

Indoor air quality at home

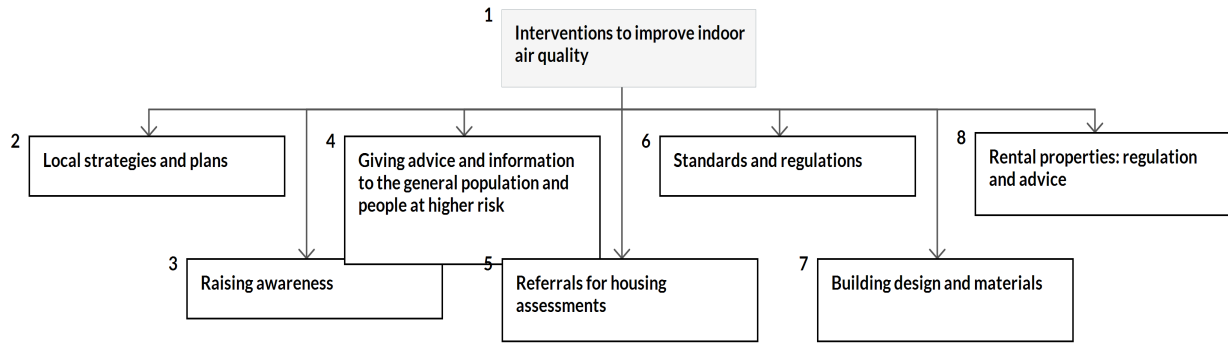
NICE Pathways bring together everything NICE says on a topic in an interactive flowchart. NICE Pathways are interactive and designed to be used online.

They are updated regularly as new NICE guidance is published. To view the latest version of this NICE Pathway see:

<http://pathways.nice.org.uk/pathways/air-pollution>

NICE Pathway last updated: 30 October 2020

This document contains a single flowchart and uses numbering to link the boxes to the associated recommendations.



1 Interventions to improve indoor air quality

No additional information

2 Local strategies and plans

NICE has produced a [visual summary on improving indoor air quality](#).

These recommendations are for local authorities.

Embed a plan for improving indoor air quality in an existing strategy or plan to improve people's health. This could be a general air quality strategy if one exists. Otherwise, for example, include it in a strategy on housing, health and wellbeing, or inequalities.

Ensure the strategy or plan takes account of the housing conditions that put people at increased risk of exposure to poor indoor air quality and especially people who are particularly vulnerable to ill health as a result of such exposure (see [factors that increase risk of ill health due to exposure to poor indoor air quality \[See page 14\]](#)).

Emphasise the need for a balanced approach to ventilation, insulation and heating for good indoor air quality. (See [raising awareness \[See page 4\]](#) and [giving advice and information to the general population \[See page 5\]](#) and [the NICE Pathway on excess winter deaths and illnesses associated with cold homes](#).)

Encourage joint working between local authority departments, across different local authorities, with local health and social care providers, and with voluntary, community and social enterprise organisations and other organisations with an interest in indoor air quality, to improve air quality in people's homes (see [raising awareness \[See page 4\]](#) and [giving advice and information to the general population \[See page 5\]](#)).

Encourage the use of existing home visits to identify poor indoor air quality. For example, visits to people's homes by housing officers, environmental health practitioners, community health services, social workers, care workers, and fire and rescue services.

Encourage the use of local inspection protocols to identify poor indoor air quality during home visits. This may include visual inspections, checklists and the monitoring of pollutant levels. Use this information to identify other homes that may be at increased risk of poor indoor air quality.

Encourage joint working with external organisations to inform home improvement programmes and identify grants to combat poor indoor air quality.

Monitor progress against the goals of the strategy. Use audit data plus [factors that increase risk of ill health due to exposure to poor indoor air quality \[See page 14\]](#) to identify people who may be vulnerable and properties that are at risk.

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

3 Raising awareness

NICE has produced a [visual summary on improving indoor air quality](#).

These recommendations are for local authorities.

Use existing communication strategies to ensure members of the public and relevant professionals (those involved in planning, designing, building, renovating and maintaining homes) are aware of:

- the causes of poor indoor air quality
- how residents' activities can affect air quality
- how health is affected by poor indoor air quality
- who is particularly vulnerable (see [people who may be vulnerable \[See page 14\]](#))
- how to prevent or reduce poor indoor air quality.

