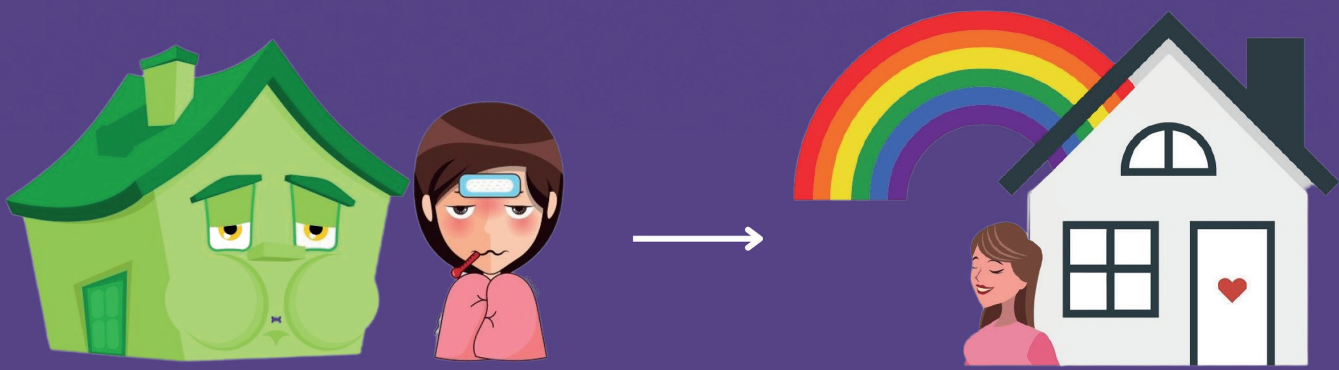
HEALTHY HOMES AND BEYOND IAQ

HEALTH BEGINS AT HOME



Information bundle

Indoor air quality

What is indoor air quality?

Indoor air quality is the air quality within a building and its structure - the air that we are all breathing right now.

Sources of indoor air pollution

- Damp
- Mould
- Condensation
- Dustmites
- VOC's from:
  - -Candles & incense stick
  - -Lack of adequate ventilation
  - -Domestic cleaning products
  - -Air fresheners
  - -bacteria & viruses
  - -Pet dander
  - -cooking
  - -gas/heating appliances

Most vulnerable to poor IAQ

- Asthma/allergies
- COPD
- Lung cancer
- Cardio vascular
- Older people
- Preschool children
- Pregnant women/unborn babies
- People who live in poor quality housing
- People exposed to tobacco smoke in home
- People who live in poverty

28000 -36000 early deaths per year in UK due to indoor air pollution

IAQ monitoring

- IAQ Formaldehyde
- Mould DNA analysis
- Surface dust samples
- IAQ monitoring subscriptions
  - this is continued monitoring
- Tobacco smoke check

+many more

These are some examples of monitoring that we do at Healthy Homes and Beyond IAQ

Monitoring equipment

What is mould?

Mould belongs to the kingdom of fungi. Fungi can be grouped as:

- Mushrooms
- Yeast
- Mould

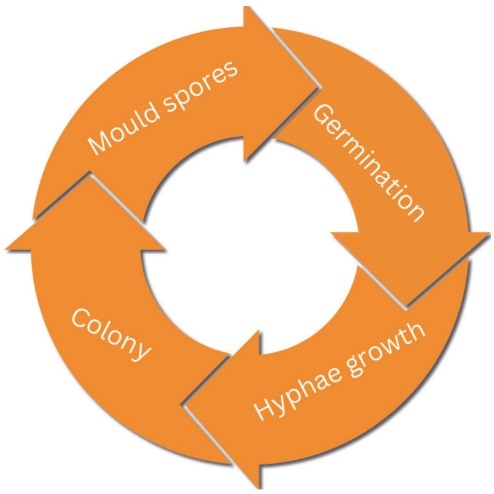
To grow mould needs:
Temperature - some mould is warm loving/some is cold loving.
Nutrients - mould needs a food source. Plasterboard, drywall, dust and dirt support mould growth. Metal and synthetic are not a food source.
Moisture - mould requires moisture to grow.

Mould spores are everywhere. they are invisible to the naked eye, so they have to be measured.
They are known to trigger asthma and allergies.
Mould spores are a particulate.

Growth cycle

Once a mould spore lands in the correct growth environment it will firstly germinate . It can then grow as quickly as 48 hours.

Any water damaged materials should be cleared/ dried within 24 - 48 hours to prevent not only moisture damage but also mould damage.



