, induction stoves have historically been expensive. However, today, prices are declining. The cost of a single induction plug-in cooktop runs as low as \$40. Costs for induction ranges (stove and oven) start around \$1,000. Some local utility districts offer incentives and rebates for removing gas stoves, so be sure to check before completing the purchase.



4. Cooler

Because induction stoves heat up food more directly, they create less waste heat when compared with electric or gas stoves. This means that during hot summer months, they don't create as much heat in the kitchen and require less air conditioning to keep cool.

Special Considerations for People with Pacemakers and Insulin Pumps

Induction stoves emit electromagnetic fields (EMF) that are non-ionizing and don't damage DNA or cells directly. [Research suggests](#) that this type of EMF, which is similar to that from a compact fluorescent bulb, is [not harmful](#) to the general population.¹¹ But individuals with pacemakers and insulin pumps should be aware of potential considerations. For these two groups, an electric smooth-top stove can be a pollution-reducing option without a magnetic field.

Pacemakers: The issue warrants more research, because studies conducted thus far have found mixed results. One [2013 analysis](#) states induction stoves should not interfere with the performance of pacemakers, whereas another [2006 report](#) warns of risks for patients with unipolar and left-sided pacemakers.¹²

In general, it's recommended to keep at least [two feet of distance](#) between the stovetop and pacemaker.¹³ Even a distance of [two to four inches](#) from the stove can greatly reduce exposure to magnetic fields.¹⁴

Insulin Pumps: Induction stoves may not be suitable for patients with insulin pumps because the electromagnetic waves could potentially damage the pump's motor that regulates insulin delivery. This [might cause overdelivery](#) and, ultimately, hypoglycemia.¹⁵

Endnotes

¹ Brady Seals and Andee Krasner, *Health Effects from Gas Stove Pollution*, RMI, Physicians for Social Responsibility, Mothers Out Front, and Sierra Club, 2020, <https://rmi.org/insight/gas-stoves-pollution-health>.

² Ibid.

³ "Indoor Air Quality," Environmental Protection Agency, accessed July 20, 2021, <https://www.epa.gov/report-environment/indoor-air-quality>.

⁴ Ibid.

⁵ Brett Singer et al., *Effective Kitchen Ventilation for Healthy Zero Net Energy Homes with Natural Gas*, Lawrence Berkeley National Laboratory, 2021, <https://www.energy.ca.gov/sites/default/files/2021-05/CEC-500-2021-005.pdf>.

⁶ Ibid.

⁷ "Ducted Range Hoods: Recommendations for New and Existing Homes," Reducing Outdoor Contaminants in Indoor Spaces (ROCIS), accessed July 27, 2021, <http://rocis.org/range-hood-document>.

⁸ Wanyu R. Chan et al., *Simulations of Short-Term Exposure to NO₂ and PM_{2.5} to Inform Capture Efficiency Standards*, Lawrence Berkeley National Laboratory, March 2020, <https://escholarship.org/uc/item/6tj6k06j>.

⁹ "Can Induction Cooktop Cause Fire? - Possible Causes and Precautions," Cookery Space, n.d. <https://cookeryspace.com/can-induction-cooktops-cause-fire/>.

¹⁰ Denis Livchak, Russell Hedrick, and Richard Young, *Residential Cooktop Performance and Energy Comparison Study*, Frontier Energy, July 2019, <https://www.smud.org/-/media/Documents/Corporate/About-Us/Energy-Research-and-Development/Induction-Range-Final-Report---July-2019.ashx>.

¹¹ "Electromagnetic Fields and Cancer," National Cancer Institute, accessed July 19, 2021, <https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/electromagnetic-fields-fact-sheet#what-are-common-sources-of-non-ionizing-emfs>; and "Induction Stoves," Physicians for Social Responsibility Greater Boston Chapter, accessed July 27, 2021, <https://gbpsr.org/issues/electrification/induction-stoves/>.

¹² Maria Tiikkaja et al., "Electromagnetic Interference with Cardiac Pacemakers and Implantable Cardioverter-Defibrillators from Low-Frequency Electromagnetic Fields in Vivo," *EP Europace* 15, no. 3 (2013): 388-394, <https://doi.org/10.1093/europace/eus345>; and Werner Irnich and Alan D. Bernstein, "Do Induction Cooktops Interfere with Cardiac Pacemakers?" *EP Europace* 8, no. 5 (2006): 377-384, <https://doi.org/10.1093/europace/eul014>.

¹³ "Heart Matters: Ask the Doctor," British Heart Foundation, accessed July 27, 2021, <https://www.bhf.org.uk/informationsupport/heart-matters-magazine/medical/ask-the-experts/induction-hobs-and-pacemakers>.

¹⁴ "Induction Hobs," Eidgenössisches Departement des Innern EDI, accessed July 27, 2021, <https://www.brooklinema.gov/DocumentCenter/View/20416/faktenblatt-induktionskochherd-e?bidId=>.

¹⁵ "Is there a serious risk to your insulin pump in your kitchen?" Juvenile Diabetes Research Foundation, accessed July 27, 2021, <https://jdrf.org.uk/news/induction-hob-magnetic-field-danger-insulin-pump/>.