Use existing professional development opportunities to ensure local authority staff who visit people in their homes (such as housing, healthcare and social care professionals):

- know about the sources of indoor air pollutants and how they can affect health
- can give general advice on how to avoid activities that increase the level of indoor air pollutants (see [giving advice and information \[See page 5\]](#))
- can give general advice on how to improve ventilation if the source of the pollutant cannot be controlled (see [giving advice and information \[See page 5\]](#))
- are aware that affordability may be a barrier to effective and efficient heating and ventilation
- know that tenants may not be allowed to repair or alter building fabric, fixtures or fittings
- know who can provide help with repairs and necessary improvements (for example, the local authority or a home improvement agency)
- can give advice to people on how to request a housing assessment (see [referrals for](#)

- [housing assessments](#) [See page 8]).

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

4 Giving advice and information to the general population and people at higher risk

NICE has produced a [visual summary on improving indoor air quality](#).

General population

These recommendations are for local authorities.

Advise people on how to reduce damp and condensation and prevent mould. For example, by:

- using background ventilation (such as trickle vents, or whole-house mechanical ventilation systems)
- using mechanical ventilation systems (such as extractor fans), and opening windows where possible and safe to provide temporary increased ventilation
- avoiding moisture-producing activities (such as air-drying clothes) indoors if possible, or improving ventilation if these cannot be avoided
- repairing sources of water damage and ensuring that residual moisture is removed.

Advise people on how to use trickle vents correctly.

Tell people that the following activities may lead to poor indoor air quality and that they should think about increasing ventilation (by using extractor fans in the bathroom or kitchen, or opening windows if possible and safe):

- using cookers, especially gas cookers
- using open solid-fuel fires
- using candles
- using free-standing gas heaters
- using cleaning products, household sprays or aerosols and paints
- having a bath or shower
- air-drying clothes in the home.

Advise people not to use unflued paraffin heaters in the home.

Advise people to follow the product instructions when using, for example, candles, paints, glues and solvents, to minimise exposure to pollutants.

Advise people to choose low-emission materials (for example, products with a low VOC or formaldehyde content and emissions) if furniture or flooring needs replacing.

Advise people installing a new cooker about the need for ventilation, especially for gas cookers.

Advise people not to use gas cookers to heat a room.

Encourage people not to smoke in the home (see [the NICE Pathway on smoking](#) for recommendations on stopping smoking, including in pregnancy and after childbirth).

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

Also see healthcare professionals' advice for women who are pregnant or who have given birth in the past 12 months below and [advice for property managers and landlords](#) [See page 10].

People with asthma/other respiratory conditions or cardiovascular conditions

These recommendations are for healthcare professionals.

Explain that indoor air pollutants (including nitrogen dioxide, damp, mould, particulate matter and VOCs) can trigger or exacerbate asthma, other respiratory conditions or cardiovascular conditions.

If a person has repeated or worsening respiratory symptoms such as a cough or wheezing, ask about their housing conditions. If these are a concern, help them request a housing assessment from the local authority (see [referrals for housing assessments](#) [See page 8]).

Advise people whose asthma is triggered by household sprays, air fresheners or aerosols to:

- avoid using them
- use non-spray alternatives.

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

Also see advice and information for the general population above for recommendations on ventilation and controlling sources of pollution and [the NICE Pathway on asthma](#).

People with allergies to house dust mites

This recommendation is for healthcare professionals.

Advise people who are allergic to house dust mites how to reduce their exposure to them. This includes:

- avoiding second-hand mattresses if possible
- using allergen barriers such as mattress and pillow covers
- washing bedding regularly.

See the NICE guideline to find out [why we made this recommendation and how it might affect practice](#).

Also see advice and information for the general population above for recommendations on ventilation and controlling sources of pollution and [NHS advice on allergen avoidance](#).

Women who are pregnant or have given birth in past 12 months

These recommendations are for healthcare professionals.

Ask about the person's housing conditions. If housing factors are a health concern, for example, because of damp or lack of ventilation, help them request a housing assessment from the local authority (see [referrals for housing assessments \[See page 8\]](#)).

Advise women who are pregnant that they are at increased risk of ill health from exposure to poor indoor air quality. Advise people who care for babies under 12 months old that the baby is at increased risk. Both groups should:

- reduce their use of household sprays, air fresheners and other aerosols, and always follow product instructions
- if possible, avoid or reduce activities that produce particulate matter such as using open solid-fuel fires or candles
- always keep the room well ventilated during these activities.

Explain that other people's tobacco smoke is a risk to a woman who is pregnant and her baby, before and after birth. Advise not smoking in the home or around the woman and her baby. (Also see [the NICE Pathway on stopping smoking in pregnancy and after childbirth](#).)

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

5 Referrals for housing assessments

NICE has produced a [visual summary on improving indoor air quality](#).