Types of mould

- **Aspergillus -** Prefers warmer conditions therefore can cause infections in our warm bodies.
- **Cladosporium -** Most common mould, found both indoors and outdoors.
- **Penicillium -** Prodcues the antibiotic penicillin.
- **Stachybotrys -** Can produce mould toxins (mycotoxins). Is considered a water damage indicator.

Dampness & health

Dampness may be a better predictor of health effects in water damaged buildings than just direct measurements of mould concentration in the air.

What is unwanted excessive moisture?

Dampness

In water damaged buildings there are contaminants other than mould including -

- Bacteria growth
- Insects
- Rodents
- Dust mites
- Wood boring insects

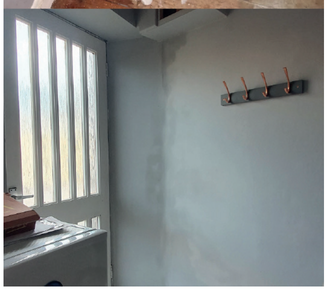
These can all cause health issues.

Book recommendation - Damp indoor spaces & health by the Institute of medicine

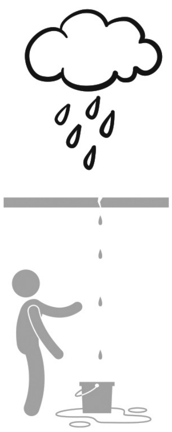
The presence of mould may mean the presence of mould spores, mycotoxins, microbial VOC's, fungal beta glucans, fungal fragments and allergic proteins.

Identifying and solving mositure problems addresses the root cause of mould growth and can help prevent future problems.

Find the moisture → Solve the problem

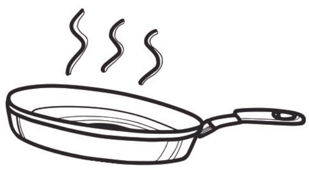


Sources of damp



External:
- Gutters
- Downpipe
- Drains
- Roof leak
- Ecessive rain

Internal:
- Leak
- Lack of ventilation
- Lifestyle e.g.
  - -cooking
  - -cleaning
  - -showering



Allergies

Allergens cause allergies and a allergy is thought to be an over exaggerated immune response.

An allergen is a specific type of antigen your body views as dangerous. an antigen is a substanace recognised by the immune system.

IgE- immunoglobulin antibody

When initially exposed to an allergen, B cells release antigenspecific antibody (IgE) which binds to a mast cell. e.g basically if you breathe in pollen your body will release an antibody specific to that pollen. In essence it is priming the body so that the next time you are exposed the body recognises it.

Mast cell - a type of white blood cell

The allergen binds to the matching antibody causing the release of histamine which causes blood vessels to dilate and increase their permeability leading to allergy symptoms eg running nose.

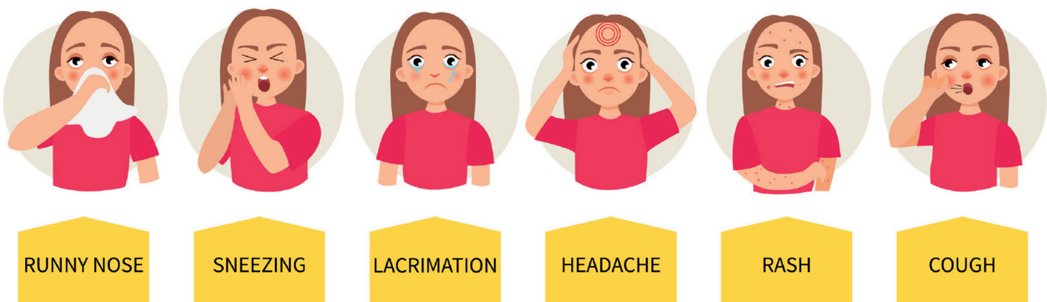
Most common allergens:

- Dust mites - indoor, require humidity
- Pets - cats/dogs saliva and skin cells
- Rats & mouse allergens
- Pollen - outdoor allergen

The following can be an asthma trigger:

- Animal fur & feathers
- Dustmites - love human skin cells and humanity (bed/couch/carpet)
- Cockroaches
- Dander

Common Allergy symptoms



VOC's

VOC's are emitted as gases from certain solids/liquids. VOC's include a variety of chemicals, some of which may have short/long term adverse health effects.