These recommendations are for local authorities.

Develop a structured process so that health and social care professionals and housing and local authority staff can use existing referral pathways to help people request a housing assessment if poor indoor air quality has been identified or is suspected, for example, by using these [housing condition factors](#) [See page 14].

Advise health and social care professionals and housing and local authority staff on how to help someone request a housing assessment if poor indoor air quality is identified or suspected, for example, by using these [housing condition factors](#) [See page 14].

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

6 Standards and regulations

NICE has produced a [visual summary on improving indoor air quality](#).

These recommendations are for regulators and building control teams.

Update existing standards, for example building regulations, or develop new ones for indoor air quality. Base them on current safe limits set for pollutants in residential developments. See, for example, WHO [guidelines on selected pollutants](#) (2010) and [dampness and mould](#) (2009), and the [Public Health England indoor air quality guidelines for selected VOCs](#) (2019).

Use existing building regulation enforcement activities to improve indoor air quality. Ensure enforcement takes place within the specified timelines. (See the [government's Building Regulations 2010](#) and [Housing health and safety rating system operating guidance](#), and the [Planning Portal's Failure to comply with the building regulations](#).)

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

7 Building design and materials

NICE has produced a [visual summary on improving indoor air quality](#).

These recommendations apply both to building new homes and renovating or refurbishing existing homes.

Avoiding sources of pollutants

These recommendations are for architects and designers.

Consider specifying building materials and products that only emit a low level of formaldehyde and VOCs. Use existing labelling schemes or other available information on product emissions (for example, on product labels) to make these specifications.

Design or specify heating systems that minimise exposure to particulate matter.

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

These recommendations are for builders, contractors and developers.

Ensure products and materials comply with building regulations, design specifications and the manufacturer's guidance on installation and commissioning.

Use materials that emit a low level of formaldehyde and VOCs as specified. If materials need to be substituted, only use products with the same or lower emission levels.

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

Heating and ventilation

These recommendations are for architects and designers.

Adopt a whole-building approach to heating and ventilation to ensure indoor air quality is maintained while achieving standards for energy use. (Also see [the NICE Pathway on excess winter deaths and illnesses associated with cold homes](#).)

Ensure design strategies include provision for removing indoor air pollutants, for example by:

- specifying kitchen extractor fans or cooker hoods that extract to the outside, and are easily accessible for cleaning or maintenance, with simple instructions for residents
- when safe and appropriate to do so, specifying that all habitable rooms are provided with windows that are openable and that windows or openings meet the purge ventilation requirements (see the [Ministry of Housing, Communities and Local Government's advice on ventilation](#)).

Design ventilation systems to reduce or avoid exposure to outdoor air pollution. For example:

- ensure windows that open face away from sources of outdoor air pollution, such as busy roads
- fit mechanical systems with filtration to protect against outdoor pollutants. (Also see the [government clean air strategy 2019](#).)

When building dwellings or refurbishing them to improve thermal performance, ensure there is permanent, effective ventilation.

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

These recommendations are for builders, contractors and developers.

Ensure all heating and ventilation is installed and commissioned in accordance with the manufacturer's instructions and meets building regulation requirements.

Ensure all installed heating and ventilation systems are easily accessible for regular maintenance.

Ensure any variations to the heating and ventilation specification comply with design specifications and building regulations (see the [Ministry of Housing, Communities and Local Government's advice on ventilation](#)).

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

8 Rental properties: regulation and advice

NICE has produced a [visual summary on improving indoor air quality](#).

These recommendations are for local authorities and cover both private and public rented

housing.

Using regulatory powers

Use existing regulatory powers to:

- reduce people's exposure to pollutants in their homes by ensuring identified problems such as damp and mould are fixed promptly
- ensure homes have suitable and efficient heating and ventilation (see the [Ministry of Housing, Communities and Local Government's advice on ventilation](#) and [Housing health and safety rating system operating guidance](#), and the [NICE Pathway on excess winter deaths and illnesses associated with cold homes](#)).

See the NICE guideline to find out [why we made this recommendation and how it might affect practice](#).

Advising private and social tenants

Advise private and social tenants to contact their landlord if:

- ventilation is not adequate (for example, if the ventilation system is not working, trickle vents are blocked or damaged, extractor fans in the kitchen or bathroom are not working, or if excessive noise from the fans discourages their use)
- repairs are needed to prevent water from entering their building
- improvements to heating or insulation are needed to prevent condensation.

Advise private and social tenants to contact their local authority if no action is taken to improve ventilation or carry out repairs (see the [government guides on private renting and council housing](#), and the [Guide for tenants: Homes \[Fitness for Human Habitation\] Act 2018](#)).

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

Advising property managers and landlords

Advise property managers and landlords to:

- develop and undertake maintenance programmes for heating and ventilation systems.
- provide clear, easy-to-understand instructions telling residents how to use the heating and ventilation systems effectively.

Advise property managers and landlords about:

- the health risks associated with poor indoor air quality
- methods to control and minimise identified sources of indoor air pollution (see [building design and materials \[See page 9\]](#))
- their responsibilities for maintaining the property.

Advise property managers and landlords to:

- use low-pollutant-emission items when replacing furniture or flooring (for example, furniture or flooring with a low formaldehyde content and emission)
- ensure rooms are well ventilated and that the manufacturer's guidelines for use of materials are followed
- ensure there is adequate ventilation provision before installing a new cooker (especially a gas cooker).

See the NICE guideline to find out [why we made these recommendations and how they might affect practice](#).

Ensuring standards of private and public rental properties

Where a housing assessment has identified problems in private or public rented housing that may contribute to poor indoor air quality, ensure the property has:

- heating appliances and ventilation systems that:
 - comply with design and performance requirements
 - are correctly installed and tested
 - keep properties warm and ventilated without excessive heat loss or draughts.
- ventilation that prevents the build-up of pollutants, including:
 - trickle vents
 - working mechanical ventilation systems, such as extractor fans, in bathrooms and kitchens
 - windows that open (but not onto busy roads or other major sources of outdoor air pollution)
- cooking appliances that:
 - comply with design and performance requirements
 - are correctly installed and tested.

Where a housing assessment has identified water damage in private or public rented housing, ensure that any water damage is repaired as soon as possible and the property has properly dried out.

See the NICE guideline to find out why we made these recommendations and how they might affect practice.

Housing condition factors

Housing conditions that put people at increased risk of exposure to poor indoor air include:

- location (external factors such as high levels of outdoor air pollution, or where noise or security risks mean residents do not open windows)
- physical infrastructure (such as small room size, inadequate ventilation and the building's layout and orientation)
- standard of housing (for example, with damp and mould or physical disrepair including flood damage or with unflued or poorly maintained fuel-burning appliances)
- overcrowding.

People who may be vulnerable

People who are particularly vulnerable to ill health as a result of exposure to poor indoor air quality include:

- people with a pre-existing health condition such as asthma, allergies, COPD and cardiovascular disease
- pregnant women and their unborn babies
- pre-school children
- older people
- people who live in poor-quality housing
- people exposed to tobacco smoke in their homes
- people who live in poverty.

Factors that increase risk of ill health due to exposure to poor indoor air quality

People who may be vulnerable

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- people with a pre-existing health condition such as asthma, allergies, COPD and cardiovascular disease
- pregnant women and their unborn babies
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- standard of housing (for example, with damp and mould or physical disrepair including flood damage or with unflued or poorly maintained fuel-burning appliances)
- overcrowding.

There are a number of activities that might contribute to poor indoor air quality (see [giving advice and information to the general population \[See page 5\]](#)).

Glossary

particulate matter

(also referred to as PM or particle pollution is a complex mixture of solid or liquid particles suspended in air: these particles can vary in size, shape and composition; indoor particulate matter can be generated through cooking, combustion [including candles, open solid-fuel fires, unvented space heaters or paraffin heaters] and smoking)

purge ventilation

(manually controlled ventilation of rooms or spaces at a relatively high rate to rapidly dilute pollutants or water vapour, for example by opening a window or using a fan)

VOC

volatile organic compound

VOCs

volatile organic compounds

WHO

World Health Organization

Sources

Indoor air quality at home (2020) NICE guideline NG149

Your responsibility

Guidelines

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Technology appraisals

The recommendations in this interactive flowchart represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, health professionals are expected to take these recommendations fully into account, alongside the individual needs, preferences and values of their patients. The application of the recommendations in this interactive flowchart is at the discretion of health professionals and their individual patients and do not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.

Commissioners and/or providers have a responsibility to provide the funding required to enable the recommendations to be applied when individual health professionals and their patients wish to use it, in accordance with the NHS Constitution. They should do so in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Medical technologies guidance, diagnostics guidance and interventional procedures guidance

The recommendations in this interactive flowchart represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take these recommendations fully into account. However, the interactive flowchart does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Commissioners and/or providers have a responsibility to implement the recommendations, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity, and foster good relations. Nothing in this interactive flowchart should be interpreted in a way that would be inconsistent with compliance with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.