VOC's- volatile organic compounds

'Volatile' means that the compound will vaporise spontaneously at the given indoor conditions. 'Organic' means containing carbon molecules also means naturally occurring. Concentration of many VOC's are consistently higher indoors than outdoors.

Off gassing is the term used when molecules escape off a solid or liquid surface in a chemical vapour form. Whenever you smell a product its off gassing. It happens the most when a product is new (new house smell/new car smell)

Common types of VOC's

- Formaldehyde
- Benzene
- Perchloroethylene
- Limonene
- Pinene
- Kylene
- 1-4 Dichlorobenzene
- Alcohols, Isopropanal, Ethanol
- Keytones - Methyethel

Sources of VOC's

- Cleaning products
- Air fresheners
- Building materials
- Paint
- Furniture
- Personal care products
- Varnish
- Cooking
- Carpets
- Humans

Reducing VOC's

- Low VOC alternative
- Ventilation
- Be aware of VOC content in products
- Try to not bring in VOC's

Symptoms of VOC's

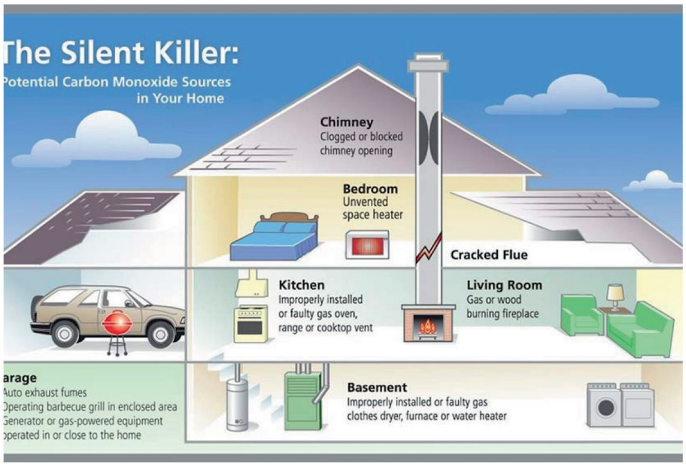
- Eye, nose and throat irritation
- Headache
- Difficulty breathing
- Fatigue
- Dizziness
- Skin reaction

Some VOC's are carcinogens which means they cause cancer.

Carbon monoxide

Carbon monoxide (CO) is colourless, odourless gas that can be deadly. It is a by-product of incomplete combustion.
Potential sources of combustion:

- Furnace
- Boiler
- Generators
- Grills (BBQ)
- Car exhaust
- Water heaters
- Gas powered tools



Homes being built with less air (airtight homes) are advised to use closed combution appliances that use power venting

According to the Office for National Statistics and the Carbon Monoxide and Gas Safety Society, approximately 50 people die from CO poisoning each year in the UK

Our red blood cells are filled with hemoglobin, which carries oxygen throughout your body. Exposure to carbon monoxide prevents the blood's ability to carry oxygen to body tissues and vital organs. When CO is inhaled, it combines with hemoglobin producing carboxyhemoglobin (COHb), which greatly diminishes hemoglobin's oxygen-carrying capacity.

At low concentrations, there might be difficulty breathing during strenuous exercise, as the concertation increases we see more serious health effects such as headaches, confusion and ultimately death.

Carbon monoxide monitor

Building material

The impact of building materials and construction methods on the health and wellbeing of occupants is often overlooked. The buildings we inhabit are contaminated with hazardous and toxic materials that we breath in everyday. Architects, builders, their clients, government bodies and the medical profession refuse to deal with the environmental causes of ill health and indoor air quality is ignored.

Sick building syndrome includes a range of symptoms thought to be linked to spending time in a certain building (eg home, work) but no specific illness or cause can be identified.

Symptoms include headaches, dizziness, nausea, aches/pains, fatigue, poor concentration, shortness of breath/chest tightness, eye/throat/nose irritation and skin irritation.

Breathability is the ability to buffer moisture – to soak it up and then release it. Most natural building materials are breathable, and you'll need to ensure you don't seal them up behind finishes that will trap moisture.

Hemp crete

Straw bale

Hemp wool insulation

Toxic building materials

- Treated timber
- Flame retardents
- Adhesives and sealents
- Asbestos
- Fibreglass
- Polyurethane spray foam
- Expanded & extruded polystyrene

Alternative building materials

- Timber (non treated)
- Hempcrete/Limecrete
- Strawbale
- Cob
- Breathaboard
- Hemp/Wool insulation
- Wood fibre
- Lime plasters and renders
- Natural paints/stains (plant based resins, oils, dyes)